2019 Annual Groundwater Monitoring and Corrective Action Report

Primary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25219067.00 | January 31, 2020

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

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1.0 INTRODUCTION

This 2019 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2019, through December 31, 2019.

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.

2.0 §257.90(e) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by §257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:*

2.1 §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**.

2.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

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

No new monitoring wells were installed and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2019.

2.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

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

Three groundwater sampling events were completed for the Primary Ash Pond CCR unit in 2019. Two semiannual sampling events were completed in April 2019 and October 2019 as required by the assessment monitoring program. A resampling event for monitoring well MW-303 was completed in June 2019.

Groundwater samples collected in the April and October 2019 sampling events were analyzed for both Appendix III and Appendix IV constituents. The sample collected in the MW-303 resampling event in June 2019 was analyzed for selected constituents. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the assessment monitoring programs is included in Table 1. The results of the analytical laboratory analyses are provided in the laboratory reports in Appendix A.

2.4 §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 2019.

Assessment monitoring for the Primary Ash Pond was initiated in April 2018 and continued through 2019. The statistical evaluation of the October 2018 detection monitoring results was completed on January 15, 2019. No Appendix IV parameters were detected at statistically significant levels above the groundwater protection standard (GPS) values established under §257.95(h). In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (USEPA, 2009), the comparison of assessment monitoring results to the GPS was based on the lower confidence limit for the arithmetic mean. Although individual results for arsenic in samples from well MW-303 have exceeded the GPS, the lower confidence limit for mean remained below the GPS; therefore, the arsenic concentration is not at a statistically significant level above the GPS.

2.5 §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 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

2.5.1 §257.90(e) General Requirements

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

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

Summary of Key Actions Completed.

- Statistical evaluation for the initial assessment monitoring events (April, August, and October 2018), completed January 14, 2019.
- Statistical evaluation for the April 2019 monitoring event, completed July 16, 2019.
- Two semiannual groundwater sampling and analysis events (April and October 2019) specified in §257.95(d)(1).
- Resampling event at MW-303 in June 2019.

Description of Any Problems Encountered: No problems were encountered during the groundwater sampling events in 2019.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2020):

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the October 2019 monitoring events (by 1/15/2020);
- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2020 monitoring events (by 7/15/20);
- If one or more Appendix IV constituents is detected at a statistically significant level above the GPS, then within 30 days Wisconsin Power and Light Company (WPL) will prepare a notification in accordance with §257.95(g) and within 90 days complete an alternative source demonstration or initiate an assessment of corrective measures

(§257.95(g)(3)). WPL will also characterize the release pursuant to §257.95(g)(1) and provide notice pursuant to §257.95(g)(2).

- Two semiannual groundwater sampling and analysis events (April and October 2020).

2.5.2 §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.

2.5.3 §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.

2.5.4 §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.

2.5.5 §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 recorded concentrations for the assessment monitoring events are in the laboratory reports in Appendix A. The background concentrations established under §257.94(b) were provided in Appendix A of the 2017 Annual Groundwater Monitoring and Corrective Action Report for the Primary Ash Pond. The groundwater protection standards established for the Primary Ash Pond are provided in Table 2.

2.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

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

Not applicable. No alternative source demonstration evaluation for assessment monitoring was completed in 2019.

2.5.7 §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.

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Tables

1 CCR Rule Groundwater Samples Summary
2 Groundwater Protection Standards – CCR Program – Assessment Monitoring

Table 1. CCR Rule Groundwater Samples Summary
Columbia Energy Center Primary Ash Pond/ SCS Engineers Project #25219067.00

Sample Dates	Downgradient Wells				Background Wells	
	MW-4R	MW-303	MW-304	MW-305	MW-84A	MW-301
4/1-3/2019	A	A	A	A	A	A
6/19/2019	--	R-A	--	--	--	--
10/7-10/2019	A	A	A	A	A	A
Total Samples	2	3	2	2	2	2

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

Created by: NDK Date: 1/4/2018
Last revision by: JR Date: 11/13/2019
Checked by: NDK Date: 1/8/2020

I:\25219067.00\Deliverables\2019 Federal Annual Report COL - PP\Tables\[Table 1 GW_Samples_Summary_Table_COL_Ponds.xlsx]GW Summary

