2024 Annual Groundwater Monitoring and Corrective Action Report

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25224067.00 | January 31, 2025

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OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Primary Ash Pond
2024 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) unit. The groundwater monitoring system for the Primary Ash Pond at the Columbia Energy Center (COL) monitors a single existing CCR unit. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was an SSI over background for one or more constituents listed in Appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and	<u>October 2023</u> Boron: MW-303 Chloride: MW-303 Field pH: MW-303 Sulfate: MW-303 Total Dissolved Solids: MW-303 <u>April 2024/June 2024</u> Boron: M-4R, MW-303, MW-304R Chloride: M-4R, MW-304R Field pH: MW-303 Sulfate: M-4R, MW-303, MW-304R Total Dissolved Solids: M-4R, MW-303, MW-304R
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018

Category	Rule Requirement	Site Status
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in Appendix IV to this part pursuant to §257.95(g) include all of the following:	
	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	October 2023 Arsenic: MW-303 April 2024/June 2024 Arsenic: MW-303
	(B) Provide the date when the assessment of corrective measures (ACM) was initiated for the CCR unit;	Not applicable – Alternative Source Demonstrations prepared in May 2024 and December 2024. ACM not required.
	(C) Provide the date when the public meeting was held for the ACM for the CCR unit; and	Not applicable – ACM not required
	(D) Provide the date when the ACM was completed for the CCR unit.	Not applicable – ACM not required
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable – Selection of remedy not required
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Remedial activities not required

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1.0 INTRODUCTION

This 2024 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the coal combustion residuals (CCR) Rule [40 Code of Federal Regulations (CFR) 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2024, through December 31, 2024.

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

- COL Primary Ash Pond (existing CCR surface impoundment)

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

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

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

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

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

2.1.2 Site Information

Soils at the site are primarily sand to a depth of approximately 50 to 100 feet and overlie sandstone bedrock. Soils encountered during the site feasibility study for the COL Ash Disposal Facility were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301, MW-303, MW-304 (now abandoned), MW-304R, MW-305, and supplemental well MW-316, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously-installed monitoring wells MW-84A and M-4R show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for Primary Ash Pond CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated sand unit.

In the vicinity of the former ash ponds, groundwater historically flowed radially away from the ponds in all directions; however, since the completion of pond closure activities, the radial flow pattern is no longer observed. Groundwater flow at the Primary Ash Pond in 2024 was from east/southeast to west/northwest for the April, August, and October groundwater elevation sampling events. The groundwater dewatering system ceased operations as of September 11, 2023, and removal of CCR from the Unit was completed on October 4, 2023.

The water table elevations and groundwater flow directions for the April 2024 monitoring event are shown on **Figure 3**. The water table elevations and groundwater flow directions for the August 2024 supplemental groundwater elevation-only monitoring event are shown on **Figure 4**. The water table elevations and groundwater flow directions for the October 2024 sampling event are shown on **Figure 5**. The groundwater elevation data for the CCR monitoring wells are provided in **Table 3**, and horizontal gradients and flow velocities for representative flow paths are provided in **Table 4.**

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of two upgradient (background) monitoring wells and four downgradient monitoring Wells (**Table 1** and **Figure 2**). The background wells include MW-84A and MW-301. The downgradient wells include M-4R, MW-303, MW-304R, and MW-305. Monitoring well MW-316 was originally installed as a temporary supplemental well to provide data on shallow groundwater flow and water quality south of the Primary Pond but is planned to be incorporated into the Primary Ash Pond monitoring system in early 2025. The CCR Rule wells are installed in the surficial sand aquifer. Well depths range from approximately 26 to 47 feet, measured from the top of the well casing.

3.0 §257.90(e) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For CCR management units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31, 2029, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key*

activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by §257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

3.1 §257.90(E)(1) SITE MAP

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

A map showing the site location is provided on **Figure 1**. A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**. Other CCR units are also shown on **Figure 2**.

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

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

MW-304 was abandoned and replaced in 2024 because the well was hit by heavy equipment and was determined to be damaged beyond repair. Replacement monitoring well MW-304R was installed on March 18, 2024. The monitoring well network certification was updated to reflect the well replacement on September 26, 2024. Applicable soil boring logs, well construction forms, and development and abandonment forms are included in **Appendix B**.

Addition of monitoring well MW-316 to the CCR unit monitoring system is planned in early 2025. MW-316 was installed as a supplemental monitoring well as part of an alternative source demonstration completed in response to the determination that arsenic was at a statistically significant level above the Groundwater Protection Standard (GPS) following the October 2022 monitoring event. MW-316 was installed as a temporary water table observation well to provide data on shallow groundwater flow and water quality south of the Primary Ash Pond. The Primary Ash Pond was undergoing excavation at the time of well installation as part of the closure process for the CCR Unit.

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

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

Two semiannual groundwater sampling events were completed for the Primary Ash Pond CCR unit in 2024. Two supplemental sampling events were completed in 2024 (June and August).

The supplemental June 2024 event was completed because M-4R and MW-305 did not have sufficient water for sampling during the April 2024 event. Groundwater levels were lowered due to dewatering activities in the Primary Pond area during 2023, and groundwater levels had not recovered enough in April 2024 to sample M-4R and MW-305. M-4R was sampled in June; however,

MW-305 still had insufficient water for sampling. Both M-4R and MW-305 were successfully sampled in August 2024.

A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection or assessment monitoring program is included in **Table 2**.

Groundwater samples collected in the April, June, August, and October 2024 sampling events were analyzed for both Appendix III and Appendix IV constituents.

The validation and evaluation of the October 2023 monitoring event data was completed and transmitted to Wisconsin Power and Light Company (WPL) on February 2, 2024, and an Alternative Source Demonstration was completed for this sampling event at the Primary Pond dated May 2, 2024. The results of the April and June 2024 sampling events were transmitted in a letter dated September 26, 2024, and an Alternative Source Demonstration was completed for the April 2023 event dated December 18, 2024. The validation and evaluation of the August and October 2024 monitoring events data were in progress at the end of 2024 and will be transmitted to WPL in 2025; therefore, these monitoring results and analytical reports will be included in the 2025 Annual Report. The August and October 2024 groundwater elevation data are included in this report. The August 2024 supplemental sampling event is being analyzed with the second semiannual event completed in October 2024.

The sampling results for Appendix III and Appendix IV parameters in October 2023 are summarized in **Table 5A**. The April and June 2024 sampling results are summarized in **Table 5B**. Field parameter results for the October 2023, April 2024, and June 2024 sampling events are provided in **Table 6**. The analytical laboratory reports for October 2023 and April and June 2024 events are provided in **Appendix C**. Historical results for each monitoring well through April 2024 are summarized in **Appendix D**.

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

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

There was no monitoring program transition in 2024.

Assessment monitoring for the Primary Ash Pond was initiated in April 2018 and continued through 2024. Evaluation of the October 2023 results was completed in February 2024. Evaluation of the April 2024 and June 2024 results was completed in September 2024.

In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. EPA, 2009), the comparison of assessment monitoring results to the GPS was based on the lower confidence limit (LCL) for the arithmetic mean. The LCL evaluation was completed for each Appendix IV parameter that has been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated, which include arsenic, molybdenum, and selenium. The LCLs were calculated with Sanitas™ using historical concentrations measured since assessment monitoring began in April 2018. LCL evaluations for data collected in October 2023, April 2024, and June 2024 are provided in **Appendix E**. August 2024 evaluations will be included with the October 2024 sampling event.

For the October 2023 monitoring event, arsenic was determined to be at an SSL above the GPS at MW-303. Based on the initial LCL evaluation using the complete data set, the arsenic, molybdenum, and selenium results were not at an SSL above the GPS. The October 2023 arsenic result at MW-303 was higher than the April 2023 result and exceeded the GPS; therefore, the arsenic results for this well were also evaluated for a potential increasing trend using a Mann-Kendall analysis. Trend analysis for the arsenic results obtained since assessment monitoring was initiated indicated no significant trend. To focus on the more recent data, Mann-Kendall trend analysis was also performed for the last eight samples. The analysis of the last eight samples also indicated no significant increasing trend.

Although the trend was not determined to be significant due to high variability in the results, observation of the data indicated that recent arsenic results had generally been higher than the earlier data: therefore, an LCL evaluation was also completed using only the last eight sample results. Based on the LCL evaluation for the last eight sampling events, arsenic was determined to be at an SSL above the GPS at MW-303.

An Alternative Source Demonstration (ASD) was completed for the October 2023 event, demonstrating that sources other than the CCR unit were the likely cause of the SSL for arsenic. The ASD report is provided in **Appendix F**.

For the April/June 2024 monitoring event, arsenic was determined to be at an SSL above the GPS at MW-303. An LCL evaluation for arsenic, molybdenum, and selenium for the complete historical data set identified arsenic levels as an SSL above the GPS for MW-303. An LCL evaluation for the last eight sample results also indicated that arsenic was at an SSL above the GPS at MW-303.

A Mann-Kendall analysis was completed on the arsenic data for MW-303. The trend analysis indicates that arsenic is increasing at MW-303 in a statistically significant increasing trend. A Mann-Kendall analysis was also completed for the most recent eight sampling events; this analysis did not indicate a significant increasing trend.

An Alternative Source Demonstration (ASD) was completed for the April/June 2024 event, demonstrating that sources other than the CCR unit were the likely cause of the SSL for arsenic. The ASD report is provided in **Appendix F**.

As shown in **Table 5A** and **Table 5B**, several Appendix III and Appendix IV parameters continue to be detected at levels that represent statistically significant increases (SSIs) above background. Based on these results, the Primary Ash Pond will continue in the assessment monitoring program.

The comparison to background was based on a prediction limit approach, comparing the results to interwell upper prediction limits (UPLs) for Appendix III parameters and upper tolerance limits (UTLs) for Appendix IV parameters based on background monitoring results from the upgradient wells (MW-84A and MW-301). The interwell UPLs and UTLs were most recently updated in September 2024 using background data collected through December 2023. The September 2024 Statistical Evaluation is included in **Appendix G** of this Annual Groundwater Monitoring Report.

3.5 §257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

3.5.1 §257.90(e) General Requirements

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

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program is currently in Assessment Monitoring.

Summary of Key Actions Completed.

- Completed statistical evaluation for the October 2023 and April 2024/June 2024 assessment monitoring events.
- Completed statistical evaluation to update UPLs and UTLs using data collected through December 2023.
- Prepared Alternative Source Demonstrations following the October 2023 and April 2024/June 2024 monitoring events.
- Completed two semiannual groundwater sampling and analysis events April and October 2024.
- Completed supplemental groundwater sampling events in June and August 2024.

Description of Any Problems Encountered. During the April 2024 sampling event, monitoring wells M-4R and MW-305 were not sampled due to insufficient water for sample collection. A dewatering well system was in place to assist with the Primary Ash Pond closure in 2023 by lowering the water table in the closure area. The dewatering system was shut down in September 2023, but by April 2024 the water levels had not recovered sufficiently to collect a sample.

Discussion of Actions to Resolve the Problems. A second attempt to sample these wells for the April 2024 event was made in June 2024., MW-4R was successfully sampled but MW-305 still had insufficient water for sample collection. Both M-4R and MW-305 were successfully sampled in a supplemental event in August 2024, after groundwater levels recovered.

Projection of Key Activities for the Upcoming Year (2025).

- Statistical evaluation and determination of any SSLs exceeding the GPS for the August/October 2024 and April 2025 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2025).
- Supplemental groundwater sampling events, as needed.

- If one or more Appendix IV constituents is detected at an SSL above the GPS, then within 30 days WPL will prepare a notification in accordance with §257.95(g) and within 90 days complete an alternative source demonstration or initiate an assessment of corrective measures (§257.95(g)(3)). WPL will also characterize the release pursuant to §257.95(g)(1) and provide notice pursuant to §257.95(g)(2).

- Further evaluation of the current groundwater monitoring network following ceasing dewatering and removal of CCR, including potential addition of MW-316 to the monitoring system.

3.5.2 §257.94(d) Alternative Detection Monitoring Frequency

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

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

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

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

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

3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

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

Not applicable. Assessment monitoring has been initiated at the site, but no alternative assessment monitoring frequency is proposed at this time.

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

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

The 2024 assessment monitoring results, background UPLs and UTLs, and GPSs established for the Primary Ash Pond are provided in Table 5A and Table 5B. The laboratory reports are provided in Appendix C. Historical monitoring results are summarized in Appendix D.

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

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

The ASD reports prepared to address the SSLs above the GPS observed for arsenic at MW-303 for the October 2023 and April/June 2024 sampling events are provided in **Appendix F**. The ASD reports are certified by a qualified professional engineer.

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

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

Not applicable. Corrective measures assessment has not been initiated.

3.6 §257.90(E)(6) OVERVIEW

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

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

4.0 REFERENCES

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

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

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

Tables

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Table 1. Groundwater Monitoring Well Network
Columbia Energy Center Primary Ash Pond / SCS Engineers Project #25224067.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
M-4R	Downgradient	Compliance
MW-303	Downgradient	Compliance
MW-304R	Downgradient	Compliance
MW-305	Downgradient	Compliance
MW-316	Downgradient	Supplemental

Created by: NDK Date: 9/19/2022
Last revision by: NLB Date: 9/25/2024
Checked by: RM Date: 12/27/2024

Table 2. Groundwater Samples Summary
Columbia Energy Center Primary Ash Pond / SCS Engineers Project #25224067.00

Sample Dates	Compliance Wells				Background Wells		Supplemental Well
	M-4R	MW-303	MW-304R	MW-305	MW-84A	MW-301	MW-316
April 17, 2024	--	A	A	--	A	A	A-S
June 4, 2024	A	--	--	--	--	--	--
August 15, 2024	A-S	--	--	A-S	--	--	--
October 2024	A	A	A	A	A	A	A-S
Total Samples	3	2	2	2	2	2	2

Abbreviations:
A = Required by Assessment Monitoring Program
A-S = Supplemental Sample for the Assessment Monitoring Program
-- = Not Sampled
NI = Not Installed

Notes:

1. April 2024, groundwater levels were too low to collect samples at M-4R and M-305. M-4R was successfully sampled in June and resampled for select parameters in August. MW-305 still did not have sufficient was for sampling in June, but was sampled in August.

Last revision by: NLB Date: 11/18/2024
Checked by: BR Date: 12/6/2024

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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	MW-93A	MW-93B	MW-312
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41	827.89	827.71	826.79
	Screen Length (ft)																	10	5	10
	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	50.7	82.5	52.5
	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	787.19	750.21	784.29
	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	NI	NI	NI
	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	NI	NI	NI
	October 8, 2013													785.66	785.42	785.97	785.52	NI	NI	NI
	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 (6)	NM	NM	NM	NM	NM	NM	NI	NI	NI
	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
Dry Ash Facility (Facility ID #03025)	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 14, 2021	778.12	aband	787.29	784.27	784.05	784.77	784.77	784.46	c	785.84	785.81	785.60	785.86	785.69	786.47	786.06	NI	NI	NI
	June 11, 2021	NM	aband	NM	784.19	NM	784.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	October 11-12, 14, 2021	784.47	aband	786.78	783.73	783.60	784.42	784.41	783.88	783.87	784.96	784.88	784.79	785.14	784.94	785.55	785.11	NI	NI	NI
	October 17, 2021	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 1, 2022	aband	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 11-13, 2022	aband	aband	785.52	783.27	783.45	784.30	784.42	783.26	783.78	785.02	785.00	784.70	784.83	784.72	785.45	785.02	783.99	783.97	783.73
	October 24-28, 2022	aband	aband	785.43	781.94	781.61	783.61	783.61	782.28	dry	784.57	784.54	784.38	784.64	784.47	785.05	784.62	783.74	782.76	783.50
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	April 15-17, 2024	aband	aband	dry	783.02	782.94	784.14	784.11	782.95	783.41	784.90	784.84	784.54	784.61	784.57	785.19	784.75	783.88	783.87	783.59
	April 19, 2024	aband	aband	785.47	783.06	783.02	784.28	784.30	783.05	dry	785.05	785.01	784.67	784.74	784.62	785.63	785.16	783.95	783.95	783.68
	July 29, 2024	aband	aband	NM	NM	NM	787.29	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	August 15, 2024	aband	aband	789.12	788.77	787.94	787.62	787.56	788.05	788.44	788.17	788.07	788.31	788.66	788.40	789.03	788.58	788.39	788.35	788.31
	October 1-3, 2024	aband	aband	788.25	787.33	786.64	786.79	786.75	786.60	788.86	787.14	787.06	787.14	787.81	787.52	788.33	787.86	787.00	786.97	786.90
	November 5, 2024	NM	NM	NM	785.98	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66	777.19	745.21	774.29

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
	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
	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	April 12, 2021	782.30	786.34	783.66	783.65	784.13	784.08	782.79	784.08	783.97	783.15	783.49
	October 11-12, 14, 2021	781.03	786.33	782.94	782.85	783.09	783.03	781.94	783.11	783.04	782.15	782.66
	April 11-13, 2022	783.95	788.26	783.37	783.34	783.10	783.10	NM	782.99	783.40	783.93	783.83
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	NM	NM	NM	NM
	October 25, 26, 28, 2022	780.41	783.85	780.76	780.66	779.57	779.55	779.23	778.98	778.61	780.33	781.49
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	April 15-17, 2024	781.73	781.38	782.58	782.51	782.42	782.35	781.82	782.23	782.17	781.47	783.40
	April 19, 2024	NM	dry	782.78	782.80	782.57	782.56	NM	782.35	782.29	781.65	783.48
	August 15, 2024	781.49	784.27	786.74	786.56	787.47	787.31	783.56	787.87	786.90	783.38	783.95
	October 1-3, 2024	779.13	783.42	785.25	785.12	785.99	785.86	782.99	785.86	785.19	782.26	783.50
	October 4, 2024	--	783.57	--	--	--	--	--	--	--	--	--
	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

Ash Pond Facility (Facility ID #02325)

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	818.88	820.37	828.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	784.6	787.4	790.7
	Measurement Date																								
	December 21-22, 2015	785.56	784.78	784.11	786.13	NI	788.96	787.58	783.77	783.50	785.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	April 4-5, 2016	786.78	785.81	785.48	788.08	NI	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 7-8, 2016	786.31	786.28	784.60	787.36	NI	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 28, 2016	NM	NM	784.35	NM	NI	NM	NM	NM	784.86	785.61	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-13, 2016	787.64	787.76	786.18	788.18	NI	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 29, 2016	787.37	787.05	NM	NM	NI	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	January 25-26, 2017	787.27	786.89	785.28	789.34	NI	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	NI	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	June 6, 2017	788.25	788.37	786.49	788.58	NI	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	August 7-9, 2017	787.34	787.55	785.42	789.52	NI	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 23-24, 2017	785.89	785.94	783.92	788.97	NI	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 21, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI	NI	NI	NI
	March 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI	NI	NI	NI
	April 23-25, 2018	785.29	784.37	783.27	789.69	NI	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83	NI	NI	NI	NI	NI	NI	NI	NI
	May 24, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI	NI	NI	NI
	June 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI	NI	NI	NI
	July 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI	NI	NI	NI
	August 7, 2018	787.06	NM	785.20	788.25	NI	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 22, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI	NI	NI	NI
	September 21, 2018	NM	788.37	786.50	NM	NI	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66	NI	NI	NI	NI	NI	NI	NI	NI
	October 22-24, 2018	788.98	789.16	787.51	789.05	NI	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64	NI	NI	NI	NI	NI	NI	NI	NI
	April 1-4, 2019	787.04	787.56	786.52	789.72	NI	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38	NI	NI	NI	NI	NI	NI	NI	NI
	June 12, 2019	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI	NI	NI	NI
	June 19, 2019	NM	NM	786.81	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-9, 2019	788.47	788.31	787.02	790.41	NI	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI	NI	NI	NI
	December 13, 2019	--	--	--	--	NI	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	NI	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI	NI	NI	NI
	January 17, 2020	--	--	785.58	--	NI	--	--	--	--	--	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 3, 2020	787.24	NM	NM	NM	NI	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	May 27-29, 2020	787.77	787.29	785.56	789.30	NI	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85	NI	NI	NI	NI	NI	NI	NI	NI
	June 30, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 6, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-8, 2020	786.53	786.74	785.16	788.52	NI	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83	NI	NI	NI	NI	NI	NI	NI	NI
	December 11, 2020	NM	NM	NM	NM	NI	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 25, 2021	NM	NM	784.27	NM	NI	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 12, 2021	786.50	785.77	784.07	787.99	NI	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15	NI	NI	NI	NI	NI	NI	NI	NI
	June 11, 2021	NM	NM	NM	NM	NI	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI	NI	NI	NI
	July 20, 2021	NM	NM	783.64	NM	NI	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	NI	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48	NI	NI	NI	NI	NI	NI	NI	NI
	December 21, 2021	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 24, 2022	NM	NM	782.34	NM	NI	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 11-13, 2022	785.44	784.42	783.40	788.20	NI	787.87	788.26	783.27	784.30	785.02	783.11	783.32	784.19	783.14	783.19	783.04	NI	NI	NI	NI	NI	NI	NI	NI
	July 27, 2022	NM	NM	783.07	NM	NI	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 25-27, 2022	784.91	784.62	778.94	781.79	NI	784.97	783.85	781.94	783.61	784.57	778.32	777.89	784.16	781.50	780.96	781.23	NI	NI	NI	NI	NI	NI	NI	NI
	November 30, 2022	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI	NI	NI	NI
	December 2, 2022	785.12	784.48	NM	783.97	NI	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	January 12-13, 2023	785.20	784.55	NM	NM	NI	NM	NM	782.75	784.10	784.88	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI	NI	NI	NI
	January 20, 2023	NM	NM	NM	788.08	NI	NM	NM	NM	NM	NM	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI
	January 24, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI	NI	NI	NI
	February 20-23, 2023	785.56	784.98	NM	NM	NI	NM	NM	NM	NM	NM	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI	NI	NI	NI
	March 27-28, 2023	786.83	785.87	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI	NI	NI	NI
	April 24-27, 2023	787.57	786.87	784.38	784.03	NI	NM	782.59	785.79	786.22	786.97	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI	NI	NI	NI
	May 5, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49	NI	NI	NI
	May 16, 2023	787.43	787.07	783.88	784.12	NI	dry	781.64	785.64	786.06	786.88	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48	NI	NI	NI
	May 30-31, 2023	787.04	786.89	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM	NI	NI	NI
	June 29-30, 2023	786.32	786.39	NM	NM	NI	NM	NM	784.32	785.04	785.92	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM	NI	NI	NI
	July 31, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM	NI	NI	NI
	August 31, 2023	NM	785.30	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM	NI	NI	NI
	October 9-11, 2023	784.67	784.65	781.21	780.09	NI	779.93	780.54	782.57	783.55	784.39	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30	NI	NI	NI

CCR Rule Wells

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	818.88	820.37	828.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	784.6	787.4	790.7
	November 9, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.76	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	November 20, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	781.97	781.45	782.85	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	December 27, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.18	783.36	NM	NI	NI	NI
	Well Number	**MW-301**	**MW-302**	**MW-303**	**MW-304**	**MW-304R**	**MW-305**	**M-4R**	**MW-33AR**	**MW-34A**	**MW-84A**	**MW-306**	**MW-307**	**MW-308**	**MW-309**	**MW-310**	**MW-311**	**MW-312**	**MW-313**	**MW-314**	**MW-315**	**MW-316**	**MW-317**	**MW-318**	**MW-319**
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	818.88	820.37	828.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	784.6	787.4	790.7
CCR Rule Wells (cont.)	April 15-17, 2024	785.27	784.49	782.16	aband	782.17	780.80	781.38	783.02	784.14	784.90	782.40	782.24	784.51	782.79	782.68	782.64	783.59	783.16	783.42	783.53	782.09	783.12	783.05	785.27
	April 19, 2024	785.51	784.55	782.26	aband	782.23	dry	dry	783.06	784.28	785.05	NM	782.64	784.69	782.90	782.82	782.74	783.68	783.30	783.49	783.62	782.15	NM	NM	NM
	May 20, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.25	NM	NM	NM	NM
	June 4, 2024	NM	NM	NM	aband	NM	783.03	783.66	NM	NM	NM	NM	NM	NM	784.27	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	June 27, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.87	785.97	787.20
	July 31, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.95	788.83	789.56
	August 8, 2024	NM	NM	787.17	aband	786.34	783.77	784.45	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.24	NM	NM	NM
	August 15, 2024	788.75	789.53	786.93	aband	786.03	783.75	784.27	788.77	787.62	788.17	787.66	787.24	788.39	787.90	787.93	788.37	788.31	aband	aband	aband	785.99	787.87	788.63	789.68
	August 30, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	aband	aband	aband	NM	787.28	787.78	789.17
	October 1-3, 2024	787.92	788.35	785.30	aband	784.91	782.80	783.42	787.33	786.79	787.14	786.04	785.94	786.88	786.46	786.35	786.40	786.90	aband	aband	aband	784.80	786.41	786.71	788.22
	October 18, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	785.50	785.08	786.34	NM	NM	NM	NM	aband	aband	aband	NM	NM	NM	NM
	October 31, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	aband	aband	aband	NM	785.73	785.92	787.88
	November 5, 2024	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.45	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	773.61	780.72	766.52	777.21	770.52	774.07	780.63	780.39	778.90	775.60	775.21	773.55	774.29	774.10	776.61	774.18	764.79	774.58	777.37	780.68

Notes:
NM = not measured
NI = not installed
aband = abandoned
(1) 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 October 10, 2017.
(2) MW-303 was extended in 2022 due to regrading. Prior to October 2022, the TOC elevation was 811.52'. For events in October 2022 and later, the TOC elevation is 815.72'.

Created by: MDB Date: 5/6/2013
Last revision by: EMS Date: 11/5/2024
Checked by: RM Date: 11/8/2024

Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Primary Pond / SCS Engineers Project #25224067.00
January - December 2024

	Flow Path A - West/Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/15-17/2024	782.17	780.80	1370	0.001	0.04

	Flow Path B - Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
8/15/2024	786.03	783.00	1361	0.002	0.09

	Flow Path C - Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
10/1-3/2024	784.91	782.00	1218	0.002	0.10

Wells	**K Values (cm/sec)**	**K Values (ft/d)**
M-4R	3.0E-03	8.4
M-303	4.0E-02	114
M-304	1.2E-02	34
MW-304R	6.3E-05	0.18
M-305	5.0E-02	141
MW-316	1.0E-02	29
Geometric Mean	6.0E-03	17

Assumed Porosity, n
0.40

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

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity
h1, h2 = point interpreted groundwater elevation locations 1 and 2
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient
NA - not applicable

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

Last revision by: NLB Date: 11/11/2024
Checked by: LH Date: 11/14/2024

Table 5A. Groundwater Analytical Results Summary - October 2023
Columbia Generating Station - Primary Pond / SCS Engineers Project #25224067.00

Parameter Name	UPL Method	UPL		Background Wells		Compliance Wells				Supplemental Well
				MW-84A	MW-301	M-4R	MW-303	MW-304	MW-305	MW-316
				10/11/2023	10/11/2023	10/10/2023	10/9/2023	10/10/2023	10/10/2023	10/9/2023
Groundwater Elevation, ft amsl				784.39	784.67	780.54	781.21	780.09^	779.93	780.30
Appendix III										
Boron, µg/L	P	35		14.0	36.2	NS	2,420	NS	NS	--
Calcium, µg/L	NP	129,000		65,100	52,300	NS	2,610	NS	NS	--
Chloride, mg/L	P	6.02		3.1	2.1	NS	46.4	NS	NS	--
Fluoride, mg/L	DQ	DQ		<0.095	<0.095 M0	NS	<0.095	NS	NS	--
Field pH, Std. Units	P	7.76		7.51	7.06	NS	9.61	NS	NS	8.27
Sulfate, mg/L	P	30.8		1.4 J	11.8	NS	188	NS	NS	--
Total Dissolved Solids, mg/L	NP	514		324	300	NS	686	NS	NS	--
Appendix IV		**UPL**	**GPS**							
Antimony, µg/L	NP	0.4	6	<0.15	<0.15	NS	0.35 J	NS	NS	--
Arsenic, µg/L	P	0.533	10	<0.28	<0.28	NS	36.3	NS	NS	1.6
Barium, µg/L	P	18.3	2000	12.7	7.3	NS	3.3	NS	NS	--
Beryllium, µg/L	NP	0.37	4	<0.25	<0.25	NS	<0.25	NS	NS	--
Cadmium, µg/L	NP	0.32	5	<0.15	<0.15	NS	<0.15	NS	NS	--
Chromium, µg/L	P	3.13	100	1.6 J	<1.0	NS	66.4	NS	NS	--
Cobalt, µg/L	NP	0.38	6	<0.12	0.13 J	NS	0.40 J	NS	NS	--
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	NS	<0.095	NS	NS	--
Lead, µg/L	NP	0.48	15	<0.24	<0.24	NS	<0.24	NS	NS	--
Lithium, µg/L	P	0.857	40	0.54 J	0.43 J	NS	0.75 J	NS	NS	--
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	NS	<0.066	NS	NS	--
Molybdenum, µg/L	NP	0.44	100	<0.44	<0.44	NS	56.3	NS	NS	--
Selenium, µg/L	NP	0.71	50	<0.32	<0.32	NS	28.3	NS	NS	--
Thallium, µg/L	NP	0.48	2	<0.14	<0.14	NS	<0.14	NS	NS	--
Radium 226/228 Combined, pCi/L	P	1.93	5	0.844	0.611	NS	0.778	NS	NS	--

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

Abbreviations:

UPL = Upper Prediction Limit
mg/L = milligrams per liter
µg/L = micrograms per liter
NP = Nonparametric UPL (highest background value) with 1-of-2- retesting
P = Parametric UPL with 1-of-2 retesting
GPS = Groundwater Protection Standard
NS = Not Sampled
-- = Not Analyzed

J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
DQ = Double Quantification Rule (not detected in background).

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or a 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 (U.S. EPA) 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. For compliance wells, only results confirmed above the LOQ are evaluated as potential statistically significant increases above background.

^. MW-304 water level dropped below pump shortly after beginning low-flow purging.

Created by: RM Date: 6/2/2023
Last revision by: RM Date: 11/13/2023
Checked by: NLB Date: 11/14/2023
Proj Mgr QA/QC: TK Date: 1/18/2024

Table 5B. Groundwater Analytical Results Summary - April and June 2024
Columbia Generating Station - Primary Pond / SCS Engineers Project #25224067.00

Parameter Name	UPL/UTL Method	UPL		Background Wells		Compliance Wells					Supplemental Well
				MW-84A	MW-301	M-4R		MW-303	MW-304R	MW-305	MW-316
				4/17/2024	4/17/2024	4/17/2024	6/4/2024	4/17/2024	4/17/2024	4/17/2024	4/17/2024
Groundwater Elevation, ft amsl				784.90	785.27	781.38	783.66	782.16	783.25	780.80	782.09
Appendix III											
Boron, µg/L	NP	36.2		11.9	24.9	NS	930	2,470	822	NS	--
Calcium, µg/L	NP	126,000		73,700	102,000	NS	117,000	2,940	85500	NS	--
Chloride, mg/L	P	5.91		3.2	1.6 J	NS	16.3	<0.59	45.6	NS	--
Fluoride, mg/L	NP	0.2		0.12 J	<0.095	NS	0.25 J	<0.095	0.14 J	NS	--
Field pH, Std. Units	P	7.75		7.68	7.06	NS	7.19	9.58	7.37	NS	8.31
Sulfate, mg/L	NP	27.5		1.4 J	11.5	NS	119	335	163	NS	--
Total Dissolved Solids, mg/L	NP	514		322	458	NS	578	728	544	NS	--
Appendix IV		**UTL**	**GPS**								
Antimony, µg/L	NP	0.550	6	<0.15	<0.15	NS	0.30 J	0.38 J	0.17 J	NS	--
Arsenic, µg/L	NP	0.910	10	0.29 J	<0.28	NS	<0.28	40.4	1.8	NS	2.6
Barium, µg/L	P	18	2000	14.4	8.1	NS	36.1	3.8	92.0	NS	--
Beryllium, µg/L	NP	0.470	4	<0.25	<0.25	NS	<0.25	<0.25	<0.25	NS	--
Cadmium, µg/L	NP	0.530	5	<0.15	<0.15	NS	<0.15	<0.15	<0.15	NS	--
Chromium, µg/L	NP	2.6	100	2.1 J	<1.0	NS	1.4 J	74.3	1.4 J	NS	--
Cobalt, µg/L	NP	0.520	6	<0.12	<0.12	NS	0.34 J	0.47 J	0.88 J	NS	--
Fluoride, mg/L	NP	0.2	4	0.12 J	<0.095	NS	0.25 J	<0.095	0.14 J	NS	--
Lead, µg/L	NP	0.550	15	<0.24	<0.24	NS	0.75 J	<0.24	0.36 J	NS	--
Lithium, µg/L	P	0.872	40	0.67 J	0.63 J	NS	5.0	0.64 J	25.2	NS	--
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	NS	<0.066 1q	<0.066	<0.066	NS	--
Molybdenum, µg/L	NP	0.620	100	<0.44	<0.44	NS	9.7	82.0	52.2	NS	--
Selenium, µg/L	NP	0.710	50	<0.32	<0.32	NS	116	36.3	<0.32	NS	--
Thallium, µg/L	NP	0.660	2	<0.14	<0.14	NS	<0.14	<0.14	<0.14	NS	--
Radium 226/228 Combined, pCi/L	P	1.95	5	0.290	1.04	NS	1.16	0.481	1.08	NS	--

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

Abbreviations:

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

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
1q = Analyte was measured in the associated method blank at -0.070 ug/L.

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or a 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 (U.S. EPA) Maximum Contamination Level (MCLs), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs calculated based on results from background wells MW-84A and MW-301.
4. For compliance wells, only results confirmed above the LOQ are evaluated as potential statistically significant increases above background.
5. Interwell UPLs and UTLs were updated September 2024 based on background data collected through October 2023.

^. MW-4R and MW-305 were dry during the April 2024 sampling event. Re-sampling was attempted in June 2024, but MW-305 was still dry.

Created by:	RM	Date:	6/2/2023
Last revision by:	RM	Date:	6/28/2024
Checked by:	GK	Date:	7/1/2024
Proj Mgr QA/QC:	SCC	Date:	9/11/2024

Table 6. Groundwater Field Data Summary
Columbia Energy Center - Primary Ash Pond / SCS Engineers Project #25224067.00

Well	Sample Date	Groundwater Elevation (feet amsl)	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	10/11/2023	784.39	12.3	7.51	8.44	599.9	91.2	0.03
	4/17/2024	784.90	11.0	7.68	7.82	588.1	0.0	0.00
MW-301	10/11/2023	784.67	10.7	7.06	0.16	536	23.8	0.34
	4/17/2024	785.27	8.6	7.06	2.53	781.0	17.9	0.00
M-4R	10/10/2023	780.54	Insufficient water to collect a sample					
	4/17/2024	781.38	Insufficient water to collect a sample					
	6/4/2024	783.66	15.50	7.19	0.47	843	77.1	4.96
MW-303	10/9/2023	781.21	12.6	9.61	7.63	1090	46.2	2.15
	4/17/2024	782.16	11.8	9.58	3.70	1164	10.5	0.04
MW-304	10/10/2023	780.09	Insufficient water to collect a sample					
MW-304R	4/17/2024	783.25	11.40	7.37	0.35	888	-105.6	50.27
MW-305	10/10/2023	779.93	Insufficient water to collect a sample					
	4/16/2024	780.80	Insufficient water to collect a sample					
MW-316	10/9/2023	780.30	12.5	8.27	0.08	680	-40.6	1.60
	4/17/2024	782.09	12.2	8.31	0.30	671	-2.3	1.62

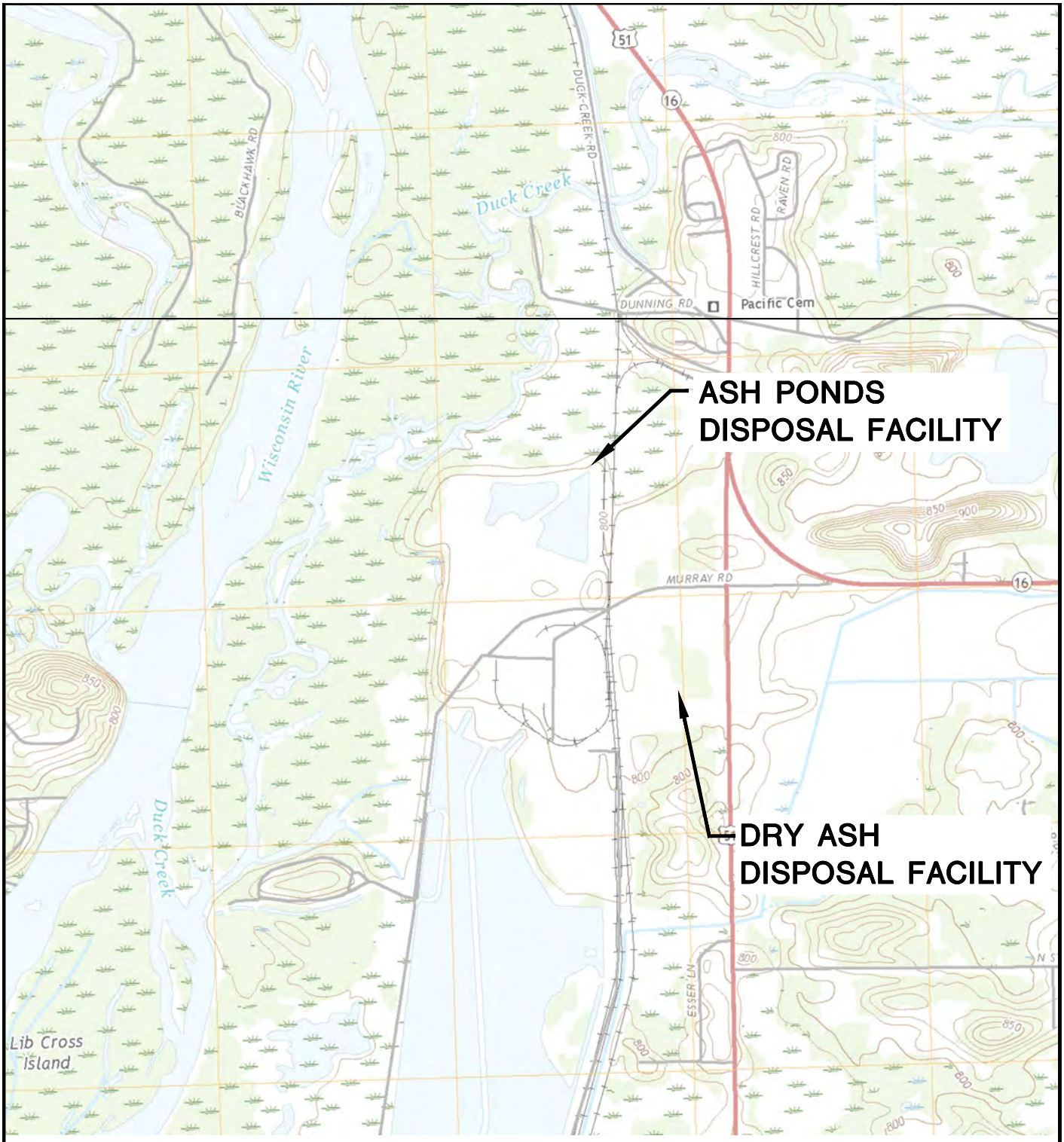
Abbreviations:
mg/L = milligrams per liter
amsl = Above mean sea level
µmhos/cm = micromhos/cm
mV = millivolts
NTU = Nephelometric Turbidity Unit
deg C = degrees Celsius

Notes:
1. Groundwater elevation was below the top of the dedicated pump at M-4R during the October 2022 monitoring event.
2. MW-304 was dry during the October 2022 sampling event due to ongoing dewatering at the site.

Last revision by: NLB Date: 1/14/2025
Checked by: LH Date: 1/14/2025

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations
3 Water Table Map – April 2024
4 Water Table Map – August 2024
5 Water Table Map – October 2024

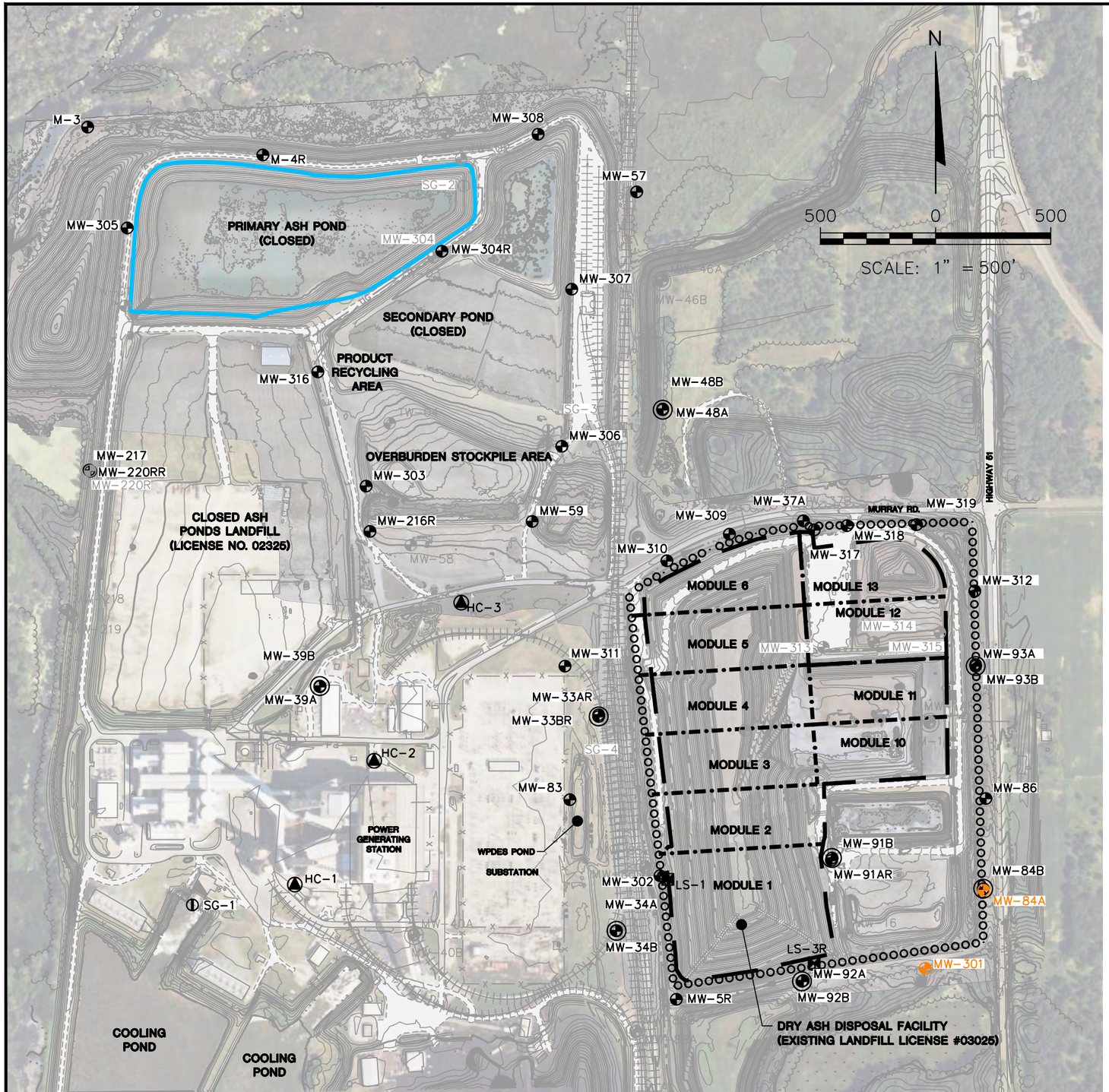


N

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

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

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



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED STAFF GUAGE
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, PERIODIC SURVEYS BY SCS ENGINEERS AND CEDAR CREEK SURVEYING, LLC, AND DECEMBER 2023 DRONE SURVEY BY AMES.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. MONITORING WELLS MW-317, MW-318, AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 9 THROUGH 11, 2024. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE ABANDONED BY HORIZON CONSTRUCTION & EXPLORATION ON MAY 22, 2024.
10. BACKGROUND MONITORING WELLS ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	01/03/2025	CHECKED BY:	NLB
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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

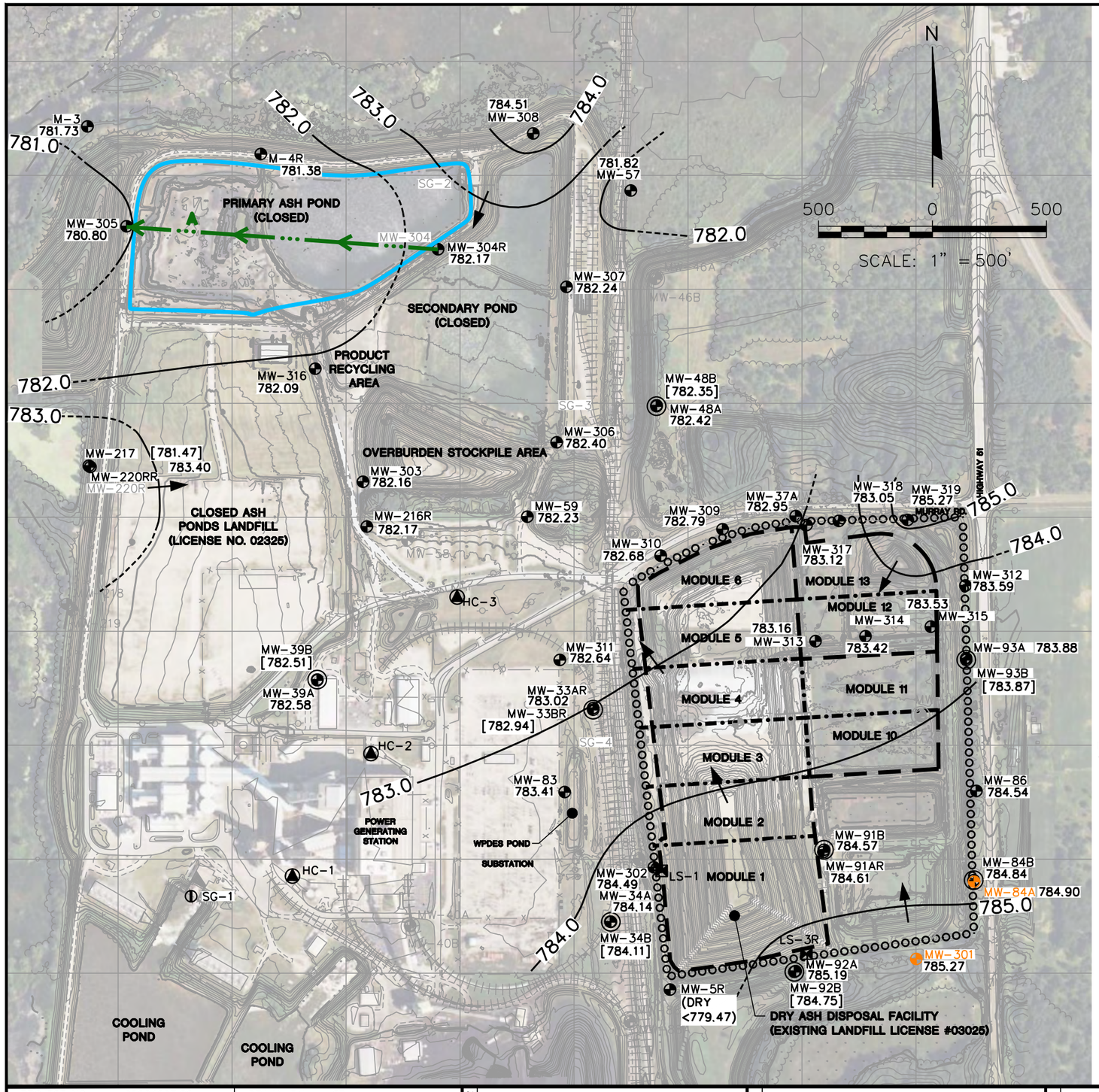
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS
COLUMBIA DRY ASH DISPOSAL FACILITY

FIGURE
2

I:\Client\Alliant_PROJECT SITES\Columbia\CAD Master References COL\Water Table Maps\Site Plan\02_Col Site Plan Figures.dwg, 1/21/2025 3:02:37 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 783.88 — WATER TABLE ELEVATION
- [781.47] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (DRY) — SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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7. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
10. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024.
11. BACKGROUND MONITORING WELLS ARE MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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

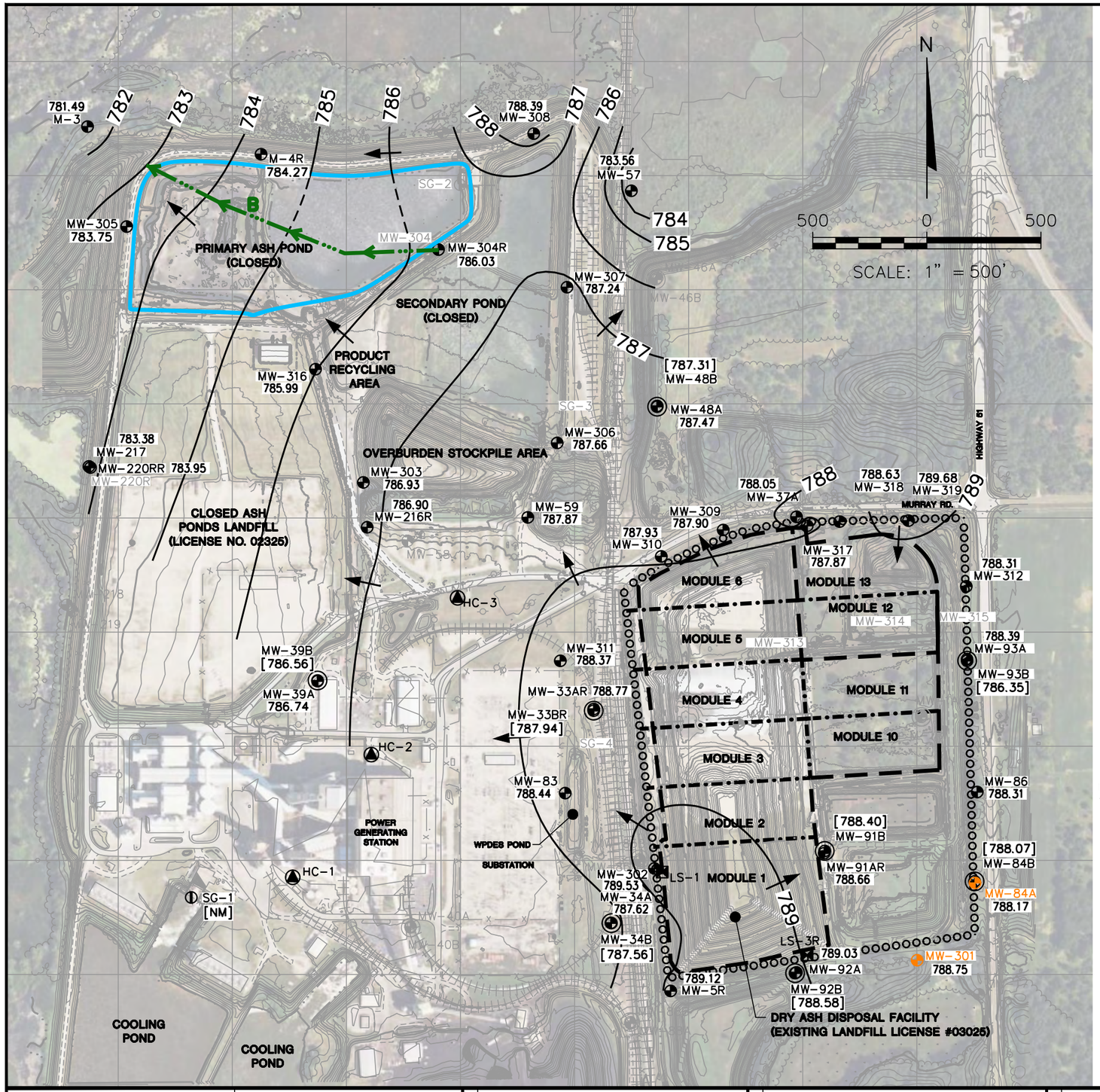
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
APRIL 15-17, 2024

FIGURE 3

I:\25224067.00\Drawings\COL April 2024 WTBL CCR Units.dwg, 1/21/2025 2:18:45 PM



LEGEND

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- EXISTING TRACKS
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- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 788.75 — WATER TABLE ELEVATION
- [781.47] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- [NM] — NOT MEASURED
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CCR UNIT

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DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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

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

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
AUGUST 15, 2024

FIGURE 4

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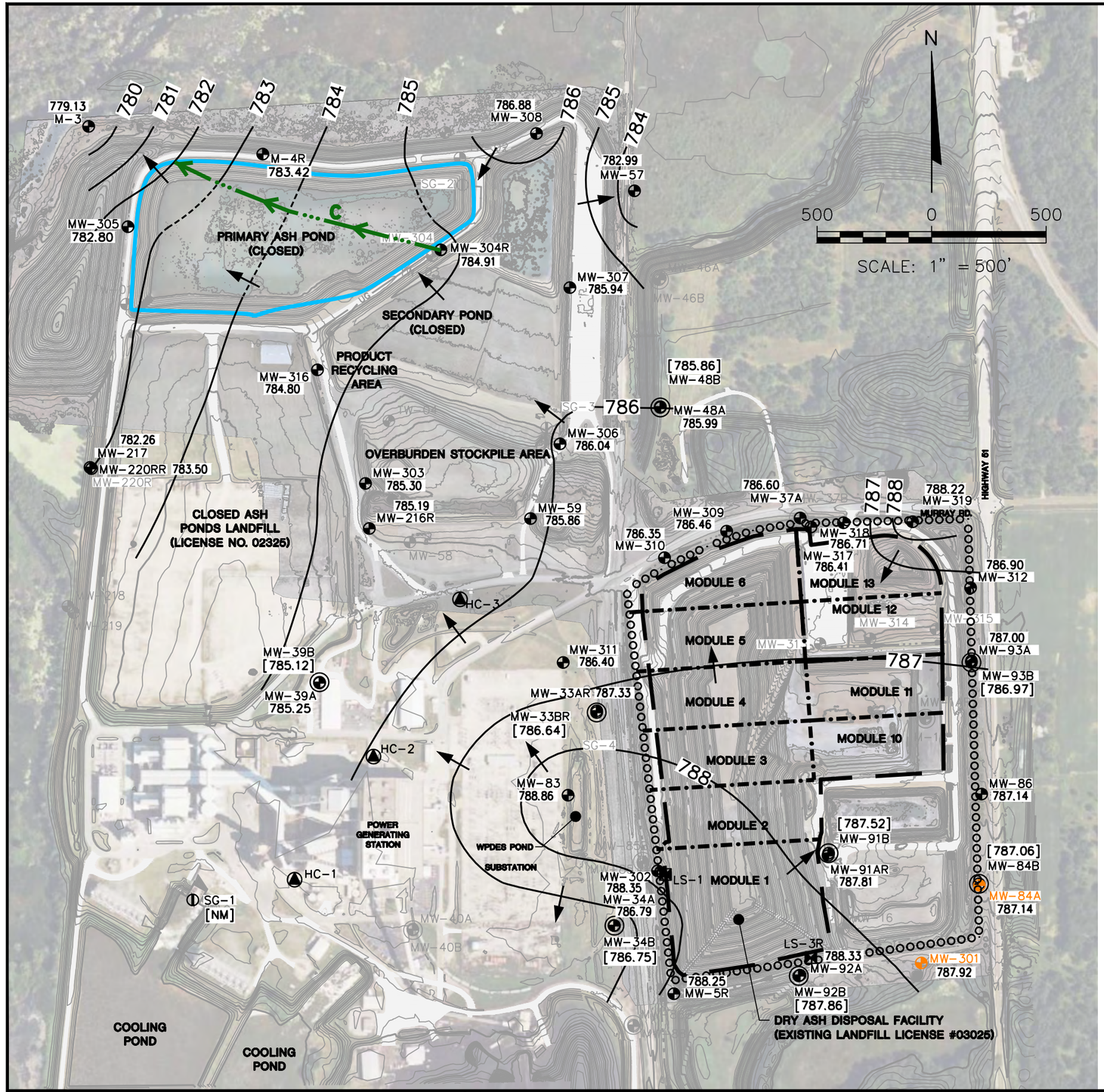

LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
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- EXISTING FENCELINE
- EXISTING TRACKS
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PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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

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

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
OCTOBER 1-3, 2024

FIGURE 5

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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	• Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	• Dolomite and shaley dolomite • Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	• Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	• Igneous and metamorphic rocks

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

Sources:

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

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

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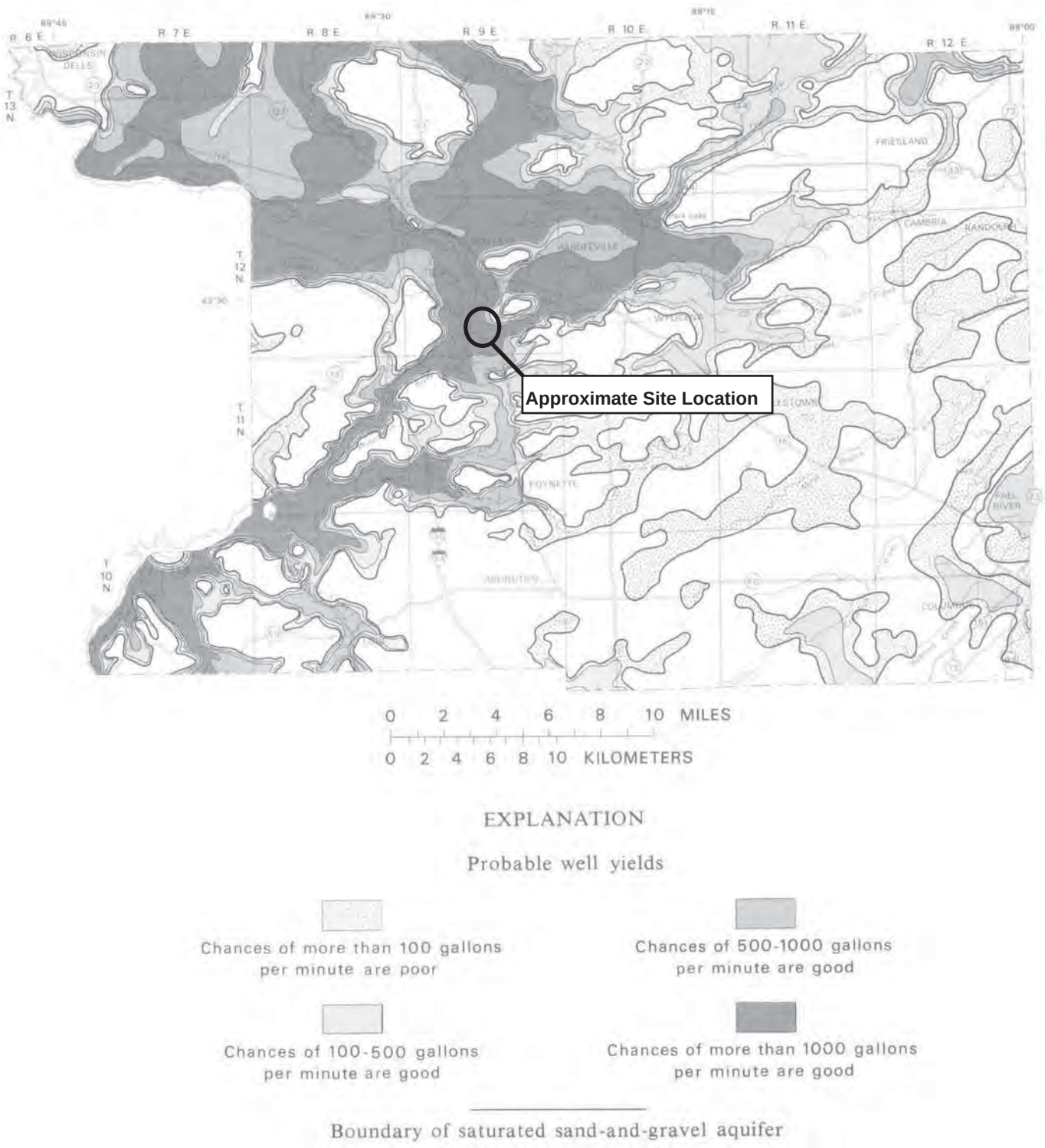
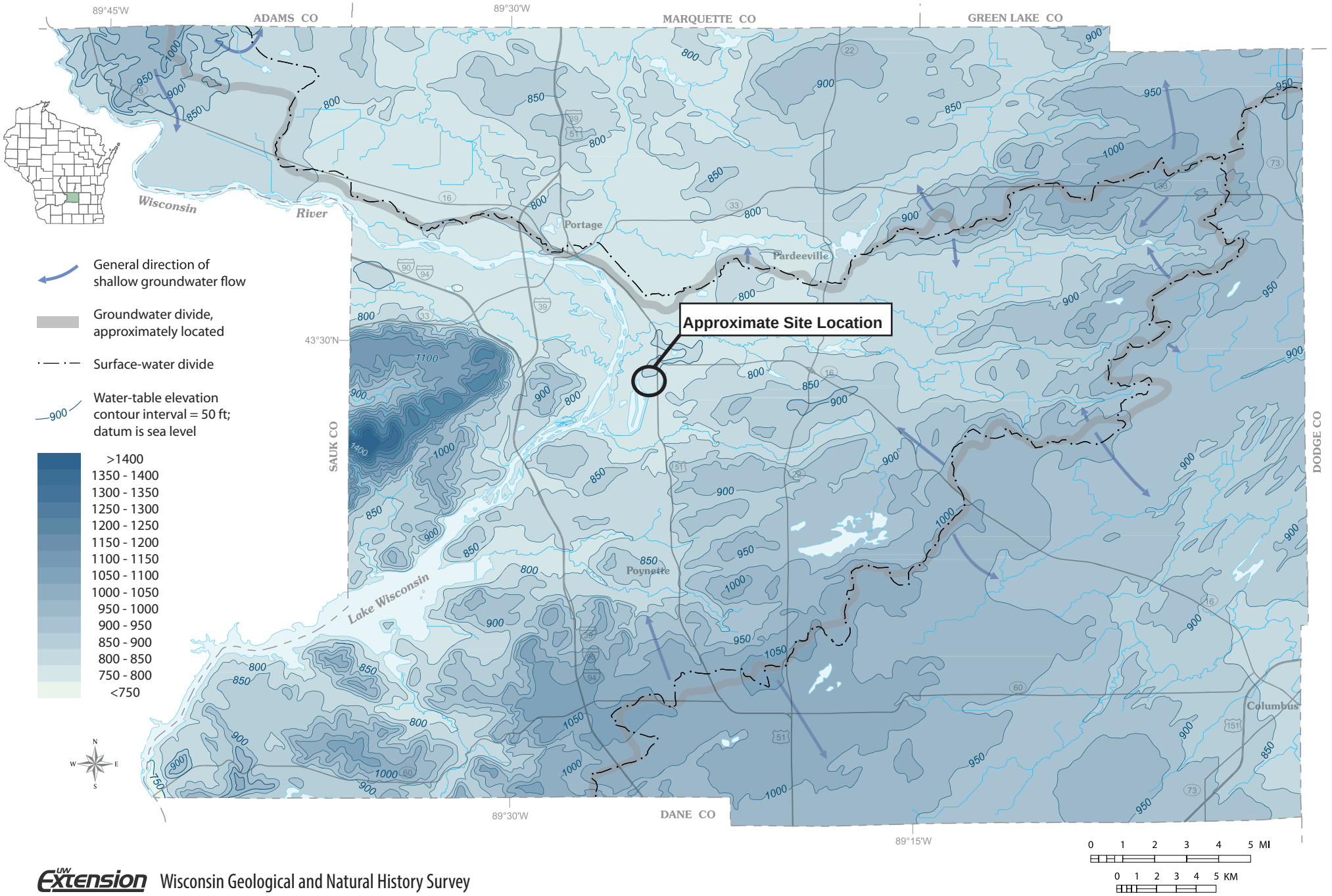


Figure 9. Probably well yields from the sand-and-gravel aquifer.

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

Generalized water-table elevation in Columbia County, Wisconsin



Wisconsin Geological and Natural History Survey

02/26/2025 - Classification: Internal - EGRM23462139

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

Appendix B

Boring Logs and Well Construction Documentation

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Columbia SCS#: 25215135.00		MW-301

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

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

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

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	21	7 6 9 10	1–2	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.						M				
S2	20	6 7 9 10	3–4	Same as above except, 10YR 5/4 (top section), 10YR 3/6 (bottom section), trace gravel.						M				
S3	22	7 6 9 6	5–7	Same as above except, 10YR 3/4 (bottom), 10YR 5/4 (top), trace little roots and sticks, trace gravel.	SM					M				
S4	21	4 5 6 5	8–10	Same as above except, 10YR (top), 10YR 4/6 (bottom), trace clay at bottom.						M				
S5	18	2 2 4 5	11–12	Same as above except, fine to coarse grained sand, little gravel, trace clay in top half, 10YR 3/6.						M				
S6	20	2 3 3 3	13–15	Same as above except, 10YR 6/8.						M				

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

Signature [signature] Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711 Tel: (608) 224-2830 Fax:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Columbia SCS#: 25215135.00		MW-303

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State Drilling	11/12/2015	11/13/2015	hollow stem auger

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

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

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	20	5 8 15 10	1–3	SILTY SAND CLAY with GRAVEL, (fill), tan colored 10YR 7/6.	SM					M				
S2	24	7 7 7 17	4–5	Same as above except, grey/brown (10YR 5/4).						M				
S3	20	13 34 50/5	6–8	SILTY SAND, trace gravel, tan color (10YR 5/4).						M				
S4	14	30 50/5	9–10		SM					M				
S5	15	31 50/3	11–13							M				
S6	15	38 50/3	14–15	Same as above with an inch of rock (limestone).						M				

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

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

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S7	10	50/4	16–17	SILTY SAND, trace gravel, tan color (10YR 5/4), with trace gravel.						M				
S8	18	28 37 50/4	18–20							M				
S9	0	50	21–22											Lost spoon tip no sample.
S10	15	35 50/5	23–24	Same as above except, fine to coarse grained sand, little gravel.	SM					M				
S11	14	7 50/3	25–27	Same as above except, tan (10YR 5/6).						W				
			28–33	End of boring at 33 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Columbia SCS#: 25215135.00		MW-304

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

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

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

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL.	TOPSOIL									
				SILTY SAND, mostly fine, brown/tan (10YR 5/6).										
S1	24	7 8 10 12	2							M				
			3											
			4	Same as above except, trace gravel, brown tan to grey (top to bottom) 10YR 5/4.										
S2	24	14 22 26 31	5							M				
			6	Same as above except, brown/tan/grey assorted coloring.										
S3	24	16 18 22 24	7							M				
			8		SM									
			9	Same as above except, black/grey/brown, saturated area about 2" thick.										
S4	24	11 15 15 14	10							M				
			11	Same as above except, 10YR 5/3.										
S5	24	23 31 30 29	12							M				
			13											
			14	trace gravel.										
S6	20	9 10 7 5	15							M				

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

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Columbia SCS#: 25215135.00		MW-305

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

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

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

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL	TOPSOIL									
S1	18	5 8 9 7	2	SILTY SAND, mostly fine, brown/tan 10YR 5/8.						M				
S2	18	2 3 3 4	5							M				
S3	18	2 8 9 8	7	Same as above except, trace gravel, tan 10YR 6/8 at bottom.	SM					M				
S4	20	5 7 6 5	10	Same as above except, light tan 10YR 6/6, trace gravel, some large gravel chunks.						M				
S5	20	9 12 17 22	12	POORLY GRADED SAND, tan (10YR 6/8), trace gravel, some saturated areas.	SP					M				
S6	24	16 19 22 34	15	SILTY SAND, trace gravel, tan (10YR 5/6).	SM					W				

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

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

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-305 Use only as an attachment to Form 4400-122. Page 2 of 2

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL - Columbia SCS#:		MW-304R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Sweet Horizon	3/18/2024	3/18/2024	roto-sonic

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-304R	23.0 Feet	801.66 Feet	6 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 544,676 N, 2,122,904 E S / C / N
NW 1/4 of NE 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
111003090	Columbia	11	Pardeeville

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	TOPSOIL.	TOPSOIL									Blind drilled to 12'. Soil types copied from adjacent MW-304 boring log
			1.5	SILTY SAND (SM), mostly fine, brown/tan (10YR 5/6).	SM									
			3.0	Same as above except, trace gravel, brown tan to grey (top to bottom) (10YR 5/4)	SM									
			4.5	Same as above except, brown/tan/grey assorted coloring.	SM									
			6.0											
			7.5	Same as above except, black/grey/brown, saturated area about 2" thick.	SM									
			9.0											
			10.5	Same as above except, 10YR 5/3.	SM									
			12.0	Same as above except, trace gravel, dark yellowish brown (10YR 4/6).										
1	9		13.5											
			15.0		SM									
			16.5											
			18.0											
2	0		19.5											

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

Signature MB for B Salome Firm SCS Tel: Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-304R Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			21.0	SILTY SAND (SM), mostly fine, some grey/black streaking, trace gravel, light brownish grey (10YR 6/2)	SM									
			22.5											
3	46		24.0											
			25.5	SILTY SAND (SM) bordering POORLY GRADED SAND (SP), trace gravel, very hard at 27', less fines at bottom, light brownish grey (10YR 6/2)	SP-SM									
			27.0											
4	10		28.5	SILTY SAND (SM), mostly fine, trace gravel, light brownish grey (10YR 6/2).	SM									
				End of boring at 29'. Installed screen from 28.5-18.5', Filter pack from 29- 14.5'.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL - Columbia Generating Station SCS#: 25223067.00		MW-316

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Adam Sweet Horizon Construction and Exploration	4/27/2023	4/27/2023	rotosonic

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
WC189		MW-316	Feet MSL	808.49 Feet MSL	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 544,152 N, 2,122,365 E S / C / N
SW 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S0	0		0	Hydrovac to 10' below ground surface. Soils predominantly silt, sand and gravel.										
			2											
			4											
			6											
			8											
			10	No recovery.										
			12											
			14											
S1	0		16											Drillers indicated that rig was spinning on a hard layer down to 20' bgs. From 20'-22' bgs drillers stated they felt "blow-out" and soils were likely silty sand or fine sand.
			18											
			20											
			22											
			24											
S2	0													

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

Signature	Firm	Tel:
	SCS Engineers 3900 Kilroy Airport Way Long Beach, CA 90806	Fax:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-316 Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S2	0		26											
			28											
S3	6		30											
			32	POORLY GRADED SNAD AND GRAVEL, fine to coarse grained, light brown, with trace large cobbles.	SP					W				
			34	No recovery.										
			36											
S4	0		38											
			40											
			42											
			44											
S5	0		46											
				End of boring at 47' below ground surface.										

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Wisconsin Power & Light

Location Columbia Generating Station

Boring No. MW-84A
Surface Elevation 813.4
Job No. C 7134
Sheet 1 of 1

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

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

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 10/5/83 Complete 10/5/83
Crew Chief JVS Rig B-40
Drilling Method ED 0-37'

State of Wisconsin
Department of Natural Resources

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

Soil Boring Log Information
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WP&L - Columbia 3024.07		M4R

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

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

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

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

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

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
1	12	22	0–1	**SILTY SAND (SM)**, trace fine gravel, non-plastic, yellowish brown 10YR 5/6, no odor, loose, (Fill).	SM					M				SS
2	24	16	2–3	As above, occasional thin layers of light brown sand.										SS
3	15	17	4–5	As above. Color change to 10YR 5/4.										SS
4	24	25	6–7	As above, occasional 10YR 4/4 dark yellowish brown seams with more silt, trace clay.										SS
5	23	19	8–9	As above. 1" gravel (dark colored) at about 9.0 feet.										SS
			10–12											

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

Signature

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

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

State of Wisconsin
Department of Natural Resources

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

Boring Number **M4R** Use only as an attachment to Form [illegible]-122.

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
6	22	34	13–14	As above.										SS
			15	Color change to 10YR 5/3 brown at 14.8 feet, (Native).						VM				
			16–18											
7	22	9	18	As above, no stratigraphy, 10YR 4/6 dark yellowish brown.						W	NV	NP	9.0%	SS
			19–23											
				End of boring at 23.5 feet.										

SCS # 25215135

State of Wisconsin
Department of Natural Resources

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

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

Facility/Project Name: WPL-Columbia	Local Grid Location of Well: ___ ft. ☐N. ☐S. ___ ft. ☐E. ☐W.	Well Name: MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY701 / DNR Well ID No.
Facility ID	St. Plane 541562.2 ft. N, 2125001 ft. E. S/C/N	Date Well Installed: 11 / 11 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of SE 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; Badger State Drilling
Distance from Waste/Source ___ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation 807.16 ft. MSL
B. Well casing, top elevation 806.89 ft. MSL
C. Land surface elevation 803.69 ft. MSL
D. Surface seal, bottom 791.69 ft. MSL or 12 ft.

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

13. Sieve analysis performed? ☐ Yes ☐ No

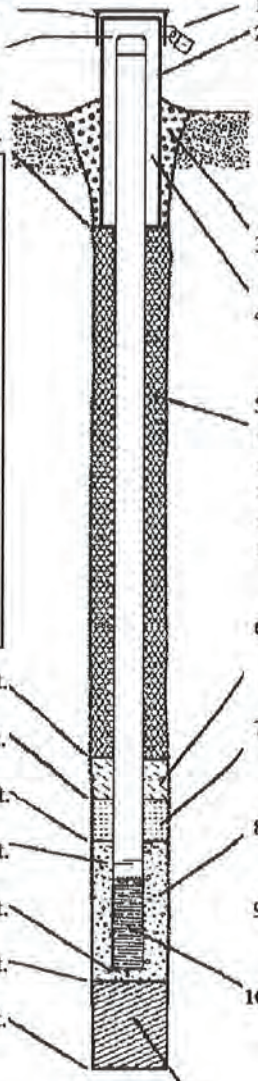
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

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

16. Drilling additives used? ☐ Yes ☒ No
Describe ___

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

E. Bentonite seal, top 803.69 ft. MSL or 0 ft.
F. Fine sand, top 791.69 ft. MSL or 12 ft.
G. Filter pack, top 789.69 ft. MSL or 14 ft.
H. Screen joint, top 787.69 ft. MSL or 16 ft.
I. Well bottom 777.69 ft. MSL or 26 ft.
J. Filter pack, bottom 776.69 ft. MSL or 27 ft.
K. Borehole, bottom 775.69 ft. MSL or 28 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐
Bentonite to grade, sand above
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. 4 ft3 Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native / None ☐ 14 / Other ☒

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

Signature: [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

SCS # 25215135

State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Columbia	Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W.	Well Name: MW-303
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY714 / DNR Well ID No.
Facility ID	St. Plane 543655.7 ft. N, 2122574 ft. E. S/C/N	Date Well Installed: 11 / 13 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; Badger State Drilling
Distance from Waste/Source ____ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 811.81 ft. MSL

B. Well casing, top elevation 811.52 ft. MSL

C. Land surface elevation 808.69 ft. MSL

D. Surface seal, bottom 789.69 ft. MSL or 19 ft.

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

13. Sieve analysis performed? ☐ Yes ☐ No

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

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

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

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

E. Bentonite seal, top 808.69 ft. MSL or 0 ft.

F. Fine sand, top 789.69 ft. MSL or 19 ft.

G. Filter pack, top 787.69 ft. MSL or 21 ft.

H. Screen joint, top 785.69 ft. MSL or 23 ft.

I. Well bottom 775.69 ft. MSL or 33 ft.

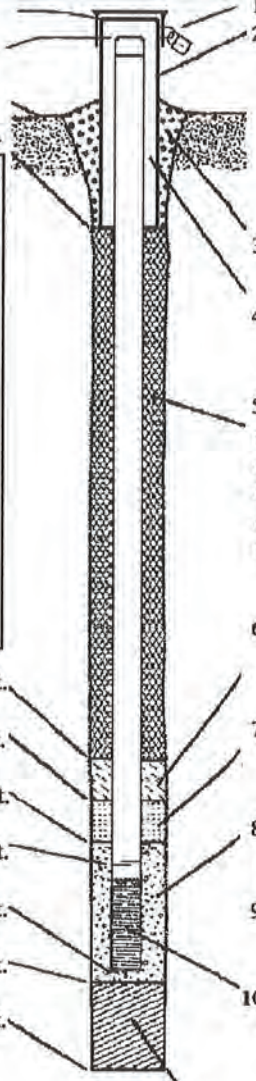
J. Filter pack, bottom 775.69 ft. MSL or 33 ft.

K. Borehole, bottom 774.69 ft. MSL or 34 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.4 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: steel — Steel ☒ 04 / Other ☐
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts

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

4. Material between well casing and protective pipe: Bentonite to grade, sand in between — Bentonite ☒ 30 / Other ☐

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

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. 6.7 ft3 — Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 2.5 ft^3

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

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): Native — None ☐ 14 / Other ☒

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

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

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

SCS # 25215135

State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Columbia	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-304
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY703 / DNR Well ID No.:
Facility ID	St. Plane 544671 ft. N, 2122897 ft. E. S/C/N	Date Well Installed: 11 / 12 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / Badger State Drilling
Distance from Waste/Source ____ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 805.67 ft. MSL

B. Well casing, top elevation 805.42 ft. MSL

C. Land surface elevation 802.50 ft. MSL

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

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

13. Sieve analysis performed? ☐ Yes ☒ No

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

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

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

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

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

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

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

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

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

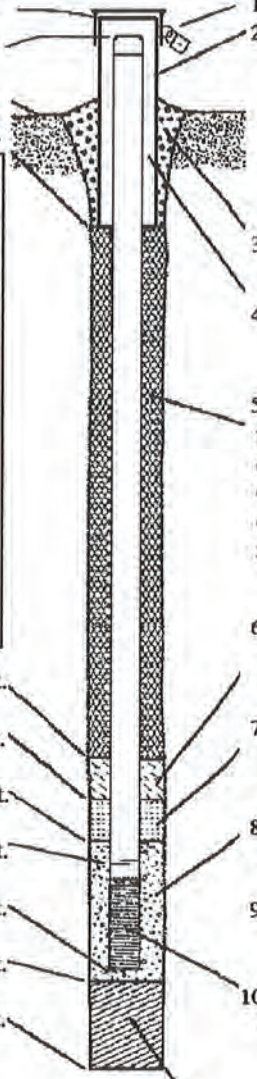
J. Filter pack, bottom 779.50 ft. MSL or 23 ft.

K. Borehole, bottom 779.50 ft. MSL or 23 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.4 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: steel — Steel ☐ 04 / Other ☐
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts

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

4. Material between well casing and protective pipe: Sand. Bentonite to grade — Bentonite ☒ 30 / Other ☐

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

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☐ 32
c. 3.4 ft3 Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 1.5 ft^3

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

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): Native — None ☐ 14 / Other ☒

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

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

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

SCS # 25215135

State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Columbia	Local Grid Location of Well ☐ ft. ☐ N. ☐ ft. ☐ E. ☐ W.	Well Name: MW-305
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY716 / DNR Well ID No.
Facility ID	St. Plane 544776.1 ft. N, 2121537 ft. E. S/C/N	Date Well Installed: 11 / 13 / 2015 (m m d d y y y y)
Type of Well: Well Code /	Section Location of Waste/Source: SW 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / Badger State Drilling
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 806.88 ft. MSL
B. Well casing, top elevation 806.32 ft. MSL
C. Land surface elevation 803.95 ft. MSL
D. Surface seal, bottom 794.95 ft. MSL or 9 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

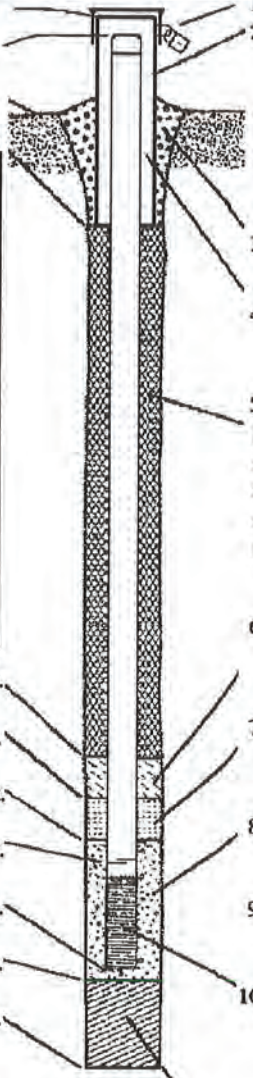
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

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

16. Drilling additives used? ☐ Yes ☒ No
Describe

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

E. Bentonite seal, top 803.95 ft. MSL or 0 ft.
F. Fine sand, top 794.95 ft. MSL or 9 ft.
G. Filter pack, top 792.95 ft. MSL or 11 ft.
H. Screen joint, top 789.95 ft. MSL or 13 ft.
I. Well bottom 779.95 ft. MSL or 23 ft.
J. Filter pack, bottom 779.95 ft. MSL or 23 ft.
K. Borehole, bottom 779.35 ft. MSL or 23.6 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: steel — Steel ☐ 04 / Other ☐
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐
4. Material between well casing and protective pipe: Bentonite to grade, sand in between — Bentonite ☐ 30 / Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. 2 ft3 — Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 3 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native — None ☐ 14 / Other ☒

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

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

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WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

DATE 10/5/83

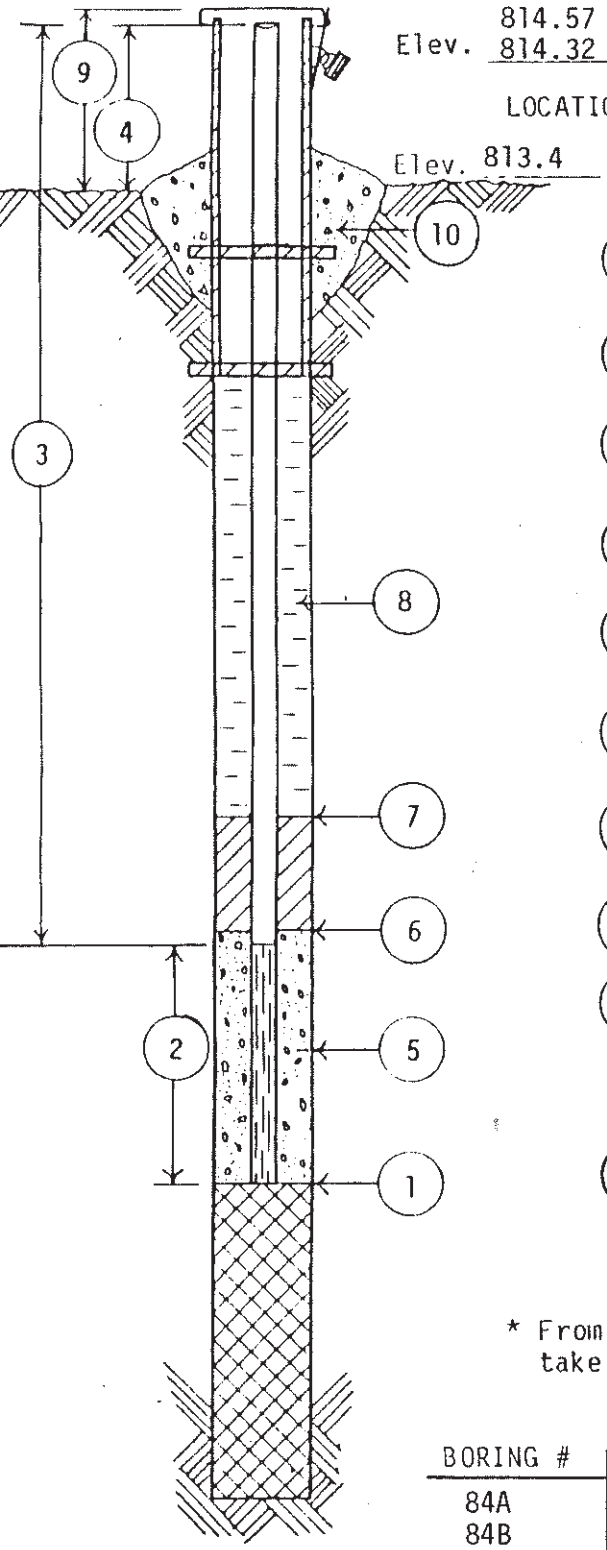
Elev. 814.57 Steel
814.32 PVC

CHIEF JS

LOCATION WP&L-Columbia Generating Station

Elev. 813.4

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



(1) DEPTH TO BOTTOM OF BOREHOLE
37 FEET

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

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

(4) HEIGHT OF WELL CASING ABOVE GROUND
2 FEET

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

(6) DEPTH OF LOWER OR BOTTOM SEAL
3 FEET

(7) DEPTH OF UPPER OR TOP SEAL
0 FEET

(8) TYPE OF BACKFILL Spoils (Sand)

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND 2'

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

WATER LEVEL CHECKS

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

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

WARZYN ENGINEERING INC.

SCS # 25224143.00

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 Dry Ash	Local Grid Location of Well: ___ ft. ☐N. ☐S. ___ ft. ☐E. ☐W.	Well Name: MW-304R
Facility License, Permit or Monitoring No.: 03025	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: ___ DNR Well ID No.: ___
Facility ID: ___	St. Plane 544675.81 ft. N, 2122903.5 ft. E. S/C/N	Date Well Installed: 03 / 18 / 2024 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: NW 1/4 of NE 1/4 of Sec. 27, T. 12 N, R. 09 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Adam Sweet; Horizon Construction and Exploration
Distance from Waste/Source ___ ft. Enf. Stds. Apply ☒	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number: ___

A. Protective pipe, top elevation 804.92 ft. MSL
B. Well casing, top elevation 804.34 ft. MSL
C. Land surface elevation 801.66 ft. MSL
D. Surface seal, bottom 1.74 ft. MSL or 799.92 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

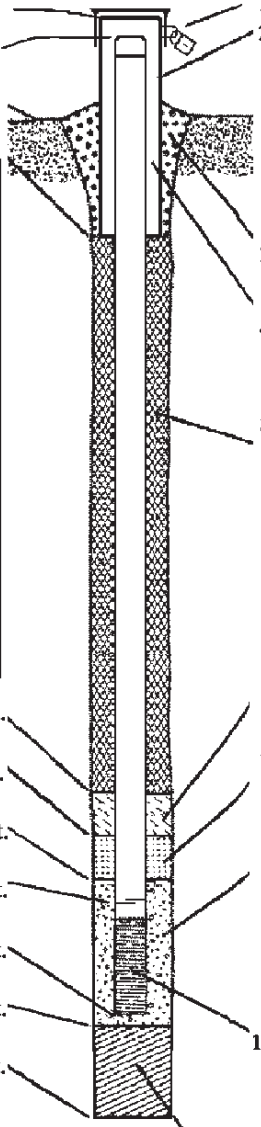
14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☐ 41 Other ☒ Rotosonic

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

16. Drilling additives used? ☐ Yes ☒ No
Describe N/A

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

E. Bentonite seal, top 801.66 ft. MSL or 0 ft.
F. Fine sand, top 787.16 ft. MSL or 14.5 ft.
G. Filter pack, top 785.16 ft. MSL or 16.5 ft.
H. Screen joint, top 783.16 ft. MSL or 18.5 ft.
I. Well bottom 773.16 ft. MSL or 28.5 ft.
J. Filter pack, bottom 772.66 ft. MSL or 29 ft.
K. Borehole, bottom 772.66 ft. MSL or 29 ft.
L. Borehole, diameter 6 in.
M. O.D. well casing 2.04 in.
N. I.D. well casing 2.00 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 4 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper posts (x3)
3. Surface seal: Bentonite ☒ 30 Concrete ☐ 01 Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 30 Other ☐
Sand. Bentonite to grade
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. 4 bags (14.5-surface) Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. Red Flint 15 ☐
b. Volume added 1 bag ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Red Flint 40 ☐
b. Volume added 3.5 bags ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
b. Manufacturer ___
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☒ 14 Other ☐

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

Signature	Firm
for B Salome	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.

State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-9(

Facility/Project Name
WP&L Columbia

Local Grid Location of Well
■ N. 545093.9 ft. ☐ S. ■ E. 2122125.9 ft. ☐ W.

Well Name
M4R

Facility License, Permit or Monitoring Number
2325

Grid Origin Location
Lat. ___ ___ ___ Long. ___ ___ ___ or
St. Plane ____ ft. N, ____ ft. E.

Wis. Unique Well Number

DNR Well Number
133

Type of Well: Water Table Observation Well ■ 11
Piezometer ☐ 12

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

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

Distance Well is From Waste/Source Boundary
120 ft.

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

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

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

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

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

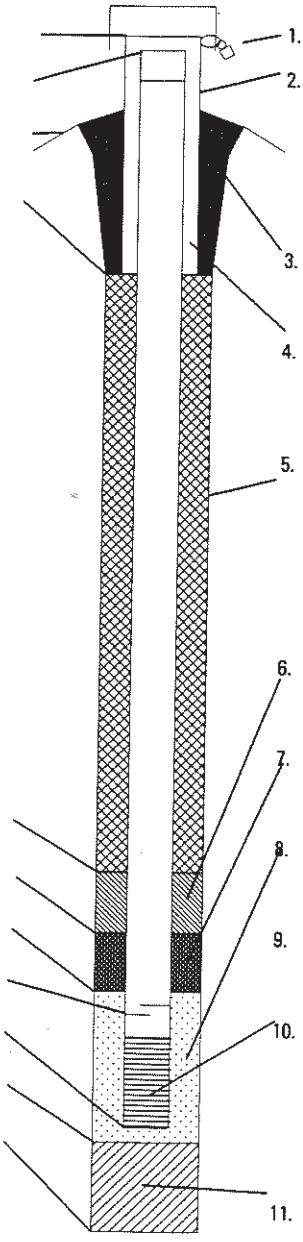
13. Sieve analysis attached? Yes ■ No ☐

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ■ 41
_____ Other ☐

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

16. Drilling additives used? Yes ☐ No ■
Describe _____

17. Source of water (attach analysis):



1. Cap and lock? ■ Yes ☐ No

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

3. Surface seal: Bentonite ■ 30
Concrete ☐ 01
Other ☐

4. Material between well casing and protective pipe: Bentonite ■ 30
Annular space seal ☐
Other ☐

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

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

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

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

9. Well casing:
Flush threaded PVC schedule 40 ■ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐

10. Screen Material: PVC
a. Screen type:
b. Manufacturer Timco
c. Slot size: 0.010 in
d. Slotted length: 10.0 ft
Factory cut ■ 11
Continuous slot ☐ 01
Other ☐

11. Backfill material (below filter pack):
None ■ 14
Other ☐

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

Signature

Firm
RMT, Inc.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

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APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G

SCS # 25215135

State of Wisconsin
Department of Natural Resources

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

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

Facility/Project Name: WPL-Columbia	Local Grid Location of Well: ____ ft. ☐N ☐S ____ ft. ☐E ☐W	Well Name: MW-304
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY703 / DNR Well ID No.:
Facility ID	St. Plane 544671 ft. N, 2122897 ft. E. S/C/N	Date Well Installed: 11 / 12 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; Badger State Drilling
Distance from Waste/Source ____ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 805.67 ft. MSL
B. Well casing, top elevation 805.42 ft. MSL
C. Land surface elevation 802.50 ft. MSL
D. Surface seal, bottom 793.50 ft. MSL or 9 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

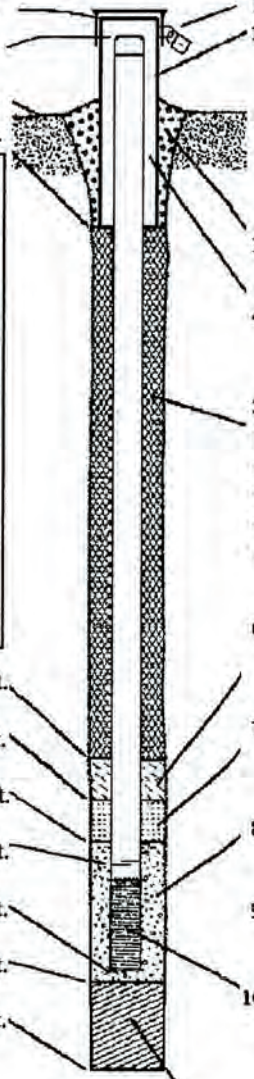
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ____

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

16. Drilling additives used? ☐ Yes ☒ No
Describe ____

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

E. Bentonite seal, top 802.50 ft. MSL or 0 ft.
F. Fine sand, top 793.50 ft. MSL or 9 ft.
G. Filter pack, top 791.50 ft. MSL or 11 ft.
H. Screen joint, top 789.50 ft. MSL or 13 ft.
I. Well bottom 779.50 ft. MSL or 23 ft.
J. Filter pack, bottom 779.50 ft. MSL or 23 ft.
K. Borehole, bottom 779.50 ft. MSL or 23 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: steel — Steel ☐ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: yes, bumper posts
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ____
4. Material between well casing and protective pipe: Sand. Bentonite to grade — Bentonite ☒ 30; Other ☐ ____
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☐ 32
c. 3.4 ft3 — Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft³
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 1.5 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Native — None ☐ 14; Other ☒ ____

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

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

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

SCS # 25223067.00

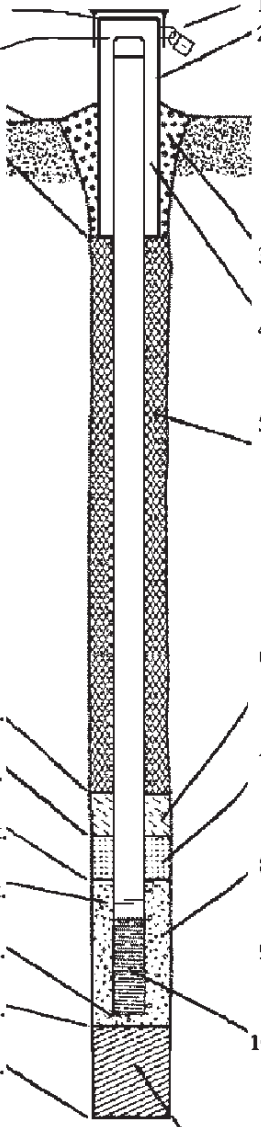
State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL - Columbia Generating Station	Local Grid Location of Well: ___ ft. ☐N. ☐S. ___ ft. ☐E. ☐W.	Well Name: MW-316
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: WC189 / DNR Well ID No.:
Facility ID	St. Plane 544,151.67 ft. N, 2,122,364.52 ft. E. S/C/N	Date Well Installed: 04 / 28 / 2023 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Adam Sweet / Horizon Construction and Exploration
Distance from Waste/Source ___ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number:



A. Protective pipe, top elevation 809.20 ft. MSL

B. Well casing, top elevation 808.49 ft. MSL

C. Land surface elevation 806.31 ft. MSL

D. Surface seal, bottom 804.31 ft. MSL or 2 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

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

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

16. Drilling additives used? ☐ Yes ☒ No

Describe --

17. Source of water (attach analysis, if required): Horizon brought to site.

E. Bentonite seal, top 806.31 ft. MSL or 0 ft.

F. Fine sand, top 780.31 ft. MSL or 26 ft.

G. Filter pack, top 778.31 ft. MSL or 28 ft.

H. Screen joint, top 776.31 ft. MSL or 30 ft.

I. Well bottom 766.31 ft. MSL or 40 ft.

J. Filter pack, bottom 764.31 ft. MSL or 42 ft.

K. Borehole, bottom 759.31 ft. MSL or 47 ft.

L. Borehole, diameter 6 in.

M. O.D. well casing 2.37 in.

N. I.D. well casing 2.01 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Bumper Posts

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

4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 6 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08

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

7. Fine sand material: Manufacturer, product name & mesh size
a. Red Flint #15 ☒
b. Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. Red Flint #40 ☒
b. Volume added 4 ft^3

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

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
b. Manufacturer Johnson
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): Filter Sand / None ☐ 14 / Other ☒

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 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.

State of Wis., Dept. of Natural Resources SCS No. 25224143.00
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, 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. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☒ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Columbia	VY703	MW-304

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼ SE	¼ NW	Section	Township	Range
or Gov't Lot #		27	12 N	9 ☒ E ☐ W

Well Street Address: W8375 Murray Rd

Well City, Village or Town	Well ZIP Code
Pardeeville	53954

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Compromised	

2. Facility / Owner Information

Facility Name: Columbia Energy Center
Facility ID (FID or PWS):
License/Permit/Monitoring #:
Original Well Owner: Wisconsin Power and Light Company
Present Well Owner: Wisconsin Power and Light Company
Mailing Address of Present Owner: W8375 Murray Rd

City of Present Owner	State	ZIP Code
Pardeeville	WI	53954

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/12/2015

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug ☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
23	2

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
8.5	13

Was well annular space grouted? ☒ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)
11	>23

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☒ Yes	☐ No	☐ N/A
Liner(s) removed?	☐ Yes	☐ No	☐ N/A
Liner(s) perforated?	☐ Yes	☐ No	☐ N/A
Screen removed?	☐ Yes	☒ No	☐ N/A
Casing left in place?	☒ Yes	☐ No	☐ N/A
Was casing cut off below surface?	☒ Yes	☐ No	☐ N/A
Did sealing material rise to surface?	☒ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☒ Yes	☐ No	☐ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☒ Yes	☐ No	☐ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
3/8 Bentonite Chips	Surface	23		

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Bri Salome		03/18/2024

Street or Route	Telephone Number
2830 Dairy Drive	(608)216 - 7368

City	State	ZIP Code
Madison	WI	53718

Signature of Person Doing Work: [signature]
Date Signed: 5/17/2024

DNR Use Only

Date Received	Noted By

Comments:

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Alliant-Columbia	Columbia	MW-301

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

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

2. Well development method

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

3. Time spent developing well ___120 min.

4. Depth of well (from top of well casisng) __29.4 ft.

5. Inside diameter of well __2.00 in.

6. Volume of water in filter pack and well casing ___7.6 gal.

7. Volume of water removed from well ___84.0 gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 21.72 ft.	21.77 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 08:30 ☒ a.m. ☐ p.m.	10:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

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

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

17. Additional comments on development:

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

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

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Alliant - Columbia	Columbia	MW-302

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

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

2. Well development method

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

3. Time spent developing well 120 min.

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

5. Inside diameter of well 2.00 in.

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

7. Volume of water removed from well 60.0 gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 28.37 ft.	28.41 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 02:00 ☐ a.m. ☒ p.m.	04:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.__ inches	0.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)

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

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

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

17. Additional comments on development:

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

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

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Alliant - Columbia	Columbia	MW-303

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

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

2. Well development method

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

3. Time spent developing well 120 min.

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

5. Inside diameter of well 2.00 in.

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

7. Volume of water removed from well 83.0 gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 28.30 ft.	28.38 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 11:45 ☒ a.m. ☐ p.m.	1:45 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___.__ inches	___.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)

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

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

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

17. Additional comments on development:

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

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

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Alliant - Columbia	Columbia	MW-304

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

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

2. Well development method

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

3. Time spent developing well 135 min.

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

5. Inside diameter of well 2.00 in.

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

7. Volume of water removed from well 88.0 gal.

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

9. Source of water added _____

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

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

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

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

17. Additional comments on development:

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

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

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Alliant - Columbia	Columbia	MW-305

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

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

2. Well development method

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

3. Time spent developing well 120 min.

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

5. Inside diameter of well 2.00 in.

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

7. Volume of water removed from well 85.0 gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 18.61 ft.	18.62 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 08:30 ☒ a.m. ☐ p.m.	11:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	____.__ inches	____.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)

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

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

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

17. Additional comments on development:

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

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

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

te of Wisconsin
epartment of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

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

cility/Project Name	County Name	Well Name
P&L Columbia	Columbia	M4R

cility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
2325	11		133

Can this well be purged dry? ☐ Yes ■ No

Well development method
- surged with bailer and bailed ☐ 41
- surged with bailer and pumped ■ 61
- surged with block and bailed ☐ 42
- surged with block and pumped ☐ 62
- surged with block, bailed and pumped ☐ 70
- compressed air ☐ 20
- bailed only ☐ 10
- pumped only ☐ 51
- pumped slowly ☐ 50
- Other _____ ☐ [illegible]

Time spent developing well 120 min.

Depth of well (from top of well casing) 253 ft.

Inside diameter of well 2.0 in.

Volume of water in filter pack and well casing 4.2 gal.

Volume of water removed from well 70. gal.

Volume of water added (if any) 0. gal.

Source of water added _____

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 199.0 ft.	200.5 ft.
Date	b. 08/23/96 (m m d d y y) ■ a.m.	08/23/96 ■ a.m.
Time	c. 8:30 ☐ p.m.	10:30 ☐ p.m.
12. Sediment in well bottom	0. inches	0. inches
13. Water clarity	Clear ☐ 10 / Turbid ■ 15 (Describe) Brn, very silty	Clear ■ 20 / Turbid ☐ 25 (Describe)

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

14. Total suspended solids	mg/l	190. mg/l
15. COD	mg/l	N/A. mg/l

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

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

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

ell developed by: Person's Name and Firm

me: Meredith Westover

m: RMT, Inc.

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

Signature: [signature]

Print Initials: M L W

Firm: RMT, Inc.

TE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes. I:\WPMSN\PJT\00-03024\07\B0003024.07A 12/31/96

APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G

SCS # 25224143

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL - Columbia Dry Ash	Columbia	MW-304R
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well ID Number**
03025	11		

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

2. Well development method

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

3. Time spent developing well 181 min.

4. Depth of well (from top of well casisng) 30.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 46. gal.

7. Volume of water removed from well 95. gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 22.97 ft.	29.62 ft.
Date	b. 03/19/2024	03/19/2024
Time	c. 11:18 ☒ a.m. ☐ p.m.	2:19 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.1 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	no odor light brown saturated, water looks thick	no odor light brown significantly less turbid

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

14. Total suspended solids	___. mg/l	340. mg/l
15. COD	___. mg/l	___. mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Bri Last Name: Salome
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

17. Additional comments on development:

TD before development: 30.63 / started surge purge at 11:18 / Went dry during second and third purge of 30 min surge/purge
11:48 Finished surge/purge DTW: 29.82 TD 30.73 purged 4 gallons
Waited for well to recover, checked DTW every 30 mins approximately / 1250 DTW 23.45; continue with purge
Purged 3 gallons, went dry DTW 30.21 / 1307 pulled pump / Going to wait one (1) hour for final purge / 1407 DTW 23.57
1409 put pump back down, continued with purge / 1419 well went dry pulled pump DTW 29.62 TD 30.73 purged 2.5 gallons
Wait 30 mins to sample / 1447 DTW 24.72 / 1449 sampled for TSS

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Brian Last Name: Clepper
Facility/Firm: Alliant/WPL Columbia Generating System (CGS)
Street: W8375 Murray Rd
City/State/Zip: Pardeeville, WI 53957

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: _____
Print Name: Bri Salome
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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

SCS # 25223067.00

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
Columbia Generating Station	Columbia	MW-316

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	__	WC189 ___	___

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

2. Well development method

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

3. Time spent developing well ___110 min.

4. Depth of well (from top of well casisng) __43.7 ft.

5. Inside diameter of well __2.01 in.

6. Volume of water in filter pack and well casing ___10.2 gal.

7. Volume of water removed from well ___105.0 gal.

8. Volume of water added (if any) ___--.- gal.

9. Source of water added NA

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. __27.65 ft.	__27.66 ft.
Date	b. 04 / 28 / 2023 (m m d d y y y y)	04 / 28 / 2023
Time	c. 9 : 40 ☒ a.m. ☐ p.m.	11 : 30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	__--.- inches	__--.- inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
(Describe)	Dark brown, cloudy	Clear

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

14. Total suspended solids	___--.- mg/l	___134.0 mg/l
15. COD	___--.- mg/l	___--.- mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Ryan Last Name: Matzuk
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

17. Additional comments on development:
SUrged and purged with pump over 110 minutes.

Name and Address of Facility Contact /Owner/Responsible Party
First Name: _____ Last Name: _____
Facility/Firm: _____
Street: _____
City/State/Zip: _____

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: _____
Print Name: Ryan Matzuk
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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

Appendix C

Laboratory Reports

C1 – October 2023 Assessment Monitoring

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

November 06, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2023. 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: Matt Bizjack, Alliant Energy
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
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 #: PA014572023-03
New Hampshire/TNI Certification #: 297622
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 #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40269529001	**MW-301**	Water	10/11/23 14:15	10/13/23 09:15
40269529002	**MW-84A**	Water	10/11/23 15:00	10/13/23 09:15

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

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40269529001	**MW-301**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40269529002	**MW-84A**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	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

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-301 **Lab ID: 40269529001** Collected: 10/11/23 14:15 Received: 10/13/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:12	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 01:12	7440-38-2	
Barium	**7.3**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 01:12	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 01:12	7440-41-7	
Boron	**36.2**	ug/L	10.0	3.0	1	10/17/23 06:27	10/19/23 01:12	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:12	7440-43-9	
Calcium	**52300**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 01:12	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 01:12	7440-47-3	
Cobalt	**0.13J**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 01:12	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 01:12	7439-92-1	
Lithium	**0.43J**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 01:12	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 01:12	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 01:12	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 01:12	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	10/18/23 10:55	10/19/23 06:31	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.06**	Std. Units			1		10/11/23 14:15		
Field Specific Conductance	**536**	umhos/cm			1		10/11/23 14:15		
Oxygen, Dissolved	**0.16**	mg/L			1		10/11/23 14:15	7782-44-7	
REDOX	**23.8**	mV			1		10/11/23 14:15		
Turbidity	**0.34**	NTU			1		10/11/23 14:15		
Static Water Level	**784.67**	feet			1		10/11/23 14:15		
Temperature, Water (C)	**10.7**	deg C			1		10/11/23 14:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**300**	mg/L	20.0	8.7	1		10/15/23 21:57		
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		10/18/23 16:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.1**	mg/L	2.0	0.59	1		10/26/23 16:25	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 16:25	16984-48-8	M0
Sulfate	**11.8**	mg/L	2.0	0.44	1		10/26/23 16:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-84A **Lab ID: 40269529002** Collected: 10/11/23 15:00 Received: 10/13/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:19	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 01:19	7440-38-2	
Barium	**12.7**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 01:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 01:19	7440-41-7	
Boron	**14.0**	ug/L	10.0	3.0	1	10/17/23 06:27	10/19/23 01:19	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:19	7440-43-9	
Calcium	**65100**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 01:19	7440-70-2	
Chromium	**1.6J**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 01:19	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 01:19	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 01:19	7439-92-1	
Lithium	**0.54J**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 01:19	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 01:19	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 01:19	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 01:19	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	10/18/23 10:55	10/19/23 06:33	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.51**	Std. Units			1		10/11/23 15:00		
Field Specific Conductance	**599.9**	umhos/cm			1		10/11/23 15:00		
Oxygen, Dissolved	**8.44**	mg/L			1		10/11/23 15:00	7782-44-7	
REDOX	**91.2**	mV			1		10/11/23 15:00		
Turbidity	**0.03**	NTU			1		10/11/23 15:00		
Static Water Level	**784.39**	feet			1		10/11/23 15:00		
Temperature, Water (C)	**12.3**	deg C			1		10/11/23 15:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**324**	mg/L	20.0	8.7	1		10/15/23 21:58		
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		10/18/23 16:13		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.1**	mg/L	2.0	0.59	1		10/26/23 17:51	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 17:51	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		10/26/23 17:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457855
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2629305 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	10/19/23 05:49	

LABORATORY CONTROL SAMPLE: 2629306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629307 2629308

Parameter	Units	40269479001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.2	4.9	103	98	85-115	6	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457669
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2628366 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/18/23 21:17	
Arsenic	ug/L	<0.28	1.0	10/18/23 21:17	
Barium	ug/L	<0.70	2.3	10/18/23 21:17	
Beryllium	ug/L	<0.25	1.0	10/18/23 21:17	
Boron	ug/L	<3.0	10.0	10/18/23 21:17	
Cadmium	ug/L	<0.15	1.0	10/18/23 21:17	
Calcium	ug/L	<76.2	254	10/18/23 21:17	
Chromium	ug/L	<1.0	3.4	10/18/23 21:17	
Cobalt	ug/L	<0.12	1.0	10/18/23 21:17	
Lead	ug/L	<0.24	1.0	10/18/23 21:17	
Lithium	ug/L	<0.22	1.0	10/18/23 21:17	
Molybdenum	ug/L	<0.44	1.5	10/18/23 21:17	
Selenium	ug/L	<0.32	1.1	10/18/23 21:17	
Thallium	ug/L	<0.14	1.0	10/18/23 21:17	

LABORATORY CONTROL SAMPLE: 2628367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	242	97	80-120	
Arsenic	ug/L	250	242	97	80-120	
Barium	ug/L	250	236	94	80-120	
Beryllium	ug/L	250	260	104	80-120	
Boron	ug/L	250	240	96	80-120	
Cadmium	ug/L	250	245	98	80-120	
Calcium	ug/L	10000	10400	104	80-120	
Chromium	ug/L	250	232	93	80-120	
Cobalt	ug/L	250	237	95	80-120	
Lead	ug/L	250	243	97	80-120	
Lithium	ug/L	250	239	95	80-120	
Molybdenum	ug/L	250	238	95	80-120	
Selenium	ug/L	250	251	100	80-120	
Thallium	ug/L	250	240	96	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2628368 2628369

Parameter	Units	40269514001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.22J	250	250	240	241	96	96	75-125	0	20	
Arsenic	ug/L	0.42J	250	250	241	245	96	98	75-125	2	20	
Barium	ug/L	18.3	250	250	251	252	93	94	75-125	0	20	
Beryllium	ug/L	<0.25	250	250	254	258	102	103	75-125	2	20	
Boron	ug/L	106	250	250	338	335	93	92	75-125	1	20	
Cadmium	ug/L	<0.15	250	250	241	241	96	96	75-125	0	20	
Calcium	ug/L	110000	10000	10000	120000	121000	97	105	75-125	1	20	
Chromium	ug/L	2.3J	250	250	230	233	91	92	75-125	2	20	
Cobalt	ug/L	0.17J	250	250	228	232	91	93	75-125	2	20	
Lead	ug/L	<0.24	250	250	241	243	96	97	75-125	1	20	
Lithium	ug/L	13.9	250	250	250	252	95	95	75-125	1	20	
Molybdenum	ug/L	7.4	250	250	244	243	94	94	75-125	0	20	
Selenium	ug/L	1.4	250	250	247	252	98	100	75-125	2	20	
Thallium	ug/L	0.15J	250	250	238	242	95	97	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457507
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2627853 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/23 21:53	

LABORATORY CONTROL SAMPLE: 2627854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	587	580	99	80-120	

SAMPLE DUPLICATE: 2627855

Parameter	Units	40269478001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	200	214	7	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457892
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

SAMPLE DUPLICATE: 2629567

Parameter	Units	40269529001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

SAMPLE DUPLICATE: 2629568

Parameter	Units	40269609008 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.8	2	20	1q,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 458622
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2633879 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	10/26/23 15:42	
Fluoride	mg/L	<0.095	0.32	10/26/23 15:42	
Sulfate	mg/L	<0.44	2.0	10/26/23 15:42	

LABORATORY CONTROL SAMPLE: 2633880

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.9	109	90-110	
Fluoride	mg/L	2	2.2	108	90-110	
Sulfate	mg/L	20	21.7	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633881 2633882

Parameter	Units	40269529001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.1	20	20	23.4	23.6	107	108	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.4	2.4	115	116	90-110	1	15	M0
Sulfate	mg/L	11.8	20	20	33.6	33.6	109	109	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633883 2633884

Parameter	Units	40269593002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	523	400	400	935	935	103	103	90-110	0	15	
Sulfate	mg/L	277	400	400	697	694	105	104	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-301 **Lab ID: 40269529001** Collected: 10/11/23 14:15 Received: 10/13/23 09:15 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	**-0.0576 ± 0.492 (1.00) C:NA T:85%**	pCi/L	11/01/23 14:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.611 ± 0.377 (0.692) C:84% T:85%**	pCi/L	10/25/23 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.611 ± 0.869 (1.69)**	pCi/L	11/02/23 11:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-84A **Lab ID: 40269529002** Collected: 10/11/23 15:00 Received: 10/13/23 09:15 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	**0.292 ± 0.445 (0.766) C:NA T:84%**	pCi/L	11/01/23 14:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.552 ± 0.360 (0.676) C:83% T:84%**	pCi/L	10/25/23 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.844 ± 0.805 (1.44)**	pCi/L	11/02/23 11:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 622852
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 3036014 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0951 ± 0.264 (0.512) C:NA T:83%	pCi/L	11/01/23 14:15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 622853
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 3036016 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.399 ± 0.328 (0.647) C:82% T:83%	pCi/L	10/25/23 14:31	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALIFIERS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

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.
DL - Adjusted Method Detection Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40269529001	**MW-301**	EPA 3010A	457669	EPA 6020B	457769
40269529002	**MW-84A**	EPA 3010A	457669	EPA 6020B	457769
40269529001	**MW-301**	EPA 7470	457855	EPA 7470	457902
40269529002	**MW-84A**	EPA 7470	457855	EPA 7470	457902
40269529001	**MW-301**				
40269529002	**MW-84A**				
40269529001	**MW-301**	EPA 903.1	622852		
40269529002	**MW-84A**	EPA 903.1	622852		
40269529001	**MW-301**	EPA 904.0	622853		
40269529002	**MW-84A**	EPA 904.0	622853		
40269529001	**MW-301**	Total Radium Calculation	626730		
40269529002	**MW-84A**	Total Radium Calculation	626730		
40269529001	**MW-301**	SM 2540C	457507		
40269529002	**MW-84A**	SM 2540C	457507		
40269529001	**MW-301**	EPA 9040	457892		
40269529002	**MW-84A**	EPA 9040	457892		
40269529001	**MW-301**	EPA 300.0	458622		
40269529002	**MW-84A**	EPA 300.0	458622		

402695 29

CHAIN-OF-CUSTODY / Analytical Request Document

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

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https //info pacelabs com/hubfs/pas-standard-terms pdf

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company	SCS ENGINEERS	Report To	Meghan Blodgett	Attention	
Address	2830 Dairy Drive	Copy To		Company Name	
Madison, WI 53718				Address	
Email	mblodgett@scsengineers com	Purchase Order #		Pace Quote	
Phone	608-216-7362 Fax	Project Name	25223067 Columbia CCR Background	Pace Project Manager	dan.milewsky@pacelabs.com,
Requested Due Date		Project #	25223067	Pace Profile #:	

Regulatory Agency	
State / Location	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N)	Analyses Test: Y/N	Radium 226	Radium 228	Metals	TDS and pH	Chlonde,Fluonde,Sulfate	Residual Chlonne (Y/N)	
	MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS																		N	N	N	N	N		
1	MW-301	WT		10/11	1415				6											X	X	X	X	X		001
2	MW-84A	WT		10/11	1500				6											X	X	X	X	X		002
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Bridget Russell SCS Engs	10/12	1100							
	CS Blodgett SCS	10/13/23	0915		10/13/23	0915	1.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: Bridget Russell DATE Signed: 10/12/2023

Sample Preservation Receipt Form

Client Name: SCS Project # 40269529

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

Lab Lot# of pH paper 10037723 Lab Std #ID of preservation (if pH adjusted).

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	Vials: VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: SP5T	ZPLC	GN 1	GN 2	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001									2		2															2	2					X		2.5 / 5
002									2		2															2	2					X		2.5 / 5
003																																		2.5 / 5
004																																		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
010																																		2.5 / 5
011																																		2.5 / 5
012																																		2.5 / 5
013																																		2.5 / 5
014																																		2.5 / 5
015																																		2.5 / 5
016																																		2.5 / 5
017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

10/13/23 SB

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	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1 body HNO3
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40269529

40269529

Client Name: SLS

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

Tracking #: _____

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

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 109 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 1.0

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

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

Person examining contents:
Date: 12/13/22 Initials: SG

Labeled By Initials: SG

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

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

November 06, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Dear Meghan Blodgett:

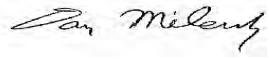
Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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: Matt Bizjack, Alliant Energy
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
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 #: PA014572023-03
New Hampshire/TNI Certification #: 297622
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 #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40269495001	**MW-303**	Water	10/09/23 14:10	10/13/23 09:15
40269495002	**FIELD BLANK-PPOND**	Water	10/10/23 10:20	10/13/23 09:15
40269495003	**MW-316**	Water	10/09/23 15:55	10/13/23 09:15

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

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40269495001	**MW-303**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40269495002	**FIELD BLANK-PPOND**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40269495003	**MW-316**	EPA 6020B	KXS	1	PASI-G
			LB	7	PASI-G

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

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Sample: MW-303 **Lab ID: 40269495001** Collected: 10/09/23 14:10 Received: 10/13/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.35J**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 00:57	7440-36-0	
Arsenic	**36.3**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 00:57	7440-38-2	
Barium	**3.3**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 00:57	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 00:57	7440-41-7	
Boron	**2420**	ug/L	100	30.3	10	10/17/23 06:27	10/19/23 12:59	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 00:57	7440-43-9	
Calcium	**2610**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 00:57	7440-70-2	
Chromium	**66.4**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 00:57	7440-47-3	
Cobalt	**0.40J**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 00:57	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 00:57	7439-92-1	
Lithium	**0.75J**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 00:57	7439-93-2	
Molybdenum	**56.3**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 00:57	7439-98-7	
Selenium	**28.3**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 00:57	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 00:57	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	10/18/23 10:55	10/19/23 06:17	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**9.61**	Std. Units			1		10/09/23 14:10		
Field Specific Conductance	**1090**	umhos/cm			1		10/09/23 14:10		
Oxygen, Dissolved	**7.63**	mg/L			1		10/09/23 14:10	7782-44-7	
REDOX	**46.2**	mV			1		10/09/23 14:10		
Turbidity	**2.15**	NTU			1		10/09/23 14:10		
Static Water Level	**781.21**	feet			1		10/09/23 14:10		
Temperature, Water (C)	**12.6**	deg C			1		10/09/23 14:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**686**	mg/L	20.0	8.7	1		10/15/23 21:55		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**9.8**	Std. Units	0.10	0.010	1		10/16/23 16:41		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**46.4**	mg/L	20.0	5.9	10		10/26/23 13:58	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 08:10	16984-48-8	
Sulfate	**188**	mg/L	20.0	4.4	10		10/26/23 13:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Sample: FIELD BLANK-PPOND **Lab ID: 40269495002** Collected: 10/10/23 10:20 Received: 10/13/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 00:35	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 00:35	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 00:35	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 00:35	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	10/17/23 06:27	10/19/23 00:35	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 00:35	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 00:35	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 00:35	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 00:35	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 00:35	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 00:35	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 00:35	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 00:35	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 00:35	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	10/18/23 10:55	10/19/23 06:19	7439-97-6	
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		10/15/23 21:55		
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		10/16/23 16:53		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.59**	mg/L	2.0	0.59	1		10/26/23 08:25	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 08:25	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/26/23 08:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Sample: MW-316 **Lab ID: 40269495003** Collected: 10/09/23 15:55 Received: 10/13/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Arsenic	**1.6**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 01:04	7440-38-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.27**	Std. Units			1		10/09/23 15:55		
Field Specific Conductance	**680**	umhos/cm			1		10/09/23 15:55		
Oxygen, Dissolved	**0.08**	mg/L			1		10/09/23 15:55	7782-44-7	
REDOX	**-40.6**	mV			1		10/09/23 15:55		
Turbidity	**1.60**	NTU			1		10/09/23 15:55		
Static Water Level	**780.30**	feet			1		10/09/23 15:55		
Temperature, Water (C)	**12.5**	deg C			1		10/09/23 15:55		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 457855
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269495001, 40269495002

METHOD BLANK: 2629305 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	10/19/23 05:49	

LABORATORY CONTROL SAMPLE: 2629306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629307 2629308

Parameter	Units	40269479001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.2	4.9	103	98	85-115	6	20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 457669
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269495001, 40269495002, 40269495003

METHOD BLANK: 2628366 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002, 40269495003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/18/23 21:17	
Arsenic	ug/L	<0.28	1.0	10/18/23 21:17	
Barium	ug/L	<0.70	2.3	10/18/23 21:17	
Beryllium	ug/L	<0.25	1.0	10/18/23 21:17	
Boron	ug/L	<3.0	10.0	10/18/23 21:17	
Cadmium	ug/L	<0.15	1.0	10/18/23 21:17	
Calcium	ug/L	<76.2	254	10/18/23 21:17	
Chromium	ug/L	<1.0	3.4	10/18/23 21:17	
Cobalt	ug/L	<0.12	1.0	10/18/23 21:17	
Lead	ug/L	<0.24	1.0	10/18/23 21:17	
Lithium	ug/L	<0.22	1.0	10/18/23 21:17	
Molybdenum	ug/L	<0.44	1.5	10/18/23 21:17	
Selenium	ug/L	<0.32	1.1	10/18/23 21:17	
Thallium	ug/L	<0.14	1.0	10/18/23 21:17	

LABORATORY CONTROL SAMPLE: 2628367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	242	97	80-120	
Arsenic	ug/L	250	242	97	80-120	
Barium	ug/L	250	236	94	80-120	
Beryllium	ug/L	250	260	104	80-120	
Boron	ug/L	250	240	96	80-120	
Cadmium	ug/L	250	245	98	80-120	
Calcium	ug/L	10000	10400	104	80-120	
Chromium	ug/L	250	232	93	80-120	
Cobalt	ug/L	250	237	95	80-120	
Lead	ug/L	250	243	97	80-120	
Lithium	ug/L	250	239	95	80-120	
Molybdenum	ug/L	250	238	95	80-120	
Selenium	ug/L	250	251	100	80-120	
Thallium	ug/L	250	240	96	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2628368 2628369

Parameter	Units	40269514001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.22J	250	250	240	241	96	96	75-125	0	20	
Arsenic	ug/L	0.42J	250	250	241	245	96	98	75-125	2	20	
Barium	ug/L	18.3	250	250	251	252	93	94	75-125	0	20	
Beryllium	ug/L	<0.25	250	250	254	258	102	103	75-125	2	20	
Boron	ug/L	106	250	250	338	335	93	92	75-125	1	20	
Cadmium	ug/L	<0.15	250	250	241	241	96	96	75-125	0	20	
Calcium	ug/L	110000	10000	10000	120000	121000	97	105	75-125	1	20	
Chromium	ug/L	2.3J	250	250	230	233	91	92	75-125	2	20	
Cobalt	ug/L	0.17J	250	250	228	232	91	93	75-125	2	20	
Lead	ug/L	<0.24	250	250	241	243	96	97	75-125	1	20	
Lithium	ug/L	13.9	250	250	250	252	95	95	75-125	1	20	
Molybdenum	ug/L	7.4	250	250	244	243	94	94	75-125	0	20	
Selenium	ug/L	1.4	250	250	247	252	98	100	75-125	2	20	
Thallium	ug/L	0.15J	250	250	238	242	95	97	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 457507
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269495001, 40269495002

METHOD BLANK: 2627853 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/23 21:53	

LABORATORY CONTROL SAMPLE: 2627854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	587	580	99	80-120	

SAMPLE DUPLICATE: 2627855

Parameter	Units	40269478001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	200	214	7	10	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 457584
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269495001, 40269495002

SAMPLE DUPLICATE: 2628095

Parameter	Units	40269422001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.2	8.2	0	20	H6

SAMPLE DUPLICATE: 2628096

Parameter	Units	40269442001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.8	1	20	1q,H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 458607
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269495001, 40269495002

METHOD BLANK: 2633793 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	10/26/23 05:27	
Fluoride	mg/L	<0.095	0.32	10/26/23 05:27	
Sulfate	mg/L	<0.44	2.0	10/26/23 05:27	

LABORATORY CONTROL SAMPLE: 2633794

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.2	101	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	19.9	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633795 2633796

Parameter	Units	40269506002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	71.3	100	100	171	166	100	95	90-110	3	15	
Fluoride	mg/L	<0.095	2	2	2.3	2.3	110	112	90-110	1	15	M0
Sulfate	mg/L	90.7	100	100	190	182	99	91	90-110	4	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Sample: MW-303 **Lab ID: 40269495001** Collected: 10/09/23 14:10 Received: 10/13/23 09:15 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	**0.233 ± 0.512 (0.926) C:NA T:81%**	pCi/L	11/01/23 14:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.545 ± 0.419 (0.826) C:81% T:81%**	pCi/L	10/25/23 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.778 ± 0.931 (1.75)**	pCi/L	11/02/23 11:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Sample: FIELD BLANK-PPOND **Lab ID: 40269495002** Collected: 10/10/23 10:20 Received: 10/13/23 09:15 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 ± 0.332 (0.701) C:NA T:84%**	pCi/L	11/01/23 14:40	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.871 ± 0.429 (0.726) C:81% T:84%**	pCi/L	10/25/23 14:34	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.871 ± 0.761 (1.43)**	pCi/L	11/02/23 11:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 622852
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40269495001, 40269495002

METHOD BLANK: 3036014 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0951 ± 0.264 (0.512) C:NA T:83%	pCi/L	11/01/23 14:15	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

QC Batch: 622853
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40269495001, 40269495002

METHOD BLANK: 3036016 Matrix: Water
Associated Lab Samples: 40269495001, 40269495002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.399 ± 0.328 (0.647) C:82% T:83%	pCi/L	10/25/23 14:31	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALIFIERS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

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.
DL - Adjusted Method Detection Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40269495

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40269495001	**MW-303**	EPA 3010A	457669	EPA 6020B	457769
40269495002	**FIELD BLANK-PPOND**	EPA 3010A	457669	EPA 6020B	457769
40269495003	**MW-316**	EPA 3010A	457669	EPA 6020B	457769
40269495001	**MW-303**	EPA 7470	457855	EPA 7470	457902
40269495002	**FIELD BLANK-PPOND**	EPA 7470	457855	EPA 7470	457902
40269495001	**MW-303**				
40269495003	**MW-316**				
40269495001	**MW-303**	EPA 903.1	622852		
40269495002	**FIELD BLANK-PPOND**	EPA 903.1	622852		
40269495001	**MW-303**	EPA 904.0	622853		
40269495002	**FIELD BLANK-PPOND**	EPA 904.0	622853		
40269495001	**MW-303**	Total Radium Calculation	626730		
40269495002	**FIELD BLANK-PPOND**	Total Radium Calculation	626730		
40269495001	**MW-303**	SM 2540C	457507		
40269495002	**FIELD BLANK-PPOND**	SM 2540C	457507		
40269495001	**MW-303**	EPA 9040	457584		
40269495002	**FIELD BLANK-PPOND**	EPA 9040	457584		
40269495001	**MW-303**	EPA 300.0	458607		
40269495002	**FIELD BLANK-PPOND**	EPA 300.0	458607		

40269495

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

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

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company	SCS ENGINEERS	Report To	Meghan Blodgett	Attention	
Address	2830 Dairy Drive	Copy To.		Company Name	
Madison, WI 53718				Address.	
Email	mblodgett@scsengineers com	Purchase Order #		Pace Quote	
Phone	608-216-7362 Fax.	Project Name.	25223067 Columbia CCR Primary Pond	Pace Project Manager	dan milewsky@pacelabs com,
Requested Due Date		Project #	25223067	Pace Profile #:	

Regulatory Agency

State / Location: WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: Radium 226	Radium 228	Metals	chlonde,fluonde,sulfate	TDS and pH	Arsenic, total	Residual Chlonne (Y/N)	
	MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS																	N	N	N	N	N	N		
1		WT																							
2	MW-303	WT		10/9	1410				5										X	X	X	X	X		001
3	~~MW-304~~	WT																	X	X	X	X	X		couldn't collect sample
4	~~MW-305~~	WT		~~10/10~~															X	X	X	X	X		couldn't collect sample
5	~~MW-1R~~	WT																	X	X	X	X	X		couldn't collect sample
6	FIELD BLANK-PPOND	WT		10/10	1020				5										X	X	X	X	X		002
7	MW-316	WT		10/9	1555				1															X	003
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Bridget Russell SCS Eng.	10/12	1100							
	[illegible]	10/13/23	0915	[signature]	10/13/23	0915	0.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: [signature] DATE Signed: 10/12/2023

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 402694.95

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

Lab Lot# of pH paper: 10027723 Lab Std #ID of preservation (if pH adjusted).

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001									2		1															2					X		2.5 / 5
002									2																	2					X		2.5 / 5
003																																	2.5 / 5
004																																	2.5 / 5
005																																	2.5 / 5
006																																	2.5 / 5
007																																	2.5 / 5
008																																	2.5 / 5
009																																	2.5 / 5
010																																	2.5 / 5
011																																	2.5 / 5
012																																	2.5 / 5
013															10/13/23 SG																		2.5 / 5
014																																	2.5 / 5
015																																	2.5 / 5
016																																	2.5 / 5
017																																	2.5 / 5
018																																	2.5 / 5
019																																	2.5 / 5
020																																	2.5 / 5

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	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1L poly HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40269495

40269495

Client Name: SCS Engineers

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

Tracking #: _____

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

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 109 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr. 0.0 /Corr 0.0

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

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

Person examining contents:
Date: 10/13/23 Initials: SG

Labeled By Initials: MH

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

C2 – April 2024 Assessment Monitoring

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

June 13, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 19, 2024. 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

Report revised to include radium data for MW-84A which was missing on the original report dated May 17, 2024.

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: Matt Bizjack, Alliant Energy
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
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 #: PA014572023-03
New Hampshire/TNI Certification #: 297622
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 #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40277089001	**MW-301**	Water	04/17/24 15:20	04/19/24 08:05
40277089002	**MW-84A**	Water	04/17/24 13:50	04/19/24 08:05

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40277089001	**MW-301**	EPA 6020B	TXW	15	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2320B	TMK	1	PASI-G
		SM 2540C	LMB	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40277089002	**MW-84A**	EPA 6020B	TXW	15	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2320B	TMK	1	PASI-G
		SM 2540C	LMB	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

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

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 **Lab ID: 40277089001** Collected: 04/17/24 15:20 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:14	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 03:14	7440-38-2	
Barium	**8.1**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 03:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 03:14	7440-41-7	
Boron	**24.9**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 03:14	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:14	7440-43-9	
Calcium	**102000**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 03:14	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 03:14	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 03:14	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 03:14	7439-92-1	
Lithium	**0.63J**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 03:14	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 03:14	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 03:14	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 03:14	7440-28-0	
Total Hardness by 2340B	**455**	mg/L	1.7	0.32	1	04/23/24 07:07	04/29/24 03:14		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/30/24 15:10	05/01/24 09:48	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.06**	Std. Units			1		04/17/24 15:20		
Field Specific Conductance	**781.0**	umhos/cm			1		04/17/24 15:20		
Oxygen, Dissolved	**2.53**	mg/L			1		04/17/24 15:20	7782-44-7	
REDOX	**17.90**	mV			1		04/17/24 15:20		
Turbidity	**0.00**	NTU			1		04/17/24 15:20		
Static Water Level	**785.27**	feet			1		04/17/24 15:20		
Temperature, Water (C)	**8.6**	deg C			1		04/17/24 15:20		
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**446**	mg/L	10.0	5.0	1		04/23/24 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**458**	mg/L	20.0	8.7	1		04/23/24 14:49		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		04/22/24 18:03		H6

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 **Lab ID: 40277089001** Collected: 04/17/24 15:20 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**1.6J**	mg/L	2.0	0.59	1		05/02/24 21:12	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 21:12	16984-48-8	
Sulfate	**11.5**	mg/L	2.0	0.44	1		05/02/24 21:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A **Lab ID: 40277089002** Collected: 04/17/24 13:50 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:19	7440-36-0	
Arsenic	**0.29J**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 03:19	7440-38-2	
Barium	**14.4**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 03:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 03:19	7440-41-7	
Boron	**11.9**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 03:19	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:19	7440-43-9	
Calcium	**73700**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 03:19	7440-70-2	
Chromium	**2.1J**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 03:19	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 03:19	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 03:19	7439-92-1	
Lithium	**0.67J**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 03:19	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 03:19	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 03:19	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 03:19	7440-28-0	
Total Hardness by 2340B	**337**	mg/L	1.7	0.32	1	04/23/24 07:07	04/29/24 03:19		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/30/24 15:10	05/01/24 09:51	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.68**	Std. Units			1		04/17/24 13:50		
Field Specific Conductance	**588.1**	umhos/cm			1		04/17/24 13:50		
Oxygen, Dissolved	**7.82**	mg/L			1		04/17/24 13:50	7782-44-7	
REDOX	**0.00**	mV			1		04/17/24 13:50		
Turbidity	**0.00**	NTU			1		04/17/24 13:50		
Static Water Level	**784.90**	feet			1		04/17/24 13:50		
Temperature, Water (C)	**11.0**	deg C			1		04/17/24 13:50		
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**335**	mg/L	10.0	5.0	1		04/23/24 11:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**322**	mg/L	20.0	8.7	1		04/23/24 14:49		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.2**	Std. Units	0.10	0.010	1		04/22/24 18:04		H6

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A **Lab ID: 40277089002** Collected: 04/17/24 13:50 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.2**	mg/L	2.0	0.59	1		05/02/24 21:26	16887-00-6	
Fluoride	**0.12J**	mg/L	0.32	0.095	1		05/02/24 21:26	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		05/02/24 21:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 473092
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2709401 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/01/24 09:18	

LABORATORY CONTROL SAMPLE: 2709402

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: 2709403 2709404

Parameter	Units	40277334002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.000066 mg/L	5	5	4.9	5.0	98	100	85-115	2	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472389
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2705531 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/29/24 01:38	
Arsenic	ug/L	<0.28	1.0	04/29/24 01:38	
Barium	ug/L	<0.70	2.3	04/29/24 01:38	
Beryllium	ug/L	<0.25	1.0	04/29/24 01:38	
Boron	ug/L	<3.0	10.0	04/29/24 01:38	
Cadmium	ug/L	<0.15	1.0	04/29/24 01:38	
Calcium	ug/L	<76.2	254	04/29/24 01:38	
Chromium	ug/L	<1.0	3.4	04/29/24 01:38	
Cobalt	ug/L	<0.12	1.0	04/29/24 01:38	
Lead	ug/L	<0.24	1.0	04/29/24 01:38	
Lithium	ug/L	<0.22	1.0	04/29/24 01:38	
Molybdenum	ug/L	<0.44	1.5	04/29/24 01:38	
Selenium	ug/L	<0.32	1.1	04/29/24 01:38	
Thallium	ug/L	<0.14	1.0	04/29/24 01:38	
Total Hardness by 2340B	mg/L	<0.32	1.7	04/29/24 01:38	

LABORATORY CONTROL SAMPLE: 2705532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	255	102	80-120	
Arsenic	ug/L	250	257	103	80-120	
Barium	ug/L	250	247	99	80-120	
Beryllium	ug/L	250	255	102	80-120	
Boron	ug/L	250	239	95	80-120	
Cadmium	ug/L	250	259	104	80-120	
Calcium	ug/L	10000	9820	98	80-120	
Chromium	ug/L	250	250	100	80-120	
Cobalt	ug/L	250	254	102	80-120	
Lead	ug/L	250	248	99	80-120	
Lithium	ug/L	250	248	99	80-120	
Molybdenum	ug/L	250	253	101	80-120	
Selenium	ug/L	250	267	107	80-120	
Thallium	ug/L	250	238	95	80-120	
Total Hardness by 2340B	mg/L		65.6			

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705533 2705534

Parameter	Units	40276984004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.30	250	250	255	259	102	103	75-125	1	20	
Arsenic	ug/L	6.9	250	250	266	268	104	105	75-125	1	20	
Barium	ug/L	293	250	250	598	603	122	124	75-125	1	20	
Beryllium	ug/L	1.3J	250	250	255	258	101	103	75-125	1	20	
Boron	ug/L	4780	250	250	4890	4930	44	63	75-125	1	20	P6
Cadmium	ug/L	<0.30	250	250	255	258	102	103	75-125	1	20	
Calcium	ug/L	278000	10000	10000	282000	286000	32	75	75-125	2	20	P6
Chromium	ug/L	42.5	250	250	294	301	101	103	75-125	2	20	
Cobalt	ug/L	13.7	250	250	250	256	95	97	75-125	2	20	
Lead	ug/L	12.0	250	250	268	275	102	105	75-125	3	20	
Lithium	ug/L	82.8	250	250	336	340	101	103	75-125	1	20	
Molybdenum	ug/L	2630	250	250	2840	2860	82	91	75-125	1	20	
Selenium	ug/L	0.95J	250	250	270	267	108	107	75-125	1	20	
Thallium	ug/L	0.32J	250	250	255	262	102	105	75-125	3	20	
Total Hardness by 2340B	mg/L	1180			1220	1240				2	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472417
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2705612 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	10.0	04/23/24 09:58	

LABORATORY CONTROL SAMPLE: 2705613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	200	198	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705614 2705615

Parameter	Units	40276976001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	44.9	200	200	219	219	87	87	80-120	0	20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472469
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2706042 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/23/24 14:46	

LABORATORY CONTROL SAMPLE: 2706043

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	616	572	93	80-120	

SAMPLE DUPLICATE: 2706044

Parameter	Units	40277009001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	618	610	1	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472280
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

SAMPLE DUPLICATE: 2705157

Parameter	Units	40276865001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	5	H6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 473315
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2710784 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	05/02/24 19:03	
Fluoride	mg/L	<0.095	0.32	05/02/24 19:03	
Sulfate	mg/L	<0.44	2.0	05/02/24 19:03	

LABORATORY CONTROL SAMPLE: 2710785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.8	109	90-110	
Fluoride	mg/L	2	2.2	108	90-110	
Sulfate	mg/L	20	21.8	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710786 2710787

Parameter	Units	40277088001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	565	1000	1000	1660	1670	110	110	90-110	1	15	
Fluoride	mg/L	<4.8	100	100	95.0	95.8	95	96	90-110	1	15	
Sulfate	mg/L	1130	1000	1000	2300	2210	117	108	90-110	4	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710788 2710789

Parameter	Units	40277096003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.6	20	20	26.1	27.2	107	113	90-110	4	15	M0
Fluoride	mg/L	0.10J	2	2	2.3	2.4	109	115	90-110	5	15	M0
Sulfate	mg/L	13.8	20	20	36.0	36.6	111	114	90-110	2	15	M0

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

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 **Lab ID: 40277089001** Collected: 04/17/24 15:20 Received: 04/19/24 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	**0.252 ± 0.392 (1.00) C:NA T:87%**	pCi/L	05/10/24 13:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.787 ± 0.488 (1.00) C:83% T:84%**	pCi/L	05/02/24 15:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.04 ± 0.880 (2.00)**	pCi/L	05/16/24 15:10	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A **Lab ID: 40277089002** Collected: 04/17/24 13:50 Received: 04/19/24 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	**-0.295 ± 0.450 (1.00) C:NA T:90%**	pCi/L	05/10/24 13:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.290 ± 0.399 (1.00) C:77% T:84%**	pCi/L	05/02/24 15:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.290 ± 0.849 (2.00)**	pCi/L	05/16/24 15:10	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 664159
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 3233909 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.760 ± 0.454 (0.835) C:85% T:72%	pCi/L	05/02/24 15:55	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 664158
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 3233908 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.246 (0.551) C:NA T:85%	pCi/L	05/10/24 13:23	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

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 - The reported result is an estimated value.
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.
DL - Adjusted Method Detection Limit.
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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.
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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40277089001	**MW-301**	EPA 3010A	472389	EPA 6020B	472486
40277089002	**MW-84A**	EPA 3010A	472389	EPA 6020B	472486
40277089001	**MW-301**	EPA 7470	473092	EPA 7470	473217
40277089002	**MW-84A**	EPA 7470	473092	EPA 7470	473217
40277089001	**MW-301**				
40277089002	**MW-84A**				
40277089001	**MW-301**	EPA 903.1	664158		
40277089002	**MW-84A**	EPA 903.1	664158		
40277089001	**MW-301**	EPA 904.0	664159		
40277089002	**MW-84A**	EPA 904.0	664159		
40277089001	**MW-301**	Total Radium Calculation	669305		
40277089002	**MW-84A**	Total Radium Calculation	669305		
40277089001	**MW-301**	SM 2320B	472417		
40277089002	**MW-84A**	SM 2320B	472417		
40277089001	**MW-301**	SM 2540C	472469		
40277089002	**MW-84A**	SM 2540C	472469		
40277089001	**MW-301**	SM 4500-H+B	472280		
40277089002	**MW-84A**	SM 4500-H+B	472280		
40277089001	**MW-301**	EPA 300.0	473315		
40277089002	**MW-84A**	EPA 300.0	473315		

Sampler on 4 coolers 40277089

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

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

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company:	SCS ENGINEERS	Report To: Meghan Blodgett	Attention:	
Address:	2830 Dairy Drive	Copy To:	Company Name:	Regulatory Agency
Madison, WI 53718			Address:	
Email:	mblodgett@scsengineers.com	Purchase Order #:	Pace Quote:	
Phone: 608-216-7362	Fax:	Project Name: 25223067 Columbia CCR Background	Pace Project Manager: dan.milewsky@pacelabs.com,	State / Location
Requested Due Date:		Project #: 25223067	Pace Profile #:	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Radium 226	Radium 228	Metals	TDS and pH	Chloride, Fluoride, Sulfate	Hardness	Alkalinity	Residual Chlorine (Y/N)	
	MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS																	Requested Analysis Filtered (Y/N)	N	N	N	N	N	N	N		
1	MW-301	WT		4/17	1520														X	X	X	X	X	X	X		CU1
2	MW-84A	WT		4/17	1350														X	X	X	X	X	X	X		CU2
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Bridget Russell	4/18	1120							
	CS Logistics 4/19/24	0805		4/19/24	0805		12.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: Bridget Russell DATE Signed: 4/18/2024

Client Name: SCS

Sample Preservation Receipt Form

Project # 402770089

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

Lab Lot# of pH paper: 100134 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: mlk Date/ Time:

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001									2		1																						2.5 / 5
002									2		1															2					X		2.5 / 5
003																										2					X		2.5 / 5
004																																	2.5 / 5
005																																	2.5 / 5
006																																	2.5 / 5
007																																	2.5 / 5
008																																	2.5 / 5
009																																	2.5 / 5
010																																	2.5 / 5
011																																	2.5 / 5
012																																	2.5 / 5
013			mlk 4/16/24																														2.5 / 5
014																																	2.5 / 5
015																																	2.5 / 5
016																																	2.5 / 5
017																																	2.5 / 5
018																																	2.5 / 5
019																																	2.5 / 5
020																																	2.5 / 5

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
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
BP2Z	500 mL plastic NaOH + Zn

VG9C	40 mL clear ascorbic w/ HCl
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN 1	1L Poly HNO3
GN 2	

Page 1 of 2

Qualtrax ID: 41307

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS

Project #: WO#: 40277089 (40277089)

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

Tracking #: ______

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no
Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no
Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other ______
Thermometer Used SR - 120 Type of Ice: (Wet) Blue Dry None ☐ Meltwater Only
Cooler Temperature Uncorr: 1.2, 1.1 /Corr: 1.2, 1.1
Temp Blank Present: ☑ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no
Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 4/19/24 /Initials: MH
Labeled By Initials: PV

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

Client Notification/ Resolution:
If checked, see attached form for additional comments ☐
Person Contacted: ______ Date/Time: ______
Comments/ Resolution: ______

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

Page 2 of 2

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

May 31, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 19, 2024. 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

This report has been revised to include the proper metals list for MW-316, and replaces the version generated on May 14, 2024.

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: Matt Bizjack, Alliant Energy
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
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 #: PA014572023-03
New Hampshire/TNI Certification #: 297622
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 #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40277101001	**MW-303**	Water	04/17/24 12:40	04/19/24 08:05
40277101002	**MW-304R**	Water	04/17/24 10:55	04/19/24 08:05
40277101003	**FIELD BLANK-PPOND**	Water	04/17/24 12:35	04/19/24 08:05
40277101004	**MW-316**	Water	04/17/24 12:35	04/19/24 08:05
40277101005	**MW-305**	Water	04/17/24 00:00	04/19/24 08:05
40277101006	**M-4R**	Water	04/17/24 00:00	04/19/24 08:05

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40277101001	**MW-303**	EPA 6020B	KXS, TXW	14	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LMB	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40277101002	**MW-304R**	EPA 6020B	TXW	14	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LMB	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40277101003	**FIELD BLANK-PPOND**	EPA 6020B	TXW	14	PASI-G
		EPA 7470	RZA	1	PASI-G
		EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LMB	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40277101004	**MW-316**	EPA 6020B	TXW	1	PASI-G
			LB	7	PASI-G
40277101005	**MW-305**		LB	1	PASI-G
40277101006	**M-4R**		LB	1	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: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-303 **Lab ID: 40277101001** Collected: 04/17/24 12:40 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.38J**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:57	7440-36-0	
Arsenic	**40.4**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 03:57	7440-38-2	
Barium	**3.8**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 03:57	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 03:57	7440-41-7	
Boron	**2470**	ug/L	100	30.3	10	04/23/24 07:07	04/30/24 15:57	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:57	7440-43-9	
Calcium	**2940**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 03:57	7440-70-2	
Chromium	**74.3**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 03:57	7440-47-3	
Cobalt	**0.47J**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 03:57	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 03:57	7439-92-1	
Lithium	**0.64J**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 03:57	7439-93-2	
Molybdenum	**82.0**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 03:57	7439-98-7	
Selenium	**36.3**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 03:57	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 03:57	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/30/24 15:10	05/01/24 10:05	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**9.58**	Std. Units			1		04/17/24 12:40		
Field Specific Conductance	**1164.0**	umhos/cm			1		04/17/24 12:40		
Oxygen, Dissolved	**3.70**	mg/L			1		04/17/24 12:40	7782-44-7	
REDOX	**10.50**	mV			1		04/17/24 12:40		
Turbidity	**0.04**	NTU			1		04/17/24 12:40		
Static Water Level	**782.16**	feet			1		04/17/24 12:40		
Temperature, Water (C)	**11.8**	deg C			1		04/17/24 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**728**	mg/L	20.0	8.7	1		04/23/24 14:52		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**10**	Std. Units	0.10	0.010	1		05/02/24 18:50		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.59**	mg/L	2.0	0.59	1		05/02/24 16:34	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 16:34	16984-48-8	
Sulfate	**335**	mg/L	40.0	8.9	20		05/06/24 14:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-304R **Lab ID: 40277101002** Collected: 04/17/24 10:55 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.17J**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 04:02	7440-36-0	
Arsenic	**1.8**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 04:02	7440-38-2	
Barium	**92.0**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 04:02	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 04:02	7440-41-7	
Boron	**822**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 04:02	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 04:02	7440-43-9	
Calcium	**85500**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 04:02	7440-70-2	
Chromium	**1.4J**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 04:02	7440-47-3	
Cobalt	**0.88J**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 04:02	7440-48-4	
Lead	**0.36J**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 04:02	7439-92-1	
Lithium	**25.2**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 04:02	7439-93-2	
Molybdenum	**52.2**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 04:02	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 04:02	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 04:02	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/30/24 15:10	05/01/24 10:07	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.37**	Std. Units			1		04/17/24 10:55		
Field Specific Conductance	**888.0**	umhos/cm			1		04/17/24 10:55		
Oxygen, Dissolved	**0.35**	mg/L			1		04/17/24 10:55	7782-44-7	
REDOX	**-105.60**	mV			1		04/17/24 10:55		
Turbidity	**50.27**	NTU			1		04/17/24 10:55		
Static Water Level	**783.25**	feet			1		04/17/24 10:55		
Temperature, Water (C)	**11.4**	deg C			1		04/17/24 10:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**544**	mg/L	20.0	8.7	1		04/23/24 14:52		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.5**	Std. Units	0.10	0.010	1		05/02/24 18:53		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**45.6**	mg/L	2.0	0.59	1		05/02/24 17:37	16887-00-6	
Fluoride	**0.14J**	mg/L	0.32	0.095	1		05/02/24 17:37	16984-48-8	
Sulfate	**163**	mg/L	20.0	4.4	10		05/06/24 14:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: FIELD BLANK-PPOND **Lab ID: 40277101003** Collected: 04/17/24 12:35 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 04:07	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 04:07	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 04:07	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 04:07	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 04:07	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 04:07	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 04:07	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 04:07	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 04:07	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 04:07	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 04:07	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 04:07	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 04:07	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 04:07	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/30/24 15:10	05/01/24 10:14	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		04/23/24 14:53		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.6**	Std. Units	0.10	0.010	1		05/02/24 19:01		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.59**	mg/L	2.0	0.59	1		05/02/24 17:51	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 17:51	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		05/02/24 17:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-316 **Lab ID: 40277101004** Collected: 04/17/24 12:35 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Arsenic	**2.6**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 04:13	7440-38-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.31**	Std. Units			1		04/17/24 12:35		
Field Specific Conductance	**671.0**	umhos/cm			1		04/17/24 12:35		
Oxygen, Dissolved	**0.30**	mg/L			1		04/17/24 12:35	7782-44-7	
REDOX	**-2.30**	mV			1		04/17/24 12:35		
Turbidity	**1.62**	NTU			1		04/17/24 12:35		
Static Water Level	**782.09**	feet			1		04/17/24 12:35		
Temperature, Water (C)	**12.2**	deg C			1		04/17/24 12:35		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-305 **Lab ID: 40277101005** Collected: 04/17/24 00:00 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Static Water Level	**780.80**	feet			1		04/17/24 00:00		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: M-4R **Lab ID: 40277101006** Collected: 04/17/24 00:00 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Static Water Level	**781.38**	feet			1		04/17/24 00:00		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch: 473092
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277101001, 40277101002, 40277101003

METHOD BLANK: 2709401 Matrix: Water
Associated Lab Samples: 40277101001, 40277101002, 40277101003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/01/24 09:18	

LABORATORY CONTROL SAMPLE: 2709402

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: 2709403 2709404

Parameter	Units	40277334002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.000066 mg/L	5	5	4.9	5.0	98	100	85-115	2	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch: 472389
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277101001, 40277101002, 40277101003, 40277101004

METHOD BLANK: 2705531 Matrix: Water
Associated Lab Samples: 40277101001, 40277101002, 40277101003, 40277101004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/29/24 01:38	
Arsenic	ug/L	<0.28	1.0	04/29/24 01:38	
Barium	ug/L	<0.70	2.3	04/29/24 01:38	
Beryllium	ug/L	<0.25	1.0	04/29/24 01:38	
Boron	ug/L	<3.0	10.0	04/29/24 01:38	
Cadmium	ug/L	<0.15	1.0	04/29/24 01:38	
Calcium	ug/L	<76.2	254	04/29/24 01:38	
Chromium	ug/L	<1.0	3.4	04/29/24 01:38	
Cobalt	ug/L	<0.12	1.0	04/29/24 01:38	
Lead	ug/L	<0.24	1.0	04/29/24 01:38	
Lithium	ug/L	<0.22	1.0	04/29/24 01:38	
Molybdenum	ug/L	<0.44	1.5	04/29/24 01:38	
Selenium	ug/L	<0.32	1.1	04/29/24 01:38	
Thallium	ug/L	<0.14	1.0	04/29/24 01:38	

LABORATORY CONTROL SAMPLE: 2705532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	255	102	80-120	
Arsenic	ug/L	250	257	103	80-120	
Barium	ug/L	250	247	99	80-120	
Beryllium	ug/L	250	255	102	80-120	
Boron	ug/L	250	239	95	80-120	
Cadmium	ug/L	250	259	104	80-120	
Calcium	ug/L	10000	9820	98	80-120	
Chromium	ug/L	250	250	100	80-120	
Cobalt	ug/L	250	254	102	80-120	
Lead	ug/L	250	248	99	80-120	
Lithium	ug/L	250	248	99	80-120	
Molybdenum	ug/L	250	253	101	80-120	
Selenium	ug/L	250	267	107	80-120	
Thallium	ug/L	250	238	95	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705533 2705534

Parameter	Units	40276984004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.30	250	250	255	259	102	103	75-125	1	20	
Arsenic	ug/L	6.9	250	250	266	268	104	105	75-125	1	20	
Barium	ug/L	293	250	250	598	603	122	124	75-125	1	20	
Beryllium	ug/L	1.3J	250	250	255	258	101	103	75-125	1	20	
Boron	ug/L	4780	250	250	4890	4930	44	63	75-125	1	20	P6
Cadmium	ug/L	<0.30	250	250	255	258	102	103	75-125	1	20	
Calcium	ug/L	278000	10000	10000	282000	286000	32	75	75-125	2	20	P6
Chromium	ug/L	42.5	250	250	294	301	101	103	75-125	2	20	
Cobalt	ug/L	13.7	250	250	250	256	95	97	75-125	2	20	
Lead	ug/L	12.0	250	250	268	275	102	105	75-125	3	20	
Lithium	ug/L	82.8	250	250	336	340	101	103	75-125	1	20	
Molybdenum	ug/L	2630	250	250	2840	2860	82	91	75-125	1	20	
Selenium	ug/L	0.95J	250	250	270	267	108	107	75-125	1	20	
Thallium	ug/L	0.32J	250	250	255	262	102	105	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch: 472469
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277101001, 40277101002, 40277101003

METHOD BLANK: 2706042 Matrix: Water
Associated Lab Samples: 40277101001, 40277101002, 40277101003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/23/24 14:46	

LABORATORY CONTROL SAMPLE: 2706043

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	616	572	93	80-120	

SAMPLE DUPLICATE: 2706044

Parameter	Units	40277009001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	618	610	1	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch: 473367
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277101001, 40277101002, 40277101003

SAMPLE DUPLICATE: 2711047

Parameter	Units	40277042003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.5	8.5	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch: 473404
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277101001, 40277101002, 40277101003

METHOD BLANK: 2711214 Matrix: Water
Associated Lab Samples: 40277101001, 40277101002, 40277101003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	05/02/24 11:19	
Fluoride	mg/L	<0.095	0.32	05/02/24 11:19	
Sulfate	mg/L	<0.44	2.0	05/02/24 11:19	

LABORATORY CONTROL SAMPLE: 2711215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.2	96	90-110	
Fluoride	mg/L	2	1.9	94	90-110	
Sulfate	mg/L	20	19.2	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2711216 2711217

Parameter	Units	40277084017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	96.8	100	100	210	208	113	111	90-110	1	15	M0
Fluoride	mg/L	<0.48	10	10	11.1	11.3	111	113	90-110	1	15	M0
Sulfate	mg/L	114	100	100	223	226	109	112	90-110	1	15	M0

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REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-303 **Lab ID: 40277101001** Collected: 04/17/24 12:40 Received: 04/19/24 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	**-0.127 ± 0.394 (1.00) C:NA T:94%**	pCi/L	05/10/24 14:45	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.481 ± 0.356 (1.00) C:78% T:83%**	pCi/L	05/02/24 14:21	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.481 ± 0.750 (2.00)**	pCi/L	05/13/24 10:36	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: MW-304R **Lab ID: 40277101002** Collected: 04/17/24 10:55 Received: 04/19/24 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	**0.467 ± 0.366 (1.00) C:NA T:91%**	pCi/L	05/10/24 14:45	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.608 ± 0.392 (1.00) C:76% T:82%**	pCi/L	05/02/24 14:21	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.08 ± 0.758 (2.00)**	pCi/L	05/13/24 10:36	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Sample: FIELD BLANK-PPOND **Lab ID: 40277101003** Collected: 04/17/24 12:35 Received: 04/19/24 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	**-0.0619 ± 0.283 (1.00) C:NA T:87%**	pCi/L	05/10/24 14:45	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.368 ± 0.356 (1.00) C:78% T:82%**	pCi/L	05/02/24 14:21	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.368 ± 0.639 (2.00)**	pCi/L	05/13/24 10:36	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch:	664275	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: 40277101001, 40277101002, 40277101003

METHOD BLANK: 3234241 Matrix: Water

Associated Lab Samples: 40277101001, 40277101002, 40277101003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0891 ± 0.204 (0.328) C:NA T:91%	pCi/L	05/10/24 14:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

QC Batch:	664276	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: 40277101001, 40277101002, 40277101003

METHOD BLANK: 3234242 Matrix: Water

Associated Lab Samples: 40277101001, 40277101002, 40277101003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.368 ± 0.341 (0.689) C:80% T:81%	pCi/L	05/02/24 14:20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALIFIERS

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

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 - The reported result is an estimated value.
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.
DL - Adjusted Method Detection Limit.
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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR PRIMARY
Pace Project No.: 40277101

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40277101001	**MW-303**	EPA 3010A	472389	EPA 6020B	472486
40277101002	**MW-304R**	EPA 3010A	472389	EPA 6020B	472486
40277101003	**FIELD BLANK-PPOND**	EPA 3010A	472389	EPA 6020B	472486
40277101004	**MW-316**	EPA 3010A	472389	EPA 6020B	472486
40277101001	**MW-303**	EPA 7470	473092	EPA 7470	473217
40277101002	**MW-304R**	EPA 7470	473092	EPA 7470	473217
40277101003	**FIELD BLANK-PPOND**	EPA 7470	473092	EPA 7470	473217
40277101001	**MW-303**				
40277101002	**MW-304R**				
40277101004	**MW-316**				
40277101005	**MW-305**				
40277101006	**M-4R**				
40277101001	**MW-303**	EPA 903.1	664275		
40277101002	**MW-304R**	EPA 903.1	664275		
40277101003	**FIELD BLANK-PPOND**	EPA 903.1	664275		
40277101001	**MW-303**	EPA 904.0	664276		
40277101002	**MW-304R**	EPA 904.0	664276		
40277101003	**FIELD BLANK-PPOND**	EPA 904.0	664276		
40277101001	**MW-303**	Total Radium Calculation	668245		
40277101002	**MW-304R**	Total Radium Calculation	668245		
40277101003	**FIELD BLANK-PPOND**	Total Radium Calculation	668245		
40277101001	**MW-303**	SM 2540C	472469		
40277101002	**MW-304R**	SM 2540C	472469		
40277101003	**FIELD BLANK-PPOND**	SM 2540C	472469		
40277101001	**MW-303**	EPA 9040	473367		
40277101002	**MW-304R**	EPA 9040	473367		
40277101003	**FIELD BLANK-PPOND**	EPA 9040	473367		
40277101001	**MW-303**	EPA 300.0	473404		
40277101002	**MW-304R**	EPA 300.0	473404		
40277101003	**FIELD BLANK-PPOND**	EPA 300.0	473404		

Samples in 4 coolers

40277101

CHAIN-OF-CUSTODY / Analytical Request Document

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

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company	SCS ENGINEERS	Report To Meghan Blodgett	Attention	
Address	2830 Dairy Drive	Copy To	Company Name	Regulatory Agency
Madison, WI 53718			Address	
Email	mblodgett@scsengineers.com	Purchase Order #	Pace Quote	
Phone	608-216-7362 Fax	Project Name 25223067 Columbia CCR Primary Pond	Pace Project Manager dan.milewsky@pacelabs.com,	State / Location
Requested Due Date		Project # 25223067	Pace Profile #:	WI

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Radium 226	Radium 228	Metals	chloride,fluoride,sulfate	TDS and pH	Arsenic, total	Residual Chlorine (Y/N)	
																		N	N	N	N	N	N	N		
1		WT																								
2	MW-303	WT		4/17	1240														X	X	X	X	X			001
3	MW-304R	WT		4/17	1055														X	X	X	X	X			002
~~4~~	~~MW-305~~	WT																	X	X	X	X	X			Dry no
~~5~~	~~M-4R~~	WT																	X	X	X	X	X			Sample
6	FIELD BLANK-PPOND	WT		4/17	1235														X	X	X	X	X			003
7	MW-316	WT		4/17	1210																			X		004
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	[signature] SCS	4/18	1120							
	CS Logistics	4/19/24	0805	[signature]	4/19/24	0805	12.1.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: [signature] DATE Signed: 4/18/2024

Client Name: SCS

Sample Preservation Receipt Form

Project # 40277101

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

Lab Lot# of pH paper: 10D0134 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: mlt Date/ Time:

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001									2		1																						2.5 / 5
002									2		1															2					X		2.5 / 5
003									2		1															2					X		2.5 / 5
004																										2					X		2.5 / 5
005																																	2.5 / 5
006																																	2.5 / 5
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016																																	2.5 / 5
017																																	2.5 / 5
018																																	2.5 / 5
019																																	2.5 / 5
020																																	2.5 / 5

pH 4/10/24

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
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
BP2Z	500 mL plastic NaOH + Zn

VG9C	40 mL clear ascorbic w/ HCl
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN 1	
GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40277101

40277101

Client Name: SCS

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

Tracking #: _____

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

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 120 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1,2,1,1 /Corr: 1,2,1,1

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

Person examining contents:
Date: 4/19/24 /Initials: MH

Labeled By Initials: MH

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

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

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____
If checked, see attached form for additional comments ☐
Comments/ Resolution: _____

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

Page 2 of 2

C3 – June 2024 Supplemental Assessment Monitoring

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

June 28, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Dear Meghan Blodgett:

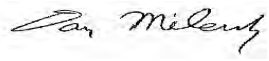
Enclosed are the analytical results for sample(s) received by the laboratory on June 05, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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: Matt Bizjack, Alliant Energy
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
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 #: PA014572023-03
New Hampshire/TNI Certification #: 297622
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 #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40279225001	**M-4R**	Water	06/04/24 12:30	06/05/24 11:00

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40279225001	**M-4R**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AG1	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LMB	1	PASI-G
		EPA 9040	HML	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

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

ANALYTICAL RESULTS

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Sample: M-4R **Lab ID: 40279225001** Collected: 06/04/24 12:30 Received: 06/05/24 11:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.30J**	ug/L	1.0	0.15	1	06/07/24 06:14	06/13/24 21:27	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	06/07/24 06:14	06/13/24 21:27	7440-38-2	
Barium	**36.1**	ug/L	2.3	0.70	1	06/07/24 06:14	06/13/24 21:27	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	06/07/24 06:14	06/13/24 21:27	7440-41-7	
Boron	**930**	ug/L	10.0	3.0	1	06/07/24 06:14	06/13/24 21:27	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	06/07/24 06:14	06/13/24 21:27	7440-43-9	
Calcium	**117000**	ug/L	254	76.2	1	06/07/24 06:14	06/13/24 21:27	7440-70-2	
Chromium	**1.4J**	ug/L	3.4	1.0	1	06/07/24 06:14	06/13/24 21:27	7440-47-3	
Cobalt	**0.34J**	ug/L	1.0	0.12	1	06/07/24 06:14	06/13/24 21:27	7440-48-4	
Lead	**0.75J**	ug/L	1.0	0.24	1	06/07/24 06:14	06/13/24 21:27	7439-92-1	
Lithium	**5.0**	ug/L	1.0	0.22	1	06/07/24 06:14	06/13/24 21:27	7439-93-2	
Molybdenum	**9.7**	ug/L	1.5	0.44	1	06/07/24 06:14	06/13/24 21:27	7439-98-7	
Selenium	**116**	ug/L	1.1	0.32	1	06/07/24 06:14	06/13/24 21:27	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	06/07/24 06:14	06/13/24 21:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	06/11/24 14:34	06/12/24 07:36	7439-97-6	1q
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.19**	Std. Units			1		06/04/24 12:30		
Field Specific Conductance	**843**	umhos/cm			1		06/04/24 12:30		
Oxygen, Dissolved	**0.47**	mg/L			1		06/04/24 12:30	7782-44-7	
REDOX	**77.1**	mV			1		06/04/24 12:30		
Turbidity	**4.96**	NTU			1		06/04/24 12:30		
Static Water Level	**783.66**	feet			1		06/04/24 12:30		
Temperature, Water (C)	**15.5**	deg C			1		06/04/24 12:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**578**	mg/L	20.0	8.7	1		06/10/24 12:00		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		06/06/24 15:56		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**16.3**	mg/L	2.0	0.59	1		06/13/24 20:43	16887-00-6	
Fluoride	**0.25J**	mg/L	0.32	0.095	1		06/13/24 20:43	16984-48-8	
Sulfate	**119**	mg/L	20.0	4.4	10		06/14/24 11:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 476717
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40279225001

METHOD BLANK: 2730299 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	06/12/24 06:36	

LABORATORY CONTROL SAMPLE: 2730300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730301 2730302

Parameter	Units	40278833001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.2	5.3	103	107	85-115	3	20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 476380
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40279225001

METHOD BLANK: 2728527 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	06/13/24 20:11	
Arsenic	ug/L	<0.28	1.0	06/13/24 20:11	
Barium	ug/L	<0.70	2.3	06/13/24 20:11	
Beryllium	ug/L	<0.25	1.0	06/13/24 20:11	
Boron	ug/L	<3.0	10.0	06/13/24 20:11	
Cadmium	ug/L	<0.15	1.0	06/13/24 20:11	
Calcium	ug/L	<76.2	254	06/13/24 20:11	
Chromium	ug/L	<1.0	3.4	06/13/24 20:11	
Cobalt	ug/L	<0.12	1.0	06/13/24 20:11	
Lead	ug/L	<0.24	1.0	06/13/24 20:11	
Lithium	ug/L	<0.22	1.0	06/13/24 20:11	
Molybdenum	ug/L	<0.44	1.5	06/13/24 20:11	
Selenium	ug/L	<0.32	1.1	06/13/24 20:11	
Thallium	ug/L	<0.14	1.0	06/13/24 20:11	

LABORATORY CONTROL SAMPLE: 2728528

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	263	105	80-120	
Arsenic	ug/L	250	264	105	80-120	
Barium	ug/L	250	267	107	80-120	
Beryllium	ug/L	250	274	110	80-120	
Boron	ug/L	250	246	98	80-120	
Cadmium	ug/L	250	261	104	80-120	
Calcium	ug/L	10000	10100	101	80-120	
Chromium	ug/L	250	256	103	80-120	
Cobalt	ug/L	250	253	101	80-120	
Lead	ug/L	250	265	106	80-120	
Lithium	ug/L	250	258	103	80-120	
Molybdenum	ug/L	250	255	102	80-120	
Selenium	ug/L	250	280	112	80-120	
Thallium	ug/L	250	266	106	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2728529 2728530

Parameter	Units	40279287002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.00018J mg/L	250	250	266	272	106	109	75-125	2	20	
Arsenic	ug/L	0.00053J mg/L	250	250	265	270	106	108	75-125	2	20	
Barium	ug/L	0.038 mg/L	250	250	309	318	108	112	75-125	3	20	
Beryllium	ug/L	<0.00025 mg/L	250	250	276	278	110	111	75-125	1	20	
Boron	ug/L	0.69 mg/L	250	250	966	967	109	109	75-125	0	20	
Cadmium	ug/L	0.00018J mg/L	250	250	258	262	103	105	75-125	1	20	
Calcium	ug/L	87.2 mg/L	10000	10000	95200	98400	81	112	75-125	3	20	
Chromium	ug/L	11.0 mg/L	250	250	11800	11700	308	276	75-125	1	20	P6
Cobalt	ug/L	0.0013 mg/L	250	250	250	253	99	101	75-125	1	20	
Lead	ug/L	0.0022 mg/L	250	250	276	280	110	111	75-125	1	20	
Lithium	ug/L	0.0034 mg/L	250	250	266	267	105	105	75-125	0	20	
Molybdenum	ug/L	0.0013J mg/L	250	250	260	266	103	106	75-125	2	20	
Selenium	ug/L	0.00052J mg/L	250	250	281	280	112	112	75-125	0	20	
Thallium	ug/L	<0.00014 mg/L	250	250	280	283	112	113	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 476549
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40279225001

METHOD BLANK: 2729573 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	06/10/24 11:56	

LABORATORY CONTROL SAMPLE: 2729574

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	613	586	96	80-120	

SAMPLE DUPLICATE: 2729575

Parameter	Units	40279229002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1650	1700	3	10	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 476351
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40279225001

SAMPLE DUPLICATE: 2728210

Parameter	Units	40279137001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.1	8.2	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 476869
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40279225001

METHOD BLANK: 2731312 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	06/13/24 19:17	
Fluoride	mg/L	<0.095	0.32	06/13/24 19:17	
Sulfate	mg/L	<0.44	2.0	06/13/24 19:17	

LABORATORY CONTROL SAMPLE: 2731313

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.7	109	90-110	
Fluoride	mg/L	2	2.1	103	90-110	
Sulfate	mg/L	20	21.8	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2731314 2731315

Parameter	Units	40279225001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.3	20	20	38.0	38.2	108	109	90-110	1	15	
Fluoride	mg/L	0.25J	2	2	2.4	2.4	110	109	90-110	0	15	
Sulfate	mg/L	119	200	200	337	333	109	107	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Sample: M-4R **Lab ID: 40279225001** Collected: 06/04/24 12:30 Received: 06/05/24 11:00 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	**-0.725 ± 0.654 (1.00) C:NA T:95%**	pCi/L	06/24/24 15:05	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.16 ± 0.650 (1.00) C:87% T:88%**	pCi/L	06/24/24 19:50	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.16 ± 1.30 (2.00)**	pCi/L	06/25/24 17:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 674003
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40279225001

METHOD BLANK: 3281387 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.480 ± 0.326 (0.620) C:85% T:91%	pCi/L	06/24/24 15:32	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

QC Batch: 674002
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40279225001

METHOD BLANK: 3281386 Matrix: Water
Associated Lab Samples: 40279225001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.211 ± 0.413 (0.742) C:NA T:95%	pCi/L	06/24/24 15:05	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

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 - The reported result is an estimated value.
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.
DL - Adjusted Method Detection Limit.
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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Analyte was measured in the associated method blank at a concentration of -.070 ug/L
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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25224067 COLUMBIA CCR PRIMARY
Pace Project No.: 40279225

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40279225001	**M-4R**	EPA 3010A	476380	EPA 6020B	476567
40279225001	**M-4R**	EPA 7470	476717	EPA 7470	476759
40279225001	**M-4R**				
40279225001	**M-4R**	EPA 903.1	674002		
40279225001	**M-4R**	EPA 904.0	674003		
40279225001	**M-4R**	Total Radium Calculation	678329		
40279225001	**M-4R**	SM 2540C	476549		
40279225001	**M-4R**	EPA 9040	476351		
40279225001	**M-4R**	EPA 300.0	476869		

40279225

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

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

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https //info pacelabs com/hubfs/pas-standard-terms pdf.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company	SCS ENGINEERS	Report To	Meghan Blodgett	Attention	
Address	2830 Dairy Drive	Copy To		Company Name	
Madison, WI 53718				Address	Regulatory Agency
Email	mblodgett@scsengineers com	Purchase Order #		Pace Quote	
Phone	608-216-7362 Fax	Project Name	25224067 Columbia CCR Primary Pond	Pace Project Manager	dan milewsky@pacelabs com, State / Location
Requested Due Date		Project #	25224067	Pace Profile #:	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: Radium 226	Radium 228	Metals	chloride,fluoride,sulfate	TDS and pH	Residual Chlorine (Y/N)
	MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS			DATE	TIME	DATE	TIME											N	N	N	N	N	N	
1																								
2	~~MW-305~~	WT																X	X	X	X	X		
3	M-4R	WT				6/4	1235		5	2		3						X	X	X	X	X		001
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED		6/4	1500							
	CSLogistics	6/5/24	1100		6/5/24	1100	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colin Gloede

SIGNATURE of SAMPLER: DATE Signed: 6/4/24

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

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 402792228

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

Lab Lot# of pH paper: 10D1034 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: GF Date/Time: 6/5/24

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	Vials: VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: SP5T	ZPLC	GN 1	GN 2	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001									①		1															①								2.5 / 5
002																																		2.5 / 5
003																																		2.5 / 5
004																																		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
010																																		2.5 / 5
011																																		2.5 / 5
012																																		2.5 / 5
013																																		2.5 / 5
014																																		2.5 / 5
015																																		2.5 / 5
016																																		2.5 / 5
017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

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	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1liter plastic HNO3
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40279225

40279225

Client Name: SCS Engineers

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

Tracking #: _____

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

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 136 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 1.0

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

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

Person examining contents:
Date: 10/5/24 /Initials: GF

Labeled By Initials: SKL

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

Page 2 of 2

Appendix D

Historical Monitoring Results

Single Location
Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 26

Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019
Boron	ug/L	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1	13.6	12
Calcium	ug/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500
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
Fluoride	mg/L	<0.2	<0.2	<0.2	--	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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
Sulfate	mg/L	4.9	4.3	3.7	--	2.6	2.7	3	2.8	2.7	2	2.2	2.8	1.9	1.6	1.4	1.3
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310
Antimony	ug/L	<0.073	0.084	0.1	--	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.15	0.29	0.14	--	0.35	0.19	0.35	<0.099	<0.28	0.28	--	<0.28	<0.28	0.33	<0.28	0.46
Barium	ug/L	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15
Chromium	ug/L	2.5	1.9	1.8	--	2	2	1.9	2.4	2	1.6	--	2.4	1.5	1.6	1.8	1.6
Cobalt	ug/L	0.095	<0.036	0.053	--	<0.036	<0.036	<0.036	<0.036	<0.085	<0.085	--	<0.085	<0.085	<0.12	<0.12	<0.12
Lead	ug/L	0.16	<0.04	0.39	--	0.049	0.11	<0.04	0.041	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24
Lithium	ug/L	0.72	0.44	0.5	--	0.56	0.56	0.56	0.55	0.46	0.58	--	0.5	0.4	0.49	0.56	0.52
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084
Molybdenum	ug/L	<0.07	<0.07	0.073	--	0.12	<0.07	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247
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
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
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
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
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
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
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
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
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

Single Location
Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 26

Parameter Name	Units	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023	4/17/2024
Boron	ug/L	15.7	10	9.7	14.3	11.1	10.5	12.2	10.3	14	11.9
Calcium	ug/L	72700	77600	69200	69100	75300	75100	78400	68600	65100	73700
Chloride	mg/L	3.7	3.7	4.3	4.4	3.5	5.2	3.4	3	3.1	3.2
Fluoride	mg/L	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.12
Field pH	Std. Units	7.51	7.34	7.49	7.34	7.42	7.34	7.31	7.01	7.51	7.68
Sulfate	mg/L	<2.2	1.5	1.3	1.4	1.3	1.4	1.1	1.3	1.4	1.4
Total Dissolved Solids	mg/L	316	340	320	328	326	334	302	326	324	322
Antimony	ug/L	--	<0.15	<0.15	0.55	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.38	0.34	0.49	0.91	0.41	0.31	0.72	<0.28	<0.28	0.29
Barium	ug/L	14	13.9	12.6	13.4	12.9	13.5	13.7	12.6	12.7	14.4
Beryllium	ug/L	--	<0.25	<0.25	0.47	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	--	<0.15	<0.15	0.53	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	1.6	1.7	1.6	2.6	1.9	2.2	2.2	1.7	1.6	2.1
Cobalt	ug/L	<0.12	<0.12	<0.12	0.52	0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Lead	ug/L	--	<0.24	<0.24	0.55	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.58	0.4	0.39	1	0.28	0.36	0.41	0.71	0.54	0.67
Mercury	ug/L	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.44	<0.44	<0.44	0.62	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.32	<0.32	<0.32	0.48	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	0.66	0.19	<0.14	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.1	0.395	0.39	0.285	0.243	0.611	0.673	0.326	0.844	--
Radium-226	pCi/L	0.1	0.368	0	-0.289	0	0.254	0.267	0	0.292	--
Radium-228	pCi/L	-0.153	0.0273	0.39	0.285	0.243	0.357	0.406	0.326	0.552	--
Field Specific Conductance	umhos/cm	618.4	613.7	610.1	610.9	598.9	600.2	585.2	556.6	599.9	588.1
Oxygen, Dissolved	mg/L	8.43	9.81	9.39	9.8	9.25	9.33	8.31	9.37	8.44	7.82
Field Oxidation Potential	mV	121.5	135	153.2	95.6	89.7	200.6	39.9	103.4	91.2	0
Groundwater Elevation	feet	786.5	787.02	786.1	785.84	784.96	785.02	784.57	786.97	784.39	784.9
Temperature	deg C	10.3	10.6	11.9	10.2	12.5	9.9	11.7	10.7	12.3	11
Turbidity	NTU	1.23	2.15	0	2.45	3.41	0	0	0.72	0.03	0
pH at 25 Degrees C	Std. Units	7.4	7.6	7.6	7.6	7.8	7.6	7.4	7.6	7.6	8.2

Single Location
Name: WPL - Columbia

Location ID: MW-301
Number of Sampling Dates: 25

Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020
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
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000
Chloride	mg/L	3.7	4	3.5	2.2	2	1.5	2	3.5	5.5	4	2.3	5.2	3.2	0.79	1.7	1.3
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--
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
Sulfate	mg/L	9.3	15.3	15	13.9	12.3	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462
Antimony	ug/L	0.15	0.094	0.13	<0.073	0.4	<0.073	<0.073	<0.15	<0.15	--	<0.15	0.36	<0.15	0.32	<0.15	--
Arsenic	ug/L	0.26	0.26	0.19	0.24	0.4	0.13	0.18	<0.28	<0.28	--	<0.28	0.45	<0.28	0.4	0.42	<0.28
Barium	ug/L	20.2	11.1	11.6	15.6	15	13.5	13.2	11.3	11.8	--	9.3	10.2	11.5	11.8	10	10.9
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.19	<0.13	<0.13	<0.18	<0.18	--	<0.18	0.37	<0.18	0.28	<0.25	--
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	0.32	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	0.21	<0.15	--
Chromium	ug/L	2.1	0.58	0.59	<0.39	0.7	0.53	0.7	2.3	<1	--	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	1.4	0.25	0.22	0.041	0.38	0.071	0.064	0.13	0.12	--	<0.085	0.28	<0.12	0.35	<0.12	0.17
Lead	ug/L	0.9	0.077	0.48	<0.04	0.34	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	0.3	<0.24	--
Lithium	ug/L	1.3	0.58	0.69	0.6	0.87	0.67	0.68	0.62	0.6	--	0.55	0.85	0.52	0.9	0.61	0.67
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--
Molybdenum	ug/L	0.35	0.15	0.14	0.12	0.38	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	0.3	0.21	0.39	<0.21	0.26	<0.21	<0.21	<0.32	<0.32	--	<0.32	0.71	<0.32	0.49	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.48	<0.14	<0.14	<0.14	<0.14	--	<0.14	0.3	<0.14	0.48	<0.14	<0.14
Total Radium	pCi/L	1.31	1.11	0.89	0.631	1.01	2.42	1.35	1.3	1.74	--	0.882	0.0351	0.652	0.552	0.701	0.502
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
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
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868
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
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
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
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
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
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

Single Location
Name: WPL - Columbia

Location ID: MW-301
Number of Sampling Dates: 25

Parameter Name	Units	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023	4/17/2024
Boron	ug/L	21.3	28.8	22.2	31.4	28.7	37.5	20.1	36.2	24.9
Calcium	ug/L	112000	93000	117000	67800	97300	62800	120000	52300	102000
Chloride	mg/L	2	3.4	1.5	2.7	1.9	2.3	1.5	2.1	1.6
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	6.73	6.95	6.66	7.01	6.6	6.8	6.65	7.06	7.06
Sulfate	mg/L	11.5	25.1	8.5	17.4	12.7	11.6	12.3	11.8	11.5
Total Dissolved Solids	mg/L	452	412	472	334	422	282	526	300	458
Antimony	ug/L	<0.15	0.33	<0.15	<0.15	0.31	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.33	0.62	<0.28	0.35	0.47	0.3	<0.28	<0.28	<0.28
Barium	ug/L	9.8	9.4	8.9	7.7	7.8	7.5	9.8	7.3	8.1
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.15	0.19	<0.15	<0.15	0.3	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	<0.12	0.29	<0.12	0.34	0.32	0.52	<0.12	0.13	<0.12
Lead	ug/L	<0.24	0.25	<0.24	<0.24	3.1	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.47	0.46	0.58	0.46	0.56	0.37	0.62	0.43	0.63
Mercury	ug/L	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	0.3	<0.14	0.17	0.32	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.193	0.38	1.16	0.172	0.179	0.00292	0.417	0.611	1.04
Radium-226	pCi/L	0	0.0511	0.418	0.172	0	-0.169	0	-0.0576	0.252
Radium-228	pCi/L	0.193	0.329	0.739	-0.0327	0.179	0.00292	0.417	0.611	0.787
Field Specific Conductance	umhos/cm	797	760	857	597.2	747	507.5	857	536	781
Oxygen, Dissolved	mg/L	2	1.22	3.9	0.25	2.47	0.1	6.5	0.16	2.53
Field Oxidation Potential	mV	118.7	183.9	102.9	57.8	207.5	80.9	95.3	23.8	17.9
Groundwater Elevation	feet	787.77	786.53	786.5	785.28	785.44	784.91	787.57	784.67	785.27
Temperature	deg C	8.1	11	7.4	11.1	7.1	10.8	8	10.7	8.6
Turbidity	NTU	0	0	2.41	3.21	0	0	0	0.34	0
pH at 25 Degrees C	Std. Units	7	7.2	6.9	7.3	7	7.1	6.9	7.2	7.9

Single Location
Name: WPL - Columbia

Location ID: M-4R
Number of Sampling Dates: 23

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

Single Location
Name: WPL - Columbia

Location ID: M-4R
Number of Sampling Dates: 23

Parameter Name	Units	4/13/2021	10/11/2021	4/11/2022	10/25/2022	4/17/2024	6/4/2024	8/15/2024
Boron	ug/L	730	2290	1160	1590	--	930	651
Calcium	ug/L	110000	90400	75900	110000	--	117000	124000
Chloride	mg/L	49.6	67.8	65.5	58.6	--	16.3	24.1
Fluoride	mg/L	0.23	0.26	0.29	0.23	--	0.25	<0.95
Field pH	Std. Units	7.18	7.41	7.05	7.23	--	7.19	6.95
Sulfate	mg/L	193	236	184	282	--	119	238
Total Dissolved Solids	mg/L	556	628	476	670	--	578	604
Antimony	ug/L	<0.15	0.23	0.2	0.28	--	0.3	0.23
Arsenic	ug/L	<0.28	<0.28	<0.28	0.4	--	<0.28	<0.28
Barium	ug/L	25.1	25.8	21.2	34.3	--	36.1	43.2
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	--	<0.25	<0.25
Cadmium	ug/L	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15
Chromium	ug/L	<1	<1	<1	<1	--	1.4	1.3
Cobalt	ug/L	<0.12	<0.12	<0.12	0.14	--	0.34	0.68
Lead	ug/L	<0.24	<0.24	<0.24	<0.24	--	0.75	<0.24
Lithium	ug/L	1.8	2.5	2.2	1.7	--	5	0.88
Mercury	ug/L	<0.066	<0.066	<0.066	<0.066	--	<0.066	<0.066
Molybdenum	ug/L	41.1	60.7	42.5	34.5	--	9.7	10.9
Selenium	ug/L	3.7	2.3	3	5.8	--	116	20.2
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14
Total Radium	pCi/L	0.139	0.498	0.427	0.181	--	1.16	0.25
Radium-226	pCi/L	-0.073	-0.174	0.0901	-0.246	--	-0.725	-0.498
Radium-228	pCi/L	0.139	0.498	0.337	0.181	--	1.16	0.25
Field Specific Conductance	umhos/cm	845	955	754	988	--	843	825
Oxygen, Dissolved	mg/L	0.27	--	0.63	0.38	--	0.47	1.26
Field Oxidation Potential	mV	128.7	150.5	208.8	103.1	--	77.1	137.1
Groundwater Elevation	feet	786.34	786.33	788.26	--	781.38	783.66	784.27
Temperature	deg C	10.3	15.6	10.3	13.6	--	15.5	16.2
Turbidity	NTU	0	0	0	0	--	4.96	3.5
pH at 25 Degrees C	Std. Units	7.5	7.8	7.6	7.4	--	7.9	7.8

Single Location
Name: WPL - Columbia

Location ID: MW-303
Number of Sampling Dates: 30

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

Single Location
Name: WPL - Columbia

Location ID: MW-303
Number of Sampling Dates: 30

Parameter Name	Units	10/7/2019	5/27/2020	10/7/2020	2/25/2021	4/12/2021	7/20/2021	10/12/2021	2/24/2022	4/12/2022	7/27/2022	10/26/2022	4/24/2023	10/9/2023	4/17/2024
Boron	ug/L	2560	2700	2520	--	2440	--	2690	--	2890	--	2730	2720	2420	2470
Calcium	ug/L	22300	27400	19700	--	10400	--	5530	--	4950	--	2360	43600	2610	2940
Chloride	mg/L	2.7	2.3	2	--	2.5	--	12.4	--	10.6	--	<8.6	3.5	46.4	<0.59
Fluoride	mg/L	0.19	<0.48	0.19	--	<0.95	--	<1.9	--	<1.9	--	<0.095	<0.48	<0.095	<0.095
Field pH	Std. Units	9.33	8.68	9.21	9.16	9.24	9.07	9.31	9.53	9.46	9.61	9.9	8.44	9.61	9.58
Sulfate	mg/L	299	326	312	--	345	--	369	--	634	--	442	229	188	335
Total Dissolved Solids	mg/L	574	570	532	--	610	--	660	--	1090	--	930	420	686	728
Antimony	ug/L	0.31	0.22	<0.15	--	0.93	--	0.55	--	0.31	--	0.7	<0.15	0.35	0.38
Arsenic	ug/L	10.2	5.9	9.5	7.7	10.4	13.9	18.6	28.8	27.1	29.4	52	4	36.3	40.4
Barium	ug/L	11.4	13.8	10	--	7.8	--	5.1	--	5.5	--	4	31	3.3	3.8
Beryllium	ug/L	<0.25	0.36	<0.25	--	<0.25	--	<0.25	--	<0.25	--	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.15	0.3	<0.15	--	0.67	--	0.27	--	<0.15	--	0.16	<0.15	<0.15	<0.15
Chromium	ug/L	62	42.8	46.4	--	44.1	--	50.2	--	44.1	--	46.3	45	66.4	74.3
Cobalt	ug/L	0.51	0.49	0.23	--	0.7	--	0.74	--	0.59	--	0.94	0.26	0.4	0.47
Lead	ug/L	<0.24	0.32	<0.24	--	0.76	--	0.32	--	<0.24	--	0.28	<0.24	<0.24	<0.24
Lithium	ug/L	1	1.2	0.69	--	0.93	--	0.62	--	0.31	--	0.34	4.4	0.75	0.64
Mercury	ug/L	--	<0.084	--	--	<0.066	--	<0.066	--	<0.066	--	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	87	67.1	67.1	--	67.1	--	78	--	174	--	89.4	41.3	56.3	82
Selenium	ug/L	16.4	18.7	17.2	--	22.4	--	28.1	--	87.2	--	74.4	9.7	28.3	36.3
Thallium	ug/L	<0.14	0.28	<0.14	--	0.89	--	0.3	--	<0.14	--	0.21	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.422	0.382	0.722	--	0.846	--	0.539	--	0.164	--	0.357	0.292	0.778	0.481
Radium-226	pCi/L	0.0995	0.168	0.0515	--	0.263	--	-0.355	--	-0.211	--	-0.175	-0.193	0.233	-0.127
Radium-228	pCi/L	0.322	0.214	0.67	--	0.583	--	0.539	--	0.164	--	0.357	0.292	0.545	0.481
Field Specific Conductance	umhos/cm	865	828	801	845	927	1058	1078	1439	1670	894	1396	575	1090	1164
Oxygen, Dissolved	mg/L	7.93	9.15	7.62	7.45	7.02	6.49	--	3.53	1.63	8.62	6.19	9.48	7.63	3.7
Field Oxidation Potential	mV	65.9	116.1	183	151	51.4	67.5	110.1	205	210.5	80.6	22.7	45.9	46.2	10.5
Groundwater Elevation	feet	787.02	785.56	785.16	784.27	784.07	783.64	783.09	782.34	783.4	783.07	774.74	784.38	781.21	782.16
Temperature	deg C	12.4	11.6	12.6	11	11.4	13.1	12.1	9.6	10.2	12.6	11	10.5	12.6	11.8
Turbidity	NTU	3.31	0	0	3.04	1.82	0.57	0	2.53	0	0	2.28	0	2.15	0.04
pH at 25 Degrees C	Std. Units	8.8	8.2	8.8	--	9	--	9.2	--	9.5	--	9.9	8.3	9.8	10

Single Location
Name: WPL - Columbia

Location ID: MW-304
Number of Sampling Dates: 22

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

Single Location
Name: WPL - Columbia

Location ID: MW-304
Number of Sampling Dates: 22

Parameter Name	Units	4/12/2021	10/11/2021	4/11/2022	10/25/2022	1/20/2023	4/25/2023
Boron	ug/L	568	1090	664	--	346	--
Calcium	ug/L	78900	86600	84900	--	92700	--
Chloride	mg/L	44.7	56.6	52.9	--	12.7	--
Fluoride	mg/L	0.16	0.15	<0.095	--	0.32	--
Field pH	Std. Units	7.3	7.07	7.22	--	7	--
Sulfate	mg/L	85.5	129	117	--	31.3	--
Total Dissolved Solids	mg/L	434	522	492	--	398	--
Antimony	ug/L	0.86	0.44	<0.15	--	<0.15	--
Arsenic	ug/L	1.8	1.6	0.87	--	1.4	--
Barium	ug/L	32.5	46.4	35.4	--	30.7	--
Beryllium	ug/L	0.86	<0.25	<0.25	--	<0.25	--
Cadmium	ug/L	0.79	0.36	<0.15	--	<0.15	--
Chromium	ug/L	1.1	<1	<1	--	<1	--
Cobalt	ug/L	0.84	1.2	0.79	--	0.37	--
Lead	ug/L	0.89	0.52	<0.24	--	0.24	--
Lithium	ug/L	1.1	0.45	<0.22	--	0.29	--
Mercury	ug/L	<0.066	<0.066	<0.066	--	<0.066	--
Molybdenum	ug/L	13	13.5	9.8	--	2.4	--
Selenium	ug/L	1.1	0.35	<0.32	--	<0.32	--
Thallium	ug/L	1	0.46	<0.14	--	0.23	--
Total Radium	pCi/L	1.22	0.371	0.256	--	0.945	--
Radium-226	pCi/L	0.219	-0.184	0	--	0.397	--
Radium-228	pCi/L	1	0.371	0.256	--	0.548	--
Field Specific Conductance	umhos/cm	751	847	830	--	664.8	--
Oxygen, Dissolved	mg/L	0.36	--	0.21	--	0.14	--
Field Oxidation Potential	mV	27.3	63.9	197.6	--	115.3	--
Groundwater Elevation	feet	787.99	787.78	788.2	781.79	788.08	784.03
Temperature	deg C	10.6	18.3	10.6	--	10	--
Turbidity	NTU	3.19	0.38	0.96	--	3.69	--
pH at 25 Degrees C	Std. Units	7.4	7.7	7.4	--	7.5	--

Single Location
Name: WPL - Columbia

Location ID: MW-304R
Number of Sampling Dates: 1

Parameter Name	Units	4/17/2024
Boron	ug/L	822
Calcium	ug/L	85500
Chloride	mg/L	45.6
Fluoride	mg/L	0.14
Field pH	Std. Units	7.37
Sulfate	mg/L	163
Total Dissolved Solids	mg/L	544
Antimony	ug/L	0.17
Arsenic	ug/L	1.8
Barium	ug/L	92
Beryllium	ug/L	<0.25
Cadmium	ug/L	<0.15
Chromium	ug/L	1.4
Cobalt	ug/L	0.88
Lead	ug/L	0.36
Lithium	ug/L	25.2
Mercury	ug/L	<0.066
Molybdenum	ug/L	52.2
Selenium	ug/L	<0.32
Thallium	ug/L	<0.14
Total Radium	pCi/L	1.08
Radium-226	pCi/L	0.467
Radium-228	pCi/L	0.608
Field Specific Conductance	umhos/cm	888
Oxygen, Dissolved	mg/L	0.35
Field Oxidation Potential	mV	-105.6
Groundwater Elevation	feet	783.25
Temperature	deg C	11.4
Turbidity	NTU	50.27
pH at 25 Degrees C	Std. Units	8.5

Single Location
Name: WPL - Columbia

Location ID: MW-305
Number of Sampling Dates: 26

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

Single Location
Name: WPL - Columbia

Location ID: MW-305
Number of Sampling Dates: 26

Parameter Name	Units	2/25/2021	4/12/2021	7/20/2021	10/11/2021	2/24/2022	4/11/2022	7/27/2022	10/25/2022	4/17/2024	8/15/2024
Boron	ug/L	--	668	--	1650	--	957	--	1610	--	524
Calcium	ug/L	--	235000	--	149000	--	97000	--	71600	--	35400
Chloride	mg/L	--	68.2	--	63	--	58.5	--	55.5	--	4
Fluoride	mg/L	--	<0.095	--	0.31	--	0.21	--	0.32	--	0.2
Field pH	Std. Units	8.68	8.67	8.71	8.95	9.36	8.52	9.12	9.31	--	7.89
Sulfate	mg/L	--	649	--	446	--	274	--	261	--	23.3
Total Dissolved Solids	mg/L	--	1020	--	730	--	484	--	474	--	158
Antimony	ug/L	--	0.31	--	0.59	--	0.33	--	0.47	--	0.41
Arsenic	ug/L	--	0.95	--	1.4	--	0.59	--	1.3	--	0.41
Barium	ug/L	--	30	--	29.3	--	16.9	--	10.8	--	7.8
Beryllium	ug/L	--	<0.25	--	<0.25	--	<0.25	--	<0.25	--	<0.25
Cadmium	ug/L	--	<0.15	--	<0.15	--	<0.15	--	<0.15	--	<0.15
Chromium	ug/L	--	<1	--	1.1	--	1.3	--	<1	--	3.1
Cobalt	ug/L	--	<0.12	--	<0.12	--	<0.12	--	<0.12	--	<0.12
Lead	ug/L	--	<0.24	--	<0.24	--	<0.24	--	<0.24	--	<0.24
Lithium	ug/L	--	<0.22	--	<0.22	--	<0.22	--	<0.22	--	0.41
Mercury	ug/L	--	<0.066	--	<0.066	--	<0.066	--	<0.066	--	<0.066
Molybdenum	ug/L	107	106	77	124	35.8	45.9	35.1	44.9	--	7.4
Selenium	ug/L	--	8	--	4.5	--	21.5	--	9.1	--	0.6
Thallium	ug/L	--	<0.14	--	<0.14	--	<0.14	--	<0.14	--	<0.14
Total Radium	pCi/L	--	0.418	--	0.483	--	0.761	--	0.309	--	0
Radium-226	pCi/L	--	-0.199	--	0.0522	--	-0.114	--	0	--	-0.47
Radium-228	pCi/L	--	0.418	--	0.431	--	0.761	--	0.309	--	-0.147
Field Specific Conductance	umhos/cm	955	1373	1046	1068	677	755	633	704	--	260
Oxygen, Dissolved	mg/L	2.33	2.7	2.38	--	1.28	4.09	5.07	1.49	--	5.32
Field Oxidation Potential	mV	170	51.5	103.3	151.8	203.5	203.7	77.4	104.1	--	112.2
Groundwater Elevation	feet	788.36	788.11	788.39	787.75	786.49	787.87	787.03	784.97	780.8	783.75
Temperature	deg C	15.9	13.6	18.2	24.2	17.2	14	15.3	18.7	--	17.6
Turbidity	NTU	0.85	1.14	0	0	0.09	0	0	0	--	0
pH at 25 Degrees C	Std. Units	--	8.3	--	8.7	--	8.4	--	9.1	--	8.1

Single Location
Name: WPL - Columbia

Location ID: MW-316
Number of Sampling Dates: 3

Parameter Name	Units	5/5/2023	10/9/2023	4/17/2024
Field pH	Std. Units	8.32	8.27	8.31
Arsenic	ug/L	1.2	1.6	2.6
Field Specific Conductance	umhos/cm	636.1	680	671
Oxygen, Dissolved	mg/L	0.09	0.08	0.3
Field Oxidation Potential	mV	-167.2	-40.6	-2.3
Groundwater Elevation	feet	--	780.3	782.09
Temperature	deg C	12.8	12.5	12.2
Turbidity	NTU	0.05	1.6	1.62

Appendix E

Statistical Evaluations

E1 – October 2023 LCLs

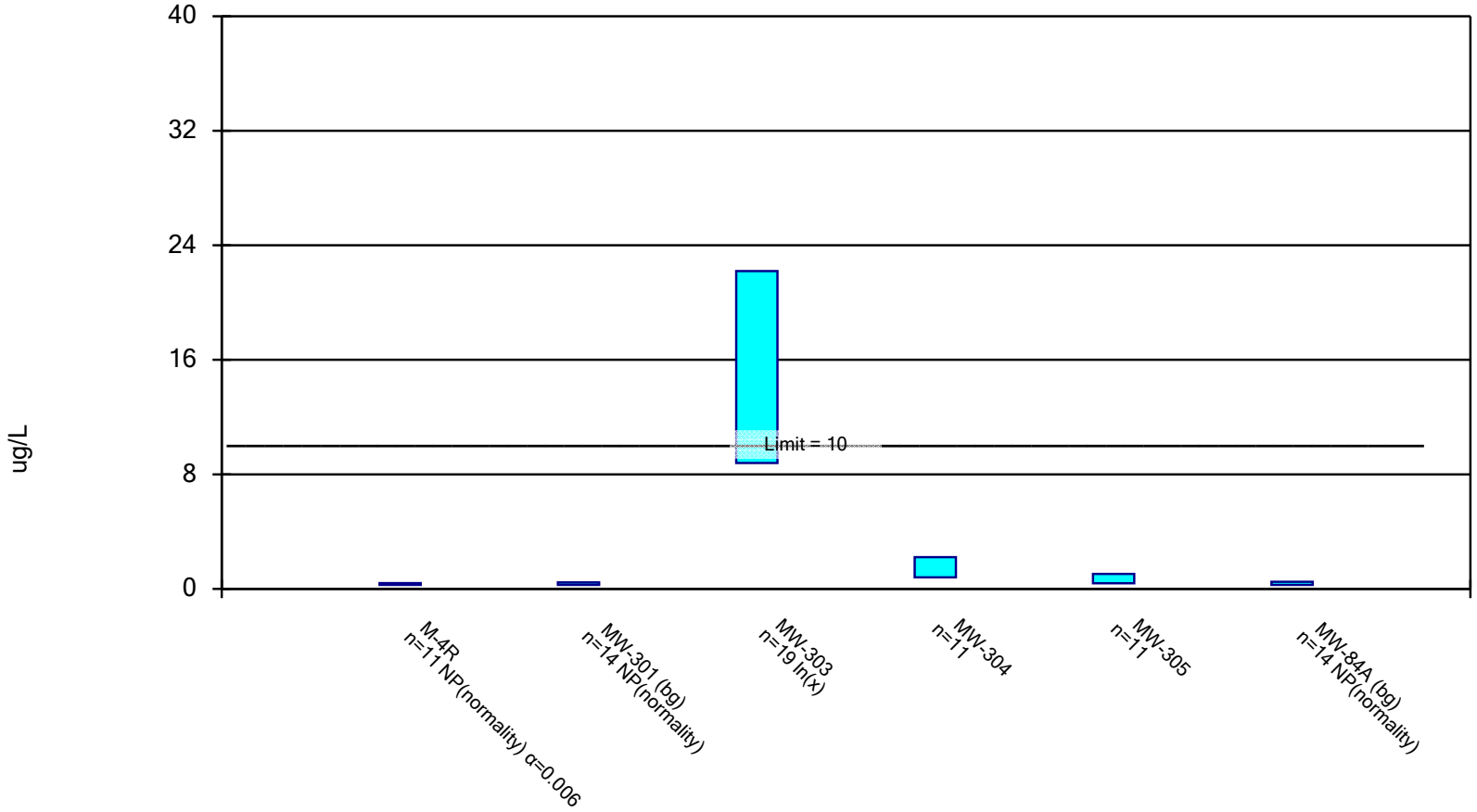
Confidence Interval

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 1/9/2024, 2:28 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.4	0.28	10	No	11	54.55	No	0.006	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.45	0.28	10	No	14	42.86	No	0.01	NP (normality)
Arsenic (ug/L)	MW-303	22.2	8.792	10	No	19	0	ln(x)	0.01	Param.
Arsenic (ug/L)	MW-304	2.215	0.803	10	No	11	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.045	0.3862	10	No	11	9.091	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.49	0.28	10	No	14	35.71	No	0.01	NP (normality)
Molybdenum (ug/L)	M-4R	42.03	19.46	100	No	11	0	No	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	14	100	No	0.01	NP (NDs)
Molybdenum (ug/L)	MW-303	103.6	64.32	100	No	15	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304	13	3	100	No	11	0	No	0.006	NP (normality)
Molybdenum (ug/L)	MW-305	82.74	48.15	100	No	16	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	14	92.86	No	0.01	NP (NDs)
Selenium (ug/L)	M-4R	8.736	2.3	50	No	11	0	No	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.49	0.32	50	No	14	85.71	No	0.01	NP (NDs)
Selenium (ug/L)	MW-303	40.92	16.66	50	No	14	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304	0.35	0.32	50	No	11	72.73	No	0.006	NP (normality)
Selenium (ug/L)	MW-305	10.05	4.299	50	No	11	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	14	92.86	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Arsenic Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

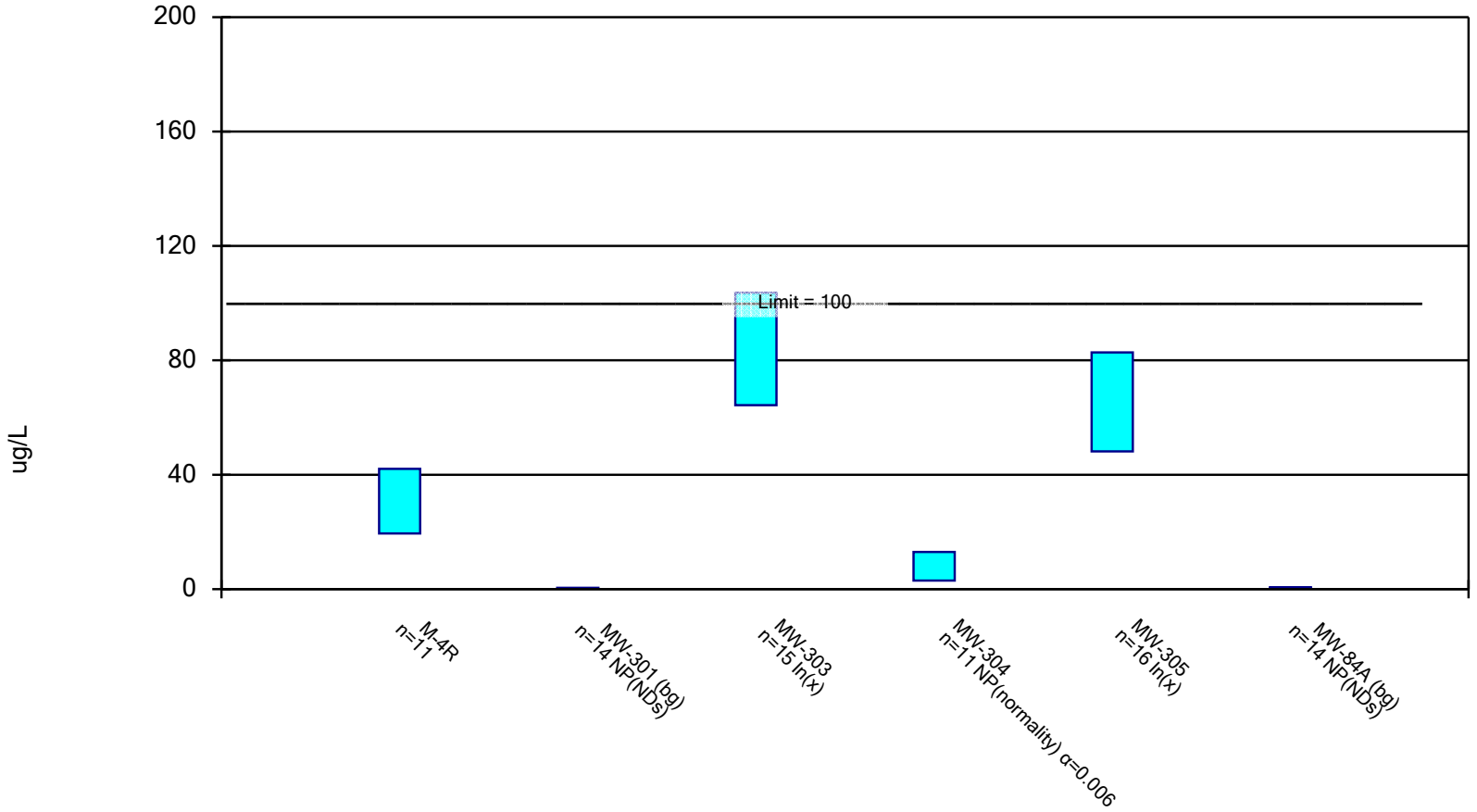
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
Mean	0.3309	0.3586	18.63	1.509	0.7155	0.4107
Std. Dev.	0.06172	0.1023	14.22	0.8474	0.3952	0.1885
Upper Lim.	0.4	0.45	22.2	2.215	1.045	0.49
Lower Lim.	0.28	0.28	8.792	0.803	0.3862	0.28

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

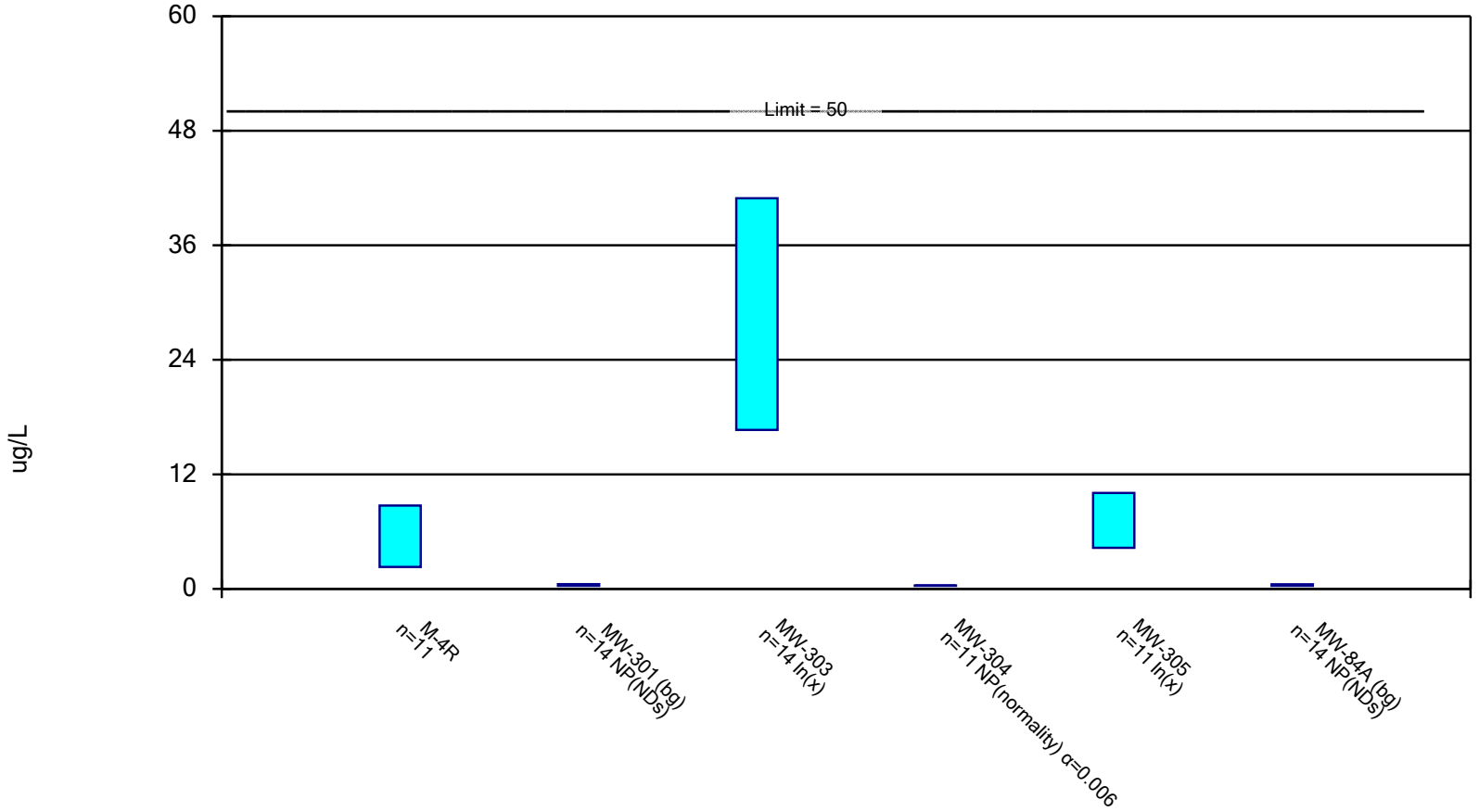
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44				<0.44
Mean	30.75	0.44	86.69	8.009	68.55	0.4529
Std. Dev.	13.54	0	33.2	4.52	29.3	0.04811
Upper Lim.	42.03	0.44	103.6	13	82.74	0.62
Lower Lim.	19.46	0.44	64.32	3	48.15	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32				<0.32
Mean	5.518	0.36	31.99	0.3945	7.536	0.3314
Std. Dev.	3.862	0.1105	23.46	0.2342	4.993	0.04276
Upper Lim.	8.736	0.49	40.92	0.35	10.05	0.48
Lower Lim.	2.3	0.32	16.66	0.32	4.299	0.32

ND substitution: RL or RL/2 if <15% NDs.

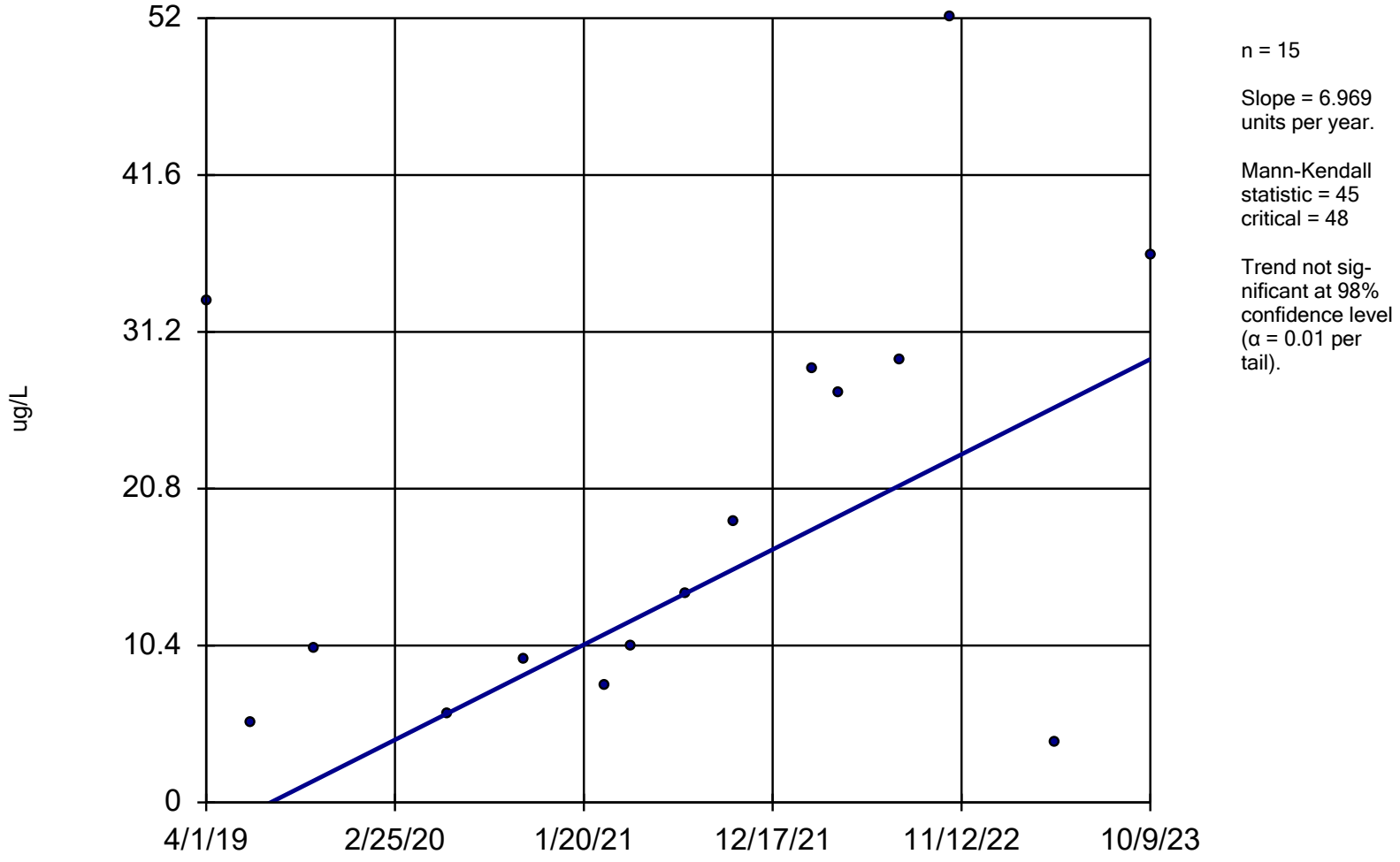
Trend Test

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:05 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	6.969	45	48	No	15	0	n/a	n/a	0.02	NP

Arsenic

MW-303



n = 15

Slope = 6.969 units per year.