Table 2. Groundwater Protection Standards - CCR Program - Assessment Monitoring
Columbia Energy Center Primary Ash Pond / SCS Engineers Project #25219067.00

Parameter Name	GPS	Source
Antimony, ug/L	6	MCL
Arsenic, ug/L	10	MCL
Barium, ug/L	2000	MCL
Beryllium, ug/L	4	MCL
Cadmium, ug/L	5	MCL
Chromium, ug/L	100	MCL
Cobalt, ug/L	6	40 CFR 257.95(h)(2)
Fluoride, mg/L	4	MCL
Lead, ug/L	15	40 CFR 257.95(h)(2)
Lithium, ug/L	40	40 CFR 257.95(h)(2)
Mercury, ug/L	2	MCL
Molybdenum, ug/L	100	40 CFR 257.95(h)(2)
Selenium, ug/L	50	MCL
Thallium, ug/L	2	MCL
Radium 226/228 Combined, pCi/L	5	MCL

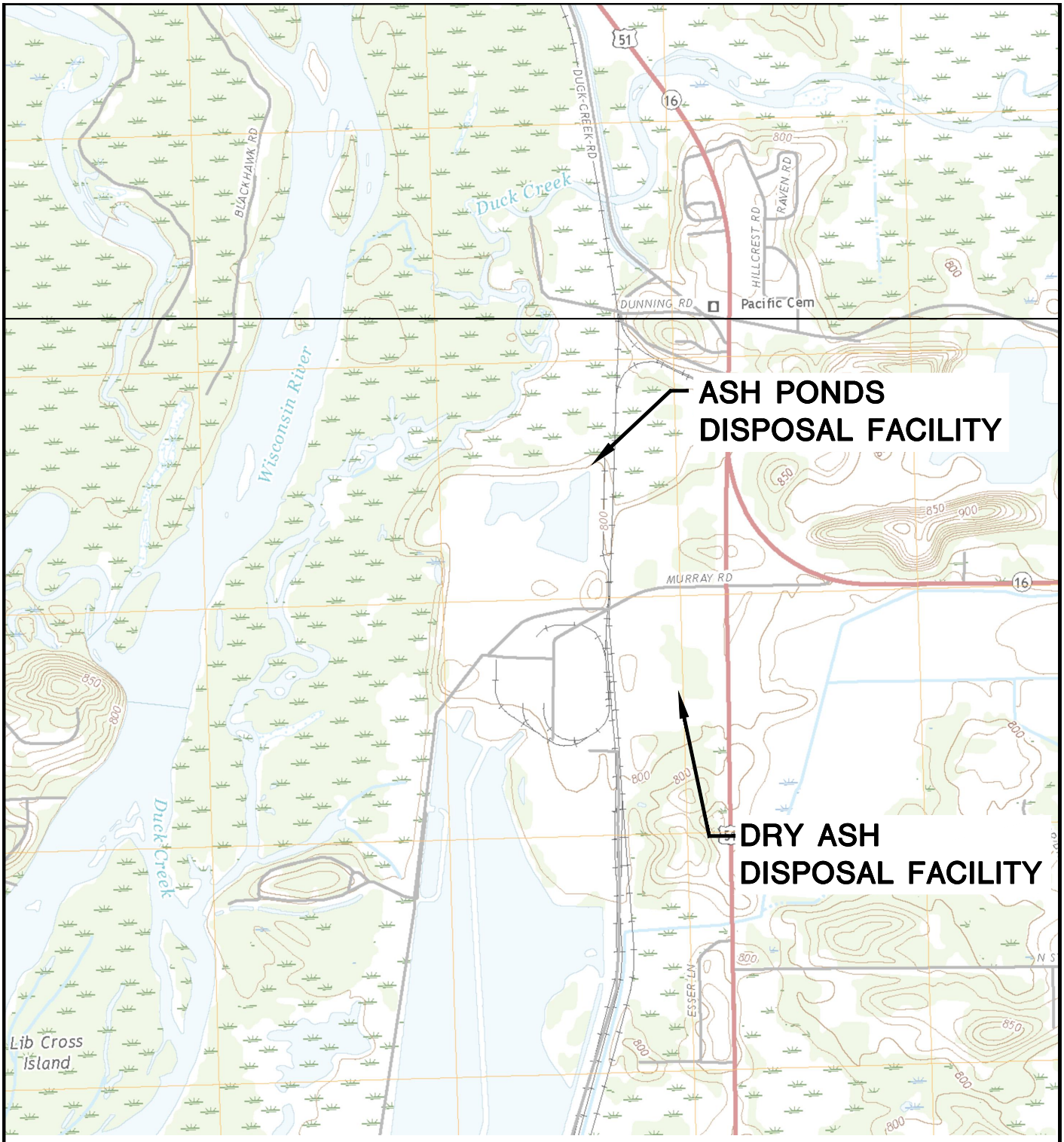
Abbreviations:
GPS = Groundwater Protection Standard
MCL = Maximum Contaminant Level established under 40 CFR 141.62 and 141.66