Mann-Kendall statistic = 45
critical = 48

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 2/1/2024 9:04 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:05 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3

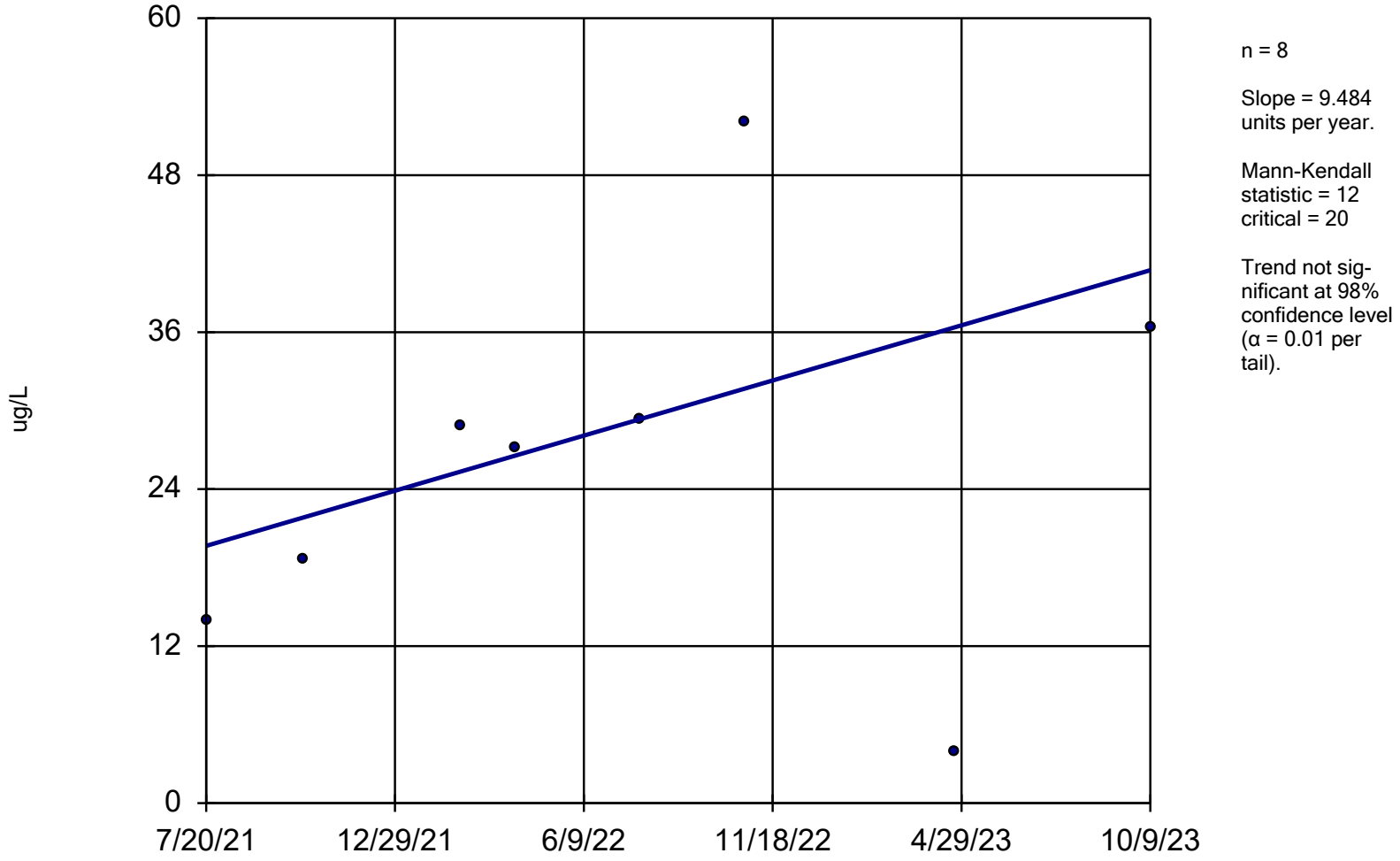
Trend Test

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:11 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	9.484	12	20	No	8	0	n/a	n/a	0.02	NP

Arsenic

MW-303



Sen's Slope Estimator Analysis Run 2/1/2024 9:10 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:11 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3

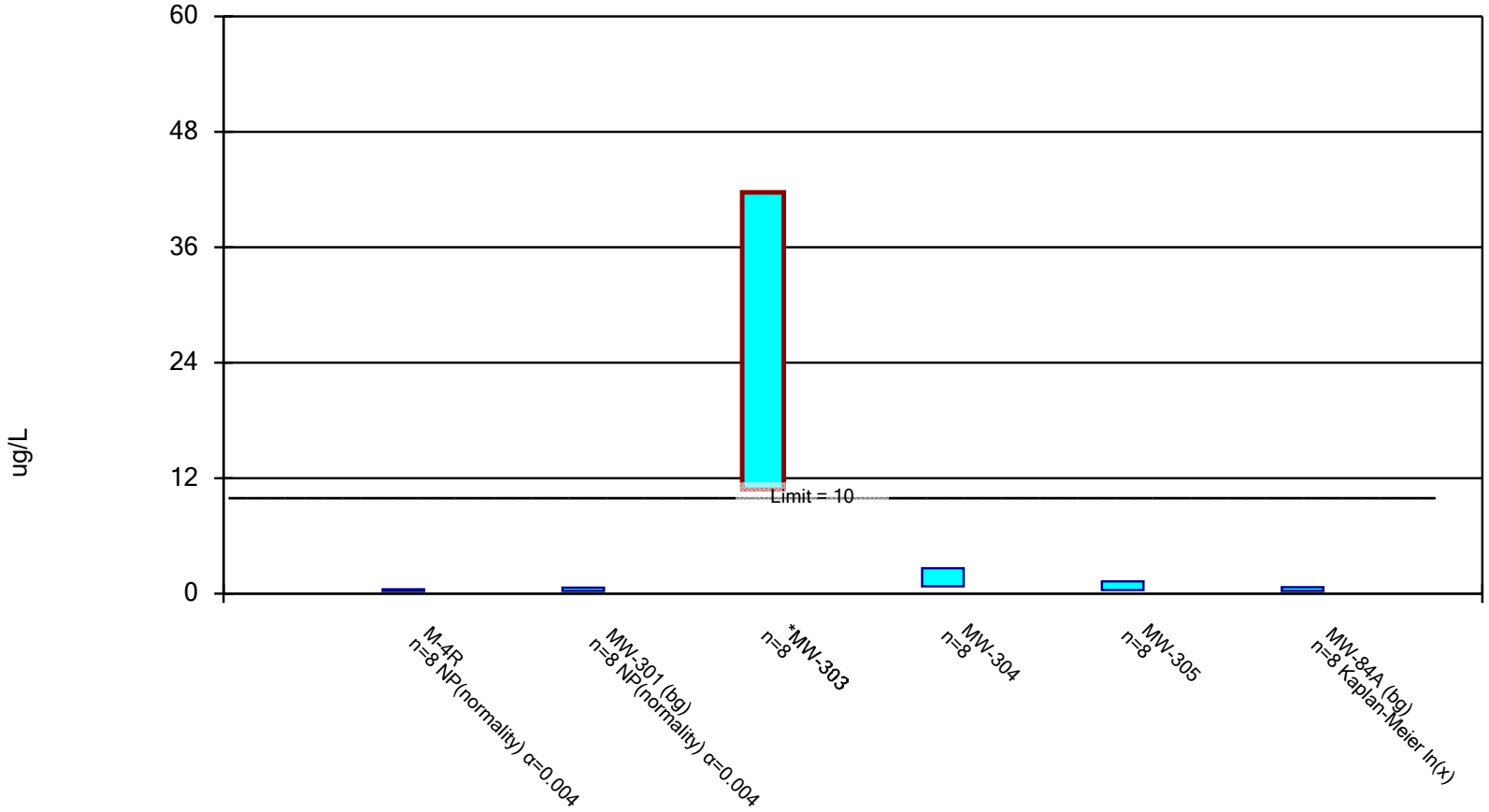
Confidence Interval

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:16 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.62	0.28	10	No	8	37.5	No	0.004	NP (normality)
Arsenic (ug/L)	**MW-303**	**41.71**	**10.81**	**10**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304	2.645	0.755	10	No	8	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.266	0.377	10	No	8	12.5	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.6615	0.2745	10	No	8	25	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	47.4	25.39	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	8	100	No	0.004	NP (NDs)
Molybdenum (ug/L)	MW-303	114.3	47.28	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304	13.52	3.02	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	110.4	33.54	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	8	87.5	No	0.004	NP (NDs)
Selenium (ug/L)	M-4R	9.29	1.705	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.32	0.32	50	No	8	100	No	0.004	NP (NDs)
Selenium (ug/L)	MW-303	60.9	12.72	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304	1.1	0.32	50	No	8	62.5	No	0.004	NP (normality)
Selenium (ug/L)	MW-305	13.01	3.73	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	8	87.5	No	0.004	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

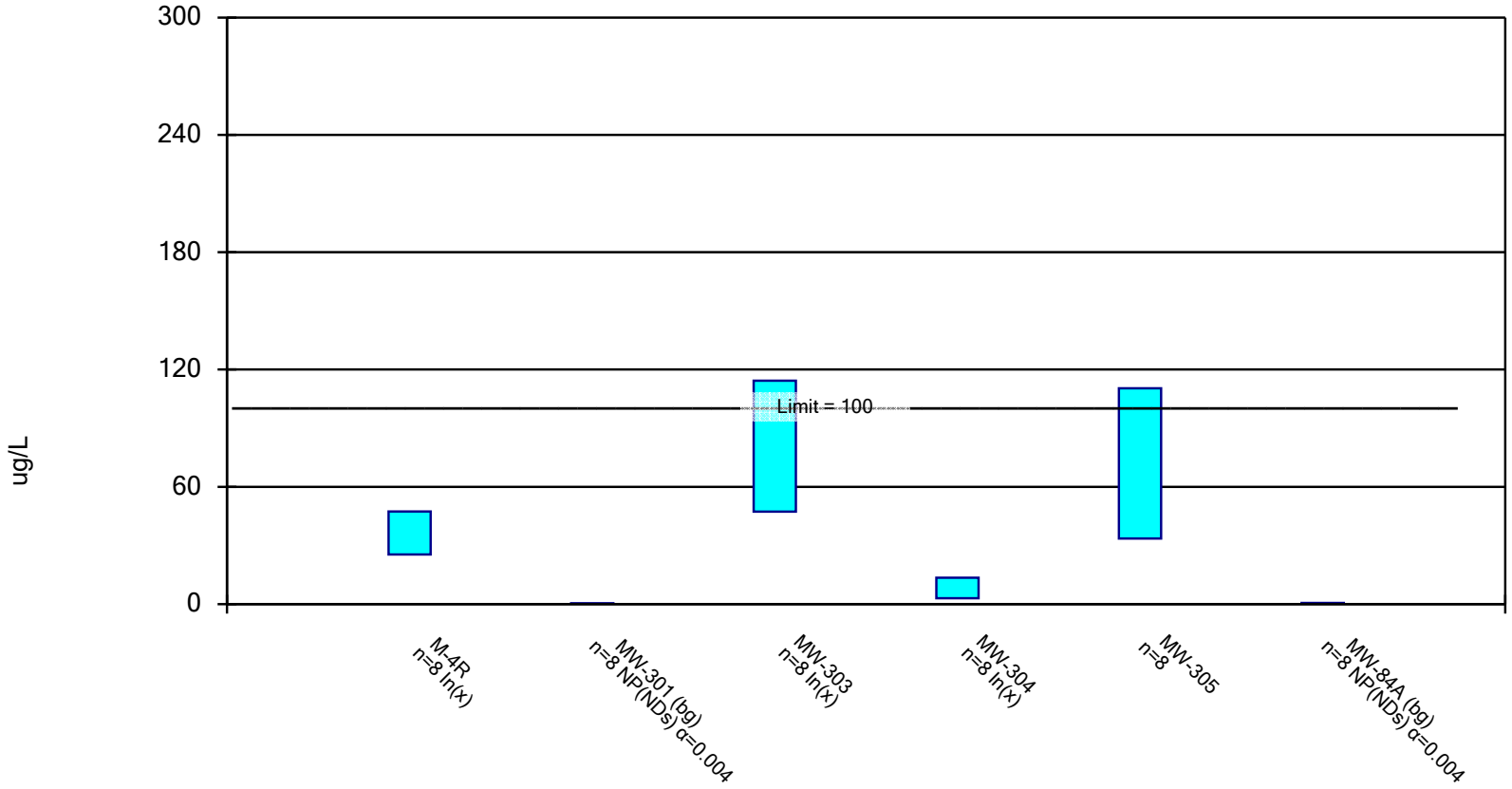
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	<0.28 (U)				<0.28 (U)	
4/2/2019				0.63 (J)		
10/7/2019	0.37 (J)			3.2	0.49 (J)	
5/27/2020	0.39 (J)			1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)			2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
4/12/2021				1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
Mean	0.34	0.3638	26.26	1.7	0.8213	0.4675
Std. Dev.	0.06698	0.1215	14.58	0.8915	0.4191	0.2314
Upper Lim.	0.44	0.62	41.71	2.645	1.266	0.6615
Lower Lim.	0.28	0.28	10.81	0.755	0.377	0.2745

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

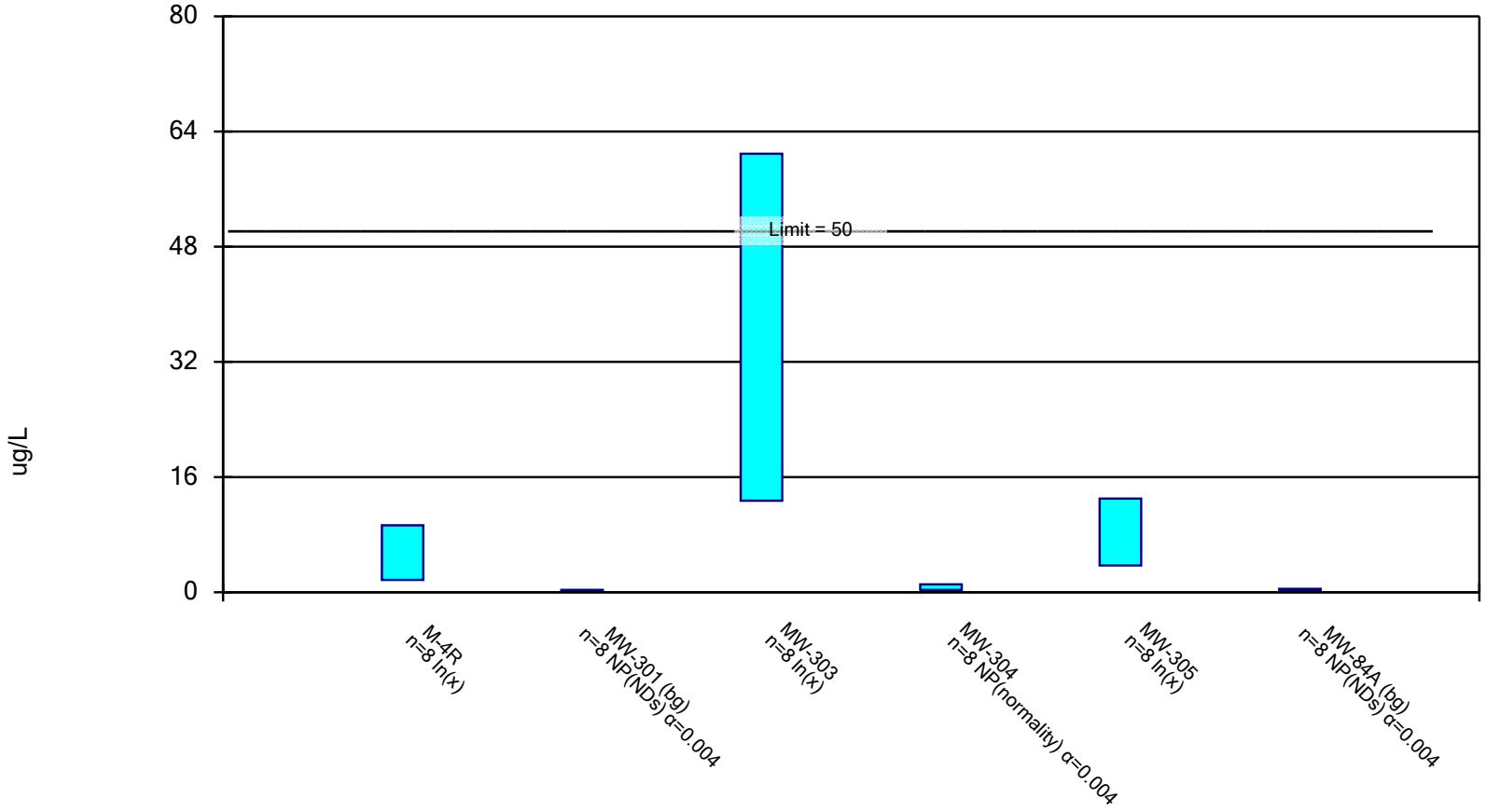
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	29.4					
4/2/2019				3		
10/7/2019	27.6			4.8		
5/27/2020	25.6		67.1	3.9		
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12		
10/8/2020		<0.44 (U)				<0.44 (U)
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
Mean	36.13	0.44	80.04	7.8	71.96	0.4625
Std. Dev.	11.79	0	40.51	4.745	36.25	0.06364
Upper Lim.	47.4	0.44	114.3	13.52	110.4	0.62
Lower Lim.	25.39	0.44	47.28	3.02	33.54	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	12.6				3.2	
4/2/2019				<0.32 (U)		
10/7/2019	1.8			<0.32 (U)	7.7	
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)
Mean	5.313	0.32	35.75	0.4225	8.225	0.34
Std. Dev.	4.429	0	28.65	0.274	5.77	0.05657
Upper Lim.	9.29	0.32	60.9	1.1	13.01	0.48
Lower Lim.	1.705	0.32	12.72	0.32	3.73	0.32

ND substitution: RL or RL/2 if <15% NDs.

E2 – April 2024 LCLs

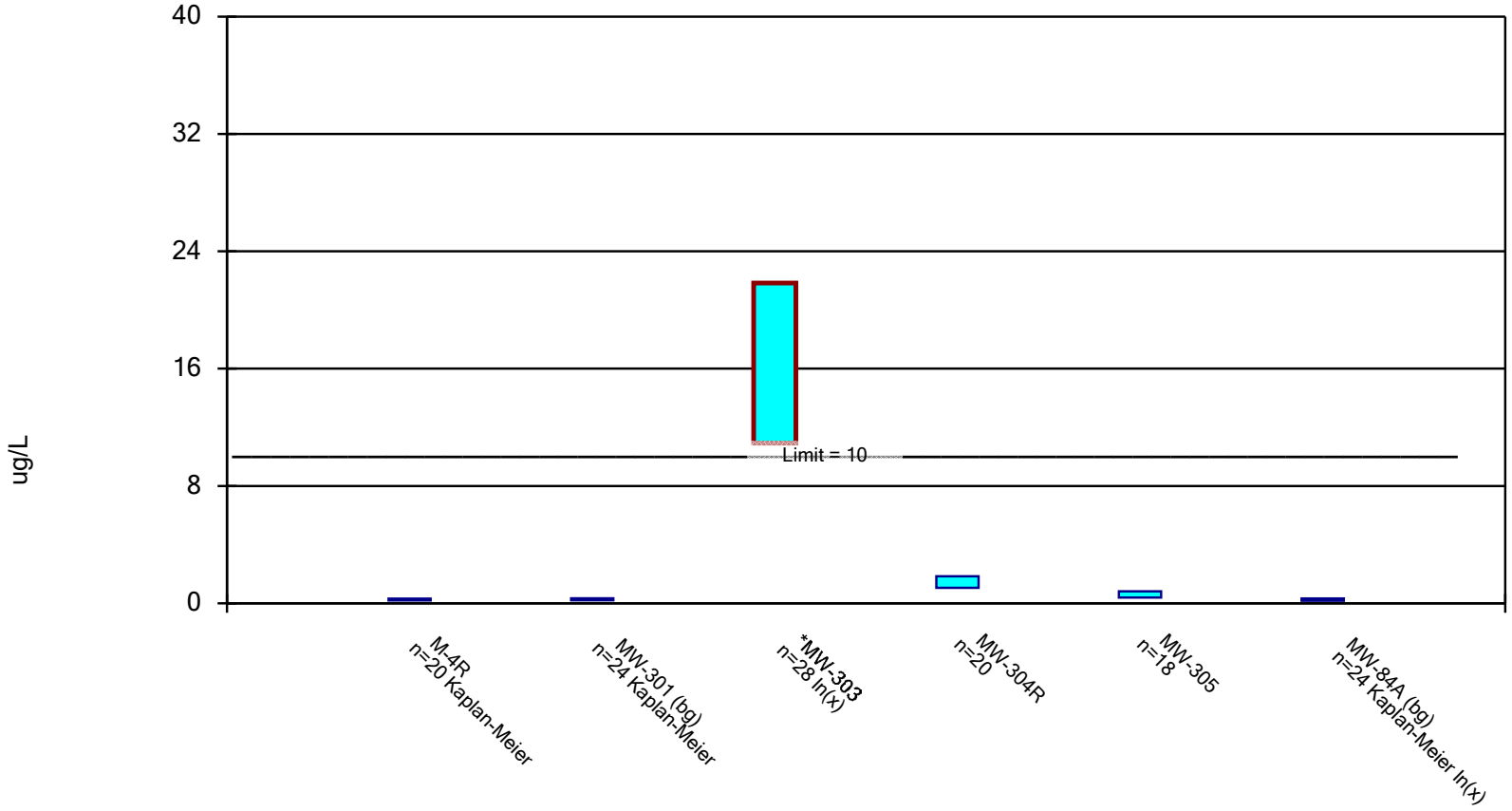
Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:26 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.3189	0.1909	10	No	20	45	No	0.01	Param.
Arsenic (ug/L)	MW-301 (bg)	0.3344	0.2091	10	No	24	37.5	No	0.01	Param.
Arsenic (ug/L)	**MW-303**	**21.84**	**10.92**	**10**	**Yes**	**28**	**0**	**ln(x)**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304R	1.837	1.05	10	No	20	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	0.8179	0.391	10	No	18	5.556	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.3321	0.1788	10	No	24	29.17	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	26.79	14.76	100	No	20	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.35	100	No	24	79.17	No	0.01	NP (NDs)
Molybdenum (ug/L)	MW-303	101	71.54	100	No	24	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304R	15.16	6.481	100	No	20	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	70.42	45.66	100	No	23	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.44	0.073	100	No	24	87.5	No	0.01	NP (NDs)
Selenium (ug/L)	M-4R	12.02	3.992	50	No	20	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.39	0.3	50	No	24	75	No	0.01	NP (normality)
Selenium (ug/L)	MW-303	38	20.22	50	No	23	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304R	0.33	0.21	50	No	20	80	No	0.01	NP (NDs)
Selenium (ug/L)	MW-305	7.422	4.185	50	No	18	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.32	0.21	50	No	24	95.83	No	0.01	NP (NDs)

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			49.2	2.3	0.56 (J)	
12/22/2015	0.17 (J)	0.26 (J)				0.15 (J)
4/4/2016	0.2 (J)		12.6	1.1	0.34 (J)	
4/5/2016		0.26 (J)				0.29 (J)
7/7/2016	0.18 (J)		27.9	1.2		
7/8/2016		0.19 (J)			0.26 (J)	0.14 (J)
10/12/2016	0.25 (J)		13.4			
10/13/2016		0.24 (J)		1.8	0.27 (J)	0.35 (J)
12/29/2016		0.4 (J)				0.19 (J)
1/25/2017	0.47 (J)	0.13 (J)			0.78 (J)	0.35 (J)
1/26/2017			27	0.99 (J)		
4/10/2017			12.1	0.98 (J)		
4/11/2017	<0.099 (U)	0.18 (J)				<0.099 (U)
6/5/2017	0.33 (J)			1.1	0.37 (J)	
6/6/2017		<0.28 (U)	9.1			<0.28 (U)
8/7/2017					0.43 (J)	
8/8/2017		<0.28 (U)	12	1		0.28 (J)
8/9/2017	<0.28 (U)					
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

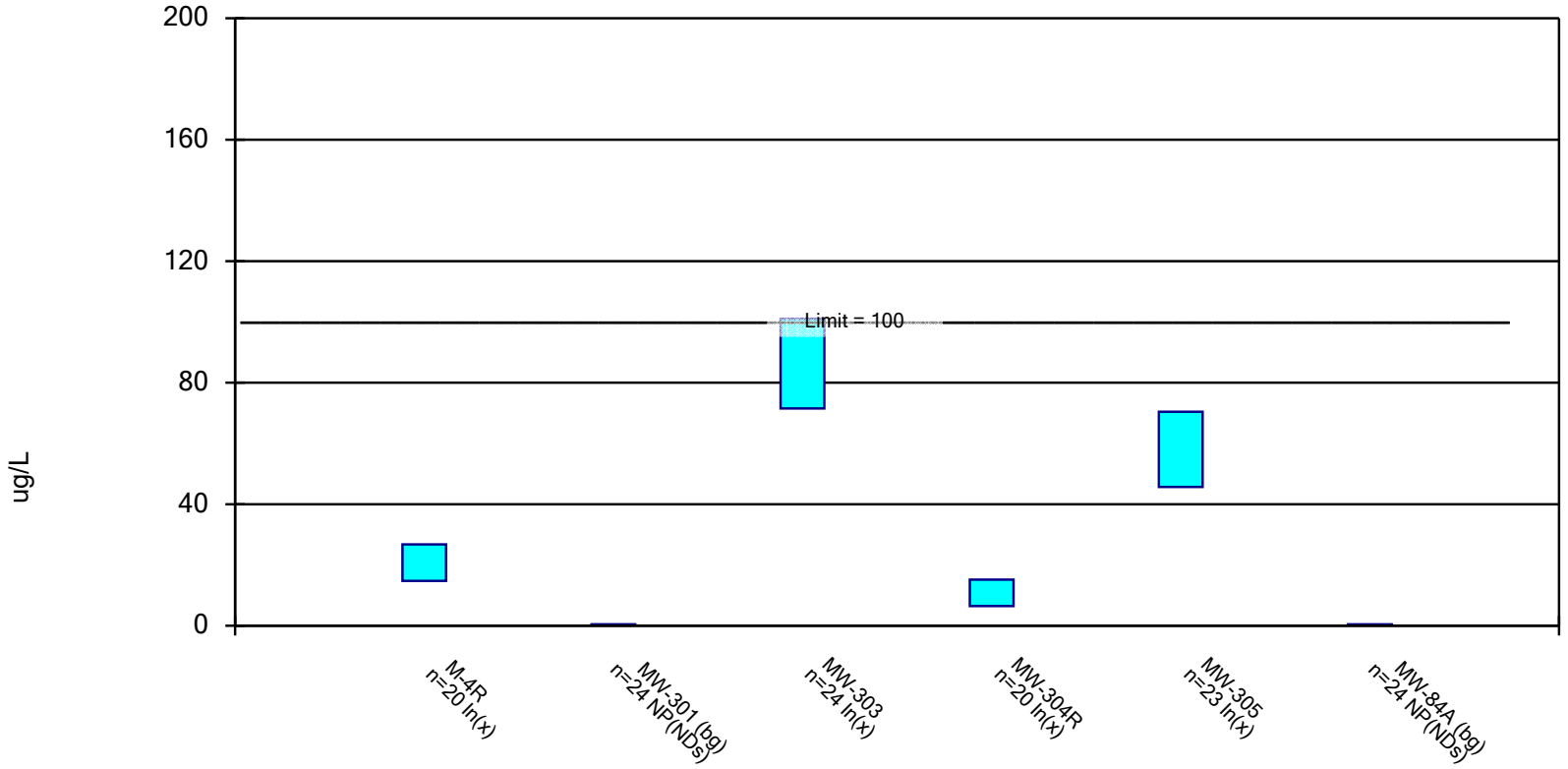
Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
4/17/2024		<0.28	40.4	1.8		0.29 (J)
6/4/2024	<0.28					
Mean	0.295	0.3133	19.91	1.444	0.6044	0.3404
Std. Dev.	0.09259	0.1049	14.14	0.6931	0.3528	0.1746
Upper Lim.	0.3189	0.3344	21.84	1.837	0.8179	0.3321
Lower Lim.	0.1909	0.2091	10.92	1.05	0.391	0.1788

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			195	15.6	33.2	
12/22/2015	14.6	0.35 (J)				<0.07 (U)
4/4/2016	9.9		62.6	9.2	37.3	
4/5/2016		0.15 (J)				<0.07 (U)
7/7/2016	13.2		69.5	21.9		
7/8/2016		0.14 (J)			34.8	0.073 (J)
10/12/2016	11.6		91.9			
10/13/2016		0.12 (J)		17.1	40.2	0.12 (J)
12/29/2016		0.38 (J)				<0.07 (U)
1/25/2017	17.6	<0.07 (U)			69.1	<0.07 (U)
1/26/2017			91.2	14.4		
4/10/2017			103	10.1		
4/11/2017	14.5	<0.07 (U)				<0.07 (U)
6/5/2017	11.9			15.6	41.3	
6/6/2017		<0.44 (U)	87			<0.44 (U)
8/7/2017					68.7	
8/8/2017		<0.44 (U)	81.6	11.8		<0.44 (U)
8/9/2017	15.8					
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

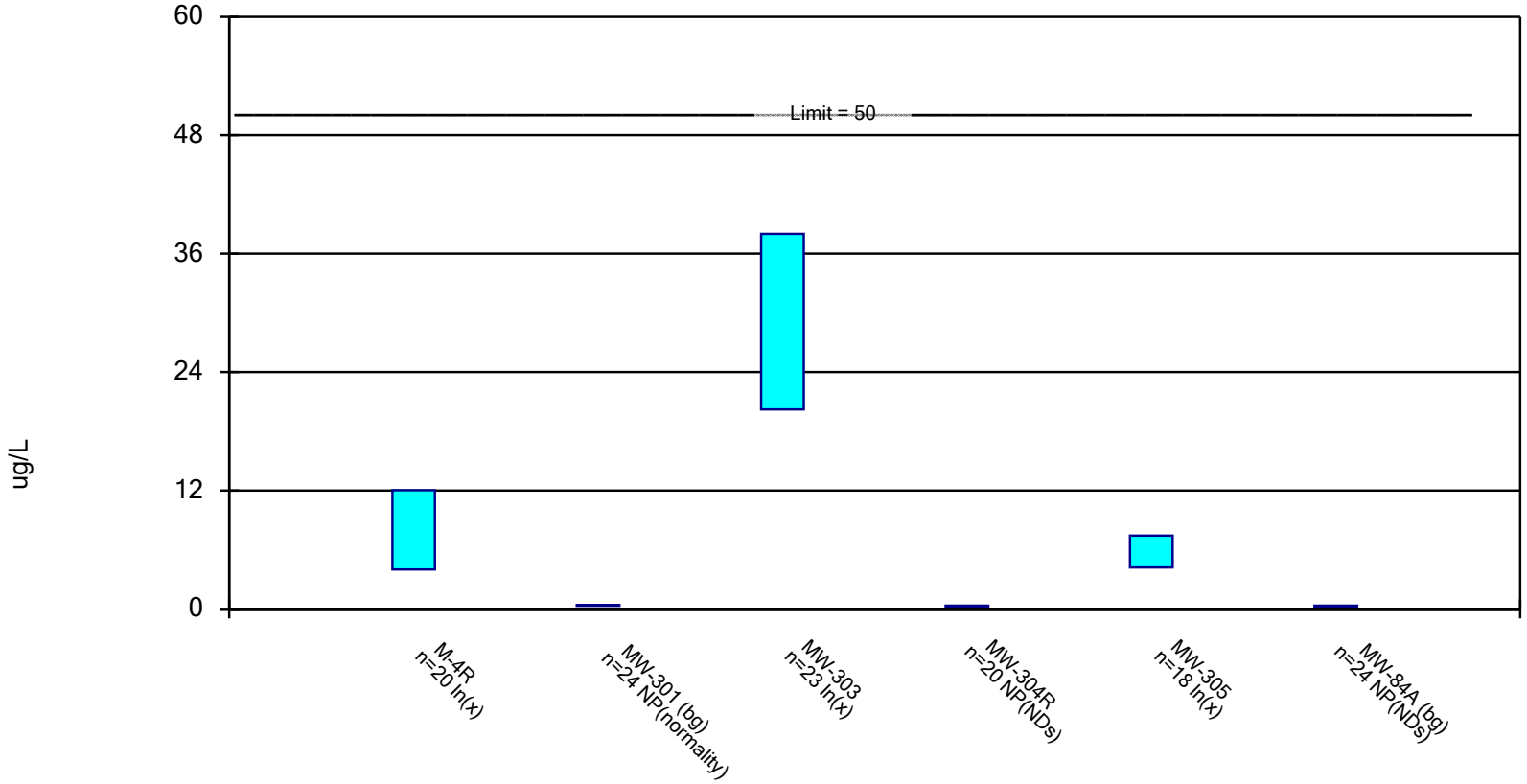
Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
4/17/2024		<0.44	82	52.2		<0.44
6/4/2024	9.7					
Mean	22.85	0.365	90.18	12.8	61.8	0.3418
Std. Dev.	13.41	0.1363	34.96	10.64	27.59	0.1772
Upper Lim.	26.79	0.44	101	15.16	70.42	0.44
Lower Lim.	14.76	0.35	71.54	6.481	45.66	0.073

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			126	1	3.7	
12/22/2015	3	0.3 (J)				<0.21 (U)
4/4/2016	6.4		24	<0.21 (U)	3	
4/5/2016		0.21 (J)				<0.21 (U)
7/7/2016	15.3		26.6	<0.21 (U)		
7/8/2016		0.39 (J)			4.8	<0.21 (U)
10/12/2016	7.7		25			
10/13/2016		<0.21 (U)		<0.21 (U)	3.7	<0.21 (U)
12/29/2016		0.26 (J)				<0.21 (U)
1/25/2017	10.5	<0.21 (U)			6.8	<0.21 (U)
1/26/2017			32.8	<0.21 (U)		
4/10/2017			25.9	<0.21 (U)		
4/11/2017	13.3	<0.21 (U)				<0.21 (U)
6/5/2017	9.7			<0.32 (U)	3.9	
6/6/2017		<0.32 (U)	18.3			<0.32 (U)
8/7/2017					5.2	
8/8/2017		<0.32 (U)	19.7	<0.32 (U)		<0.32 (U)
8/9/2017	15					
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/17/2024		<0.32	36.3	<0.32		<0.32
6/4/2024	116					
Mean	12.88	0.3246	34.02	0.3675	6.333	0.2946
Std. Dev.	24.68	0.1017	27.33	0.2392	4.201	0.0642
Upper Lim.	12.02	0.39	38	0.33	7.422	0.32
Lower Lim.	3.992	0.3	20.22	0.21	4.185	0.21

ND substitution: RL or RL/2 if <15% NDs.

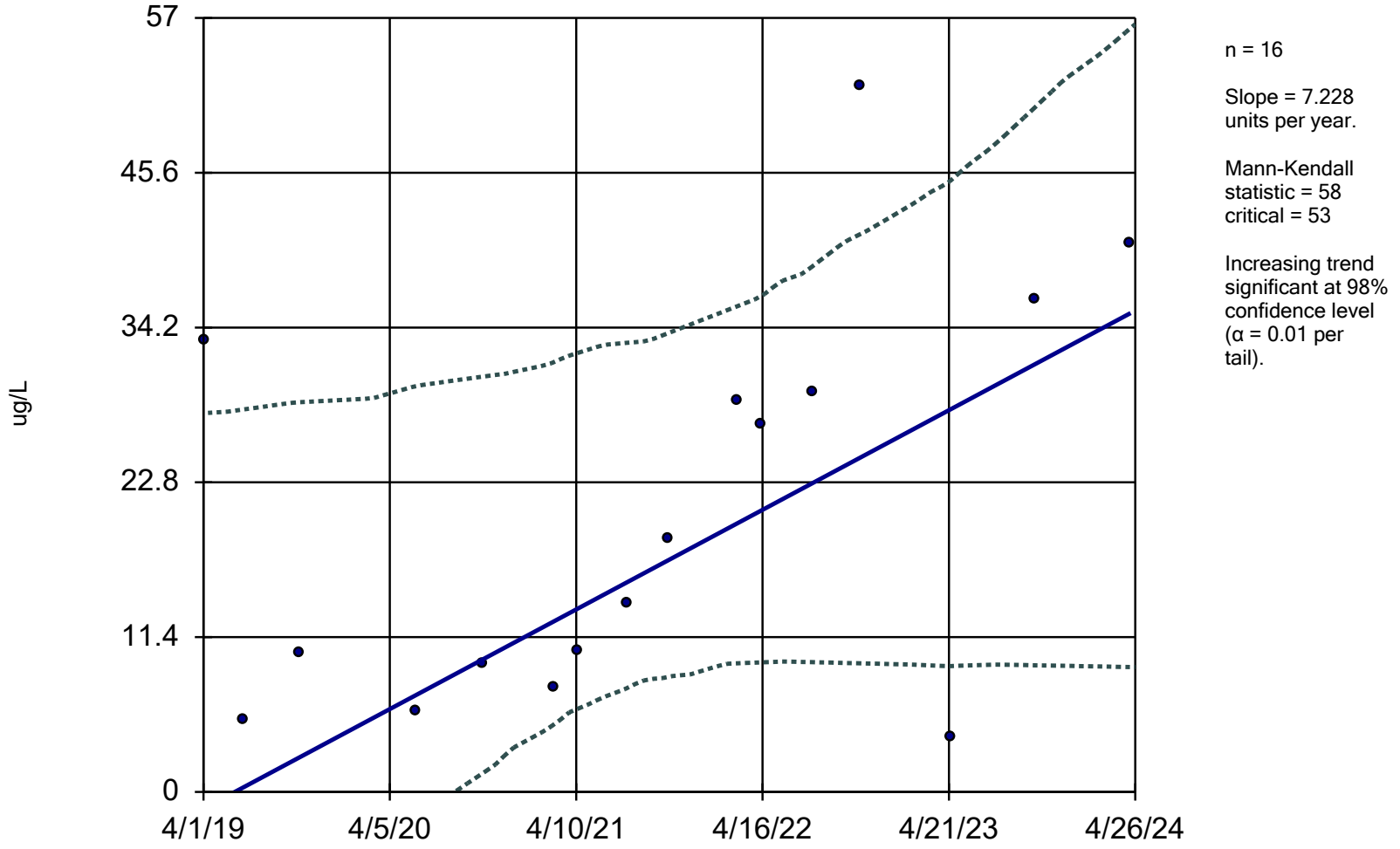
Trend Test

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:34 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	**MW-303**	**7.228**	**58**	**53**	**Yes**	**16**	**0**	**n/a**	**n/a**	**0.02**	**NP**

Arsenic

MW-303



Sen's Slope and 98% Confidence Band Analysis Run 8/6/2024 2:33 PM View: COL Primary Pond

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

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:34 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-303	LCL	UCL
4/1/2019	33.2	-16.31	27.9
6/19/2019	5.3	-13.76	28.17
10/7/2019	10.2	-9.96	28.69
5/27/2020	5.9	-2.269	29.9
10/7/2020	9.5	1.378	30.58
2/25/2021	7.7	4.958	31.65
4/12/2021	10.4	6.109	32.3
7/20/2021	13.9	7.648	33.07
10/12/2021	18.6	8.48	33.81
2/24/2022	28.8	9.475	35.75
4/12/2022	27.1	9.541	36.47
7/27/2022	29.4	9.555	38.78
10/26/2022	52	9.473	41.05
4/24/2023	4	9.268	44.99
10/9/2023	36.3	9.328	50.39
4/17/2024	40.4	9.199	56.25

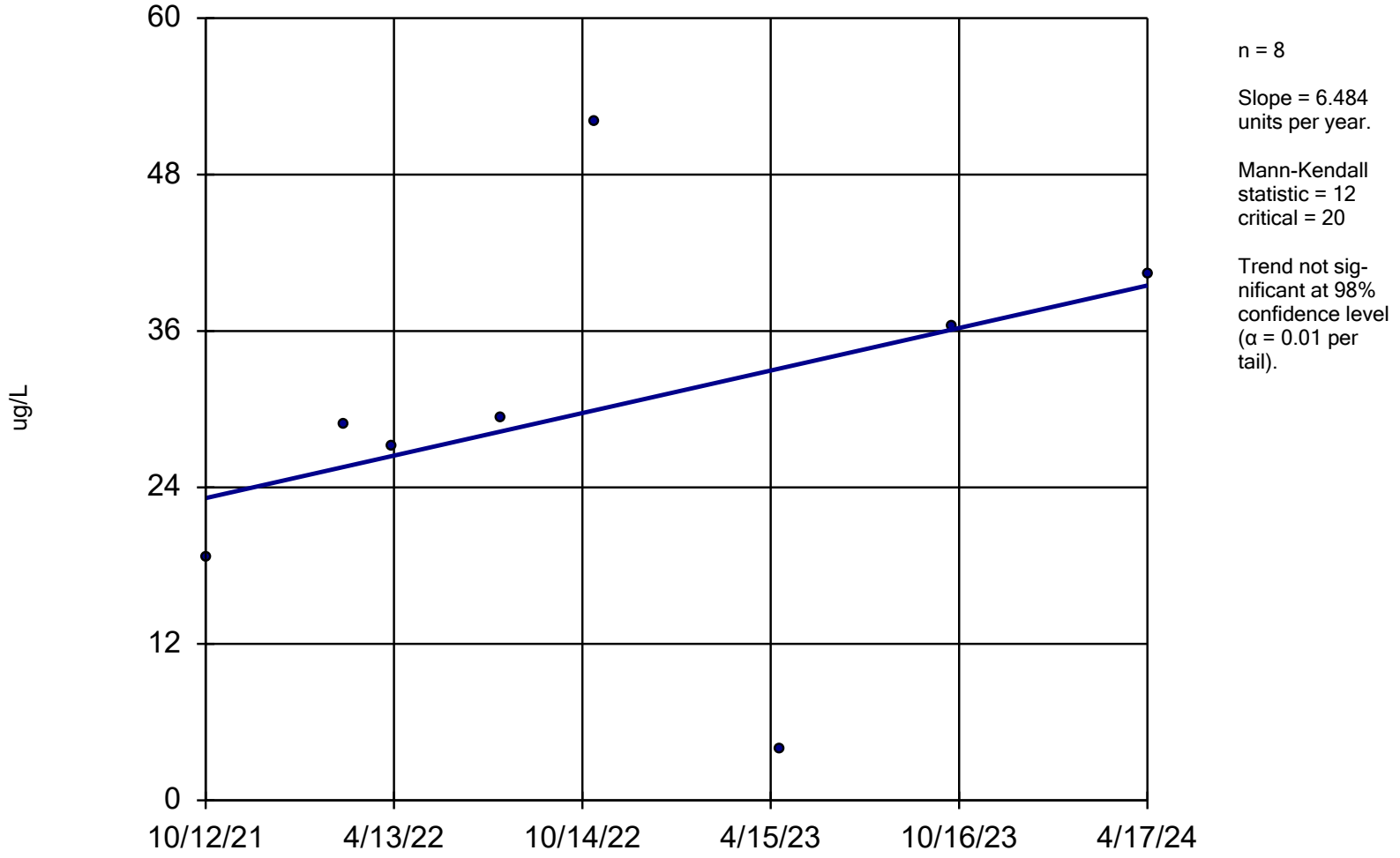
Trend Test

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:36 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	6.484	12	20	No	8	0	n/a	n/a	0.02	NP

Arsenic

MW-303



Sen's Slope and 98% Confidence Band Analysis Run 8/6/2024 2:35 PM View: COL Primary Pond

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

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:36 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3
4/17/2024	40.4

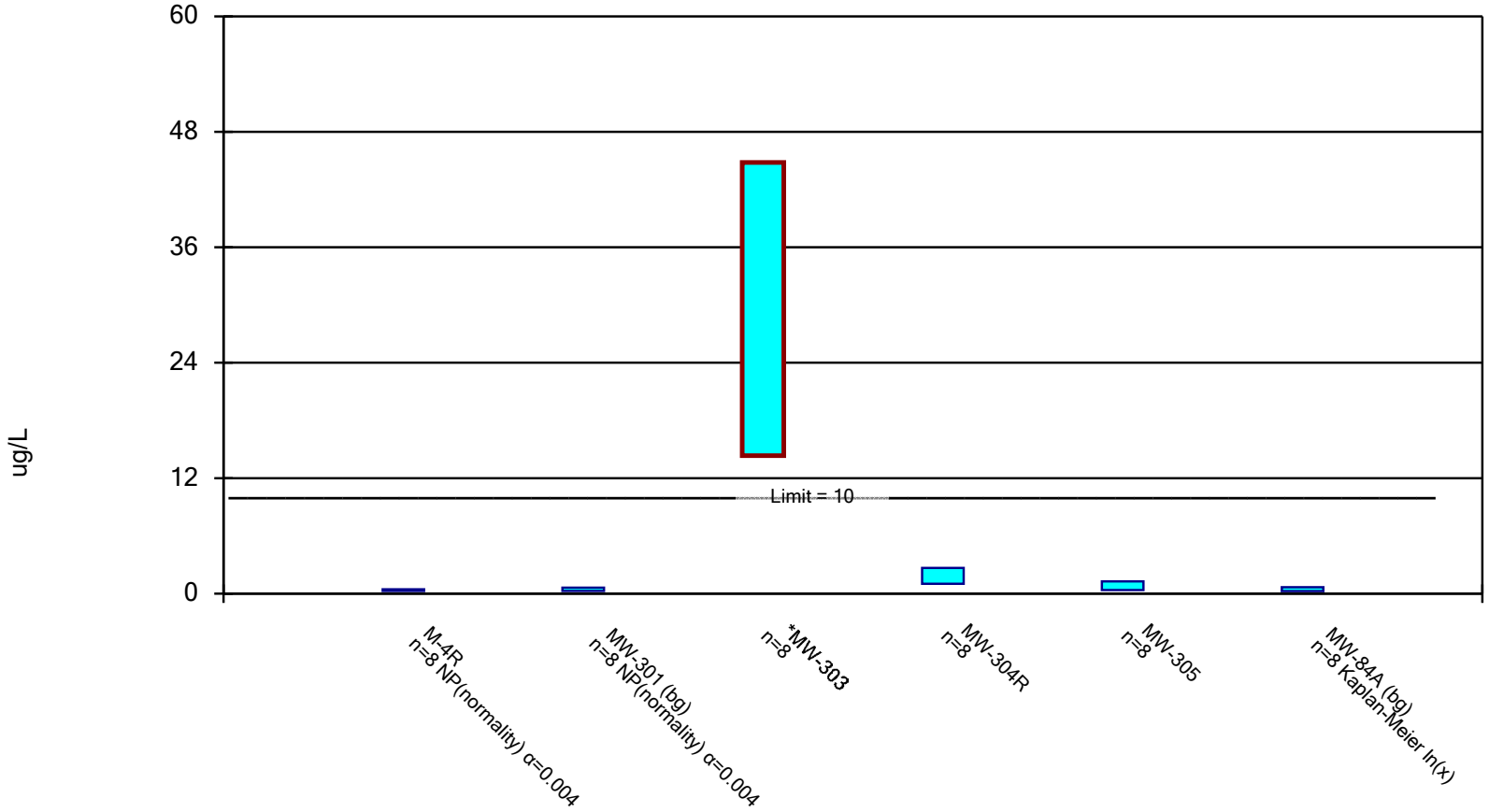
Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.62	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	**MW-303**	**44.81**	**14.34**	**10**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304R	2.673	1.02	10	No	8	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.266	0.377	10	No	8	12.5	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.6581	0.2652	10	No	8	25	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	49.58	17.75	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	8	100	No	0.004	NP (NDs)
Molybdenum (ug/L)	MW-303	117.1	48.5	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304R	25	3.336	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	110.4	33.54	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	8	87.5	No	0.004	NP (NDs)
Selenium (ug/L)	M-4R	116	1.6	50	No	8	0	No	0.004	NP (normality)
Selenium (ug/L)	MW-301 (bg)	0.32	0.32	50	No	8	100	No	0.004	NP (NDs)
Selenium (ug/L)	MW-303	65.2	14.03	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304R	1.1	0.32	50	No	8	62.5	No	0.004	NP (normality)
Selenium (ug/L)	MW-305	13.01	3.73	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	8	87.5	No	0.004	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond

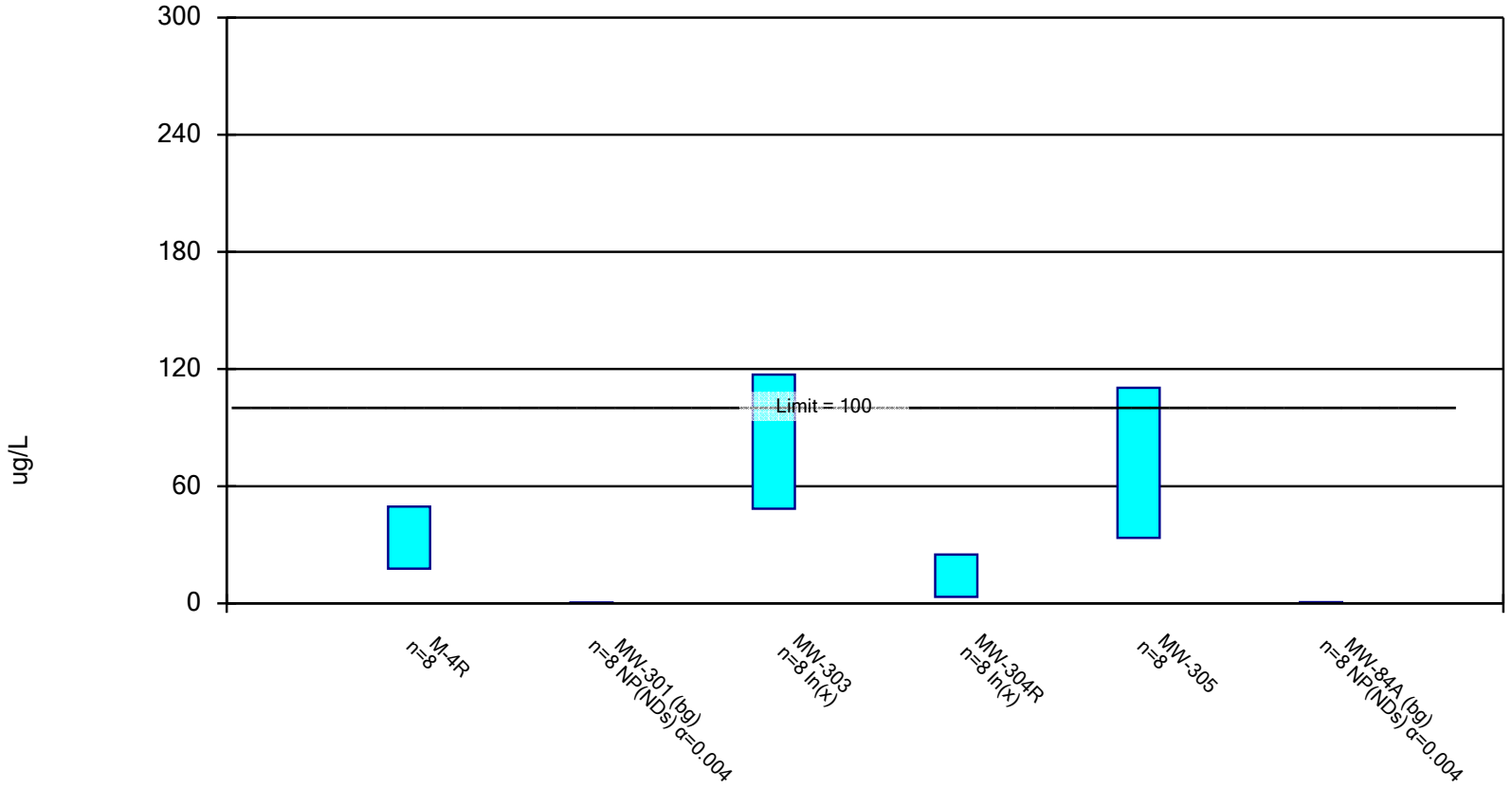
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/1/2019					<0.28 (U)	
10/7/2019	0.37 (J)			3.2	0.49 (J)	
5/27/2020	0.39 (J)			1.3	0.75 (J)	
10/7/2020	0.44 (J)			2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
4/12/2021				1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
4/17/2024		<0.28	40.4	1.8		0.29 (J)
6/4/2024	<0.28					
Mean	0.34	0.3575	29.58	1.846	0.8213	0.4613
Std. Dev.	0.06698	0.1248	14.38	0.7799	0.4191	0.2359
Upper Lim.	0.44	0.62	44.81	2.673	1.266	0.6581
Lower Lim.	0.28	0.28	14.34	1.02	0.377	0.2652

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

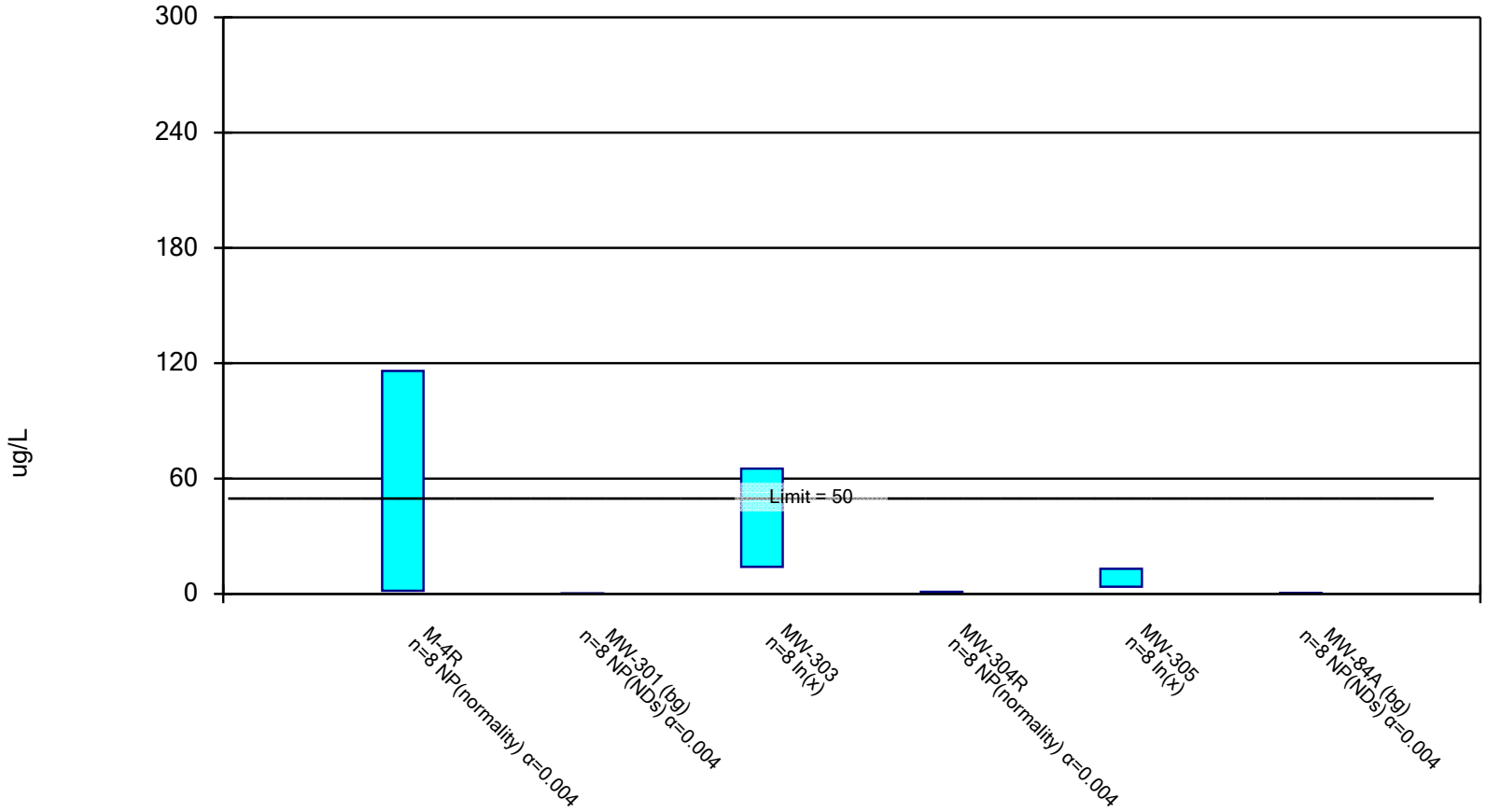
Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
10/7/2019	27.6			4.8		
5/27/2020	25.6			3.9		
10/7/2020	27.6		67.1	12		
10/8/2020		<0.44 (U)				<0.44 (U)
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
4/17/2024		<0.44	82	52.2		<0.44
6/4/2024	9.7					
Mean	33.66	0.44	81.9	13.95	71.96	0.4625
Std. Dev.	15.01	0	40.17	16.05	36.25	0.06364
Upper Lim.	49.58	0.44	117.1	25	110.4	0.62
Lower Lim.	17.75	0.44	48.5	3.336	33.54	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/1/2019					3.2	
10/7/2019	1.8			<0.32 (U)	7.7	
5/27/2020	11.7			0.33 (J)	4.2	
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)
4/17/2024		<0.32	36.3	<0.32		<0.32
6/4/2024	116					
Mean	18.24	0.32	37.95	0.4225	8.225	0.34
Std. Dev.	39.64	0	27.82	0.274	5.77	0.05657
Upper Lim.	116	0.32	65.2	1.1	13.01	0.48
Lower Lim.	1.6	0.32	14.03	0.32	3.73	0.32

ND substitution: RL or RL/2 if <15% NDs.

Appendix F

Alternative Source Demonstration

Alternative Source Demonstration
October 2023 Assessment Monitoring

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

SCS ENGINEERS

25224067.00 | May 2, 2024

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

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Table 3. Groundwater Elevation – State Monitoring Program and CCR Well Network

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Appendices

Appendix A October 2023 Statistical Evaluation
Appendix B Trend Plots for CCR Wells
Appendix C Regional Information

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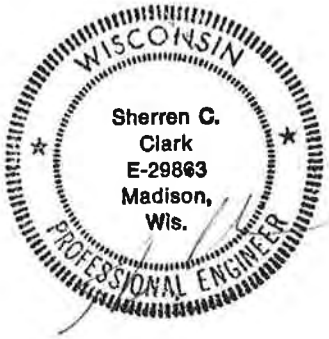
PE CERTIFICATION



I, Sherren Clark, hereby certify that that the information in this alternative source demonstration is accurate and meets the requirements of 40 CFR 257.95(g)(3)(ii). This certification is based on my review of the groundwater data and related site information available for the Columbia Energy Center Primary Ash Pond. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

5-1-2024

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2024.

Pages or sheets covered by this seal:
Alternative Source Demonstration, October 2023 Assessment Monitoring, Primary Ash Pond, Columbia Energy Center, Pardeeville, Wisconsin

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.95(g)(3)(ii). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.95(G)(3)(II) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

40 CFR 257.95(g)(3): Within 90 days of finding that any of the constituents listed in Appendix IV to this part have been detected at a statistically significant level exceeding the groundwater protection standards the owner or operator must either:

(i) Initiate an assessment of corrective measures as required by § 257.96; or

(ii) Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in Appendix III and Appendix IV of this part are at or below background as specified in paragraph (e) of this section. 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 or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating that arsenic was identified to be at a statistically significant level (SSL) above the groundwater protection standard (GPS) during assessment monitoring under the CCR Rule.

This ASD report evaluates an SSL observed in the statistical evaluation of the October 2023 assessment monitoring event at the Columbia Energy Center (COL) Primary Ash Pond CCR Unit. This is the second ASD prepared for this facility unit since monitoring began in December 2015.

1.2 SITE INFORMATION AND MAP

The COL site is located at W8375 Murray Road, Pardeeville, Columbia County, Wisconsin (**Figure 1**). It is an active coal-burning generating station, which has been burning coal and disposing of CCR on site since the mid-1970s. The layout of the site is shown on **Figure 2**. The COL property includes two

CCR surface impoundments: the Primary Pond (existing CCR surface impoundment) and the Secondary Pond (inactive CCR surface impoundment). This ASD will evaluate the conditions at the site for the Primary Ash Pond only.

The groundwater monitoring system monitors the following CCR Unit:

- COL Primary Ash Pond (existing CCR surface impoundment)

The system is designed to detect monitored constituents at the waste boundary of the Primary Ash Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two background monitoring wells (MW-84A and MW-301) and four downgradient monitoring wells (M-4R, MW-303, MW-304, and MW-305). A temporary monitoring well, MW-316, was installed in 2023 to evaluate groundwater quality between compliance well MW-303 and the Primary Pond (**Figure 2**).

A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided on **Figure 2**. Separate monitoring systems have been established for the other CCR Units at COL, which include the Secondary Ash Pond and Modules 1-3, Modules 4-6, and Modules 10-11 of the COL Dry Ash Disposal Facility (ADF).

In 2023, closure activities were ongoing for the Primary Ash Pond, including CCR removal facilitated by operation of dewatering wells installed around the perimeter of the pond to lower the groundwater table. Removal of CCR from the Primary Ash Pond was completed on October 4, 2023. In 2022, closure activities were completed for the adjacent Secondary Pond, including CCR removal facilitated by operation of dewatering wells installed around perimeter of the Secondary Pond to lower the groundwater table elevation.

1.3 STATISTICALLY SIGNIFICANT LEVELS IDENTIFIED

The October 2023 results for Appendix IV parameters were compared to the Groundwater Protection Standards (GPSs) established under 40 CFR 257.95(h) to evaluate whether any Appendix IV parameter was present at an SSL above the GPS. The October 2023 results and GPS values are shown in **Table 1**.

For the October 2023 monitoring event, assessment monitoring parameters for which an individual monitoring result exceeded the GPS at a compliance well included the following:

- Arsenic: MW-303

The U.S. EPA's Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (EPA 530-R-09-007, March 2009) recommends the use of confidence intervals for comparison of assessment monitoring data to fixed GPS values. Specifically, the suggested approach for comparing assessment groundwater monitoring data to GPS values based on long-term chronic health risk, such as drinking water Maximum Contaminant Levels (MCLs), is to compare the lower confidence limit (LCL) around the arithmetic mean with the fixed GPS.

An LCL evaluation was completed for each Appendix IV parameter that has been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated, which includes arsenic, molybdenum, and selenium. The LCLs were calculated with Sanitas™ using historical concentrations measured since assessment monitoring began in

April 2018. The evaluation is provided in **Appendix A**. Based on the LCL evaluation using the complete data set, the arsenic, molybdenum, and selenium results to date were not identified as representing an SSL above the GPS.

In the evaluation of the October 2022 monitoring results, arsenic was determined to be at an SSL above the GPS at MW-303 based on a confidence band around a statistically significant increasing trend for the last eight monitoring events, as calculated using the Mann-Kendall/Sen's Slope analysis in Sanitas. The previously identified SSL for arsenic at MW-303 was attributed to alternative sources in an alternative source demonstration completed on June 9, 2023. In the evaluation of the April 2023 monitoring results, the arsenic concentration had decreased to a value below the GPS, and arsenic was not determined to be at an SSL above the GPS.

The October 2023 arsenic result at MW-303 was higher than the April 2023 result and exceeded the GPS; therefore, the arsenic results for this well were also evaluated for a potential increasing trend using a Mann-Kendall analysis (**Appendix A**). Trend analysis for the arsenic results obtained since assessment monitoring was initiated indicated no significant trend. To focus on the more recent data, Mann-Kendall trend analysis was also performed for the last eight samples (**Appendix A**). The analysis of the last eight samples also indicated no significant increasing trend.

Although the trend was not determined to be significant due to high variability in the results, observation of the data indicates that recent arsenic results have generally been higher than the earlier data; therefore, an LCL evaluation was also completed using only the last eight sample results (**Appendix A**). Based on the LCL evaluation for the last eight sampling events, arsenic was determined to be at an SSL above the GPS at MW-303.

A time series plot for arsenic at all of the Primary Pond monitoring wells is provided in **Appendix B.**

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

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

The CCR Rule constituent results from background and compliance sampling for arsenic are provided in **Table 2**. The laboratory reports for the October 2023 assessment monitoring event were reviewed, finalized, and transmitted in March 2024, and will be included in the 2024 Annual Groundwater Monitoring and Corrective Action Report to be completed in January 2025. Complete laboratory reports for the background monitoring events and the previous detection monitoring events were included in previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the COL Dry Ash Disposal Facility - Modules 1-3 for the October 2017 event (SCS, 2018).

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

2.1.1 Regional Information

For the purposes of groundwater monitoring, the surficial sand and gravel aquifer is considered the uppermost aquifer, as defined under 40 CFR 257.53. 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 C**. 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 C**.

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 C**.

2.1.2 Site Information

Soils at the site are primarily sand to a depth of approximately 50 to 100 feet and overlie sandstone bedrock. Soils encountered during the site feasibility study for the COL Ash Disposal Facility were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301, MW-303, MW-304, and MW-305, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously-installed monitoring wells MW-84A and M-4R show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for Primary Ash Pond CCR monitoring wells are provided in Appendix B of the 2023 Annual Report (SCS Engineers, 2024). The boring log for monitoring well MW-316 is included in the October 2022 ASD for the Primary Pond (SCS Engineers, 2023). All CCR monitoring wells are screened within the unconsolidated sand unit.

In the vicinity of the ash ponds, groundwater has historically flowed radially away from the ponds in all directions. The October 2020 water table is shown on **Figure 3** as an example of the typical historical flow patterns.

As discussed in Section 1.2, closure activities for the Secondary Pond and Primary Ash Pond were ongoing in 2022 and 2023. The groundwater dewatering pumps for the Secondary Pond were shut off on November 30, 2022. Groundwater dewatering pumps for the Primary Ash Pond were turned

on March 8, 2023, and shut off September 11, 2023. Primary Pond excavation began on March 20, 2023 and was completed on October 4, 2023. The October 2022, May 2023, and October 2023 water levels and apparent flow directions, shown on **Figures 4**, **5**, and **6**, reflect the influence of the dewatering and excavation of the Secondary Pond and the Primary Ash Pond. Excavation of the Primary Pond was completed just prior to the October 2023 sampling event.

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-301 and MW-84A. The downgradient wells include MW-303, MW-304, MW-305, and M-4R. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 25 to 41 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Additional groundwater monitoring wells currently exist at COL as part of the monitoring systems developed for the state monitoring program and for the other CCR Units.

Monitoring wells for the state monitoring program are installed in the unconsolidated sand and gravel unit, which is the uppermost aquifer as defined under 40 CFR 257.53. This shallow monitoring system includes water table wells and mid-depth piezometers. Well depths range from approximately 14 to 76 feet, measured from the top of the well casing.

A temporary monitoring well, MW-316, was installed in April 2023 to support the source evaluation for the arsenic SSL originally discussed in the October 2022 ASD. Monitoring well MW-316 is located between well
MW-303 and the Primary Ash Pond (**Figure 2**) and is also installed in the unconsolidated sand and gravel unit that comprises the uppermost aquifer.

3.0 METHODOLOGY AND ANALYSIS REVIEW

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

3.1 SAMPLING AND FIELD ANALYSIS

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSL. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field errors. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers.

Based on the review of field notes and comparison to previous results, no sampling error issues were identified in the laboratory analytical reports or the field notes that would indicate a sampling error

may have caused or contributed to the observed SSL. The historical results for arsenic are summarized in Table 2.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2023 assessment monitoring event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSL for arsenic. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results.

Based on the review of the laboratory reports, SCS did not identify any issues that indicate the SSL for arsenic may have been due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for assessment monitoring.

A time series plot of the arsenic analytical data was also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plot is provided in Appendix B. Arsenic concentrations at MW-303 have been highly variable since sampling began, but the variations do not appear to reflect a sampling or laboratory error.

3.3 STATISTICAL EVALUATION REVIEW

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

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSL

Based on the review of the statistical evaluation, SCS did not identify any errors in the statistical evaluation that caused or contributed to the determination that arsenic was at an SSL above the GPS for the October 2023 assessment monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, arsenic was determined to be at an SSL above the GPS based on the October 2023 monitoring event. There were no changes to the SSL determinations for the October 2023 monitoring event based on the methodology and analysis review. No errors or issues causing or contributing to the reported SSL were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the arsenic SSL at the monitoring well MW-303, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSL.

4.1 POTENTIAL CAUSES OF SSL

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the October 2023 detection monitoring results to the UPLs calculated based on the sampling of the background wells (MW-84A and MW-301). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation. Previous monitoring results for arsenic at the COL Primary Pond are shown in Table 2.

Natural variation may be present in the shallow aquifer for any of the parameters and may have contributed to the GPS exceedance for arsenic in MW-303. Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source that caused the arsenic SSL.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the arsenic GPS exceedance at Primary Pond monitoring well MW-303 could include the closed ash landfill, the product recycling area, or other CCR management activities.

Recent changes in groundwater flow due to dewatering activities make determination of man-made alternative sources uncertain. CCR removal activities from the Secondary Ash Pond and the Primary Pond in 2022 and 2023 could also contribute to movement of arsenic in groundwater from uncertain sources. Changes in groundwater flow direction and differing recharge patterns caused by dewatering and subsequent movement of surface water to the ponds could also affect the ambient redox conditions, and mobilize naturally occurring arsenic.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the GPS exceedance for arsenic is due to an alternative source include:

1. Temporary monitoring well MW-316 installed between well MW-303 and the Primary Pond has a low arsenic concentration.

2. CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentration in the new temporary well is consistent with those results.

3. The effects of the ongoing dewatering activities on the arsenic concentrations at MW-303 indicate that the Primary Pond is not the source of arsenic at MW-303, and suggest the closed ash landfill is a more likely source.

4.2.1 Low Arsenic Concentration in Well MW-316

Temporary monitoring well MW-316, installed between well MW-303 and the Primary Pond, has a low arsenic concentration. Elevated arsenic concentrations would be expected at MW-316 if the Primary Pond is the source of the arsenic SSL at MW-303.

Temporary monitoring well MW-316 was installed between monitoring well MW-303 and the Primary Pond (**Figure 2**). Unlike the other Primary Pond compliance wells, which were installed at the edge of the Primary Pond, well MW-303 was installed approximately 700 feet south of the impounded water due to active ash management and beneficial use activities adjacent to the Primary Pond. Closure activities have since provided room to install the new well MW-316 approximately 500 feet closer to the Primary Pond. MW-316 was specifically installed to evaluate the Primary Pond as a potential source of the elevated arsenic in well MW-303. Prior to the groundwater dewatering and pond closure activities, groundwater flowed from the Primary Pond, past the location of the new MW-316 well, then toward well MW-303 (**Figures 2** and **3**).

Monitoring well MW-316 was installed on April 27, 2023, and sampled on May 5, 2023, and October 9, 2023. The laboratory results for the groundwater arsenic concentrations were 1.2 µg/L in May 2023 and 1.6 µg/L in October 2023 (**Appendix D**). Since well MW-316 is located on the historical groundwater flow path between the Primary Pond and well MW-303, it appears unlikely that the Primary Pond is the source of the elevated arsenic in well MW-303.

4.2.2 Low Arsenic in Other Primary Pond Wells

CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentrations in temporary well MW-316 are consistent with those results. Due to historic radial flow outward from the Primary Pond, elevated arsenic concentrations at multiple compliance wells would be expected if the Primary Pond were the source of arsenic at MW-303.

Primary Pond compliance wells M-4R, MW-304, and MW-305 have a low historic range of arsenic concentrations (**Table 2**). The arsenic concentrations range from <0.099 µg/L to 0.47 µg/L in well MW-4R, 0.63 µg/L to 3.2 µg/L in well MW-304, and 0.20 µg/L to 1.4 µg/L in well MW-305. These wells are located immediately adjacent to the Primary Pond, which has historically been a source of groundwater infiltration with radial flow, while MW-303 is located much further from the Primary Pond, as discussed in **Section 4.2.1**. The results from sampling of well MW-316 are consistent with the historical monitoring at Primary Pond wells M-4R, MW-304, and MW-305. Based on the historical arsenic results for the Primary Pond wells located immediately adjacent to the pond, it appears unlikely that the Primary Pond is the source of the elevated arsenic in well MW-303.

4.2.3 Groundwater Dewatering Impacts on Arsenic Concentration in Well MW-303

The effects of the groundwater dewatering activities on the arsenic concentrations at MW-303 indicate that the Primary Pond is not the source of arsenic at MW-303, and suggest the closed ash landfill is a more likely source. Arsenic concentrations at MW-303 increased in 2022, when groundwater dewatering was ongoing for the Secondary Pond closure, decreased in 2023 when groundwater dewatering was ongoing for the Primary Pond closure, and increased after dewatering systems had been shut down in late 2023.

The arsenic result for well MW-303 from the April 2023 sampling event was 4.0 µg/L. This was the lowest arsenic concentration detected at MW-303 since the initiation of baseline sampling in 2015. The previously observed increasing trend in arsenic in 2022, followed by a sharp decrease in April 2023 and increase in October 2023, are likely related to temporary changes in flow direction induced by the dewatering systems operating around the Secondary Pond and Primary Pond during and following the pond closure activities.

Groundwater dewatering wells for closure of the Secondary Pond were installed from fall 2021 through summer 2022. The complete Secondary Pond groundwater dewatering system was operational by August 2, 2022, and continued to operate until November 30, 2022, discharging into the Primary Pond. In preparation for Primary Pond closure activities, discharge from the plant to the Primary Pond was reduced beginning in October 2022 and was terminated in March 2023. Groundwater dewatering for the Primary Pond closure began in March 2023 and was completed in September 2023.

Historically, the ponds were a source of infiltration, with groundwater mounding and radial flow (October 2020, **Figure 3**). Under dewatering conditions, flow was toward the dewatering wells around the Secondary Pond (e.g., October 2022, **Figure 4**) or the Primary Pond (e.g., May 2023, **Figure 5**). Shortly following the pump shutdown and completion of the excavation of the Primary Pond, groundwater continued to flow toward the Primary Pond from the MW-303 area (October 2023, **Figure 6**). For the period when flow was toward the Secondary Pond in 2022, MW-303 was located between the closed fly ash landfill and the Secondary Pond, which suggests that the closed fly ash landfill may be a source of elevated arsenic in MW-303. In May 2023, with flow toward the Primary Pond, MW-303 was no longer downgradient from the closed landfill, and the arsenic concentration decreased. In October 2023, water levels indicated flow toward the Primary Pond, but since the pumps had only recently been turned off it is likely that flow directions and groundwater levels were still recovering from pumping. Under these conditions, it is more difficult to confirm the source of arsenic at MW-303, but since the Primary Pond is downgradient from MW-303 it is not a likely source.

Due to dewatering, excavation, and closure of the ponds, arsenic concentrations at MW-303 have been highly variable, which may have been due to slight changes in groundwater flow direction or changes in redox conditions during periods of high or low recharge to the aquifer. Groundwater flow and arsenic concentrations will be analyzed as more data is collected in subsequent semi-annual groundwater monitoring events.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSL reported for arsenic in compliance monitoring well MW-303 demonstrate that the SSL is likely due to sources other than the CCR Unit. The CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentration in monitoring well MW-316, located between the Primary Pond and MW-303, is consistent with those results. Based on the recent flow direction changes associated with dewatering for the Primary and Secondary Pond closures and the observed changes in arsenic concentration at MW-303, the closed fly ash landfill appears to be a likely source of the elevated arsenic at MW-303.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.95(g)(3)(ii) of the CCR Rule, the Primary Pond CCR Unit may continue with assessment monitoring based on this ASD. The ASD report will be included in the 2024 Annual Report due January 31, 2025.

7.0 REFERENCES

SCS Engineers, 2018, Alternative Source Demonstration, October 2017 Detection Monitoring, Columbia Energy Center Dry Ash Disposal Facility, April 2018.

SCS Engineers, 2023, Alternative Source Demonstration, October 2022 Assessment Monitoring, Primary Ash Pond, Columbia Energy Center, June 9, 2023.

SCS Engineers, 2024, 2023 Annual Groundwater Monitoring and Corrective Action Report, Primary Ash Pond, Columbia Energy Center, January 31, 2024.

U.S. EPA, 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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.

Warzyn Engineering, Inc., 1979, and Preliminary Engineering Concepts, Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

Tables

1 Groundwater Analytical Results Summary – October 2023 Event
2 Historical Analytical Results for Arsenic
3 Groundwater Elevation – State Monitoring Program and CCR Well Network

Table 1. Groundwater Analytical Results Summary - Assessment Monitoring
Columbia Generating Station - Primary Pond / SCS Engineers Project #25224067.00

				Background Wells		Compliance Wells				Supplemental Well
Parameter Name	**UPL Method**	**UPL**		**MW-84A**	**MW-301**	**M-4R**	**MW-303**	**MW-304**	**MW-305**	**MW-316**
				10/11/2023	10/11/2023	10/10/2023	10/9/2023	10/10/2023	10/10/2023	10/9/2023
Groundwater Elevation, ft amsl				784.39	784.67	780.54	781.21	780.09^	779.93	780.30
Appendix III										
Boron, µg/L	P	35		14.0	36.2	NS	2,420	NS	NS	--
Calcium, µg/L	NP	129,000		65,100	52,300	NS	2,610	NS	NS	--
Chloride, mg/L	P	6.02		3.1	2.1	NS	46.4	NS	NS	--
Fluoride, mg/L	DQ	DQ		<0.095	<0.095 M0	NS	<0.095	NS	NS	--
Field pH, Std. Units	P	7.76		7.51	7.06	NS	9.61	NS	NS	8.27
Sulfate, mg/L	P	30.8		1.4 J	11.8	NS	188	NS	NS	--
Total Dissolved Solids, mg/L	NP	514		324	300	NS	686	NS	NS	--
Appendix IV		**UPL**	**GPS**							
Antimony, µg/L	NP	0.4	6	<0.15	<0.15	NS	0.35 J	NS	NS	--
Arsenic, µg/L	P	0.533	10	<0.28	<0.28	NS	36.3	NS	NS	1.6
Barium, µg/L	P	18.3	2000	12.7	7.3	NS	3.3	NS	NS	--
Beryllium, µg/L	NP	0.37	4	<0.25	<0.25	NS	<0.25	NS	NS	--
Cadmium, µg/L	NP	0.32	5	<0.15	<0.15	NS	<0.15	NS	NS	--
Chromium, µg/L	P	3.13	100	1.6 J	<1.0	NS	66.4	NS	NS	--
Cobalt, µg/L	NP	0.38	6	<0.12	0.13 J	NS	0.40 J	NS	NS	--
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	NS	<0.095	NS	NS	--
Lead, µg/L	NP	0.48	15	<0.24	<0.24	NS	<0.24	NS	NS	--
Lithium, µg/L	P	0.857	40	0.54 J	0.43 J	NS	0.75 J	NS	NS	--
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	NS	<0.066	NS	NS	--
Molybdenum, µg/L	NP	0.44	100	<0.44	<0.44	NS	56.3	NS	NS	--
Selenium, µg/L	NP	0.71	50	<0.32	<0.32	NS	28.3	NS	NS	--
Thallium, µg/L	NP	0.48	2	<0.14	<0.14	NS	<0.14	NS	NS	--
Radium 226/228 Combined, pCi/L	P	1.93	5	0.844	0.611	NS	0.778	NS	NS	--

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

Abbreviations:

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

Lab Notes:

J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or a 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 (U.S. EPA) 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. For compliance wells, only results confirmed above the LOQ are evaluated as potential statistically significant increases above background.

^. MW-304 water level dropped below pump shortly after beginning low-flow purging.

Created by: RM Date: 6/2/2023
Last revision by: RM Date: 11/13/2023
Checked by: NLB Date: 11/14/2023
Proj Mgr QA/QC: TK Date: 1/18/2024

Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Background	MW-301	12/22/2015	0.26 J
		4/5/2016	0.26 J
		7/8/2016	0.19 J, 1q
		10/13/2016	0.24 J
		12/29/2016	0.40 J, 1q
		1/25/2017	0.13 J
		4/11/2017	0.18 J, 1q
		6/6/2017	<0.28
		8/8/2017	<0.28
		4/25/2018	<0.28
		8/8/2018	0.45 J
		10/24/2018	<0.28
		4/2/2019	0.40 J
		10/9/2019	0.42 J
		2/3/2020	<0.28
		5/29/2020	0.33 J
		10/8/2020	0.62 J
		4/14/2021	<0.28
		10/14/2021	0.35 J
		4/13/2022	0.47 J
		10/27/2022	0.30 J
		4/27/2023	<0.28
		10/11/2023	<0.28
	MW-84A	12/22/2015	0.15 J
		4/5/2016	0.29 J
		7/8/2016	0.14 J, 1q
		10/13/2016	0.35 J
		12/29/2016	0.19 J, 1q
		1/25/2017	0.35 J
		4/11/2017	<0.099 1q
		6/6/2017	<0.28
		8/8/2017	0.28 J
		4/25/2018	<0.28
		8/8/2018	<0.28
		10/24/2018	0.33 J
		4/3/2019	<0.28
		10/9/2019	0.46 J
		2/3/2020	0.38 J
		5/29/2020	0.34 J
		10/8/2020	0.49 J
		4/14/2021	0.91 J
		10/14/2021	0.41 J
		4/13/2022	0.31 J
		10/27/2022	0.72 J
		4/27/2023	<0.28
		10/11/2023	<0.28

Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Compliance	M-4R	12/22/2015	0.17 J
		4/4/2016	0.2 J
		7/7/2016	0.18 J
		10/12/2016	0.25 J
		1/25/2017	0.47 J
		4/11/2017	<0.099
		6/5/2017	0.33 J
		8/9/2017	<0.28
		4/23/2018	0.36 J
		8/7/2018	<0.28
		10/24/2018	<0.28
		4/1/2019	<0.28
		10/7/2019	0.37 J
		5/27/2020	0.39 J
		10/7/2020	0.44 J
		4/13/2021	<0.28
		10/11/2021	<0.28
		4/11/2022	<0.28
		10/25/2022	0.40 J
	MW-303	12/21/2015	49.2
		4/4/2016	12.6
		7/7/2016	27.9
		10/12/2016	13.4
		1/26/2017	27
		4/10/2017	12.1
		6/6/2017	9.1
		8/8/2017	12.0
		4/24/2018	39.1
		8/8/2018	8.7
		9/21/2018	6.0
		10/24/2018	7.8
		4/1/2019	33.2
		6/19/2019	5.3
		10/7/2019	10.2
		5/27/2020	5.9
		10/7/2020	9.5
		2/25/2021	7.7
		4/12/2021	10.4
		7/20/2021	13.9
		10/12/2021	18.6
		2/24/2022	28.8
		4/12/2022	27.1
		7/27/2022	29.4
		10/26/2022	52.0
		4/24/2023	4.0
		10/9/2023	36.3

Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Compliance	MW-304	12/21/2015	2.3
		4/4/2016	1.1
		7/7/2016	1.2
		10/13/2016	1.8
		1/26/2017	0.99 J
		4/10/2017	0.98 J, 1q
		6/5/2017	1.1
		8/8/2017	1.0
		4/24/2018	0.64 J
		8/8/2018	0.76 J
		10/24/2018	1.6
		4/2/2019	0.63 J
		10/7/2019	3.2
		5/27/2020	1.3
		10/7/2020	2.8
		4/12/2021	1.8
		10/11/2021	1.6
		4/11/2022	0.87 J
	MW-305	12/21/2015	0.56 J
		4/4/2016	0.34 J
		7/8/2016	0.26 J, 1q
		10/13/2016	0.27 J
		1/25/2017	0.78 J
		4/10/2017	0.20 J, 1q
		6/5/2017	0.37 J
		8/7/2017	0.43 J
		4/23/2018	0.48 J
		8/7/2018	0.42 J
		10/24/2018	0.40 J
		4/1/2019	<0.28
		10/7/2019	0.49 J
		5/27/2020	0.75 J
		10/7/2020	0.95 J
		4/12/2021	0.95 J
		10/11/2021	1.4
		4/11/2022	0.59 J
		10/25/2022	1.3
Supplemental	MW-316	5/5/2023	1.2
		10/9/2023	1.6

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
J = Estimated value below the laboratory's limit of quantitation
1q = Analyte was measured in the associated method blank at a negative concentration.

Notes:
(1) Analytical laboratory reports provided in the Annual Groundwater Monitoring and Corrective Action Reports.

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Checked by: JSN Date: 4/2/2024

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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	MW-93A	MW-93B	MW-312
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41	827.89	827.71	826.79
	Screen Length (ft)																	10	5	10
	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	50.7	82.5	52.5
	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	787.19	750.21	784.29
	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	NI	NI	NI
	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	NI	NI	NI
	October 8, 2013													785.66	785.42	785.97	785.52	NI	NI	NI
	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 [6]	NM	NM	NM	NM	NM	NM	NI	NI	NI
Dry Ash Facility (Facility ID #03025)	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 14, 2021	778.12	aband	787.29	784.27	784.05	784.77	784.77	784.46	784.34	785.84	785.81	785.60	785.86	785.69	786.47	786.06	NI	NI	NI
	June 11, 2021	NM	aband	NM	784.19	NM	784.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	October 11-12, 14, 2021	784.47	aband	786.78	783.73	783.60	784.42	784.41	783.88	783.87	784.96	784.88	784.79	785.14	784.94	785.55	785.11	NI	NI	NI
	October 17, 2021	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 1, 2022	aband	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 11-13, 2022	aband	aband	785.52	783.27	783.45	784.30	784.42	783.26	783.78	785.02	785.00	784.70	784.83	784.72	785.45	785.02	783.99	783.97	783.73
	October 24-28, 2022	aband	aband	785.43	781.94	781.61	783.61	783.61	782.28	dry	784.57	784.54	784.38	784.64	784.47	785.05	784.62	783.74	782.76	783.50
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	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	777.19	745.21	774.29

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
	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
	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											
Ash Pond Facility (Facility ID #02325)	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	April 12, 2021	782.30	786.34	783.66	783.65	784.13	784.08	782.79	784.08	783.97	783.15	783.49
	October 11-12, 14, 2021	781.03	786.33	782.94	782.85	783.09	783.03	781.94	783.11	783.04	782.15	782.66
	April 11-13, 2022	783.95	788.26	783.37	783.34	783.10	783.10	NM	782.99	783.40	783.93	783.83
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	NM	NM	NM	NM
	October 25, 26, 28, 2022	780.41	783.85	780.76	780.66	779.57	779.55	779.23	778.98	778.61	780.33	781.49
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

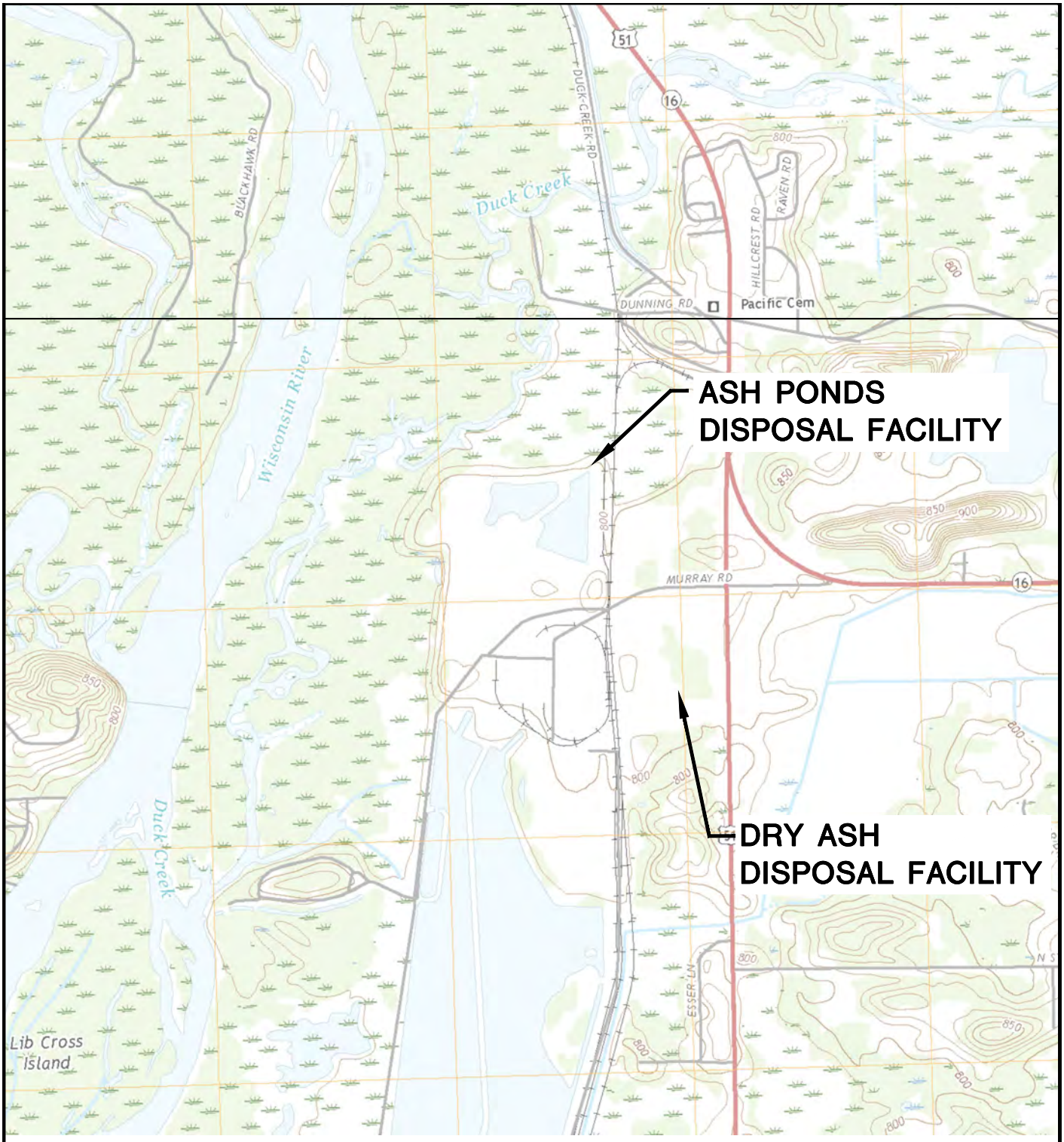
	Well Number	MW-301	MW-302	MW-303	MW-304	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49
	Screen Length (ft)	10	10	10	10	10	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	52.5				43.7
	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	784.29				774.79
	Measurement Date																				
	December 21-22, 2015	785.56	784.78	784.11	786.13	788.96	787.58	783.77	783.50	785.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	April 4-5, 2016	786.78	785.81	785.48	788.08	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--	NI	NI	NI	NI	NI
	July 7-8, 2016	786.31	786.28	784.60	787.36	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--	NI	NI	NI	NI	NI
	July 28, 2016	NM	NM	784.35	NM	NM	NM	NM	784.86	785.61	--	--	--	--	--	--	NI	NI	NI	NI	NI
	October 11-13, 2016	787.64	787.76	786.18	788.18	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--	NI	NI	NI	NI	NI
	December 29, 2016	787.37	787.05	NM	NM	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--	NI	NI	NI	NI	NI
	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	--	--	--	NI	NI	NI	NI	NI
	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	--	--	--	NI	NI	NI	NI	NI
	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	--	--	--	NI	NI	NI	NI	NI
	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	--	--	--	NI	NI	NI	NI	NI
	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	--	--	--	NI	NI	NI	NI	NI
	February 21, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI
	March 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	May 24, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI
	June 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI
	July 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI
	August 7, 2018	787.06	NM	785.20	788.25	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	August 22, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	June 12, 2019	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI
	June 19, 2019	NM	NM	786.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
CCR Rule Wells	December 13, 2019	--	--	--	--	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI
	January 17, 2020	--	--	785.58	--	--	--	--	--	--	--	--	--	--	--	--	NI	NI	NI	NI	NI
	February 3, 2020	787.24	NM	NM	NM	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI
	August 6, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	December 11, 2020	NM	NM	NM	NM	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI
	February 25, 2021	NM	NM	784.27	NM	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	April 12, 2021	786.50	785.77	784.07	787.99	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15	NI	NI	NI	NI	NI
	June 11, 2021	NM	NM	NM	NM	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI
	July 20, 2021	NM	NM	783.64	NM	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48	NI	NI	NI	NI	NI
	December 21, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI
	February 24, 2022	NM	NM	782.34	NM	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	April 11-13, 2022	785.44	784.42	783.40	788.20	787.87	788.26	783.27	784.30	785.02	783.11	783.32	784.19	783.14	783.19	783.04	NI	NI	NI	NI	NI
	July 27, 2022	NM	NM	783.07	NM	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	October 25-27, 2022	784.91	784.62	778.94	781.79	784.97	783.85	781.94	783.61	784.57	778.32	777.89	784.16	781.50	780.96	781.23	NI	NI	NI	NI	NI
	November 30, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI
	December 2, 2022	785.12	784.48	NM	783.97	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NM	NI	NI	NI	NI	NI
	January 12-13, 2023	785.20	784.55	NM	NM	NM	NM	782.75	784.10	784.88	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI
	January 20, 2023	NM	NM	NM	788.08	NM	NM	NM	NM	NM	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI
	January 24, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI
	February 20-23, 2023	785.56	784.98	NM	NM	NM	NM	NM	NM	NM	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI
	March 27-28, 2023	786.83	785.87	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI
	April 24-27, 2023	787.57	786.87	784.38	784.03	NM	782.59	785.79	786.22	786.97	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI
	May 5, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49
	May 16, 2023	787.43	787.07	783.88	784.12	dry	781.64	785.64	786.06	786.88	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48
	May 30-31, 2023	787.04	786.89	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM
	June 29-30, 2023	786.32	786.39	NM	NM	NM	NM	784.32	785.04	785.92	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM
	July 31, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM
	August 31, 2023	NM	785.30	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM
	October 9-11, 2023	784.67	784.65	781.21	780.09	779.93	780.54	782.57	783.55	784.39	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30
	November 9, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.76	NM	NM	NM	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	780.72	766.52	777.21	770.52	774.07	780.63	780.39	778.90	775.60	775.21	773.55	774.29	820.30	821.57	819.78	764.79

Created by: MDB Date: 5/6/2013
Last revision by: NLB Date: 11/29/2023
Checked by: EMS Date: 11/29/2023
Proj Mgr QA/QC: TK Date: 11/11/2023

Notes:
NM = not measured
(1) 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 October 10, 2017.
(2) MW-303 was extended in 2022 due to regrading. Prior to October 2022, the TOC elevation was 811.52'. For events in October 2022 and later, the TOC elevation is 815.72'.

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations
3 Water Table Map – October 2020
4 Water Table Map – October 2022
5 Water Table Map – May 2023
6 Water Table Map – October 2023

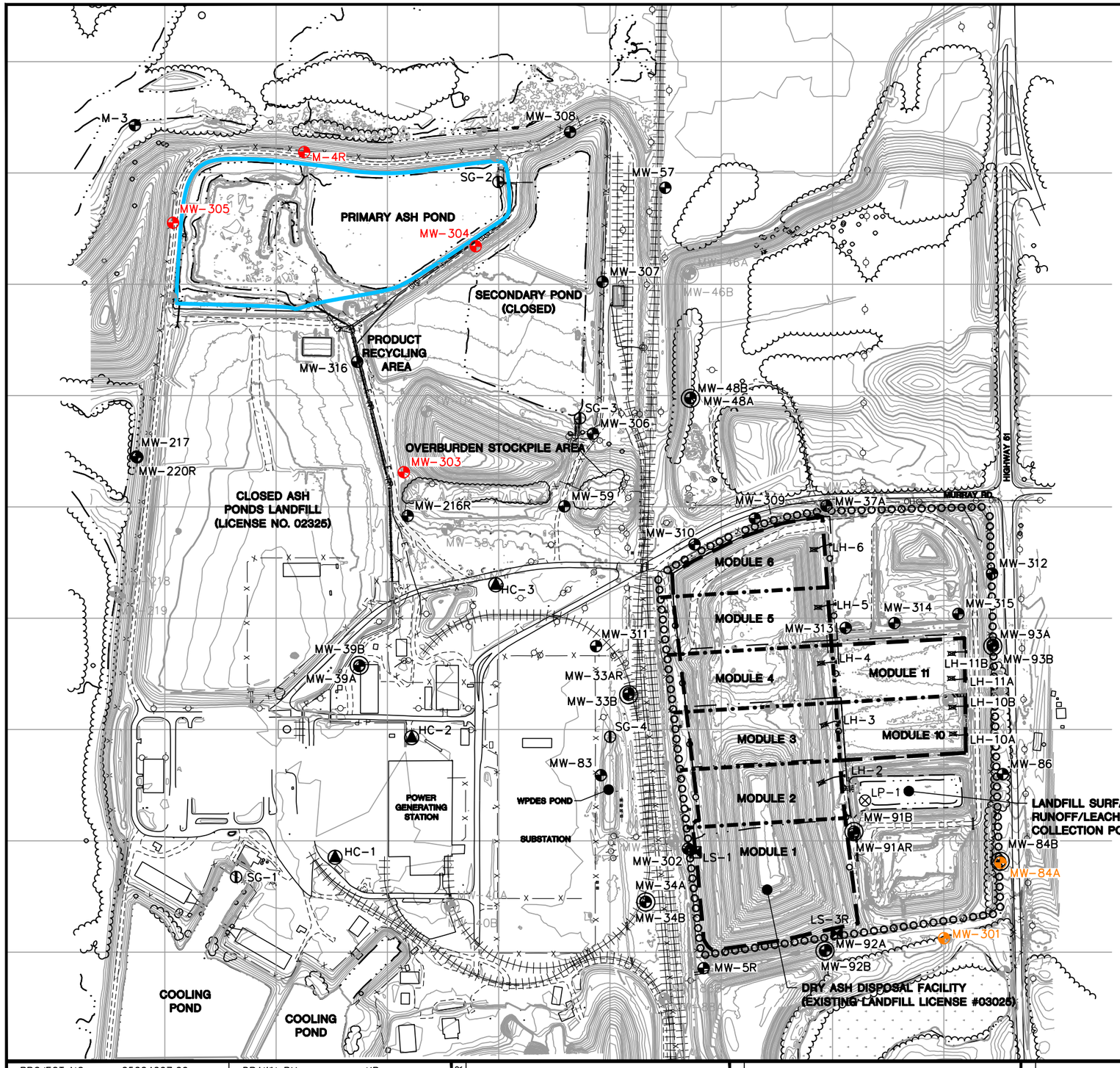


N

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

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

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



LEGEND

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

N

500 0 500

SCALE: 1" = 500'

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. BACKGROUND MONITORING WELLS FOR THE PRIMARY POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	04/19/2024	APPROVED BY:	TK 05/01/2024

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

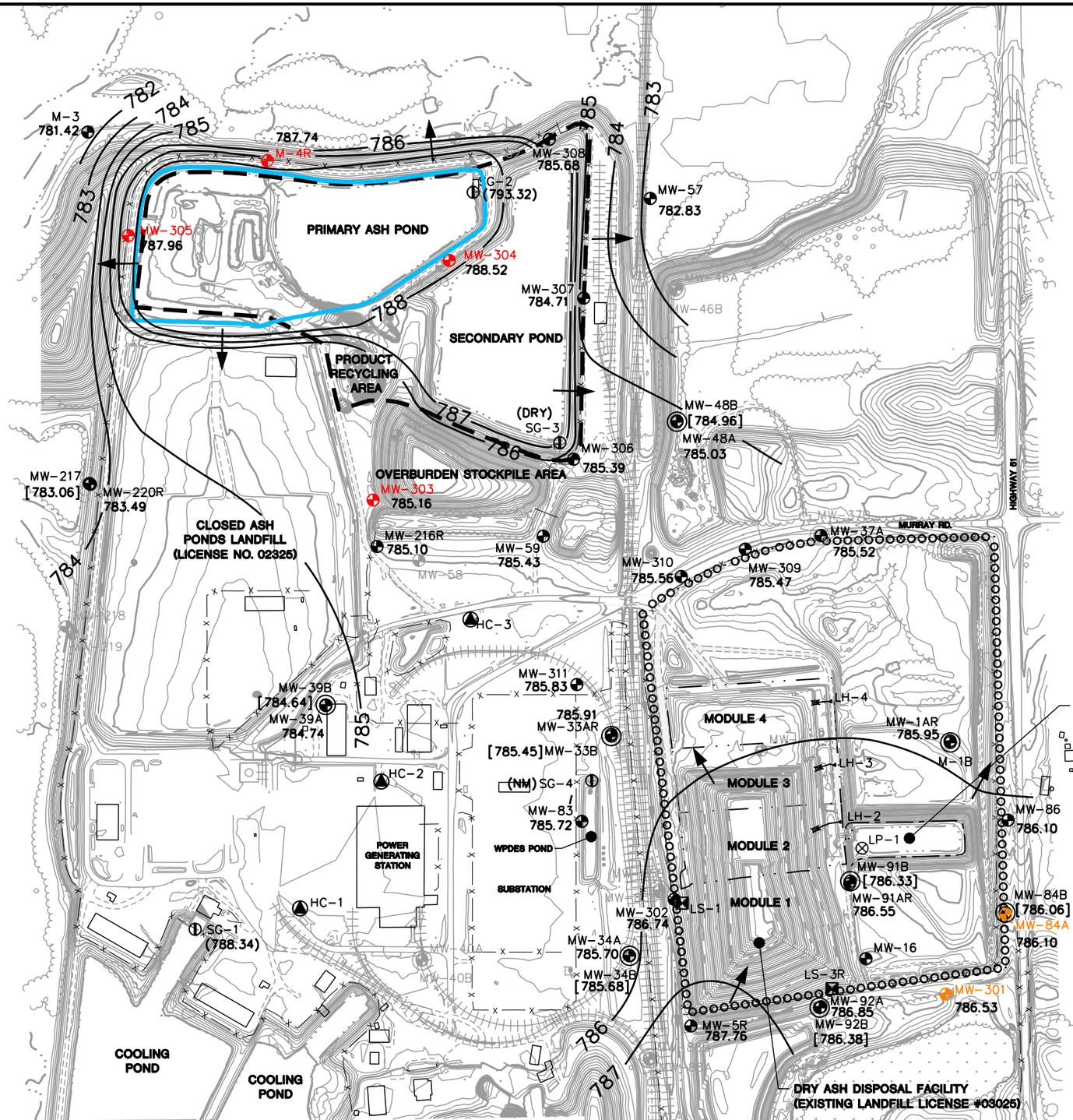
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25224067.00\Drawings\Primary Pond\Site Plan and Monitoring Well Locations.dwg, 4/24/2024 3:32:01 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCE LINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
- CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- **787.62** WATER TABLE ELEVATION MEASURED 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. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS AND PIEZOMETERS ON OCTOBER 7, 8, AND 17, 2020.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP/ZTW
DRAWN:	08/07/2020	CHECKED BY:	TK
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

CLIENT: ALLIANT ENERGY
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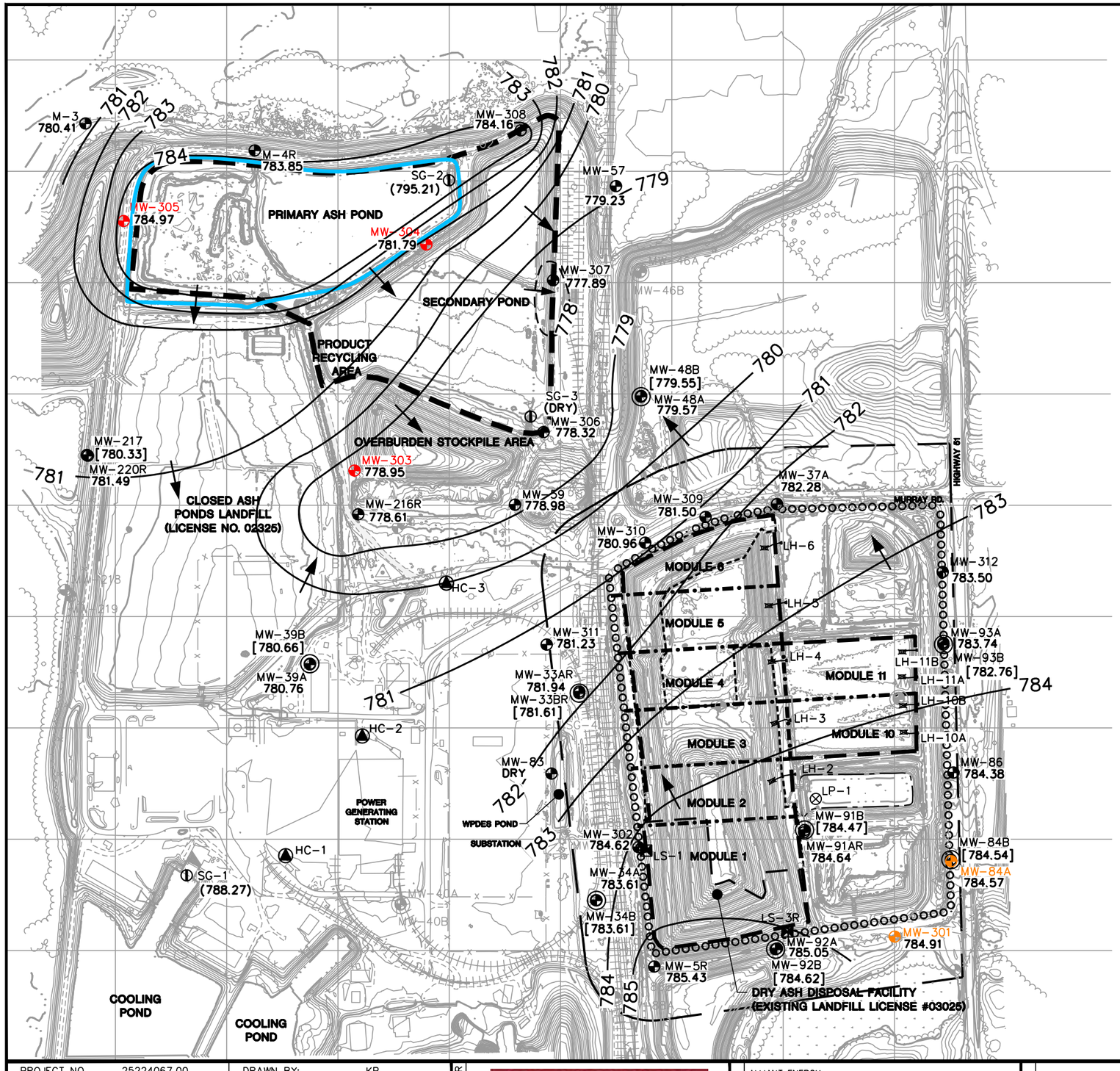
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2020

FIGURE 3

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map Oct 2020 PP.dwg, 4/18/2024 3:35:58 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
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- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (795.20) — SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 25–27, 2022.
3. DEWATERING WELLS (NOT SHOWN) AROUND THE SECONDARY POND WERE PUMPING AND DISCHARGING TO THE PRIMARY POND DURING THE OCTOBER 2022 SAMPLING EVENT.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	NLB
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

CLIENT: ALLIANT ENERGY
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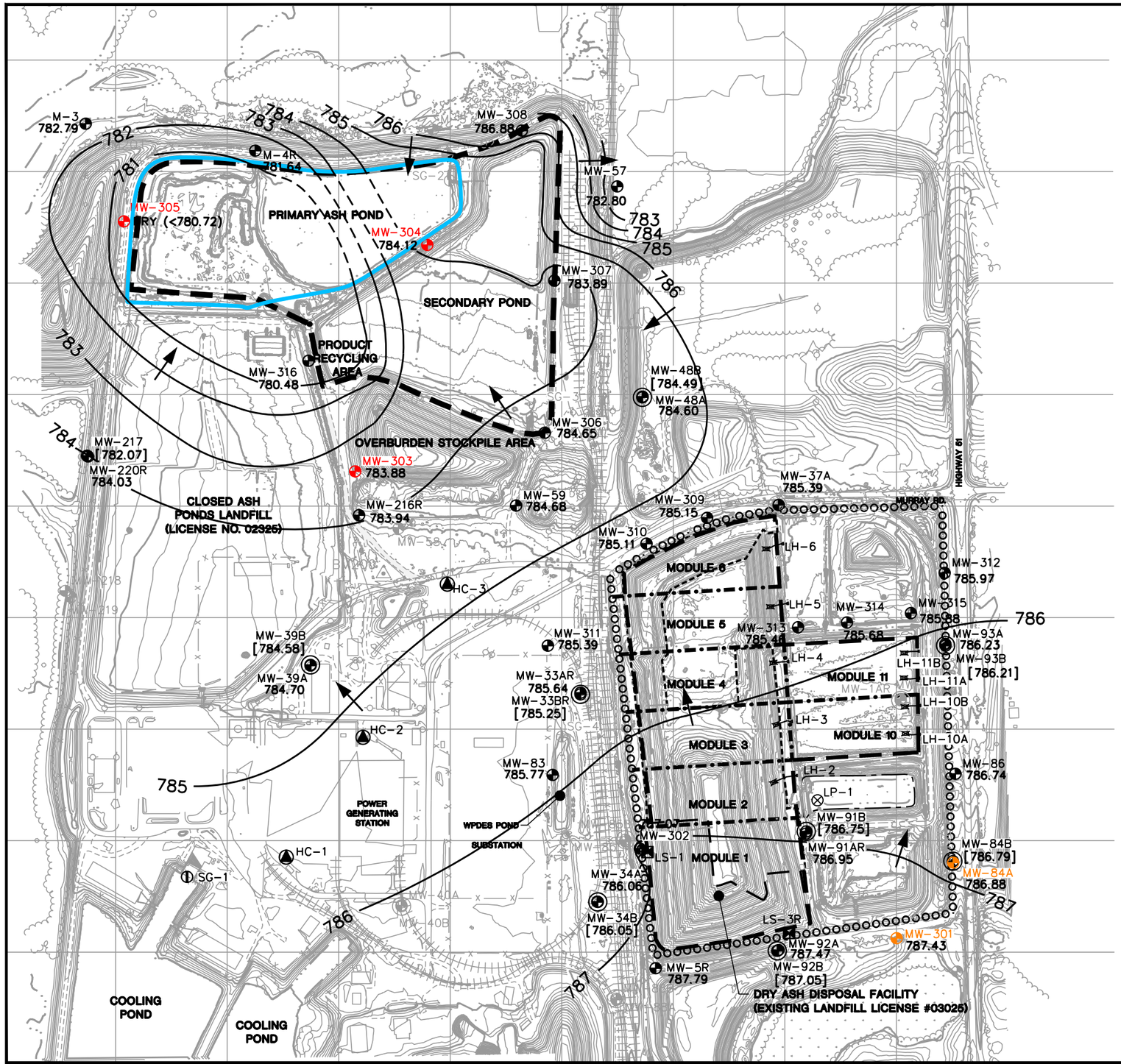
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2022

FIGURE
4

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map - Oct 22.dwg, 4/18/2024 3:23:48 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- ABANDONED STAFF GAUGE
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON MAY 16, 2023.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	06/01/2023	CHECKED BY:	NLB
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
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CLIENT: ALLIANT ENERGY
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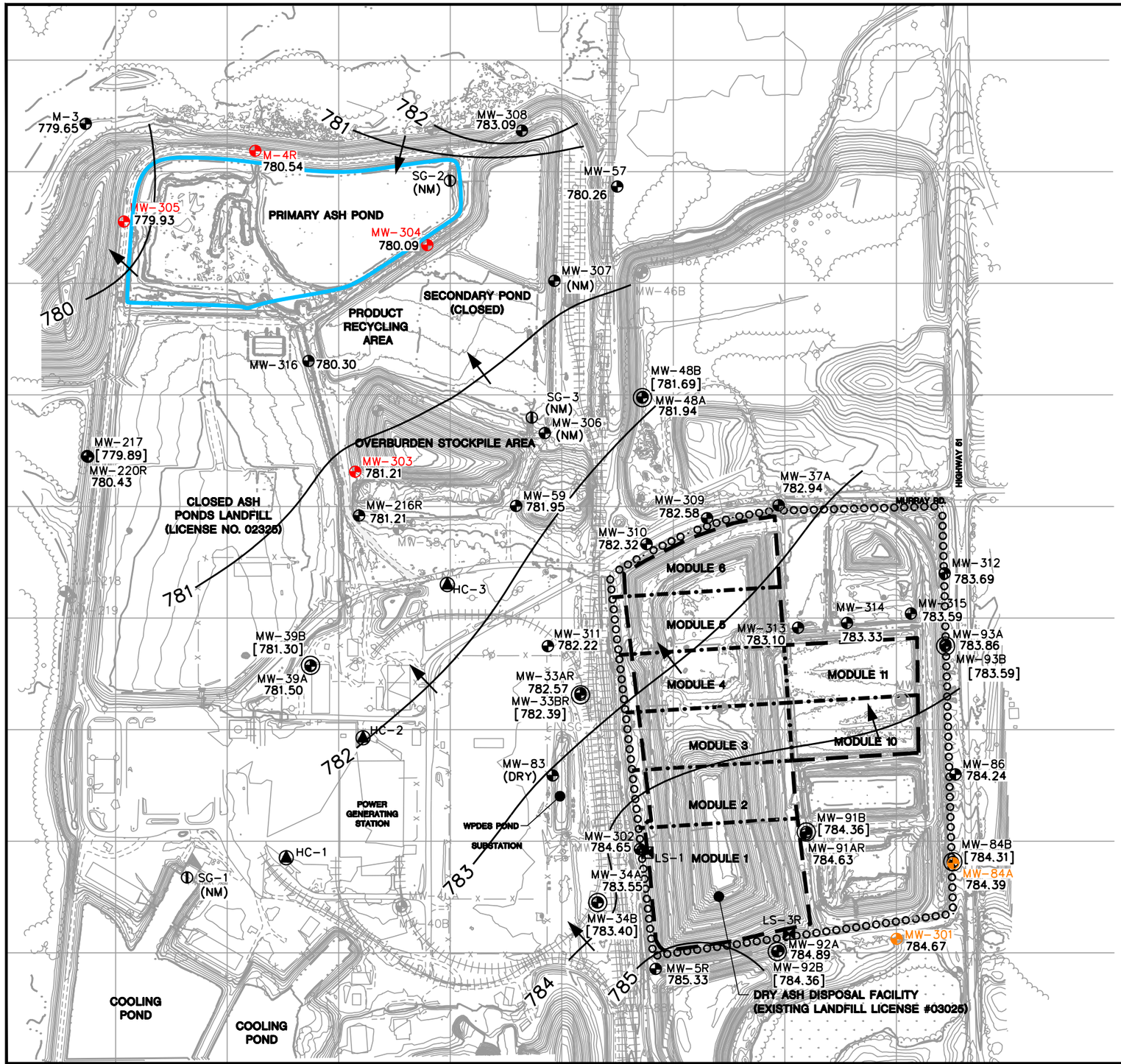
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
MAY 2023

FIGURE 5

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map - May 23.dwg, 4/18/2024 3:25:56 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
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- ABANDONED PIEZOMETER
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (NM) — NOT MEASURED
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 9–11, 2023.
3. DEWATERING PUMPING WAS STOPPED BY SEPTEMBER 11, 2023.
4. EXCAVATION OF CCR MATERIAL FROM THE PRIMARY POND WAS COMPLETED OCTOBER 4, 2024.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	11/13/2023	CHECKED BY:	RM
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
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CLIENT: ALLIANT ENERGY
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PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2023

FIGURE
6

I:\25224067.00\Drawings\Primary Pond\Water Table Map-October 2023.dwg, 4/24/2024 3:34:37 PM

Appendix A

October 2023 Statistical Evaluation

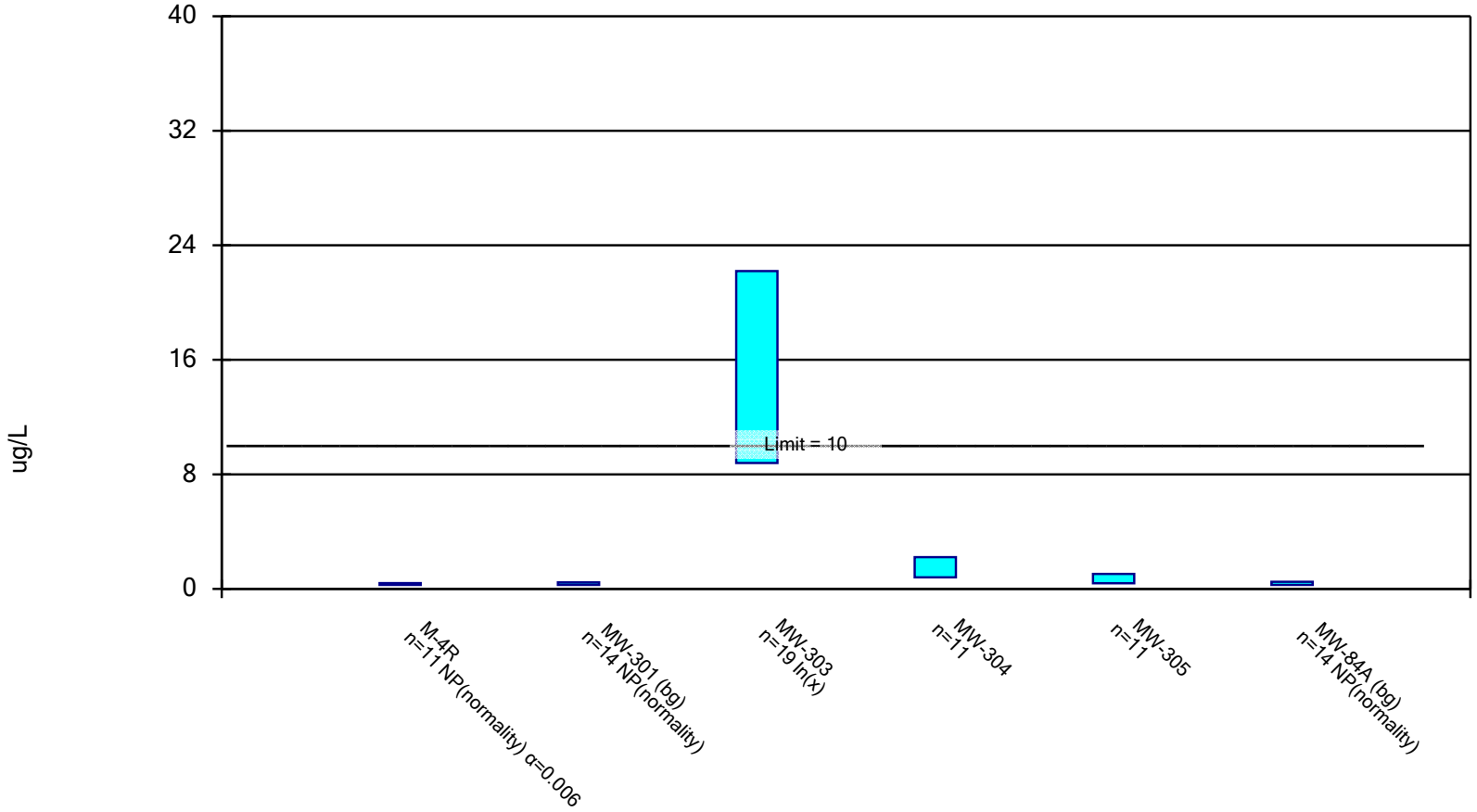
Confidence Interval

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 1/9/2024, 2:28 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.4	0.28	10	No	11	54.55	No	0.006	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.45	0.28	10	No	14	42.86	No	0.01	NP (normality)
Arsenic (ug/L)	MW-303	22.2	8.792	10	No	19	0	ln(x)	0.01	Param.
Arsenic (ug/L)	MW-304	2.215	0.803	10	No	11	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.045	0.3862	10	No	11	9.091	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.49	0.28	10	No	14	35.71	No	0.01	NP (normality)
Molybdenum (ug/L)	M-4R	42.03	19.46	100	No	11	0	No	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	14	100	No	0.01	NP (NDs)
Molybdenum (ug/L)	MW-303	103.6	64.32	100	No	15	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304	13	3	100	No	11	0	No	0.006	NP (normality)
Molybdenum (ug/L)	MW-305	82.74	48.15	100	No	16	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	14	92.86	No	0.01	NP (NDs)
Selenium (ug/L)	M-4R	8.736	2.3	50	No	11	0	No	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.49	0.32	50	No	14	85.71	No	0.01	NP (NDs)
Selenium (ug/L)	MW-303	40.92	16.66	50	No	14	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304	0.35	0.32	50	No	11	72.73	No	0.006	NP (normality)
Selenium (ug/L)	MW-305	10.05	4.299	50	No	11	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	14	92.86	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Arsenic Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

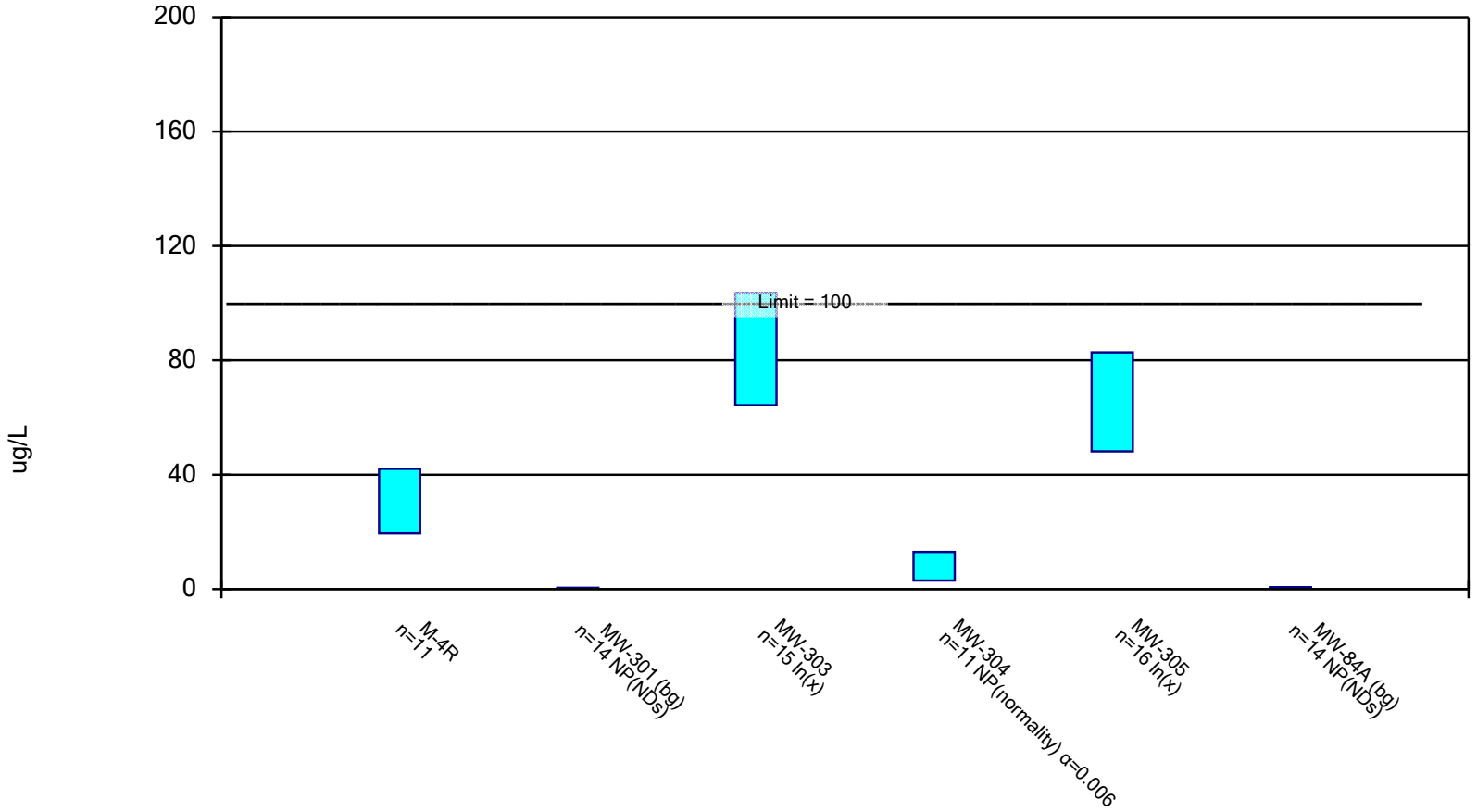
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
Mean	0.3309	0.3586	18.63	1.509	0.7155	0.4107
Std. Dev.	0.06172	0.1023	14.22	0.8474	0.3952	0.1885
Upper Lim.	0.4	0.45	22.2	2.215	1.045	0.49
Lower Lim.	0.28	0.28	8.792	0.803	0.3862	0.28

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

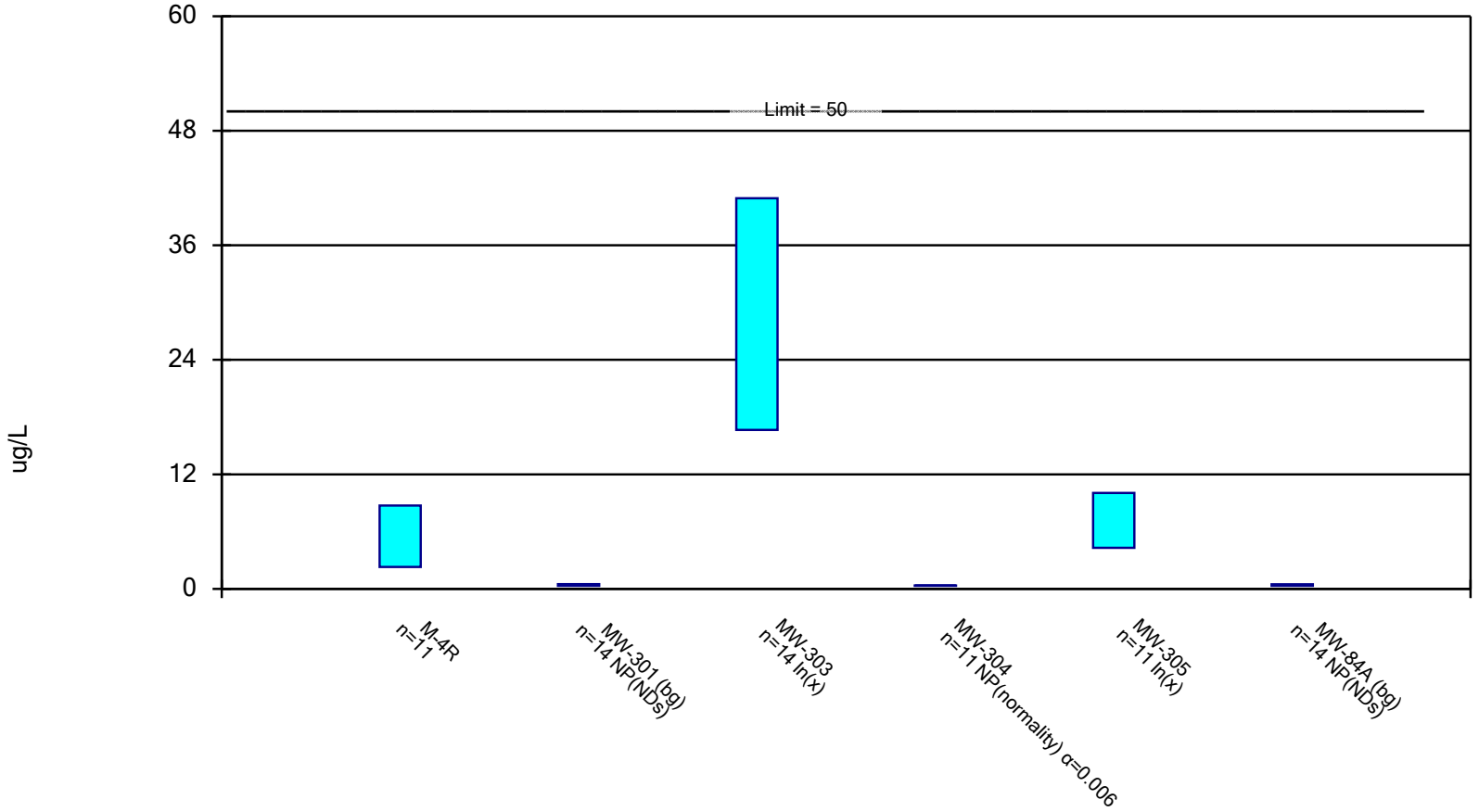
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44				<0.44
Mean	30.75	0.44	86.69	8.009	68.55	0.4529
Std. Dev.	13.54	0	33.2	4.52	29.3	0.04811
Upper Lim.	42.03	0.44	103.6	13	82.74	0.62
Lower Lim.	19.46	0.44	64.32	3	48.15	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 1/9/2024 2:27 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 1/9/2024 2:28 PM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32				<0.32
Mean	5.518	0.36	31.99	0.3945	7.536	0.3314
Std. Dev.	3.862	0.1105	23.46	0.2342	4.993	0.04276
Upper Lim.	8.736	0.49	40.92	0.35	10.05	0.48
Lower Lim.	2.3	0.32	16.66	0.32	4.299	0.32

ND substitution: RL or RL/2 if <15% NDs.

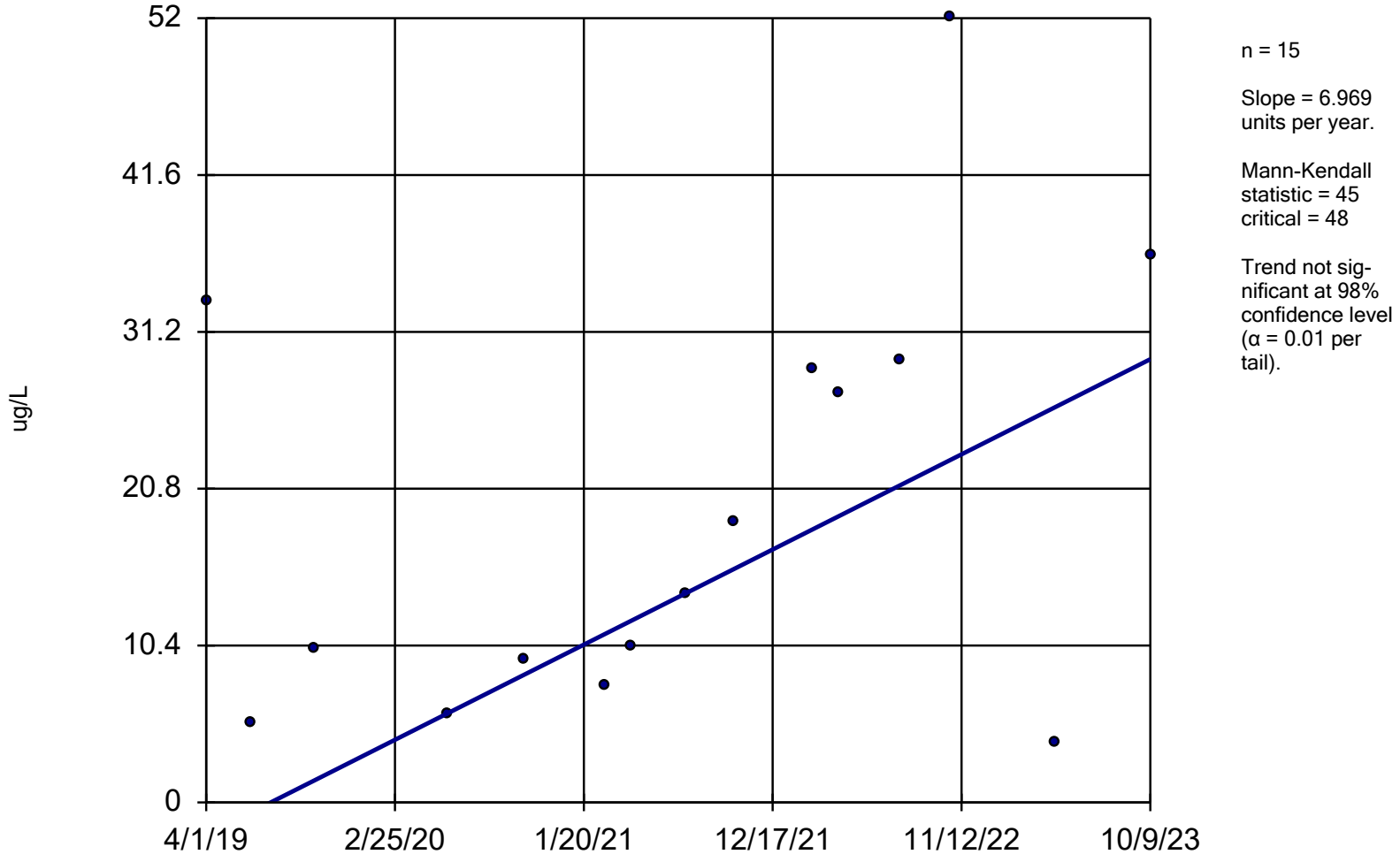
Trend Test

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:05 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	6.969	45	48	No	15	0	n/a	n/a	0.02	NP

Arsenic

MW-303



n = 15

Slope = 6.969 units per year.

Mann-Kendall statistic = 45
critical = 48

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 2/1/2024 9:04 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:05 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3

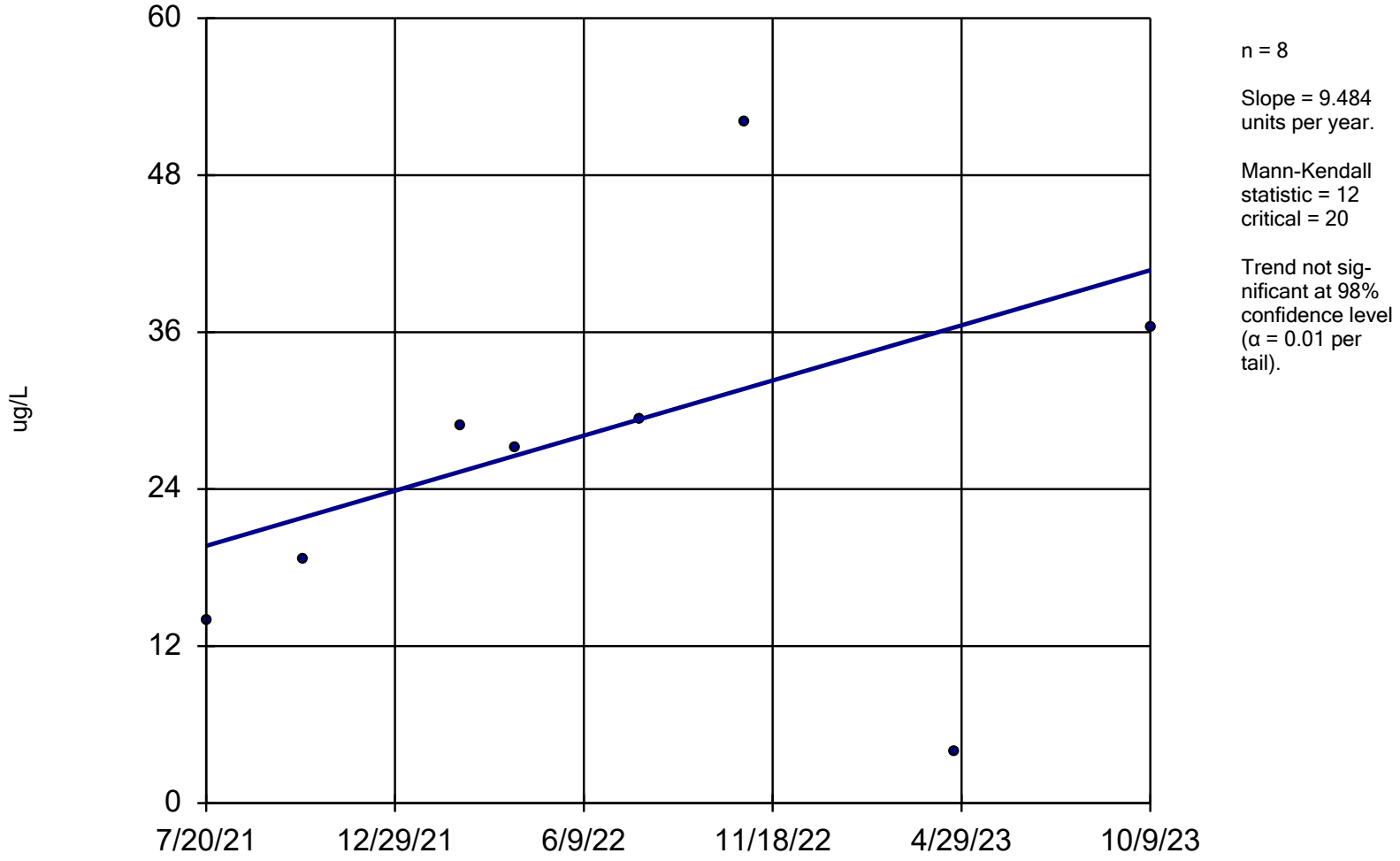
Trend Test

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:11 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	9.484	12	20	No	8	0	n/a	n/a	0.02	NP

Arsenic

MW-303



Sen's Slope Estimator Analysis Run 2/1/2024 9:10 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:11 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3

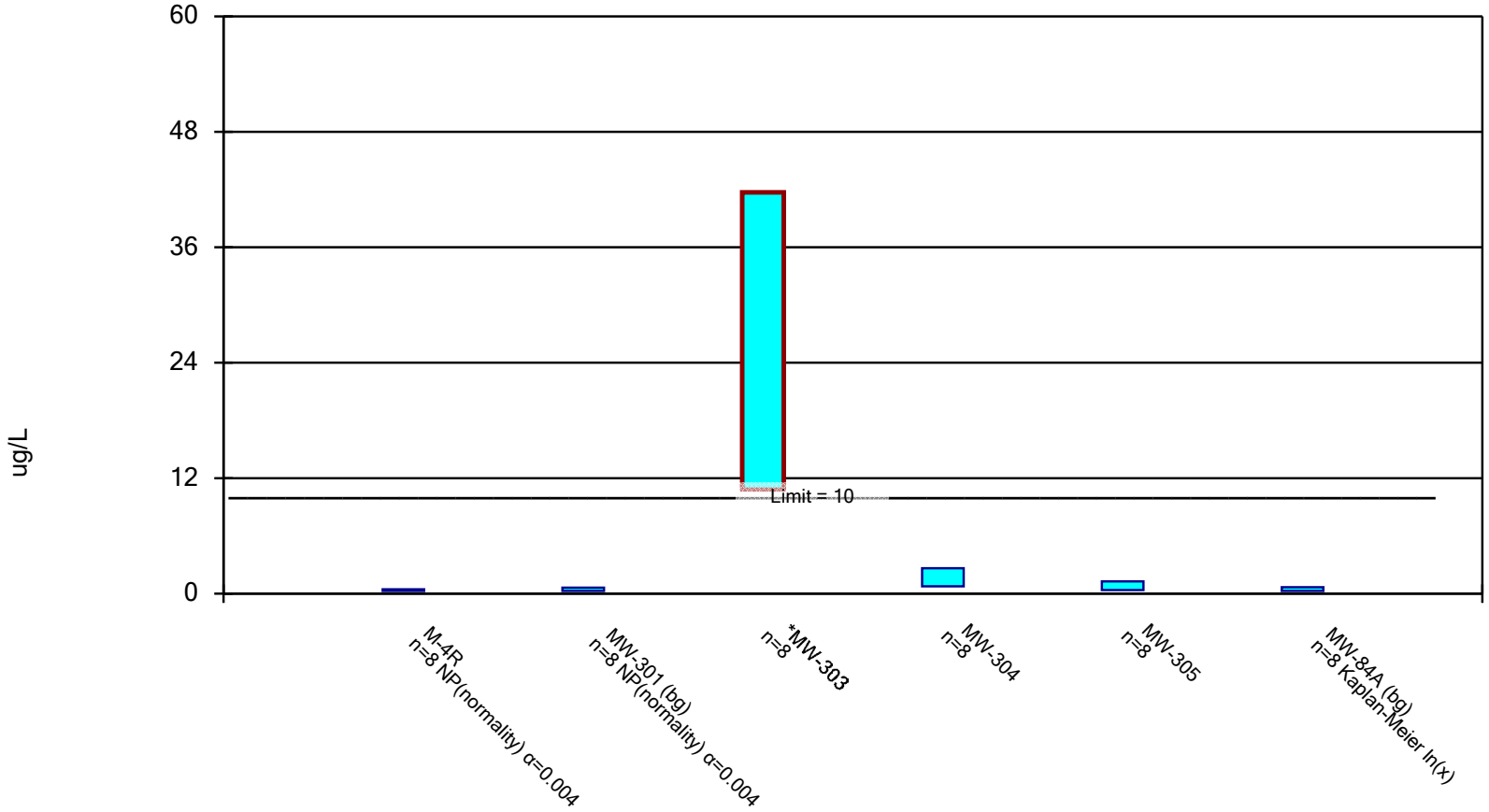
Confidence Interval

Columbia Energy Center Data: December - Chem- export-Dec2020 Printed 2/1/2024, 9:16 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.62	0.28	10	No	8	37.5	No	0.004	NP (normality)
Arsenic (ug/L)	**MW-303**	**41.71**	**10.81**	**10**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304	2.645	0.755	10	No	8	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.266	0.377	10	No	8	12.5	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.6615	0.2745	10	No	8	25	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	47.4	25.39	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	8	100	No	0.004	NP (NDs)
Molybdenum (ug/L)	MW-303	114.3	47.28	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304	13.52	3.02	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	110.4	33.54	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	8	87.5	No	0.004	NP (NDs)
Selenium (ug/L)	M-4R	9.29	1.705	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.32	0.32	50	No	8	100	No	0.004	NP (NDs)
Selenium (ug/L)	MW-303	60.9	12.72	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304	1.1	0.32	50	No	8	62.5	No	0.004	NP (normality)
Selenium (ug/L)	MW-305	13.01	3.73	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	8	87.5	No	0.004	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

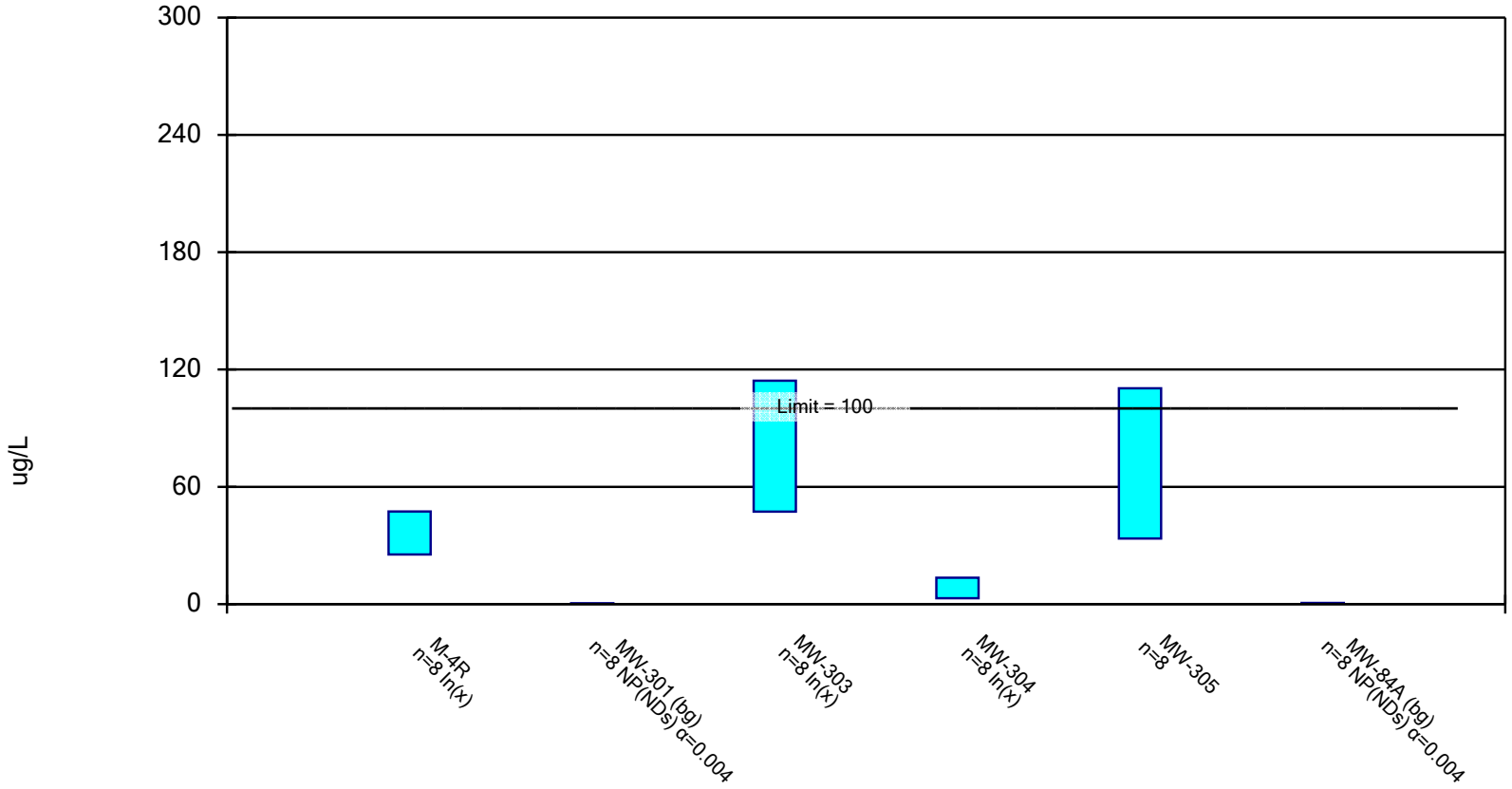
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	<0.28 (U)				<0.28 (U)	
4/2/2019				0.63 (J)		
10/7/2019	0.37 (J)			3.2	0.49 (J)	
5/27/2020	0.39 (J)			1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)			2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
4/12/2021				1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
Mean	0.34	0.3638	26.26	1.7	0.8213	0.4675
Std. Dev.	0.06698	0.1215	14.58	0.8915	0.4191	0.2314
Upper Lim.	0.44	0.62	41.71	2.645	1.266	0.6615
Lower Lim.	0.28	0.28	10.81	0.755	0.377	0.2745

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

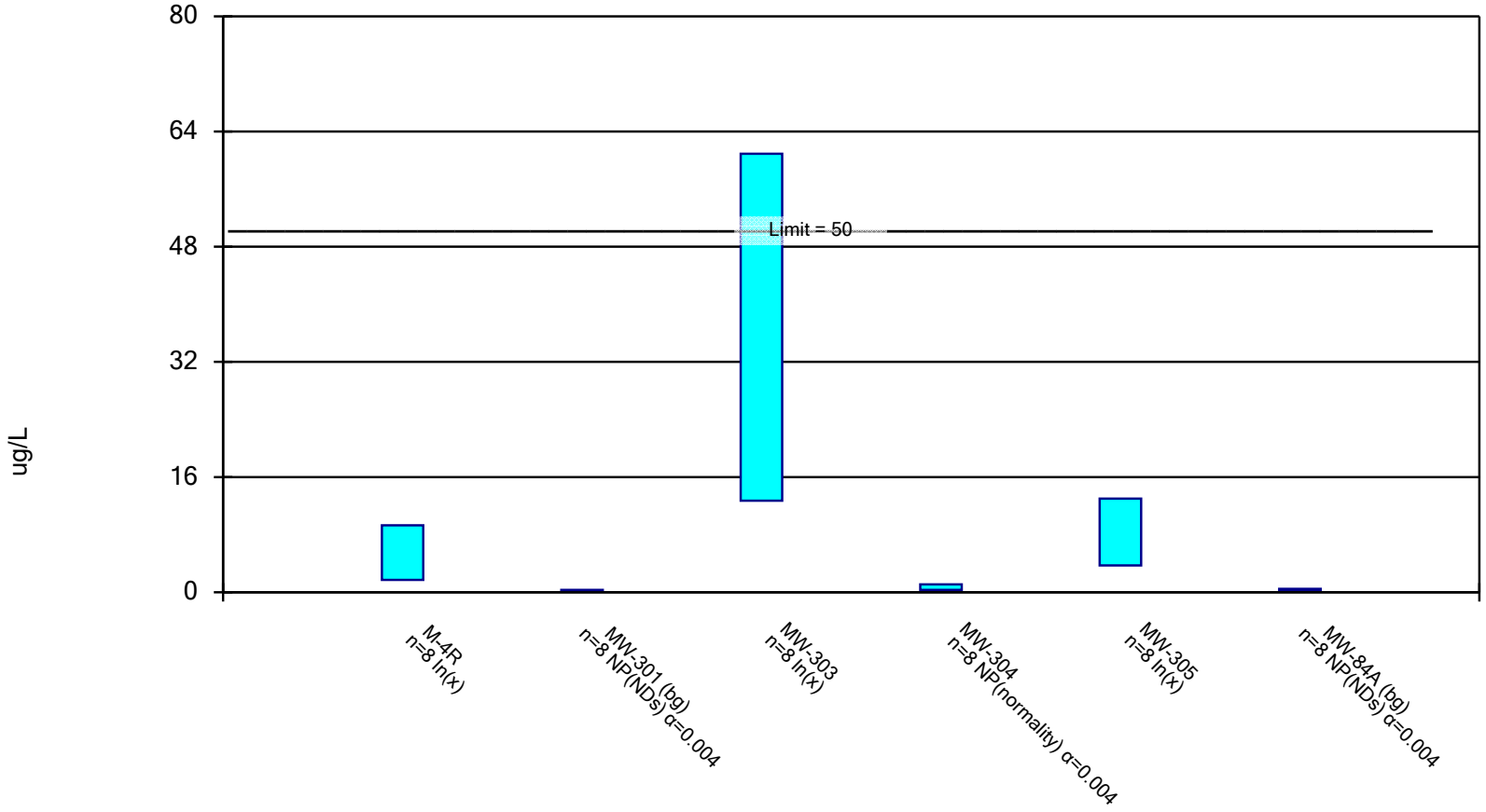
Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	29.4					
4/2/2019				3		
10/7/2019	27.6			4.8		
5/27/2020	25.6		67.1	3.9		
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12		
10/8/2020		<0.44 (U)				<0.44 (U)
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
Mean	36.13	0.44	80.04	7.8	71.96	0.4625
Std. Dev.	11.79	0	40.51	4.745	36.25	0.06364
Upper Lim.	47.4	0.44	114.3	13.52	110.4	0.62
Lower Lim.	25.39	0.44	47.28	3.02	33.54	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 2/1/2024 9:13 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 2/1/2024 9:16 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
4/1/2019	12.6				3.2	
4/2/2019				<0.32 (U)		
10/7/2019	1.8			<0.32 (U)	7.7	
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)
Mean	5.313	0.32	35.75	0.4225	8.225	0.34
Std. Dev.	4.429	0	28.65	0.274	5.77	0.05657
Upper Lim.	9.29	0.32	60.9	1.1	13.01	0.48
Lower Lim.	1.705	0.32	12.72	0.32	3.73	0.32

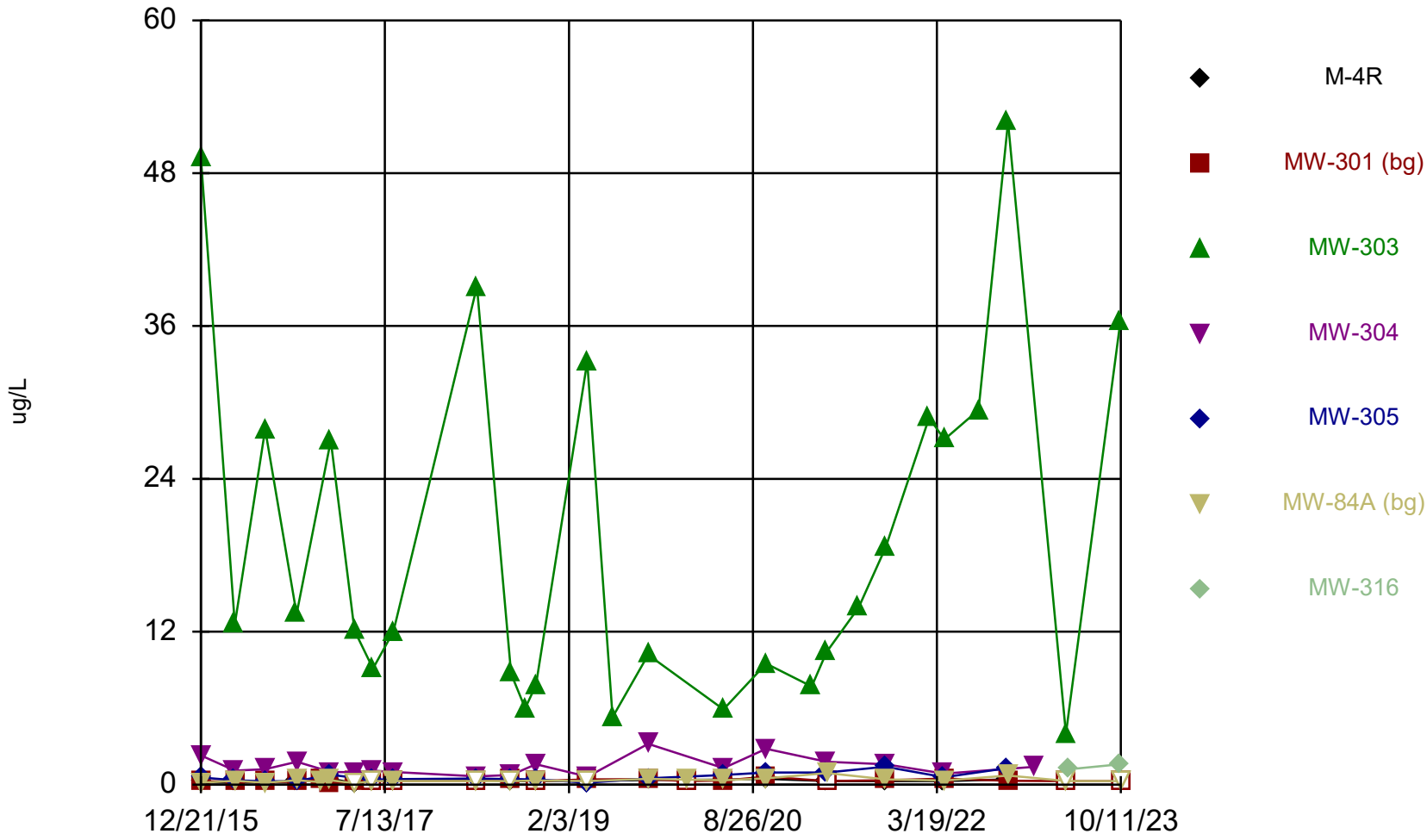
ND substitution: RL or RL/2 if <15% NDs.

Appendix B

Trend Plots for CCR Wells

Hollow symbols indicate censored values.

Arsenic



Time Series Analysis Run 3/27/2024 11:29 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

Time Series

Constituent: Arsenic (ug/L) Analysis Run 3/27/2024 11:29 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)	MW-316
12/21/2015			49.2	2.3	0.56 (J)		
12/22/2015	0.17 (J)	0.26 (J)				0.15 (J)	
4/4/2016	0.2 (J)		12.6	1.1	0.34 (J)		
4/5/2016		0.26 (J)				0.29 (J)	
7/7/2016	0.18 (J)		27.9	1.2			
7/8/2016		0.19 (J)			0.26 (J)	0.14 (J)	
10/12/2016	0.25 (J)		13.4				
10/13/2016		0.24 (J)		1.8	0.27 (J)	0.35 (J)	
12/29/2016		0.4 (J)				0.19 (J)	
1/25/2017	0.47 (J)	0.13 (J)			0.78 (J)	0.35 (J)	
1/26/2017			27	0.99 (J)			
4/10/2017			12.1	0.98 (J)			
4/11/2017	<0.099 (U)	0.18 (J)				<0.099 (U)	
6/5/2017	0.33 (J)			1.1	0.37 (J)		
6/6/2017		<0.28 (U)	9.1			<0.28 (U)	
8/7/2017					0.43 (J)		
8/8/2017		<0.28 (U)	12	1		0.28 (J)	
8/9/2017	<0.28 (U)						
4/23/2018	0.36 (J)				0.48 (J)		
4/24/2018			39.1	0.64 (J)			
4/25/2018		<0.28 (U)				<0.28 (U)	
8/7/2018	<0.28 (U)				0.42 (J)		
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)	
9/21/2018			6				
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)	
4/1/2019	<0.28 (U)		33.2		<0.28 (U)		
4/2/2019		0.4 (J)		0.63 (J)			
4/3/2019						<0.28 (U)	
6/19/2019			5.3				
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)		
10/9/2019		0.42 (J)				0.46 (J)	
2/3/2020		<0.28 (U)				0.38 (J)	
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)		
5/29/2020		0.33 (J)				0.34 (J)	
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)		
10/8/2020		0.62 (J)				0.49 (J)	
2/25/2021			7.7				
4/12/2021			10.4	1.8	0.95 (J)		
4/13/2021	<0.28 (U)						
4/14/2021		<0.28 (U)				0.91 (J)	
7/20/2021			13.9				
10/11/2021	<0.28 (U)			1.6	1.4		
10/12/2021			18.6				
10/14/2021		0.35 (J)				0.41 (J)	
2/24/2022			28.8				
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)		
4/12/2022			27.1				
4/13/2022		0.47 (J)				0.31 (J)	
7/27/2022			29.4				
10/25/2022	0.4 (J)				1.3		
10/26/2022			52				
10/27/2022		0.3 (J)				0.72 (J)	

ND substitution: RL or RL/2 if <15% NDs.

Time Series

Constituent: Arsenic (ug/L) Analysis Run 3/27/2024 11:29 AM View: COL Primary Pond

Columbia Energy Center Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)	MW-316
1/20/2023				1.4			
4/24/2023			4				
4/27/2023		<0.28 (U)				<0.28 (U)	
5/5/2023							1.2
10/9/2023			36.3				1.6
10/11/2023		<0.28				<0.28	

ND substitution: RL or RL/2 if <15% NDs.

Appendix C

Regional Information

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

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

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

Sources:

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

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

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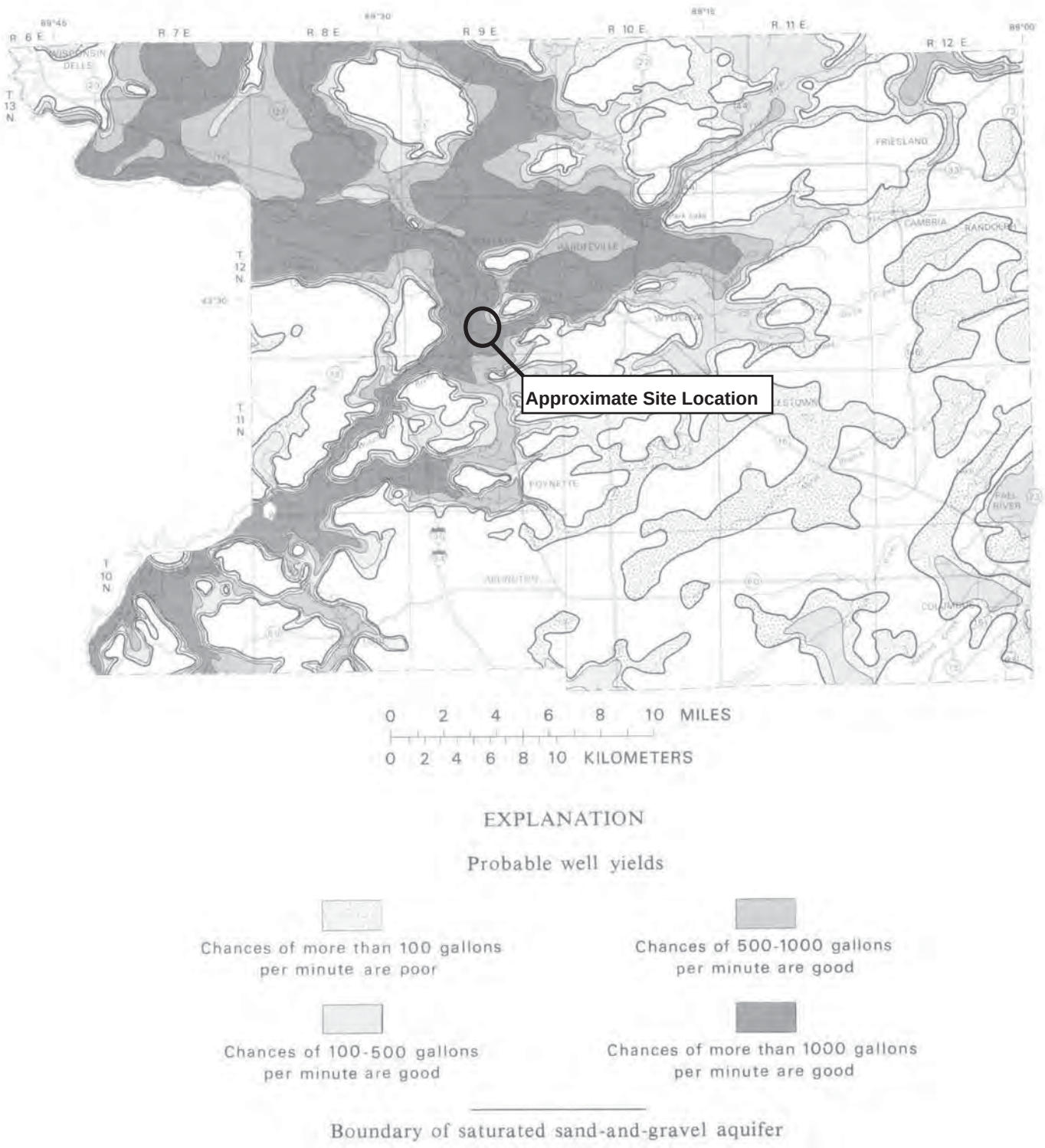
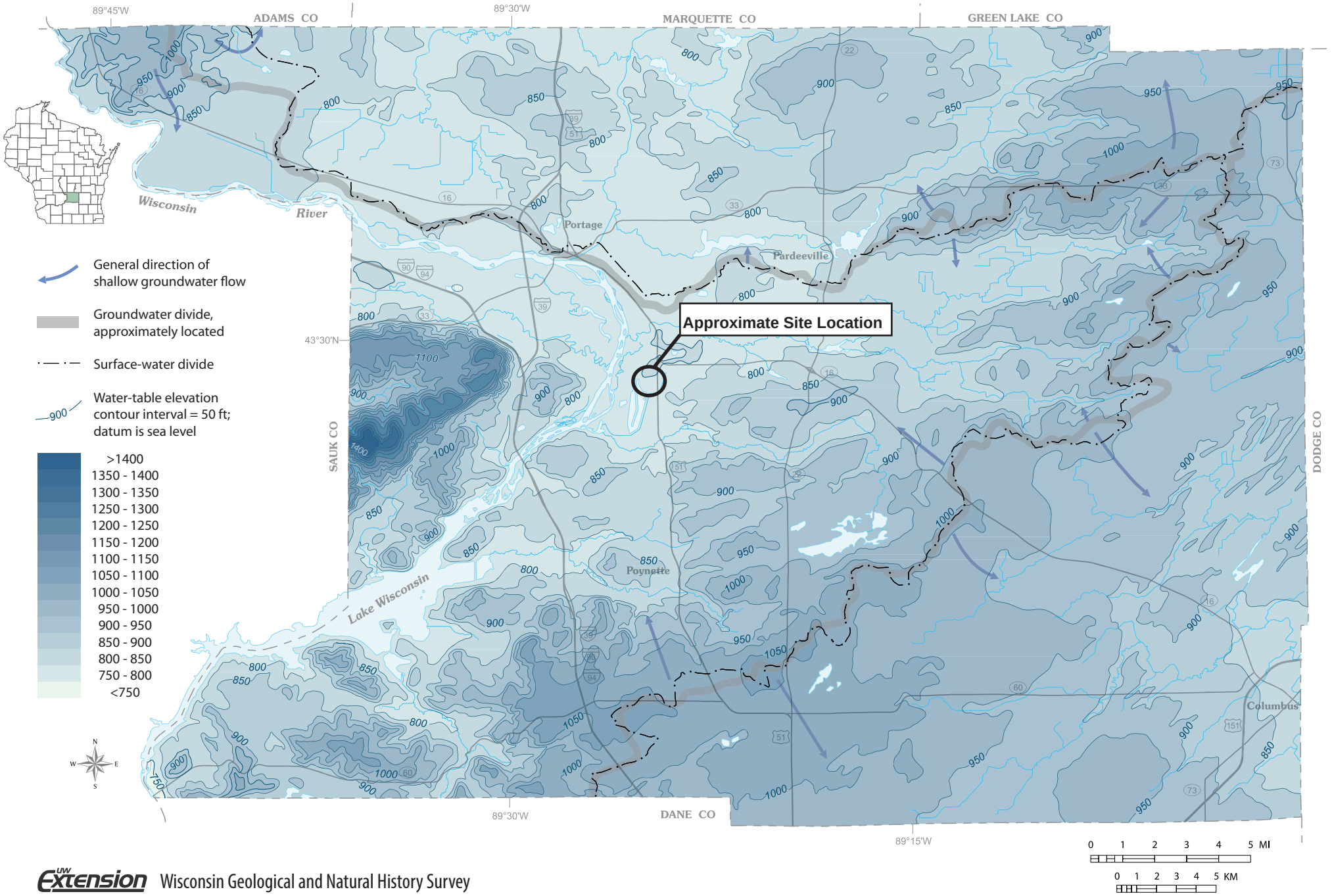


Figure 9. Probably well yields from the sand-and-gravel aquifer.

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

Generalized water-table elevation in Columbia County, Wisconsin



Wisconsin Geological and Natural History Survey

02/26/2025 - Classification: Internal - EGRM23462139

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

Alternative Source Demonstration
April 2024 Assessment Monitoring

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

SCS ENGINEERS

25224067.00 | December 18, 2024

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Appendices

Appendix A Statistical Evaluation
Appendix B Time Series Plot for CCR Wells
Appendix C Regional Information

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternative source demonstration is accurate and meets the requirements of 40 CFR 257.95(g)(3)(ii). This certification is based on my review of the groundwater data and related site information available for the Columbia Energy Center Primary Ash Pond. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

12/18/2024

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2026.

Pages or sheets covered by this seal:
Alternative Source Demonstration, April 2024 Assessment Monitoring, Primary Ash Pond, Columbia Energy Center, Pardeeville, Wisconsin

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.95(g)(3)(ii). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.95(G)(3)(II) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

40 CFR 257.95(g)(3): Within 90 days of finding that any of the constituents listed in Appendix IV to this part have been detected at a statistically significant level exceeding the groundwater protection standards the owner or operator must either:

(i) Initiate an assessment of corrective measures as required by § 257.96; or

(ii) Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in Appendix III and Appendix IV of this part are at or below background as specified in paragraph (e) of this section. 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 or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating that arsenic was identified to be at a statistically significant level (SSL) above the groundwater protection standard (GPS) based on the results of the April 2024 assessment monitoring event.

1.2 SITE INFORMATION AND MAP

The COL site is located at W8375 Murray Road, Pardeeville, Columbia County, Wisconsin (**Figure 1**). It is an active coal-burning generating station, which has been burning coal and disposing of CCR on site since the mid-1970s. The layout of the site is shown on **Figure 2**. The COL property formerly included two CCR surface impoundments: the Primary Pond (existing CCR surface impoundment) and the Secondary Pond (inactive CCR surface impoundment). This ASD will evaluate the conditions

at the site for the Primary Ash Pond only. The CCR has been removed from both former impoundments, as described below.

The groundwater monitoring system monitors the following CCR Unit:

- COL Primary Ash Pond (existing CCR surface impoundment)

The system is designed to detect monitored constituents at the waste boundary of the Primary Ash Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two background monitoring wells (MW-84A and MW-301) and four downgradient monitoring wells (M-4R, MW-303, MW-304, and MW-305). A temporary monitoring well, MW-316, was installed in 2023 to evaluate groundwater quality between compliance well MW-303 and the Primary Pond (**Figure 2**).

A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided on **Figure 2**. Separate monitoring systems have been established for the other CCR Units at COL, which include the Secondary Ash Pond and Modules 1-3, Modules 4-6, and Modules 10-11 of the COL Dry Ash Disposal Facility (ADF).

In 2023, closure activities were completed for the Primary Ash Pond, including CCR removal facilitated by operation of dewatering wells installed around the perimeter of the pond to lower the groundwater table. Removal of CCR from the Primary Ash Pond was completed on October 4, 2023. In 2022, closure activities were completed for the adjacent Secondary Pond, including CCR removal facilitated by operation of dewatering wells installed around perimeter of the Secondary Pond to lower the groundwater table elevation.

1.3 STATISTICALLY SIGNIFICANT LEVELS IDENTIFIED

The April 2024 results for Appendix IV parameters were compared to the GPSs established under 40 CFR 257.95(h) to evaluate whether any Appendix IV parameter was present at an SSL above the GPS. Compliance wells M-4R and MW-305 were dry during the April 2024 event and a resample was attempted at both wells in June 2024. A sample was successfully collected from M-4R during the June 2024 event. The April 2024 and June 2024 results and GPS values are shown in **Table 1**.

For the April and June 2024 monitoring events, assessment monitoring parameters for which an individual monitoring result exceeded the GPS at a compliance well included the following:

- Arsenic: MW-303
- Selenium: M-4R

The U.S. EPA's Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (EPA 530-R-09-007, March 2009) recommends the use of confidence intervals for comparison of assessment monitoring data to fixed GPS values. Specifically, the suggested approach for comparing assessment groundwater monitoring data to GPS values based on long-term chronic health risk, such as drinking water Maximum Contaminant Levels (MCLs), is to compare the lower confidence limit (LCL) around the arithmetic mean with the fixed GPS.

An LCL evaluation was completed for each Appendix IV parameter that has been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated, which includes arsenic, molybdenum, and selenium. The LCLs were calculated with

Sanitas™ using historical concentrations measured since assessment monitoring began in April 2018. The evaluation is provided in **Appendix A**. Based on the LCL evaluation using the complete data set, the arsenic results represent an SSL above the GPS for MW-303. However, molybdenum and selenium results to date do not represent SSLs above the GPS.

An LCL evaluation was also completed for all compliance and background wells using only the last eight sample results (**Appendix A**). Based on the LCL evaluation for the last eight sampling events, arsenic is at an SSL above the GPS at MW-303.

Arsenic was first determined to be at an SSL above the GPS at MW-303 in the evaluation of the October 2022 monitoring results. Based on a confidence band around a statistically significant increasing trend for the last eight monitoring events, as calculated using the Mann-Kendall/Sen's Slope analysis in Sanitas. The previously identified SSL for arsenic at MW-303 was attributed to alternative sources in an alternative source demonstration completed on June 9, 2023. In the evaluation of the April 2023 monitoring results, the arsenic concentration had decreased to a value below the GPS, and arsenic was not determined to be at an SSL above the GPS. The October 2023 arsenic result at MW-303 was higher than the April 2023 result with the evaluation of the result indicating that arsenic was at an SSL above the GPS. The October 2023 SSL was also attributed to alternative sources in an alternative source demonstration completed on May 2, 2024.

The April 2024 arsenic result at MW-303 was slightly higher than the October 2023 result and both exceeded the GPS; therefore, the arsenic results for this well were also evaluated for a potential increasing trend using a Mann-Kendall analysis (**Appendix A**). Trend analysis for the arsenic results obtained since assessment monitoring began indicated a significant increasing trend; however, the lower limit of the confidence band was below the GPS. To focus on the more recent data, Mann-Kendall trend analysis was also performed for the last eight samples (**Appendix A**). The analysis of the last eight samples indicated no significant increasing trend.

In summary, based on the LCL evaluation for the last eight sampling events, arsenic is at an SSL above the GPS at MW-303. The recent data do not indicate a significant increasing trend.

Time series plots for arsenic at the Primary Pond monitoring wells are provided in **Appendix B.**

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

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

The CCR Rule constituent results from background and compliance sampling for arsenic are provided in **Table 2**. The laboratory reports for the April 2024 assessment monitoring event were reviewed, finalized, and transmitted in September 2024, and will be included in the 2024 Annual

Groundwater Monitoring and Corrective Action Report to be completed in January 2025. Complete laboratory reports for the background monitoring events and the previous detection monitoring events were included in previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the COL Dry Ash Disposal Facility - Modules 1-3 for the October 2017 event (SCS, 2018).

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

2.1.1 Regional Information

For the purposes of groundwater monitoring, the surficial sand and gravel aquifer is considered the uppermost aquifer, as defined under 40 CFR 257.53. 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 C. 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 C.

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 C.

2.1.2 Site Information

Soils at the site are primarily sand to a depth of approximately 50 to 100 feet and overlie sandstone bedrock. Soils encountered during the site feasibility study for the COL Ash Disposal Facility were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301, MW-303, MW-304, and MW-305, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously-installed monitoring wells MW-84A and M-4R show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for Primary Ash Pond CCR monitoring wells are provided in Appendix B of the 2023 Annual Report (SCS Engineers, 2024). The boring log for monitoring well MW-316 is included in the October 2022 ASD for the Primary Pond (SCS Engineers, 2023), which is included in Appendix F of the 2023 Annual Report (SCS Engineers, 2024). All CCR monitoring wells are screened within the unconsolidated sand unit.

In the vicinity of the ash ponds, groundwater historically flowed radially away from the ponds in all directions when the ponds were in operation for CCR management. The October 2020 water table is shown on **Figure 3** as an example of the typical historical flow patterns.

As discussed in Section 1.2, closure activities for the Secondary Pond and Primary Ash Pond were ongoing in 2022 and 2023. The groundwater dewatering pumps for the Secondary Pond operated in 2022 and were shut off on November 30, 2022. Groundwater dewatering pumps for the Primary Ash Pond were turned on March 8, 2023, and shut off September 11, 2023. Primary Pond excavation began on March 20, 2023, and was completed on October 4, 2023. The October 2022, May 2023, and October 2023 water levels and apparent flow directions, shown on **Figures 4**, **5**, and **6**, reflect the influence of the dewatering and excavation of the Secondary Pond and the Primary Ash Pond. Excavation of the Primary Pond was completed just prior to the October 2023 sampling event. The April 2024 groundwater map (**Figure 7**) shows groundwater flow direction toward the Wisconsin River and generally shows that groundwater flow directions around the Primary Pond are no longer impacted by dewatering and excavation activities.

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-301 and MW-84A. The downgradient wells include MW-303, MW-304R, MW-305, and M-4R. Monitoring well MW-304 was damaged by heavy equipment during the impoundment closure. MW-304 was abandoned and replaced with MW-304R on March 18, 2024. The monitoring system was recertified on September 26, 2024. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 25 to 41 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Additional groundwater monitoring wells currently exist at COL as part of the monitoring systems developed for the state monitoring program and for the other CCR Units.

Monitoring wells for the state monitoring program are installed in the unconsolidated sand and gravel unit, which is the uppermost aquifer as defined under 40 CFR 257.53. This shallow monitoring system includes water table wells and mid-depth piezometers. Well depths range from approximately 14 to 76 feet, measured from the top of the well casing.

A temporary monitoring well, MW-316, was installed in April 2023 to support the source evaluation for the arsenic SSL in the ASD for the October 2022 monitoring event. Monitoring well MW-316 is located between well MW-303 and the Primary Ash Pond (**Figure 2**) and is also installed in the unconsolidated sand and gravel unit that comprises the uppermost aquifer.

3.0 METHODOLOGY AND ANALYSIS REVIEW

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

3.1 SAMPLING AND FIELD ANALYSIS

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSL. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field errors. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers.

Based on the review of field notes and comparison to previous results, no sampling error issues were identified in the laboratory analytical reports or the field notes that would indicate a sampling error may have caused or contributed to the observed SSL. The historical results for arsenic are summarized in Table 2.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2024 assessment monitoring event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSL for arsenic. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results.

Based on the review of the laboratory reports, SCS did not identify any issues that indicate the SSL for arsenic may have been due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for assessment monitoring.

A time series plot of the arsenic analytical data was also reviewed for anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plot is provided in Appendix B. Arsenic concentrations at MW-303 have been highly variable since sampling began, but the variations do not appear to reflect a sampling or laboratory error.

3.3 STATISTICAL EVALUATION REVIEW

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

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSL

Based on the review of the statistical evaluation, SCS did not identify any errors in the statistical evaluation that caused or contributed to the determination that arsenic was at an SSL above the GPS for the April 2024 assessment monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, arsenic was determined to be at an SSL above the GPS based on the April 2024 monitoring event. There were no changes to the SSL determinations for the April 2024 monitoring event based on the methodology and analysis review. No errors or issues causing or contributing to the reported SSL were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the arsenic SSL at monitoring well MW-303, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSL.

4.1 POTENTIAL CAUSES OF SSL

4.1.1 Natural Variation

Natural variation can cause or contribute to an SSL if the background concentration at the compliance well location is naturally higher than the upgradient concentrations and higher than the GPS. Since monitoring well MW-303 was not installed and sampled prior to operation of the Primary Pond and other CCR management activities at the site, the true background concentration at this location is not known. Natural arsenic concentrations can vary in groundwater in response to changes in soil type and redox conditions.

The arsenic concentrations at MW-303 can be compared with the concentrations at the upgradient wells and other compliance wells by reviewing the LCL evaluations (**Appendix A**) and the times series plot (**Appendix B**). Relative to the other wells, the arsenic concentrations for MW-303 are significantly higher and also much more variable. Based on the observed concentrations, it appears unlikely that natural variation is the primary cause of the arsenic SSL.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the arsenic SSL at Primary Pond monitoring well MW-303 could include the closed ash landfill, the product recycling area, or other CCR management activities.

Recent changes in groundwater flow due to dewatering activities make determination of man-made alternative sources uncertain. CCR removal activities from the Secondary Ash Pond and the Primary Pond in 2022 and 2023 could also contribute to movement of arsenic in groundwater from uncertain sources. Changes in groundwater flow direction and differing recharge patterns caused by dewatering and subsequent movement of surface water to the ponds could also affect the ambient redox conditions, and mobilize naturally occurring arsenic.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the GPS exceedance for arsenic is due to an alternative source include:

1. Monitoring well MW-316, installed between well MW-303 and the Primary Pond in 2023, has a low arsenic concentration.

2. CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentrations in samples from MW-316 are consistent with those results.

3. The effects of the completed dewatering activities on the arsenic concentrations at MW-303 indicate that the Primary Pond is not the source of arsenic at MW-303, and suggest the closed ash landfill is a more likely source.

4.2.1 Low Arsenic Concentration in Well MW-316

Monitoring well MW-316, installed between well MW-303 and the Primary Pond in 2023, has a low arsenic concentration. Elevated arsenic concentrations would be expected at MW-316 if the Primary Pond is the source of the arsenic SSL at MW-303.

Unlike the other Primary Pond compliance wells, which were installed at the edge of the Primary Pond, well MW-303 was installed approximately 700 feet south of the impounded water due to active ash management and beneficial use activities adjacent to the Primary Pond. Closure activities have since provided room to install the new well MW-316 approximately 500 feet closer to the Primary Pond. MW-316 was specifically installed to evaluate the Primary Pond as a potential source of the elevated arsenic in well MW-303. Prior to the groundwater dewatering and pond closure activities, groundwater flowed from the Primary Pond, past the location of the new MW-316 well, then toward well MW-303 (**Figures 2** and **3**).

Monitoring well MW-316 was installed on April 27, 2023, and sampled on May 5, 2023, October 9, 2023, and April 17, 2024. The laboratory results for the groundwater arsenic concentrations were 1.2 µg/L in May 2023, 1.6 µg/L in October 2023, and 2.6 µg/L in April 2024 (**Appendix D**). Since well MW-316 is located on the historical groundwater flow path between the Primary Pond and well MW-303, it appears unlikely that the Primary Pond is the source of the elevated arsenic in well MW-303.

4.2.2 Low Arsenic in Other Primary Pond Wells

CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentrations in temporary well MW-316 are consistent with those results. Due to historic radial flow outward from the Primary Pond, elevated arsenic concentrations at multiple compliance wells would be expected if the Primary Pond were the source of arsenic at MW-303.

Arsenic concentrations at Primary Pond compliance wells M-4R, MW-304, MW-304R, and MW-305 have ranged from less than 0.099 µg/L to 0.47 µg/L in well M-4R, from 0.63 µg/L to 3.2 µg/L in well MW-304, and from 0.20 µg/L to 1.4 µg/L in well MW-305 (**Table 2**). These wells are located immediately adjacent to the Primary Pond, which has historically been a source of groundwater infiltration with radial flow, while MW-303 is located much further from the Primary Pond, as discussed in **Section 4.2.1**. Based on the historical arsenic results for the Primary Pond wells located immediately adjacent to the pond, it appears unlikely that the Primary Pond is the source of the elevated arsenic in well MW-303.

4.2.3 Groundwater Dewatering Impacts on Arsenic Concentration in Well MW-303

The effects of the groundwater dewatering activities on the arsenic concentrations at MW-303 indicate that the Primary Pond is not the source of arsenic at MW-303, and suggest the closed ash landfill is a more likely source. Arsenic concentrations at MW-303 increased in 2022, when groundwater dewatering was ongoing for the Secondary Pond closure, decreased in 2023 when groundwater dewatering was ongoing for the Primary Pond closure, and increased after dewatering systems had been shut down in late 2023.

The arsenic result for well MW-303 from the April 2023 sampling event was 4.0 µg/L. This was the lowest arsenic concentration detected at MW-303 since the initiation of baseline sampling in 2015. The previously observed increasing trend in arsenic in 2022, followed by a sharp decrease in April

2023 and increase in October 2023, are likely related to temporary changes in flow direction induced by the dewatering systems operating around the Secondary Pond and Primary Pond during and following the pond closure activities.

Groundwater dewatering wells for closure of the Secondary Pond were installed from fall 2021 through summer 2022. The complete Secondary Pond groundwater dewatering system was operational by August 2, 2022, and continued to operate until November 30, 2022, discharging into the Primary Pond. In preparation for Primary Pond closure activities, discharge from the plant to the Primary Pond was reduced beginning in October 2022 and was terminated in March 2023. Groundwater dewatering for the Primary Pond closure began in March 2023 and was completed in September 2023.

Historically, the ponds were a source of infiltration, with groundwater mounding and radial flow (October 2020, **Figure 3**). Under dewatering conditions, flow was toward the dewatering wells around the Secondary Pond (e.g., October 2022, **Figure 4**) or the Primary Pond (e.g., May 2023, **Figure 5**). Shortly following the pump shutdown and completion of the excavation of the Primary Pond, groundwater continued to flow toward the Primary Pond from the MW-303 area (October 2023, **Figure 6**). For the period when flow was toward the Secondary Pond in 2022, MW-303 was located between the closed fly ash landfill and the Secondary Pond, which suggests that the closed fly ash landfill may be a source of elevated arsenic in MW-303. In May 2023, with flow toward the Primary Pond, MW-303 was no longer downgradient from the closed landfill, and the arsenic concentration decreased. In October 2023, water levels indicated flow toward the Primary Pond, but since the pumps had only recently been turned off it is likely that flow directions and groundwater levels were still recovering from pumping. Under these conditions, it is more difficult to confirm the source of arsenic at MW-303, but since the Primary Pond is downgradient from MW-303 it is not a likely source.

The water table map for April 2024 (**Figure 7**) shows conditions after more time had elapsed following the dewatering activities. The map shows that in April 2024, MW-303 was potentially downgradient from the closed fly ash landfill, with a higher water table elevation on the west side of the landfill than at MW-303, east of the landfill.

Due to dewatering, excavation, and closure of the ponds, arsenic concentrations at MW-303 have been highly variable, which may have been due to slight changes in groundwater flow direction or changes in redox conditions during periods of high or low recharge to the aquifer. The observed variations in concentration in combination with the observed variations in flow direction suggest that an alternative source of arsenic is likely.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSL reported for arsenic in compliance monitoring well MW-303 demonstrate that the SSL is likely due to sources other than the CCR Unit. The CCR wells located immediately adjacent to the Primary Pond have always had low arsenic. The low arsenic concentration in monitoring well MW-316, located between the Primary Pond and MW-303, is consistent with those results. Based on the recent flow direction changes associated with dewatering for the Primary and Secondary Pond closures and the observed changes in arsenic concentration at MW-303, the closed fly ash landfill appears to be a likely source of the elevated arsenic at MW-303.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.95(g)(3)(ii) of the CCR Rule, the Primary Pond CCR Unit may continue with assessment monitoring based on this ASD. The ASD report will be included in the 2024 Annual Report due January 31, 2025.

7.0 REFERENCES

SCS Engineers, 2018, Alternative Source Demonstration, October 2017 Detection Monitoring, Columbia Energy Center Dry Ash Disposal Facility, April 2018.

SCS Engineers, 2023, Alternative Source Demonstration, October 2022 Assessment Monitoring, Primary Ash Pond, Columbia Energy Center, June 9, 2023.

SCS Engineers, 2024, 2023 Annual Groundwater Monitoring and Corrective Action Report, Primary Ash Pond, Columbia Energy Center, January 31, 2024.

U.S. EPA, 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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.

Warzyn Engineering, Inc., 1979, and Preliminary Engineering Concepts, Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

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Tables

1 Groundwater Analytical Results Summary – April 2024 Event
2 Historical Analytical Results for Arsenic
3 Groundwater Elevation – State Monitoring Program and CCR Well Network

Table 1. Groundwater Analytical Results Summary - Assessment Monitoring
Columbia Generating Station - Primary Pond / SCS Engineers Project #25224067.00

Parameter Name	UPL/UTL Method	UPL		Background Wells		Compliance Wells					Supplemental Well
				MW-84A	MW-301	M-4R		MW-303	MW-304R	MW-305	MW-316
				4/17/2024	4/17/2024	4/17/2024	6/4/2024	4/17/2024	4/17/2024	4/17/2024	4/17/2024
Groundwater Elevation, ft amsl				784.90	785.27	781.38	783.66	782.16	783.25	780.80	782.09
Appendix III											
Boron, µg/L	NP	36.2		11.9	24.9	NS	930	2,470	822	NS	--
Calcium, µg/L	NP	126,000		73,700	102,000	NS	117,000	2,940	85500	NS	--
Chloride, mg/L	P	5.91		3.2	1.6 J	NS	16.3	<0.59	45.6	NS	--
Fluoride, mg/L	NP	0.2		0.12 J	<0.095	NS	0.25 J	<0.095	0.14 J	NS	--
Field pH, Std. Units	P	7.75		7.68	7.06	NS	7.19	9.58	7.37	NS	8.31
Sulfate, mg/L	NP	27.5		1.4 J	11.5	NS	119	335	163	NS	--
Total Dissolved Solids, mg/L	NP	514		322	458	NS	578	728	544	NS	--
Appendix IV		**UTL**	**GPS**								
Antimony, µg/L	NP	0.550	6	<0.15	<0.15	NS	0.30 J	0.38 J	0.17 J	NS	--
Arsenic, µg/L	NP	0.910	10	0.29 J	<0.28	NS	<0.28	40.4	1.8	NS	2.6
Barium, µg/L	P	18	2000	14.4	8.1	NS	36.1	3.8	92.0	NS	--
Beryllium, µg/L	NP	0.470	4	<0.25	<0.25	NS	<0.25	<0.25	<0.25	NS	--
Cadmium, µg/L	NP	0.530	5	<0.15	<0.15	NS	<0.15	<0.15	<0.15	NS	--
Chromium, µg/L	NP	2.6	100	2.1 J	<1.0	NS	1.4 J	74.3	1.4 J	NS	--
Cobalt, µg/L	NP	0.520	6	<0.12	<0.12	NS	0.34 J	0.47 J	0.88 J	NS	--
Fluoride, mg/L	NP	0.2	4	0.12 J	<0.095	NS	0.25 J	<0.095	0.14 J	NS	--
Lead, µg/L	NP	0.550	15	<0.24	<0.24	NS	0.75 J	<0.24	0.36 J	NS	--
Lithium, µg/L	P	0.872	40	0.67 J	0.63 J	NS	5.0	0.64 J	25.2	NS	--
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	NS	<0.066 1q	<0.066	<0.066	NS	--
Molybdenum, µg/L	NP	0.620	100	<0.44	<0.44	NS	9.7	82.0	52.2	NS	--
Selenium, µg/L	NP	0.710	50	<0.32	<0.32	NS	116	36.3	<0.32	NS	--
Thallium, µg/L	NP	0.660	2	<0.14	<0.14	NS	<0.14	<0.14	<0.14	NS	--
Radium 226/228 Combined, pCi/L	P	1.95	5	0.290	1.04	NS	1.16	0.481	1.08	NS	--

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

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

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
1q = Analyte was measured in the associated method blank at -0.070 ug/L.

Notes:
1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or a 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 (U.S. EPA) Maximum Contamination Level (MCLs), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs calculated based on results from background wells MW-84A and MW-301.
4. For compliance wells, only results confirmed above the LOQ are evaluated as potential statistically significant increases above background.
5. Interwell UPLs and UTLs were updated September 2024 based on background data collected through October 2023.
^. MW-4R and MW-305 were dry during the April 2024 sampling event. Re-sampling was attempted in June 2024, but MW-305 was still dry.

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Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Background	MW-301	12/22/2015	0.26 J
		4/5/2016	0.26 J
		7/8/2016	0.19 J, 1q
		10/13/2016	0.24 J
		12/29/2016	0.40 J, 1q
		1/25/2017	0.13 J
		4/11/2017	0.18 J, 1q
		6/6/2017	<0.28
		8/8/2017	<0.28
		4/25/2018	<0.28
		8/8/2018	0.45 J
		10/24/2018	<0.28
		4/2/2019	0.40 J
		10/9/2019	0.42 J
		2/3/2020	<0.28
		5/29/2020	0.33 J
		10/8/2020	0.62 J
		4/14/2021	<0.28
		10/14/2021	0.35 J
		4/13/2022	0.47 J
		10/27/2022	0.30 J
		4/27/2023	<0.28
		10/11/2023	<0.28
		4/17/2024	<0.28
	MW-84A	12/22/2015	0.15 J
		4/5/2016	0.29 J
		7/8/2016	0.14 J, 1q
		10/13/2016	0.35 J
		12/29/2016	0.19 J, 1q
		1/25/2017	0.35 J
		4/11/2017	<0.099 1q
		6/6/2017	<0.28
		8/8/2017	0.28 J
		4/25/2018	<0.28
		8/8/2018	<0.28
		10/24/2018	0.33 J
		4/3/2019	<0.28
		10/9/2019	0.46 J
		2/3/2020	0.38 J
		5/29/2020	0.34 J
		10/8/2020	0.49 J
		4/14/2021	0.91 J
		10/14/2021	0.41 J
		4/13/2022	0.31 J
		10/27/2022	0.72 J
		4/27/2023	<0.28
		10/11/2023	<0.28
		4/17/2024	0.29 J

Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Compliance	M-4R	12/22/2015	0.17 J
		4/4/2016	0.2 J
		7/7/2016	0.18 J
		10/12/2016	0.25 J
		1/25/2017	0.47 J
		4/11/2017	<0.099
		6/5/2017	0.33 J
		8/9/2017	<0.28
		4/23/2018	0.36 J
		8/7/2018	<0.28
		10/24/2018	<0.28
		4/1/2019	<0.28
		10/7/2019	0.37 J
		5/27/2020	0.39 J
		10/7/2020	0.44 J
		4/13/2021	<0.28
		10/11/2021	<0.28
		4/11/2022	<0.28
		10/25/2022	0.40 J
		4/17/2024	NS
	MW-303	12/21/2015	49.2
		4/4/2016	12.6
		7/7/2016	27.9
		10/12/2016	13.4
		1/26/2017	27
		4/10/2017	12.1
		6/6/2017	9.1
		8/8/2017	12.0
		4/24/2018	39.1
		8/8/2018	8.7
		9/21/2018	6.0
		10/24/2018	7.8
		4/1/2019	33.2
		6/19/2019	5.3
		10/7/2019	10.2
		5/27/2020	5.9
		10/7/2020	9.5
		2/25/2021	7.7
		4/12/2021	10.4
		7/20/2021	13.9
		10/12/2021	18.6
		2/24/2022	28.8
		4/12/2022	27.1
		7/27/2022	29.4
		10/26/2022	52.0
		4/24/2023	4.0
		10/9/2023	36.3
		4/17/2024	40.4

Table 2. Historical Analytical Results for Arsenic
Columbia Dry Ash Disposal Facility - Primary Pond

Well Group	Well	Collection Date	Arsenic (µg/L)
Compliance	MW-304	12/21/2015	2.3
		4/4/2016	1.1
		7/7/2016	1.2
		10/13/2016	1.8
		1/26/2017	0.99 J
		4/10/2017	0.98 J, 1q
		6/5/2017	1.1
		8/8/2017	1.0
		4/24/2018	0.64 J
		8/8/2018	0.76 J
		10/24/2018	1.6
		4/2/2019	0.63 J
		10/7/2019	3.2
		5/27/2020	1.3
		10/7/2020	2.8
		4/12/2021	1.8
		10/11/2021	1.6
		4/11/2022	0.87 J
	MW-304R	4/17/2024	1.8
	MW-305	12/21/2015	0.56 J
		4/4/2016	0.34 J
		7/8/2016	0.26 J, 1q
		10/13/2016	0.27 J
		1/25/2017	0.78 J
		4/10/2017	0.20 J, 1q
		6/5/2017	0.37 J
		8/7/2017	0.43 J
		4/23/2018	0.48 J
		8/7/2018	0.42 J
		10/24/2018	0.40 J
		4/1/2019	<0.28
		10/7/2019	0.49 J
		5/27/2020	0.75 J
		10/7/2020	0.95 J
		4/12/2021	0.95 J
		10/11/2021	1.4
		4/11/2022	0.59 J
		10/25/2022	1.3
		4/17/2024	NS
Supplementa —	MW-316	5/5/2023	1.2
		10/9/2023	1.6
		4/17/2024	2.6

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
J = Estimated value below the laboratory's limit of quantitation
1q = Analyte was measured in the associated method blank at a negative concentration.

Notes:
(1) Analytical laboratory reports provided in the Annual Groundwater Monitoring and Corrective Action Reports.
NS - not sampled

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Last revision by:	NLB	Date:	11/4/2024
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Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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	MW-93A	MW-93B	MW-312
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41	827.89	827.71	826.79
	Screen Length (ft)																	10	5	10
	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	50.7	82.5	52.5
	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	787.19	750.21	784.29
	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	NI	NI	NI
	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	NI	NI	NI
	October 8, 2013													785.66	785.42	785.97	785.52	NI	NI	NI
	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 (6)	NM	NM	NM	NM	NM	NM	NI	NI	NI
Dry Ash Facility (Facility ID #03025	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	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	NI	NI	NI
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 14, 2021	778.12	aband	787.29	784.27	784.05	784.77	784.77	784.46	c	785.84	785.81	785.60	785.86	785.69	786.47	786.06	NI	NI	NI
	June 11, 2021	NM	aband	NM	784.19	NM	784.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	October 11-12, 14, 2021	784.47	aband	786.78	783.73	783.60	784.42	784.41	783.88	783.87	784.96	784.88	784.79	785.14	784.94	785.55	785.11	NI	NI	NI
	October 17, 2021	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 1, 2022	aband	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 11-13, 2022	aband	aband	785.52	783.27	783.45	784.30	784.42	783.26	783.78	785.02	785.00	784.70	784.83	784.72	785.45	785.02	783.99	783.97	783.73
	October 24-28, 2022	aband	aband	785.43	781.94	781.61	783.61	783.61	782.28	dry	784.57	784.54	784.38	784.64	784.47	785.05	784.62	783.74	782.76	783.50
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	April 15-17, 2024	aband	aband	dry	783.02	782.94	784.14	784.11	782.95	783.41	784.90	784.84	784.54	784.61	784.57	785.19	784.75	783.88	783.87	783.59
	April 19, 2024	aband	aband	785.47	783.06	783.02	784.28	784.30	783.05	dry	785.05	785.01	784.67	784.74	784.62	785.63	785.16	783.95	783.95	783.68
	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	777.19	745.21	774.29

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
Ash Pond Facility (Facility ID #02325)	Top of Casing Elevation (feet amsl)	788.23	806.10	809.62	809.50	828.86	828.84	786.29	815.48	814.21	791.55	792.90
	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	April 12, 2021	782.30	786.34	783.66	783.65	784.13	784.08	782.79	784.08	783.97	783.15	783.49
	October 11-12, 14, 2021	781.03	786.33	782.94	782.85	783.09	783.03	781.94	783.11	783.04	782.15	782.66
	April 11-13, 2022	783.95	788.26	783.37	783.34	783.10	783.10	NM	782.99	783.40	783.93	783.83
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	NM	NM	NM	NM
	October 25, 26, 28, 2022	780.41	783.85	780.76	780.66	779.57	779.55	779.23	778.98	778.61	780.33	781.49
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	April 15-17, 2024	781.73	781.38	782.58	782.51	782.42	782.35	781.82	782.23	782.17	781.47	783.40
	April 19, 2024	NM	dry	782.78	782.80	782.57	782.56	NM	782.35	782.29	781.65	783.48

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

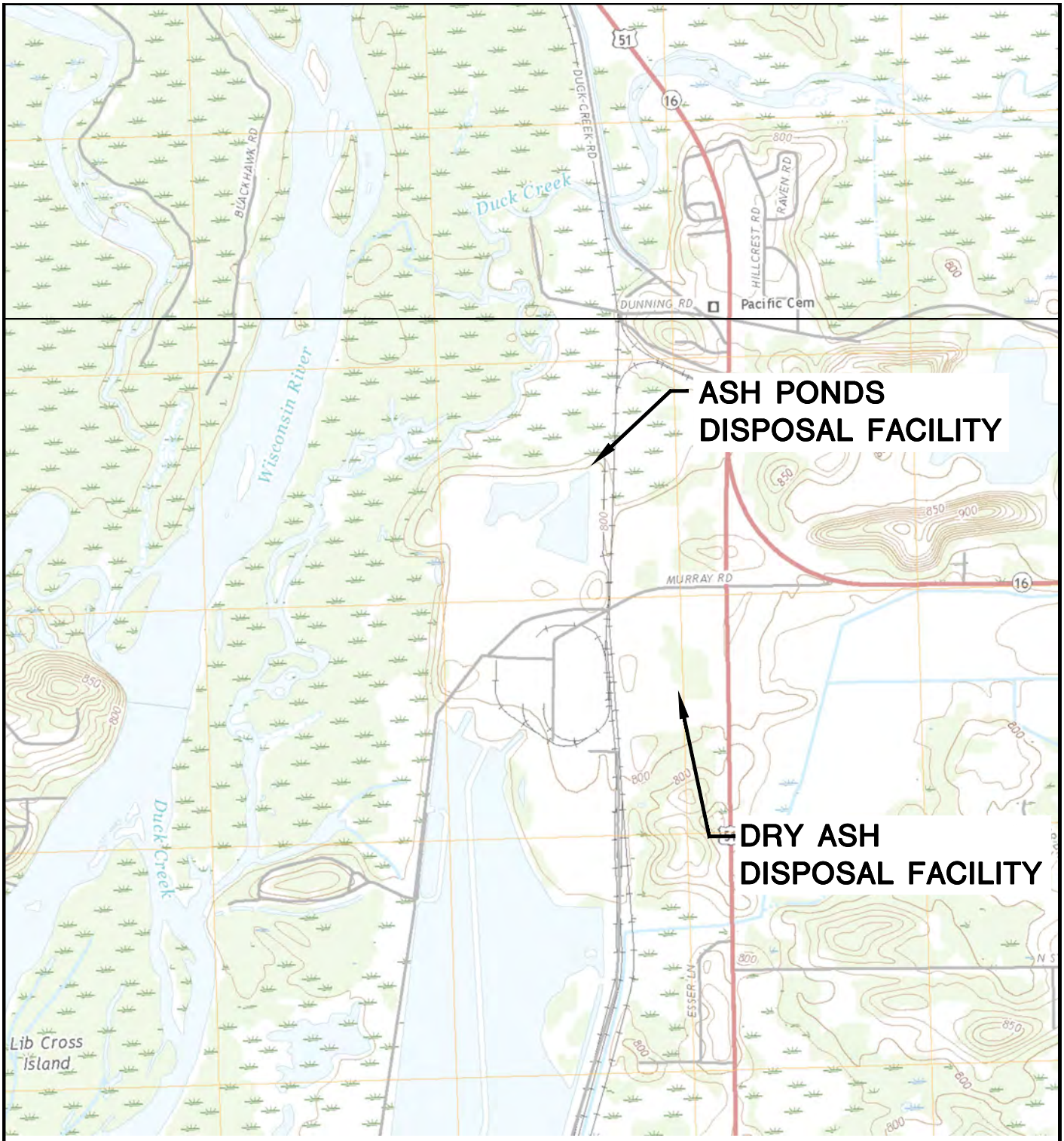
	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	819.36	820.94	828.77
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	785.1	787.9	791.2
	Measurement Date																								
	December 21-22, 2015	785.56	784.78	784.11	786.13	NI	788.96	787.58	783.77	783.50	785.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	April 4-5, 2016	786.78	785.81	785.48	788.08	NI	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 7-8, 2016	786.31	786.28	784.60	787.36	NI	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 28, 2016	NM	NM	784.35	NM	NI	NM	NM	NM	784.86	785.61	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-13, 2016	787.64	787.76	786.18	788.18	NI	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 29, 2016	787.37	787.05	NM	NM	NI	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	January 25-26, 2017	787.27	786.89	785.28	789.34	NI	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	NI	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	June 6, 2017	788.25	788.37	786.49	788.58	NI	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	August 7-9, 2017	787.34	787.55	785.42	789.52	NI	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 23-24, 2017	785.89	785.94	783.92	788.97	NI	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 21, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI	NI	NI	NI
	March 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI	NI	NI	NI
	April 23-25, 2018	785.29	784.37	783.27	789.69	NI	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83	NI	NI	NI	NI	NI	NI	NI	NI
	May 24, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI	NI	NI	NI
	June 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI	NI	NI	NI
	July 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI	NI	NI	NI
	August 7, 2018	787.06	NM	785.20	788.25	NI	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 22, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI	NI	NI	NI
	September 21, 2018	NM	788.37	786.50	NM	NI	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66	NI	NI	NI	NI	NI	NI	NI	NI
	October 22-24, 2018	788.98	789.16	787.51	789.05	NI	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64	NI	NI	NI	NI	NI	NI	NI	NI
	April 1-4, 2019	787.04	787.56	786.52	789.72	NI	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38	NI	NI	NI	NI	NI	NI	NI	NI
	June 12, 2019	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI	NI	NI	NI
	June 19, 2019	NM	NM	786.81	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-9, 2019	788.47	788.31	787.02	790.41	NI	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI	NI	NI	NI
	December 13, 2019	--	--	--	--	NI	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	NI	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI	NI	NI	NI
CCR Rule Wells	January 17, 2020	--	--	785.58	--	NI	--	--	--	--	--	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 3, 2020	787.24	NM	NM	NM	NI	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	May 27-29, 2020	787.77	787.29	785.56	789.30	NI	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85	NI	NI	NI	NI	NI	NI	NI	NI
	June 30, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 6, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-8, 2020	786.53	786.74	785.16	788.52	NI	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83	NI	NI	NI	NI	NI	NI	NI	NI
	December 11, 2020	NM	NM	NM	NM	NI	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 25, 2021	NM	NM	784.27	NM	NI	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 12, 2021	786.50	785.77	784.07	787.99	NI	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15	NI	NI	NI	NI	NI	NI	NI	NI
	June 11, 2021	NM	NM	NM	NM	NI	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI	NI	NI	NI
	July 20, 2021	NM	NM	783.64	NM	NI	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	NI	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48	NI	NI	NI	NI	NI	NI	NI	NI
	December 21, 2021	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 24, 2022	NM	NM	782.34	NM	NI	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 11-13, 2022	785.44	784.42	783.40	788.20	NI	787.87	788.26	783.27	784.30	785.02	783.11	783.32	784.19	783.14	783.19	783.04	NI	NI	NI	NI	NI	NI	NI	NI
	July 27, 2022	NM	NM	783.07	NM	NI	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 25-27, 2022	784.91	784.62	778.94	781.79	NI	784.97	783.85	781.94	783.61	784.57	778.32	777.89	784.16	781.50	780.96	781.23	NI	NI	NI	NI	NI	NI	NI	NI
	November 30, 2022	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI	NI	NI	NI
	December 2, 2022	785.12	784.48	NM	783.97	NI	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	January 12-13, 2023	785.20	784.55	NM	NM	NI	NM	NM	782.75	784.10	784.88	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI	NI	NI	NI
	January 20, 2023	NM	NM	NM	788.08	NI	NM	NM	NM	NM	NM	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI
	January 24, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI	NI	NI	NI
	February 20-23, 2023	785.56	784.98	NM	NM	NI	NM	NM	NM	NM	NM	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI	NI	NI	NI
	March 27-28, 2023	786.83	785.87	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI	NI	NI	NI
	April 24-27, 2023	787.57	786.87	784.38	784.03	NI	NM	782.59	785.79	786.22	786.97	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI	NI	NI	NI
	May 5, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49	NI	NI	NI
	May 16, 2023	787.43	787.07	783.88	784.12	NI	dry	781.64	785.64	786.06	786.88	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48	NI	NI	NI
	May 30-31, 2023	787.04	786.89	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM	NI	NI	NI
	June 29-30, 2023	786.32	786.39	NM	NM	NI	NM	NM	784.32	785.04	785.92	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM	NI	NI	NI
	July 31, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM	NI	NI	NI
	August 31, 2023	NM	785.30	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM	NI	NI	NI
	October 9-11, 2023	784.67	784.65	781.21	780.09	NI	779.93	780.54	782.57	783.55	784.39	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30	NI	NI	NI
	November 9, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.76	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	November 20, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	781.97	781.45	782.85	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	December 27, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.18	783.36	NM	NI	NI	NI
	April 15-17, 2024	785.27	784.49	782.16	aband	782.17	780.80	781.38	783.02	784.14	784.90	782.40	782.24	784.51	782.79	782.68	782.64	783.59	783.16	783.42	783.53	782.09	783.60	783.62	785.76
	April 19, 2024	785.51	784.55	782.26	aband	782.23	dry	dry	783.06	784.28	785.05	NM	782.64	784.69	782.90	782.82	782.74	783.68	783.30	783.49	783.62	782.15	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	773.61	780.72	766.52	777.21	770.52	774.07	780.63	780.39	778.90	775.60	775.21	773.55	774.29	774.10	776.61	774.18	764.79	775.06	777.94	781.17

Notes:
NM = not measured
NI = not installed
aband = abandoned
(1) 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 October 10, 2017.
(2) MW-303 was extended in 2022 due to regrading. Prior to October 2022, the TOC elevation was 811.52'. For events in October 2022 and later, the TOC elevation is 815.72'.
(3) A supplemental water level measurement event was conducted on April 19, 2024.