Created by: NDK, 9/24/2018
Checked by: SCC, 10/14/2018

I:\25219067.00\Deliverables\2019 Federal Annual Report COL - PP\Tables\[Table 2_GPS_COL Primary Pond.xlsx]Table

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations

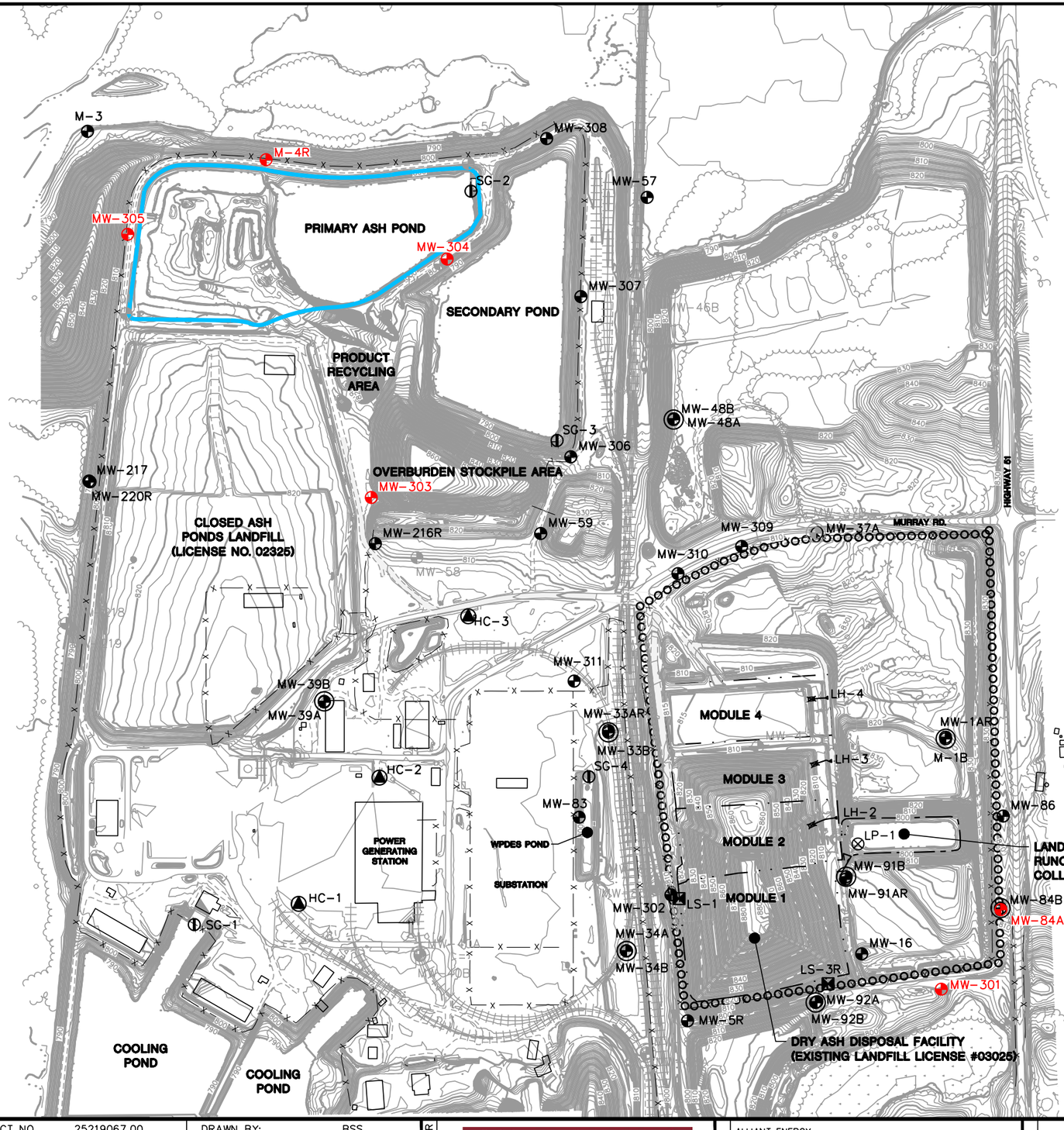


N

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

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

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



LEGEND

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

NOTES:

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

500 0 500

SCALE: 1" = 500'

N

PROJECT NO.	25219067.00	DRAWN BY:	BSS
DRAWN:	12/02/2019	CHECKED BY:	MDB
REVISED:	01/13/2020	APPROVED BY:	TK 01/30/2020

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

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

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
PRIMARY ASH POND
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

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Appendix A

Laboratory Reports

A1 Assessment Monitoring Event Round 1, April 2019

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

May 03, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report: Anions for MW-301 were reanalyzed at a lesser dilution.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Pennsylvania Certification IDs

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

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

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

SAMPLE SUMMARY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40185256001	**MW-301**	Water	04/02/19 17:20	04/04/19 09:30
40185256002	**MW-84A**	Water	04/03/19 09:40	04/04/19 09:30

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40185256001	**MW-301**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40185256002	**MW-84A**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Sample: MW-301 **Lab ID: 40185256001** Collected: 04/02/19 17:20 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.32J**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:15	7440-36-0	
Arsenic	**0.40J**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 06:15	7440-38-2	
Barium	**11.8**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 06:15	7440-39-3	
Beryllium	**0.28J**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 06:15	7440-41-7	
Boron	**26.9**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 06:15	7440-42-8	
Cadmium	**0.21J**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:15	7440-43-9	
Calcium	**126000**	ug/L	2500	698	10	04/05/19 08:40	04/09/19 05:48	7440-70-2	P6
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 06:15	7440-47-3	
Cobalt	**0.35J**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 06:15	7440-48-4	
Lead	**0.30J**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 06:15	7439-92-1	
Lithium	**0.90J**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 06:15	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 06:15	7439-98-7	
Selenium	**0.49J**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 06:15	7782-49-2	
Thallium	**0.48J**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 06:15	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:05	7439-97-6	
Field Data	Analytical Method:								
Field pH	**6.62**	Std. Units			1		04/02/19 17:20		
Field Specific Conductance	**883**	umhos/cm			1		04/02/19 17:20		
Oxygen, Dissolved	**2.20**	mg/L			1		04/02/19 17:20	7782-44-7	
REDOX	**152.1**	mV			1		04/02/19 17:20		
Turbidity	**2.02**	NTU			1		04/02/19 17:20		
Static Water Level	**787.04**	feet			1		04/02/19 17:20		
Temperature, Water (C)	**7.5**	deg C			1		04/02/19 17:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**462**	mg/L	20.0	8.7	1		04/09/19 12:34		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.8**	Std. Units	0.10	0.010	1		04/08/19 11:21		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.79J**	mg/L	2.0	0.50	1		04/30/19 11:06	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/30/19 11:06	16984-48-8	
Sulfate	**4.4**	mg/L	3.0	1.0	1		04/30/19 11:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Sample: MW-84A **Lab ID: 40185256002** Collected: 04/03/19 09:40 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:42	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 06:42	7440-38-2	
Barium	**14.7**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 06:42	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 06:42	7440-41-7	
Boron	**13.6**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 06:42	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:42	7440-43-9	
Calcium	**80100**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 06:42	7440-70-2	
Chromium	**1.8J**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 06:42	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 06:42	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 06:42	7439-92-1	
Lithium	**0.56J**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 06:42	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 06:42	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 06:42	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 06:42	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:07	7439-97-6	
Field Data	Analytical Method:								
Field pH	**7.03**	Std. Units			1		04/03/19 09:40		
Field Specific Conductance	**637.2**	umhos/cm			1		04/03/19 09:40		
Oxygen, Dissolved	**9.49**	mg/L			1		04/03/19 09:40	7782-44-7	
REDOX	**103.4**	mV			1		04/03/19 09:40		
Turbidity	**1.90**	NTU			1		04/03/19 09:40		
Static Water Level	**787.35**	feet			1		04/03/19 09:40		
Temperature, Water (C)	**10.2**	deg C			1		04/03/19 09:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**318**	mg/L	20.0	8.7	1		04/09/19 12:34		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/08/19 11:24		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**3.6**	mg/L	2.0	0.50	1		04/16/19 20:03	16887-00-6	B
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/16/19 20:03	16984-48-8	
Sulfate	**1.4J**	mg/L	3.0	1.0	1		04/16/19 20:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 318138 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1849587 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	04/15/19 09:25	