Created by: MDB Date: 5/6/2013
Last revision by: RM Date: 8/19/2024
Checked by: BLR Date: 8/21/2024

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations
3 Water Table Map – October 2020
4 Water Table Map – October 2022
5 Water Table Map – May 2023
6 Water Table Map – October 2023
7 Water Table Map – April 2024



N

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

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

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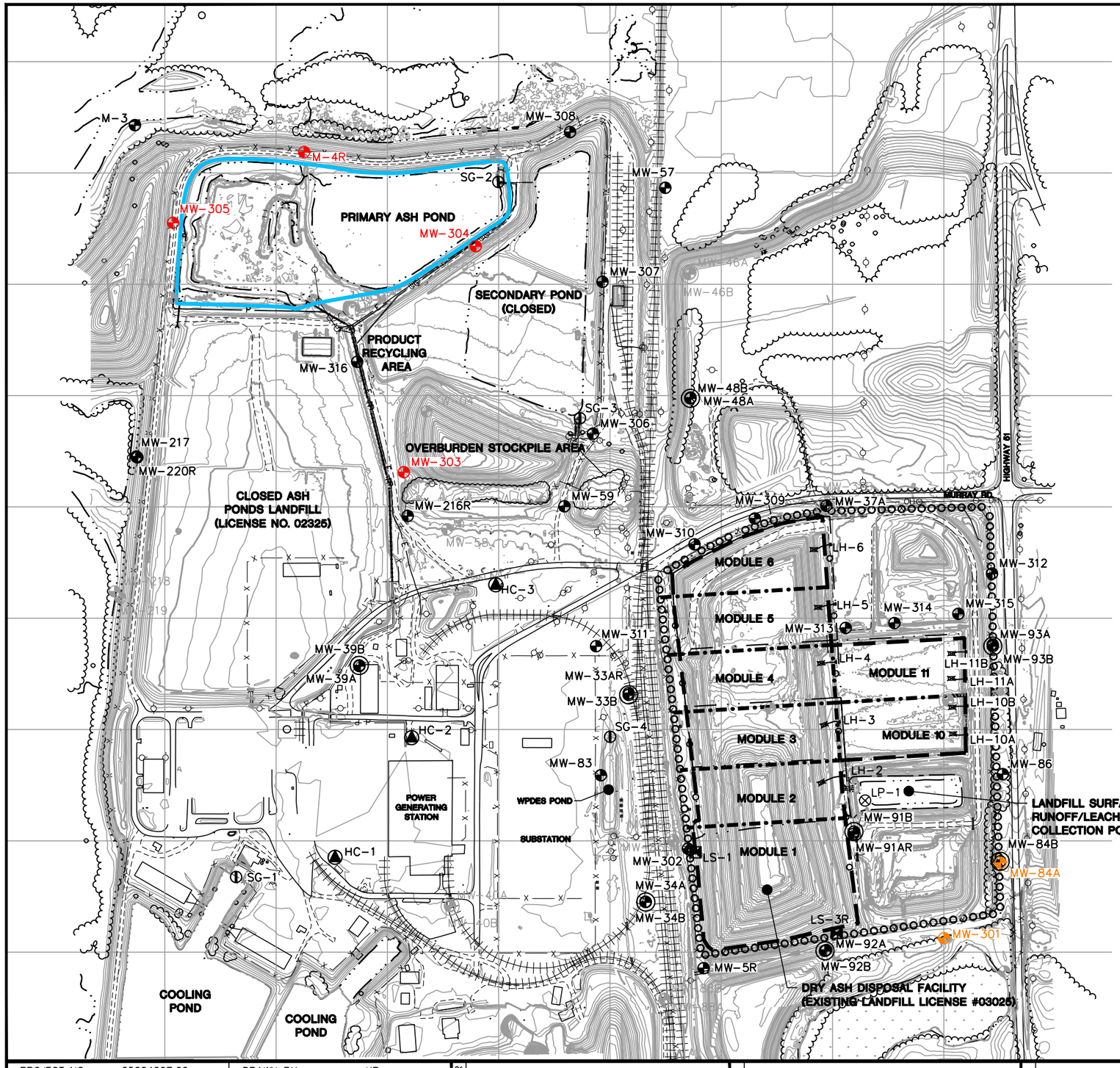


LEGEND

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

N

500 0 500

SCALE: 1" = 500'

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. BACKGROUND MONITORING WELLS FOR THE PRIMARY POND ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	04/19/2024	APPROVED BY:	TK 05/01/2024

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

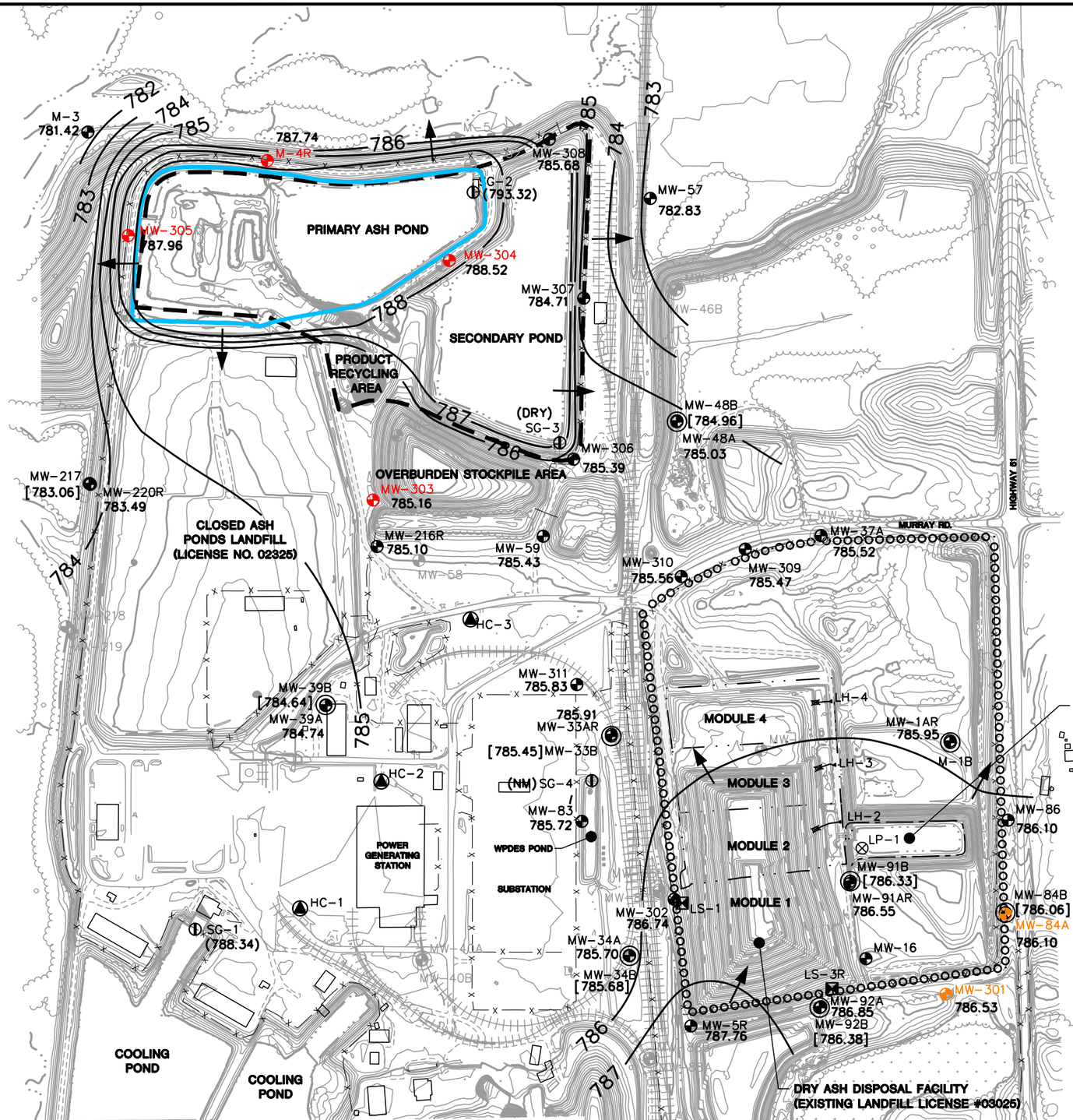
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25224067.00\Drawings\Primary Pond\Site Plan and Monitoring Well Locations.dwg, 4/24/2024 3:32:01 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCE LINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
- CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- **787.62** WATER TABLE ELEVATION MEASURED 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. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS AND PIEZOMETERS ON OCTOBER 7, 8, AND 17, 2020.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP/ZTW
DRAWN:	08/07/2020	CHECKED BY:	TK
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

CLIENT: ALLIANT ENERGY
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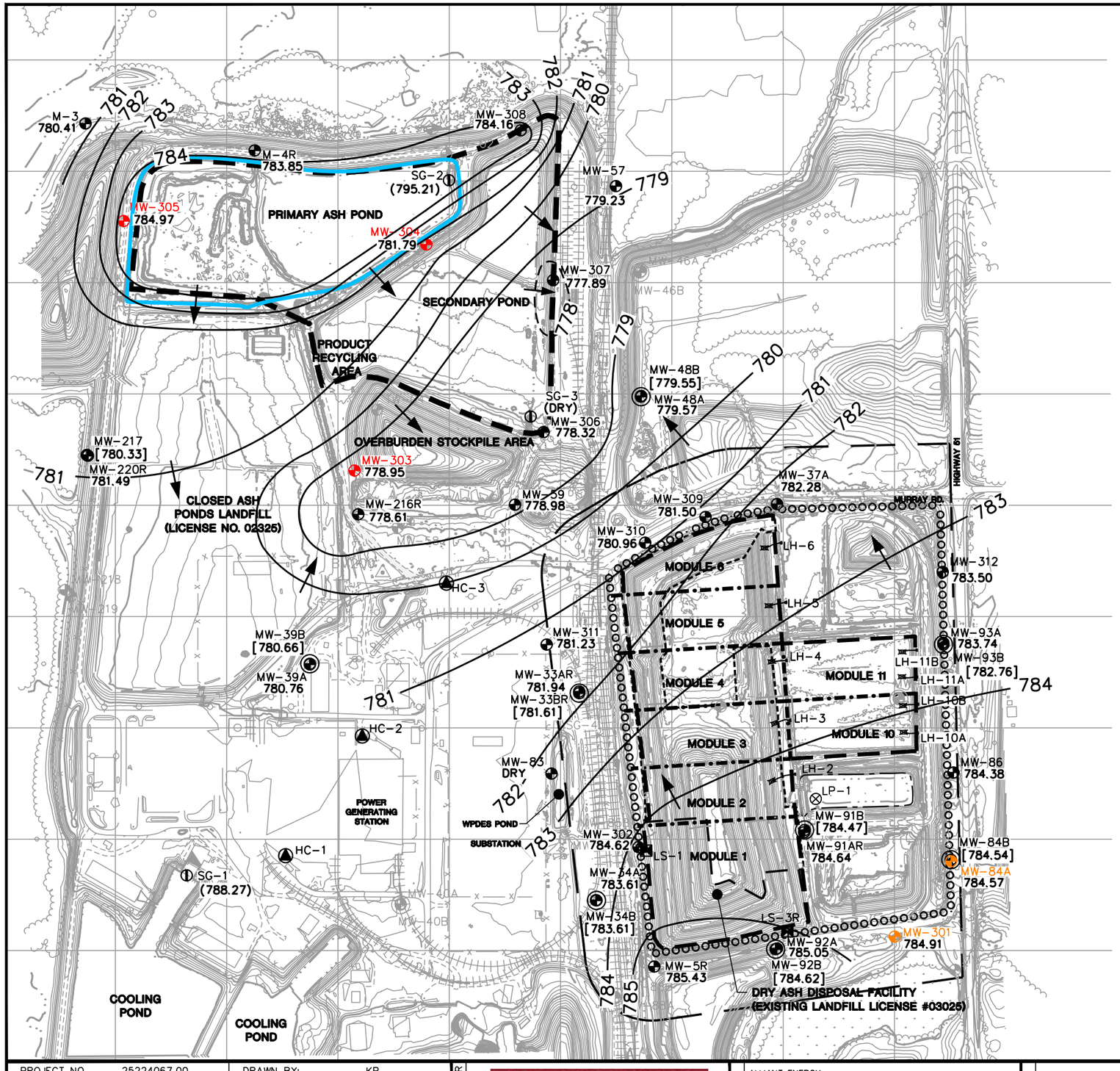
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2020

FIGURE 3

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map Oct 2020 PP.dwg, 4/18/2024 3:35:58 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (795.20) — SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 25–27, 2022.
3. DEWATERING WELLS (NOT SHOWN) AROUND THE SECONDARY POND WERE PUMPING AND DISCHARGING TO THE PRIMARY POND DURING THE OCTOBER 2022 SAMPLING EVENT.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	NLB
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

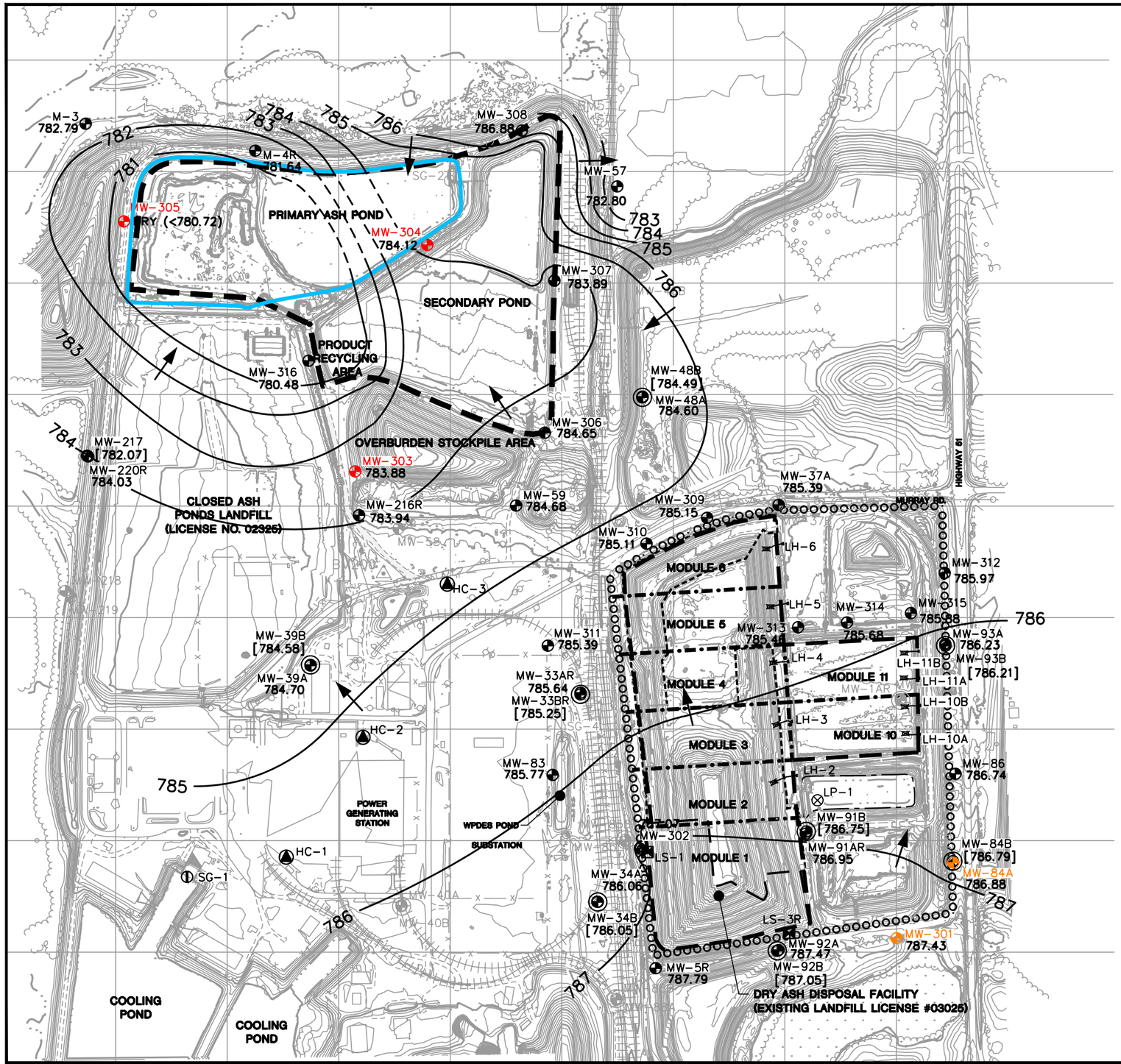
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2022

FIGURE
4

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map - Oct 22.dwg, 4/18/2024 3:23:48 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- ABANDONED STAFF GAUGE
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON MAY 16, 2023.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	06/01/2023	CHECKED BY:	NLB
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

CLIENT: ALLIANT ENERGY
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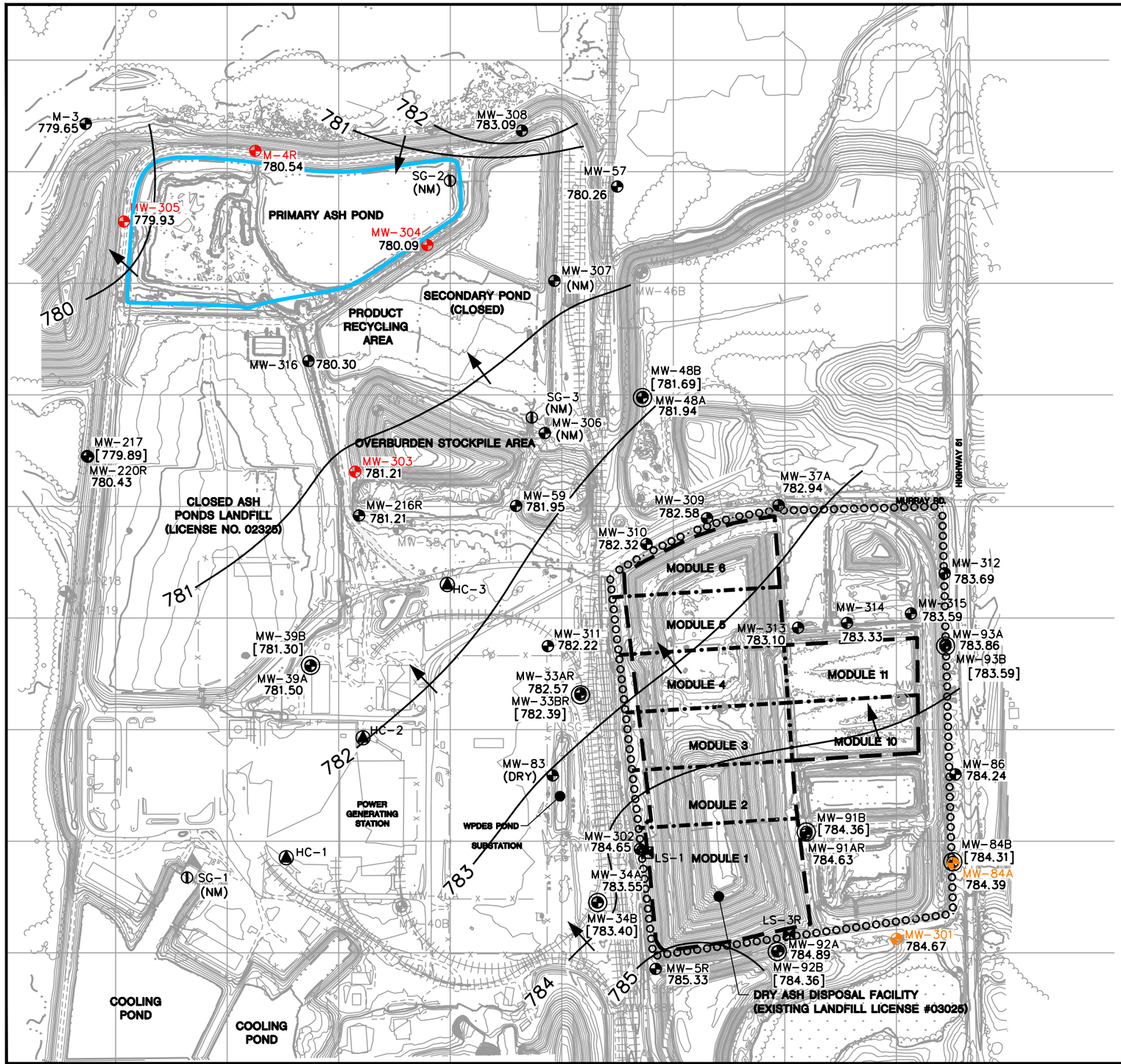
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
MAY 2023

FIGURE 5

\\Mad-fs01\data\Projects\25224067.00\Drawings\Water Table Map - May 23.dwg, 4/18/2024 3:25:56 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (NM) — NOT MEASURED
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. SEE FIGURE 2, SITE PLAN AND MONITORING WELL LOCATIONS, FOR BASE MAP NOTES.
2. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 9–11, 2023.
3. DEWATERING PUMPING WAS STOPPED BY SEPTEMBER 11, 2023.
4. EXCAVATION OF CCR MATERIAL FROM THE PRIMARY POND WAS COMPLETED OCTOBER 4, 2024.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	11/13/2023	CHECKED BY:	RM
REVISED:	04/18/2024	APPROVED BY:	TK 05/01/2024

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

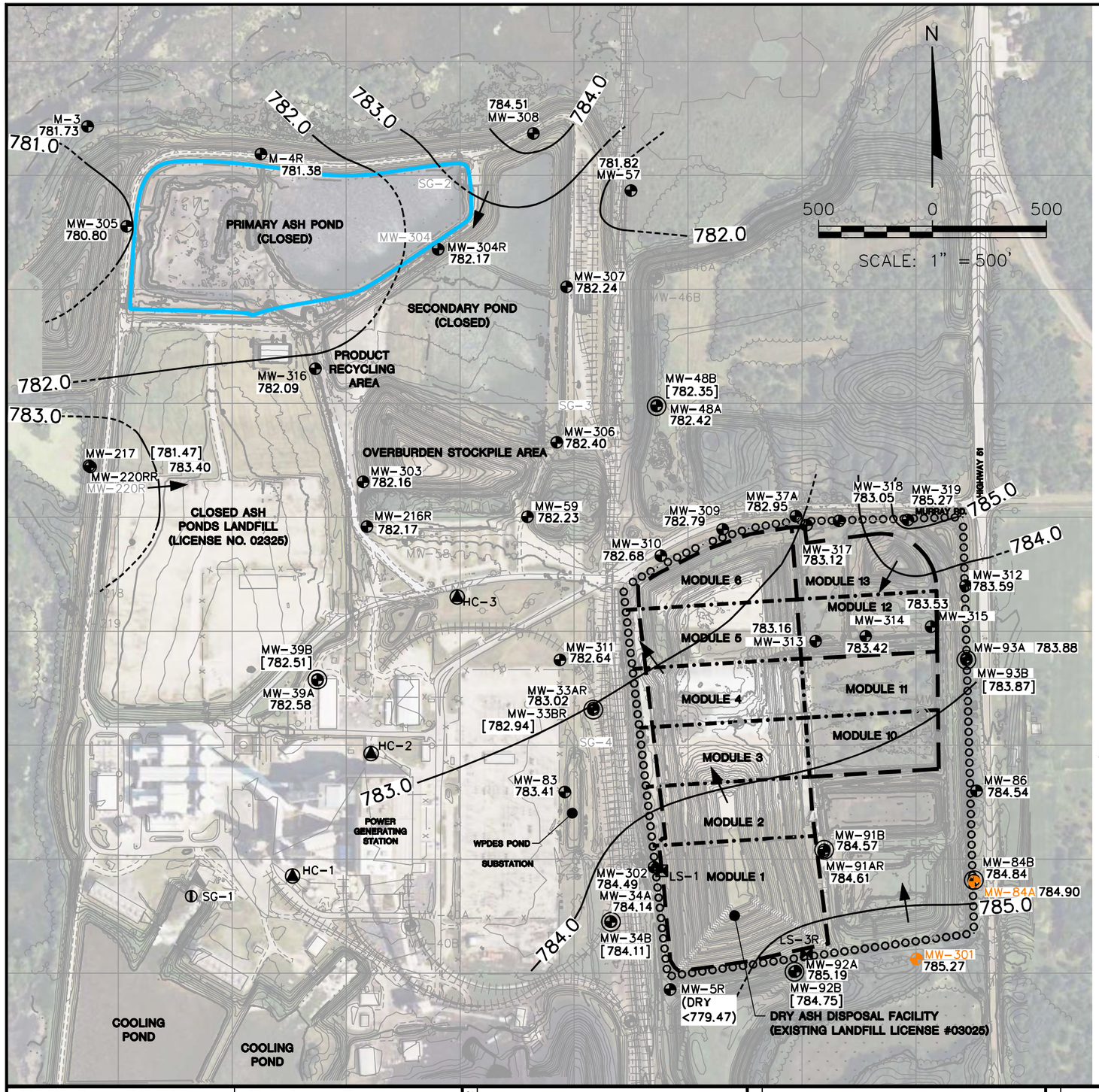
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2023

FIGURE
6

I:\25224067.00\Drawings\Primary Pond\Water Table Map-October 2023.dwg, 4/24/2024 3:34:37 PM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 783.88 — WATER TABLE ELEVATION
- [781.47] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (DRY) — SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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.
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4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 12-14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE PRIMARY ASH POND ARE: MW-301 AND MW-84A.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
10. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK
REVISED:	10/25/2024	APPROVED BY:	BRK (10/30/2024)

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

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

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
APRIL 15-17, 2024
PRIMARY POND

FIGURE 7

I:\25224067.00\Drawings\COL April 2024 WTBL CCR Units.dwg, 11/5/2024 1:00:39 PM

Appendix A

Statistical Evaluation

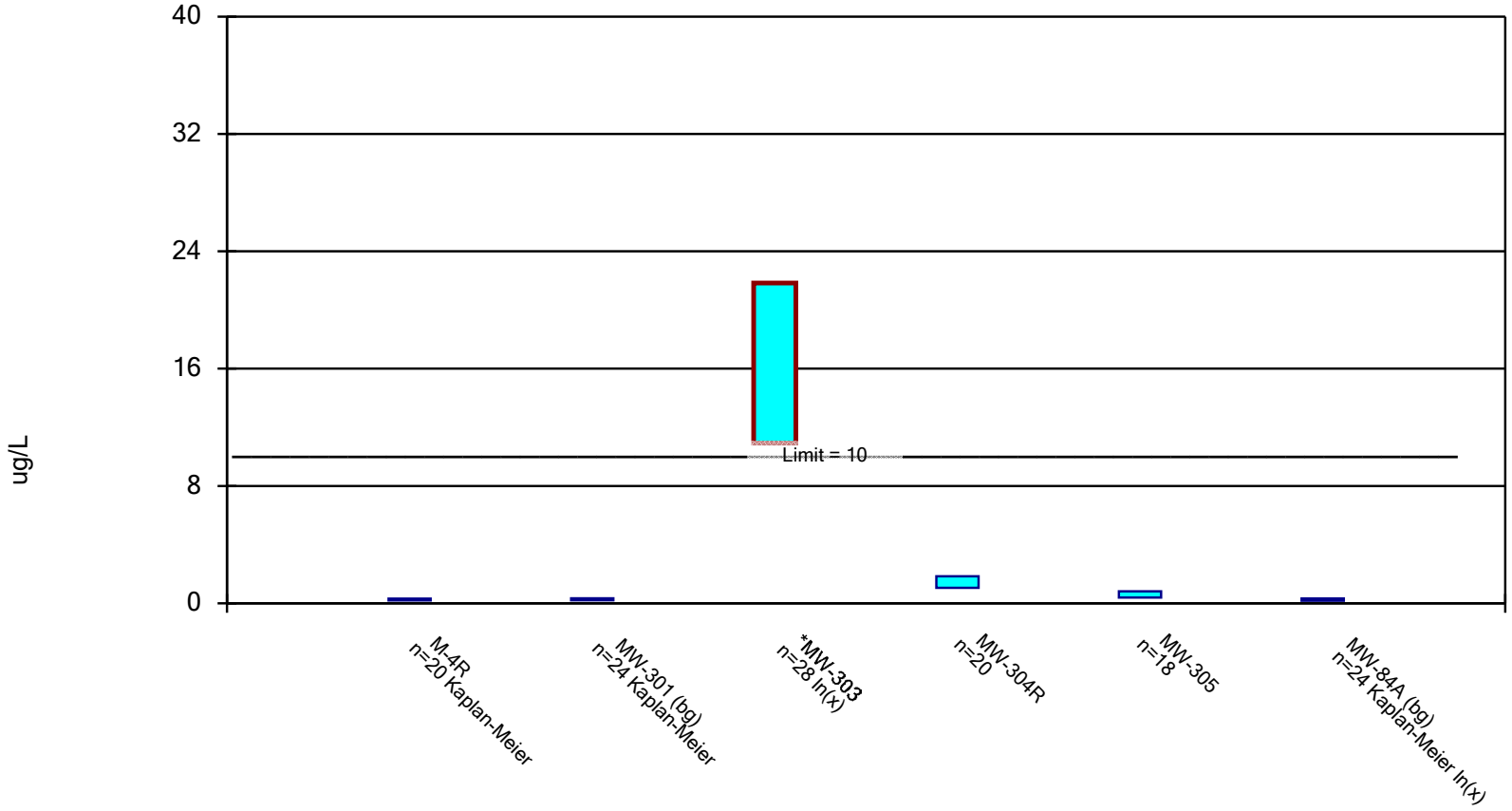
Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:26 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.3189	0.1909	10	No	20	45	No	0.01	Param.
Arsenic (ug/L)	MW-301 (bg)	0.3344	0.2091	10	No	24	37.5	No	0.01	Param.
Arsenic (ug/L)	**MW-303**	**21.84**	**10.92**	**10**	**Yes**	**28**	**0**	**ln(x)**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304R	1.837	1.05	10	No	20	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	0.8179	0.391	10	No	18	5.556	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.3321	0.1788	10	No	24	29.17	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	26.79	14.76	100	No	20	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.35	100	No	24	79.17	No	0.01	NP (NDs)
Molybdenum (ug/L)	MW-303	101	71.54	100	No	24	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304R	15.16	6.481	100	No	20	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	70.42	45.66	100	No	23	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.44	0.073	100	No	24	87.5	No	0.01	NP (NDs)
Selenium (ug/L)	M-4R	12.02	3.992	50	No	20	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-301 (bg)	0.39	0.3	50	No	24	75	No	0.01	NP (normality)
Selenium (ug/L)	MW-303	38	20.22	50	No	23	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304R	0.33	0.21	50	No	20	80	No	0.01	NP (NDs)
Selenium (ug/L)	MW-305	7.422	4.185	50	No	18	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.32	0.21	50	No	24	95.83	No	0.01	NP (NDs)

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			49.2	2.3	0.56 (J)	
12/22/2015	0.17 (J)	0.26 (J)				0.15 (J)
4/4/2016	0.2 (J)		12.6	1.1	0.34 (J)	
4/5/2016		0.26 (J)				0.29 (J)
7/7/2016	0.18 (J)		27.9	1.2		
7/8/2016		0.19 (J)			0.26 (J)	0.14 (J)
10/12/2016	0.25 (J)		13.4			
10/13/2016		0.24 (J)		1.8	0.27 (J)	0.35 (J)
12/29/2016		0.4 (J)				0.19 (J)
1/25/2017	0.47 (J)	0.13 (J)			0.78 (J)	0.35 (J)
1/26/2017			27	0.99 (J)		
4/10/2017			12.1	0.98 (J)		
4/11/2017	<0.099 (U)	0.18 (J)				<0.099 (U)
6/5/2017	0.33 (J)			1.1	0.37 (J)	
6/6/2017		<0.28 (U)	9.1			<0.28 (U)
8/7/2017					0.43 (J)	
8/8/2017		<0.28 (U)	12	1		0.28 (J)
8/9/2017	<0.28 (U)					
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

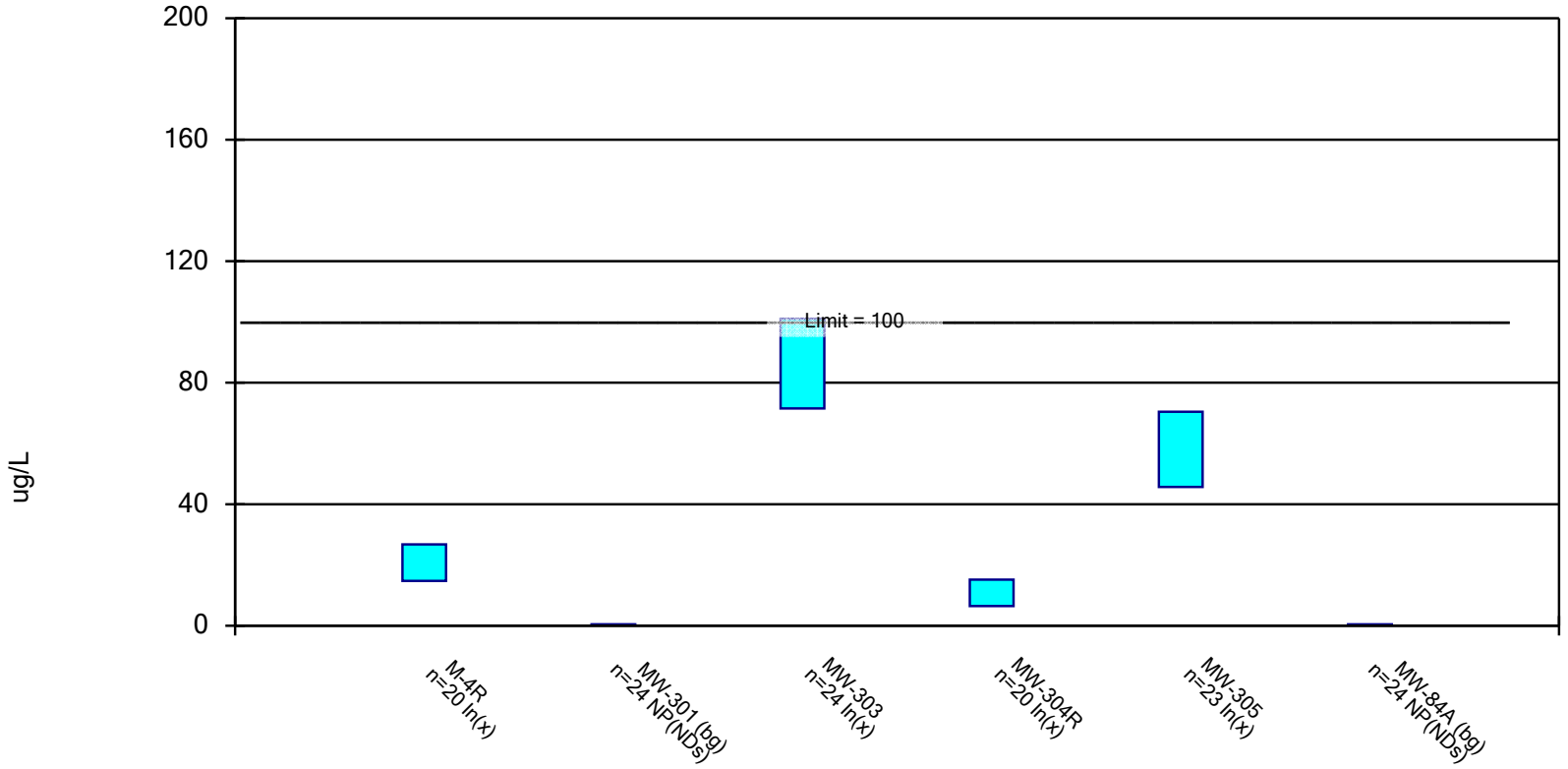
Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
4/17/2024		<0.28	40.4	1.8		0.29 (J)
6/4/2024	<0.28					
Mean	0.295	0.3133	19.91	1.444	0.6044	0.3404
Std. Dev.	0.09259	0.1049	14.14	0.6931	0.3528	0.1746
Upper Lim.	0.3189	0.3344	21.84	1.837	0.8179	0.3321
Lower Lim.	0.1909	0.2091	10.92	1.05	0.391	0.1788

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			195	15.6	33.2	
12/22/2015	14.6	0.35 (J)				<0.07 (U)
4/4/2016	9.9		62.6	9.2	37.3	
4/5/2016		0.15 (J)				<0.07 (U)
7/7/2016	13.2		69.5	21.9		
7/8/2016		0.14 (J)			34.8	0.073 (J)
10/12/2016	11.6		91.9			
10/13/2016		0.12 (J)		17.1	40.2	0.12 (J)
12/29/2016		0.38 (J)				<0.07 (U)
1/25/2017	17.6	<0.07 (U)			69.1	<0.07 (U)
1/26/2017			91.2	14.4		
4/10/2017			103	10.1		
4/11/2017	14.5	<0.07 (U)				<0.07 (U)
6/5/2017	11.9			15.6	41.3	
6/6/2017		<0.44 (U)	87			<0.44 (U)
8/7/2017					68.7	
8/8/2017		<0.44 (U)	81.6	11.8		<0.44 (U)
8/9/2017	15.8					
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

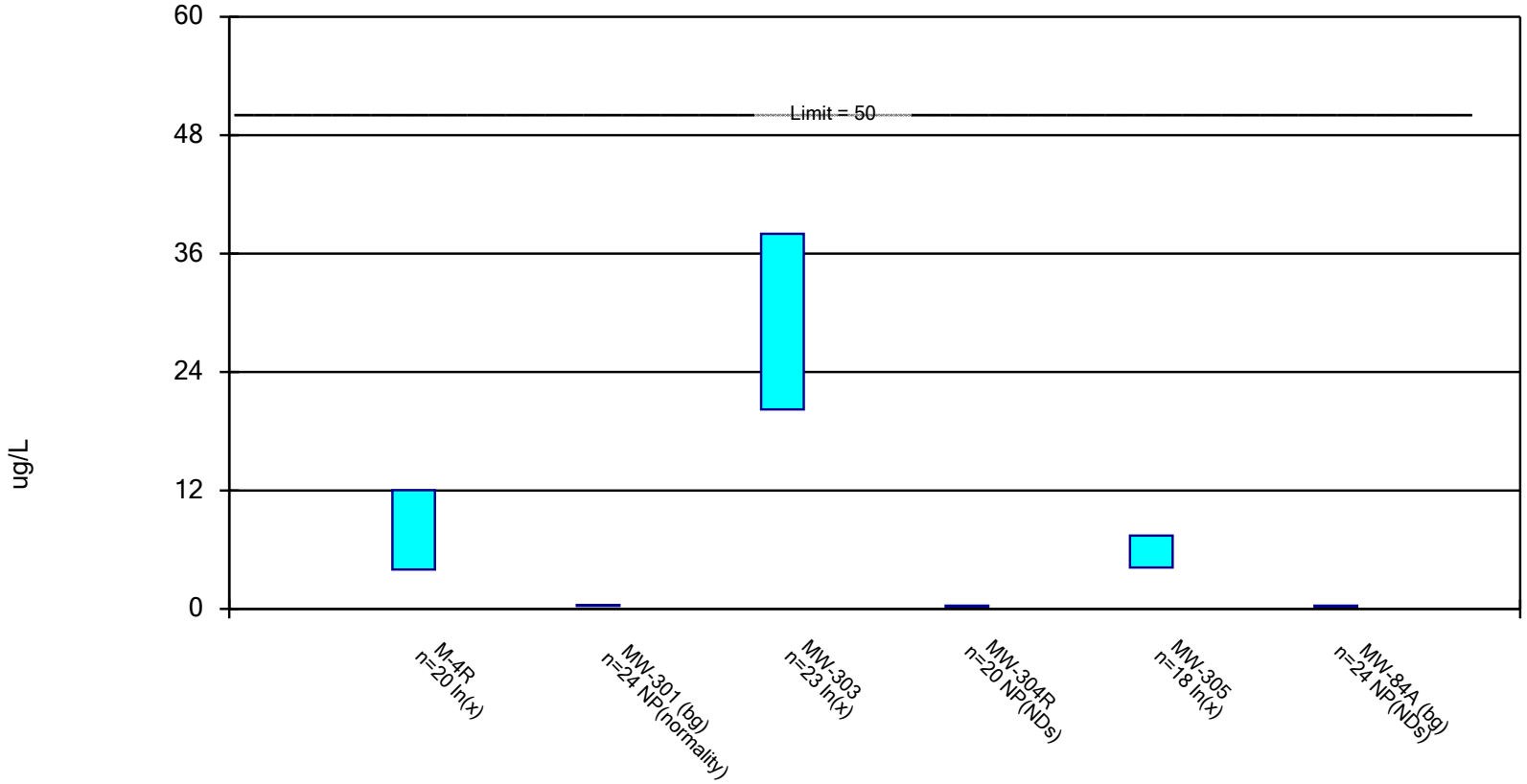
Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
4/17/2024		<0.44	82	52.2		<0.44
6/4/2024	9.7					
Mean	22.85	0.365	90.18	12.8	61.8	0.3418
Std. Dev.	13.41	0.1363	34.96	10.64	27.59	0.1772
Upper Lim.	26.79	0.44	101	15.16	70.42	0.44
Lower Lim.	14.76	0.35	71.54	6.481	45.66	0.073

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 8/6/2024 2:25 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
12/21/2015			126	1	3.7	
12/22/2015	3	0.3 (J)				<0.21 (U)
4/4/2016	6.4		24	<0.21 (U)	3	
4/5/2016		0.21 (J)				<0.21 (U)
7/7/2016	15.3		26.6	<0.21 (U)		
7/8/2016		0.39 (J)			4.8	<0.21 (U)
10/12/2016	7.7		25			
10/13/2016		<0.21 (U)		<0.21 (U)	3.7	<0.21 (U)
12/29/2016		0.26 (J)				<0.21 (U)
1/25/2017	10.5	<0.21 (U)			6.8	<0.21 (U)
1/26/2017			32.8	<0.21 (U)		
4/10/2017			25.9	<0.21 (U)		
4/11/2017	13.3	<0.21 (U)				<0.21 (U)
6/5/2017	9.7			<0.32 (U)	3.9	
6/6/2017		<0.32 (U)	18.3			<0.32 (U)
8/7/2017					5.2	
8/8/2017		<0.32 (U)	19.7	<0.32 (U)		<0.32 (U)
8/9/2017	15					
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/17/2024		<0.32	36.3	<0.32		<0.32
6/4/2024	116					
Mean	12.88	0.3246	34.02	0.3675	6.333	0.2946
Std. Dev.	24.68	0.1017	27.33	0.2392	4.201	0.0642
Upper Lim.	12.02	0.39	38	0.33	7.422	0.32
Lower Lim.	3.992	0.3	20.22	0.21	4.185	0.21

ND substitution: RL or RL/2 if <15% NDs.

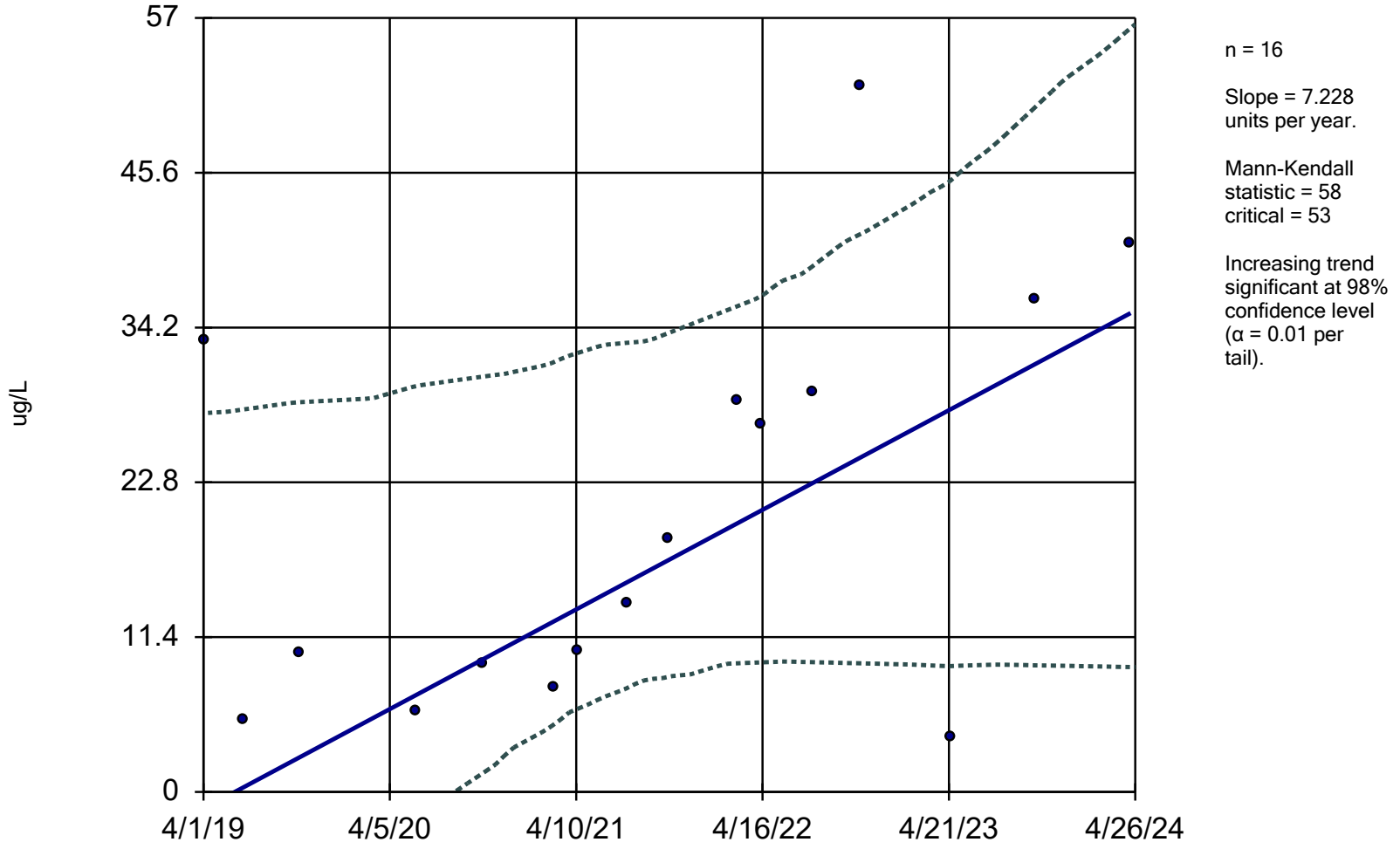
Trend Test

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:34 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	**MW-303**	**7.228**	**58**	**53**	**Yes**	**16**	**0**	**n/a**	**n/a**	**0.02**	**NP**

Arsenic

MW-303



Sen's Slope and 98% Confidence Band Analysis Run 8/6/2024 2:33 PM View: COL Primary Pond

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

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:34 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-303	LCL	UCL
4/1/2019	33.2	-16.31	27.9
6/19/2019	5.3	-13.76	28.17
10/7/2019	10.2	-9.96	28.69
5/27/2020	5.9	-2.269	29.9
10/7/2020	9.5	1.378	30.58
2/25/2021	7.7	4.958	31.65
4/12/2021	10.4	6.109	32.3
7/20/2021	13.9	7.648	33.07
10/12/2021	18.6	8.48	33.81
2/24/2022	28.8	9.475	35.75
4/12/2022	27.1	9.541	36.47
7/27/2022	29.4	9.555	38.78
10/26/2022	52	9.473	41.05
4/24/2023	4	9.268	44.99
10/9/2023	36.3	9.328	50.39
4/17/2024	40.4	9.199	56.25

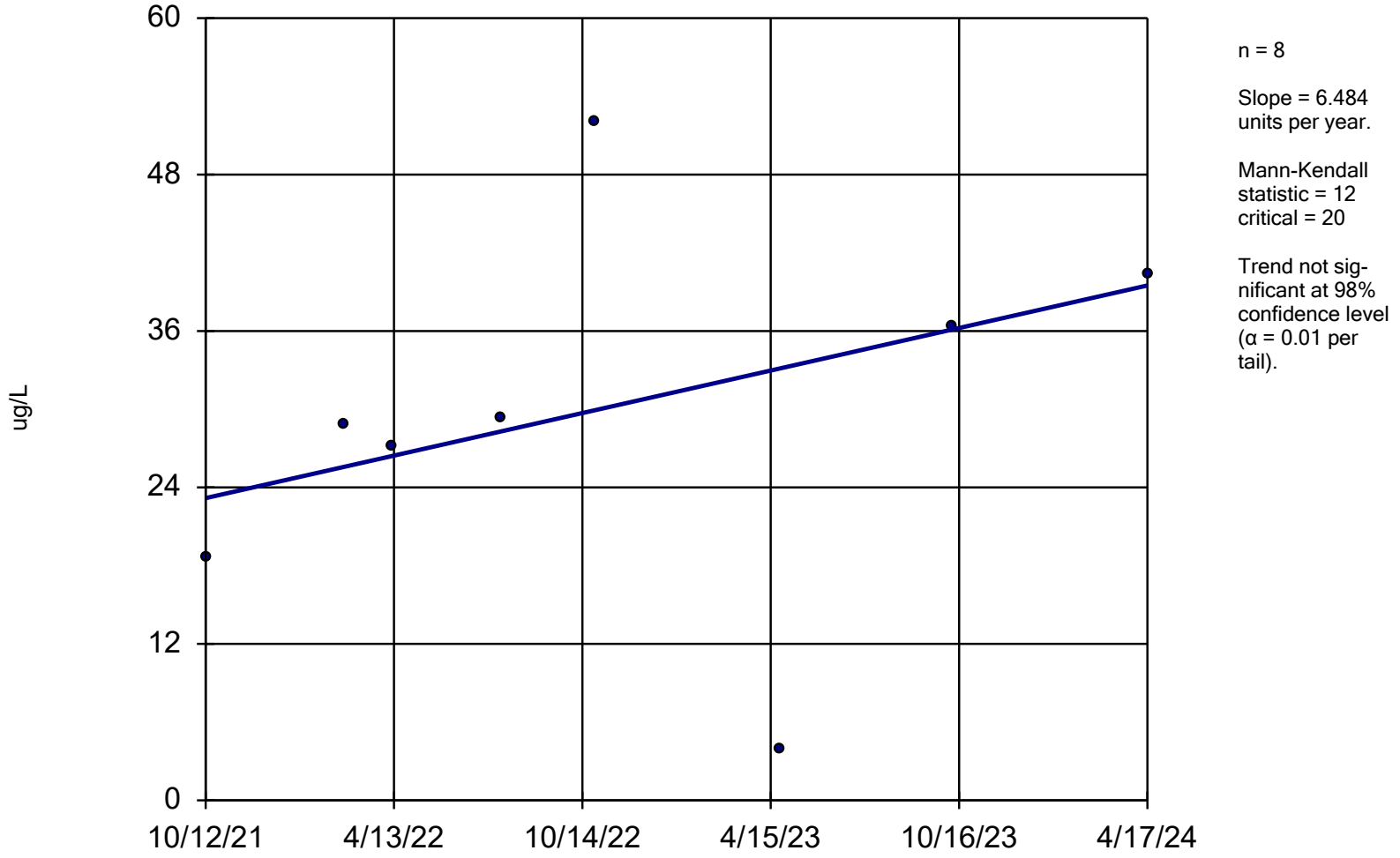
Trend Test

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:36 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (ug/L)	MW-303	6.484	12	20	No	8	0	n/a	n/a	0.02	NP

Arsenic

MW-303



Sen's Slope and 98% Confidence Band Analysis Run 8/6/2024 2:35 PM View: COL Primary Pond

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

Sen's Slope Estimator

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:36 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-303
4/1/2019	33.2
6/19/2019	5.3
10/7/2019	10.2
5/27/2020	5.9
10/7/2020	9.5
2/25/2021	7.7
4/12/2021	10.4
7/20/2021	13.9
10/12/2021	18.6
2/24/2022	28.8
4/12/2022	27.1
7/27/2022	29.4
10/26/2022	52
4/24/2023	4
10/9/2023	36.3
4/17/2024	40.4

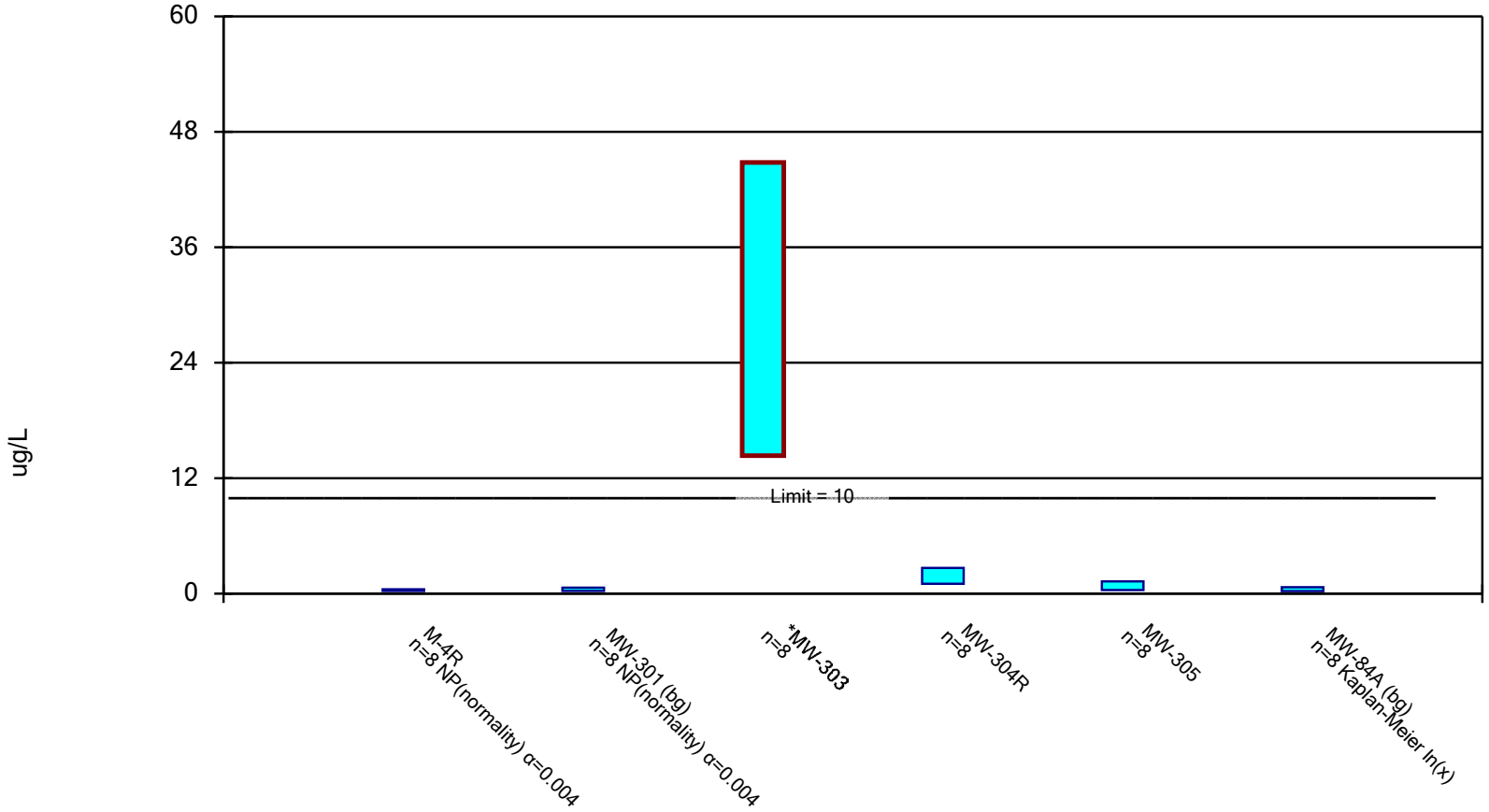
Confidence Interval

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 8/6/2024, 2:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (ug/L)	M-4R	0.44	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	MW-301 (bg)	0.62	0.28	10	No	8	50	No	0.004	NP (normality)
Arsenic (ug/L)	**MW-303**	**44.81**	**14.34**	**10**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Arsenic (ug/L)	MW-304R	2.673	1.02	10	No	8	0	No	0.01	Param.
Arsenic (ug/L)	MW-305	1.266	0.377	10	No	8	12.5	No	0.01	Param.
Arsenic (ug/L)	MW-84A (bg)	0.6581	0.2652	10	No	8	25	ln(x)	0.01	Param.
Molybdenum (ug/L)	M-4R	49.58	17.75	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-301 (bg)	0.44	0.44	100	No	8	100	No	0.004	NP (NDs)
Molybdenum (ug/L)	MW-303	117.1	48.5	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-304R	25	3.336	100	No	8	0	ln(x)	0.01	Param.
Molybdenum (ug/L)	MW-305	110.4	33.54	100	No	8	0	No	0.01	Param.
Molybdenum (ug/L)	MW-84A (bg)	0.62	0.44	100	No	8	87.5	No	0.004	NP (NDs)
Selenium (ug/L)	M-4R	116	1.6	50	No	8	0	No	0.004	NP (normality)
Selenium (ug/L)	MW-301 (bg)	0.32	0.32	50	No	8	100	No	0.004	NP (NDs)
Selenium (ug/L)	MW-303	65.2	14.03	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-304R	1.1	0.32	50	No	8	62.5	No	0.004	NP (normality)
Selenium (ug/L)	MW-305	13.01	3.73	50	No	8	0	ln(x)	0.01	Param.
Selenium (ug/L)	MW-84A (bg)	0.48	0.32	50	No	8	87.5	No	0.004	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Arsenic (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond

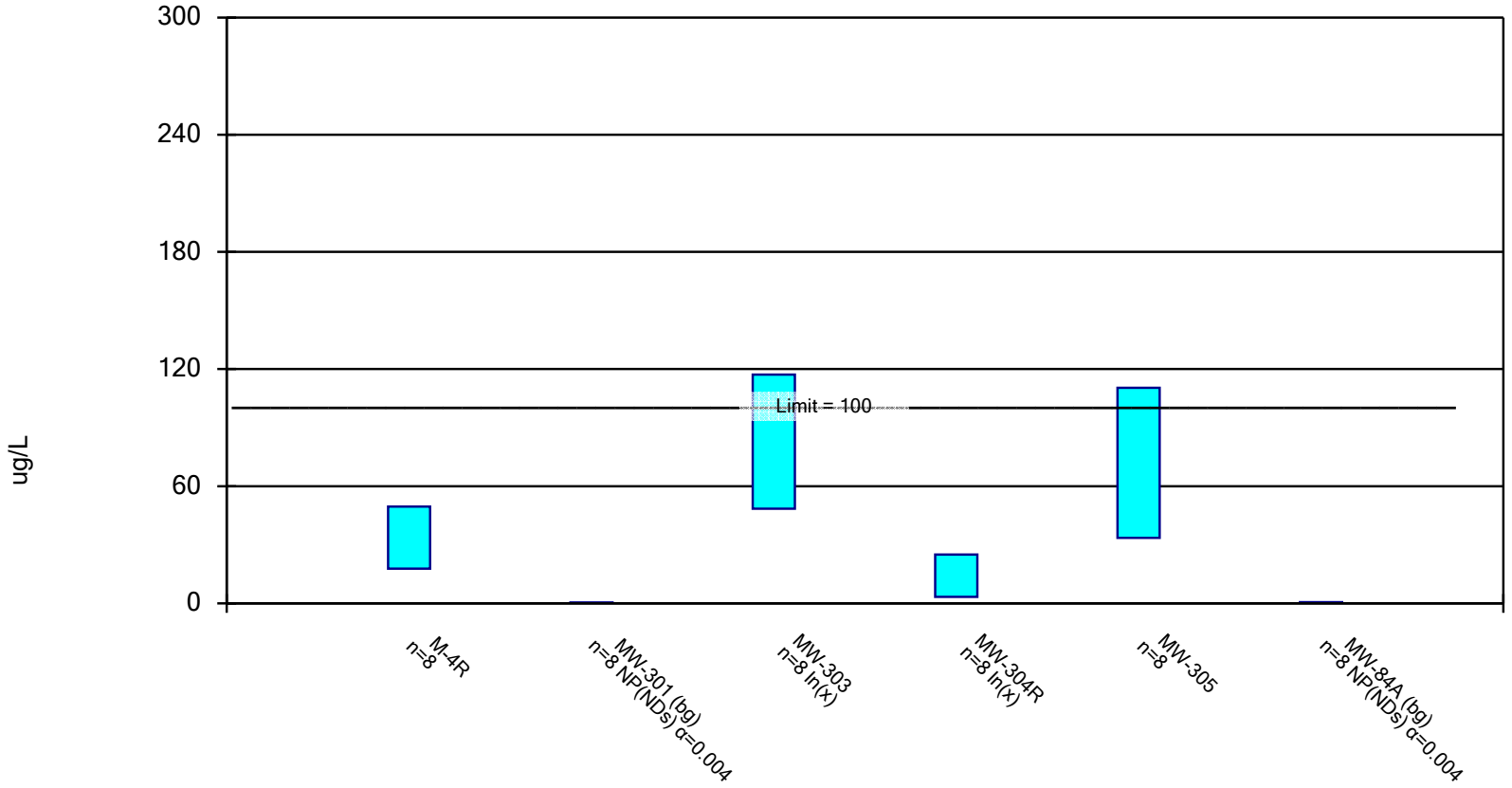
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/1/2019					<0.28 (U)	
10/7/2019	0.37 (J)			3.2	0.49 (J)	
5/27/2020	0.39 (J)			1.3	0.75 (J)	
10/7/2020	0.44 (J)			2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
4/12/2021				1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28
4/17/2024		<0.28	40.4	1.8		0.29 (J)
6/4/2024	<0.28					
Mean	0.34	0.3575	29.58	1.846	0.8213	0.4613
Std. Dev.	0.06698	0.1248	14.38	0.7799	0.4191	0.2359
Upper Lim.	0.44	0.62	44.81	2.673	1.266	0.6581
Lower Lim.	0.28	0.28	14.34	1.02	0.377	0.2652

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Molybdenum Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

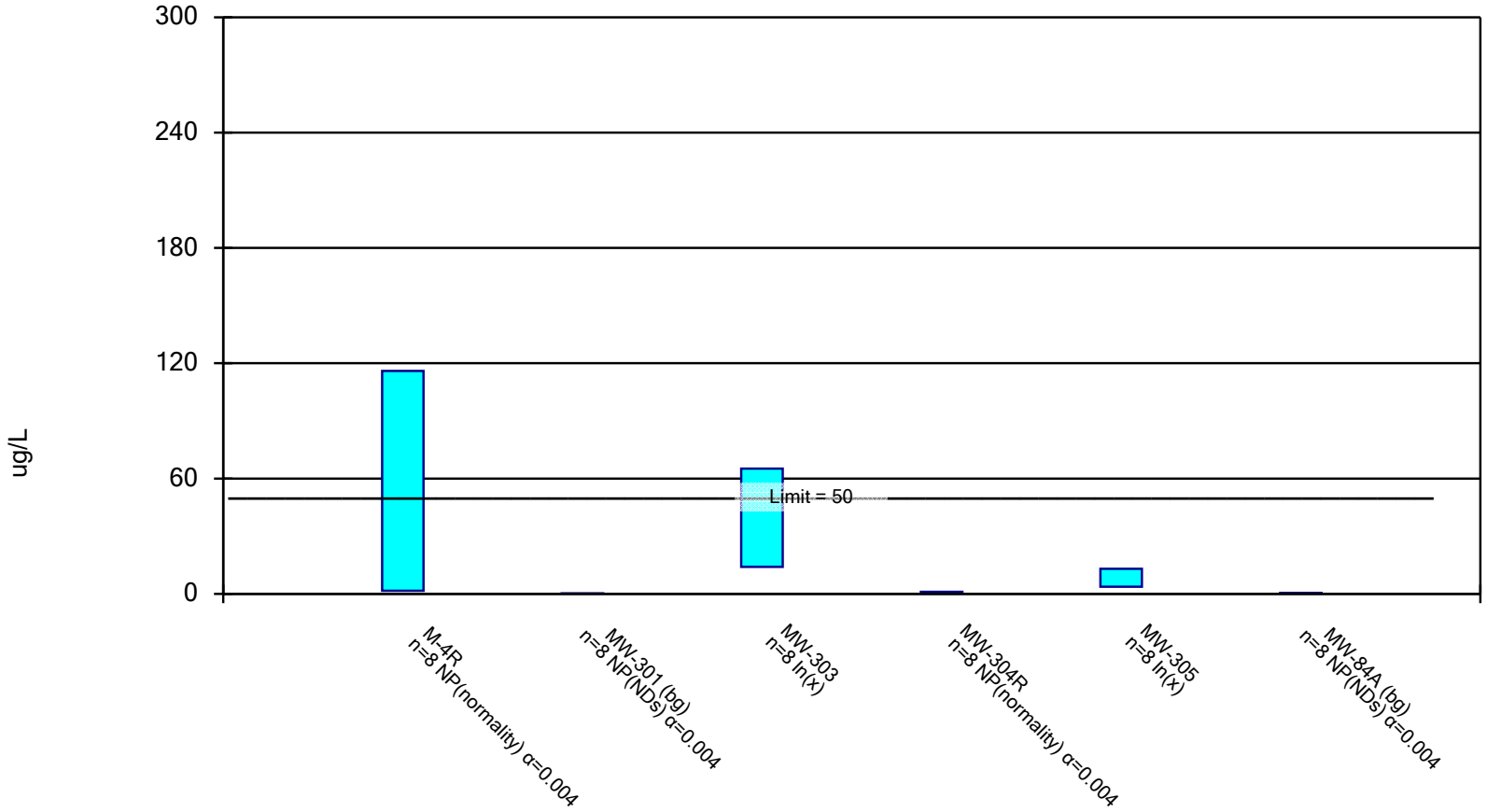
Constituent: Molybdenum (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
10/7/2019	27.6			4.8		
5/27/2020	25.6			3.9		
10/7/2020	27.6		67.1	12		
10/8/2020		<0.44 (U)				<0.44 (U)
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)
4/17/2024		<0.44	82	52.2		<0.44
6/4/2024	9.7					
Mean	33.66	0.44	81.9	13.95	71.96	0.4625
Std. Dev.	15.01	0	40.17	16.05	36.25	0.06364
Upper Lim.	49.58	0.44	117.1	25	110.4	0.62
Lower Lim.	17.75	0.44	48.5	3.336	33.54	0.44

ND substitution: RL or RL/2 if <15% NDs.

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 8/6/2024 2:21 PM View: COL Primary Pond

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

Confidence Interval

Constituent: Selenium (ug/L) Analysis Run 8/6/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)
4/1/2019					3.2	
10/7/2019	1.8			<0.32 (U)	7.7	
5/27/2020	11.7			0.33 (J)	4.2	
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)
4/17/2024		<0.32	36.3	<0.32		<0.32
6/4/2024	116					
Mean	18.24	0.32	37.95	0.4225	8.225	0.34
Std. Dev.	39.64	0	27.82	0.274	5.77	0.05657
Upper Lim.	116	0.32	65.2	1.1	13.01	0.48
Lower Lim.	1.6	0.32	14.03	0.32	3.73	0.32

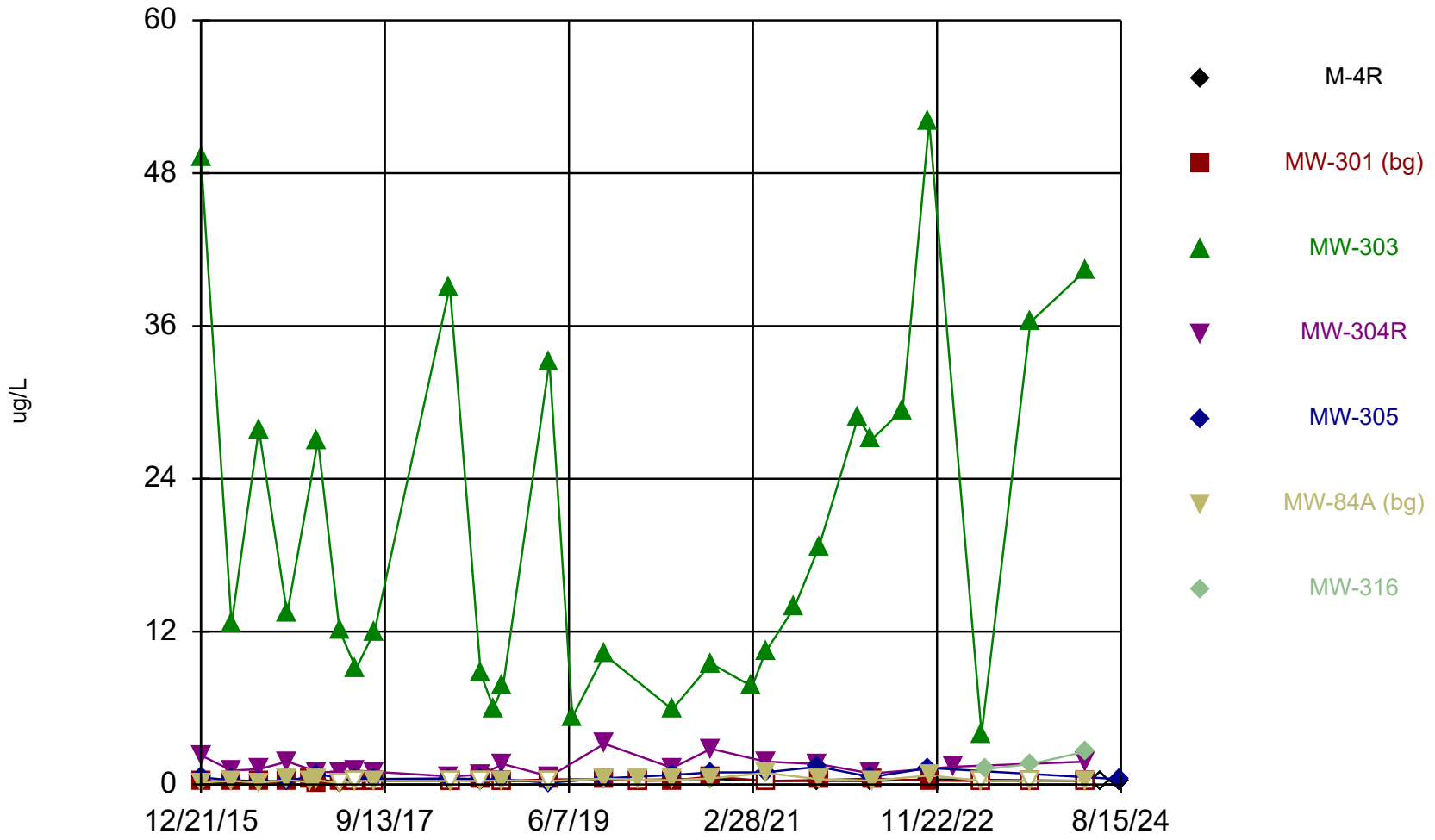
ND substitution: RL or RL/2 if <15% NDs.

Appendix B

Time Series Plot for CCR Wells

Hollow symbols indicate censored values.

Arsenic



Time Series Analysis Run 11/4/2024 1:37 PM View: COL Primary Pond

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

Time Series

Constituent: Arsenic (ug/L) Analysis Run 11/4/2024 1:38 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)	MW-316
12/21/2015			49.2	2.3	0.56 (J)		
12/22/2015	0.17 (J)	0.26 (J)				0.15 (J)	
4/4/2016	0.2 (J)		12.6	1.1	0.34 (J)		
4/5/2016		0.26 (J)				0.29 (J)	
7/7/2016	0.18 (J)		27.9	1.2			
7/8/2016		0.19 (J)			0.26 (J)	0.14 (J)	
10/12/2016	0.25 (J)		13.4				
10/13/2016		0.24 (J)		1.8	0.27 (J)	0.35 (J)	
12/29/2016		0.4 (J)				0.19 (J)	
1/25/2017	0.47 (J)	0.13 (J)			0.78 (J)	0.35 (J)	
1/26/2017			27	0.99 (J)			
4/10/2017			12.1	0.98 (J)			
4/11/2017	<0.099 (U)	0.18 (J)				<0.099 (U)	
6/5/2017	0.33 (J)			1.1	0.37 (J)		
6/6/2017		<0.28 (U)	9.1			<0.28 (U)	
8/7/2017					0.43 (J)		
8/8/2017		<0.28 (U)	12	1		0.28 (J)	
8/9/2017	<0.28 (U)						
4/23/2018	0.36 (J)				0.48 (J)		
4/24/2018			39.1	0.64 (J)			
4/25/2018		<0.28 (U)				<0.28 (U)	
8/7/2018	<0.28 (U)				0.42 (J)		
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)	
9/21/2018			6				
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)	
4/1/2019	<0.28 (U)		33.2		<0.28 (U)		
4/2/2019		0.4 (J)		0.63 (J)			
4/3/2019						<0.28 (U)	
6/19/2019			5.3				
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)		
10/9/2019		0.42 (J)				0.46 (J)	
2/3/2020		<0.28 (U)				0.38 (J)	
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)		
5/29/2020		0.33 (J)				0.34 (J)	
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)		
10/8/2020		0.62 (J)				0.49 (J)	
2/25/2021			7.7				
4/12/2021			10.4	1.8	0.95 (J)		
4/13/2021	<0.28 (U)						
4/14/2021		<0.28 (U)				0.91 (J)	
7/20/2021			13.9				
10/11/2021	<0.28 (U)			1.6	1.4		
10/12/2021			18.6				
10/14/2021		0.35 (J)				0.41 (J)	
2/24/2022			28.8				
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)		
4/12/2022			27.1				
4/13/2022		0.47 (J)				0.31 (J)	
7/27/2022			29.4				
10/25/2022	0.4 (J)				1.3		
10/26/2022			52				
10/27/2022		0.3 (J)				0.72 (J)	

ND substitution: RL or RL/2 if <15% NDs.

Time Series

Constituent: Arsenic (ug/L) Analysis Run 11/4/2024 1:38 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304R	MW-305	MW-84A (bg)	MW-316
1/20/2023				1.4			
4/24/2023			4				
4/27/2023		<0.28 (U)				<0.28 (U)	
5/5/2023							1.2
10/9/2023			36.3				1.6
10/11/2023		<0.28				<0.28	
4/17/2024		<0.28	40.4	1.8		0.29 (J)	2.6
6/4/2024	<0.28						
8/15/2024	<0.28				0.41 (J)		

ND substitution: RL or RL/2 if <15% NDs.

Appendix C

Regional Information

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

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

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

Sources:

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

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

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

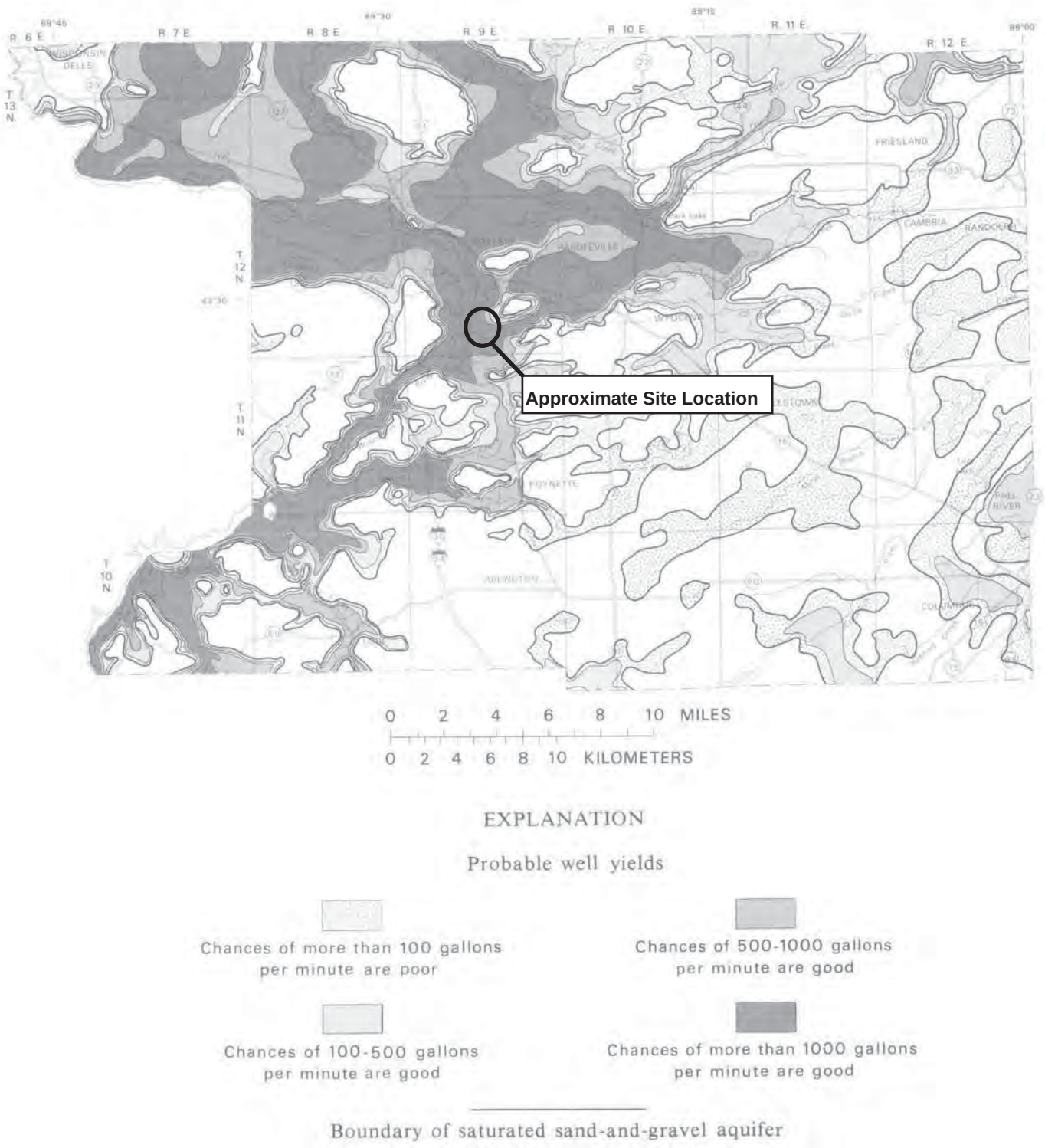
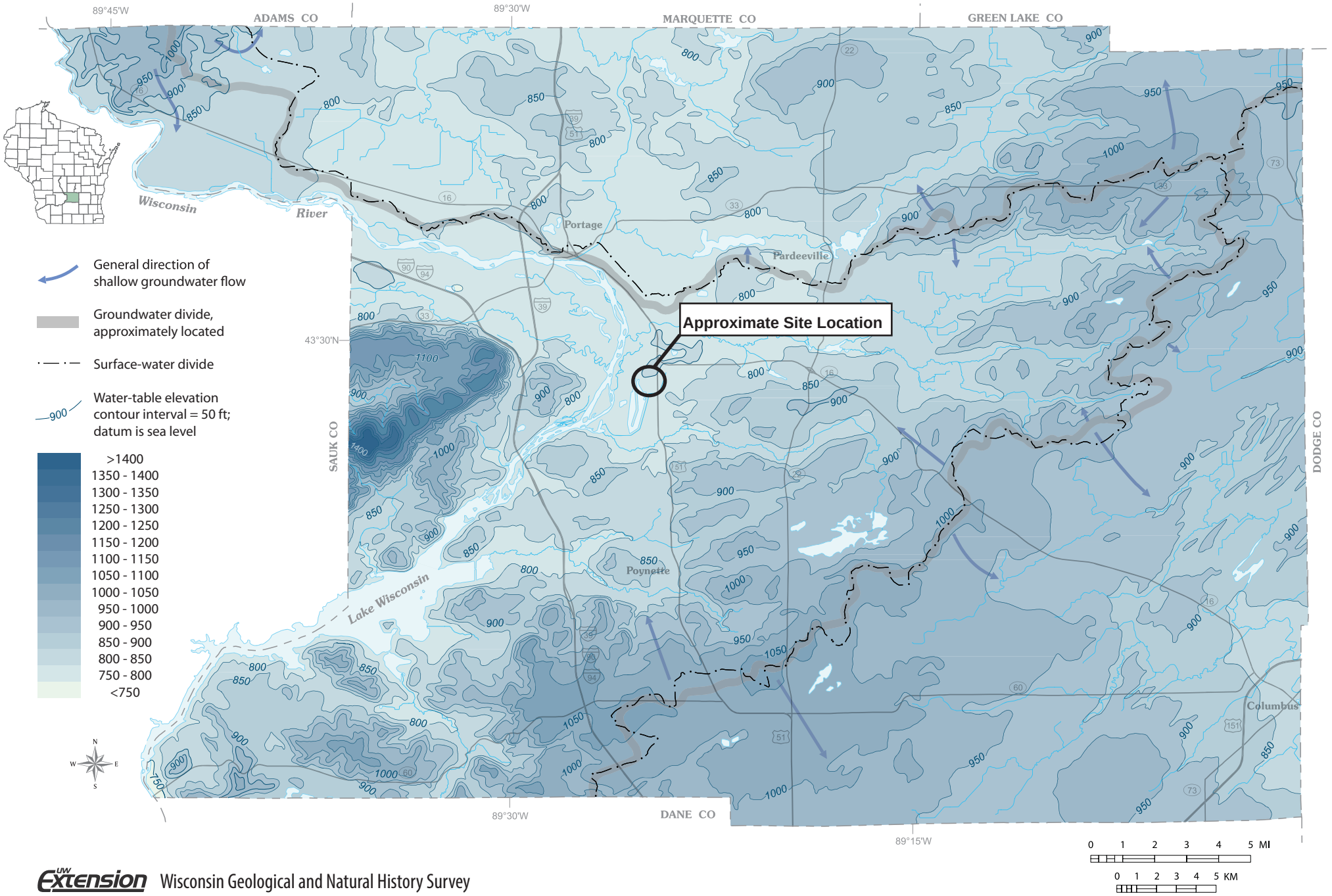


Figure 9. Probably well yields from the sand-and-gravel aquifer.

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

Generalized water-table elevation in Columbia County, Wisconsin



Wisconsin Geological and Natural History Survey

02/26/2025 - Classification: Internal - EGRM23462139

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

Appendix G

Updated UPLs Memorandum

September 16, 2024
File No. 25224067.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results
COL Primary Pond, 2024 UPL Update and UTL Calculation

PREPARED BY: Ryan Matzuk

CHECKED BY: Sherren Clark

STATISTICAL METHOD

For comparison to background, groundwater monitoring data for the Columbia Energy Center (COL) Primary Pond CCR Unit is evaluated in accordance with 40 CFR 257.93(f)(3) using a prediction interval or tolerance interval procedure. In this evaluation, 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 either the upper prediction limit (UPL) or upper tolerance limit (UTL).

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

For the prediction interval evaluation, interwell testing was selected based on the considerations outlined in Chapter 6 of the Unified Guidance. The statistical program used to calculate the interwell prediction interval is Sanitas™ (v.10.0.16).

Under the interwell approach for comparison to background, monitoring results are compared to UPLs for Appendix III parameters and are compared to UTLs for Appendix IV parameters calculated based on background monitoring results from the two background wells: MW-84A and MW-301. Compliance wells for the Primary Pond include MW-303, MW-304, MW-305, and MW-4R. This is the first statistical update for the Columbia Primary Pond Unit to include UTL calculations for Appendix IV parameters.

The initial UPLs were calculated based on nine rounds of background monitoring were performed prior to the initiation of compliance monitoring, from December 2015 through August 2017. Since then, an additional six rounds of monitoring for Appendix III parameters and five rounds of monitoring for Appendix IV parameters were performed at the background wells, and this data was used to update the UPLs for this site in October 2019. Since the update in 2019, background wells MW-84A and MW-301 have been sampled for App III and App IV parameters semi-annually with periodic resamples for select parameters when appropriate. As part of a statistical update to

assessment monitoring results, the background data set for the UPL and UTL calculations is being updated to include data from the background wells collected through December 2023.

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

TIME SERIES PLOTS

Time series plots were prepared for the required detection and assessment monitoring parameters to show the concentration variations over time, and are included in Attachment 1. The time series plots include the four compliance wells and two background wells for the Primary Pond.

OUTLIER ANALYSIS

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

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

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

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

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

The Sanitas output for the outlier analysis is provided in Attachment 2. The background outlier analysis included the complete pooled data set, including sample dates from December 2015 through December 2023.

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

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

- Antimony (MW-84A). One high result from the April 2021 event was flagged as a statistical outlier. This result was left in the dataset because there was no known reason for the high result and the result appeared to be within the range of potential natural variation. This result was below the limit of quantification (LOQ).

- 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.

- Boron (MW-84A). Two high results from the August 2017 and April 2018 sampling events were flagged by Sanitas as statistical outliers. These results were kept in the dataset because there was no known explanation for the varying results, and the results (22.9 ug/L and 25 ug/L) appeared to fall within a reasonable range of potential natural variation for this parameter based on similar results at MW-301.

- Calcium (MW-301). Three low results from the October 2021, October 2022, and October 2023 sampling events were flagged as statistical outliers. These results were not removed from the dataset because they appeared to represent seasonal variation in calcium at this well.

- Chromium (MW-301). Two high results from the December 2015 and June 2017 sampling events were flagged by Sanitas as statistical outliers. These results were kept in the dataset because there was no known explanation for the varying results. The high results from December 2015 (2.1 ug/L) and June 2017 (2.3 ug/L) appeared to be within the range of potential natural variation based on similar results at MW-84A.

- Cobalt (MW-301). One high result from the December 2015 sampling 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 affected groundwater conditions.

- Cobalt (MW-84A). One high result from the April 2021 sampling event was flagged as a statistical outlier. This result was left in the dataset because there was no known reason for the high result, and the result was below the LOQ.

- Lead (MW-301). Two high results from the December 2015 and April 2022 sampling event were flagged as statistical outliers. The high value from the December 2015 sampling event was removed from the dataset because this was the first sample collected following the well installation, which may have affected groundwater conditions. The high result from the April 2022 sampling event was removed from the dataset because it is an order of magnitude greater than previous results, many of which are non-detects or below the LOQ.

- 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 affected groundwater conditions.

- Molybdenum (MW-301). Two low results from the January 2017 and April 2017 sampling events were flagged as statistical outliers. These results were left in the dataset because they were non-detect results and appeared to be within the range of potential natural variation.

- Selenium (MW-301). Three high results from the July 2016, August 2018, and April 2019 sampling events and four low results from the April 2016, October 2016, January 2017, and April 2017 sampling events were flagged as statistical outliers. All seven results identified as outliers were left in the dataset because they appeared to represent natural variation above and below the LOD. All results were below the LOQ and many were below the LOD.

- Thallium (MW-301). Five high results from the December 2016, August 2018, April 2019, October 2020, and April 2022 sampling events were flagged as statistical outliers. All five results were left in the dataset because they appeared to represent a combination of natural variation above and below the LOD. All results were below the LOQ and many were below the LOD.

- Total Dissolved Solids (TDS) (MW-301). Three low results from the October 2021, October 2022, and October 2023 sampling events were flagged as statistical outliers. Consistent with the approach for calcium outliers at this well, these results were not removed from the dataset because they appeared to represent seasonal variation in TDS at this well.

- Total Dissolved Solids (MW-84A). One high result from the August 2018 sampling event were flagged as a statistical outlier. This result was left in the dataset because there was no known reason for the high result and the result appeared to be within the range of potential natural variation.

- Total Radium (MW-301). Two low results from the August 2018 and October 2022 sampling events were flagged as statistical outliers. These results were left in the dataset because there was no known reason for the low results and the results appeared to be within the range of potential natural variation.

BACKGROUND UPDATE

The background data pool for Appendix III and Appendix IV parameters was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (12/2015 through 10/2019) and the data to be added (12/2019 through 12/2023) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1 percent level of significance. If a difference is identified, then the background sample data set should be revised to determine which observations are most representative of the current groundwater conditions.

The statistical comparison between the two background data sets was performed for parameters with a least one result above the limit of quantitation. For parameters with no results above the LOQ, the dataset was expanded to include the recent data except for any outliers removed as described above.

The comparison uses Welch's t-test for normally distributed data and the Mann-Whitney test for non-normal data. (Note: The Sanitas output labels the earlier background dataset as "Background" and the later background dataset as "Compliance," but all data from background wells MW-301 and MW-84A is background data.) A two-tailed analysis was used to evaluate for singificant increases or decreases in background concentrations at the two background wells.

The Sanitas Welch's t-test (parametric) and Mann-Whitney rank-sum analysis (non-parametric) included in Attachment 3, indicated no signficant increases in background concentrations. Decreases in background concentrations were identfied for the following wells and parameters and handled as decribed:

- Barium (MW-301). Barium concentrations decreased slightly at MW-301, while remaining steady at MW-84. All results to date are in the range from 7.3 to 20 ug/L. All results to date appear to be representative of background conditions; therefore, the complete data set will be used.

- Chloride (MW-84A). Chloride concentrations decreased slightly at MW-84. Results to date for both MW-84A and MW-301 are low, typically less than 5 mg/L. All results to date appear to be representative of background conditions; therefore, the complete data set will be used.

- Sulfate (MW-84A). Sulfate concentrations at MW-84A decreased from the beginning of background monitoring in 2015 through 2018, and have leveled off below the LOQ since then. Sulfate concentrations at MW-301 are higher than at MW-84A, ranging from 4.4 to 31.6 mg/L. The pooled results appear to be representative of the range and variability of background concentrations; therefore, the complete data set will be used.

- Total Radium (MW-301). Radium concentrations at MW-301 have been variable. The Mann-Whitney analysis indicated a significant decrease in the median, but there is overlap between the values in the two time periods. All results to date appear to be representative of background conditions; therefore, the complete data set will be used.

INTERWELL PREDICTION LIMITS

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

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

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

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

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

Consistent with the Unified Guidance, parametric prediction limits were calculated based on a 1-of-2 retesting protocol and a target 10 percent annual site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the 2024 statistical update using data collected through October 2023, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	April and October events
Appendix III Constituents analyzed	7	Total of 7 constituents analyzed.
Compliance wells	4	MW-303, MW-304, MW-305, M-4R

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. For the current sample size, the non-parametric limit is the second highest value in the background dataset, to achieve a per-test significance level for the non-parametric tests that is approximately equal to that for the parametric tests.

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

Updated interwell prediction limits for the Appendix III parameters are included in **Attachment 4**.

INTERWELL TOLERANCE LIMITS

Interwell tolerance limits for Appendix IV parameters were calculated using background data from the upgradient monitoring wells (MW-84A and MW-301) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring, groundwater results from December 2015 through October 2023 were included to calculate the interwell tolerance limits. The tolerance limit analysis was performed in Sanitas following the same five steps listed above. Management of non-detect results in the background data was also the same as described above for prediction limits. As recommended in the Unified Guidance, the UTL was calculated with 95 percent confidence and 95 percent coverage.

Interwell tolerance limits analysis results are included in **Attachment 5**.

A summary of the new UPLs ad UTLs in comparison to the previous background limits is provided in **Attachment 6**.

RM/AJR/SCC

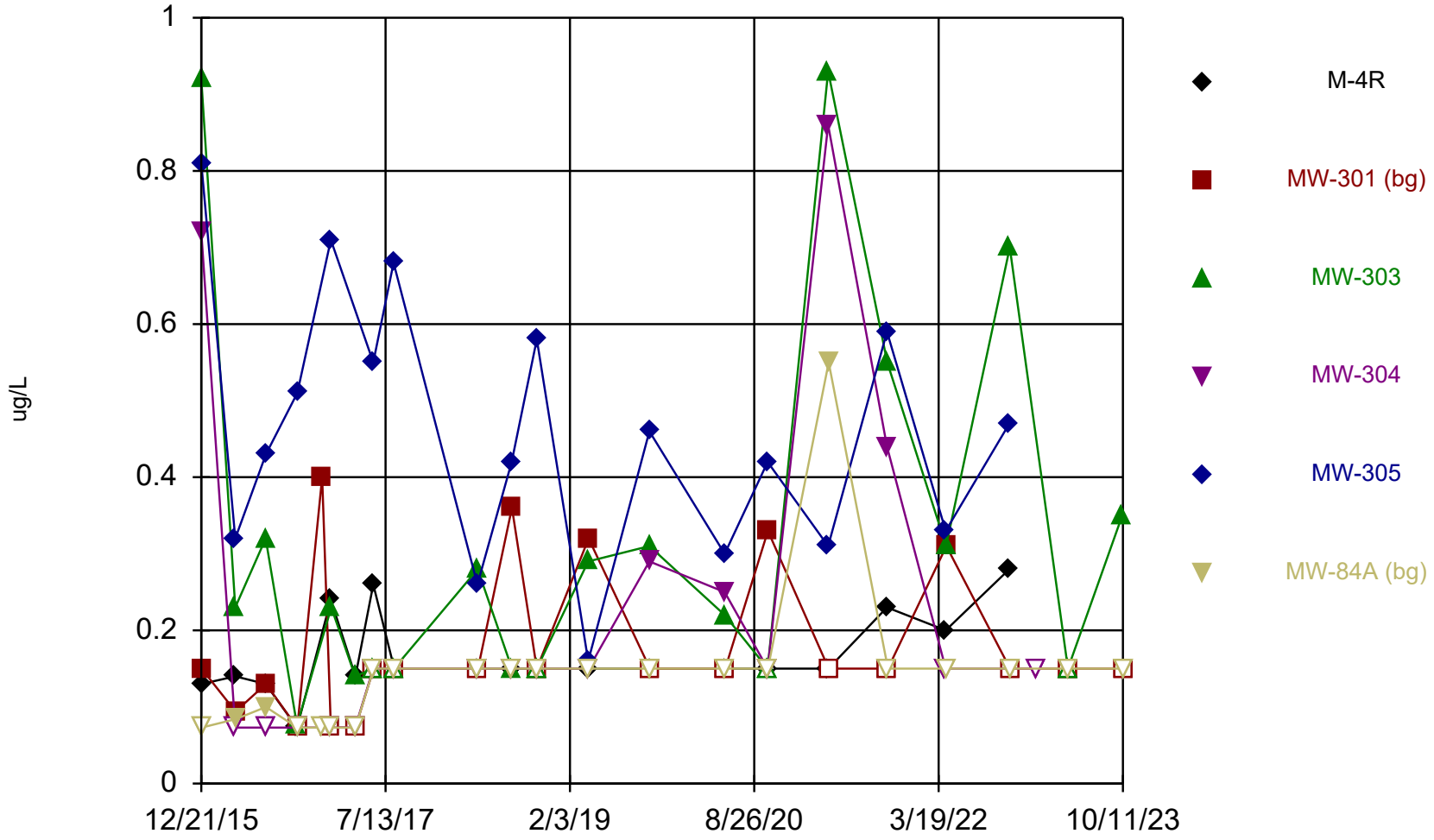
I:\25223067.00\Data and Calculations\Sanitas\UPL and Stats Memos_COL\PPond\240916_COL Prim Pond CCR Stats Memo_2.docx

Attachment 1

Times Series Plots

Hollow symbols indicate censored values.

Antimony



Time Series Analysis Run 3/18/2024 1:54 PM View: COL Primary Pond

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

Time Series

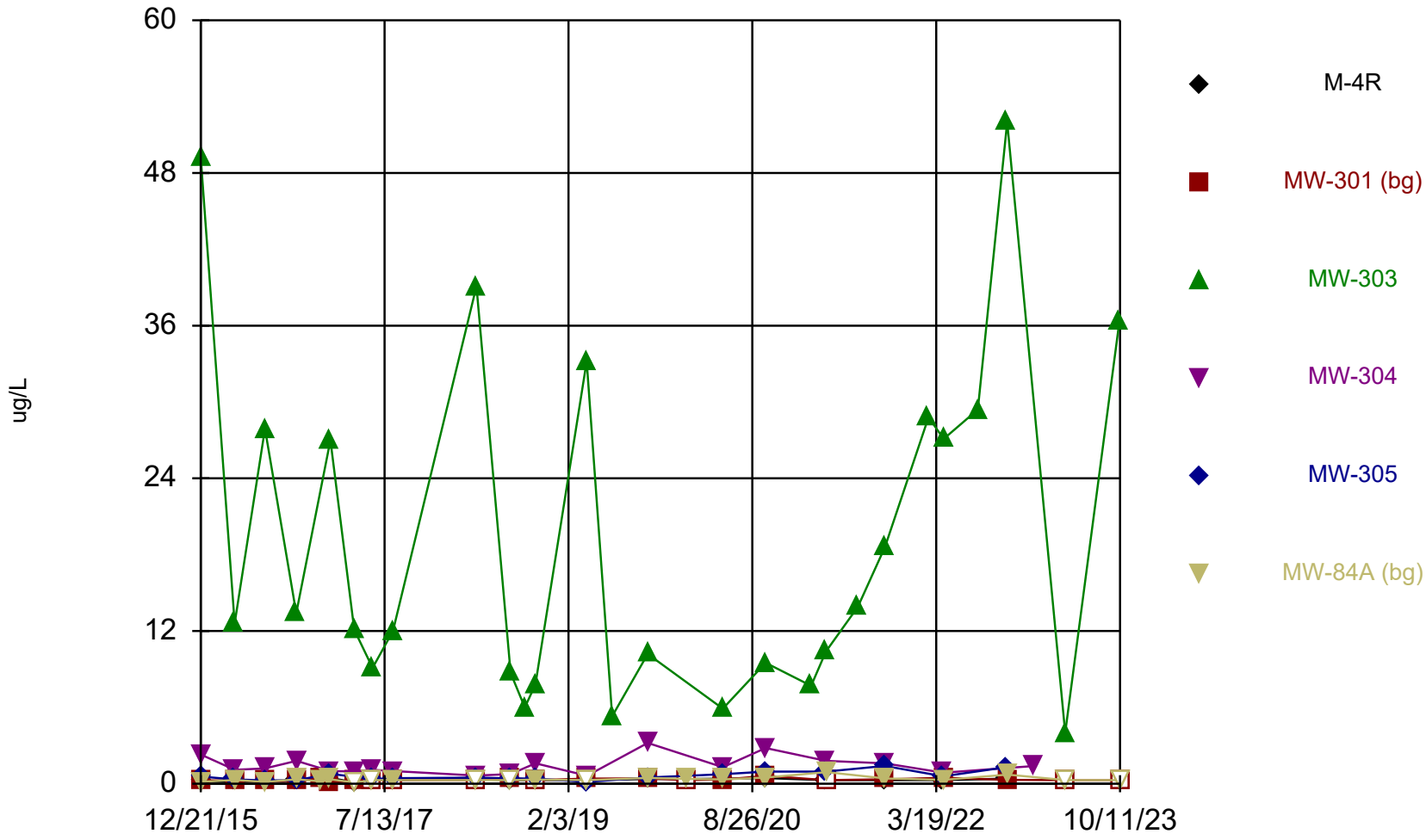
Constituent: Antimony (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			0.92 (J)	0.72 (J)	0.81 (J)	
12/22/2015	0.13 (J)	0.15 (J)				<0.073 (U)
4/4/2016	0.14 (J)		0.23 (J)	<0.073 (U)	0.32 (J)	
4/5/2016		0.094 (J)				0.084 (J)
7/7/2016	0.13 (J)		0.32 (J)	<0.073 (U)		
7/8/2016		0.13 (J)			0.43 (J)	0.1 (J)
10/12/2016	<0.073 (U)		0.076 (J)			
10/13/2016		<0.073 (U)		<0.073 (U)	0.51 (J)	<0.073 (U)
12/29/2016		0.4 (J)				<0.073 (U)
1/25/2017	0.24 (J)	<0.073 (U)			0.71 (J)	<0.073 (U)
1/26/2017			0.23 (J)	<0.073 (U)		
4/10/2017			0.14 (J)	<0.073 (U)		
4/11/2017	0.14 (J)	<0.073 (U)				<0.073 (U)
6/5/2017	0.26 (J)			<0.15 (U)	0.55 (J)	
6/6/2017		<0.15 (U)	<0.15 (U)			<0.15 (U)
8/7/2017					0.68 (J)	
8/8/2017		<0.15 (U)	<0.15 (U)	<0.15 (U)		<0.15 (U)
8/9/2017	0.15 (J)					
4/23/2018	<0.15 (U)				0.26 (J)	
4/24/2018			0.28 (J)	<0.15 (U)		
4/25/2018		<0.15 (U)				<0.15 (U)
8/7/2018	<0.15 (U)				0.42 (J)	
8/8/2018		0.36 (J)	0.15 (J)	<0.15 (U)		<0.15 (U)
10/24/2018	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)	0.58 (J)	<0.15 (U)
4/1/2019	<0.15 (U)		0.29 (J)		0.16 (J)	
4/2/2019		0.32 (J)		<0.15 (U)		
4/3/2019						<0.15 (U)
10/7/2019	<0.15 (U)		0.31 (J)	0.29 (J)	0.46 (J)	
10/9/2019		<0.15 (U)				<0.15 (U)
5/27/2020	<0.15 (U)		0.22 (J)	0.25 (J)	0.3 (J)	
5/29/2020		<0.15 (U)				<0.15 (U)
10/7/2020	<0.15 (U)		<0.15 (U)	<0.15 (U)	0.42 (J)	
10/8/2020		0.33 (J)				<0.15 (U)
4/12/2021			0.93 (J)	0.86 (J)	0.31 (J)	
4/13/2021	<0.15 (U)					
4/14/2021		<0.15 (U)				0.55 (J)
10/11/2021	0.23			0.44 (J)	0.59 (J)	
10/12/2021			0.55 (J)			
10/14/2021		<0.15 (U)				<0.15 (U)
4/11/2022	0.2 (J)			<0.15 (U)	0.33 (J)	
4/12/2022			0.31 (J)			
4/13/2022		0.31 (J)				<0.15 (U)
10/25/2022	0.28 (J)				0.47 (J)	
10/26/2022			0.7 (J)			
10/27/2022		<0.15 (U)				<0.15 (U)
1/20/2023				<0.15 (U)		
4/24/2023			<0.15 (U)			
4/27/2023		<0.15 (U)				<0.15 (U)
10/9/2023			0.35 (J)			
10/11/2023		<0.15 (U)				<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Arsenic



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Arsenic (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			49.2	2.3	0.56 (J)	
12/22/2015	0.17 (J)	0.26 (J)				0.15 (J)
4/4/2016	0.2 (J)		12.6	1.1	0.34 (J)	
4/5/2016		0.26 (J)				0.29 (J)
7/7/2016	0.18 (J)		27.9	1.2		
7/8/2016		0.19 (J)			0.26 (J)	0.14 (J)
10/12/2016	0.25 (J)		13.4			
10/13/2016		0.24 (J)		1.8	0.27 (J)	0.35 (J)
12/29/2016		0.4 (J)				0.19 (J)
1/25/2017	0.47 (J)	0.13 (J)			0.78 (J)	0.35 (J)
1/26/2017			27	0.99 (J)		
4/10/2017			12.1	0.98 (J)		
4/11/2017	<0.099 (U)	0.18 (J)				<0.099 (U)
6/5/2017	0.33 (J)			1.1	0.37 (J)	
6/6/2017		<0.28 (U)	9.1			<0.28 (U)
8/7/2017					0.43 (J)	
8/8/2017		<0.28 (U)	12	1		0.28 (J)
8/9/2017	<0.28 (U)					
4/23/2018	0.36 (J)				0.48 (J)	
4/24/2018			39.1	0.64 (J)		
4/25/2018		<0.28 (U)				<0.28 (U)
8/7/2018	<0.28 (U)				0.42 (J)	
8/8/2018		0.45 (J)	8.7	0.76 (J)		<0.28 (U)
9/21/2018			6			
10/24/2018	<0.28 (U)	<0.28 (U)	7.8	1.6	0.4 (J)	0.33 (J)
4/1/2019	<0.28 (U)		33.2		<0.28 (U)	
4/2/2019		0.4 (J)		0.63 (J)		
4/3/2019						<0.28 (U)
6/19/2019			5.3			
10/7/2019	0.37 (J)		10.2	3.2	0.49 (J)	
10/9/2019		0.42 (J)				0.46 (J)
2/3/2020		<0.28 (U)				0.38 (J)
5/27/2020	0.39 (J)		5.9	1.3	0.75 (J)	
5/29/2020		0.33 (J)				0.34 (J)
10/7/2020	0.44 (J)		9.5	2.8	0.95 (J)	
10/8/2020		0.62 (J)				0.49 (J)
2/25/2021			7.7			
4/12/2021			10.4	1.8	0.95 (J)	
4/13/2021	<0.28 (U)					
4/14/2021		<0.28 (U)				0.91 (J)
7/20/2021			13.9			
10/11/2021	<0.28 (U)			1.6	1.4	
10/12/2021			18.6			
10/14/2021		0.35 (J)				0.41 (J)
2/24/2022			28.8			
4/11/2022	<0.28 (U)			0.87 (J)	0.59 (J)	
4/12/2022			27.1			
4/13/2022		0.47 (J)				0.31 (J)
7/27/2022			29.4			
10/25/2022	0.4 (J)				1.3	
10/26/2022			52			
10/27/2022		0.3 (J)				0.72 (J)

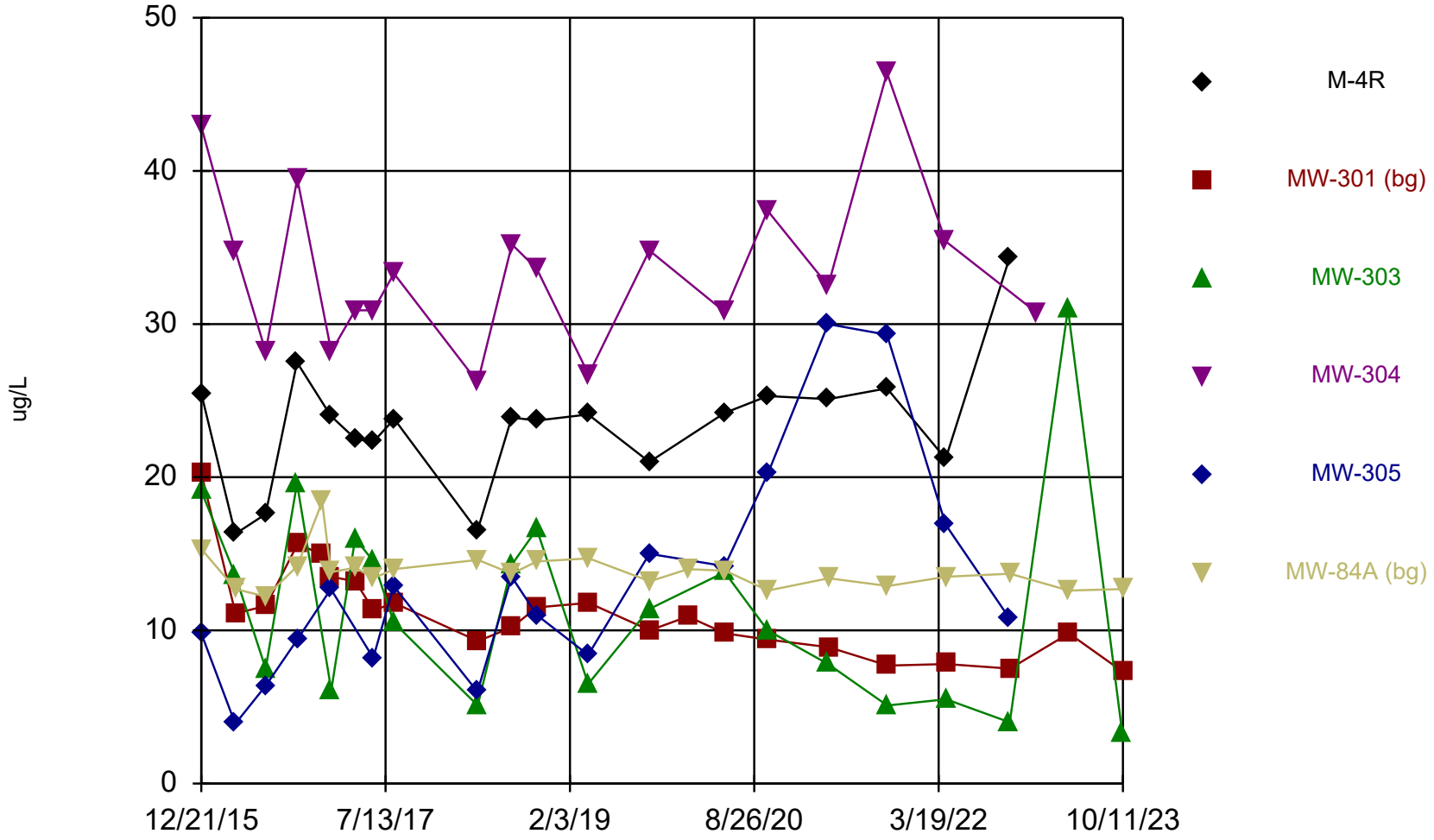
ND substitution: RL or RL/2 if <15% NDs.

Time Series

Constituent: Arsenic (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
1/20/2023				1.4		
4/24/2023			4			
4/27/2023		<0.28 (U)				<0.28 (U)
10/9/2023			36.3			
10/11/2023		<0.28				<0.28

Barium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

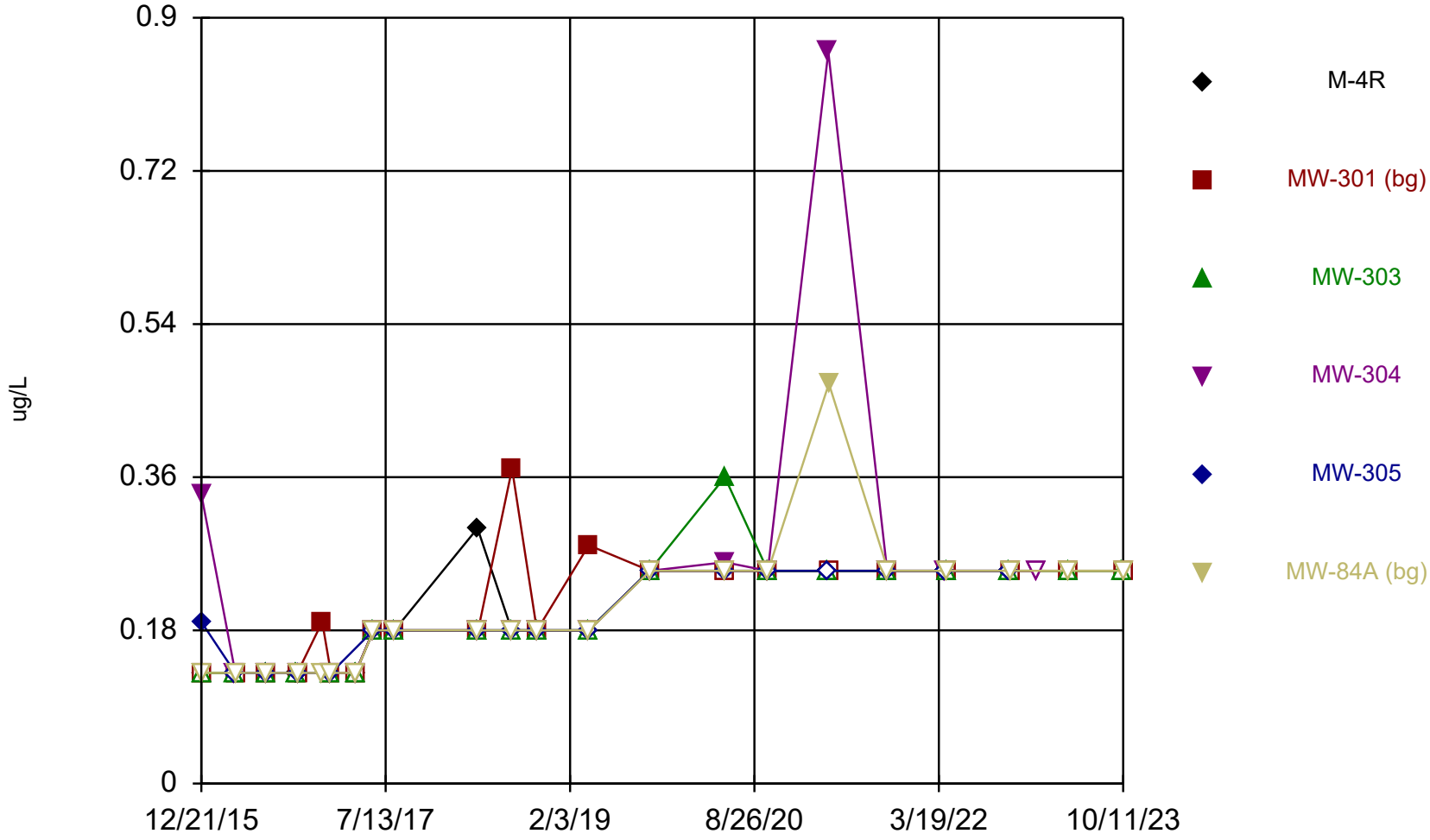
Time Series

Constituent: Barium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			19.1	42.9	9.8	
12/22/2015	25.4	20.2				15.3
4/4/2016	16.3		13.6	34.8	3.9	
4/5/2016		11.1				12.7
7/7/2016	17.6		7.5	28.2		
7/8/2016		11.6			6.4	12.2
10/12/2016	27.5		19.6			
10/13/2016		15.6		39.5	9.4	14.2
12/29/2016		15				18.4
1/25/2017	24	13.5			12.7	13.8
1/26/2017			6.1	28.2		
4/10/2017			16	30.9		
4/11/2017	22.5	13.2				14.1
6/5/2017	22.3			30.9	8.2	
6/6/2017		11.3	14.5			13.4
8/7/2017					12.9	
8/8/2017		11.8	10.5	33.3		14
8/9/2017	23.8					
4/23/2018	16.5				6	
4/24/2018			5.1	26.2		
4/25/2018		9.3				14.6
8/7/2018	23.9				13.5	
8/8/2018		10.2	14.3	35.2		13.7
10/24/2018	23.7	11.5	16.6	33.6	11	14.5
4/1/2019	24.1		6.5		8.4	
4/2/2019		11.8		26.7		
4/3/2019						14.7
10/7/2019	21		11.4	34.8	15	
10/9/2019		10				13.2
2/3/2020		10.9				14
5/27/2020	24.2		13.8	30.8	14.2	
5/29/2020		9.8				13.9
10/7/2020	25.3		10	37.4	20.2	
10/8/2020		9.4				12.6
4/12/2021			7.8	32.5	30	
4/13/2021	25.1					
4/14/2021		8.9				13.4
10/11/2021	25.8			46.4	29.3	
10/12/2021			5.1			
10/14/2021		7.7				12.9
4/11/2022	21.2			35.4	16.9	
4/12/2022			5.5			
4/13/2022		7.8				13.5
10/25/2022	34.3				10.8	
10/26/2022			4			
10/27/2022		7.5				13.7
1/20/2023				30.7		
4/24/2023			31			
4/27/2023		9.8				12.6
10/9/2023			3.3			
10/11/2023		7.3				12.7

Hollow symbols indicate censored values.

Beryllium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

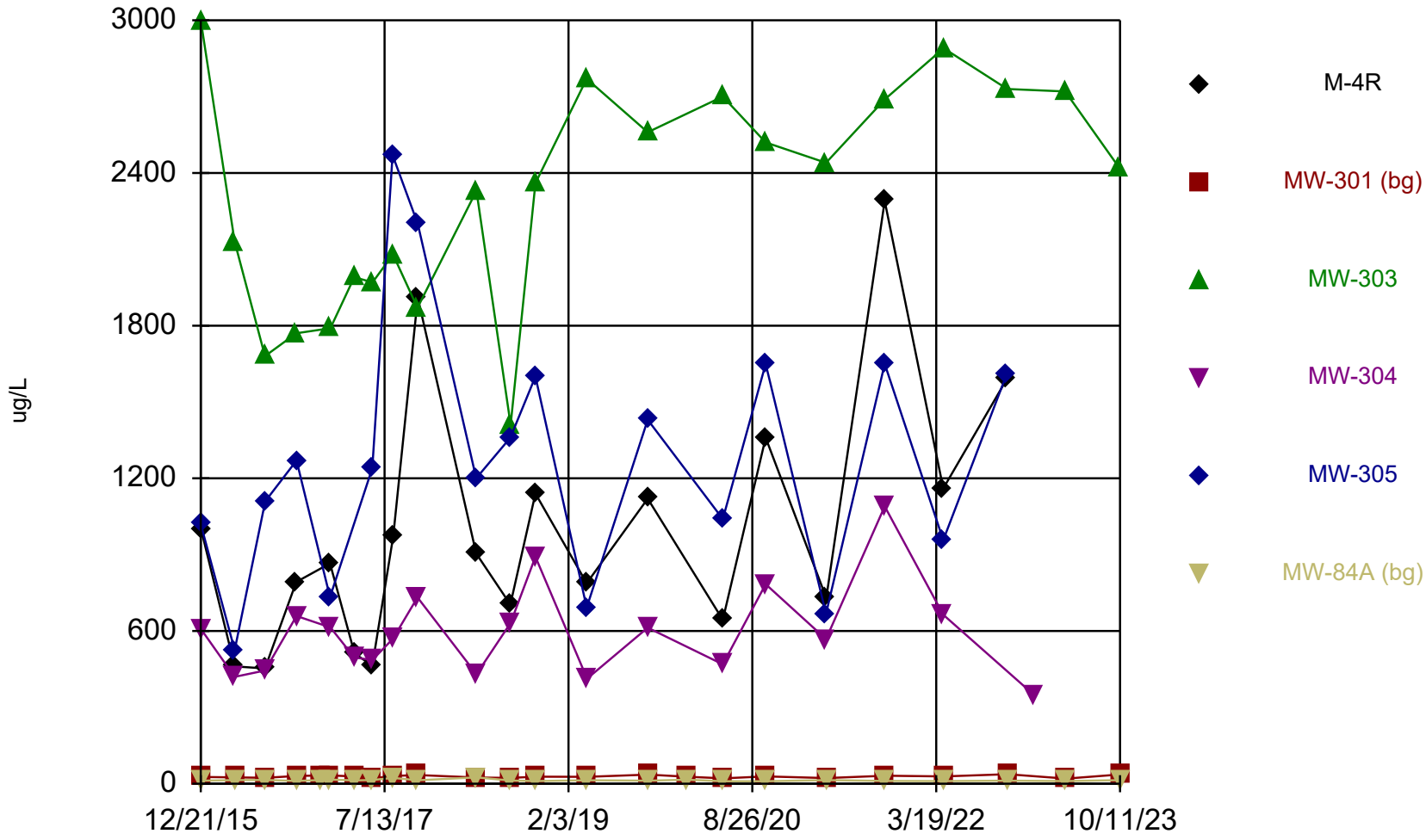
Time Series

Constituent: Beryllium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			<0.13 (U)	0.34 (J)	0.19 (J)	
12/22/2015	<0.13 (U)	<0.13 (U)				<0.13 (U)
4/4/2016	<0.13 (U)		<0.13 (U)	<0.13 (U)	<0.13 (U)	
4/5/2016		<0.13 (U)				<0.13 (U)
7/7/2016	<0.13 (U)		<0.13 (U)	<0.13 (U)		
7/8/2016		<0.13 (U)			<0.13 (U)	<0.13 (U)
10/12/2016	<0.13 (U)		<0.13 (U)			
10/13/2016		<0.13 (U)		<0.13 (U)	<0.13 (U)	<0.13 (U)
12/29/2016		0.19 (J)				<0.13 (U)
1/25/2017	<0.13 (U)	<0.13 (U)			<0.13 (U)	<0.13 (U)
1/26/2017			<0.13 (U)	<0.13 (U)		
4/10/2017			<0.13 (U)	<0.13 (U)		
4/11/2017	<0.13 (U)	<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)			<0.18 (U)
8/7/2017					<0.18 (U)	
8/8/2017		<0.18 (U)	<0.18 (U)	<0.18 (U)		<0.18 (U)
8/9/2017	<0.18 (U)					
4/23/2018	0.3 (J)				<0.18 (U)	
4/24/2018			<0.18 (U)	<0.18 (U)		
4/25/2018		<0.18 (U)				<0.18 (U)
8/7/2018	<0.18 (U)				<0.18 (U)	
8/8/2018		0.37 (J)	<0.18 (U)	<0.18 (U)		<0.18 (U)
10/24/2018	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)	<0.18 (U)
4/1/2019	<0.18 (U)		<0.18 (U)		<0.18 (U)	
4/2/2019		0.28 (J)		<0.18 (U)		
4/3/2019						<0.18 (U)
10/7/2019	<0.25 (U)		<0.25 (U)	<0.25 (U)	<0.25 (U)	
10/9/2019		<0.25 (U)				<0.25 (U)
5/27/2020	<0.25 (U)		0.36 (J)	0.26 (J)	<0.25 (U)	
5/29/2020		<0.25 (U)				<0.25 (U)
10/7/2020	<0.25 (U)		<0.25 (U)	<0.25 (U)	<0.25 (U)	
10/8/2020		<0.25 (U)				<0.25 (U)
4/12/2021			<0.25 (U)	0.86 (J)	<0.25 (U)	
4/13/2021	<0.25 (U)					
4/14/2021		<0.25 (U)				0.47 (J)
10/11/2021	<0.25 (U)			<0.25 (U)	<0.25 (U)	
10/12/2021			<0.25 (U)			
10/14/2021		<0.25 (U)				<0.25 (U)
4/11/2022	<0.25 (U)			<0.25 (U)	<0.25 (U)	
4/12/2022			<0.25 (U)			
4/13/2022		<0.25 (U)				<0.25 (U)
10/25/2022	<0.25 (U)				<0.25 (U)	
10/26/2022			<0.25 (U)			
10/27/2022		<0.25 (U)				<0.25 (U)
1/20/2023				<0.25 (U)		
4/24/2023			<0.25 (U)			
4/27/2023		<0.25 (U)				<0.25 (U)
10/9/2023			<0.25 (U)			
10/11/2023		<0.25 (U)				<0.25 (U)

ND substitution: RL or RL/2 if <15% NDs.

Boron



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Boron (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			3000	609	1020	
12/22/2015	1000	26.5				11.9
4/4/2016	461		2130	420	525	
4/5/2016		25.2				14
7/7/2016	453		1680	445		
7/8/2016		23.6			1110	14.7
10/12/2016	793		1770			
10/13/2016		30.6		659	1270	11.1
12/29/2016		32.8				14.7
1/25/2017	866	32.6			733	16.1
1/26/2017			1790	614		
4/10/2017			1990	496		
4/11/2017	512	28.8				12.9
6/5/2017	464			486	1240	
6/6/2017		21.3	1970			14.8
8/7/2017					2470	
8/8/2017		30.6	2080	570		22.9
8/9/2017	973					
10/23/2017		34.3	1870	732		
10/24/2017	1910				2200	13.8
4/23/2018	905				1200	
4/24/2018			2330	430		
4/25/2018		24.3				25
8/7/2018	704				1360	
8/8/2018		22.8	1410	632		12.8
10/24/2018	1140	27.8	2360	892	1600	10.1 (J)
4/1/2019	788		2770		692	
4/2/2019		26.9		413		
4/3/2019						13.6
10/7/2019	1120		2560	613	1430	
10/9/2019		35.9				12
2/3/2020		27.9				15.7
5/27/2020	644		2700	469	1040	
5/29/2020		21.3				10
10/7/2020	1360		2520	784	1650	
10/8/2020		28.8				9.7 (J)
4/12/2021			2440	568	668	
4/13/2021	730					
4/14/2021		22.2				14.3
10/11/2021	2290			1090	1650	
10/12/2021			2690			
10/14/2021		31.4				11.1
4/11/2022	1160			664	957	
4/12/2022			2890			
4/13/2022		28.7				10.5
10/25/2022	1590				1610	
10/26/2022			2730			
10/27/2022		37.5				12.2
1/20/2023				346		
4/24/2023			2720			
4/27/2023		20.1				10.3
10/9/2023			2420			

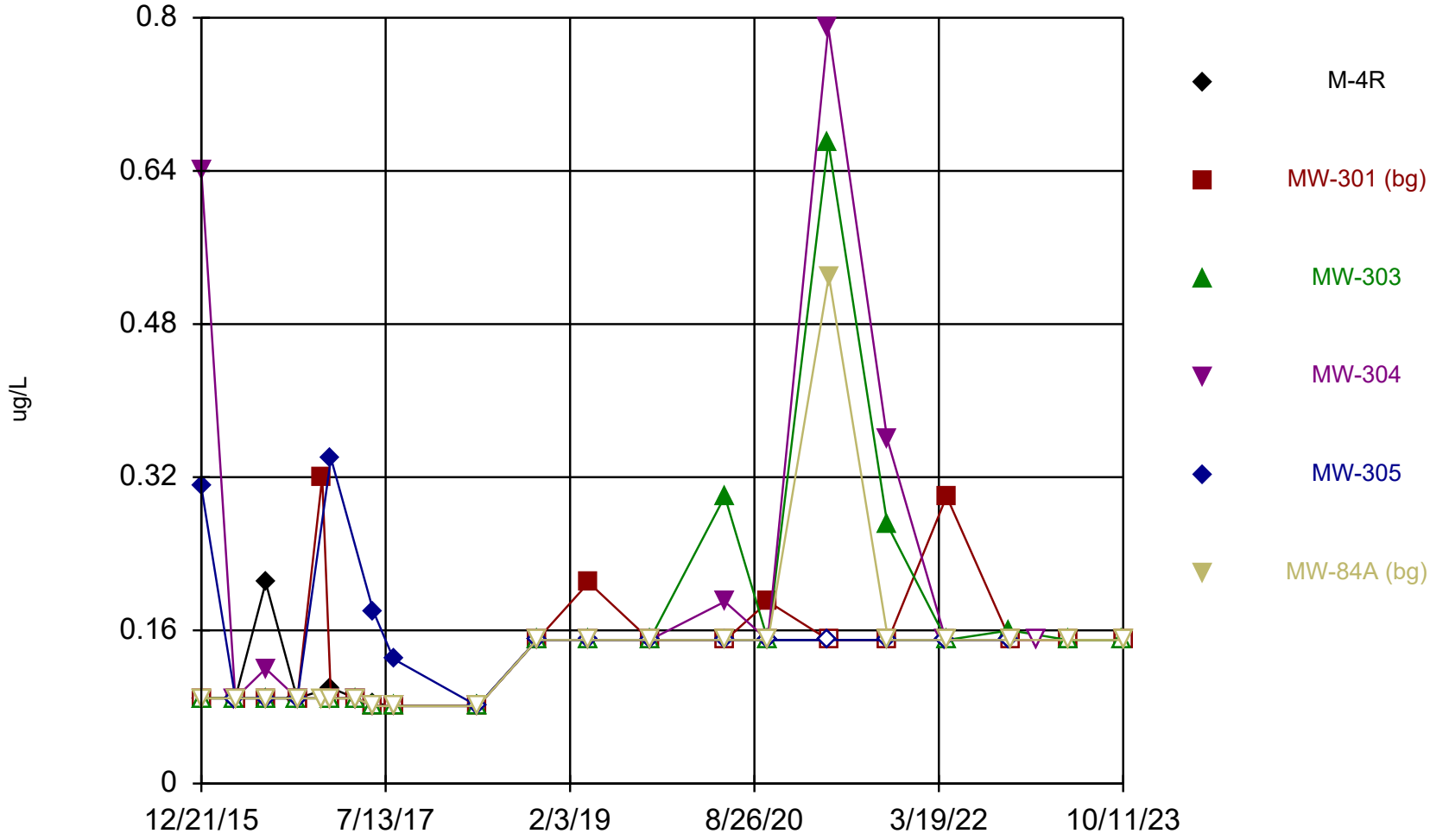
Time Series

Constituent: Boron (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/11/2023		36.2				14

Hollow symbols indicate censored values.

Cadmium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

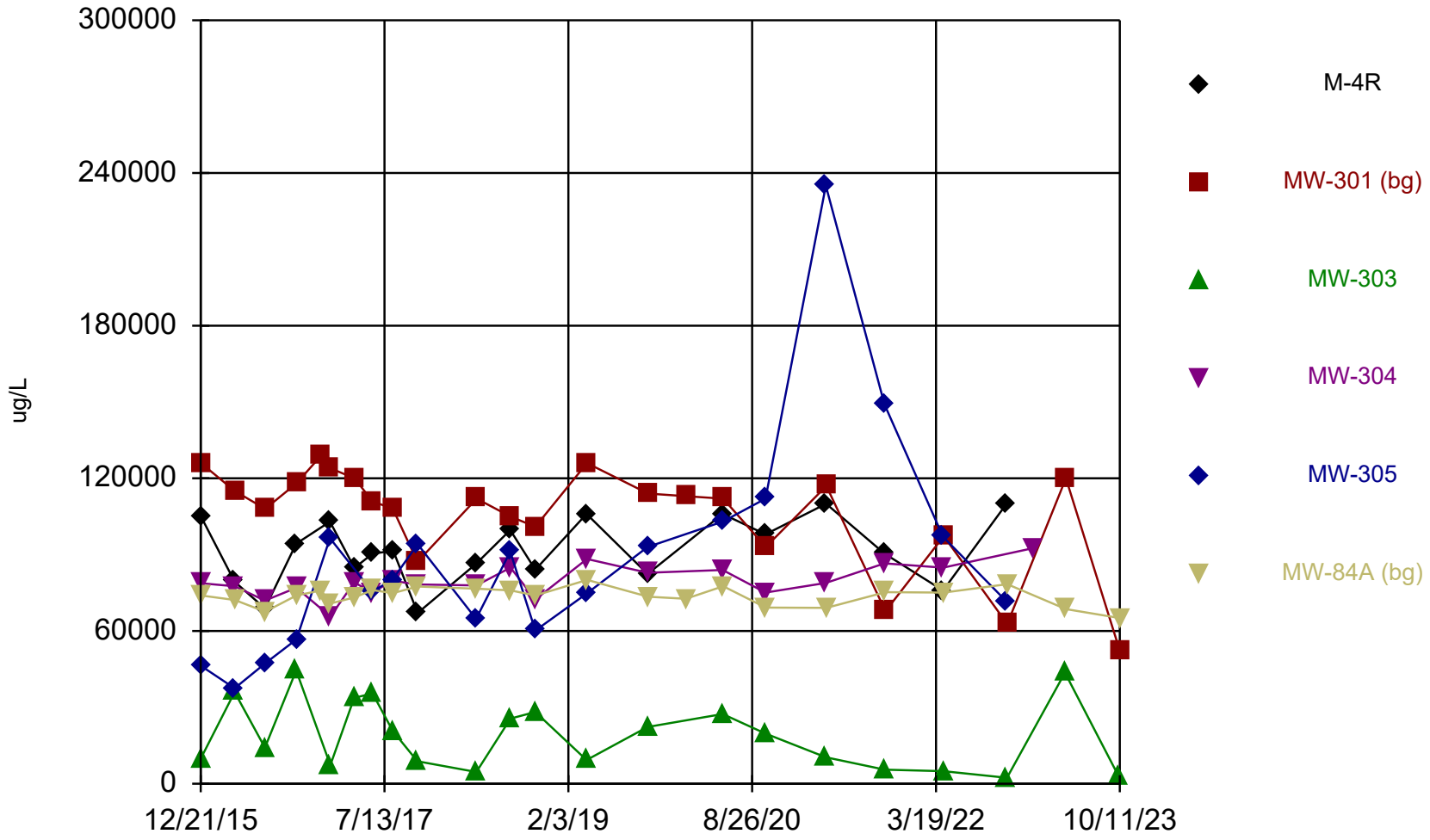
Time Series

Constituent: Cadmium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			<0.089 (U)	0.64 (J)	0.31 (J)	
12/22/2015	<0.089 (U)	<0.089 (U)				<0.089 (U)
4/4/2016	<0.089 (U)		<0.089 (U)	<0.089 (U)	<0.089 (U)	
4/5/2016		<0.089 (U)				<0.089 (U)
7/7/2016	0.21 (J)		<0.089 (U)	0.12 (J)		
7/8/2016		<0.089 (U)			<0.089 (U)	<0.089 (U)
10/12/2016	<0.089 (U)		<0.089 (U)			
10/13/2016		<0.089 (U)		<0.089 (U)	<0.089 (U)	<0.089 (U)
12/29/2016		0.32 (J)				<0.089 (U)
1/25/2017	0.1 (J)	<0.089 (U)			0.34 (J)	<0.089 (U)
1/26/2017			<0.089 (U)	<0.089 (U)		
4/10/2017			<0.089 (U)	<0.089 (U)		
4/11/2017	<0.089 (U)	<0.089 (U)				<0.089 (U)
6/5/2017	0.084 (J)			<0.081 (U)	0.18 (J)	
6/6/2017		<0.081 (U)	<0.081 (U)			<0.081 (U)
8/7/2017					0.13 (J)	
8/8/2017		<0.081 (U)	<0.081 (U)	<0.081 (U)		<0.081 (U)
8/9/2017	<0.081 (U)					
4/23/2018	<0.081 (U)				<0.081 (U)	
4/24/2018			<0.081 (U)	<0.081 (U)		
4/25/2018		<0.081 (U)				<0.081 (U)
10/24/2018	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)	<0.15 (U)
4/1/2019	<0.15 (U)		<0.15 (U)		<0.15 (U)	
4/2/2019		0.21 (J)		<0.15 (U)		
4/3/2019						<0.15 (U)
10/7/2019	<0.15 (U)		<0.15 (U)	<0.15 (U)	<0.15 (U)	
10/9/2019		<0.15 (U)				<0.15 (U)
5/27/2020	<0.15 (U)		0.3 (J)	0.19 (J)	<0.15 (U)	
5/29/2020		<0.15 (U)				<0.15 (U)
10/7/2020	<0.15 (U)		<0.15 (U)	<0.15 (U)	<0.15 (U)	
10/8/2020		0.19 (J)				<0.15 (U)
4/12/2021			0.67 (J)	0.79 (J)	<0.15 (U)	
4/13/2021	<0.15 (U)					
4/14/2021		<0.15 (U)				0.53 (J)
10/11/2021	<0.15 (U)			0.36 (J)	<0.15 (U)	
10/12/2021			0.27 (J)			
10/14/2021		<0.15 (U)				<0.15 (U)
4/11/2022	<0.15 (U)			<0.15 (U)	<0.15 (U)	
4/12/2022			<0.15 (U)			
4/13/2022		0.3 (J)				<0.15 (U)
10/25/2022	<0.15 (U)				<0.15 (U)	
10/26/2022			0.16 (J)			
10/27/2022		<0.15 (U)				<0.15 (U)
1/20/2023				<0.15 (U)		
4/24/2023			<0.15 (U)			
4/27/2023		<0.15 (U)				<0.15 (U)
10/9/2023			<0.15 (U)			
10/11/2023		<0.15 (U)				<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Calcium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Calcium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			9830	78800	46400	
12/22/2015	105000	126000				74000
4/4/2016	79400		36000	77600	37500	
4/5/2016		115000				72200
7/7/2016	68900		14200	72000		
7/8/2016		108000			47300	67600
10/12/2016	94300		44500			
10/13/2016		118000		77000	56700	74000
12/29/2016		129000				76000
1/25/2017	103000	124000			96500	70800
1/26/2017			7330	65700		
4/10/2017			33700	79100		
4/11/2017	84800	120000				73200
6/5/2017	90300			75200	75500	
6/6/2017		111000	35500			76100
8/7/2017					80200	
8/8/2017		108000	20700	79700		74900
8/9/2017	91600					
10/23/2017		87200	8850	78300		
10/24/2017	67100				94100	77500
4/23/2018	86400				64800	
4/24/2018			4610	77900		
4/25/2018		112000				76600
8/7/2018	99700				91200	
8/8/2018		105000	25600	84900		76000
10/24/2018	84100	101000	28200	72400	60200	74000
4/1/2019	106000		9290		74700	
4/2/2019		126000		88300		
4/3/2019						80100
10/7/2019	82400		22300	82900	93000	
10/9/2019		114000				73500
2/3/2020		113000				72700
5/27/2020	106000		27400	84000	103000	
5/29/2020		112000				77600
10/7/2020	98000		19700	75100	112000	
10/8/2020		93000				69200
4/12/2021			10400	78900	235000	
4/13/2021	110000					
4/14/2021		117000				69100
10/11/2021	90400			86600	149000	
10/12/2021			5530			
10/14/2021		67800				75300
4/11/2022	75900			84900	97000	
4/12/2022			4950			
4/13/2022		97300				75100
10/25/2022	110000				71600	
10/26/2022			2360			
10/27/2022		62800				78400
1/20/2023				92700		
4/24/2023			43600			
4/27/2023		120000				68600
10/9/2023			2610			

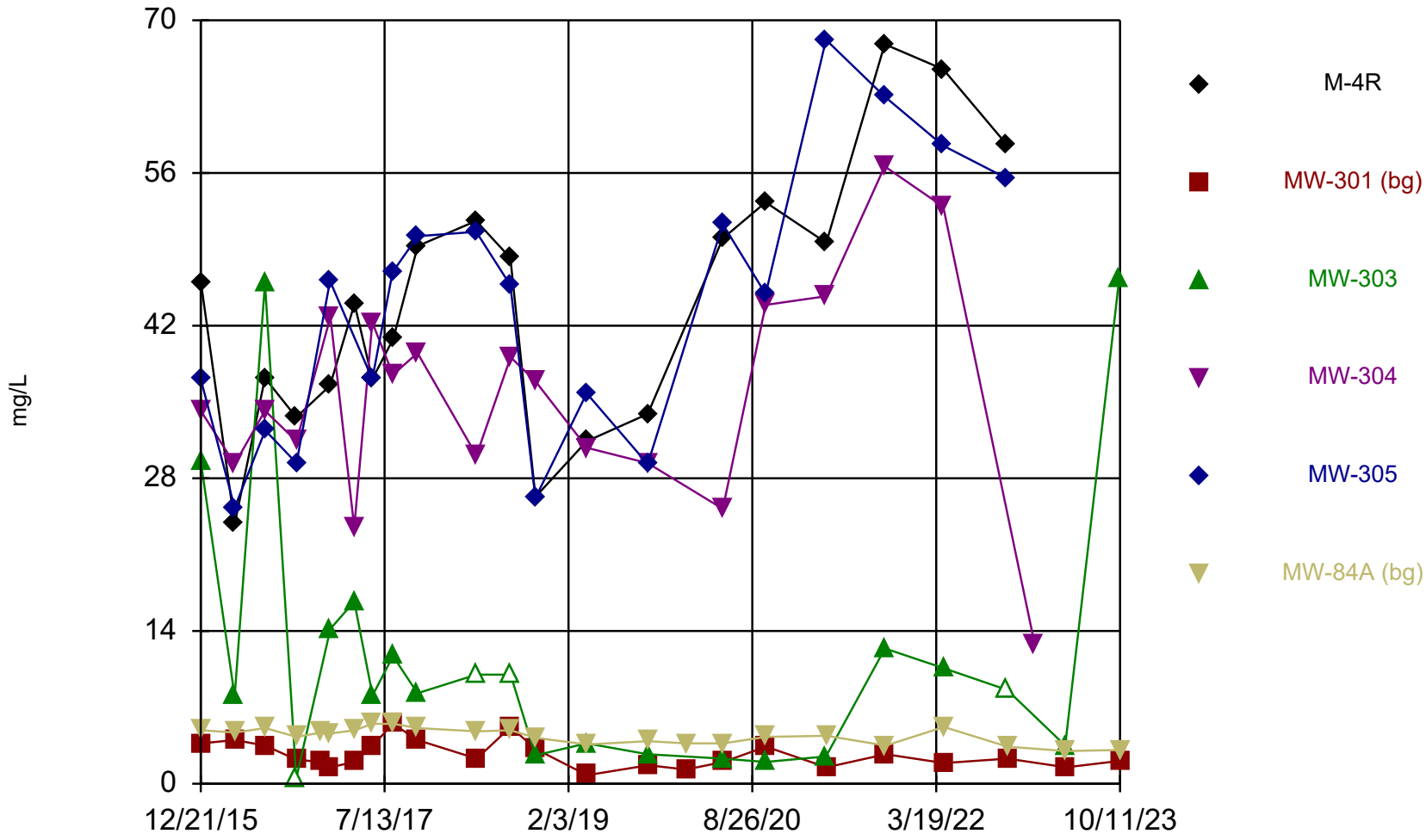
Time Series

Constituent: Calcium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/11/2023		52300				65100

Hollow symbols indicate censored values.

Chloride



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Chloride (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			29.6 (J)	34.2	37.1	
12/22/2015	45.9	3.7 (J)				4.9
4/4/2016	23.8		8	29.3	25.3	
4/5/2016		4				4.7
7/7/2016	37.2		45.9 (J)	34.2		
7/8/2016		3.5 (J)			32.4	5.1
10/12/2016	33.6		<0.5 (U)			
10/13/2016		2.2		31.4	29.4	4.3
12/29/2016		2 (J)				4.7
1/25/2017	36.5	1.5 (J)			46.1	4.6
1/26/2017			14.2 (J)	42.8		
4/10/2017			16.7 (J)	23.5		
4/11/2017	44	2				4.9
6/5/2017	37.1			42.3	37.1	
6/6/2017		3.5	8.1			5.5
8/7/2017					46.9	
8/8/2017		5.5	11.7 (J)	37.5		5.5
8/9/2017	40.8					
10/23/2017		4	8.3 (J)	39.5		
10/24/2017	49.3				50.2	5.1
4/23/2018	51.6				50.6	
4/24/2018			<10 (U)	30.1		
4/25/2018		2.3				4.8
8/7/2018	48.2				45.7	
8/8/2018		5.2	<10 (U)	39.1		4.9
10/24/2018	26.3	3.2	2.6	36.9	26.2	4.2
4/1/2019	31.4		3.7 (J)		35.8	
4/2/2019		0.79 (J)		30.8		
4/3/2019						3.6
10/7/2019	33.9		2.7	29.4	29.3	
10/9/2019		1.7 (J)				3.9
2/3/2020		1.3 (J)				3.7
5/27/2020	50		2.3 (J)	25.2	51.3	
5/29/2020		2 (J)				3.7
10/7/2020	53.3		2 (J)	43.9	44.9	
10/8/2020		3.4				4.3
4/12/2021			2.5	44.7	68.2	
4/13/2021	49.6					
4/14/2021		1.5 (J)				4.4
10/11/2021	67.8			56.6	63	
10/12/2021			12.4 (J)			
10/14/2021		2.7				3.5
4/11/2022	65.5			52.9	58.5	
4/12/2022			10.6 (J)			
4/13/2022		1.9 (J)				5.2
10/25/2022	58.6				55.5	
10/26/2022			<8.6 (U)			
10/27/2022		2.3				3.4
1/20/2023				12.7		
4/24/2023			3.5 (J)			
4/27/2023		1.5 (J)				3
10/9/2023			46.4			

ND substitution: RL or RL/2 if <15% NDs.

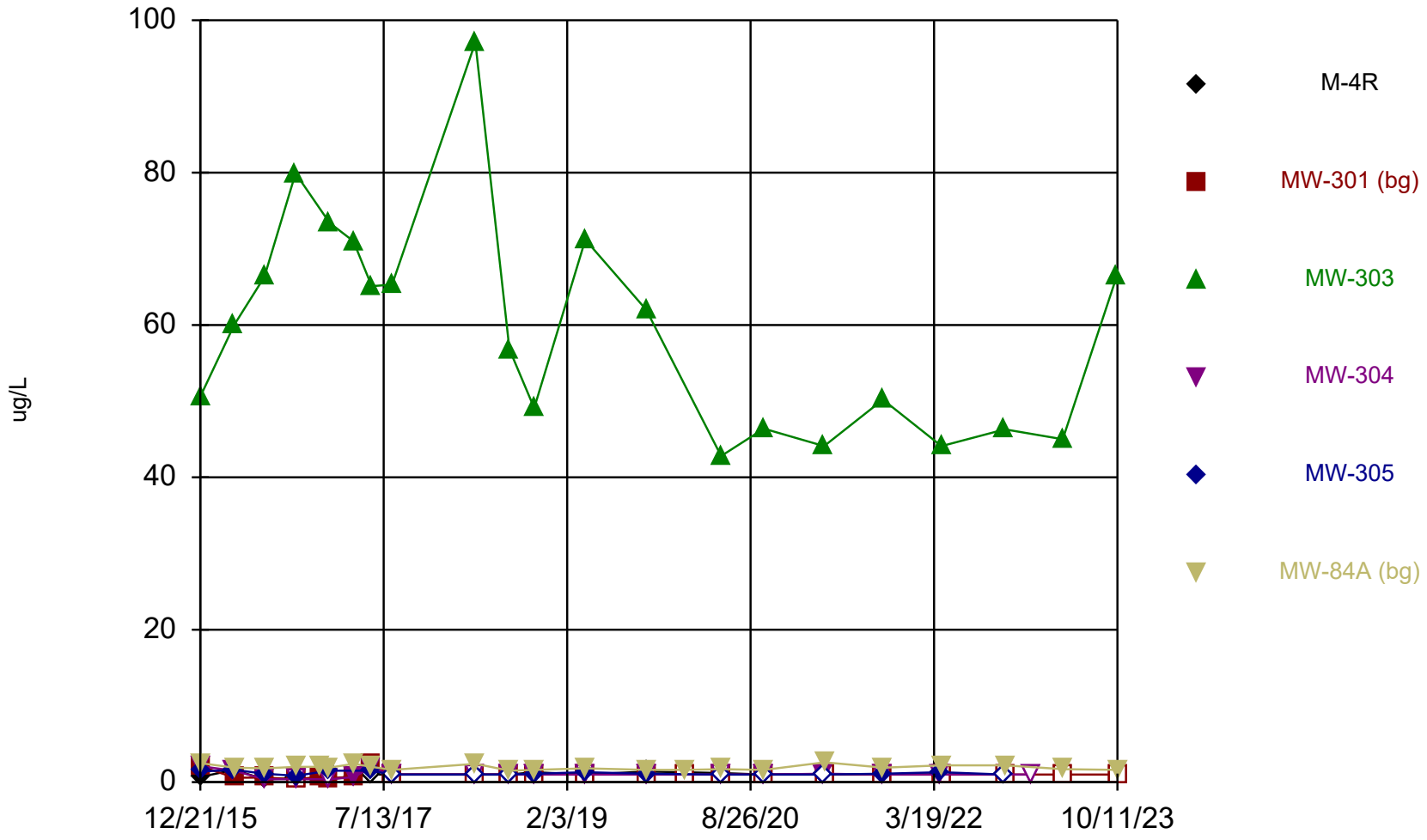
Time Series

Constituent: Chloride (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/11/2023		2.1				3.1

Hollow symbols indicate censored values.

Chromium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

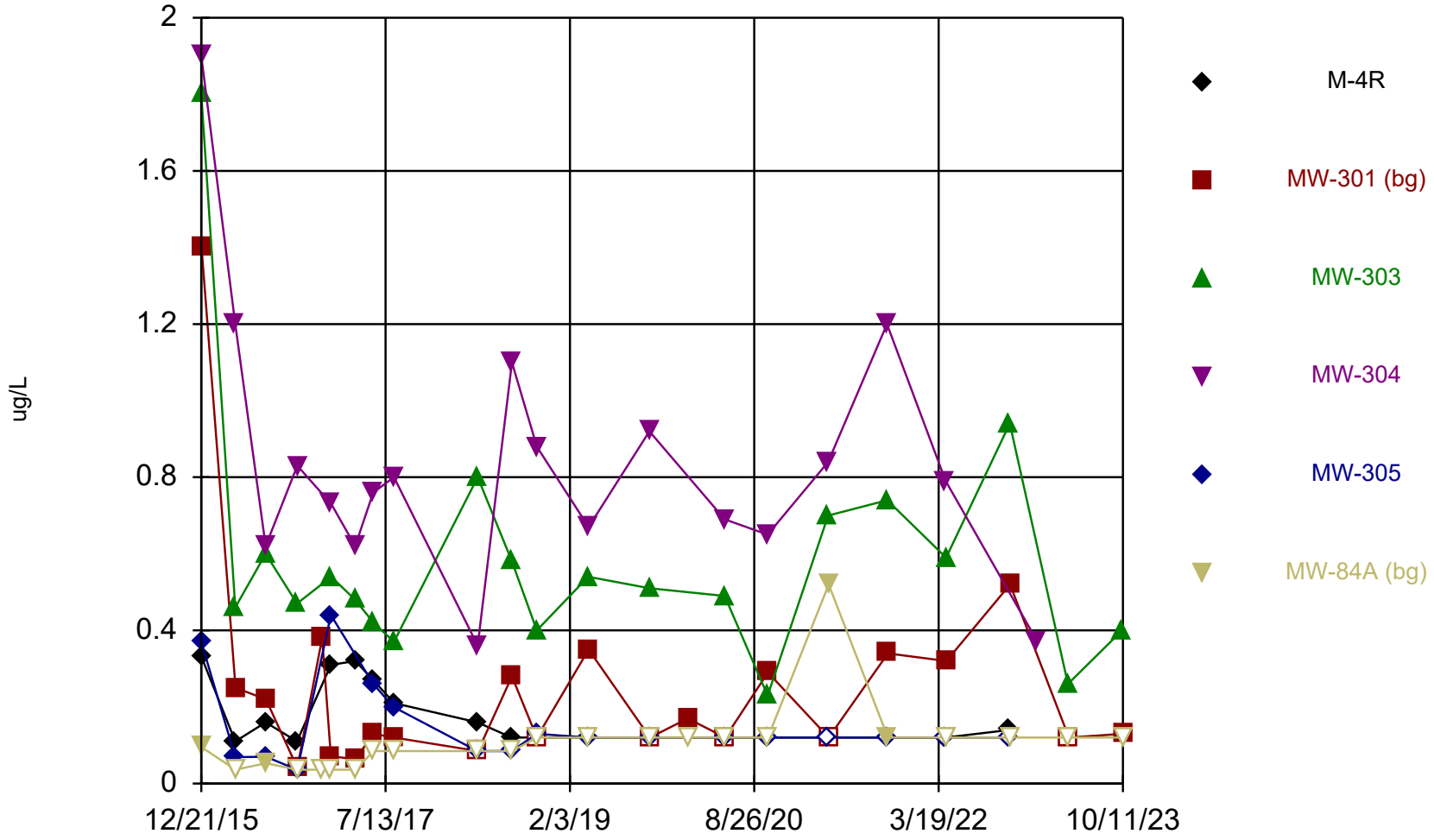
Constituent: Chromium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			50.6	2.1	1.4	
12/22/2015	0.68 (J)	2.1				2.5
4/4/2016	1.6		60	1.5	1.6	
4/5/2016		0.58 (J)				1.9
7/7/2016	<0.39 (U)		66.3	<0.39 (U)		
7/8/2016		0.59 (J)			1.1	1.8
10/12/2016	0.49 (J)		79.9			
10/13/2016		<0.39 (U)		<0.39 (U)	0.83 (J)	2
12/29/2016		0.7 (J)				2
1/25/2017	0.4 (J)	0.53 (J)			1.5	1.9
1/26/2017			73.4	<0.39 (U)		
4/10/2017			71	0.65 (J)		
4/11/2017	0.7 (J)	0.7 (J)				2.4
6/5/2017	<1 (U)			1.9 (J)	1.5 (J)	
6/6/2017		2.3 (J)	65.1			2 (J)
8/7/2017					<1 (U)	
8/8/2017		<1 (U)	65.3	<1 (U)		1.6 (J)
8/9/2017	<1 (U)					
4/23/2018	<1 (U)				<1 (U)	
4/24/2018			97.1	<1 (U)		
4/25/2018		<1 (U)				2.4 (J)
8/7/2018	<1 (U)				<1 (U)	
8/8/2018		<1 (U)	56.8	<1 (U)		1.5 (J)
10/24/2018	1.3 (J)	<1 (U)	49.1	<1 (U)	1.1 (J)	1.6 (J)
4/1/2019	<1 (U)		71.2		1.3 (J)	
4/2/2019		<1 (U)		<1 (U)		
4/3/2019						1.8 (J)
10/7/2019	1.4 (J)		62	<1 (U)	1.1 (J)	
10/9/2019		<1 (U)				1.6 (J)
2/3/2020		<1 (U)				1.6 (J)
5/27/2020	1.2 (J)		42.8	<1 (U)	<1 (U)	
5/29/2020		<1 (U)				1.7 (J)
10/7/2020	<1 (U)		46.4	<1 (U)	<1 (U)	
10/8/2020		<1 (U)				1.6 (J)
4/12/2021			44.1	1.1 (J)	<1 (U)	
4/13/2021	<1 (U)					
4/14/2021		<1 (U)				2.6 (J)
10/11/2021	<1 (U)			<1 (U)	1.1 (J)	
10/12/2021			50.2			
10/14/2021		<1 (U)				1.9 (J)
4/11/2022	<1 (U)			<1 (U)	1.3 (J)	
4/12/2022			44.1			
4/13/2022		<1 (U)				2.2 (J)
10/25/2022	<1 (U)				<1 (U)	
10/26/2022			46.3			
10/27/2022		<1 (U)				2.2 (J)
1/20/2023				<1 (U)		
4/24/2023			45			
4/27/2023		<1 (U)				1.7 (J)
10/9/2023			66.4			
10/11/2023		<1 (U)				1.6 (J)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Cobalt



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

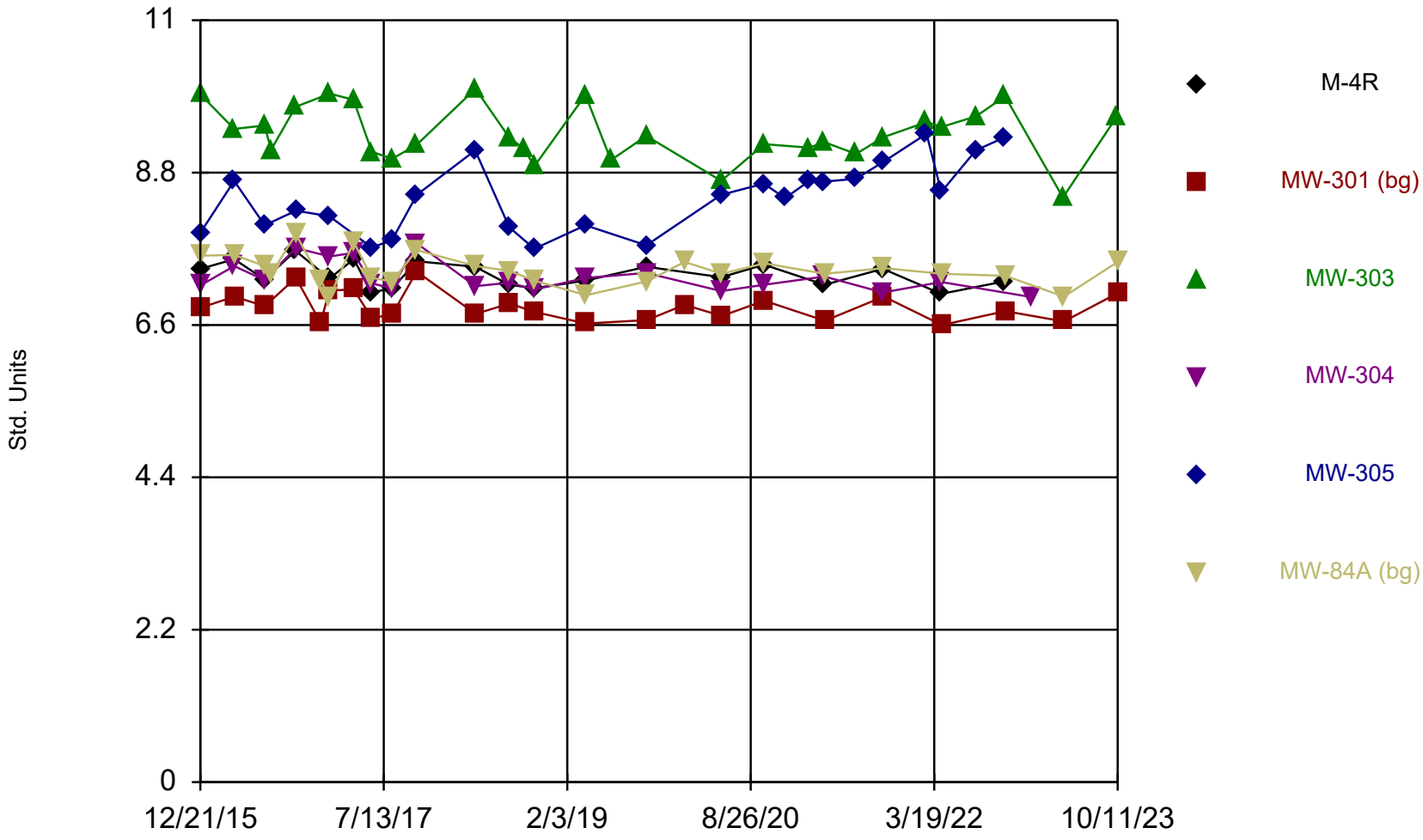
Time Series

Constituent: Cobalt (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			1.8	1.9	0.37 (J)	
12/22/2015	0.33 (J)	1.4				0.095 (J)
4/4/2016	0.11 (J)		0.46 (J)	1.2	0.069 (J)	
4/5/2016		0.25 (J)				<0.036 (U)
7/7/2016	0.16 (J)		0.6 (J)	0.62 (J)		
7/8/2016		0.22 (J)			0.07 (J)	0.053 (J)
10/12/2016	0.11 (J)		0.47 (J)			
10/13/2016		0.041 (J)		0.83 (J)	<0.036 (U)	<0.036 (U)
12/29/2016		0.38 (J)				<0.036 (U)
1/25/2017	0.31 (J)	0.071 (J)			0.44 (J)	<0.036 (U)
1/26/2017			0.54 (J)	0.73 (J)		
4/10/2017			0.48 (J)	0.62 (J)		
4/11/2017	0.32 (J)	0.064 (J)				<0.036 (U)
6/5/2017	0.27 (J)			0.76 (J)	0.26 (J)	
6/6/2017		0.13 (J)	0.42 (J)			<0.085 (U)
8/7/2017					0.2 (J)	
8/8/2017		0.12 (J)	0.37 (J)	0.8 (J)		<0.085 (U)
8/9/2017	0.21 (J)					
4/23/2018	0.16 (J)				<0.085 (U)	
4/24/2018			0.8 (J)	0.36 (J)		
4/25/2018		<0.085 (U)				<0.085 (U)
8/7/2018	0.12 (J)				<0.085 (U)	
8/8/2018		0.28 (J)	0.58 (J)	1.1		<0.085 (U)
10/24/2018	<0.12 (U)	<0.12 (U)	0.4 (J)	0.88 (J)	0.13 (J)	<0.12 (U)
4/1/2019	<0.12 (U)		0.54 (J)		<0.12 (U)	
4/2/2019		0.35 (J)		0.67 (J)		
4/3/2019						<0.12 (U)
10/7/2019	<0.12 (U)		0.51 (J)	0.92 (J)	<0.12 (U)	
10/9/2019		<0.12 (U)				<0.12 (U)
2/3/2020		0.17 (J)				<0.12 (U)
5/27/2020	<0.12 (U)		0.49 (J)	0.69 (J)	<0.12 (U)	
5/29/2020		<0.12 (U)				<0.12 (U)
10/7/2020	<0.12		0.23 (J)	0.65 (J)	<0.12 (U)	
10/8/2020		0.29 (J)				<0.12 (U)
4/12/2021			0.7 (J)	0.84 (J)	<0.12 (U)	
4/13/2021	<0.12 (U)					
4/14/2021		<0.12 (U)				0.52 (J)
10/11/2021	<0.12 (U)			1.2	<0.12 (U)	
10/12/2021			0.74 (J)			
10/14/2021		0.34 (J)				0.12 (J)
4/11/2022	<0.12 (U)			0.79 (J)	<0.12 (U)	
4/12/2022			0.59 (J)			
4/13/2022		0.32 (J)				<0.12 (U)
10/25/2022	0.14 (J)				<0.12 (U)	
10/26/2022			0.94			
10/27/2022		0.52 (J)				<0.12 (U)
1/20/2023				0.37 (J)		
4/24/2023			0.26 (J)			
4/27/2023		<0.12 (U)				<0.12 (U)
10/9/2023			0.4 (J)			
10/11/2023		0.13 (J)				<0.12

ND substitution: RL or RL/2 if <15% NDs.

Field pH



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Field pH (Std. Units) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			9.93	7.17	7.93	
12/22/2015	7.41	6.85				7.6
4/4/2016	7.55		9.43	7.45	8.68	
4/5/2016		7.01				7.61
7/7/2016	7.26		9.48	7.25		
7/8/2016		6.87			8.04	7.45
7/28/2016			9.13			7.34
10/12/2016	7.67		9.75			
10/13/2016		7.28		7.71	8.25	7.91
12/29/2016		6.63				7.25
1/25/2017	7.27	7.1			8.17	6.99
1/26/2017			9.94	7.59		
4/10/2017			9.85	7.64		
4/11/2017	7.55	7.11				7.8
6/5/2017	7.07			7.2	7.72	
6/6/2017		6.7	9.1			7.28
8/7/2017					7.82	
8/8/2017		6.75	9	7.13		7.23
8/9/2017	7.13					
10/23/2017		7.37	9.2	7.78		
10/24/2017	7.52				8.48	7.68
4/23/2018	7.44				9.12	
4/24/2018			10.01	7.16		
4/25/2018		6.76				7.45
8/7/2018	7.18				8.01	
8/8/2018		6.91	9.3	7.21		7.38
9/21/2018			9.15			
10/24/2018	7.13	6.79	8.89	7.11	7.7	7.24
4/1/2019	7.24		9.92		8.04	
4/2/2019		6.62		7.28		
4/3/2019						7.03
6/19/2019			8.98			
10/7/2019	7.44		9.33	7.35	7.75	
10/9/2019		6.67				7.23
2/3/2020		6.89				7.51
5/27/2020	7.29		8.68	7.09	8.48	
5/29/2020		6.73				7.34
10/7/2020	7.47		9.21	7.18	8.64	
10/8/2020		6.95				7.49
12/11/2020					8.43	
2/25/2021			9.16		8.68	
4/12/2021			9.24	7.3	8.67	
4/13/2021	7.18					
4/14/2021		6.66				7.34
7/20/2021			9.07		8.71	
10/11/2021	7.41			7.07	8.95	
10/12/2021			9.31			
10/14/2021		7.01				7.42
2/24/2022			9.53		9.36	
4/11/2022	7.05			7.22	8.52	
4/12/2022			9.46			
4/13/2022		6.6				7.34

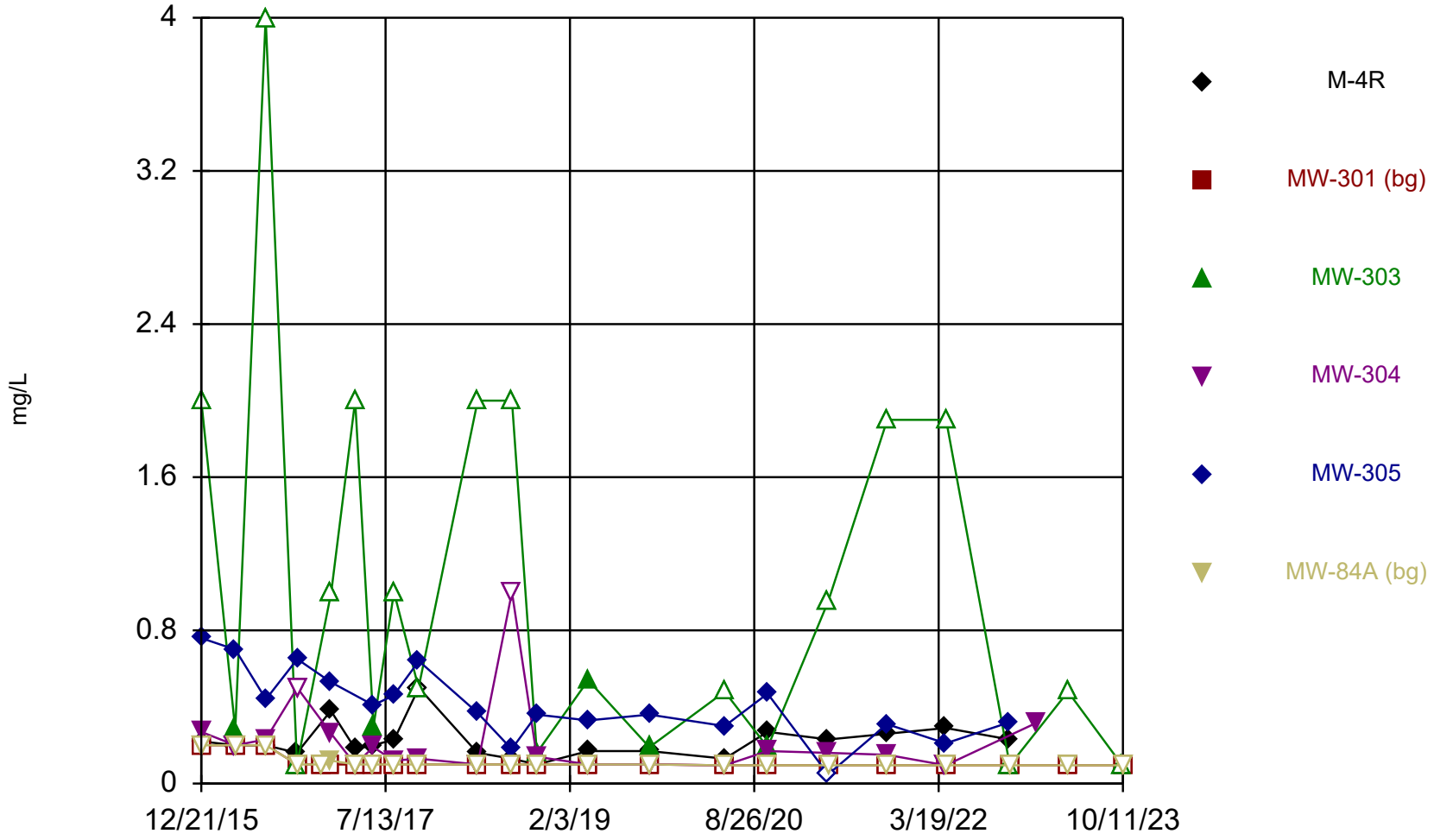
Time Series

Constituent: Field pH (Std. Units) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
7/27/2022			9.61		9.12	
10/25/2022	7.23				9.31	
10/26/2022			9.9			
10/27/2022		6.8				7.31
1/20/2023				7		
4/24/2023			8.44			
4/27/2023		6.65				7.01
10/9/2023			9.61			
10/11/2023		7.06				7.51

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Fluoride (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

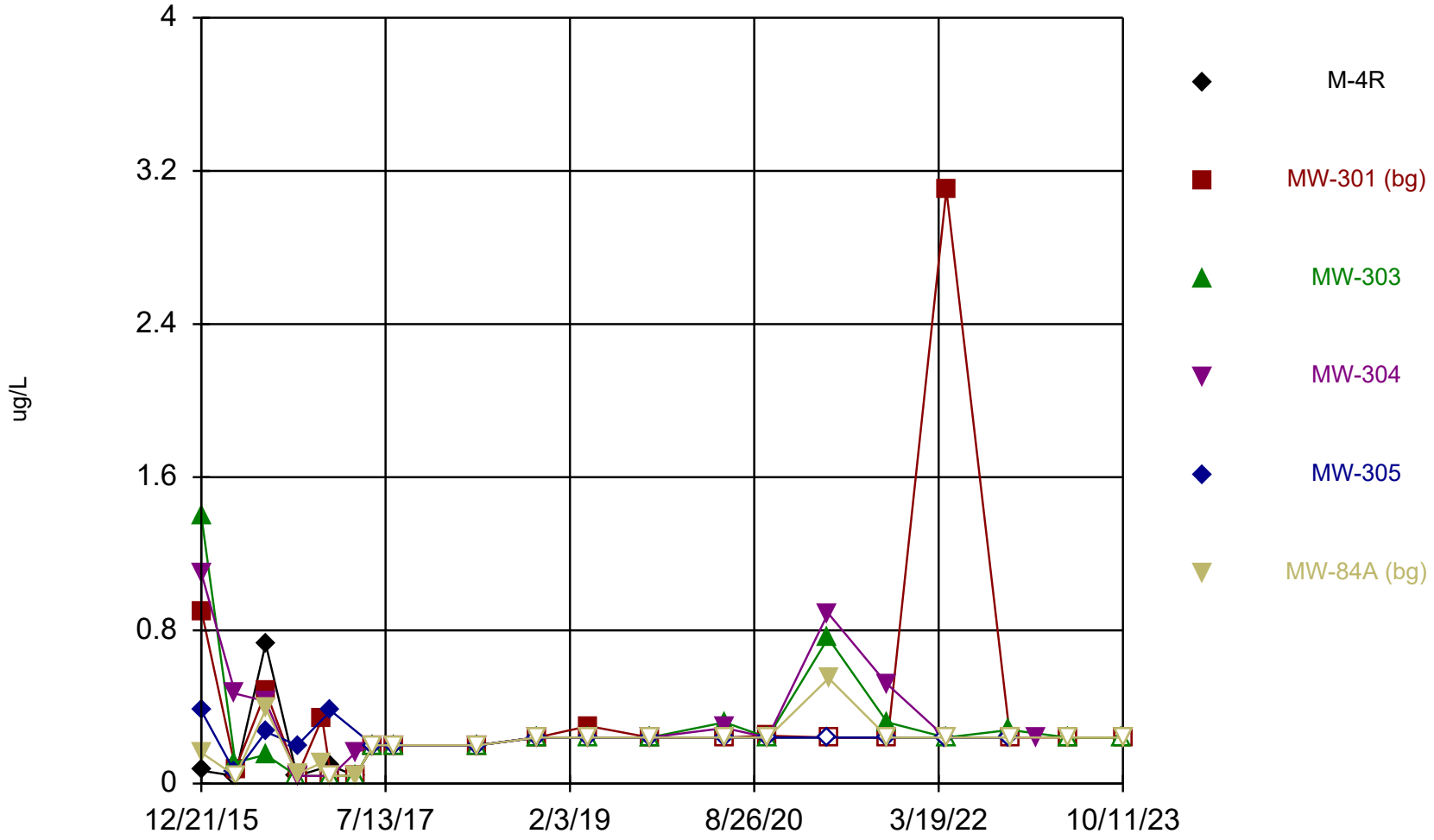
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			<2 (U)	0.27 (J)	0.76	
12/22/2015	0.22 (J)	<0.2 (U)				<0.2 (U)
4/4/2016	<0.2 (U)		0.28 (J)	<0.2 (U)	0.7	
4/5/2016		<0.2 (U)				<0.2 (U)
7/7/2016	<0.2 (U)		<4 (U)	0.23 (J)		
7/8/2016		<0.2 (U)			0.44	<0.2 (U)
10/12/2016	0.16 (J)		<0.1 (U)			
10/13/2016		<0.1 (U)		<0.5 (U)	0.65 (J)	<0.1 (U)
12/29/2016		<0.1 (U)				<0.1 (U)
1/25/2017	0.38	<0.1 (U)			0.53	0.12 (J)
1/26/2017			<1 (U)	0.26 (J)		
4/10/2017			<2 (U)	0.1 (J)		
4/11/2017	0.18 (J)	<0.1 (U)				<0.1 (U)
6/5/2017	0.2 (J)			0.19 (J)	0.41	
6/6/2017		<0.1 (U)	0.3 (J)			<0.1 (U)
8/7/2017					0.46	
8/8/2017		<0.1 (U)	<1 (U)	0.12 (J)		<0.1 (U)
8/9/2017	0.23 (J)					
10/23/2017		<0.1 (U)	<0.5 (U)	0.13 (J)		
10/24/2017	<0.5 (U)				0.64	<0.1 (U)
4/23/2018	0.16 (J)				0.37	
4/24/2018			<2 (U)	<0.1 (U)		
4/25/2018		<0.1 (U)				<0.1 (U)
8/7/2018	0.13 (J)				0.18 (J)	
8/8/2018		<0.1 (U)	<2 (U)	<1 (U)		<0.1 (U)
10/24/2018	<0.1 (U)	<0.1 (U)	0.16 (J)	0.14 (J)	0.36	<0.1 (U)
4/1/2019	0.17 (J)		0.54 (J)		0.33	
4/2/2019		<0.1 (U)		<0.1 (U)		
4/3/2019						<0.1 (U)
10/7/2019	0.17 (J)		0.19 (J)	<0.1 (U)	0.36	
10/9/2019		<0.1 (U)				<0.1 (U)
5/27/2020	0.13 (J)		<0.48 (U)	<0.095 (U)	0.3 (J)	
5/29/2020		<0.095 (U)				<0.095 (U)
10/7/2020	0.27 (J)		0.19 (J)	0.17 (J)	0.47	
10/8/2020		<0.095 (U)				<0.095 (U)
4/12/2021			<0.95 (U)	0.16 (J)	<0.095 (U)	
4/13/2021	0.23 (J)					
4/14/2021		<0.095 (U)				<0.095 (U)
10/11/2021	0.26 (J)			0.15 (J)	0.31 (J)	
10/12/2021			<1.9 (U)			
10/14/2021		<0.095 (U)				<0.095 (U)
4/11/2022	0.29 (J)			<0.095 (U)	0.21 (J)	
4/12/2022			<1.9 (U)			
4/13/2022		<0.095 (U)				<0.095 (U)
10/25/2022	0.23 (J)				0.32	
10/26/2022			<0.095 (U)			
10/27/2022		<0.095 (U)				<0.095 (U)
1/20/2023				0.32		
4/24/2023			<0.48 (U)			
4/27/2023		<0.095 (U)				<0.095 (U)
10/9/2023			<0.095 (U)			
10/11/2023		<0.095 (U)				<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Lead



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Lead (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

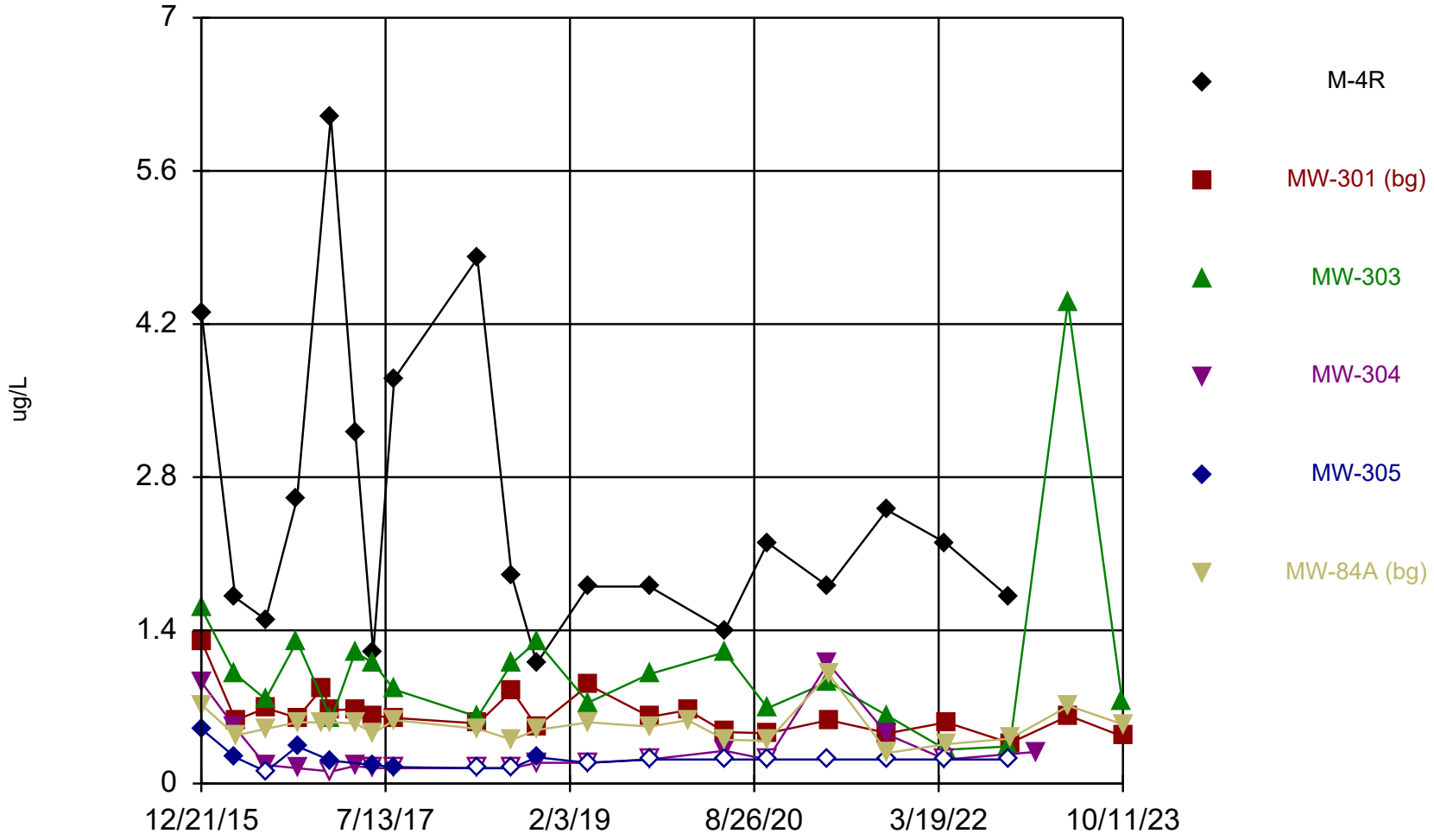
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			1.4	1.1	0.38 (J)	
12/22/2015	0.067 (J)	0.9 (J)				0.16 (J)
4/4/2016	<0.04 (U)		0.11 (J)	0.47 (J)	0.056 (J)	
4/5/2016		0.077 (J)				<0.04 (U)
7/7/2016	0.73 (J)		0.15 (J)	0.43 (J)		
7/8/2016		0.48 (J)			0.27 (J)	0.39 (J)
10/12/2016	<0.04 (U)		<0.04 (U)			
10/13/2016		<0.04 (U)		<0.04 (U)	0.2 (J)	0.049 (J)
12/29/2016		0.34 (J)				0.11 (J)
1/25/2017	0.094 (J)	<0.04 (U)			0.38 (J)	<0.04 (U)
1/26/2017			<0.04 (U)	<0.04 (U)		
4/10/2017			<0.04 (U)	0.16 (J)		
4/11/2017	<0.04 (U)	<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)			<0.2 (U)
8/7/2017					<0.2 (U)	
8/8/2017		<0.2 (U)	<0.2 (U)	<0.2 (U)		<0.2 (U)
8/9/2017	<0.2 (U)					
4/23/2018	<0.2 (U)				<0.2 (U)	
4/24/2018			<0.2 (U)	<0.2 (U)		
4/25/2018		<0.2 (U)				<0.2 (U)
10/24/2018	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)
4/1/2019	<0.24 (U)		<0.24 (U)		<0.24 (U)	
4/2/2019		0.3 (J)		<0.24 (U)		
4/3/2019						<0.24 (U)
10/7/2019	<0.24 (U)		<0.24 (U)	<0.24 (U)	<0.24 (U)	
10/9/2019		<0.24 (U)				<0.24 (U)
5/27/2020	<0.24 (U)		0.32 (J)	0.29 (J)	<0.24 (U)	
5/29/2020		<0.24 (U)				<0.24 (U)
10/7/2020	<0.24 (U)		<0.24 (U)	<0.24 (U)	<0.24 (U)	
10/8/2020		0.25 (J)				<0.24 (U)
4/12/2021			0.76 (J)	0.89 (J)	<0.24 (U)	
4/13/2021	<0.24 (U)					
4/14/2021		<0.24 (U)				0.55 (J)
10/11/2021	<0.24 (U)			0.52 (J)	<0.24 (U)	
10/12/2021			0.32 (J)			
10/14/2021		<0.24 (U)				<0.24 (U)
4/11/2022	<0.24 (U)			<0.24 (U)	<0.24 (U)	
4/12/2022			<0.24 (U)			
4/13/2022		3.1 (X)				<0.24 (U)
10/25/2022	<0.24 (U)				<0.24 (U)	
10/26/2022			0.28 (J)			
10/27/2022		<0.24 (U)				<0.24 (U)
1/20/2023				0.24 (J)		
4/24/2023			<0.24 (U)			
4/27/2023		<0.24 (U)				<0.24 (U)
10/9/2023			<0.24 (U)			
10/11/2023		<0.24 (U)				<0.24 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Lithium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

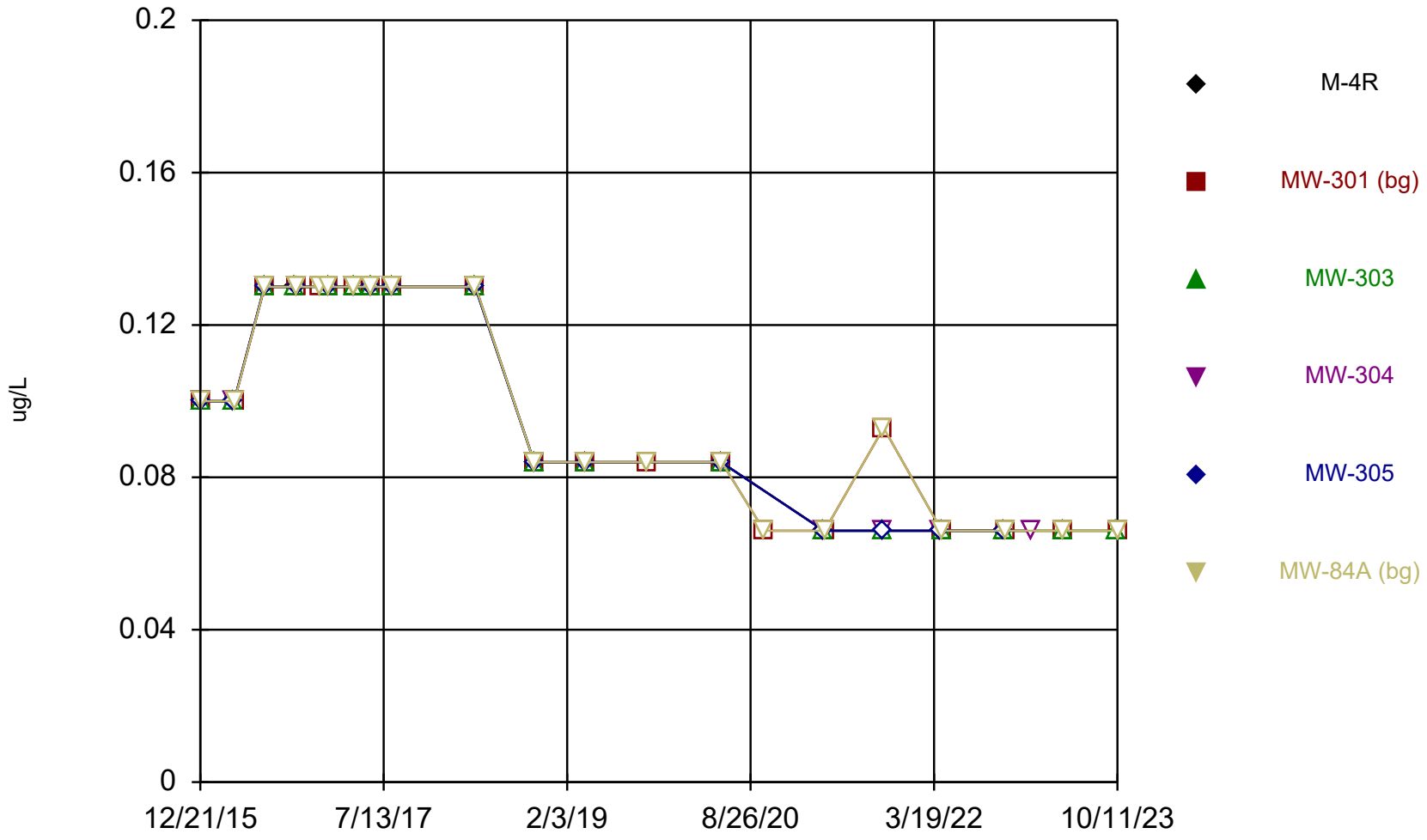
Constituent: Lithium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			1.6	0.93 (J)	0.5 (J)	
12/22/2015	4.3	1.3 (X)				0.72 (J)
4/4/2016	1.7		1	0.51 (J)	0.24 (J)	
4/5/2016		0.58 (J)				0.44 (J)
7/7/2016	1.5		0.77 (J)	0.17 (J)		
7/8/2016		0.69 (J)			<0.11 (U)	0.5 (J)
10/12/2016	2.6		1.3			
10/13/2016		0.6 (J)		0.14 (J)	0.34 (J)	0.56 (J)
12/29/2016		0.87 (J)				0.56 (J)
1/25/2017	6.1	0.67 (J)			0.21 (J)	0.56 (J)
1/26/2017			0.59 (J)	<0.11 (U)		
4/10/2017			1.2	0.16 (J)		
4/11/2017	3.2	0.68 (J)				0.55 (J)
6/5/2017	1.2			<0.14 (U)	0.17 (J)	
6/6/2017		0.62 (J)	1.1			0.46 (J)
8/7/2017					0.15 (J)	
8/8/2017		0.6 (J)	0.86 (J)	<0.14 (U)		0.58 (J)
8/9/2017	3.7					
4/23/2018	4.8				<0.14 (U)	
4/24/2018			0.61 (J)	<0.14 (U)		
4/25/2018		0.55 (J)				0.5 (J)
8/7/2018	1.9				<0.14 (U)	
8/8/2018		0.85 (J)	1.1	<0.14 (U)		0.4 (J)
10/24/2018	1.1	0.52 (J)	1.3	<0.19 (U)	0.24 (J)	0.49 (J)
4/1/2019	1.8		0.74 (J)		<0.19 (U)	
4/2/2019		0.9 (J)		<0.19 (U)		
4/3/2019						0.56 (J)
10/7/2019	1.8		1	<0.22 (U)	<0.22 (U)	
10/9/2019		0.61 (J)				0.52 (J)
2/3/2020		0.67 (J)				0.58 (J)
5/27/2020	1.4		1.2	0.3 (J)	<0.22 (U)	
5/29/2020		0.47 (J)				0.4 (J)
10/7/2020	2.2		0.69 (J)	<0.22 (U)	<0.22 (U)	
10/8/2020		0.46 (J)				0.39 (J)
4/12/2021			0.93 (J)	1.1	<0.22 (U)	
4/13/2021	1.8					
4/14/2021		0.58 (J)				1 (X)
10/11/2021	2.5			0.45 (J)	<0.22 (U)	
10/12/2021			0.62			
10/14/2021		0.46 (J)				0.28 (J)
4/11/2022	2.2			<0.22 (U)	<0.22 (U)	
4/12/2022			0.31 (J)			
4/13/2022		0.56 (J)				0.36 (J)
10/25/2022	1.7				<0.22 (U)	
10/26/2022			0.34 (J)			
10/27/2022		0.37 (J)				0.41 (J)
1/20/2023				0.29 (J)		
4/24/2023			4.4			
4/27/2023		0.62 (J)				0.71 (J)
10/9/2023			0.75 (J)			
10/11/2023		0.43 (J)				0.54 (J)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Mercury



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

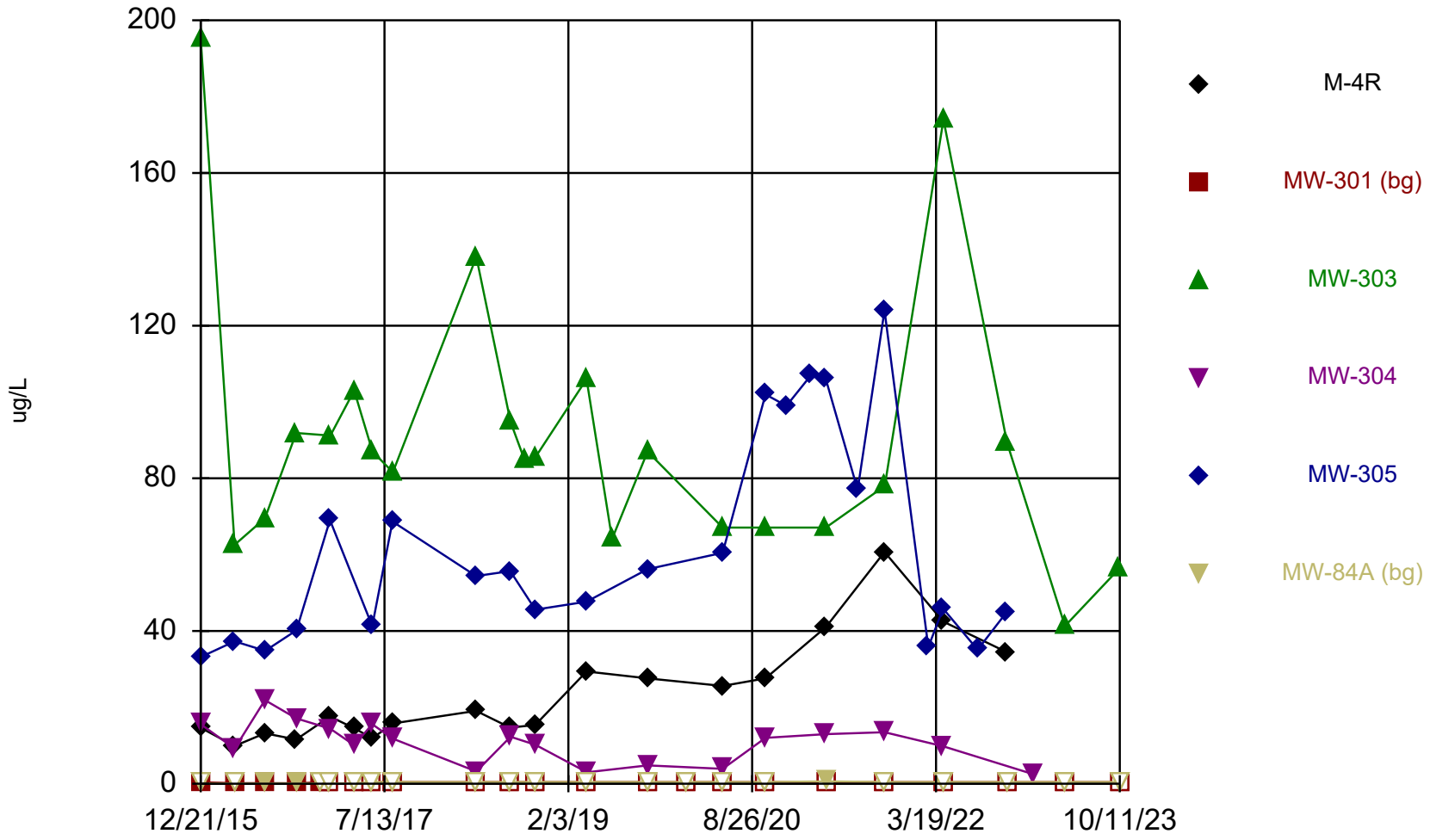
Constituent: Mercury (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			<0.1 (U)	<0.1 (U)	<0.1 (U)	
12/22/2015	<0.1 (U)	<0.1 (U)				<0.1 (U)
4/4/2016	<0.1 (U)		<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/5/2016		<0.1 (U)				<0.1 (U)
7/7/2016	<0.13 (U)		<0.13 (U)	<0.13 (U)		
7/8/2016		<0.13 (U)			<0.13 (U)	<0.13 (U)
10/12/2016	<0.13 (U)		<0.13 (U)			
10/13/2016		<0.13 (U)		<0.13 (U)	<0.13 (U)	<0.13 (U)
12/29/2016		<0.13 (U)				<0.13 (U)
1/25/2017	<0.13 (U)	<0.13 (U)			<0.13 (U)	<0.13 (U)
1/26/2017			<0.13 (U)	<0.13 (U)		
4/10/2017			<0.13 (U)	<0.13 (U)		
4/11/2017	<0.13 (U)	<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)			<0.13 (U)
8/7/2017					<0.13 (U)	
8/8/2017		<0.13 (U)	<0.13 (U)	<0.13 (U)		<0.13 (U)
8/9/2017	<0.13 (U)					
4/23/2018	<0.13 (U)				<0.13 (U)	
4/24/2018			<0.13 (U)	<0.13 (U)		
4/25/2018		<0.13 (U)				<0.13 (U)
10/24/2018	<0.084 (U)	<0.084 (U)	<0.084 (U)	<0.084 (U)	<0.084 (U)	<0.084 (U)
4/1/2019	<0.084 (U)		<0.084 (U)		<0.084 (U)	
4/2/2019		<0.084 (U)		<0.084 (U)		
4/3/2019						<0.084 (U)
10/9/2019		<0.084 (U)				<0.084 (U)
5/27/2020	<0.084 (U)		<0.084 (U)	<0.084 (U)	<0.084 (U)	
5/29/2020		<0.084 (U)				<0.084 (U)
10/8/2020		<0.066 (U)				<0.066 (U)
4/12/2021			<0.066 (U)	<0.066 (U)	<0.066 (U)	
4/13/2021	<0.066 (U)					
4/14/2021		<0.066 (U)				<0.066 (U)
10/11/2021	<0.066 (U)			<0.066 (U)	<0.066 (U)	
10/12/2021			<0.066 (U)			
10/14/2021		<0.093 (U)				<0.093 (U)
4/11/2022	<0.066 (U)			<0.066 (U)	<0.066 (U)	
4/12/2022			<0.066 (U)			
4/13/2022		<0.066 (U)				<0.066 (U)
10/25/2022	<0.066 (U)				<0.066 (U)	
10/26/2022			<0.066 (U)			
10/27/2022		<0.066 (U)				<0.066 (U)
1/20/2023				<0.066 (U)		
4/24/2023			<0.066 (U)			
4/27/2023		<0.066 (U)				<0.066 (U)
10/9/2023			<0.066 (U)			
10/11/2023		<0.066 (U)				<0.066 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Molybdenum



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Molybdenum (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			195	15.6	33.2	
12/22/2015	14.6	0.35 (J)				<0.07 (U)
4/4/2016	9.9		62.6	9.2	37.3	
4/5/2016		0.15 (J)				<0.07 (U)
7/7/2016	13.2		69.5	21.9		
7/8/2016		0.14 (J)			34.8	0.073 (J)
10/12/2016	11.6		91.9			
10/13/2016		0.12 (J)		17.1	40.2	0.12 (J)
12/29/2016		0.38 (J)				<0.07 (U)
1/25/2017	17.6	<0.07 (U)			69.1	<0.07 (U)
1/26/2017			91.2	14.4		
4/10/2017			103	10.1		
4/11/2017	14.5	<0.07 (U)				<0.07 (U)
6/5/2017	11.9			15.6	41.3	
6/6/2017		<0.44 (U)	87			<0.44 (U)
8/7/2017					68.7	
8/8/2017		<0.44 (U)	81.6	11.8		<0.44 (U)
8/9/2017	15.8					
4/23/2018	19.1				54.4	
4/24/2018			138	3.2		
4/25/2018		<0.44 (U)				<0.44 (U)
8/7/2018	14.7				55.7	
8/8/2018		<0.44 (U)	94.8	12.3		<0.44 (U)
9/21/2018			84.7			
10/24/2018	15.4	<0.44 (U)	85.5	10.2	45.6	<0.44 (U)
4/1/2019	29.4		106		47.7	
4/2/2019		<0.44 (U)		3		
4/3/2019						<0.44 (U)
6/19/2019			64.1			
10/7/2019	27.6		87	4.8	56.2	
10/9/2019		<0.44 (U)				<0.44 (U)
2/3/2020		<0.44 (U)				<0.44 (U)
5/27/2020	25.6		67.1	3.9	60.5	
5/29/2020		<0.44 (U)				<0.44 (U)
10/7/2020	27.6		67.1	12	102	
10/8/2020		<0.44 (U)				<0.44 (U)
12/11/2020					99	
2/25/2021					107	
4/12/2021			67.1	13	106	
4/13/2021	41.1					
4/14/2021		<0.44 (U)				0.62 (J)
7/20/2021					77	
10/11/2021	60.7			13.5	124	
10/12/2021			78			
10/14/2021		<0.44 (U)				<0.44 (U)
2/24/2022					35.8	
4/11/2022	42.5			9.8	45.9	
4/12/2022			174			
4/13/2022		<0.44 (U)				<0.44 (U)
7/27/2022					35.1	
10/25/2022	34.5				44.9	
10/26/2022			89.4			

ND substitution: RL or RL/2 if <15% NDs.

Time Series

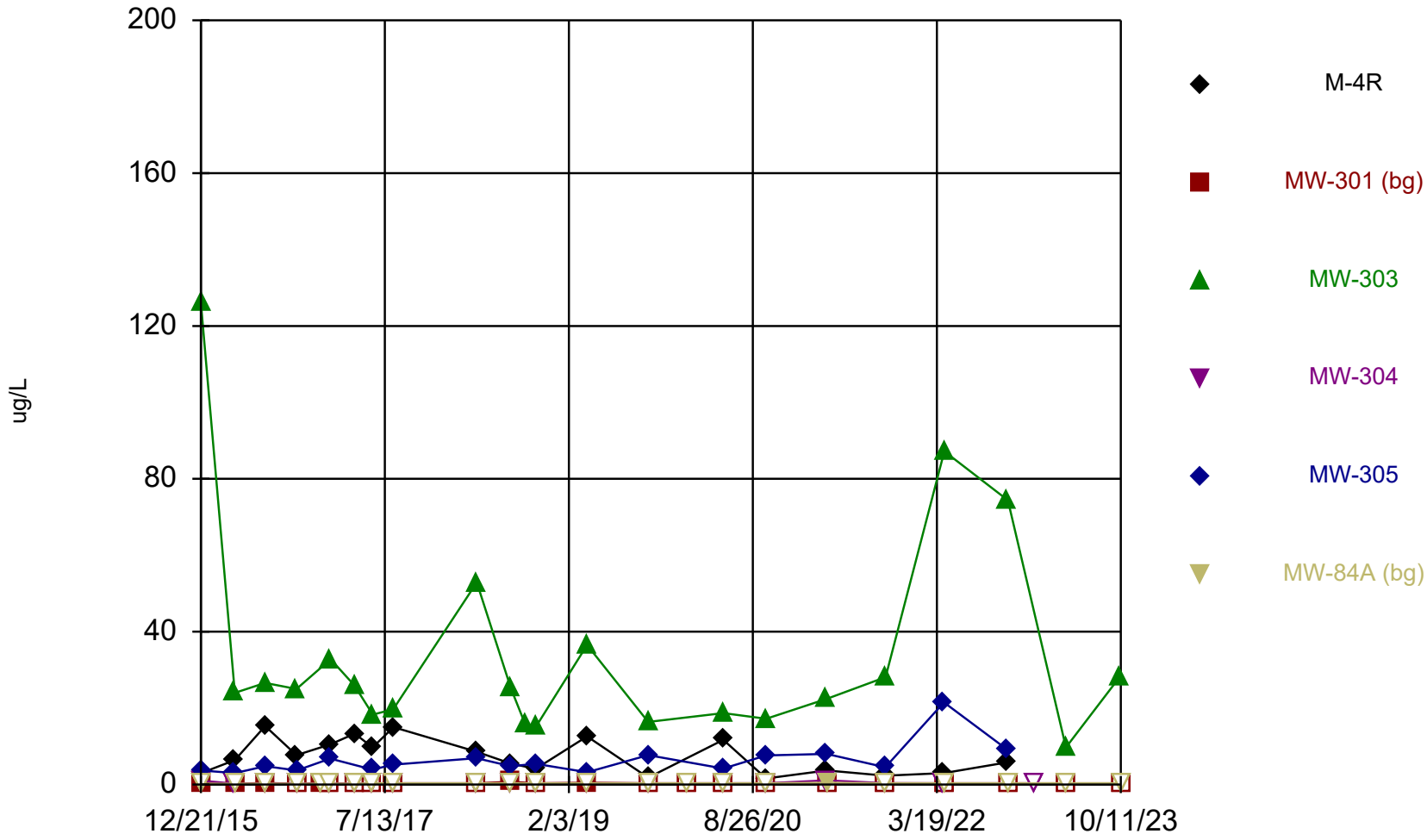
Constituent: Molybdenum (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/27/2022		<0.44 (U)				<0.44 (U)
1/20/2023				2.4		
4/24/2023			41.3			
4/27/2023		<0.44 (U)				<0.44 (U)
10/9/2023			56.3			
10/11/2023		<0.44 (U)				<0.44 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Selenium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Selenium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

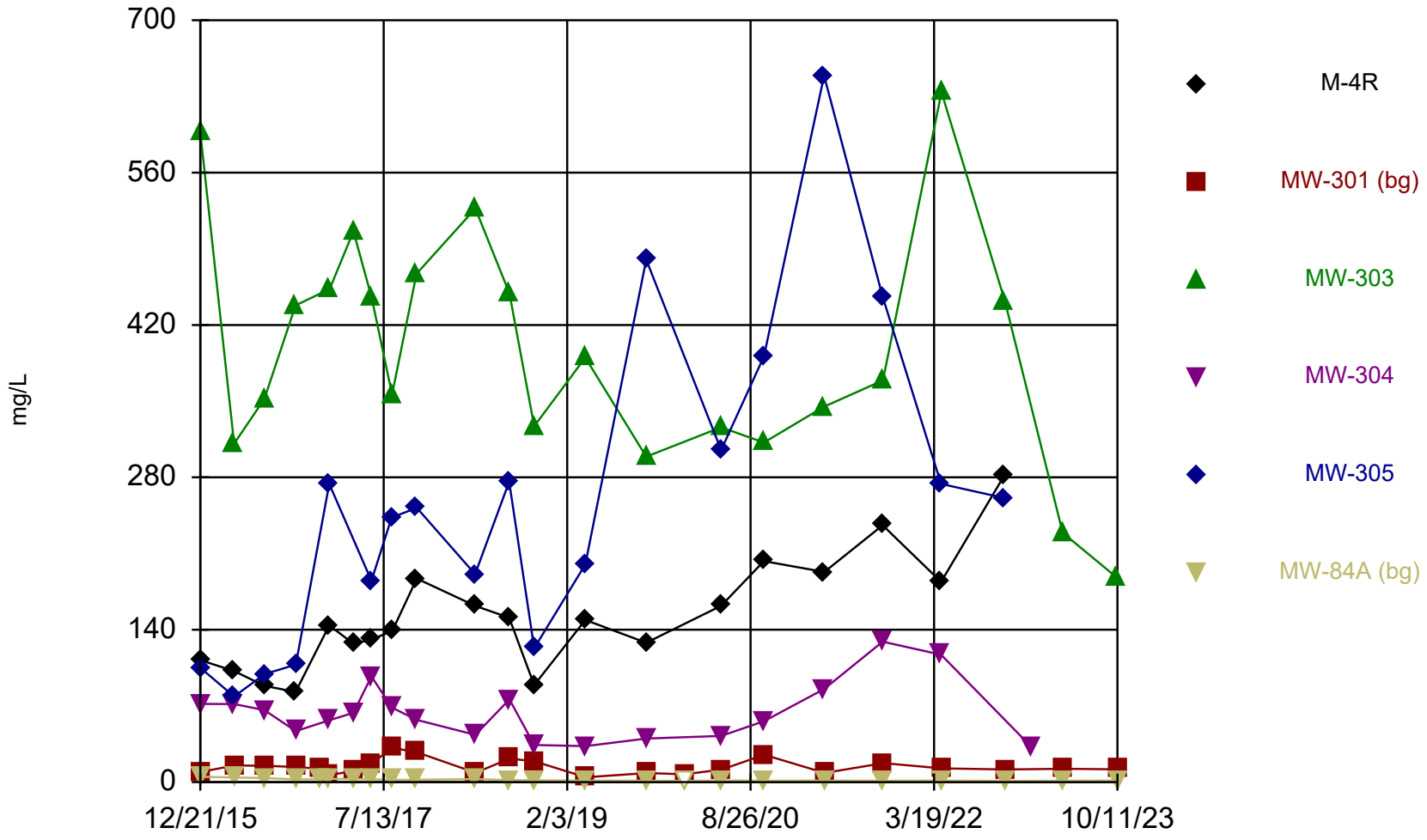
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			126	1	3.7	
12/22/2015	3	0.3 (J)				<0.21 (U)
4/4/2016	6.4		24	<0.21 (U)	3	
4/5/2016		0.21 (J)				<0.21 (U)
7/7/2016	15.3		26.6	<0.21 (U)		
7/8/2016		0.39 (J)			4.8	<0.21 (U)
10/12/2016	7.7		25			
10/13/2016		<0.21 (U)		<0.21 (U)	3.7	<0.21 (U)
12/29/2016		0.26 (J)				<0.21 (U)
1/25/2017	10.5	<0.21 (U)			6.8	<0.21 (U)
1/26/2017			32.8	<0.21 (U)		
4/10/2017			25.9	<0.21 (U)		
4/11/2017	13.3	<0.21 (U)				<0.21 (U)
6/5/2017	9.7			<0.32 (U)	3.9	
6/6/2017		<0.32 (U)	18.3			<0.32 (U)
8/7/2017					5.2	
8/8/2017		<0.32 (U)	19.7	<0.32 (U)		<0.32 (U)
8/9/2017	15					
4/23/2018	8.6				6.9	
4/24/2018			52.9	<0.32 (U)		
4/25/2018		<0.32 (U)				<0.32 (U)
8/7/2018	5.5				4.8	
8/8/2018		0.71 (J)	25.1	<0.32 (U)		<0.32 (U)
9/21/2018			15.8			
10/24/2018	4.1	<0.32 (U)	15.1	<0.32 (U)	5.4	<0.32 (U)
4/1/2019	12.6		36.5		3.2	
4/2/2019		0.49 (J)		<0.32 (U)		
4/3/2019						<0.32 (U)
10/7/2019	1.8		16.4	<0.32 (U)	7.7	
10/9/2019		<0.32 (U)				<0.32 (U)
2/3/2020		<0.32 (U)				<0.32 (U)
5/27/2020	11.7		18.7	0.33 (J)	4.2	
5/29/2020		<0.32 (U)				<0.32 (U)
10/7/2020	1.6		17.2	<0.32 (U)	7.6	
10/8/2020		<0.32 (U)				<0.32 (U)
4/12/2021			22.4	1.1	8	
4/13/2021	3.7					
4/14/2021		<0.32 (U)				0.48 (J)
10/11/2021	2.3			0.35 (J)	4.5	
10/12/2021			28.1			
10/14/2021		<0.32 (U)				<0.32 (U)
4/11/2022	3			<0.32 (U)	21.5	
4/12/2022			87.2			
4/13/2022		<0.32 (U)				<0.32 (U)
10/25/2022	5.8				9.1	
10/26/2022			74.4			
10/27/2022		<0.32 (U)				<0.32 (U)
1/20/2023				<0.32 (U)		
4/24/2023			9.7			
4/27/2023		<0.32 (U)				<0.32 (U)
10/9/2023			28.3			
10/11/2023		<0.32 (U)				<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Sulfate (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			597	71.9	105	
12/22/2015	112	9.3				4.9
4/4/2016	102		311	71.7	78.7	
4/5/2016		15.3				4.3
7/7/2016	88.5		352	66.2		
7/8/2016		15			99.2	3.7 (J)
10/12/2016	82.8		438			
10/13/2016		13.9		46.8	108	2.6 (J)
12/29/2016		12.3 (J)				2.7 (J)
1/25/2017	144	6.5			274	3
1/26/2017			453	56.9		
4/10/2017			506	63.6		
4/11/2017	127	10.3				2.8 (J)
6/5/2017	131			97.1	185	
6/6/2017		17.1	445			2.7 (J)
8/7/2017					243	
8/8/2017		31.6	356	68.5		2 (J)
8/9/2017	139					
10/23/2017		27.5	467	57.2		
10/24/2017	187				252	2.2 (J)
4/23/2018	162				191	
4/24/2018			527	43.5		
4/25/2018		8.6				2.8 (J)
8/7/2018	151				276	
8/8/2018		21.6	449	76		1.9 (J)
10/24/2018	89.2	19.2	327	34.1	123	1.6 (J)
4/1/2019	149		390		200	
4/2/2019		4.4		33.1		
4/3/2019						1.4 (J)
10/7/2019	128		299	40	480	
10/9/2019		8.4				1.3 (J)
2/3/2020		7.2				<2.2 (U)
5/27/2020	162		326	42.4	305	
5/29/2020		11.5				1.5 (J)
10/7/2020	203		312	55.9	391	
10/8/2020		25.1				1.3 (J)
4/12/2021			345	85.5	649	
4/13/2021	193					
4/14/2021		8.5				1.4 (J)
10/11/2021	236			129	446	
10/12/2021			369			
10/14/2021		17.4				1.3 (J)
4/11/2022	184			117	274	
4/12/2022			634			
4/13/2022		12.7				1.4 (J)
10/25/2022	282				261	
10/26/2022			442			
10/27/2022		11.6				1.1 (J)
1/20/2023				31.3		
4/24/2023			229			
4/27/2023		12.3				1.3 (J)
10/9/2023			188			

ND substitution: RL or RL/2 if <15% NDs.

Time Series

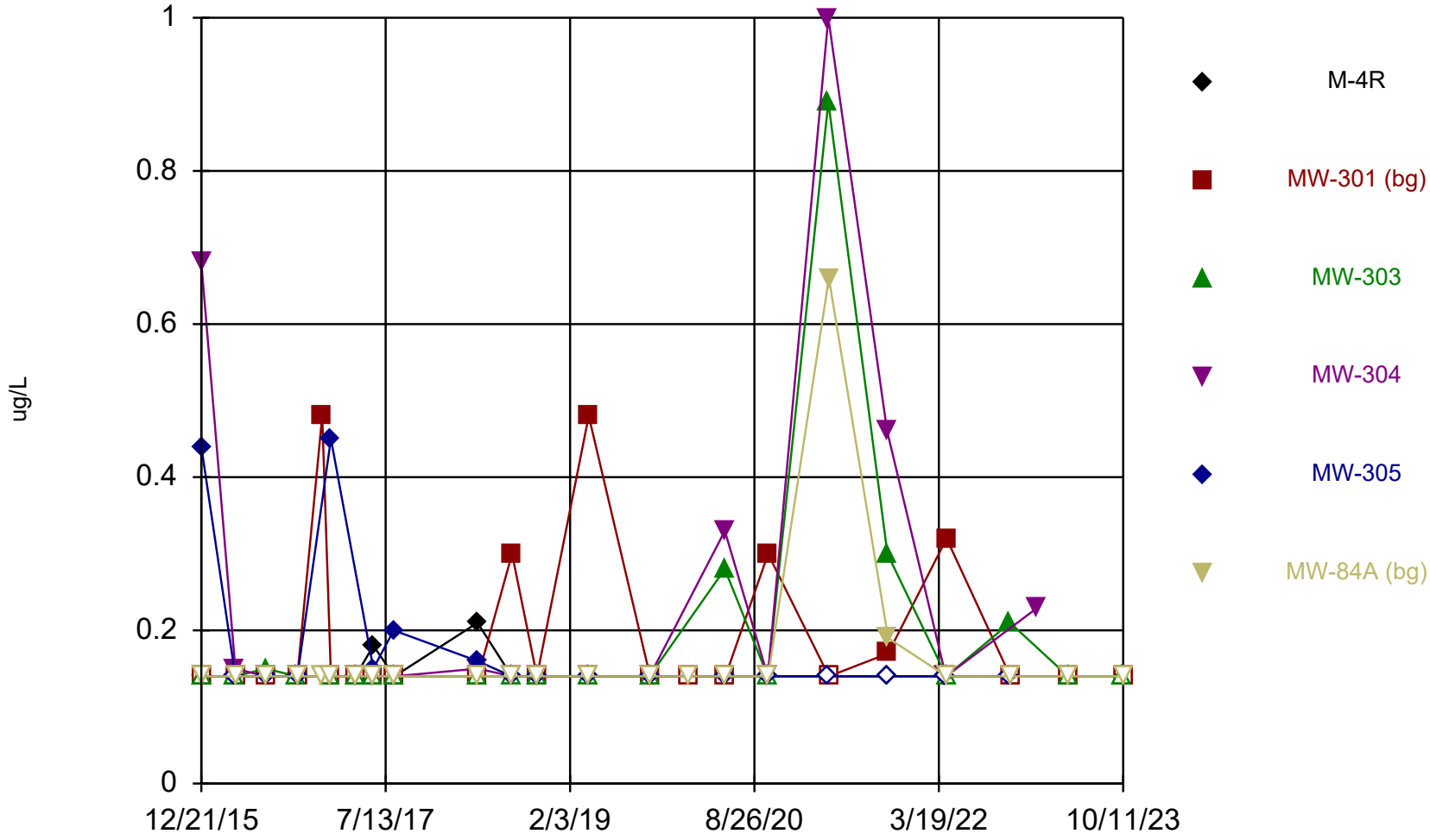
Constituent: Sulfate (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/11/2023		11.8				1.4 (J)

Hollow symbols indicate censored values.

Thallium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

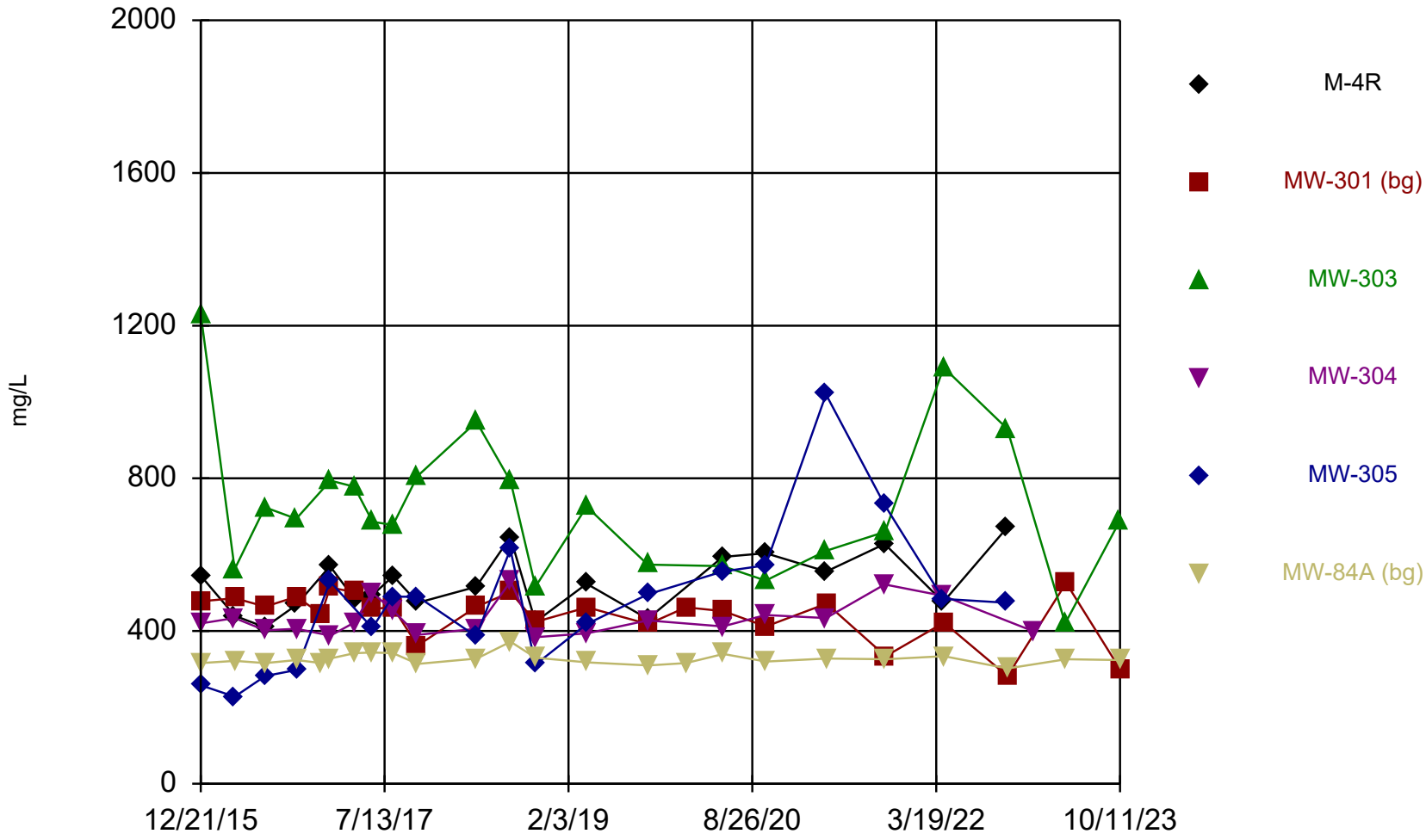
Constituent: Thallium (ug/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

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

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			<0.14 (U)	0.68 (J)	0.44 (J)	
12/22/2015	<0.14 (U)	<0.14 (U)				<0.14 (U)
4/4/2016	<0.14 (U)		<0.14 (U)	0.15 (J)	<0.14 (U)	
4/5/2016		<0.14 (U)				<0.14 (U)
7/7/2016	<0.14 (U)		0.15 (J)	<0.14 (U)		
7/8/2016		<0.14 (U)			<0.14 (U)	<0.14 (U)
10/12/2016	<0.14 (U)		<0.14 (U)			
10/13/2016		<0.14 (U)		<0.14 (U)	<0.14 (U)	<0.14 (U)
12/29/2016		0.48 (J)				<0.14 (U)
1/25/2017	<0.14 (U)	<0.14 (U)			0.45 (J)	<0.14 (U)
1/26/2017			<0.14 (U)	<0.14 (U)		
4/10/2017			<0.14 (U)	<0.14 (U)		
4/11/2017	<0.14 (U)	<0.14 (U)				<0.14 (U)
6/5/2017	0.18 (J)			<0.14 (U)	0.15 (J)	
6/6/2017		<0.14 (U)	<0.14 (U)			<0.14 (U)
8/7/2017					0.2 (J)	
8/8/2017		<0.14 (U)	<0.14 (U)	<0.14 (U)		<0.14 (U)
8/9/2017	<0.14 (U)					
4/23/2018	0.21 (J)				0.16 (J)	
4/24/2018			<0.14 (U)	0.15 (J)		
4/25/2018		<0.14 (U)				<0.14 (U)
8/7/2018	<0.14 (U)				<0.14 (U)	
8/8/2018		0.3 (J)	<0.14 (U)	<0.14 (U)		<0.14 (U)
10/24/2018	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)	<0.14 (U)
4/1/2019	<0.14 (U)		<0.14 (U)		<0.14 (U)	
4/2/2019		0.48 (J)		<0.14 (U)		
4/3/2019						<0.14 (U)
10/7/2019	<0.14 (U)		<0.14 (U)	<0.14 (U)	<0.14 (U)	
10/9/2019		<0.14 (U)				<0.14 (U)
2/3/2020		<0.14 (U)				<0.14 (U)
5/27/2020	<0.14 (U)		0.28 (J)	0.33 (J)	<0.14 (U)	
5/29/2020		<0.14 (U)				<0.14 (U)
10/7/2020	<0.14 (U)		<0.14 (U)	<0.14 (U)	<0.14 (U)	
10/8/2020		0.3 (J)				<0.14 (U)
4/12/2021			0.89 (J)	1 (J)	<0.14 (U)	
4/13/2021	<0.14 (U)					
4/14/2021		<0.14 (U)				0.66 (J)
10/11/2021	<0.14 (U)			0.46 (J)	<0.14 (U)	
10/12/2021			0.3 (J)			
10/14/2021		0.17 (J)				0.19 (J)
4/11/2022	<0.14 (U)			<0.14 (U)	<0.14 (U)	
4/12/2022			<0.14 (U)			
4/13/2022		0.32 (J)				<0.14 (U)
10/25/2022	<0.14 (U)				<0.14 (U)	
10/26/2022			0.21 (J)			
10/27/2022		<0.14 (U)				<0.14 (U)
1/20/2023				0.23 (J)		
4/24/2023			<0.14 (U)			
4/27/2023		<0.14 (U)				<0.14 (U)
10/9/2023			<0.14 (U)			
10/11/2023		<0.14 (U)				<0.14 (U)

ND substitution: RL or RL/2 if <15% NDs.

Total Dissolved Solids



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond

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

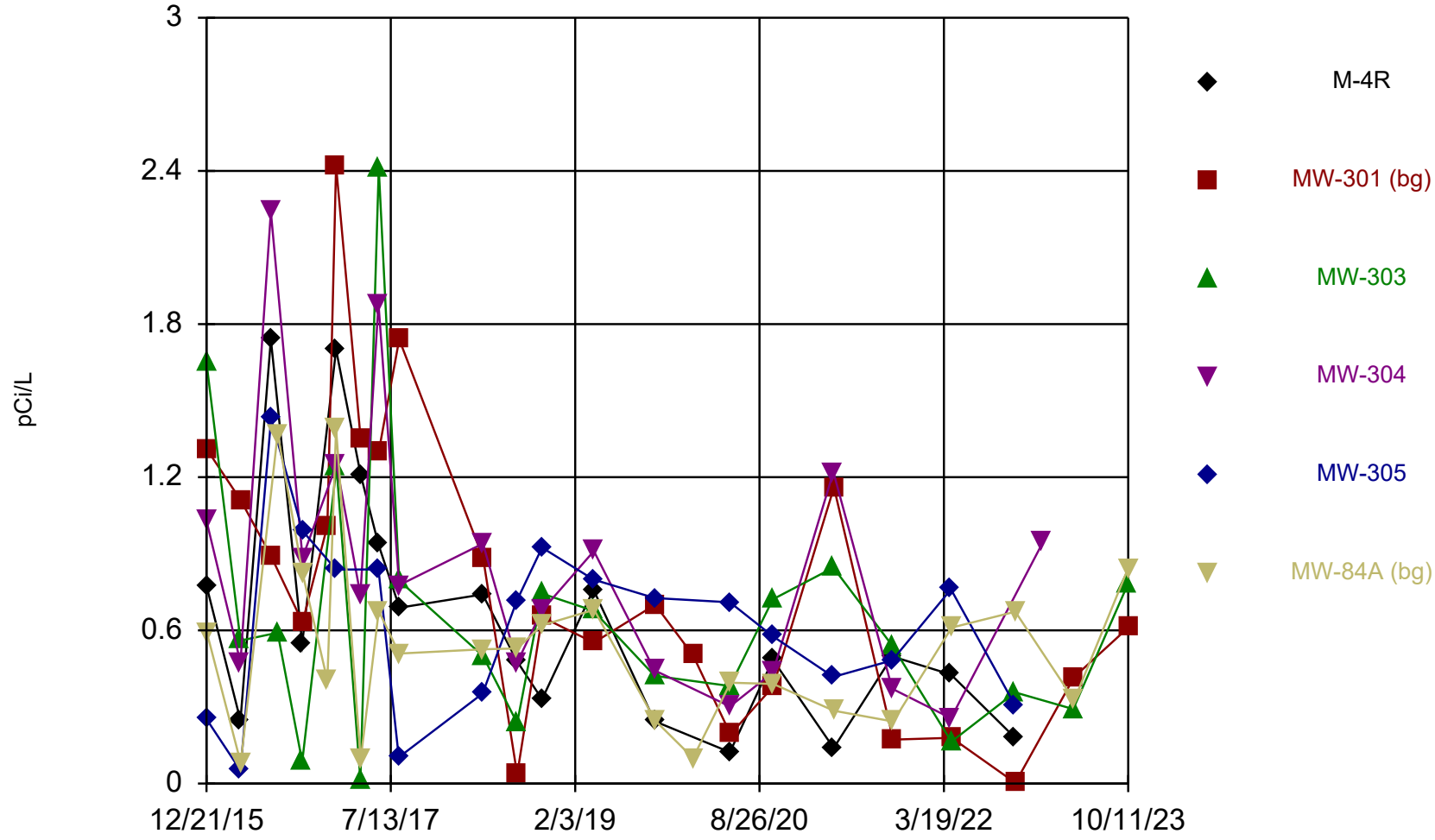
	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			1230	420	258	
12/22/2015	544	478				316
4/4/2016	440		562	434	228	
4/5/2016		486				322
7/7/2016	410		724	402		
7/8/2016		464			282	316
10/12/2016	468		694			
10/13/2016		490		406	298	324
12/29/2016		444				316
1/25/2017	570	514			530	328
1/26/2017			794	388		
4/10/2017			778	422		
4/11/2017	484	502				342
6/5/2017	494			500	408	
6/6/2017		458	686			344
8/7/2017					490	
8/8/2017		462	678	454		342
8/9/2017	544					
10/23/2017		362	806	390		
10/24/2017	474				490	314
4/23/2018	516				386	
4/24/2018			948	406		
4/25/2018		464				328
8/7/2018	646				614	
8/8/2018		502	792	530		372
10/24/2018	424	424	516	384	312	330
4/1/2019	524		726		418	
4/2/2019		462		394		
4/3/2019						318
10/7/2019	432		574	428	496	
10/9/2019		418				310
2/3/2020		462				316
5/27/2020	594		570	412	556	
5/29/2020		452				340
10/7/2020	604		532	442	572	
10/8/2020		412				320
4/12/2021			610	434	1020	
4/13/2021	556					
4/14/2021		472				328
10/11/2021	628			522	730	
10/12/2021			660			
10/14/2021		334				326
4/11/2022	476			492	484	
4/12/2022			1090			
4/13/2022		422				334
10/25/2022	670				474	
10/26/2022			930			
10/27/2022		282				302
1/20/2023				398		
4/24/2023			420			
4/27/2023		526				326
10/9/2023			686			

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/18/2024 1:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
10/11/2023		300				324

Total Radium



Time Series Analysis Run 3/18/2024 1:55 PM View: COL Primary Pond

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

Time Series

Constituent: Total Radium (pCi/L) Analysis Run 3/18/2024 2:00 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	M-4R	MW-301 (bg)	MW-303	MW-304	MW-305	MW-84A (bg)
12/21/2015			1.65	1.03	0.253	
12/22/2015	0.771	1.31				0.593
4/4/2016	0.247		0.56	0.474	0.0515	
4/5/2016		1.11				0.0809
7/7/2016	1.74			2.24		
7/8/2016		0.89			1.43	
7/28/2016			0.591			1.37
10/12/2016	0.549		0.0851			
10/13/2016		0.631		0.885	0.99	0.825
12/29/2016		1.01				0.404
1/25/2017	1.7	2.42			0.838	1.39
1/26/2017			1.24	1.25		
4/10/2017			0.016	0.74		
4/11/2017	1.21	1.35				0.0929
6/5/2017	0.936			1.88	0.839	
6/6/2017		1.3	2.41			0.676
8/7/2017					0.103	
8/8/2017		1.74	0.795	0.777		0.509
8/9/2017	0.689					
4/23/2018	0.741				0.353	
4/24/2018			0.5	0.94		
4/25/2018		0.882				0.526
8/7/2018	0.48				0.717	
8/8/2018		0.0351	0.237	0.474		0.529
10/24/2018	0.33	0.652	0.744	0.678	0.924	0.62
4/1/2019	0.76		0.677		0.799	
4/2/2019		0.552		0.911		
4/3/2019						0.681
10/7/2019	0.244		0.422	0.443	0.727	
10/9/2019		0.701				0.247
2/3/2020		0.502				0.1
5/27/2020	0.123		0.382	0.302	0.71	
5/29/2020		0.193				0.395
10/7/2020	0.485		0.722	0.435	0.577	
10/8/2020		0.38				0.39
4/12/2021			0.846	1.22	0.418	
4/13/2021	0.139					
4/14/2021		1.16				0.285
10/11/2021	0.498			0.371	0.483	
10/12/2021			0.539			
10/14/2021		0.172				0.243
4/11/2022	0.427			0.256	0.761	
4/12/2022			0.164			
4/13/2022		0.179				0.611
10/25/2022	0.181				0.309	
10/26/2022			0.357			
10/27/2022		0.00292				0.673
1/20/2023				0.945		
4/24/2023			0.292			
4/27/2023		0.417				0.326
10/9/2023			0.778			
10/11/2023		0.611				0.844

Attachment 2

Outlier Analysis

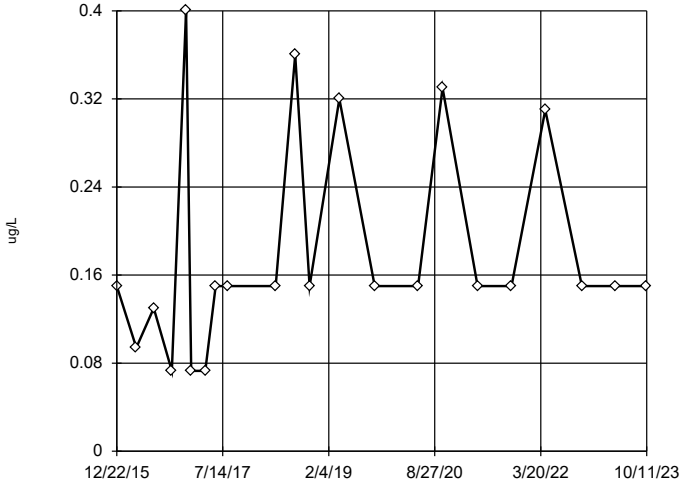
Outlier Analysis

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 3/18/2024, 2:26 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	22	0.1801	0.09632	unknown	ShapiroWilk
Antimony (ug/L)	**MW-84A (bg)**	**Yes**	**0.55**	**4/14/2021**	**NP (nrm)**	**NaN**	**22**	**0.1454**	**0.09662**	**unknown**	**ShapiroWilk**
Arsenic (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	23	0.3148	0.107	ln(x)	ShapiroWilk
Arsenic (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	23	0.3426	0.1781	ln(x)	ShapiroWilk
Barium (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	23	11.1	2.986	ln(x)	ShapiroWilk
Barium (ug/L)	**MW-84A (bg)**	**Yes**	**18.4**	**12/29/2016**	**Dixon`s**	**0.05**	**23**	**13.83**	**1.264**	**normal**	**ShapiroWilk**
Beryllium (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	22	0.2086	0.06446	unknown	ShapiroWilk
Beryllium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	22	0.2027	0.07851	unknown	ShapiroWilk
Boron (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	24	28.25	5.049	normal	ShapiroWilk
Boron (ug/L)	**MW-84A (bg)**	**Yes**	**22.9,25**	**8/8/2017,...**	**Dixon`s**	**0.05**	**24**	**13.68**	**3.693**	**normal**	**ShapiroWilk**
Cadmium (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.1427	0.06786	unknown	ShapiroWilk
Cadmium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.1379	0.0953	unknown	ShapiroWilk
Calcium (ug/L)	**MW-301 (bg)**	**Yes**	**67800,523...**	**10/14/202...**	**Dixon`s**	**0.05**	**24**	**105808**	**20261**	**normal**	**ShapiroWilk**
Calcium (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	24	73650	3696	normal	ShapiroWilk
Chloride (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	24	2.658	1.223	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	24	4.375	0.7385	normal	ShapiroWilk
Chromium (ug/L)	**MW-301 (bg)**	**Yes**	**2.1,2.3**	**12/22/201...**	**NP (nrm)**	**NaN**	**23**	**0.9952**	**0.4273**	**unknown**	**ShapiroWilk**
Chromium (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	23	1.917	0.327	unknown	ShapiroWilk
Cobalt (ug/L)	**MW-301 (bg)**	**Yes**	**1.4**	**12/22/2015**	**Dixon`s**	**0.05**	**23**	**0.2505**	**0.279**	**ln(x)**	**ShapiroWilk**
Cobalt (ug/L)	**MW-84A (bg)**	**Yes**	**0.52**	**4/14/2021**	**NP (nrm)**	**NaN**	**23**	**0.109**	**0.09595**	**unknown**	**ShapiroWilk**
Field pH (Std. Units)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	24	6.865	0.211	normal	ShapiroWilk
Field pH (Std. Units)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	25	7.39	0.2253	normal	ShapiroWilk
Fluoride (mg/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	23	0.1113	0.0352	unknown	ShapiroWilk
Fluoride (mg/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	23	0.1122	0.03516	unknown	ShapiroWilk
Lead (ug/L)	**MW-301 (bg)**	**Yes**	**0.9,3.1**	**12/22/201...**	**NP (nrm)**	**NaN**	**21**	**0.3851**	**0.6479**	**unknown**	**ShapiroWilk**
Lead (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	21	0.2086	0.1188	unknown	ShapiroWilk
Lithium (ug/L)	**MW-301 (bg)**	**Yes**	**1.3**	**12/22/2015**	**Dixon`s**	**0.05**	**23**	**0.6374**	**0.1974**	**normal**	**ShapiroWilk**
Lithium (ug/L)	MW-84A (bg)	No	n/a	n/a	EPA 1989	0.05	23	0.5248	0.1467	ln(x)	ShapiroWilk
Mercury (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.09833	0.02752	unknown	ShapiroWilk
Mercury (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.09833	0.02752	unknown	ShapiroWilk
Molybdenum (ug/L)	**MW-301 (bg)**	**Yes**	**0.07,0.07**	**1/25/2017...**	**NP (nrm)**	**NaN**	**23**	**0.3617**	**0.1384**	**unknown**	**ShapiroWilk**
Molybdenum (ug/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	23	0.3375	0.18	unknown	ShapiroWilk
Selenium (ug/L)	**MW-301 (bg)**	**Yes**	**0.21,0.21...**	**4/5/2016,...**	**NP (nrm)**	**NaN**	**23**	**0.3248**	**0.104**	**unknown**	**ShapiroWilk**
Selenium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	23	0.2935	0.06541	unknown	ShapiroWilk
Sulfate (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	24	14.13	6.818	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	24	2.154	1.045	unknown	ShapiroWilk
Thallium (ug/L)	**MW-301 (bg)**	**Yes**	**0.48,0.48...**	**12/29/201...**	**NP (nrm)**	**NaN**	**23**	**0.1926**	**0.107**	**unknown**	**ShapiroWilk**
Thallium (ug/L)	MW-84A (bg)	n/a	n/a	n/a	NP (nrm)	NaN	23	0.1648	0.1085	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	**MW-301 (bg)**	**Yes**	**334,282,300**	**10/14/202...**	**Dixon`s**	**0.05**	**24**	**441.3**	**64.07**	**normal**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	**MW-84A (bg)**	**Yes**	**372**	**8/8/2018**	**Dixon`s**	**0.05**	**24**	**326.6**	**14.34**	**normal**	**ShapiroWilk**
Total Radium (pCi/L)	**MW-301 (bg)**	**Yes**	**0.0351,0....**	**8/8/2018,...**	**Dixon`s**	**0.05**	**23**	**0.7913**	**0.5855**	**ln(x)**	**ShapiroWilk**
Total Radium (pCi/L)	MW-84A (bg)	No	n/a	n/a	NP (nrm)	NaN	23	0.5396	0.3443	unknown	ShapiroWilk

Antimony

MW-301 (bg)



n = 22

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.

High cutoff = 0.5, low cutoff = -0.13, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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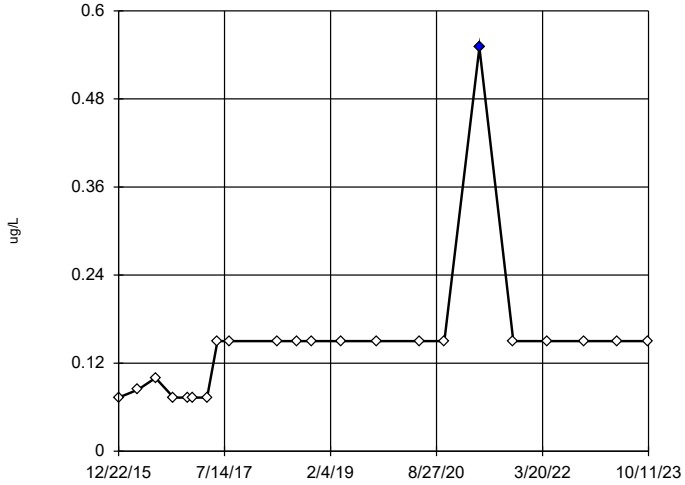
Antimony

MW-84A (bg)



n = 22

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.3645, low cutoff = -0.136, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
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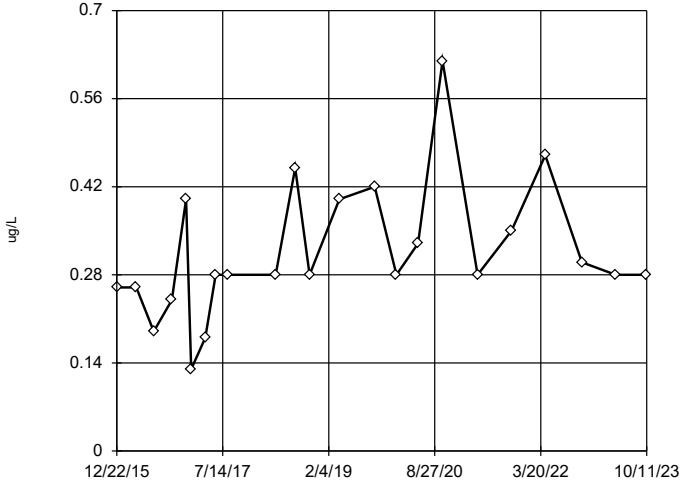
Arsenic

MW-301 (bg)



n = 23

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3148, std. dev. 0.107, critical Tn 2.624

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9457
Critical = 0.928 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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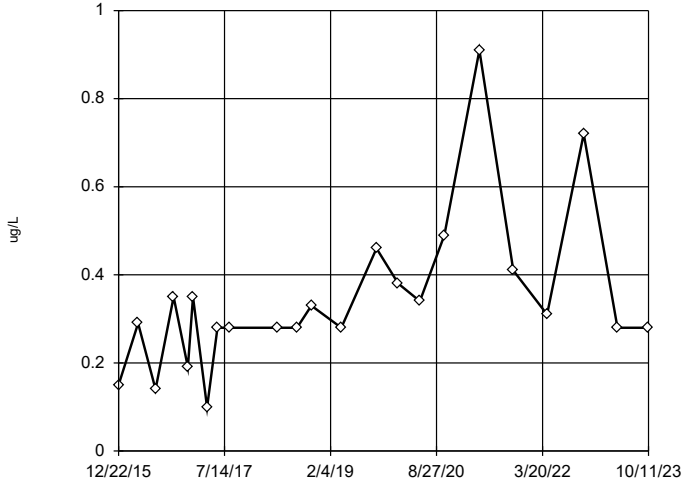
Arsenic

MW-84A (bg)



n = 23

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.3426, std. dev. 0.1781, critical Tn 2.624

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9329
Critical = 0.928 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Antimony (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	<0.15 (U)
10/14/2021	<0.15 (U)
4/13/2022	0.31 (J)
10/27/2022	<0.15 (U)
4/27/2023	<0.15 (U)
10/11/2023	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Antimony (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	0.55 (JO)
10/14/2021	<0.15 (U)
4/13/2022	<0.15 (U)
10/27/2022	<0.15 (U)
4/27/2023	<0.15 (U)
10/11/2023	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	<0.28 (U)
10/14/2021	0.35 (J)
4/13/2022	0.47 (J)
10/27/2022	0.3 (J)
4/27/2023	<0.28 (U)
10/11/2023	<0.28

ND substitution: RL or RL/2 if <15% NDs.

EPA 1989 Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	0.91 (J)
10/14/2021	0.41 (J)
4/13/2022	0.31 (J)
10/27/2022	0.72 (J)
4/27/2023	<0.28 (U)
10/11/2023	<0.28

ND substitution: RL or RL/2 if <15% NDs.

Barium

MW-301 (bg)

n = 23

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 11.1, std. dev. 2.986, critical Tn 2.624

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9628
Critical = 0.928 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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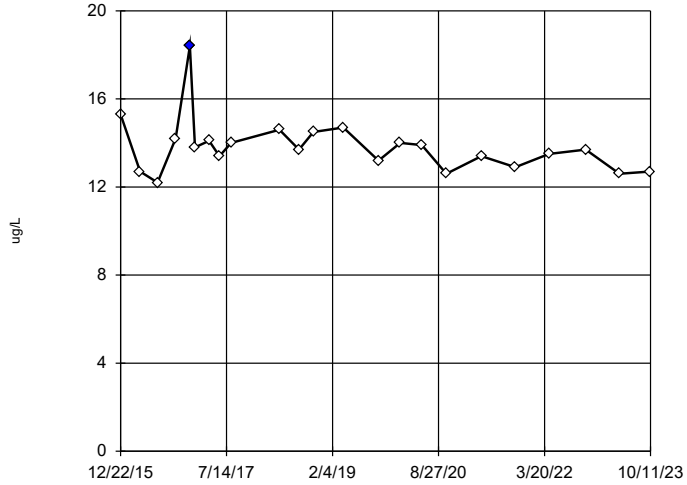
Barium

MW-84A (bg)



n = 23

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 13.83.
Std. Dev. = 1.264.
18.4: c = 0.6379
tabl = 0.421.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9788
Critical = 0.926
The distribution, after removal of suspect value, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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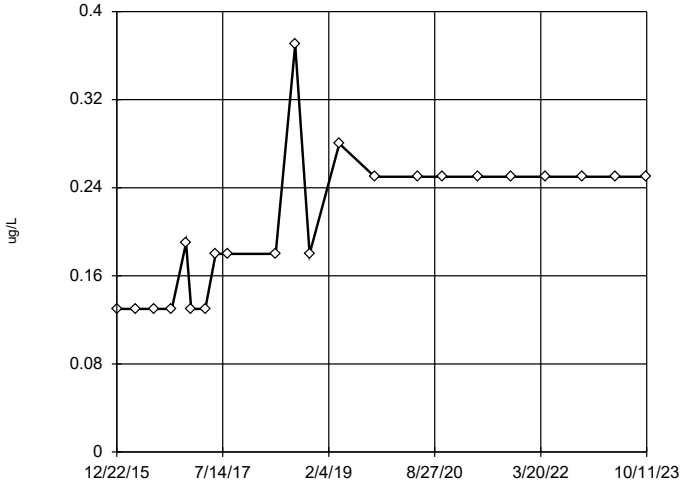
Beryllium

MW-301 (bg)



n = 22

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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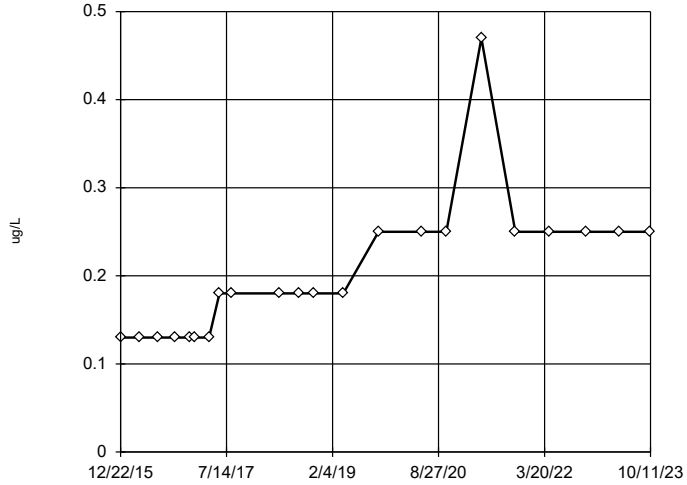
Beryllium

MW-84A (bg)



n = 22

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:24 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Barium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	20.2
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
4/14/2021	8.9
10/14/2021	7.7
4/13/2022	7.8
10/27/2022	7.5
4/27/2023	9.8
10/11/2023	7.3

Dixon's Outlier Test

Constituent: Barium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	13.4
10/14/2021	12.9
4/13/2022	13.5
10/27/2022	13.7
4/27/2023	12.6
10/11/2023	12.7

Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	<0.25 (U)
10/14/2021	<0.25 (U)
4/13/2022	<0.25 (U)
10/27/2022	<0.25 (U)
4/27/2023	<0.25 (U)
10/11/2023	<0.25 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Beryllium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

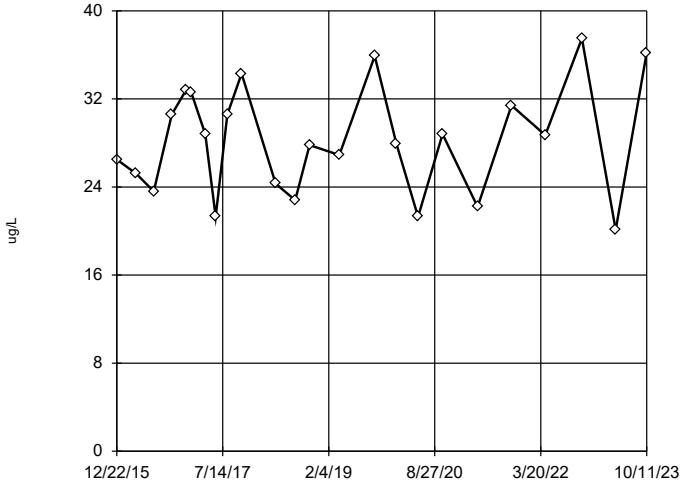
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	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)
4/14/2021	0.47 (J)
10/14/2021	<0.25 (U)
4/13/2022	<0.25 (U)
10/27/2022	<0.25 (U)
4/27/2023	<0.25 (U)
10/11/2023	<0.25 (U)

ND substitution: RL or RL/2 if <15% NDs.

Boron

MW-301 (bg)



n = 24

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 28.25, std. dev. 5.049, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9664
Critical = 0.93
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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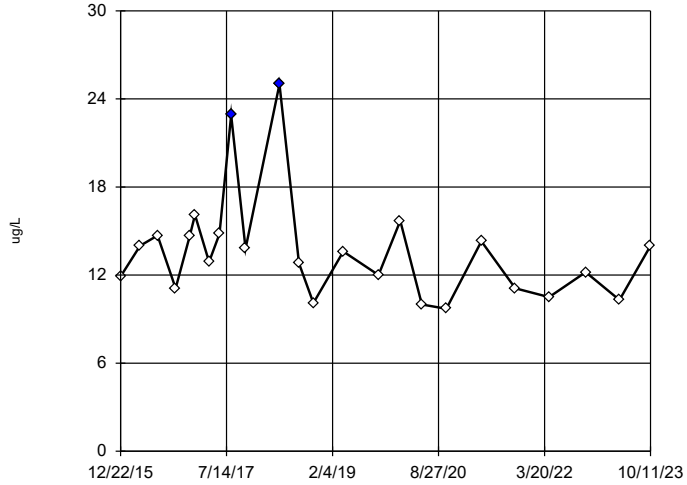
Boron

MW-84A (bg)



n = 24

Statistical outliers are drawn as solid.
Testing for 2 high outliers.
Mean = 13.68.
Std. Dev. = 3.693.
22.9: c = 0.5625
tabl = 0.413.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9478
Critical = 0.926
The distribution, after removal of suspect values, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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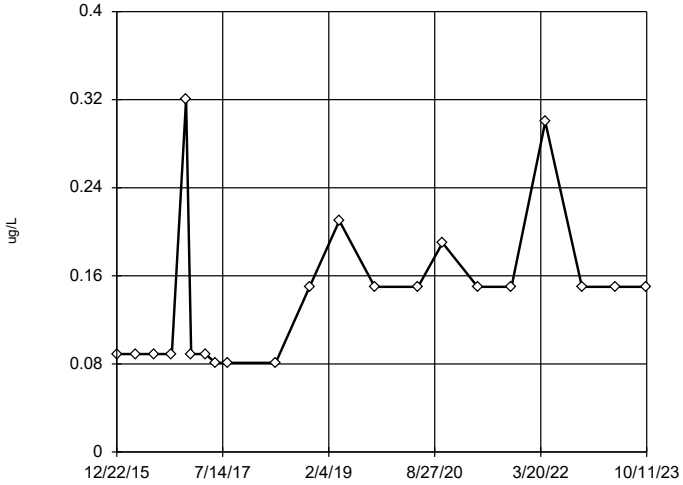
Cadmium

MW-301 (bg)



n = 21

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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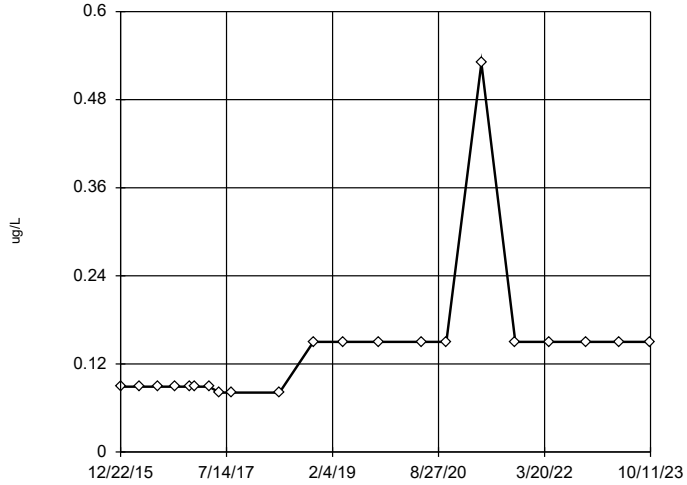
Cadmium

MW-84A (bg)



n = 21

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	22.2
10/14/2021	31.4
4/13/2022	28.7
10/27/2022	37.5
4/27/2023	20.1
10/11/2023	36.2

Dixon's Outlier Test

Constituent: Boron (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (O)
10/24/2017	13.8
4/25/2018	25 (O)
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)
4/14/2021	14.3
10/14/2021	11.1
4/13/2022	10.5
10/27/2022	12.2
4/27/2023	10.3
10/11/2023	14

Tukey's Outlier Screening

Constituent: Cadmium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	<0.15 (U)
10/14/2021	<0.15 (U)
4/13/2022	0.3 (J)
10/27/2022	<0.15 (U)
4/27/2023	<0.15 (U)
10/11/2023	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Cadmium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

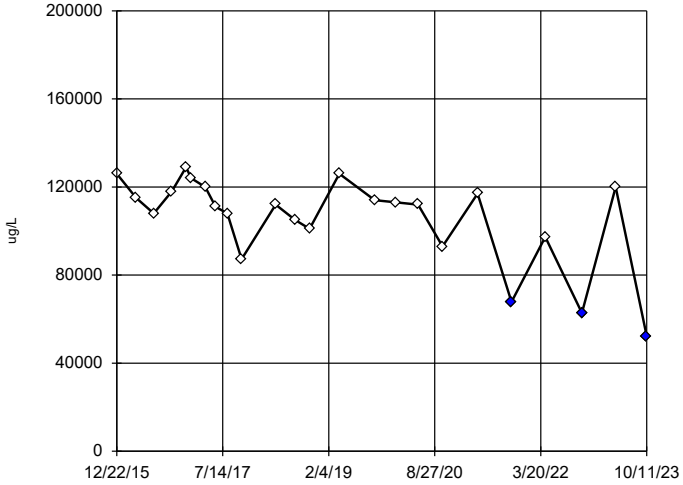
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	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)
4/14/2021	0.53 (J)
10/14/2021	<0.15 (U)
4/13/2022	<0.15 (U)
10/27/2022	<0.15 (U)
4/27/2023	<0.15 (U)
10/11/2023	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Calcium

MW-301 (bg)



n = 24

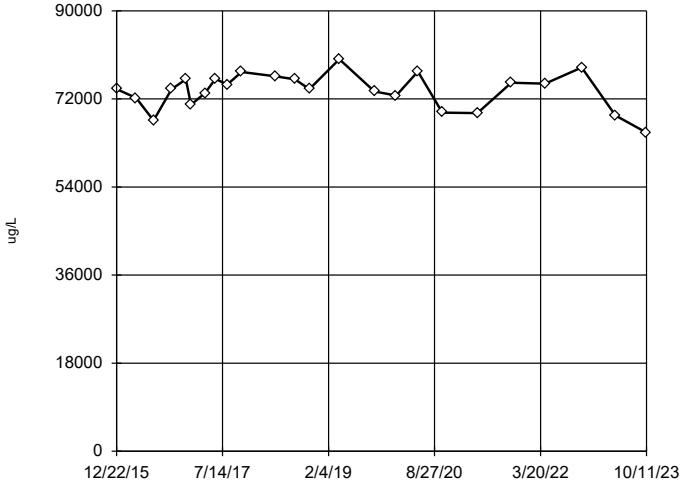
Statistical outliers are drawn as solid.
Testing for 3 low outliers.
Mean = 105808.
Std. Dev. = 20261.
67800: c = 0.433
tabl = 0.413.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9615
Critical = 0.923
The distribution, after removal of suspect values, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Calcium

MW-84A (bg)



n = 24

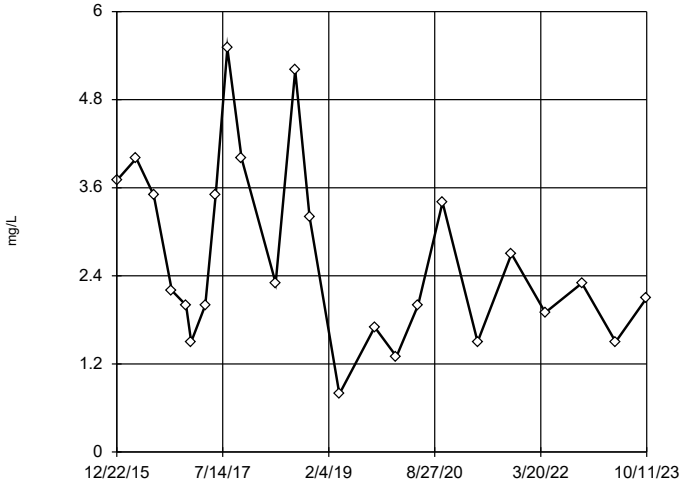
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 73650, std. dev. 3696, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9639
Critical = 0.93
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Chloride

MW-301 (bg)



n = 24

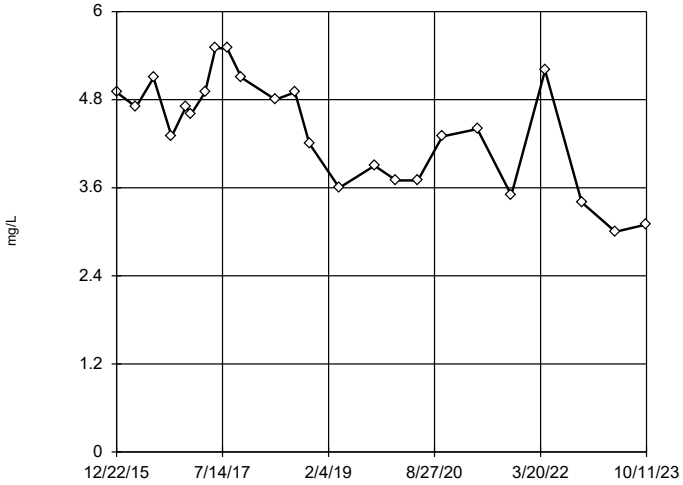
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2.658, std. dev. 1.223, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9706
Critical = 0.93 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Chloride

MW-84A (bg)



n = 24

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 4.375, std. dev. 0.7385, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9508
Critical = 0.93
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Dixon's Outlier Test

Constituent: Calcium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	117000
10/14/2021	67800 (O)
4/13/2022	97300
10/27/2022	62800 (O)
4/27/2023	120000
10/11/2023	52300 (O)

EPA 1989 Outlier Screening

Constituent: Calcium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	69100
10/14/2021	75300
4/13/2022	75100
10/27/2022	78400
4/27/2023	68600
10/11/2023	65100

EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	1.5 (J)
10/14/2021	2.7
4/13/2022	1.9 (J)
10/27/2022	2.3
4/27/2023	1.5 (J)
10/11/2023	2.1

EPA 1989 Outlier Screening

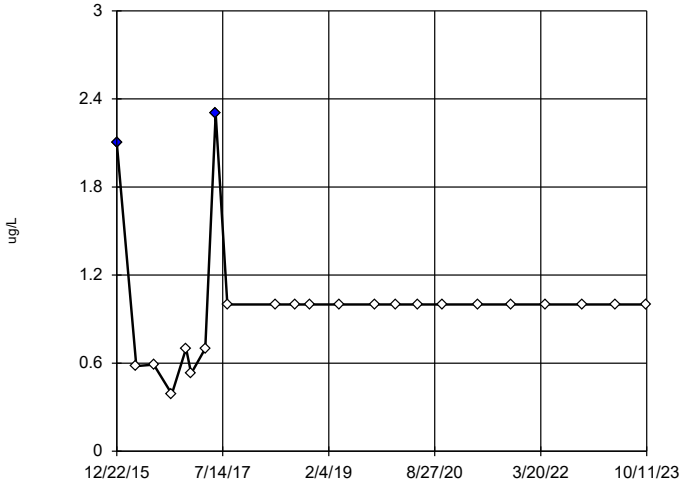
Constituent: Chloride (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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
4/14/2021	4.4
10/14/2021	3.5
4/13/2022	5.2
10/27/2022	3.4
4/27/2023	3
10/11/2023	3.1

Chromium

MW-301 (bg)



n = 23

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 1.9, low cutoff = -0.2, based on IQR multiplier of 3.

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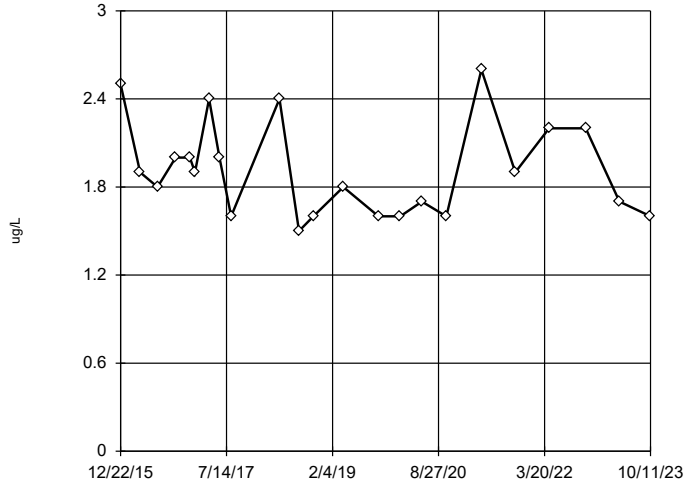
Chromium

MW-84A (bg)



n = 23

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.

High cutoff = 4, low cutoff = -0.2, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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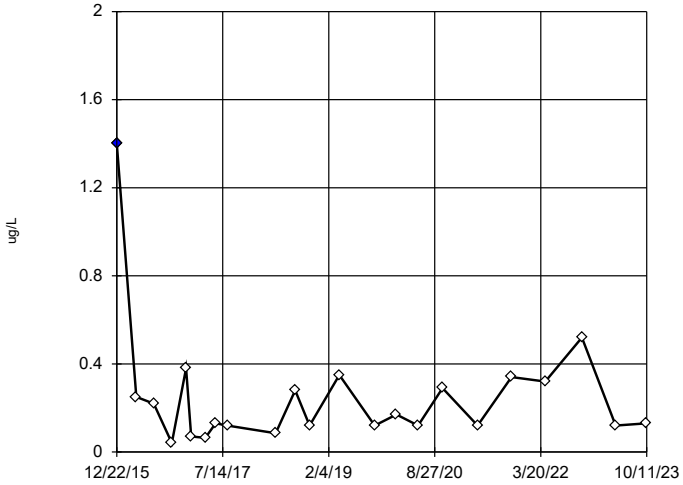
Cobalt

MW-301 (bg)



n = 23

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.2505.
Std. Dev. = 0.279.
1.4: c = 0.4374
tabl = 0.421.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9539
Critical = 0.926 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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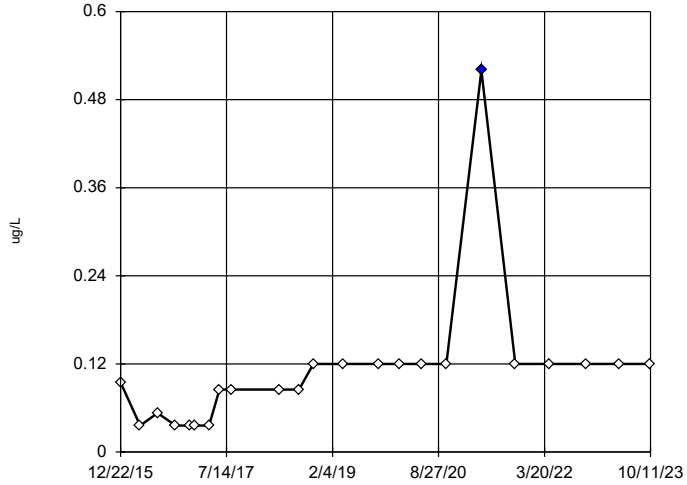
Cobalt

MW-84A (bg)



n = 23

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.321, low cutoff = -0.148, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Chromium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	2.1 (O)
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 (JO)
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)
4/14/2021	<1 (U)
10/14/2021	<1 (U)
4/13/2022	<1 (U)
10/27/2022	<1 (U)
4/27/2023	<1 (U)
10/11/2023	<1 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Chromium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	2.6 (J)
10/14/2021	1.9 (J)
4/13/2022	2.2 (J)
10/27/2022	2.2 (J)
4/27/2023	1.7 (J)
10/11/2023	1.6 (J)

Dixon's Outlier Test

Constituent: Cobalt (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	<0.12 (U)
10/14/2021	0.34 (J)
4/13/2022	0.32 (J)
10/27/2022	0.52 (J)
4/27/2023	<0.12 (U)
10/11/2023	0.13 (J)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

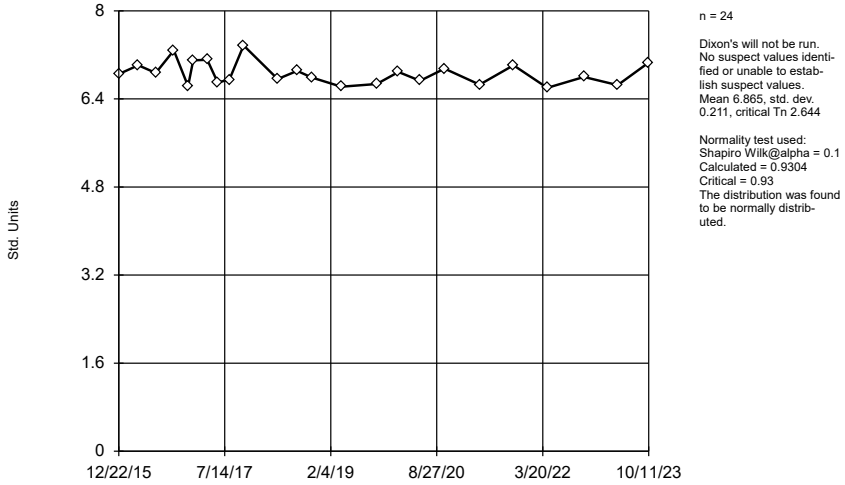
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	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)
4/14/2021	0.52 (JO)
10/14/2021	0.12 (J)
4/13/2022	<0.12 (U)
10/27/2022	<0.12 (U)
4/27/2023	<0.12 (U)
10/11/2023	<0.12

ND substitution: RL or RL/2 if <15% NDs.

Field pH

MW-301 (bg)



n = 24

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 6.865, std. dev. 0.211, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9304
Critical = 0.93
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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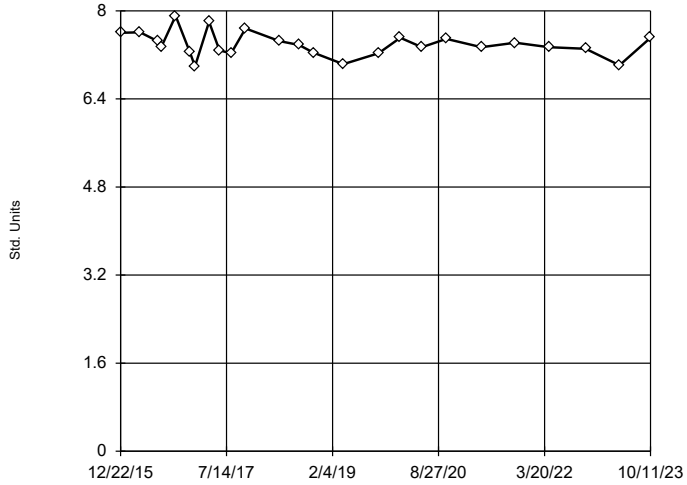
Field pH

MW-84A (bg)



n = 25

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.39, std. dev. 0.2253, critical Tn 2.663

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9672
Critical = 0.931
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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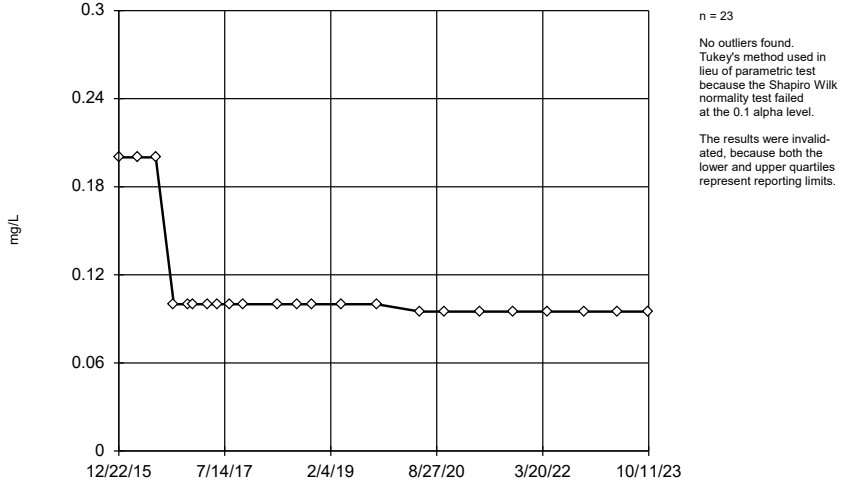
Fluoride

MW-301 (bg)



n = 23

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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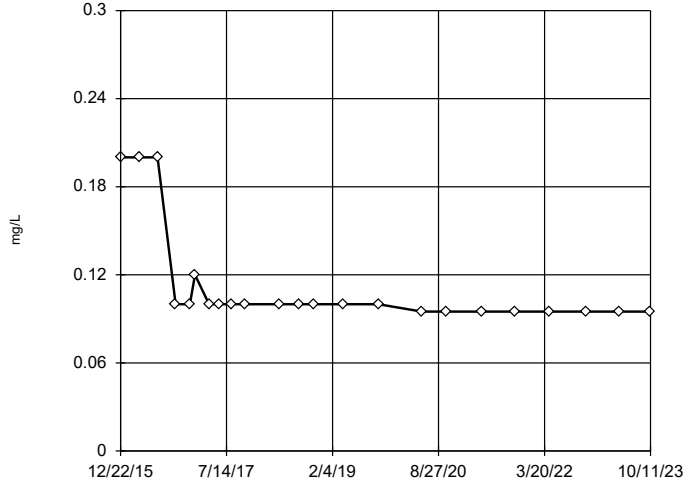
Fluoride

MW-84A (bg)



n = 23

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Field pH (Std. Units) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	6.66
10/14/2021	7.01
4/13/2022	6.6
10/27/2022	6.8
4/27/2023	6.65
10/11/2023	7.06

EPA 1989 Outlier Screening

Constituent: Field pH (Std. Units) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	7.34
10/14/2021	7.42
4/13/2022	7.34
10/27/2022	7.31
4/27/2023	7.01
10/11/2023	7.51

Tukey's Outlier Screening

Constituent: Fluoride (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	<0.2 (U)
4/5/2016	<0.2 (U)
7/8/2016	<0.2 (U)
10/13/2016	<0.1 (U)
12/29/2016	<0.1 (U)
1/25/2017	<0.1 (U)
4/11/2017	<0.1 (U)
6/6/2017	<0.1 (U)
8/8/2017	<0.1 (U)
10/23/2017	<0.1 (U)
4/25/2018	<0.1 (U)
8/8/2018	<0.1 (U)
10/24/2018	<0.1 (U)
4/2/2019	<0.1 (U)
10/9/2019	<0.1 (U)
5/29/2020	<0.095 (U)
10/8/2020	<0.095 (U)
4/14/2021	<0.095 (U)
10/14/2021	<0.095 (U)
4/13/2022	<0.095 (U)
10/27/2022	<0.095 (U)
4/27/2023	<0.095 (U)
10/11/2023	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Fluoride (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

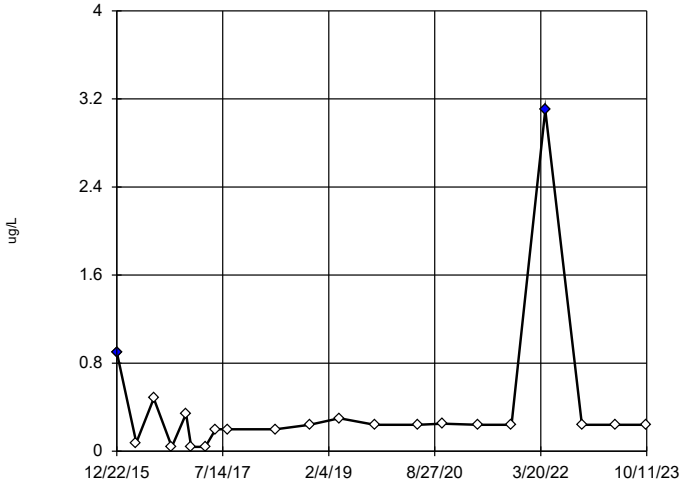
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)
12/22/2015	<0.2 (U)
4/5/2016	<0.2 (U)
7/8/2016	<0.2 (U)
10/13/2016	<0.1 (U)
12/29/2016	<0.1 (U)
1/25/2017	0.12 (J)
4/11/2017	<0.1 (U)
6/6/2017	<0.1 (U)
8/8/2017	<0.1 (U)
10/24/2017	<0.1 (U)
4/25/2018	<0.1 (U)
8/8/2018	<0.1 (U)
10/24/2018	<0.1 (U)
4/3/2019	<0.1 (U)
10/9/2019	<0.1 (U)
5/29/2020	<0.095 (U)
10/8/2020	<0.095 (U)
4/14/2021	<0.095 (U)
10/14/2021	<0.095 (U)
4/13/2022	<0.095 (U)
10/27/2022	<0.095 (U)
4/27/2023	<0.095 (U)
10/11/2023	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Lead

MW-301 (bg)



n = 21

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.5, low cutoff = -0.025, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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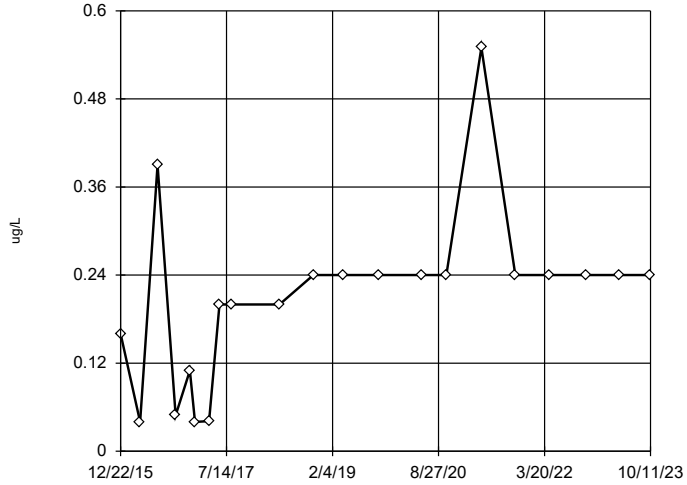
Lead

MW-84A (bg)



n = 21

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.

High cutoff = 0.555, low cutoff = -0.18, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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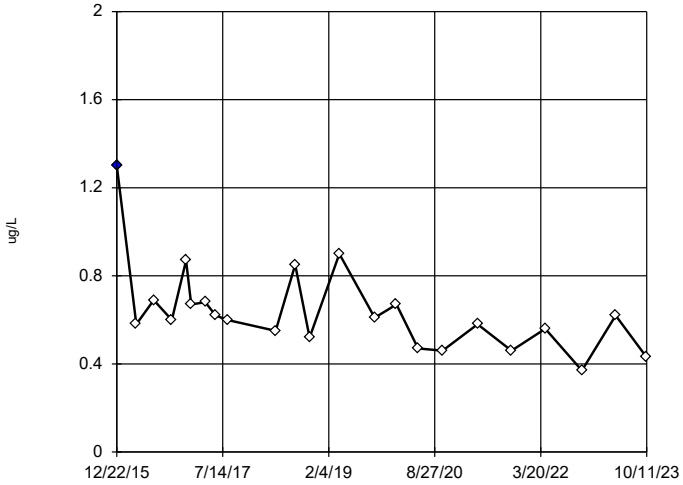
Lithium

MW-301 (bg)



n = 23

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.6374.
Std. Dev. = 0.1974.
1.3 (X): c = 0.5119
tabl = 0.421.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9419
Critical = 0.926
The distribution, after removal of suspect value, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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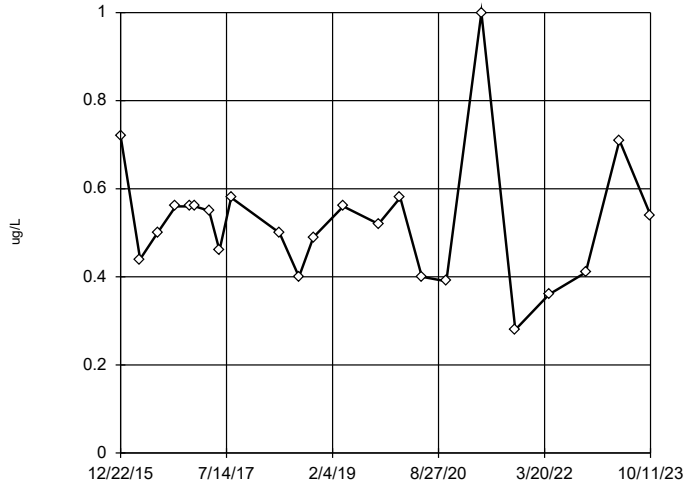
Lithium

MW-84A (bg)



n = 23

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.5248, std. dev. 0.1467, critical Tn 2.624

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9577
Critical = 0.928 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	0.9 (JO)
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)
4/14/2021	<0.24 (U)
10/14/2021	<0.24 (U)
4/13/2022	3.1 (XO)
10/27/2022	<0.24 (U)
4/27/2023	<0.24 (U)
10/11/2023	<0.24 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	0.55 (J)
10/14/2021	<0.24 (U)
4/13/2022	<0.24 (U)
10/27/2022	<0.24 (U)
4/27/2023	<0.24 (U)
10/11/2023	<0.24 (U)

ND substitution: RL or RL/2 if <15% NDs.

Dixon's Outlier Test

Constituent: Lithium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	1.3 (XO)
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)
4/14/2021	0.58 (J)
10/14/2021	0.46 (J)
4/13/2022	0.56 (J)
10/27/2022	0.37 (J)
4/27/2023	0.62 (J)
10/11/2023	0.43 (J)

EPA 1989 Outlier Screening

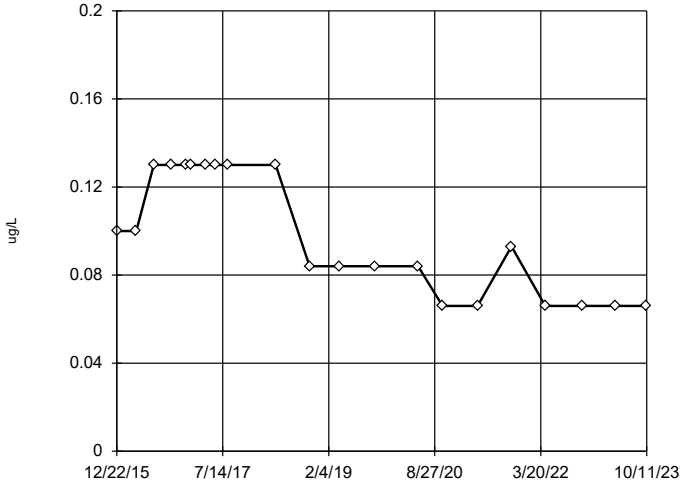
Constituent: Lithium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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)
4/14/2021	1 (X)
10/14/2021	0.28 (J)
4/13/2022	0.36 (J)
10/27/2022	0.41 (J)
4/27/2023	0.71 (J)
10/11/2023	0.54 (J)

Mercury

MW-301 (bg)



n = 21

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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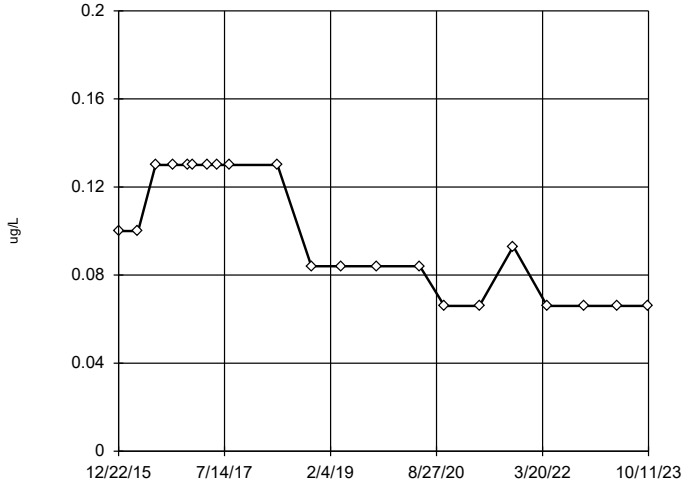
Mercury

MW-84A (bg)



n = 21

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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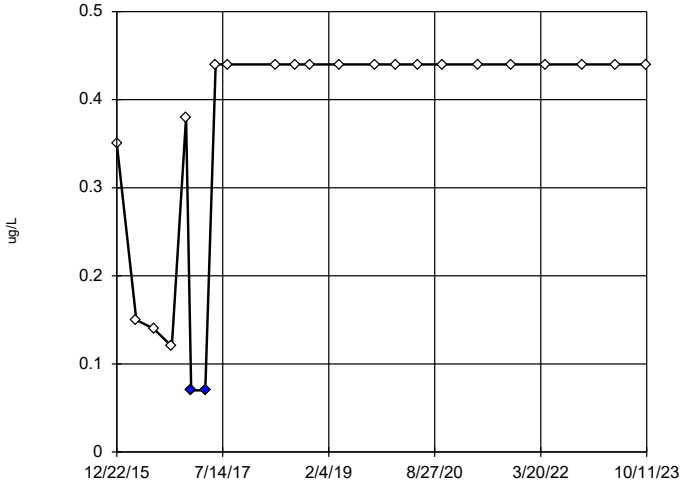
Molybdenum

MW-301 (bg)



n = 23

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.71, low cutoff = 0.08, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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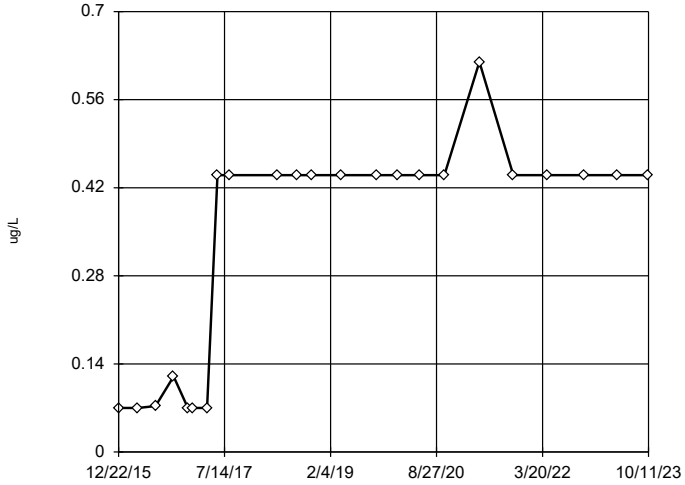
Molybdenum

MW-84A (bg)



n = 23

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.

High cutoff = 1.541, low cutoff = -1.028, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Mercury (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-301 (bg)
12/22/2015	<0.1 (U)
4/5/2016	<0.1 (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	<0.13 (U)
8/8/2017	<0.13 (U)
4/25/2018	<0.13 (U)
10/24/2018	<0.084 (U)
4/2/2019	<0.084 (U)
10/9/2019	<0.084 (U)
5/29/2020	<0.084 (U)
10/8/2020	<0.066 (U)
4/14/2021	<0.066 (U)
10/14/2021	<0.093 (U)
4/13/2022	<0.066 (U)
10/27/2022	<0.066 (U)
4/27/2023	<0.066 (U)
10/11/2023	<0.066 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Mercury (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

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

	MW-84A (bg)
12/22/2015	<0.1 (U)
4/5/2016	<0.1 (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	<0.13 (U)
8/8/2017	<0.13 (U)
4/25/2018	<0.13 (U)
10/24/2018	<0.084 (U)
4/3/2019	<0.084 (U)
10/9/2019	<0.084 (U)
5/29/2020	<0.084 (U)
10/8/2020	<0.066 (U)
4/14/2021	<0.066 (U)
10/14/2021	<0.093 (U)
4/13/2022	<0.066 (U)
10/27/2022	<0.066 (U)
4/27/2023	<0.066 (U)
10/11/2023	<0.066 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Molybdenum (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (UO)
4/11/2017	<0.07 (UO)
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)
4/14/2021	<0.44 (U)
10/14/2021	<0.44 (U)
4/13/2022	<0.44 (U)
10/27/2022	<0.44 (U)
4/27/2023	<0.44 (U)
10/11/2023	<0.44 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

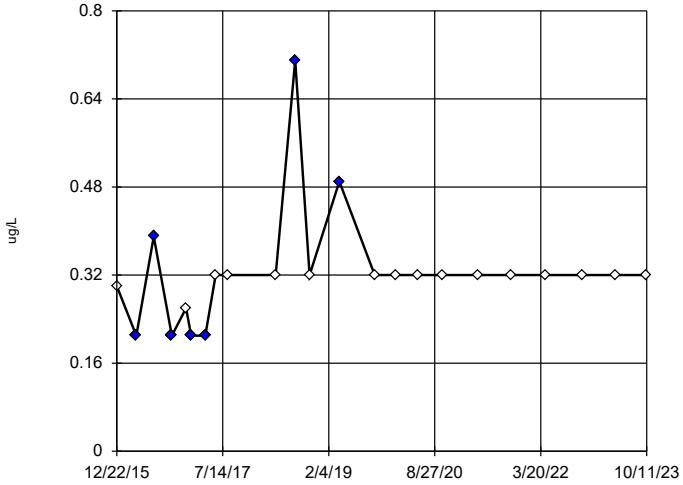
Constituent: Molybdenum (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	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)
4/14/2021	0.62 (J)
10/14/2021	<0.44 (U)
4/13/2022	<0.44 (U)
10/27/2022	<0.44 (U)
4/27/2023	<0.44 (U)
10/11/2023	<0.44 (U)

ND substitution: RL or RL/2 if <15% NDs.

Selenium

MW-301 (bg)



n = 23

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.38, low cutoff = 0.24, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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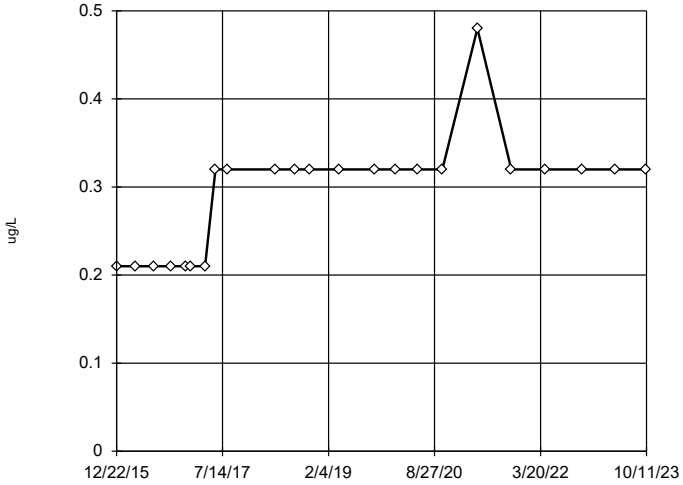
Selenium

MW-84A (bg)



n = 23

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.

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

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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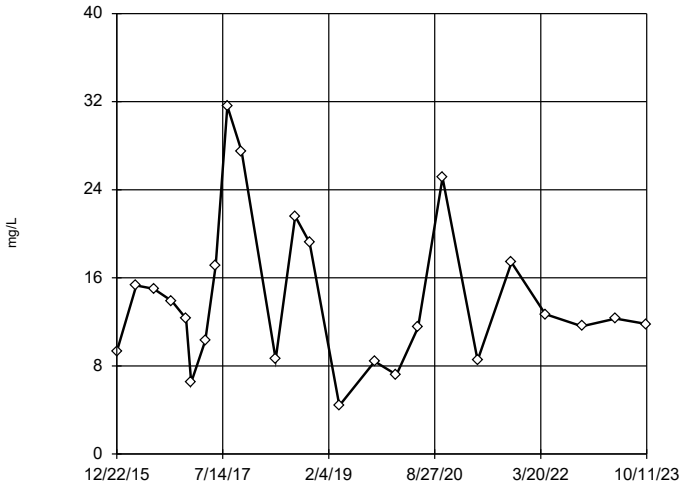
Sulfate

MW-301 (bg)



n = 24

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 14.13, std. dev. 6.818, critical Tn 2.644

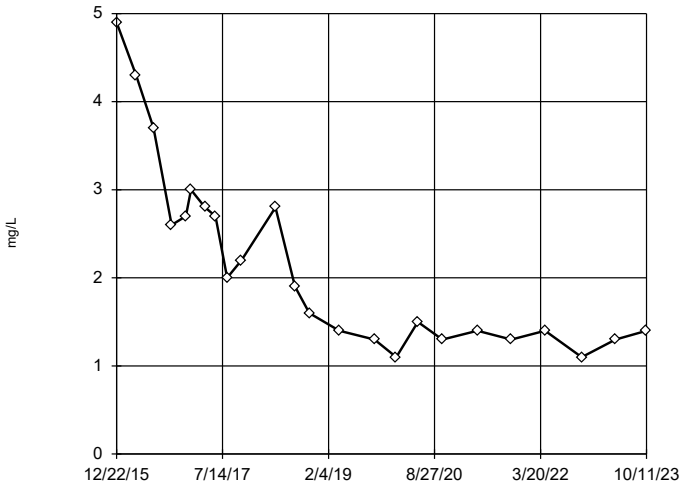
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9884
Critical = 0.93 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG

Sulfate

MW-84A (bg)



n = 24

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.

High cutoff = 6.95, low cutoff = -2.85, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (JO)
7/8/2016	0.39 (JO)
10/13/2016	<0.21 (UO)
12/29/2016	0.26 (J)
1/25/2017	<0.21 (UO)
4/11/2017	<0.21 (UO)
6/6/2017	<0.32 (U)
8/8/2017	<0.32 (U)
4/25/2018	<0.32 (U)
8/8/2018	0.71 (JO)
10/24/2018	<0.32 (U)
4/2/2019	0.49 (JO)
10/9/2019	<0.32 (U)
2/3/2020	<0.32 (U)
5/29/2020	<0.32 (U)
10/8/2020	<0.32 (U)
4/14/2021	<0.32 (U)
10/14/2021	<0.32 (U)
4/13/2022	<0.32 (U)
10/27/2022	<0.32 (U)
4/27/2023	<0.32 (U)
10/11/2023	<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	0.48 (J)
10/14/2021	<0.32 (U)
4/13/2022	<0.32 (U)
10/27/2022	<0.32 (U)
4/27/2023	<0.32 (U)
10/11/2023	<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

EPA 1989 Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	8.5
10/14/2021	17.4
4/13/2022	12.7
10/27/2022	11.6
4/27/2023	12.3
10/11/2023	11.8

Tukey's Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond

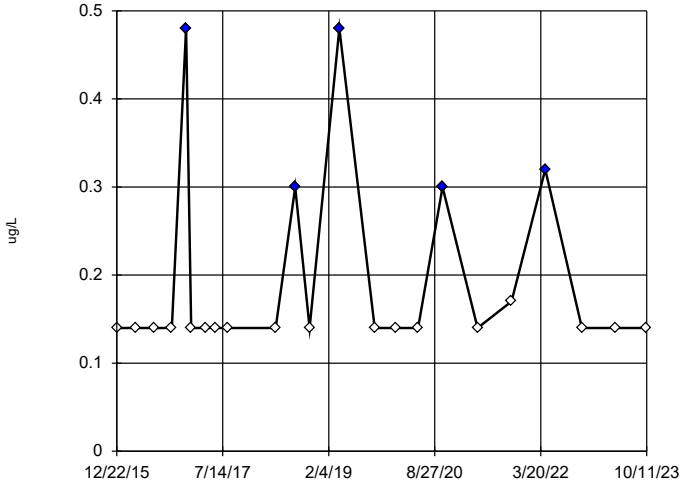
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	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)
4/14/2021	1.4 (J)
10/14/2021	1.3 (J)
4/13/2022	1.4 (J)
10/27/2022	1.1 (J)
4/27/2023	1.3 (J)
10/11/2023	1.4 (J)

ND substitution: RL or RL/2 if <15% NDs.

Thallium

MW-301 (bg)



n = 23

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 0.26, low cutoff = 0.05, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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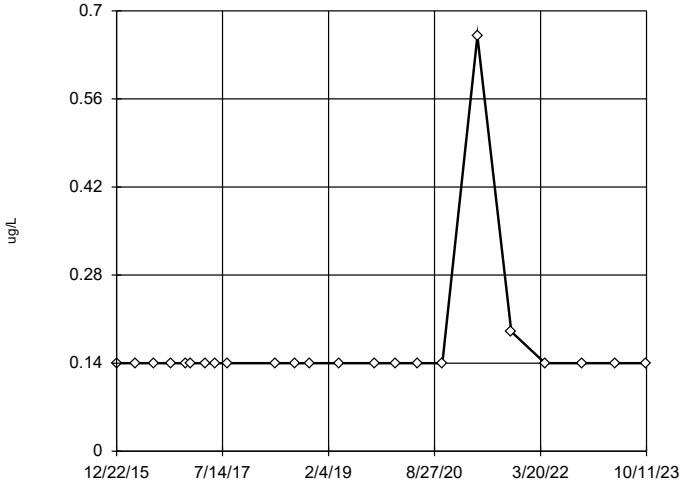
Thallium

MW-84A (bg)



n = 23

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.

The results were invalidated, because the lower and upper quartiles are equal.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

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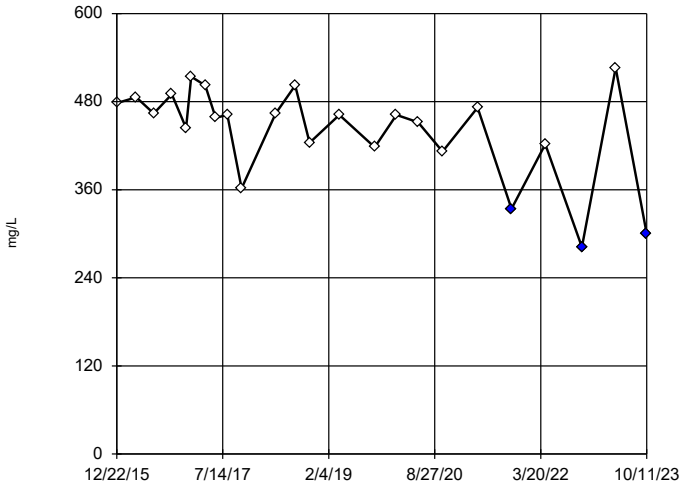
Total Dissolved Solids

MW-301 (bg)



n = 24

Statistical outliers are drawn as solid.
Testing for 4 low outliers.
Mean = 441.3.
Std. Dev. = 64.07.
362: c = 0.4
tabl = 0.413.
Alpha = 0.05.
334: c = 0.4643
tabl = 0.413.
Alpha = 0.05.

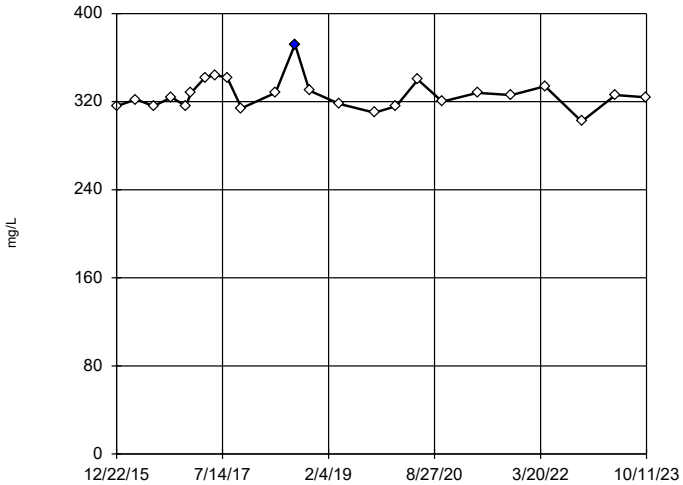
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.961
Critical = 0.923
The distribution, after removal of suspect values, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG

Total Dissolved Solids

MW-84A (bg)



n = 24

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 326.6.
Std. Dev. = 14.34.
372: c = 0.5172
tabl = 0.413.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9632
Critical = 0.928
The distribution, after removal of suspect value, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Thallium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (JO)
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 (JO)
10/24/2018	<0.14 (U)
4/2/2019	0.48 (JO)
10/9/2019	<0.14 (U)
2/3/2020	<0.14 (U)
5/29/2020	<0.14 (U)
10/8/2020	0.3 (JO)
4/14/2021	<0.14 (U)
10/14/2021	0.17 (J)
4/13/2022	0.32 (JO)
10/27/2022	<0.14 (U)
4/27/2023	<0.14 (U)
10/11/2023	<0.14 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Thallium (ug/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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)
4/14/2021	0.66 (J)
10/14/2021	0.19 (J)
4/13/2022	<0.14 (U)
10/27/2022	<0.14 (U)
4/27/2023	<0.14 (U)
10/11/2023	<0.14 (U)

ND substitution: RL or RL/2 if <15% NDs.

Dixon's Outlier Test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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
4/14/2021	472
10/14/2021	334 (O)
4/13/2022	422
10/27/2022	282 (O)
4/27/2023	526
10/11/2023	300 (O)

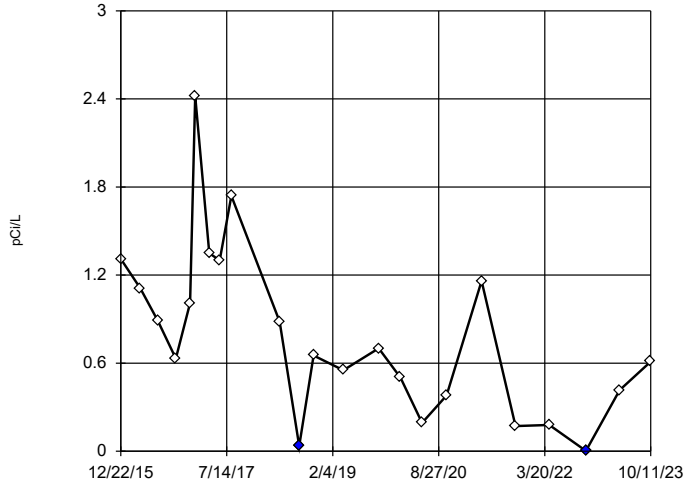
Dixon's Outlier Test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (O)
10/24/2018	330
4/3/2019	318
10/9/2019	310
2/3/2020	316
5/29/2020	340
10/8/2020	320
4/14/2021	328
10/14/2021	326
4/13/2022	334
10/27/2022	302
4/27/2023	326
10/11/2023	324

Total Radium

MW-301 (bg)



n = 23

Statistical outliers are drawn as solid.
Testing for 2 low outliers.
Mean = 0.7913.
Std. Dev. = 0.5855.
-3.35: c = 0.4464
tabl = 0.421.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9482
Critical = 0.923 (after natural log transformation)
The distribution, after removal of suspect values, was found to be log-normal.

Dixon's Outlier Test Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond

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

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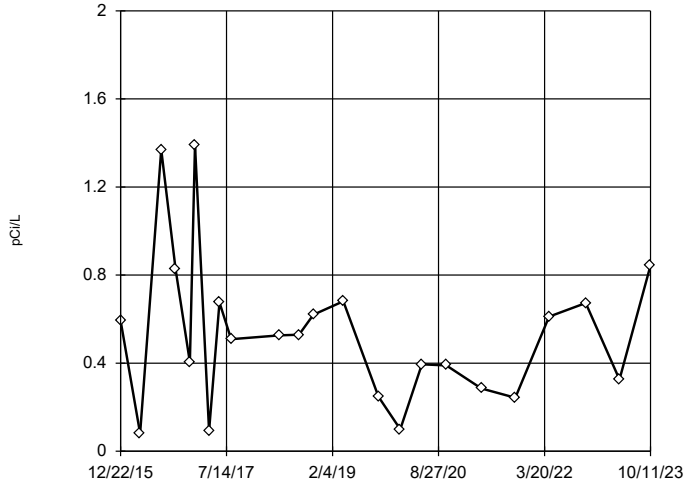
Total Radium

MW-84A (bg)



n = 23

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.

High cutoff = 1.849, low cutoff = -0.888, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 3/18/2024 2:25 PM View: COL Primary Pond

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

Dixon's Outlier Test

Constituent: Total Radium (pCi/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary 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 (O)
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
4/14/2021	1.16
10/14/2021	0.172
4/13/2022	0.179
10/27/2022	0.00292 (O)
4/27/2023	0.417
10/11/2023	0.611

Tukey's Outlier Screening

Constituent: Total Radium (pCi/L) Analysis Run 3/18/2024 2:26 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

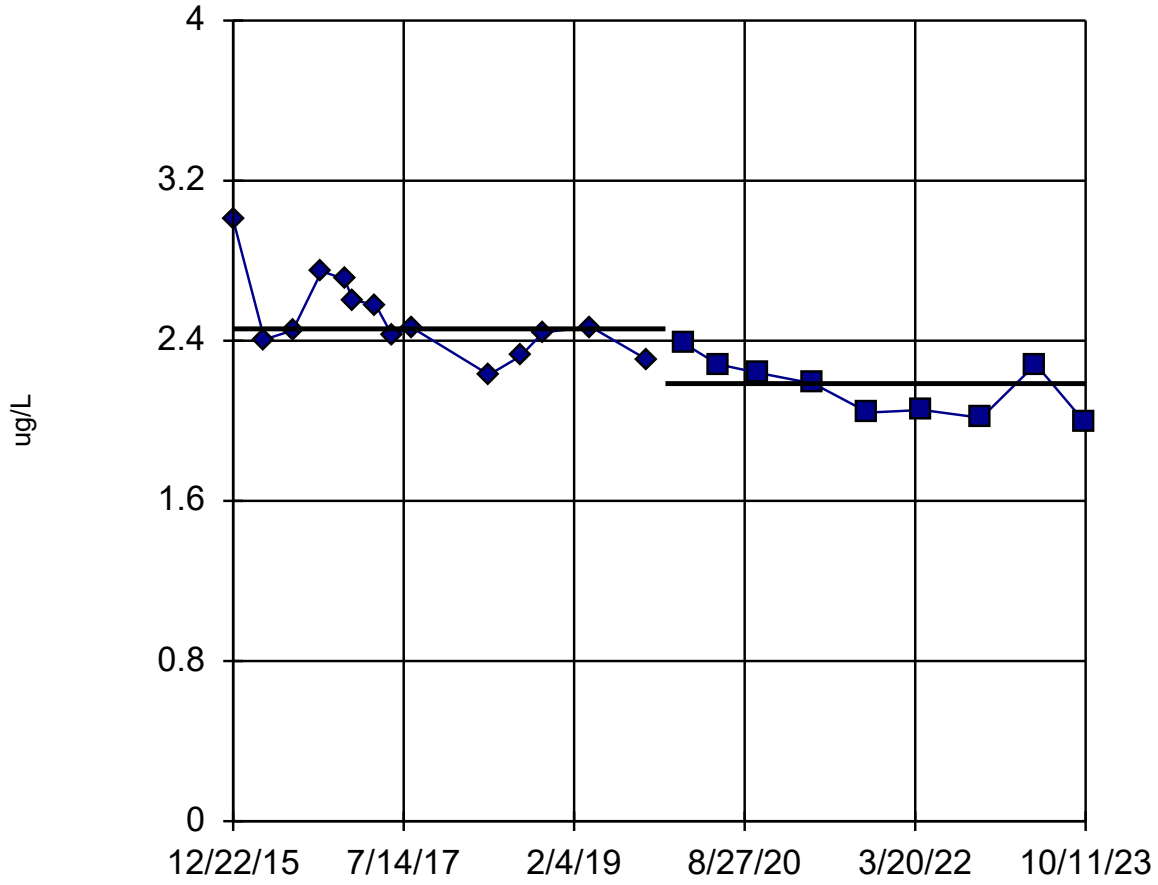
	MW-84A (bg)
12/22/2015	0.593
4/5/2016	0.0809
7/28/2016	1.37
10/13/2016	0.825
12/29/2016	0.404
1/25/2017	1.39
4/11/2017	0.0929
6/6/2017	0.676
8/8/2017	0.509
4/25/2018	0.526
8/8/2018	0.529
10/24/2018	0.62
4/3/2019	0.681
10/9/2019	0.247
2/3/2020	0.1
5/29/2020	0.395
10/8/2020	0.39
4/14/2021	0.285
10/14/2021	0.243
4/13/2022	0.611
10/27/2022	0.673
4/27/2023	0.326
10/11/2023	0.844

Attachment 3

Wilcoxon Rank-Sum

Barium

MW-301 (bg)



◆ MW-301 background

■ MW-301 compliance

background median = 2.46

compliance median = 2.186

t = -4.784 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	Yes
0.05	1.721	Yes
0.02	2.189	Yes
0.01	2.518	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9231 after natural log transformation, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

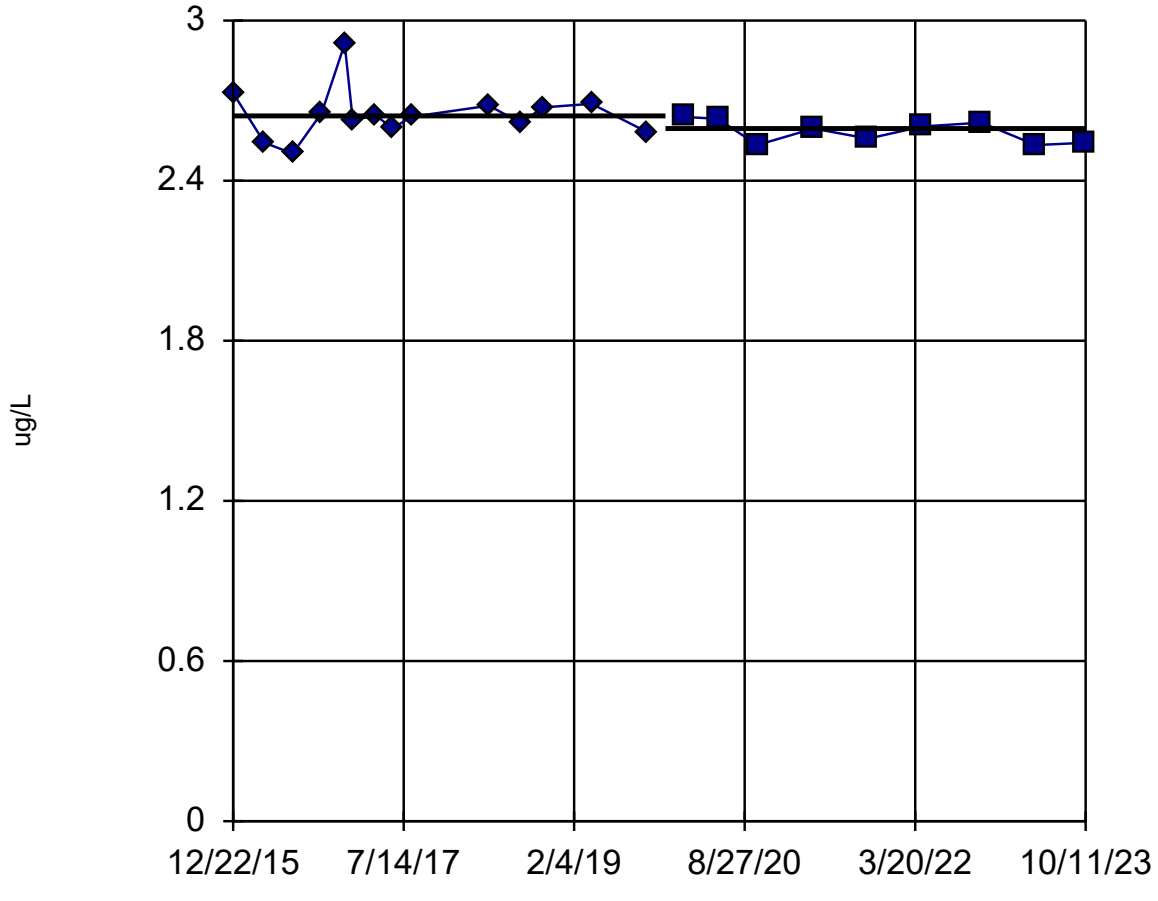
Constituent: Barium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-301	MW-301
12/22/2015	20.2	
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
4/14/2021		8.9
10/14/2021		7.7
4/13/2022		7.8
10/27/2022		7.5
4/27/2023		9.8
10/11/2023		7.3

Barium

MW-84A (bg)



◆ MW-84A background

■ MW-84A compliance

background median = 2.643

compliance median = 2.595

t = -2.21 (two-tail)

Alpha	Table	Sig.
0.2	0.861	Yes
0.1	1.328	Yes
0.05	1.729	Yes
0.02	2.205	Yes
0.01	2.539	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8906 after natural log transformation, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

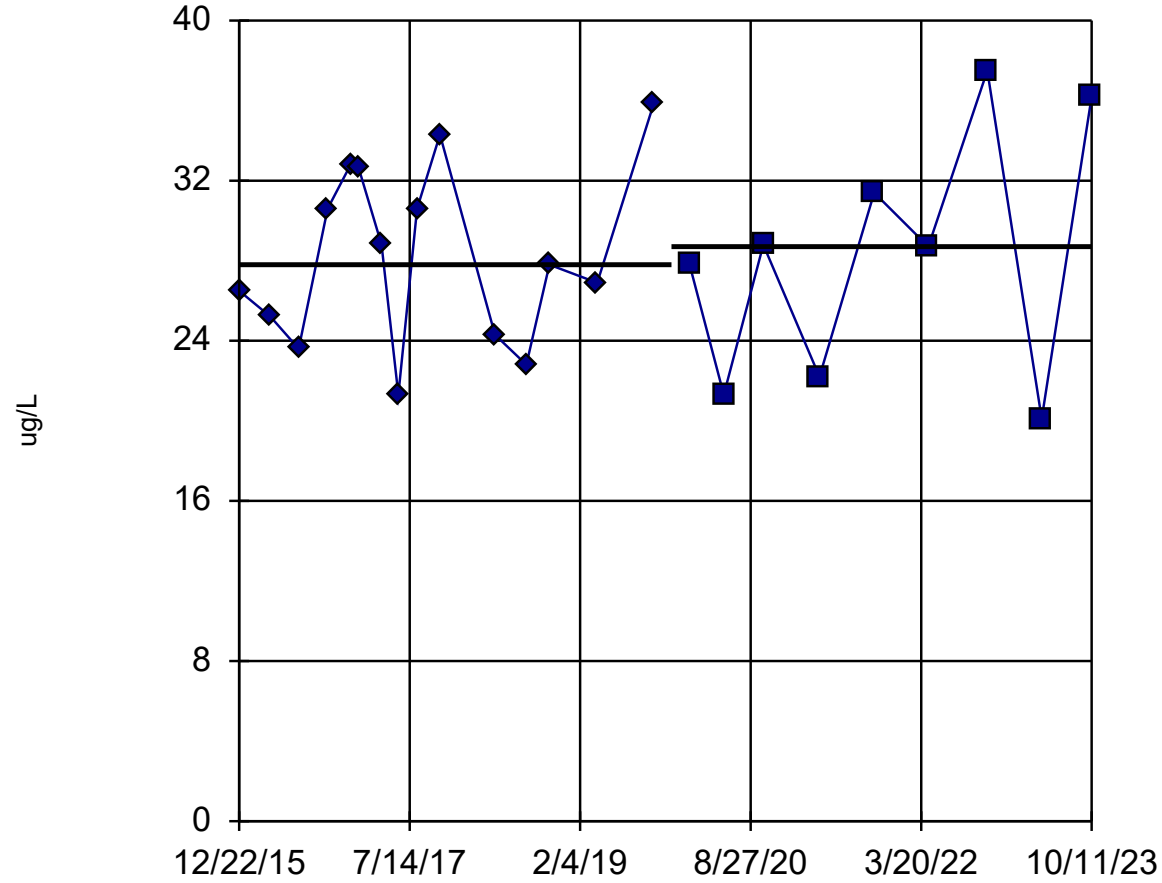
Constituent: Barium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-84A	MW-84A
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	
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
4/14/2021		13.4
10/14/2021		12.9
4/13/2022		13.5
10/27/2022		13.7
4/27/2023		12.6
10/11/2023		12.7

Boron

MW-301 (bg)



◆ MW-301 background

■ MW-301 compliance

background median = 27.8

compliance median = 28.7

t = -0.01405 (two-tail)

Alpha	Table	Sig.
0.2	0.87	No
0.1	1.35	No
0.05	1.771	No
0.02	2.282	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9694, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

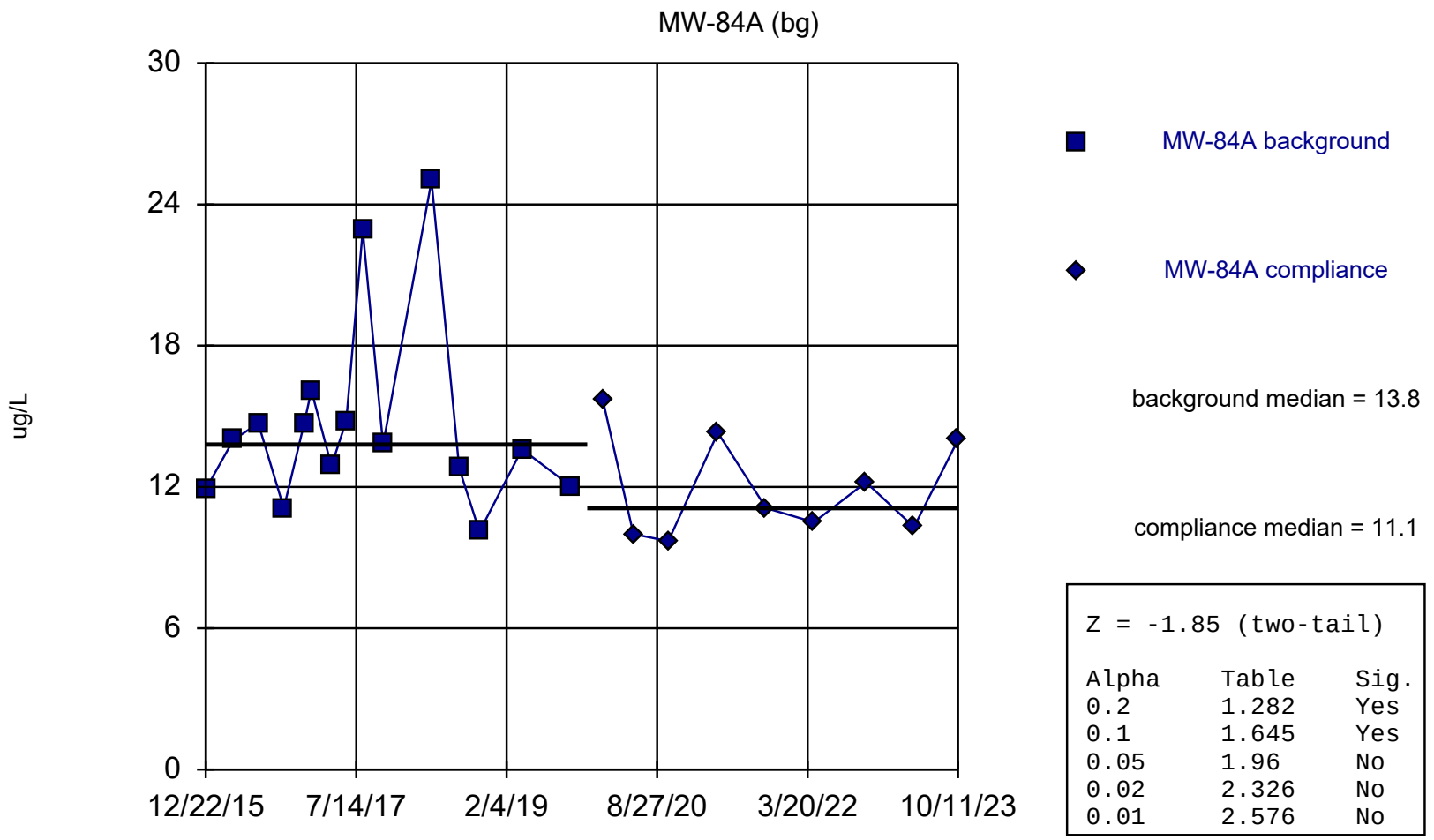
Welch's t-test

Constituent: Boron (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-301	MW-301
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
4/14/2021		22.2
10/14/2021		31.4
4/13/2022		28.7
10/27/2022		37.5
4/27/2023		20.1
10/11/2023		36.2

Boron




```
Z = -1.85 (two-tail)

Alpha     Table     Sig.
0.2       1.282     Yes
0.1       1.645     Yes
0.05      1.96      No
0.02      2.326     No
0.01      2.576     No
```

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

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Mann-Whitney (Wilcoxon Rank Sum)

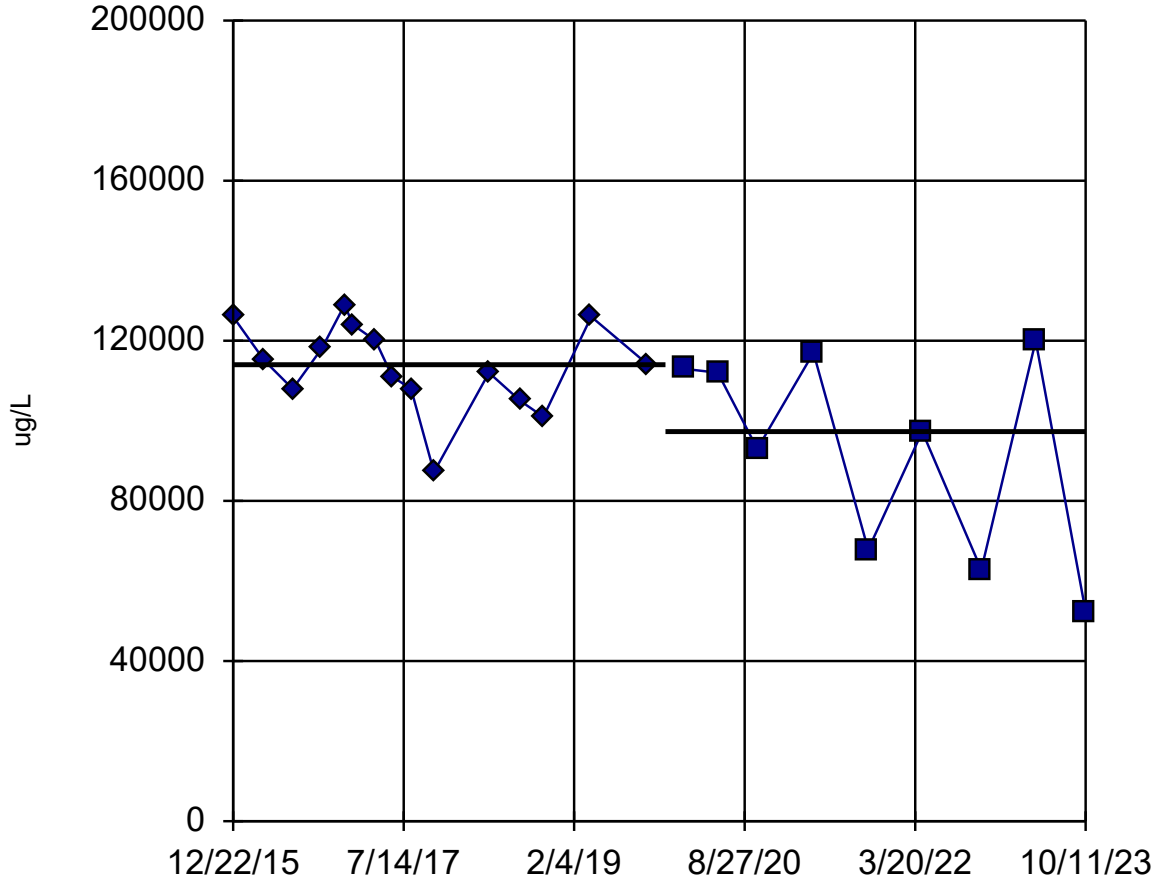
Constituent: Boron (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-84A	MW-84A
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)
4/14/2021		14.3
10/14/2021		11.1
4/13/2022		10.5
10/27/2022		12.2
4/27/2023		10.3
10/11/2023		14

Calcium

MW-301 (bg)



◆ MW-301 background

■ MW-301 compliance

background median = 114000

compliance median = 97300

t = -2.304 (two-tail)

Alpha	Table	Sig.
0.2	0.879	Yes
0.1	1.372	Yes
0.05	1.812	Yes
0.02	2.359	No
0.01	2.764	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9509, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

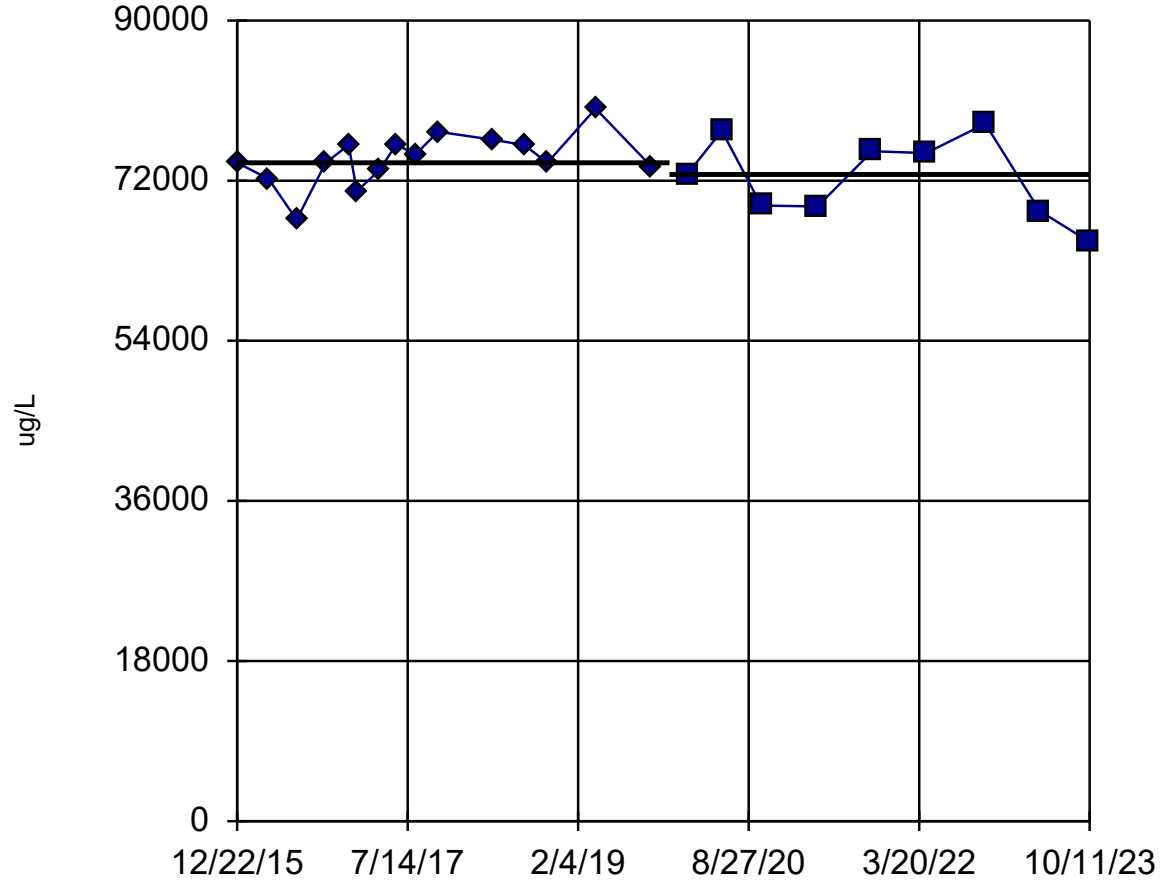
Constituent: Calcium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-301	MW-301
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
4/14/2021		117000
10/14/2021		67800
4/13/2022		97300
10/27/2022		62800
4/27/2023		120000
10/11/2023		52300

Calcium

MW-84A (bg)



◆ MW-84A background

■ MW-84A compliance

background median = 74000

compliance median = 72700

t = -1.225 (two-tail)

Alpha	Table	Sig.
0.2	0.873	Yes
0.1	1.356	No
0.05	1.782	No
0.02	2.303	No
0.01	2.681	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.965, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

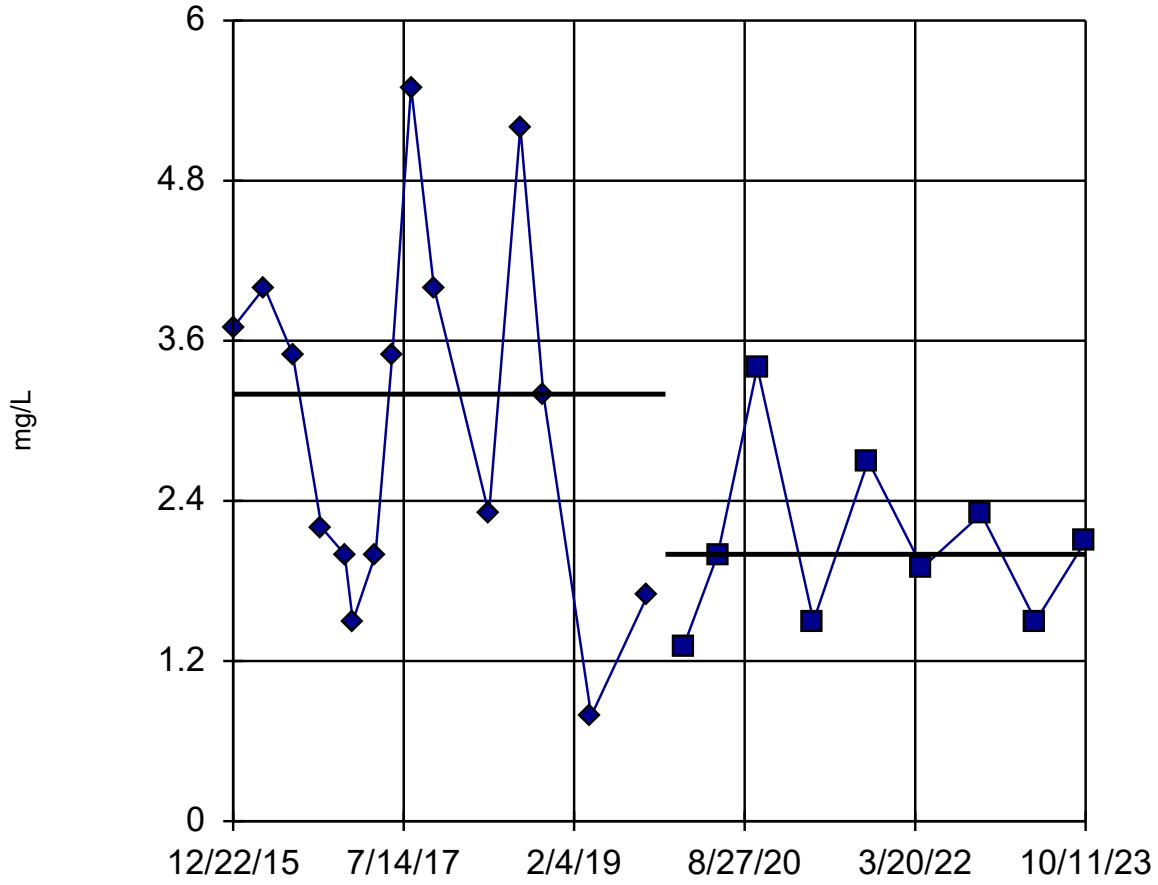
Constituent: Calcium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-84A	MW-84A
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
4/14/2021		69100
10/14/2021		75300
4/13/2022		75100
10/27/2022		78400
4/27/2023		68600
10/11/2023		65100

Chloride

MW-301 (bg)



◆ MW-301 background

■ MW-301 compliance

background median = 3.2

compliance median = 2

t = -2.234 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	Yes
0.05	1.721	Yes
0.02	2.189	Yes
0.01	2.518	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9568, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

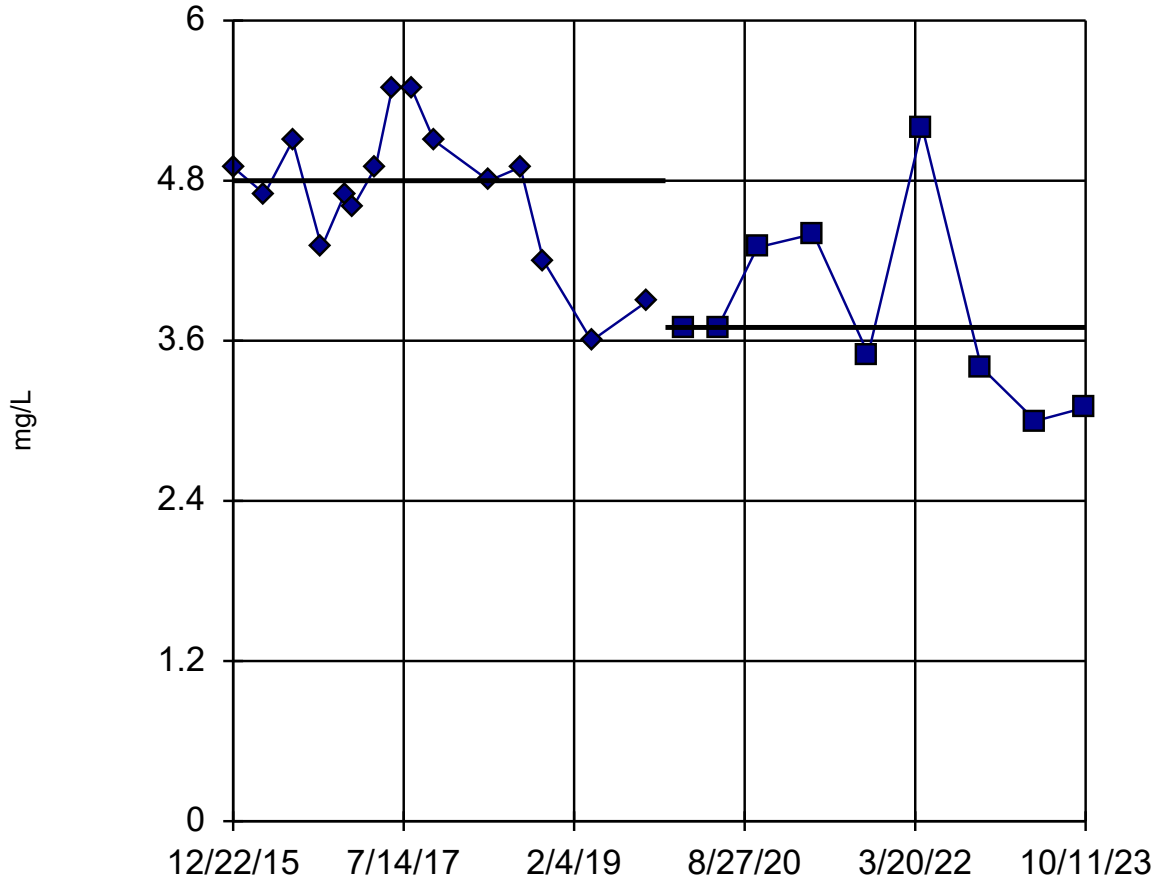
Welch's t-test

Constituent: Chloride (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301	MW-301
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
4/14/2021		1.5 (J)
10/14/2021		2.7
4/13/2022		1.9 (J)
10/27/2022		2.3
4/27/2023		1.5 (J)
10/11/2023		2.1

Chloride

MW-84A (bg)



background median = 4.8

compliance median = 3.7

t = -3.313 (two-tail)

Alpha	Table	Sig.
0.2	0.868	Yes
0.1	1.345	Yes
0.05	1.761	Yes
0.02	2.264	Yes
0.01	2.624	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9504, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

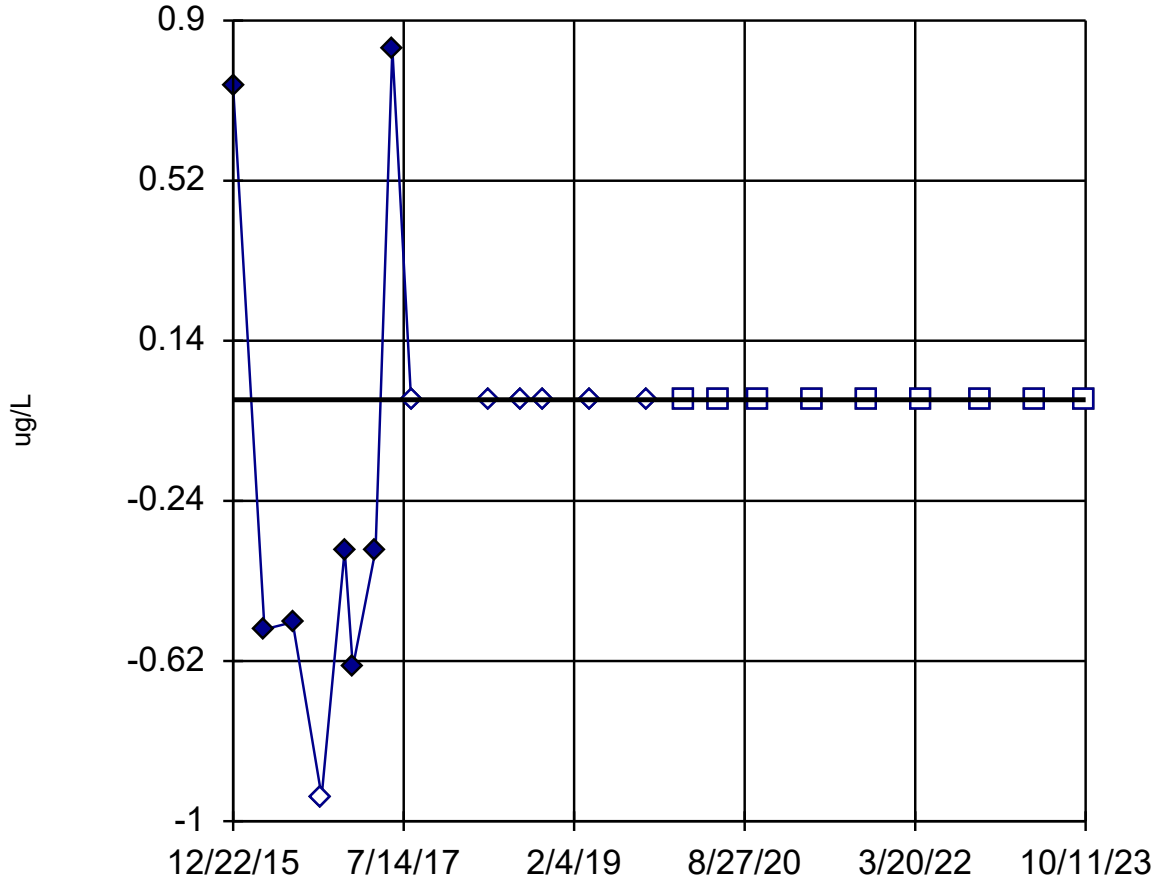
Constituent: Chloride (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A	MW-84A
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
4/14/2021		4.4
10/14/2021		3.5
4/13/2022		5.2
10/27/2022		3.4
4/27/2023		3
10/11/2023		3.1

Hollow symbols indicate censored values.

Chromium

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 0

compliance median = 0

t = 0.9727 (two-tail)

Alpha	Table	Sig.
0.2	0.87	Yes
0.1	1.35	No
0.05	1.771	No
0.02	2.282	No
0.01	2.65	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9087 after natural log transformation, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

Constituent: Chromium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

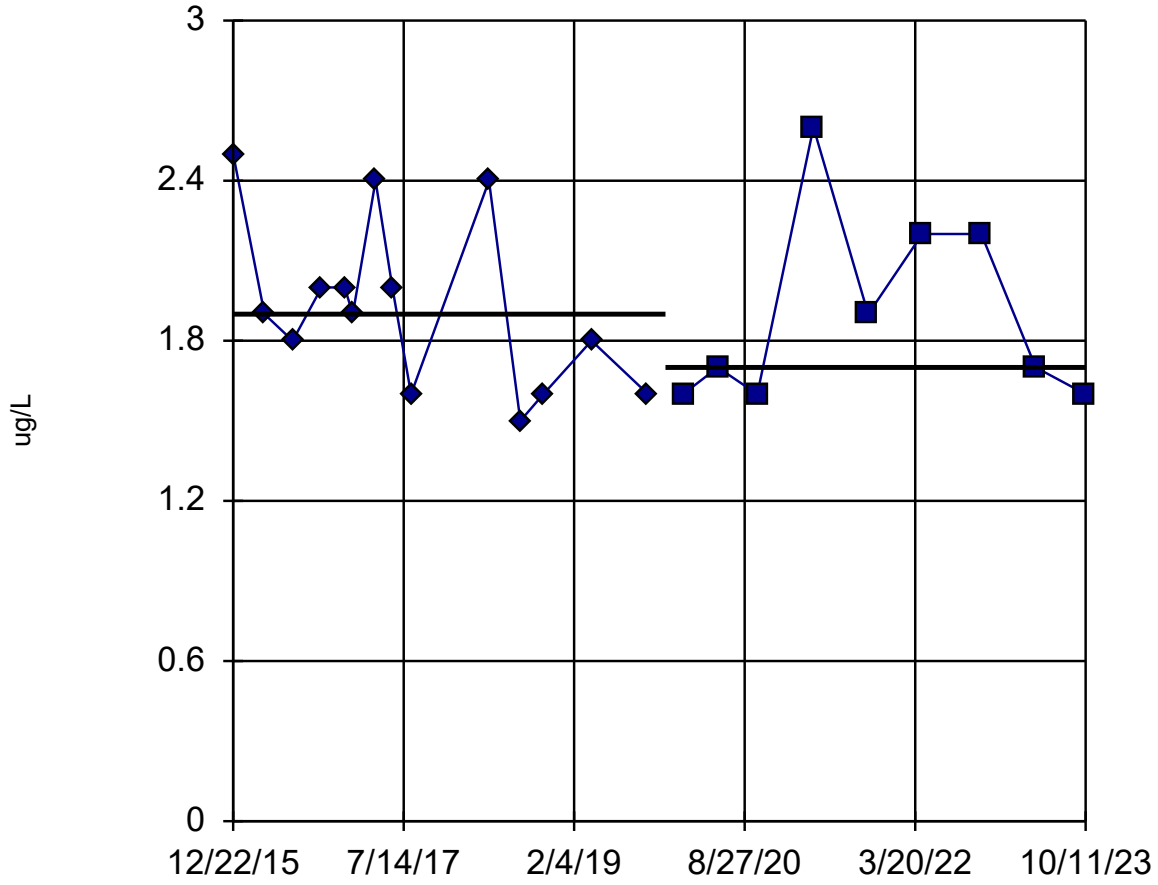
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301	MW-301
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)
4/14/2021		<1 (U)
10/14/2021		<1 (U)
4/13/2022		<1 (U)
10/27/2022		<1 (U)
4/27/2023		<1 (U)
10/11/2023		<1 (U)

ND substitution: RL or RL/2 if <15% NDs.

Chromium

MW-84A (bg)



◆ MW-84A background

■ MW-84A compliance

background median = 1.9

compliance median = 1.7

t = -0.195 (two-tail)

Alpha	Table	Sig.
0.2	0.865	No
0.1	1.337	No
0.05	1.746	No
0.02	2.235	No
0.01	2.583	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9087, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

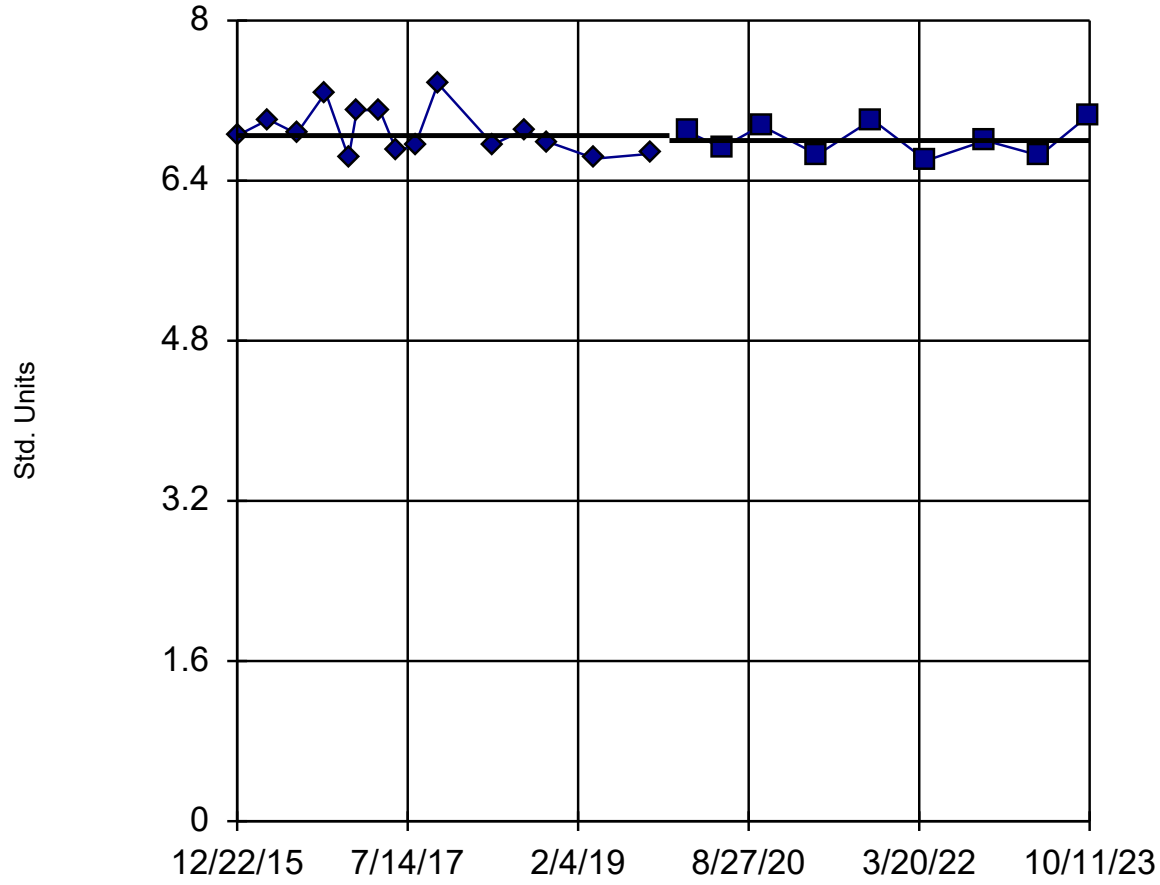
Welch's t-test

Constituent: Chromium (ug/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A	MW-84A
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)
4/14/2021		2.6 (J)
10/14/2021		1.9 (J)
4/13/2022		2.2 (J)
10/27/2022		2.2 (J)
4/27/2023		1.7 (J)
10/11/2023		1.6 (J)

Field pH

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 6.85

compliance median = 6.8

t = -0.9471 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	No
0.05	1.721	No
0.02	2.189	No
0.01	2.518	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9201, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

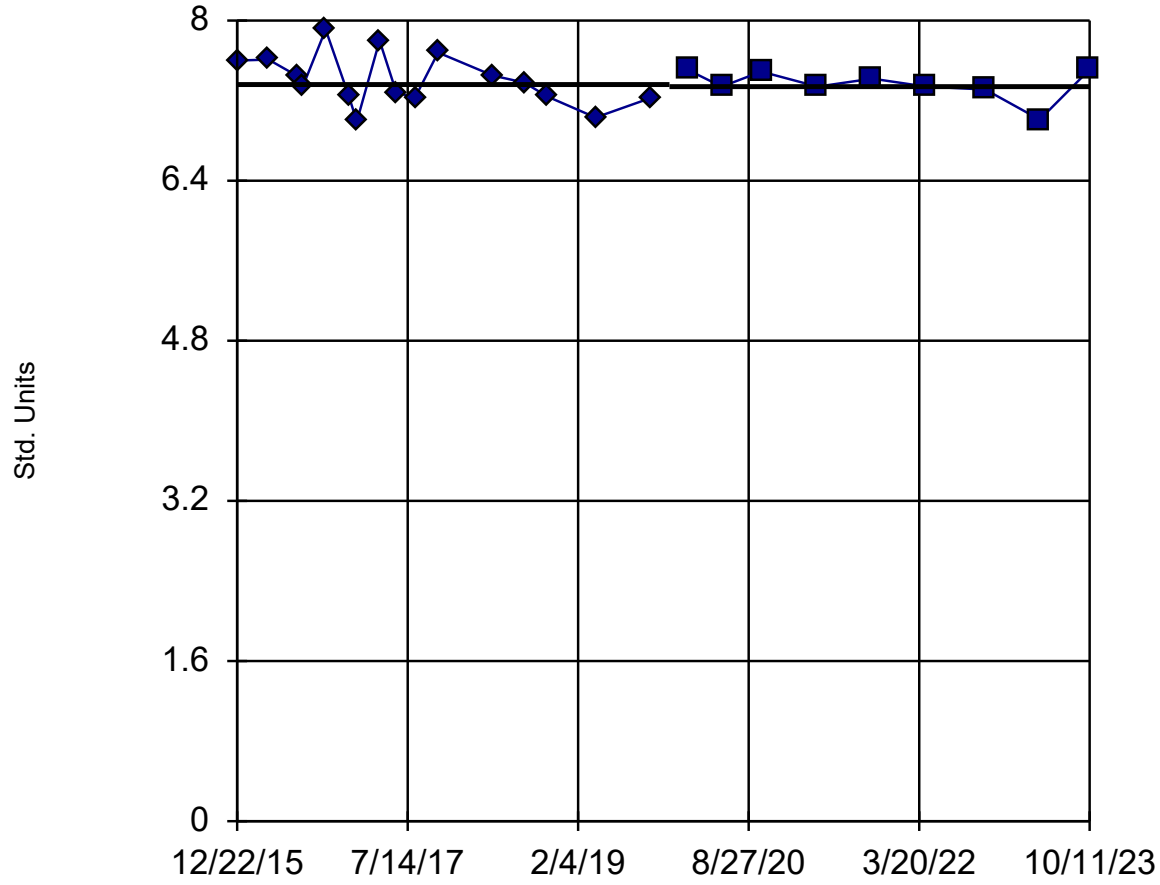
Welch's t-test

Constituent: Field pH (Std. Units) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301	MW-301
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
4/14/2021		6.66
10/14/2021		7.01
4/13/2022		6.6
10/27/2022		6.8
4/27/2023		6.65
10/11/2023		7.06

Field pH

MW-84A (bg)



MW-84A background

MW-84A compliance

background median = 7.36

compliance median = 7.34

t = -0.4942 (two-tail)

Alpha	Table	Sig.
0.2	0.858	No
0.1	1.319	No
0.05	1.714	No
0.02	2.177	No
0.01	2.5	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9615, critical = 0.887.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

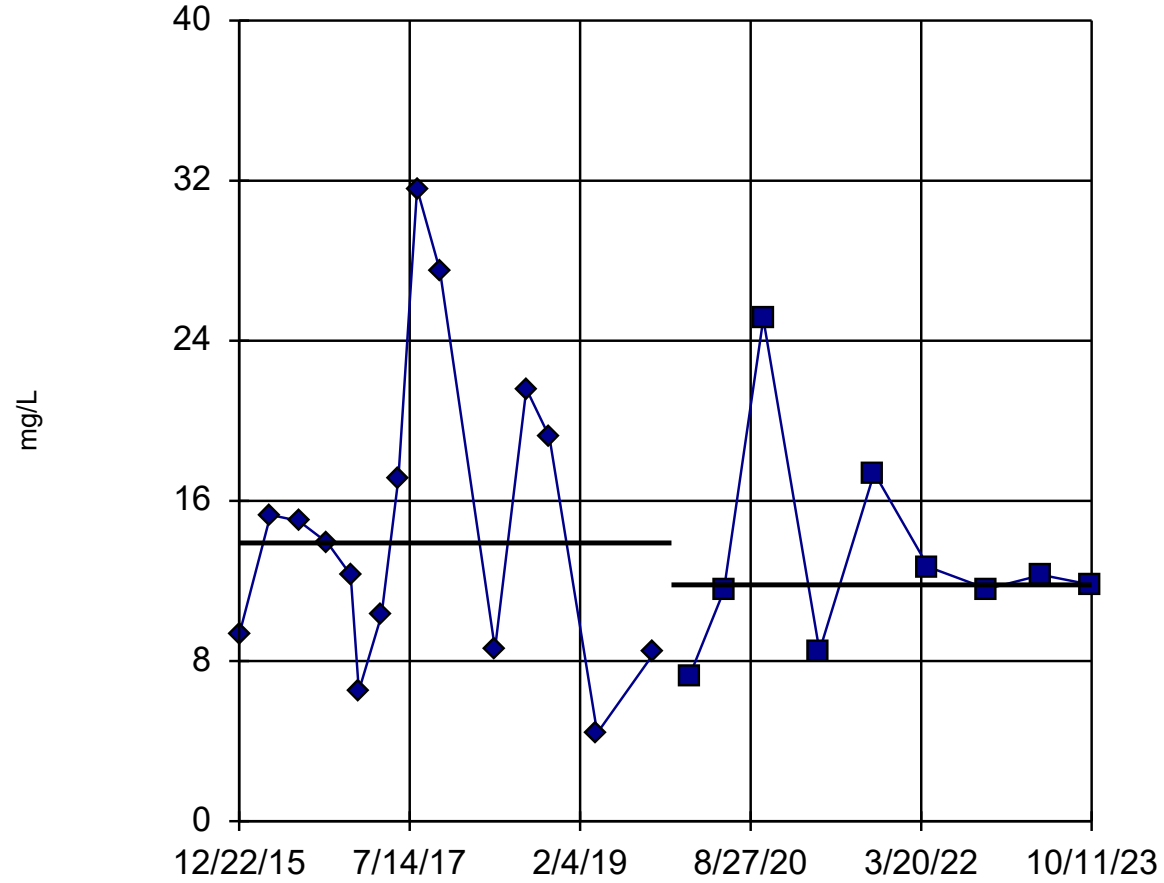
Welch's t-test

Constituent: Field pH (Std. Units) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A	MW-84A
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
4/14/2021		7.34
10/14/2021		7.42
4/13/2022		7.34
10/27/2022		7.31
4/27/2023		7.01
10/11/2023		7.51

Sulfate

MW-301 (bg)



◆ MW-301 background

■ MW-301 compliance

background median = 13.9

compliance median = 11.8

t = -0.6054 (two-tail)

Alpha	Table	Sig.
0.2	0.859	No
0.1	1.323	No
0.05	1.721	No
0.02	2.189	No
0.01	2.518	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9358, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

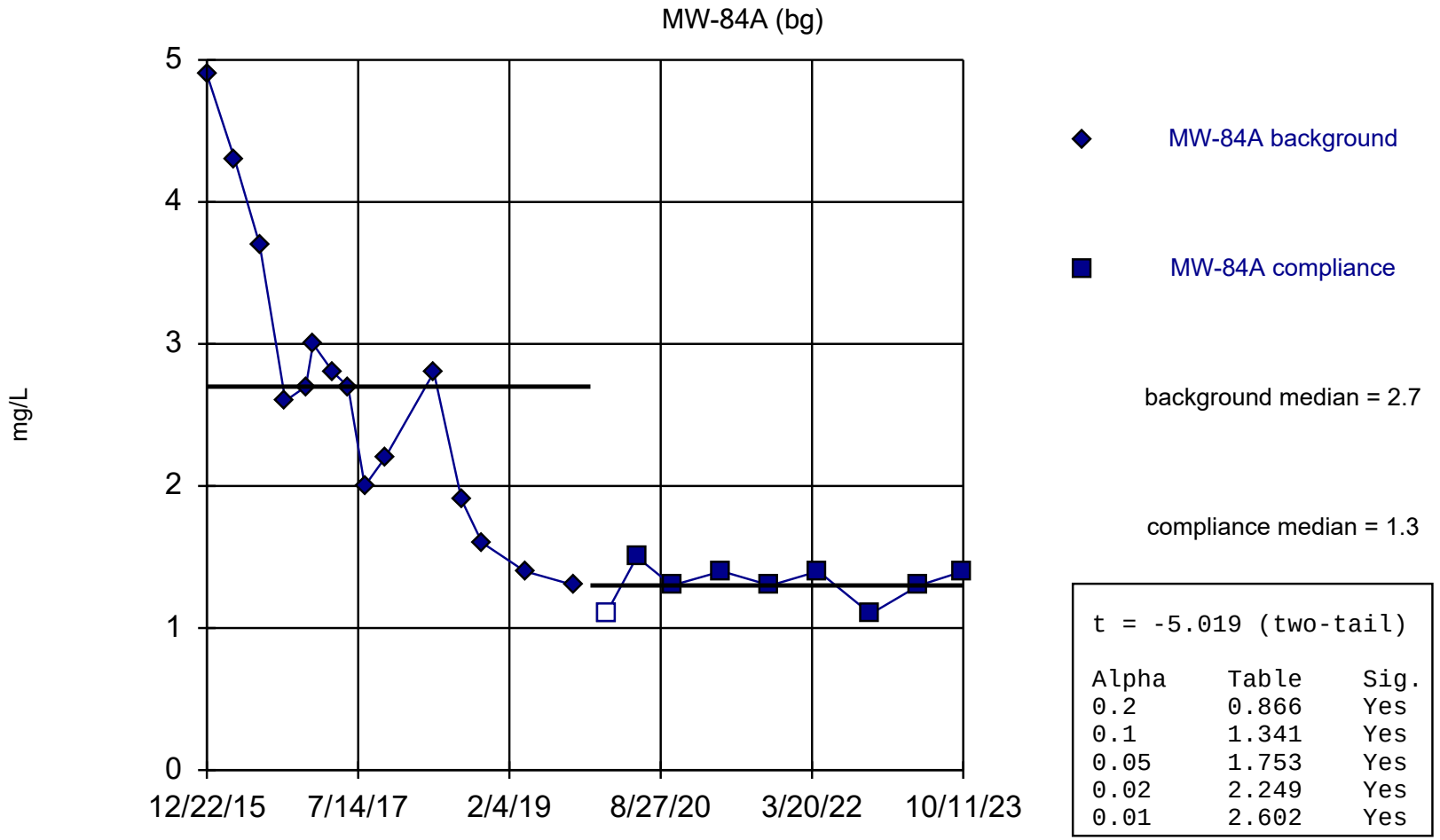
Welch's t-test

Constituent: Sulfate (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301	MW-301
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
4/14/2021		8.5
10/14/2021		17.4
4/13/2022		12.7
10/27/2022		11.6
4/27/2023		12.3
10/11/2023		11.8

Hollow symbols indicate censored values.

Sulfate



t = -5.019 (two-tail)

Alpha	Table	Sig.
0.2	0.866	Yes
0.1	1.341	Yes
0.05	1.753	Yes
0.02	2.249	Yes
0.01	2.602	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9334, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

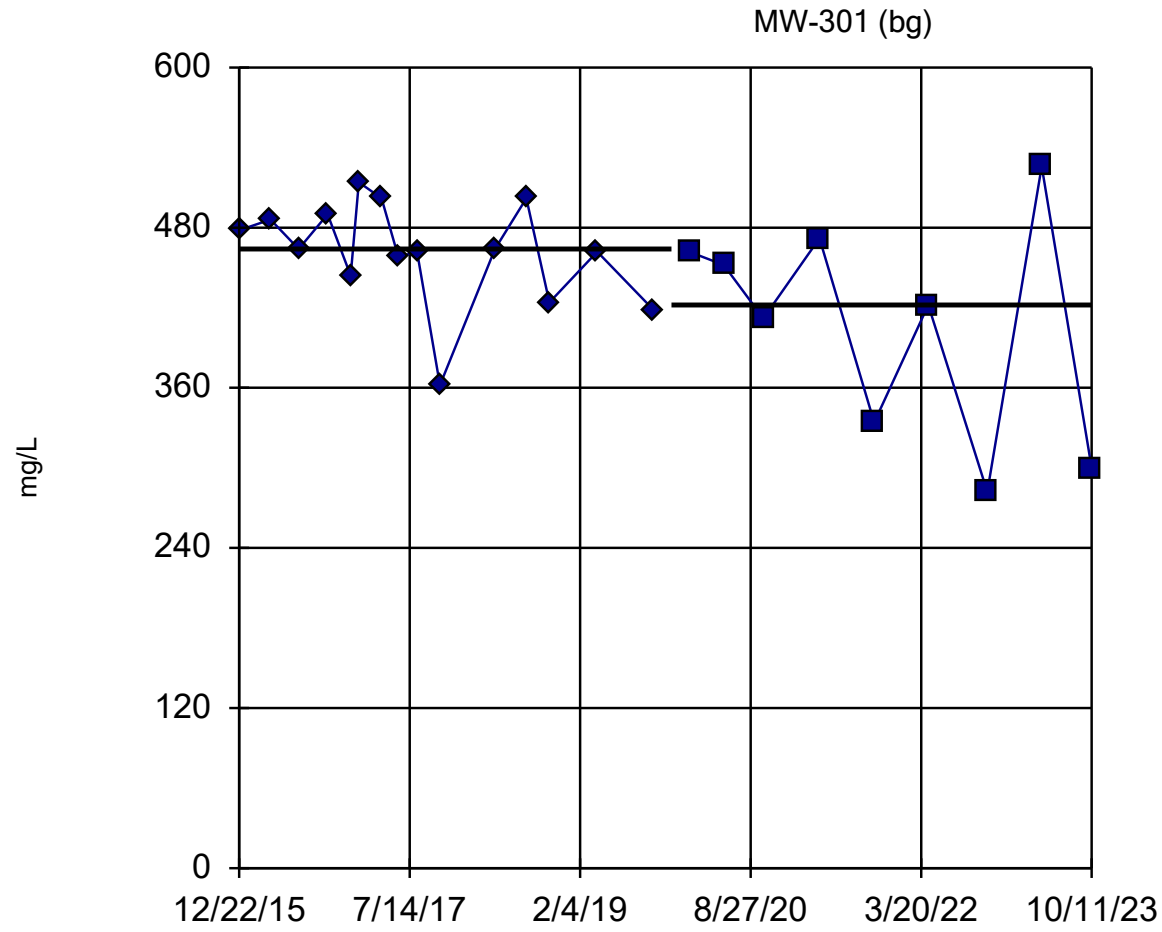
Constituent: Sulfate (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-84A	MW-84A
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)
4/14/2021		1.4 (J)
10/14/2021		1.3 (J)
4/13/2022		1.4 (J)
10/27/2022		1.1 (J)
4/27/2023		1.3 (J)
10/11/2023		1.4 (J)

ND substitution: RL or RL/2 if <15% NDs.

Total Dissolved Solids



◆ MW-301 background

■ MW-301 compliance

background median = 464

compliance median = 422

t = -1.858 (two-tail)

Alpha	Table	Sig.
0.2	0.879	Yes
0.1	1.372	Yes
0.05	1.812	Yes
0.02	2.359	No
0.01	2.764	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.915, critical = 0.881.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

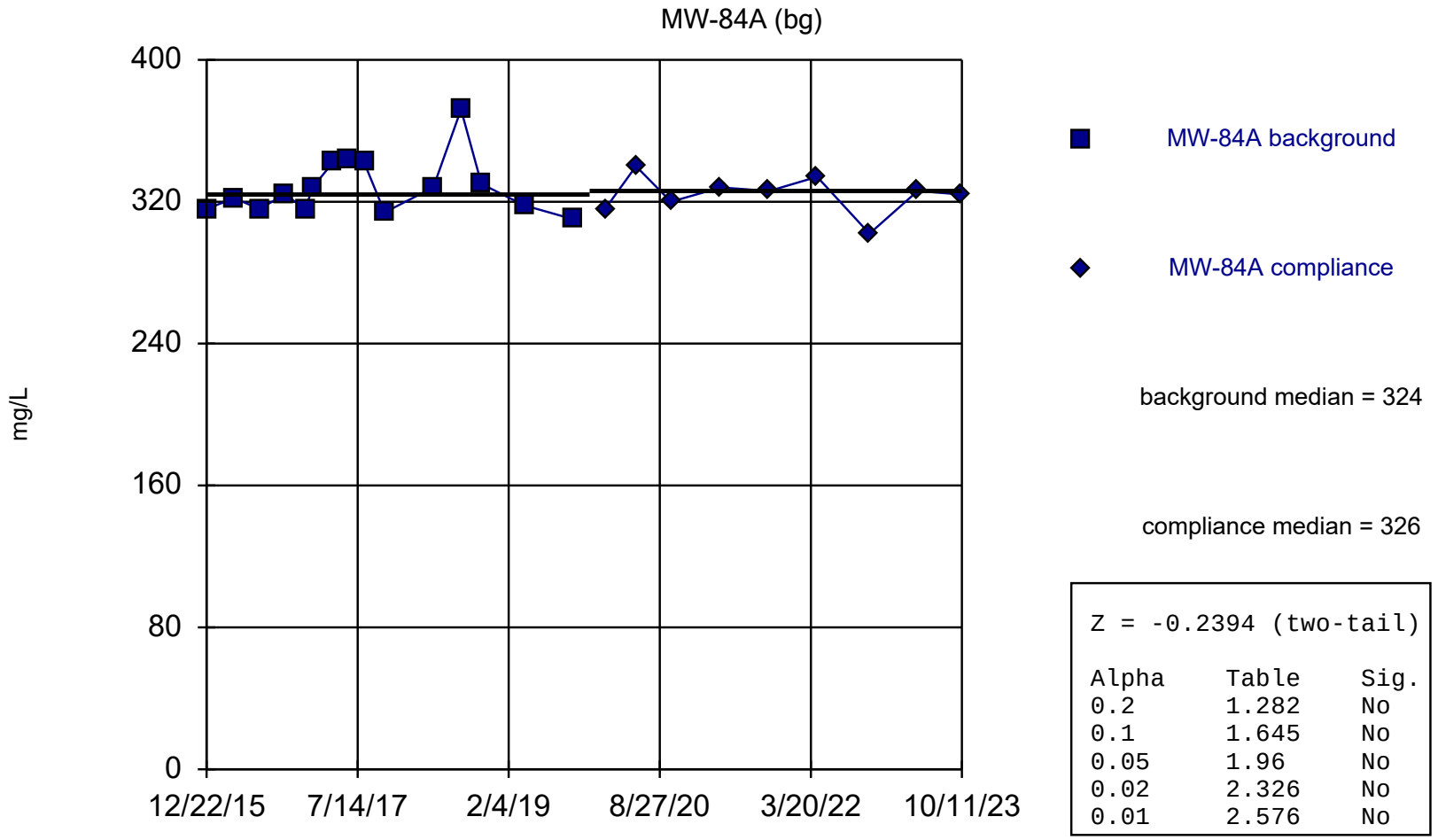
Welch's t-test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-301	MW-301
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
4/14/2021		472
10/14/2021		334
4/13/2022		422
10/27/2022		282
4/27/2023		526
10/11/2023		300

Total Dissolved Solids



Z = -0.2394 (two-tail)		
Alpha	Table	Sig.
0.2	1.282	No
0.1	1.645	No
0.05	1.96	No
0.02	2.326	No
0.01	2.576	No

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

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Mann-Whitney (Wilcoxon Rank Sum)

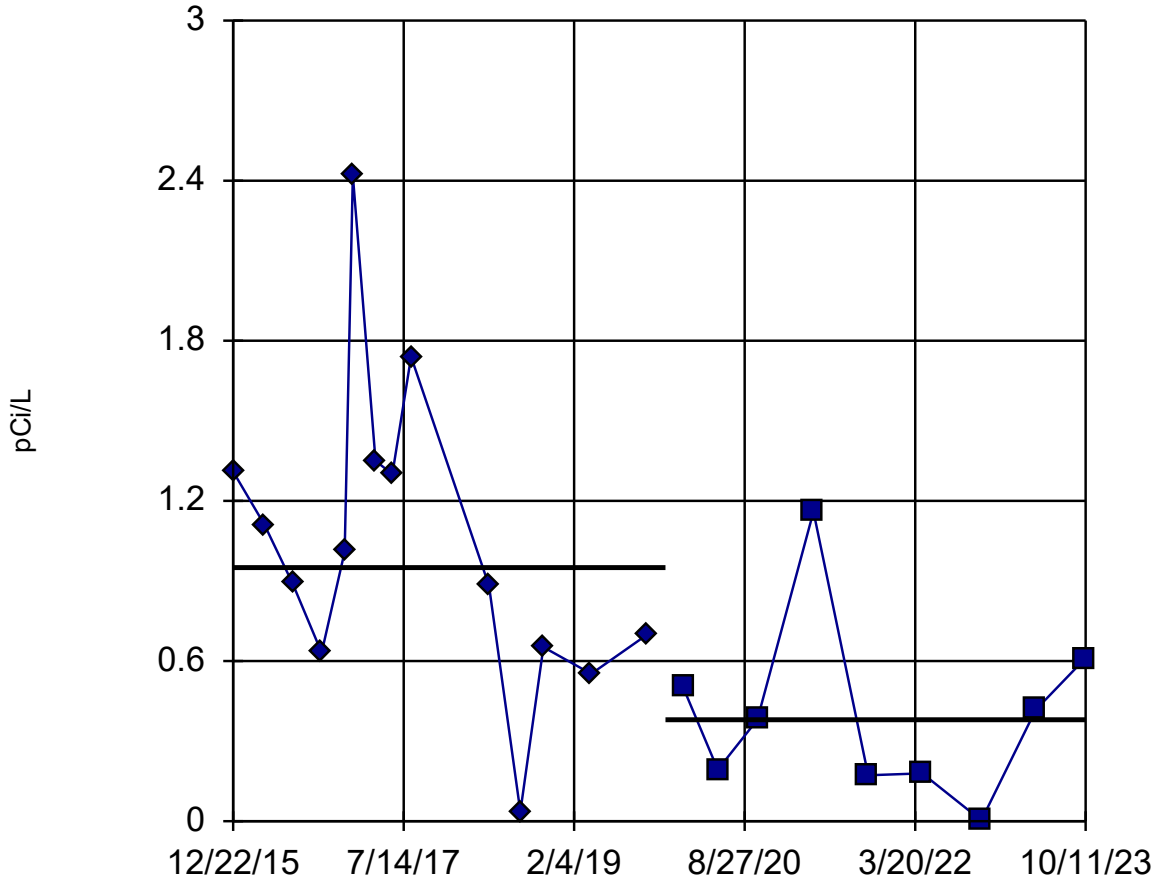
Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond

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

	MW-84A	MW-84A
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
4/14/2021		328
10/14/2021		326
4/13/2022		334
10/27/2022		302
4/27/2023		326
10/11/2023		324

Total Radium

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 0.95

compliance median = 0.38

t = -3.328 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	Yes
0.05	1.721	Yes
0.02	2.189	Yes
0.01	2.518	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9494, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

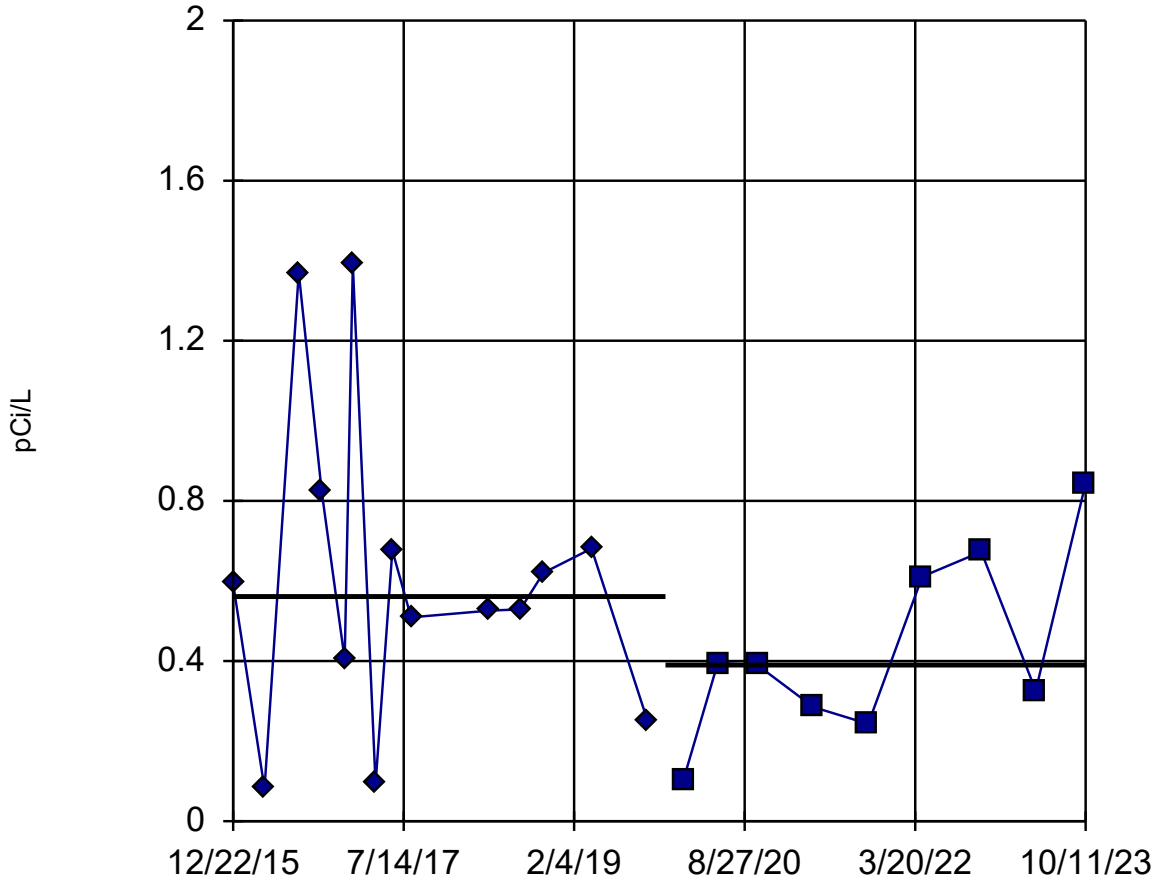
Welch's t-test

Constituent: Total Radium (pCi/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301	MW-301
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
4/14/2021		1.16
10/14/2021		0.172
4/13/2022		0.179
10/27/2022		0.00292
4/27/2023		0.417
10/11/2023		0.611

Total Radium

MW-84A (bg)



MW-84A background

MW-84A compliance

background median = 0.561

compliance median = 0.39

t = -1.383 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	Yes
0.05	1.721	No
0.02	2.189	No
0.01	2.518	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8932, critical = 0.874.

Welch's t-test Analysis Run 9/11/2024 10:18 AM View: COL Primary Pond

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

Welch's t-test

Constituent: Total Radium (pCi/L) Analysis Run 9/11/2024 10:20 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A	MW-84A
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
4/14/2021		0.285
10/14/2021		0.243
4/13/2022		0.611
10/27/2022		0.673
4/27/2023		0.326
10/11/2023		0.844

Attachment 4

Interwell Prediction Limit Analysis – Appendix III Parameters

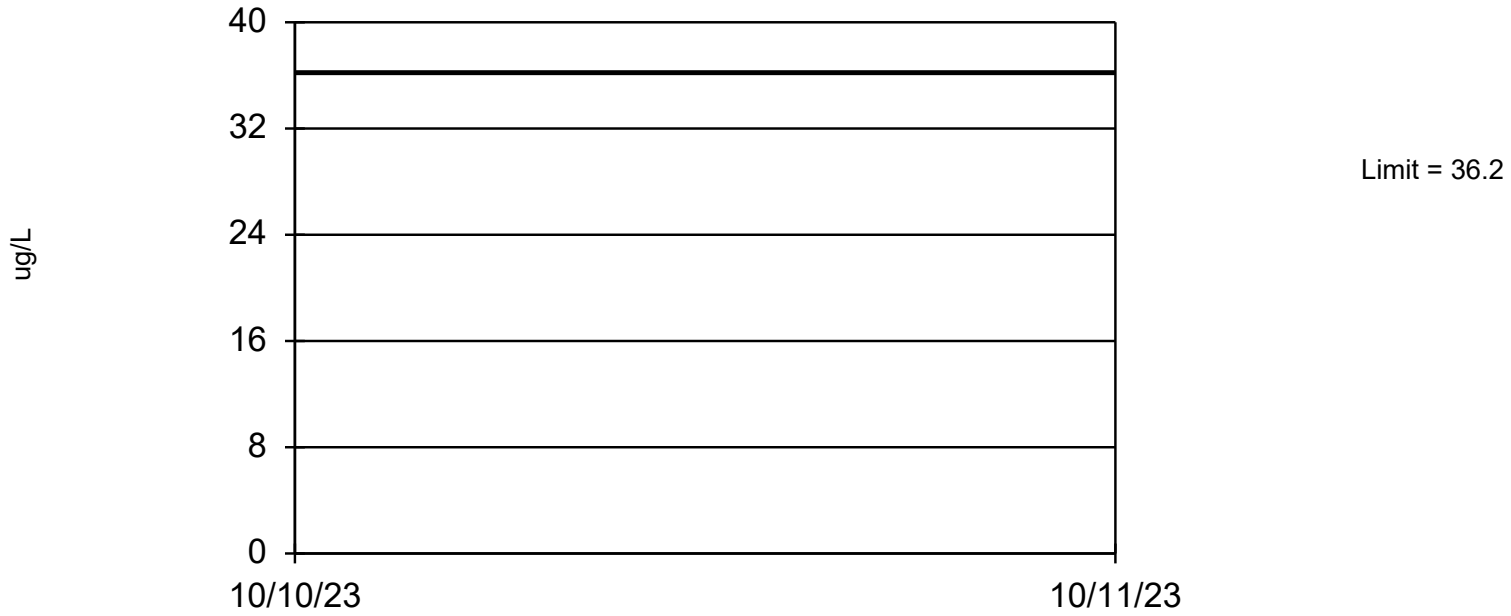
Prediction Limit

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 9/11/2024, 4:18 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	n/a	36.2	n/a	4 future	n/a	48	MW-84A,MW-301	n/a	n/a	0	n/a	n/a	0.00246	NP Inter (normality) ...
Calcium (ug/L)	n/a	126000	n/a	4 future	n/a	48	MW-301,MW-84A	n/a	n/a	0	n/a	n/a	0.00246	NP Inter (normality) ...
Chloride (mg/L)	n/a	5.91	n/a	4 future	n/a	48	MW-301,MW-84A	3.516	1.324	0	None	No	0.00188	Param Inter 1 of 2
Field pH (Std. Units)	n/a	7.75	n/a	4 future	n/a	49	MW-301,MW-84A	7.133	0.3418	0	None	No	0.00188	Param Inter 1 of 2
Fluoride (mg/L)	n/a	0.200	n/a	4 future	n/a	46	MW-301,MW-84A	n/a	n/a	97.83	n/a	n/a	0.002695	NP Inter (NDs) 1 of 2
Sulfate (mg/L)	n/a	27.5	n/a	4 future	n/a	48	MW-84A,MW-301	n/a	n/a	2.083	n/a	n/a	0.00246	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	n/a	514	n/a	4 future	n/a	48	MW-301,MW-84A	n/a	n/a	0	n/a	n/a	0.00246	NP Inter (normality) ...

Boron

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 second highest of 48 background values. Annual per-constituent alpha = 0.01951. Individual comparison alpha = 0.00246 (1 of 2). Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond

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

	MW-301 (bg)	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
4/11/2017	28.8	12.9
6/6/2017	21.3	14.8
8/8/2017	30.6	22.9
10/23/2017	34.3	
10/24/2017		13.8
4/25/2018	24.3	25
8/8/2018	22.8	12.8
10/24/2018	27.8	10.1 (J)
4/2/2019	26.9	
4/3/2019		13.6
10/9/2019	35.9	12
2/3/2020	27.9	15.7
5/29/2020	21.3	10
10/8/2020	28.8	9.7 (J)
4/14/2021	22.2	14.3
10/14/2021	31.4	11.1
4/13/2022	28.7	10.5
10/27/2022	37.5	12.2
4/27/2023	20.1	10.3
10/11/2023	36.2	14

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 second highest of 48 background values. Annual per-constituent alpha = 0.01951. Individual comparison alpha = 0.00246 (1 of 2). Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

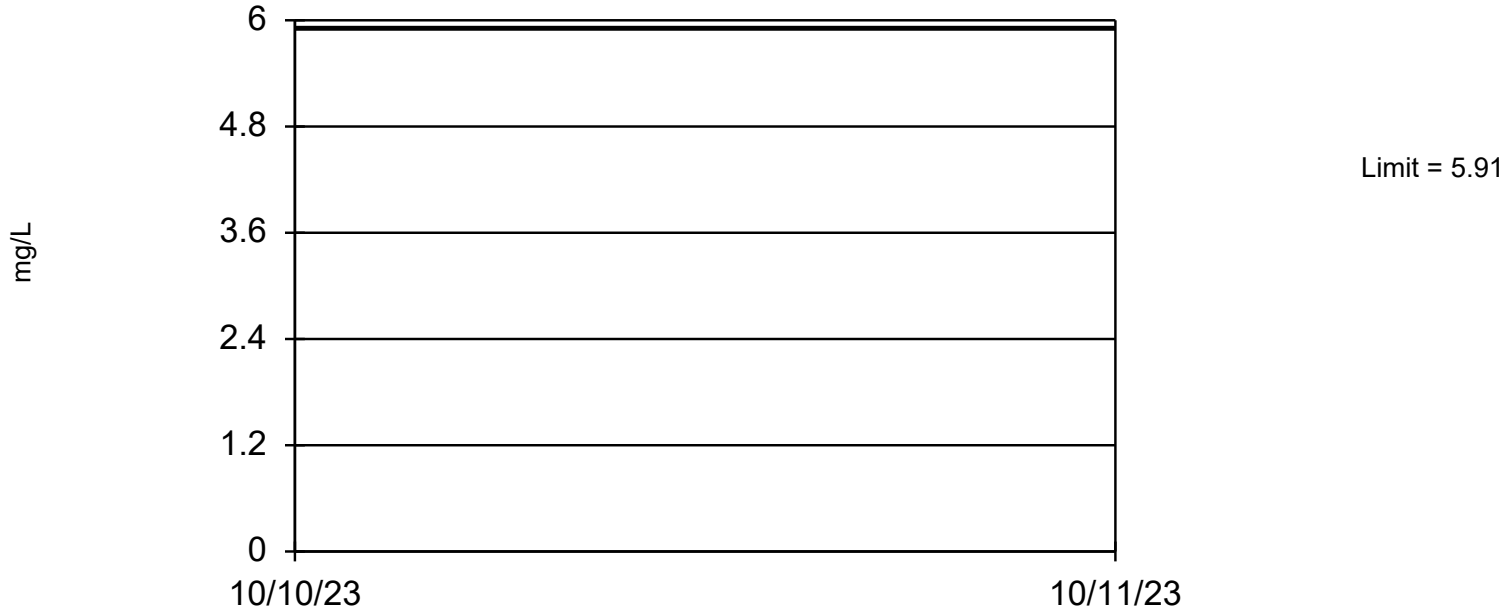
Constituent: Calcium (ug/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond

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

	MW-301 (bg)	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
4/11/2017	120000	73200
6/6/2017	111000	76100
8/8/2017	108000	74900
10/23/2017	87200	
10/24/2017		77500
4/25/2018	112000	76600
8/8/2018	105000	76000
10/24/2018	101000	74000
4/2/2019	126000	
4/3/2019		80100
10/9/2019	114000	73500
2/3/2020	113000	72700
5/29/2020	112000	77600
10/8/2020	93000	69200
4/14/2021	117000	69100
10/14/2021	67800	75300
4/13/2022	97300	75100
10/27/2022	62800	78400
4/27/2023	120000	68600
10/11/2023	52300	65100

Chloride

Interwell Parametric



Background Data Summary: Mean=3.516, Std. Dev.=1.324, n=48. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9366, critical = 0.929. Kappa = 1.808 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

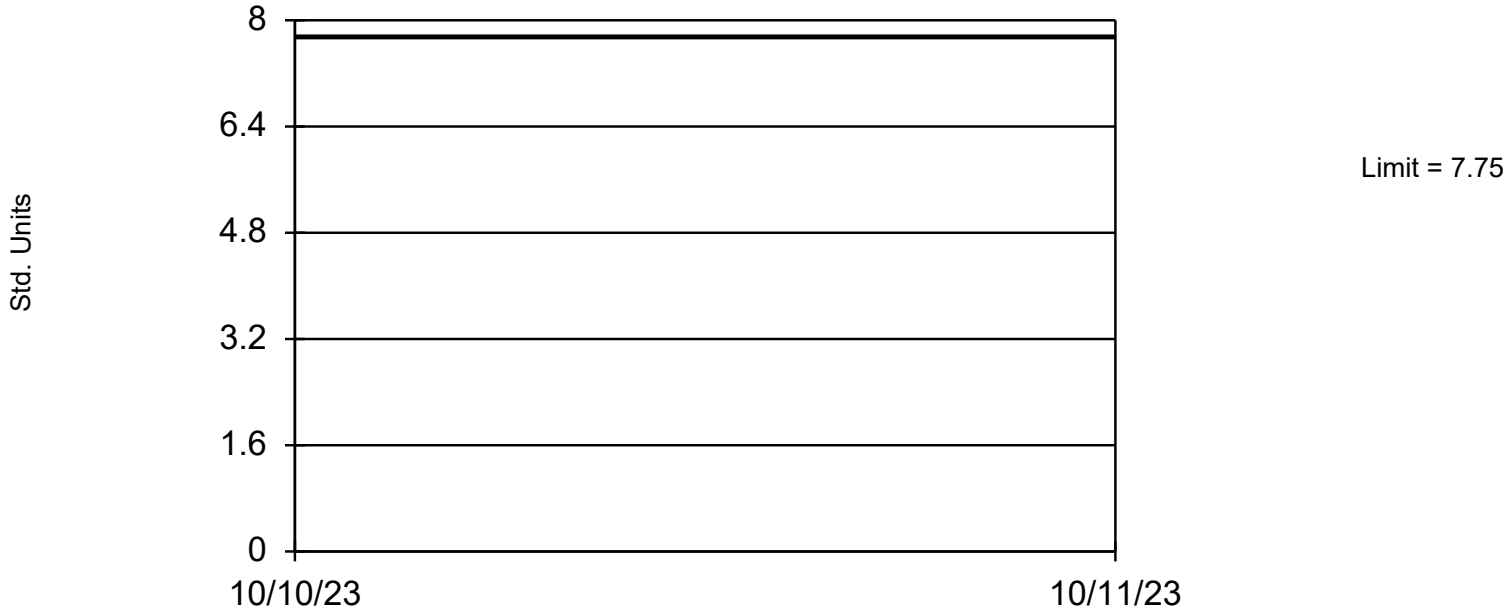
Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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
4/11/2017	2	4.9
6/6/2017	3.5	5.5
8/8/2017	5.5	5.5
10/23/2017	4	
10/24/2017		5.1
4/25/2018	2.3	4.8
8/8/2018	5.2	4.9
10/24/2018	3.2	4.2
4/2/2019	0.79 (J)	
4/3/2019		3.6
10/9/2019	1.7 (J)	3.9
2/3/2020	1.3 (J)	3.7
5/29/2020	2 (J)	3.7
10/8/2020	3.4	4.3
4/14/2021	1.5 (J)	4.4
10/14/2021	2.7	3.5
4/13/2022	1.9 (J)	5.2
10/27/2022	2.3	3.4
4/27/2023	1.5 (J)	3
10/11/2023	2.1	3.1

Field pH

Interwell Parametric



Background Data Summary: Mean=7.133, Std. Dev.=0.3418, n=49. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9533, critical = 0.929. Kappa = 1.805 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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
4/11/2017	7.11	7.8
6/6/2017	6.7	7.28
8/8/2017	6.75	7.23
10/23/2017	7.37	
10/24/2017		7.68
4/25/2018	6.76	7.45
8/8/2018	6.91	7.38
10/24/2018	6.79	7.24
4/2/2019	6.62	
4/3/2019		7.03
10/9/2019	6.67	7.23
2/3/2020	6.89	7.51
5/29/2020	6.73	7.34
10/8/2020	6.95	7.49
4/14/2021	6.66	7.34
10/14/2021	7.01	7.42
4/13/2022	6.6	7.34
10/27/2022	6.8	7.31
4/27/2023	6.65	7.01
10/11/2023	7.06	7.51

Fluoride

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is second highest of 46 background values. 97.83% NDs. Annual per-constituent alpha = 0.02135. Individual comparison alpha = 0.002695 (1 of 2). Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond

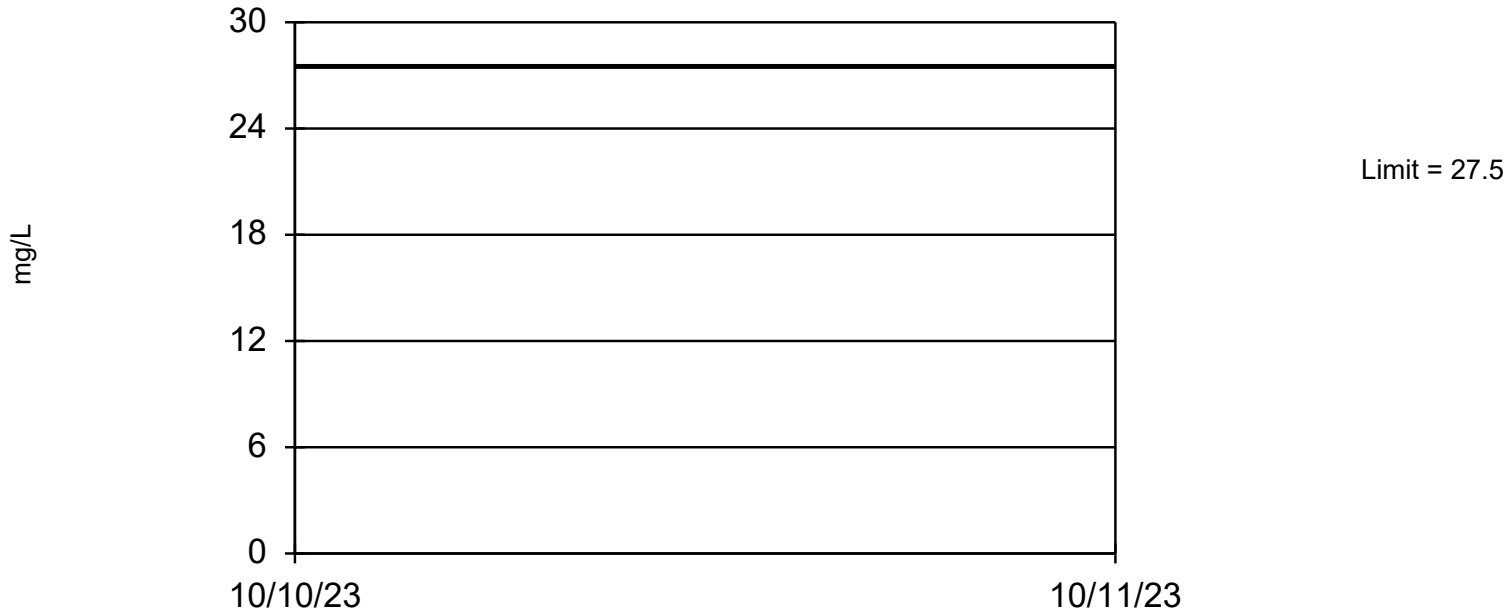
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.1 (U)	<0.1 (U)
6/6/2017	<0.1 (U)	<0.1 (U)
8/8/2017	<0.1 (U)	<0.1 (U)
10/23/2017	<0.1 (U)	
10/24/2017		<0.1 (U)
4/25/2018	<0.1 (U)	<0.1 (U)
8/8/2018	<0.1 (U)	<0.1 (U)
10/24/2018	<0.1 (U)	<0.1 (U)
4/2/2019	<0.1 (U)	
4/3/2019		<0.1 (U)
10/9/2019	<0.1 (U)	<0.1 (U)
5/29/2020	<0.095 (U)	<0.095 (U)
10/8/2020	<0.095 (U)	<0.095 (U)
4/14/2021	<0.095 (U)	<0.095 (U)
10/14/2021	<0.095 (U)	<0.095 (U)
4/13/2022	<0.095 (U)	<0.095 (U)
10/27/2022	<0.095 (U)	<0.095 (U)
4/27/2023	<0.095 (U)	<0.095 (U)
10/11/2023	<0.095 (U)	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Sulfate

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 second highest of 48 background values. 2.083% NDs. Annual per-constituent alpha = 0.01951. Individual comparison alpha = 0.00246 (1 of 2). Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond

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

	MW-301 (bg)	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
4/11/2017	10.3	2.8 (J)
6/6/2017	17.1	2.7 (J)
8/8/2017	31.6	2 (J)
10/23/2017	27.5	
10/24/2017		2.2 (J)
4/25/2018	8.6	2.8 (J)
8/8/2018	21.6	1.9 (J)
10/24/2018	19.2	1.6 (J)
4/2/2019	4.4	
4/3/2019		1.4 (J)
10/9/2019	8.4	1.3 (J)
2/3/2020	7.2	<2.2 (U)
5/29/2020	11.5	1.5 (J)
10/8/2020	25.1	1.3 (J)
4/14/2021	8.5	1.4 (J)
10/14/2021	17.4	1.3 (J)
4/13/2022	12.7	1.4 (J)
10/27/2022	11.6	1.1 (J)
4/27/2023	12.3	1.3 (J)
10/11/2023	11.8	1.4 (J)

ND substitution: RL or RL/2 if <15% NDs.

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 second highest of 48 background values. Annual per-constituent alpha = 0.01951. Individual comparison alpha = 0.00246 (1 of 2). Assumes 4 future values.

Prediction Limit Analysis Run 9/11/2024 4:17 PM View: COL Primary Pond

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

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/11/2024 4:18 PM View: COL Primary Pond

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

	MW-301 (bg)	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
4/11/2017	502	342
6/6/2017	458	344
8/8/2017	462	342
10/23/2017	362	
10/24/2017		314
4/25/2018	464	328
8/8/2018	502	372
10/24/2018	424	330
4/2/2019	462	
4/3/2019		318
10/9/2019	418	310
2/3/2020	462	316
5/29/2020	452	340
10/8/2020	412	320
4/14/2021	472	328
10/14/2021	334	326
4/13/2022	422	334
10/27/2022	282	302
4/27/2023	526	326
10/11/2023	300	324

Attachment 5

Interwell Tolerance Limit Analysis – Appendix IV Parameters

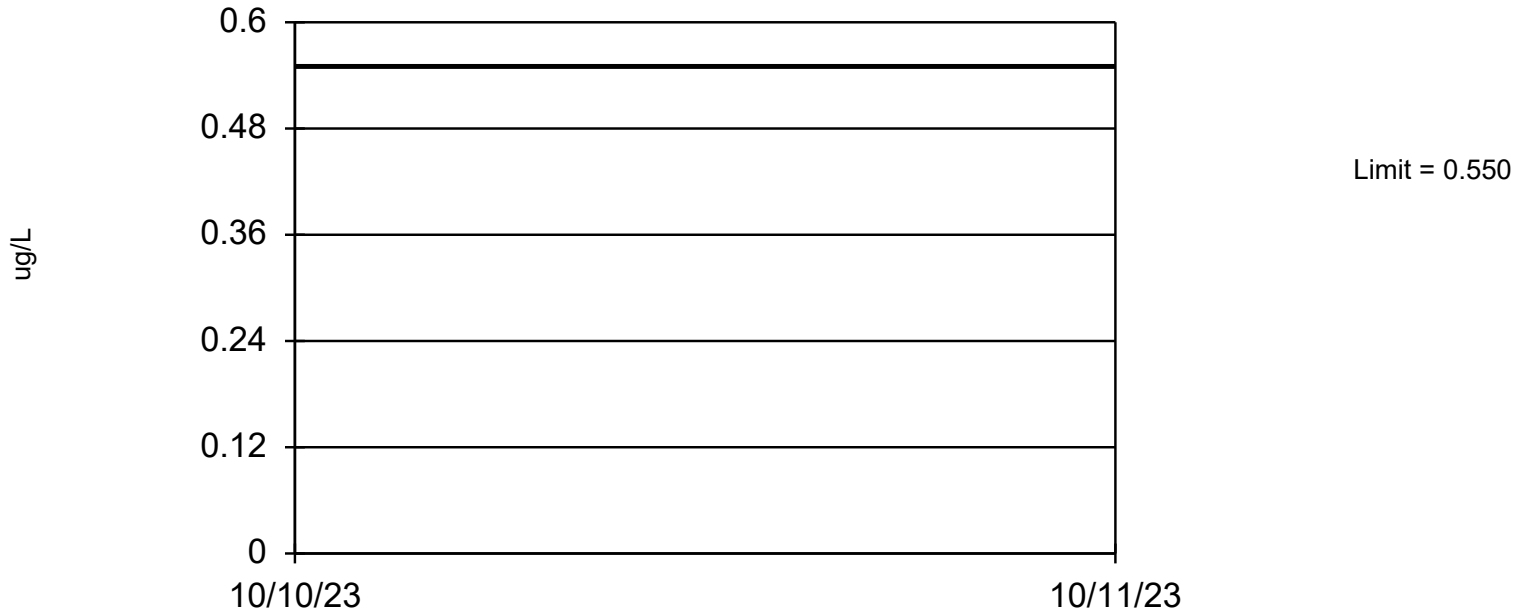
Tolerance Limit

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 9/11/2024, 3:59 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (ug/L)	n/a	0.550	n/a	n/a	n/a	44	MW-301,MW-84A	75	n/a	n/a	0.1047	NP Inter(normal...
Arsenic (ug/L)	n/a	0.910	n/a	n/a	n/a	46	MW-301,MW-84A	32.61	n/a	n/a	0.09447	NP Inter(Cohens...
Barium (ug/L)	n/a	18	n/a	n/a	n/a	46	MW-301,MW-84A	0	None	No	0.05	Inter
Beryllium (ug/L)	n/a	0.470	n/a	n/a	n/a	44	MW-301,MW-84A	90.91	n/a	n/a	0.1047	NP Inter(NDs)
Cadmium (ug/L)	n/a	0.530	n/a	n/a	n/a	42	MW-301,MW-84A	88.1	n/a	n/a	0.116	NP Inter(NDs)
Chromium (ug/L)	n/a	2.60	n/a	n/a	n/a	46	MW-301,MW-84A	34.78	n/a	n/a	0.09447	NP Inter(Cohens...
Cobalt (ug/L)	n/a	0.520	n/a	n/a	n/a	45	MW-301,MW-84A	55.56	n/a	n/a	0.09944	NP Inter(normal...
Fluoride (mg/L)	n/a	0.200	n/a	n/a	n/a	46	MW-301,MW-84A	97.83	n/a	n/a	0.09447	NP Inter(NDs)
Lead (ug/L)	n/a	0.550	n/a	n/a	n/a	40	MW-301,MW-84A	72.5	n/a	n/a	0.1285	NP Inter(normal...
Lithium (ug/L)	n/a	0.872	n/a	n/a	n/a	45	MW-301,MW-84A	0	None	No	0.05	Inter
Mercury (ug/L)	n/a	0.0660	n/a	n/a	n/a	42	MW-301,MW-84A	100	n/a	n/a	0.116	NP Inter(NDs)
Molybdenum (ug/L)	n/a	0.620	n/a	n/a	n/a	46	MW-301,MW-84A	82.61	n/a	n/a	0.09447	NP Inter(NDs)
Selenium (ug/L)	n/a	0.710	n/a	n/a	n/a	46	MW-301,MW-84A	84.78	n/a	n/a	0.09447	NP Inter(NDs)
Thallium (ug/L)	n/a	0.660	n/a	n/a	n/a	46	MW-301,MW-84A	82.61	n/a	n/a	0.09447	NP Inter(NDs)
Total Radium (pCi/L)	n/a	1.95	n/a	n/a	n/a	46	MW-301,MW-84A	0	None	sqrt(x)	0.05	Inter

Antimony

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 44 background values. 75% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Antimony (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

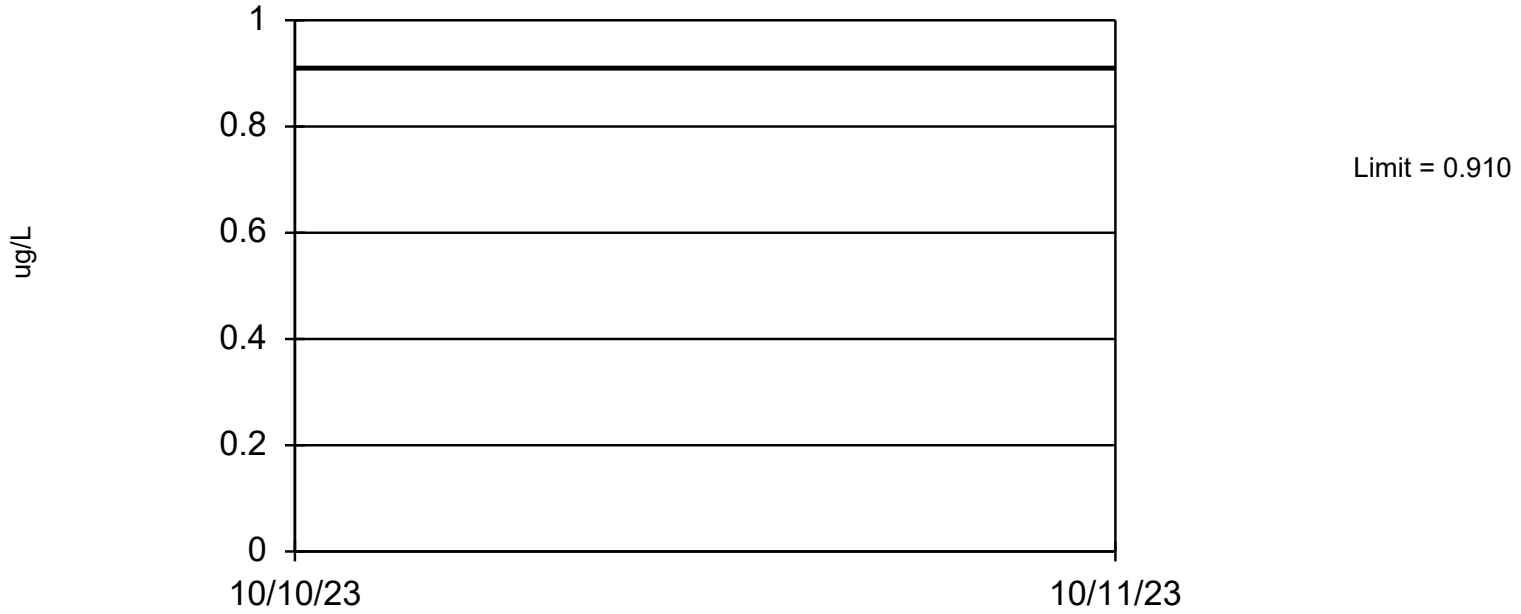
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.073 (U)	<0.073 (U)
6/6/2017	<0.15 (U)	<0.15 (U)
8/8/2017	<0.15 (U)	<0.15 (U)
4/25/2018	<0.15 (U)	<0.15 (U)
8/8/2018	0.36 (J)	<0.15 (U)
10/24/2018	<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)
5/29/2020	<0.15 (U)	<0.15 (U)
10/8/2020	0.33 (J)	<0.15 (U)
4/14/2021	<0.15 (U)	0.55 (J)
10/14/2021	<0.15 (U)	<0.15 (U)
4/13/2022	0.31 (J)	<0.15 (U)
10/27/2022	<0.15 (U)	<0.15 (U)
4/27/2023	<0.15 (U)	<0.15 (U)
10/11/2023	<0.15 (U)	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Arsenic

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the data required both a power transformation and Cohen's adjustment. Limit is highest of 46 background values. 32.61% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Arsenic (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

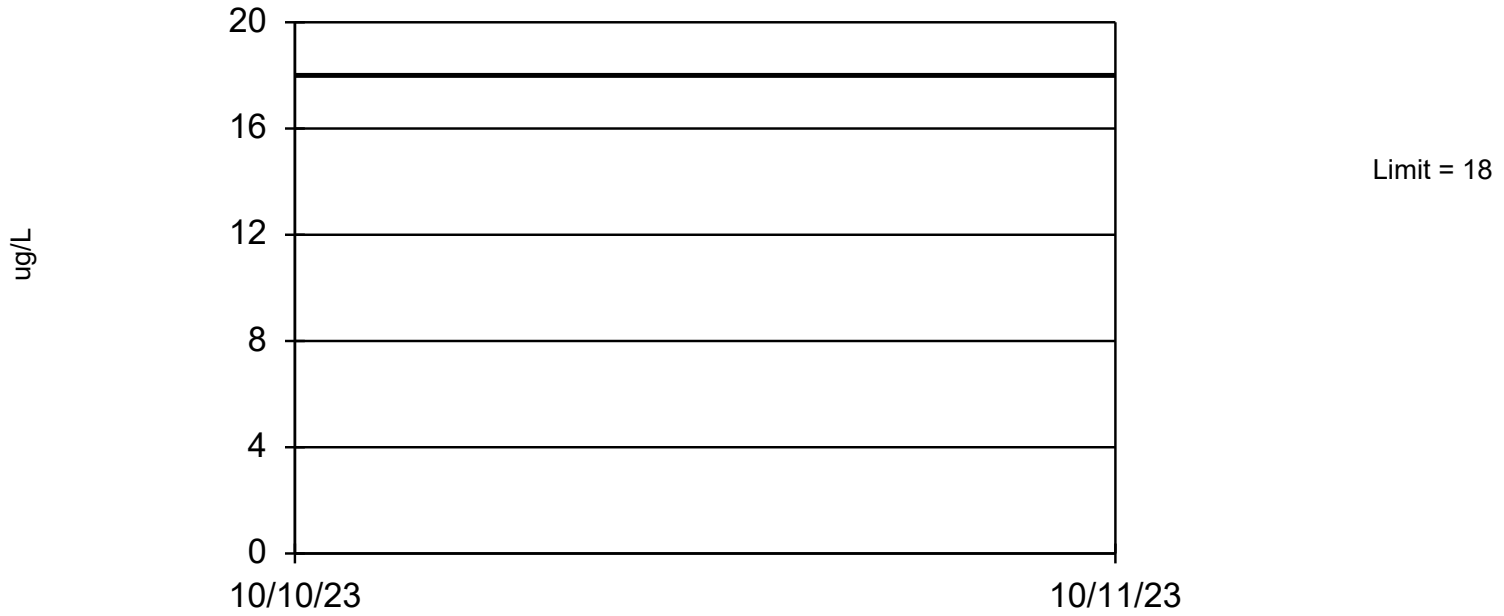
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	0.18 (J)	<0.099 (U)
6/6/2017	<0.28 (U)	<0.28 (U)
8/8/2017	<0.28 (U)	0.28 (J)
4/25/2018	<0.28 (U)	<0.28 (U)
8/8/2018	0.45 (J)	<0.28 (U)
10/24/2018	<0.28 (U)	0.33 (J)
4/2/2019	0.4 (J)	
4/3/2019		<0.28 (U)
10/9/2019	0.42 (J)	0.46 (J)
2/3/2020	<0.28 (U)	0.38 (J)
5/29/2020	0.33 (J)	0.34 (J)
10/8/2020	0.62 (J)	0.49 (J)
4/14/2021	<0.28 (U)	0.91 (J)
10/14/2021	0.35 (J)	0.41 (J)
4/13/2022	0.47 (J)	0.31 (J)
10/27/2022	0.3 (J)	0.72 (J)
4/27/2023	<0.28 (U)	<0.28 (U)
10/11/2023	<0.28	<0.28

ND substitution: RL or RL/2 if <15% NDs.

Barium

Interwell Parametric



95% coverage. Background Data Summary: Mean=12.46, Std. Dev.=2.655, n=46. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9571, critical = 0.927. Report alpha = 0.05.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

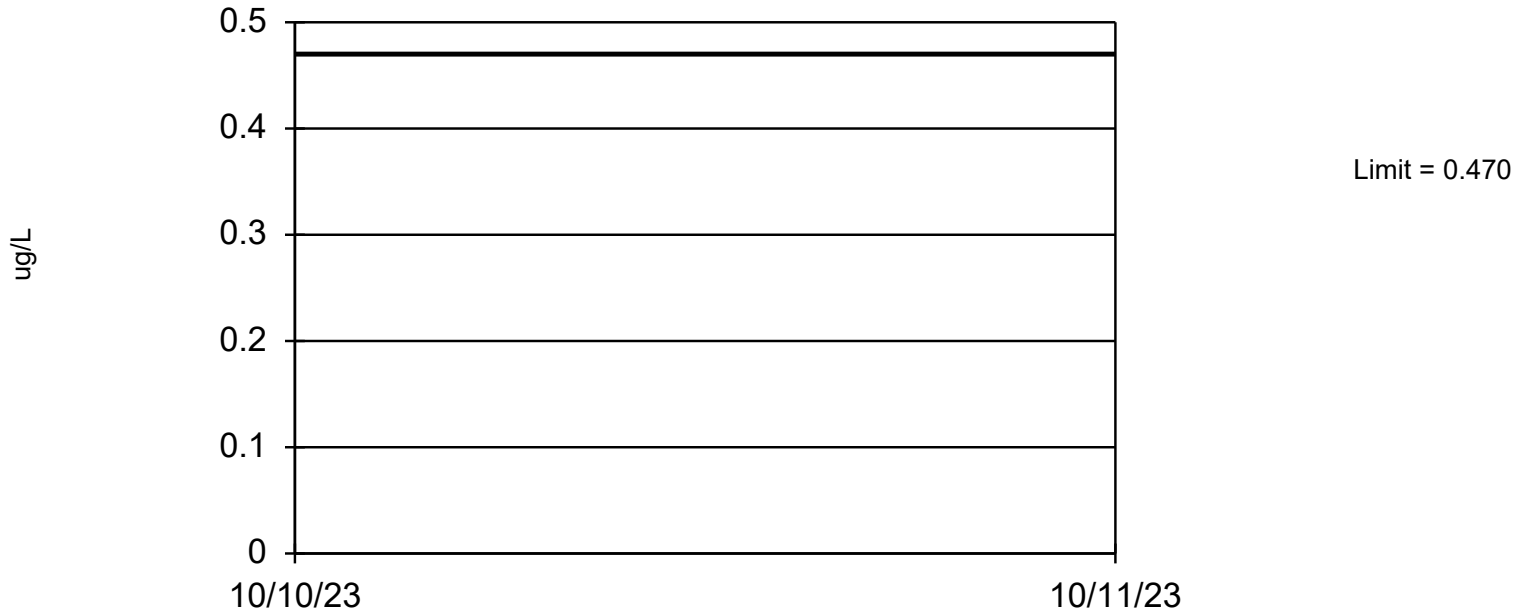
Tolerance Limit

Constituent: Barium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)
12/22/2015	20.2	15.3
4/5/2016	11.1	12.7
7/8/2016	11.6	12.2
10/13/2016	15.6	14.2
12/29/2016	15	18.4
1/25/2017	13.5	13.8
4/11/2017	13.2	14.1
6/6/2017	11.3	13.4
8/8/2017	11.8	14
4/25/2018	9.3	14.6
8/8/2018	10.2	13.7
10/24/2018	11.5	14.5
4/2/2019	11.8	
4/3/2019		14.7
10/9/2019	10	13.2
2/3/2020	10.9	14
5/29/2020	9.8	13.9
10/8/2020	9.4	12.6
4/14/2021	8.9	13.4
10/14/2021	7.7	12.9
4/13/2022	7.8	13.5
10/27/2022	7.5	13.7
4/27/2023	9.8	12.6
10/11/2023	7.3	12.7

Beryllium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 44 background values. 90.91% NDs. 90.04% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1047.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Beryllium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

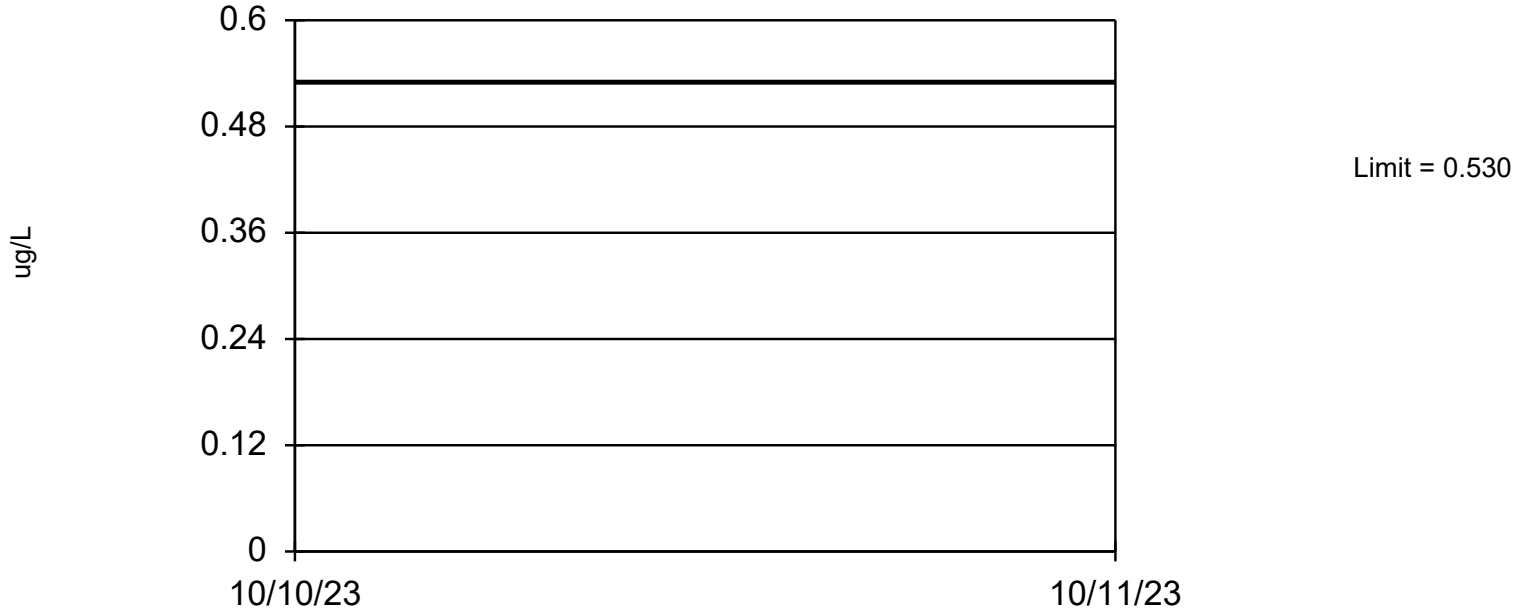
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.13 (U)	<0.13 (U)
6/6/2017	<0.18 (U)	<0.18 (U)
8/8/2017	<0.18 (U)	<0.18 (U)
4/25/2018	<0.18 (U)	<0.18 (U)
8/8/2018	0.37 (J)	<0.18 (U)
10/24/2018	<0.18 (U)	<0.18 (U)
4/2/2019	0.28 (J)	
4/3/2019		<0.18 (U)
10/9/2019	<0.25 (U)	<0.25 (U)
5/29/2020	<0.25 (U)	<0.25 (U)
10/8/2020	<0.25 (U)	<0.25 (U)
4/14/2021	<0.25 (U)	0.47 (J)
10/14/2021	<0.25 (U)	<0.25 (U)
4/13/2022	<0.25 (U)	<0.25 (U)
10/27/2022	<0.25 (U)	<0.25 (U)
4/27/2023	<0.25 (U)	<0.25 (U)
10/11/2023	<0.25 (U)	<0.25 (U)

ND substitution: RL or RL/2 if <15% NDs.

Cadmium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 42 background values. 88.1% NDs. 89.65% coverage at alpha=0.01; 93.16% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.116.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Cadmium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

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

	MW-301 (bg)	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)
4/11/2017	<0.089 (U)	<0.089 (U)
6/6/2017	<0.081 (U)	<0.081 (U)
8/8/2017	<0.081 (U)	<0.081 (U)
4/25/2018	<0.081 (U)	<0.081 (U)
10/24/2018	<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)
5/29/2020	<0.15 (U)	<0.15 (U)
10/8/2020	0.19 (J)	<0.15 (U)
4/14/2021	<0.15 (U)	0.53 (J)
10/14/2021	<0.15 (U)	<0.15 (U)
4/13/2022	0.3 (J)	<0.15 (U)
10/27/2022	<0.15 (U)	<0.15 (U)
4/27/2023	<0.15 (U)	<0.15 (U)
10/11/2023	<0.15 (U)	<0.15 (U)

ND substitution: RL or RL/2 if <15% NDs.

Chromium

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because the data required both a power transformation and Cohen's adjustment. Limit is highest of 46 background values. 34.78% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Chromium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

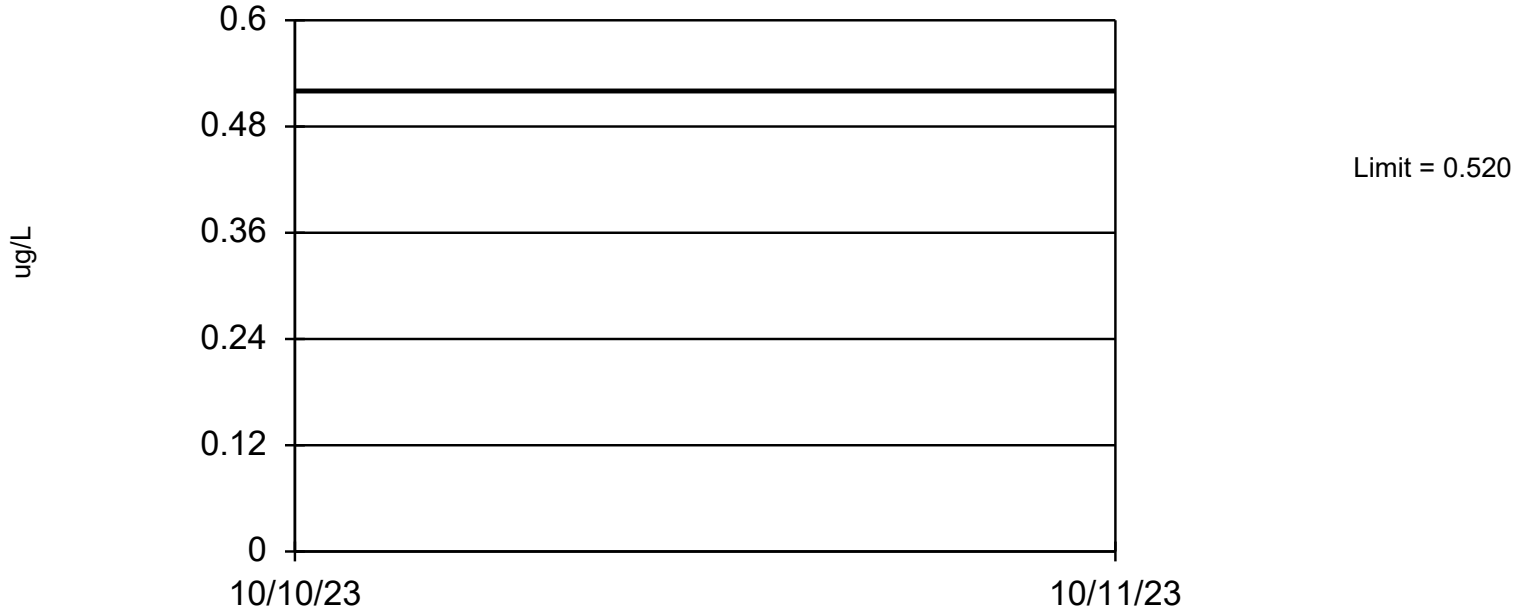
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)
12/22/2015	2.1	2.5
4/5/2016	0.58 (J)	1.9
7/8/2016	0.59 (J)	1.8
10/13/2016	<0.39 (U)	2
12/29/2016	0.7 (J)	2
1/25/2017	0.53 (J)	1.9
4/11/2017	0.7 (J)	2.4
6/6/2017	2.3 (J)	2 (J)
8/8/2017	<1 (U)	1.6 (J)
4/25/2018	<1 (U)	2.4 (J)
8/8/2018	<1 (U)	1.5 (J)
10/24/2018	<1 (U)	1.6 (J)
4/2/2019	<1 (U)	
4/3/2019		1.8 (J)
10/9/2019	<1 (U)	1.6 (J)
2/3/2020	<1 (U)	1.6 (J)
5/29/2020	<1 (U)	1.7 (J)
10/8/2020	<1 (U)	1.6 (J)
4/14/2021	<1 (U)	2.6 (J)
10/14/2021	<1 (U)	1.9 (J)
4/13/2022	<1 (U)	2.2 (J)
10/27/2022	<1 (U)	2.2 (J)
4/27/2023	<1 (U)	1.7 (J)
10/11/2023	<1 (U)	1.6 (J)

ND substitution: RL or RL/2 if <15% NDs.

Cobalt

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 45 background values. 55.56% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09944.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Cobalt (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

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

	MW-84A (bg)	MW-301 (bg)
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)
4/11/2017	<0.036 (U)	0.064 (J)
6/6/2017	<0.085 (U)	0.13 (J)
8/8/2017	<0.085 (U)	0.12 (J)
4/25/2018	<0.085 (U)	<0.085 (U)
8/8/2018	<0.085 (U)	0.28 (J)
10/24/2018	<0.12 (U)	<0.12 (U)
4/2/2019		0.35 (J)
4/3/2019	<0.12 (U)	
10/9/2019	<0.12 (U)	<0.12 (U)
2/3/2020	<0.12 (U)	0.17 (J)
5/29/2020	<0.12 (U)	<0.12 (U)
10/8/2020	<0.12 (U)	0.29 (J)
4/14/2021	0.52 (J)	<0.12 (U)
10/14/2021	0.12 (J)	0.34 (J)
4/13/2022	<0.12 (U)	0.32 (J)
10/27/2022	<0.12 (U)	0.52 (J)
4/27/2023	<0.12 (U)	<0.12 (U)
10/11/2023	<0.12	0.13 (J)

ND substitution: RL or RL/2 if <15% NDs.

Fluoride

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 46 background values. 97.83% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Fluoride (mg/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

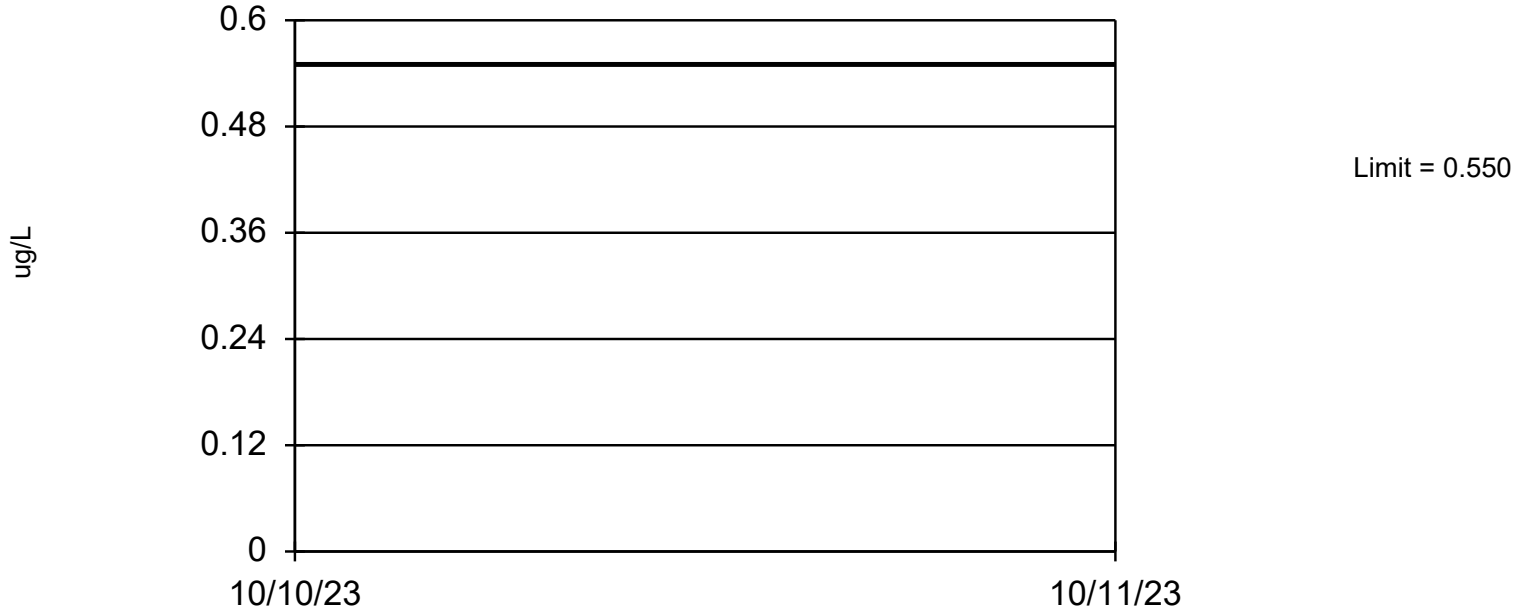
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.1 (U)	<0.1 (U)
6/6/2017	<0.1 (U)	<0.1 (U)
8/8/2017	<0.1 (U)	<0.1 (U)
10/23/2017	<0.1 (U)	
10/24/2017		<0.1 (U)
4/25/2018	<0.1 (U)	<0.1 (U)
8/8/2018	<0.1 (U)	<0.1 (U)
10/24/2018	<0.1 (U)	<0.1 (U)
4/2/2019	<0.1 (U)	
4/3/2019		<0.1 (U)
10/9/2019	<0.1 (U)	<0.1 (U)
5/29/2020	<0.095 (U)	<0.095 (U)
10/8/2020	<0.095 (U)	<0.095 (U)
4/14/2021	<0.095 (U)	<0.095 (U)
10/14/2021	<0.095 (U)	<0.095 (U)
4/13/2022	<0.095 (U)	<0.095 (U)
10/27/2022	<0.095 (U)	<0.095 (U)
4/27/2023	<0.095 (U)	<0.095 (U)
10/11/2023	<0.095 (U)	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Lead

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 40 background values. 72.5% NDs. 89.26% coverage at alpha=0.01; 92.77% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1285.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Lead (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

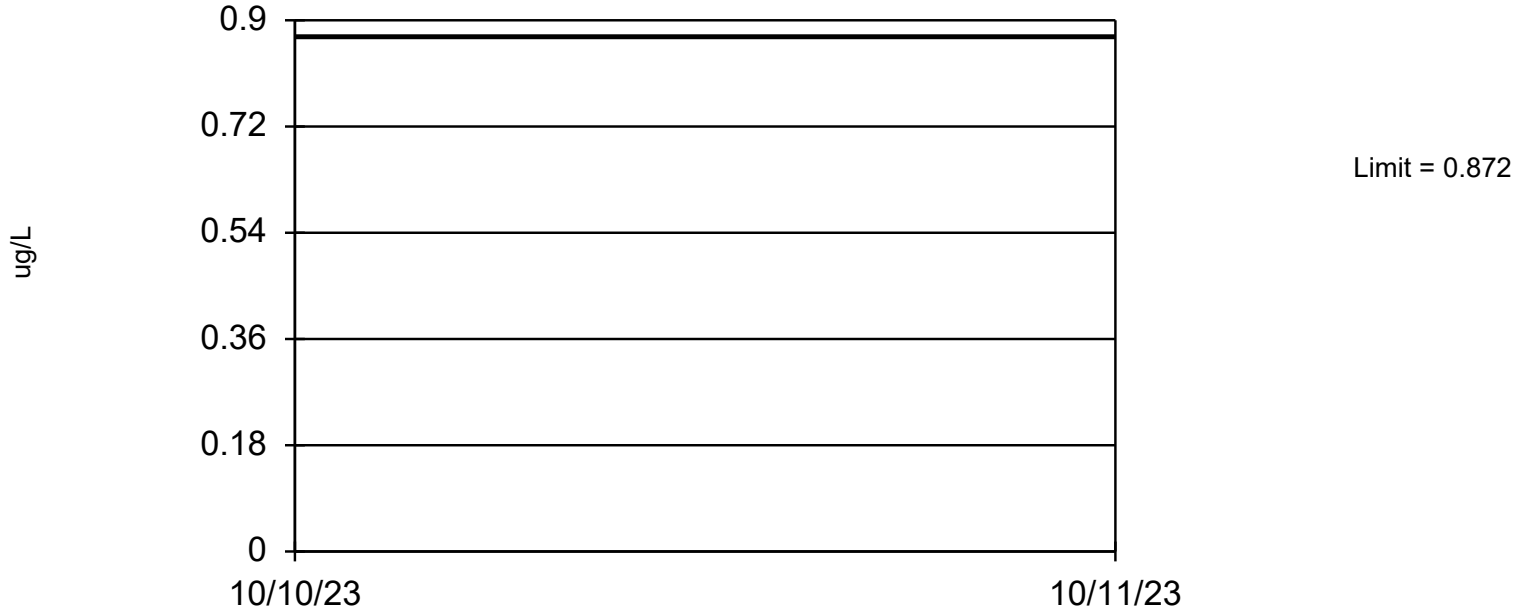
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)	MW-301 (bg)
12/22/2015	0.16 (J)	0.9 (JX)
4/5/2016	<0.04 (U)	0.077 (J)
7/8/2016	0.39 (J)	0.48 (J)
10/13/2016	0.049 (J)	<0.04 (U)
12/29/2016	0.11 (J)	0.34 (J)
1/25/2017	<0.04 (U)	<0.04 (U)
4/11/2017	0.041 (J)	<0.04 (U)
6/6/2017	<0.2 (U)	<0.2 (U)
8/8/2017	<0.2 (U)	<0.2 (U)
4/25/2018	<0.2 (U)	<0.2 (U)
10/24/2018	<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)
5/29/2020	<0.24 (U)	<0.24 (U)
10/8/2020	<0.24 (U)	0.25 (J)
4/14/2021	0.55 (J)	<0.24 (U)
10/14/2021	<0.24 (U)	<0.24 (U)
4/13/2022	<0.24 (U)	3.1 (X)
10/27/2022	<0.24 (U)	<0.24 (U)
4/27/2023	<0.24 (U)	<0.24 (U)
10/11/2023	<0.24 (U)	<0.24 (U)

ND substitution: RL or RL/2 if <15% NDs.

Lithium

Interwell Parametric



95% coverage. Background Data Summary: Mean=0.5651, Std. Dev.=0.1468, n=45. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9458, critical = 0.926. Report alpha = 0.05.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

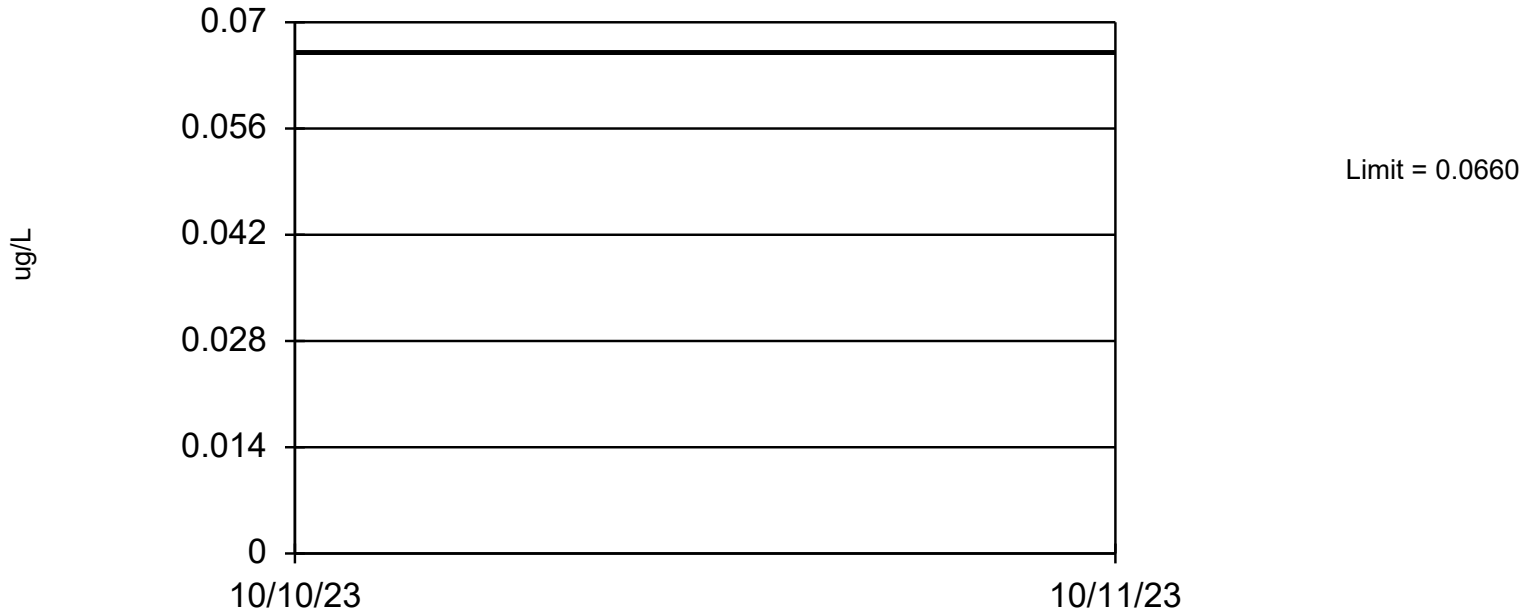
Tolerance Limit

Constituent: Lithium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-84A (bg)	MW-301 (bg)
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)
4/11/2017	0.55 (J)	0.68 (J)
6/6/2017	0.46 (J)	0.62 (J)
8/8/2017	0.58 (J)	0.6 (J)
4/25/2018	0.5 (J)	0.55 (J)
8/8/2018	0.4 (J)	0.85 (J)
10/24/2018	0.49 (J)	0.52 (J)
4/2/2019		0.9 (J)
4/3/2019	0.56 (J)	
10/9/2019	0.52 (J)	0.61 (J)
2/3/2020	0.58 (J)	0.67 (J)
5/29/2020	0.4 (J)	0.47 (J)
10/8/2020	0.39 (J)	0.46 (J)
4/14/2021	1	0.58 (J)
10/14/2021	0.28 (J)	0.46 (J)
4/13/2022	0.36 (J)	0.56 (J)
10/27/2022	0.41 (J)	0.37 (J)
4/27/2023	0.71 (J)	0.62 (J)
10/11/2023	0.54 (J)	0.43 (J)

Mercury

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. All background values were censored; limit is most recent reporting limit. 89.65% coverage at alpha=0.01; 93.16% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.116.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Mercury (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

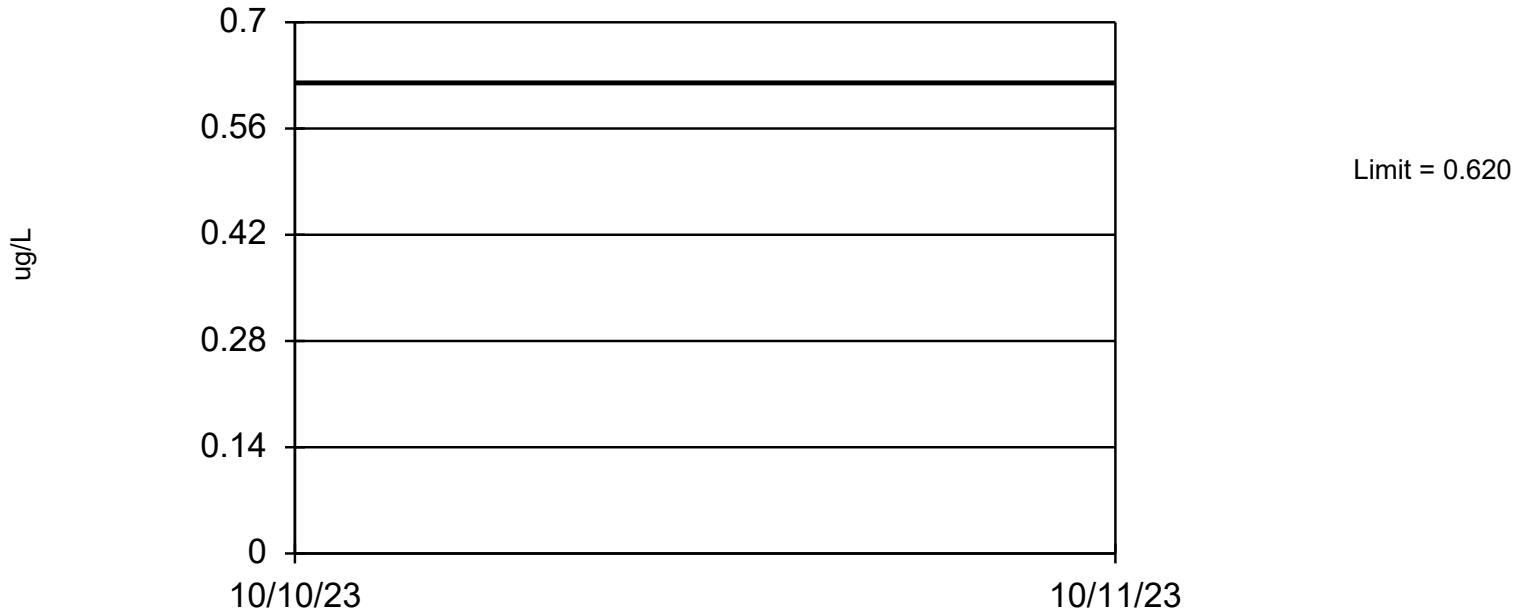
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.13 (U)	<0.13 (U)
6/6/2017	<0.13 (U)	<0.13 (U)
8/8/2017	<0.13 (U)	<0.13 (U)
4/25/2018	<0.13 (U)	<0.13 (U)
10/24/2018	<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)
5/29/2020	<0.084 (U)	<0.084 (U)
10/8/2020	<0.066 (U)	<0.066 (U)
4/14/2021	<0.066 (U)	<0.066 (U)
10/14/2021	<0.093 (U)	<0.093 (U)
4/13/2022	<0.066 (U)	<0.066 (U)
10/27/2022	<0.066 (U)	<0.066 (U)
4/27/2023	<0.066 (U)	<0.066 (U)
10/11/2023	<0.066 (U)	<0.066 (U)

ND substitution: RL or RL/2 if <15% NDs.

Molybdenum

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 46 background values. 82.61% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

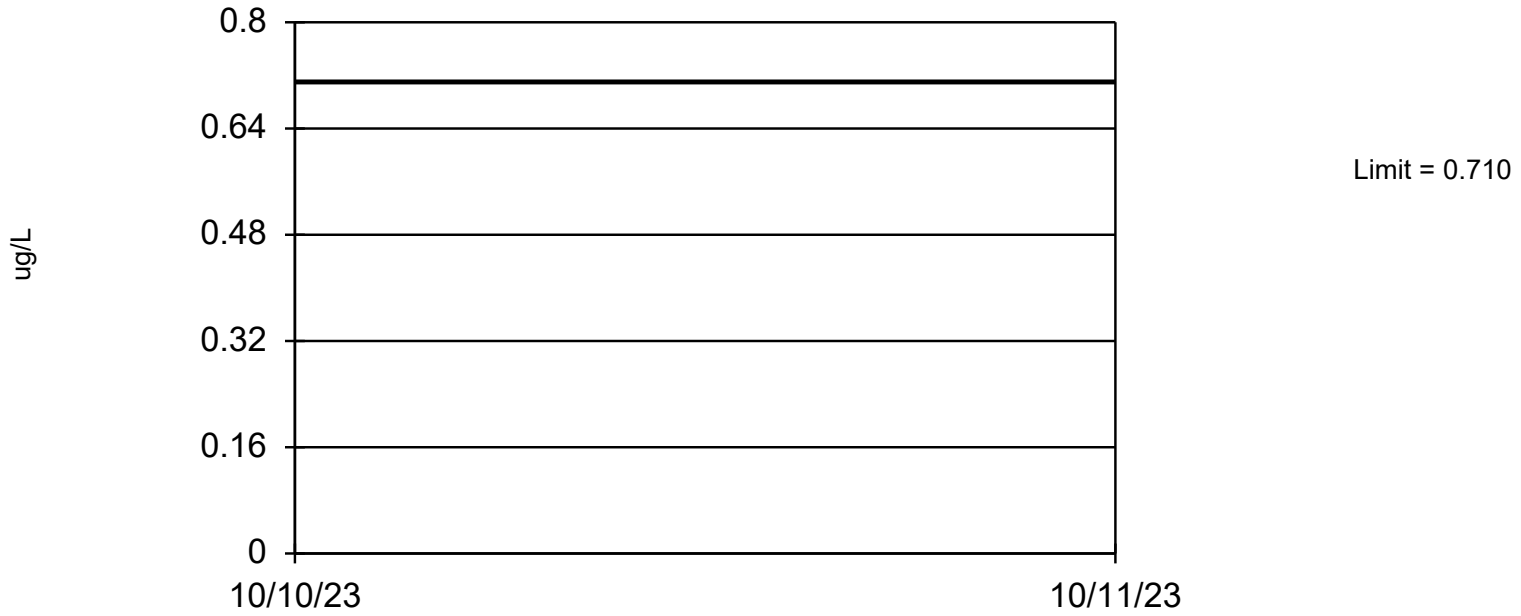
Constituent: Molybdenum (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.07 (U)	<0.07 (U)
6/6/2017	<0.44 (U)	<0.44 (U)
8/8/2017	<0.44 (U)	<0.44 (U)
4/25/2018	<0.44 (U)	<0.44 (U)
8/8/2018	<0.44 (U)	<0.44 (U)
10/24/2018	<0.44 (U)	<0.44 (U)
4/2/2019	<0.44 (U)	
4/3/2019		<0.44 (U)
10/9/2019	<0.44 (U)	<0.44 (U)
2/3/2020	<0.44 (U)	<0.44 (U)
5/29/2020	<0.44 (U)	<0.44 (U)
10/8/2020	<0.44 (U)	<0.44 (U)
4/14/2021	<0.44 (U)	0.62 (J)
10/14/2021	<0.44 (U)	<0.44 (U)
4/13/2022	<0.44 (U)	<0.44 (U)
10/27/2022	<0.44 (U)	<0.44 (U)
4/27/2023	<0.44 (U)	<0.44 (U)
10/11/2023	<0.44 (U)	<0.44 (U)

ND substitution: RL or RL/2 if <15% NDs.

Selenium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 46 background values. 84.78% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Selenium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

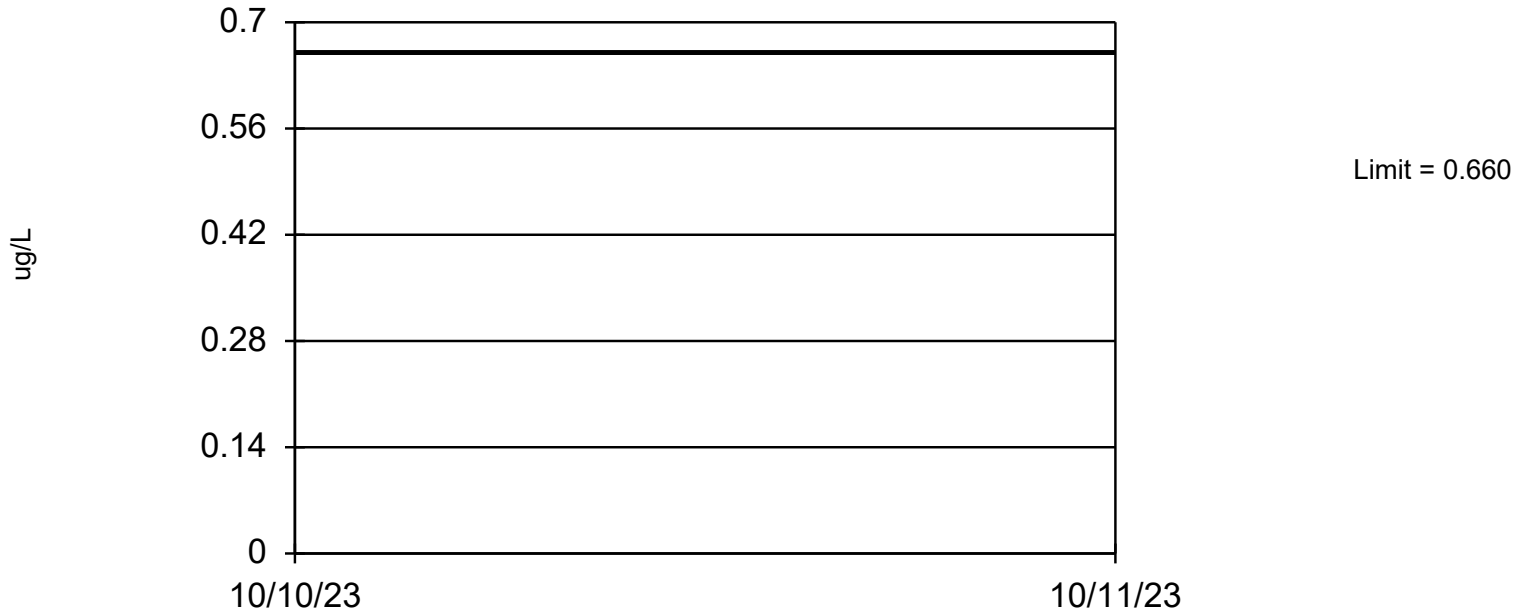
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.21 (U)	<0.21 (U)
6/6/2017	<0.32 (U)	<0.32 (U)
8/8/2017	<0.32 (U)	<0.32 (U)
4/25/2018	<0.32 (U)	<0.32 (U)
8/8/2018	0.71 (J)	<0.32 (U)
10/24/2018	<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)
2/3/2020	<0.32 (U)	<0.32 (U)
5/29/2020	<0.32 (U)	<0.32 (U)
10/8/2020	<0.32 (U)	<0.32 (U)
4/14/2021	<0.32 (U)	0.48 (J)
10/14/2021	<0.32 (U)	<0.32 (U)
4/13/2022	<0.32 (U)	<0.32 (U)
10/27/2022	<0.32 (U)	<0.32 (U)
4/27/2023	<0.32 (U)	<0.32 (U)
10/11/2023	<0.32 (U)	<0.32 (U)

ND substitution: RL or RL/2 if <15% NDs.

Thallium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 75%. Limit is highest of 46 background values. 82.61% NDs. 90.43% coverage at alpha=0.01; 93.55% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.09447.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Thallium (ug/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond

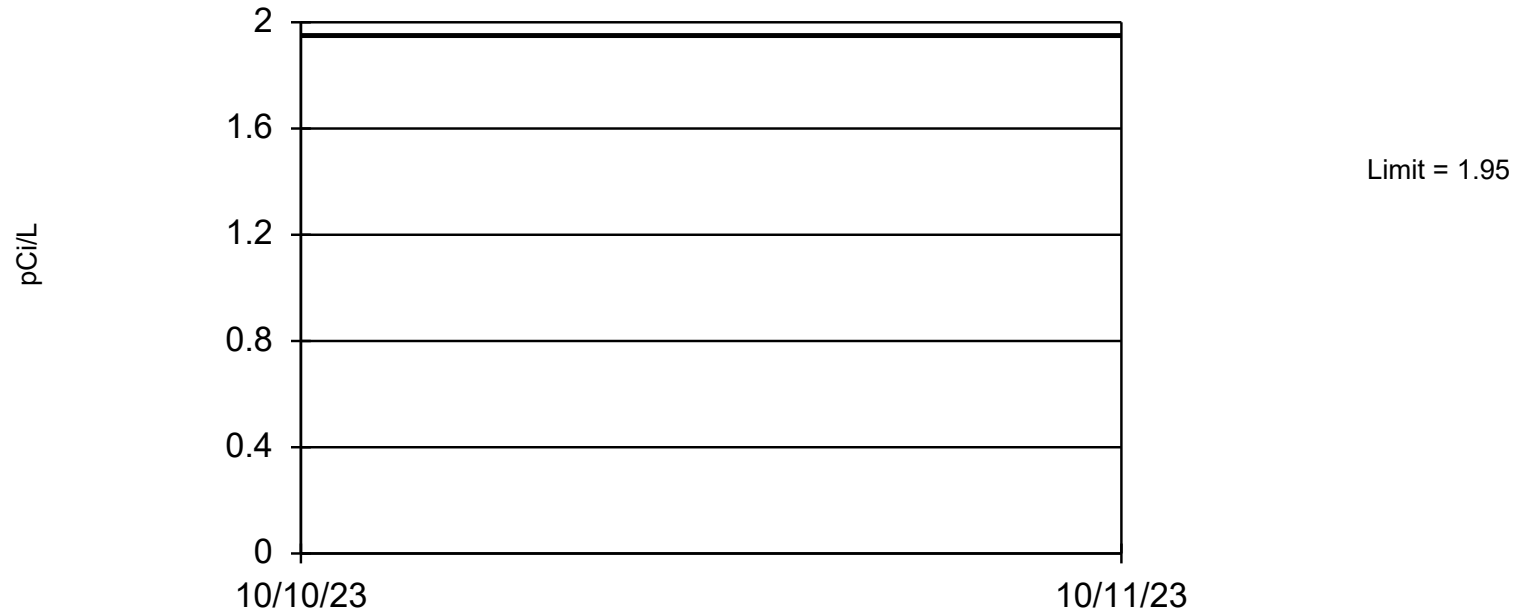
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	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)
4/11/2017	<0.14 (U)	<0.14 (U)
6/6/2017	<0.14 (U)	<0.14 (U)
8/8/2017	<0.14 (U)	<0.14 (U)
4/25/2018	<0.14 (U)	<0.14 (U)
8/8/2018	0.3 (J)	<0.14 (U)
10/24/2018	<0.14 (U)	<0.14 (U)
4/2/2019	0.48 (J)	
4/3/2019		<0.14 (U)
10/9/2019	<0.14 (U)	<0.14 (U)
2/3/2020	<0.14 (U)	<0.14 (U)
5/29/2020	<0.14 (U)	<0.14 (U)
10/8/2020	0.3 (J)	<0.14 (U)
4/14/2021	<0.14 (U)	0.66 (J)
10/14/2021	0.17 (J)	0.19 (J)
4/13/2022	0.32 (J)	<0.14 (U)
10/27/2022	<0.14 (U)	<0.14 (U)
4/27/2023	<0.14 (U)	<0.14 (U)
10/11/2023	<0.14 (U)	<0.14 (U)

ND substitution: RL or RL/2 if <15% NDs.

Total Radium

Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.7572, Std. Dev.=0.3069, n=46. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9896, critical = 0.927. Report alpha = 0.05.

Tolerance Limit Analysis Run 9/11/2024 3:57 PM View: COL Primary Pond

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

Tolerance Limit

Constituent: Total Radium (pCi/L) Analysis Run 9/11/2024 3:59 PM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-84A (bg)
12/22/2015	1.31	0.593
4/5/2016	1.11	0.0809
7/8/2016	0.89	
7/28/2016		1.37
10/13/2016	0.631	0.825
12/29/2016	1.01	0.404
1/25/2017	2.42	1.39
4/11/2017	1.35	0.0929
6/6/2017	1.3	0.676
8/8/2017	1.74	0.509
4/25/2018	0.882	0.526
8/8/2018	0.0351	0.529
10/24/2018	0.652	0.62
4/2/2019	0.552	
4/3/2019		0.681
10/9/2019	0.701	0.247
2/3/2020	0.502	0.1
5/29/2020	0.193	0.395
10/8/2020	0.38	0.39
4/14/2021	1.16	0.285
10/14/2021	0.172	0.243
4/13/2022	0.179	0.611
10/27/2022	0.00292	0.673
4/27/2023	0.417	0.326
10/11/2023	0.611	0.844

Attachment 6

UPL and UTL Summary – Current and Previous

UPL Summary - COL Primary Pond

Source	1/10/2020 Mod 1-3 Stats Memo		1/25/2020 P Pond Stats Memo (Revised 1/17/2022)		9/11/2024 PPond Stats Memo	
Parameter Name	**UPL Method**	**UPL**	**UPL Method**	**UPL**	**UPL Method**	**UPL**
Appendix III						
Boron, µg/L	P	35.6	Same as Mod 1-3		NP	36.2
Calcium, µg/L	NP	129000			NP	126000
Chloride, mg/L	P	6.20			P	5.91
Fluoride, mg/L	DQ	DQ			NP	0.2
Field pH, Std. Units	P	7.78			P	7.75
Sulfate, mg/L	P	30.3			NP	27.5
Total Dissolved Solids, mg/L	NP	514			NP	514
Appendix IV			**UPL Method**	**UPL**	**UTL Method**	**UTL**
Antimony, ug/L			NP	0.400	NP	0.550
Arsenic, ug/L			P	0.533	NP	0.910
Barium, ug/L			P	18.3	P	18
Beryllium, ug/L			NP	0.370	NP	0.470
Cadmium, ug/L			NP	0.320	NP	0.530
Chromium, ug/L			P	3.13	NP	2.6
Cobalt, ug/L			NP	0.380	NP	0.520
Fluoride, mg/L			DQ	DQ	NP	0.2
Lead, ug/L			NP	0.480	NP	0.550
Lithium, ug/L			P	0.857	P	0.872
Mercury, ug/L			DQ	DQ	DQ	DQ
Molybdenum, ug/L			NP	0.440	NP	0.620
Selenium, ug/L			NP	0.710	NP	0.710
Thallium, ug/L			NP	0.480	NP	0.660
Radium 226/228 Combined, pCi/L			P	1.93	P	1.95

Abbreviations:
UPL = Upper Prediction Limit
UTL = Upper Tolerance Limit
mg/L = milligrams per liter
µg/L = micrograms per liter
GPS = Groundwater Protection Standard
NP = Nonparametric UPL (highest background value) with 1-of-2- retesting
P = Parametric UPL with 1-of-2 retesting
DQ = Double Quantification Rule (not detected in background)

Created by: MDB 5/9/2023
Last revision by: RM Date: 3/19/2024
Checked by: SCC Date: 9/11/2024

I:\25223067.00\Data and Calculations\Sanitas\UPL and Stats Memos_COL\PPond\[Att 6 - UPL Summary_COL PPond.xlsx]Primary Pond