LABORATORY CONTROL SAMPLE: 1849588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.3	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1849589 1849590

Parameter	Units	40185483005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.00016J mg/L	5	5	5.4	5.2	105	101	85-115	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317485 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1846066 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/09/19 04:47	
Arsenic	ug/L	<0.28	1.0	04/09/19 04:47	
Barium	ug/L	<1.5	4.9	04/09/19 04:47	
Beryllium	ug/L	<0.18	1.0	04/09/19 04:47	
Boron	ug/L	<3.3	11.0	04/09/19 04:47	
Cadmium	ug/L	<0.15	1.0	04/09/19 04:47	
Calcium	ug/L	<69.8	250	04/09/19 04:47	
Chromium	ug/L	<1.0	3.4	04/09/19 04:47	
Cobalt	ug/L	<0.12	1.0	04/09/19 04:47	
Lead	ug/L	<0.24	1.0	04/09/19 04:47	
Lithium	ug/L	<0.19	1.0	04/09/19 04:47	
Molybdenum	ug/L	<0.44	1.5	04/09/19 04:47	
Selenium	ug/L	<0.32	1.1	04/09/19 04:47	
Thallium	ug/L	<0.14	1.0	04/09/19 04:47	

LABORATORY CONTROL SAMPLE: 1846067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	500	100	80-120	
Arsenic	ug/L	500	474	95	80-120	
Barium	ug/L	500	487	97	80-120	
Beryllium	ug/L	500	492	98	80-120	
Boron	ug/L	500	486	97	80-120	
Cadmium	ug/L	500	500	100	80-120	
Calcium	ug/L	5000	4990	100	80-120	
Chromium	ug/L	500	492	98	80-120	
Cobalt	ug/L	500	485	97	80-120	
Lead	ug/L	500	463	93	80-120	
Lithium	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	465	93	80-120	
Selenium	ug/L	500	508	102	80-120	
Thallium	ug/L	500	464	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.32J	500	500	496	496	99	99	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	0.40J	500	500	480	478	96	95	75-125	0	20	
Barium	ug/L	11.8	500	500	496	498	97	97	75-125	0	20	
Beryllium	ug/L	0.28J	500	500	481	480	96	96	75-125	0	20	
Boron	ug/L	26.9	500	500	492	498	93	94	75-125	1	20	
Cadmium	ug/L	0.21J	500	500	491	490	98	98	75-125	0	20	
Calcium	ug/L	126000	5000	5000	126000	123000	12	-46	75-125	2	20	P6
Chromium	ug/L	<1.0	500	500	484	483	97	96	75-125	0	20	
Cobalt	ug/L	0.35J	500	500	476	473	95	95	75-125	1	20	
Lead	ug/L	0.30J	500	500	467	468	93	94	75-125	0	20	
Lithium	ug/L	0.90J	500	500	463	463	92	92	75-125	0	20	
Molybdenum	ug/L	<0.44	500	500	465	464	93	93	75-125	0	20	
Selenium	ug/L	0.49J	500	500	512	513	102	103	75-125	0	20	
Thallium	ug/L	0.48J	500	500	474	476	95	95	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317813 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1847582 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/09/19 12:32	

LABORATORY CONTROL SAMPLE: 1847583

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	552	96	80-120	

SAMPLE DUPLICATE: 1847584

Parameter	Units	40185256001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	462	0	5	

SAMPLE DUPLICATE: 1847585

Parameter	Units	40185260001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	290	284	2	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317619 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40185256001, 40185256002

SAMPLE DUPLICATE: 1846956

Parameter	Units	40185113001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	1.1	1.1	7	20	H6

SAMPLE DUPLICATE: 1846957

Parameter	Units	40185204001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317955
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1848305 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	0.52J	2.0	04/16/19 10:22	
Fluoride	mg/L	<0.10	0.30	04/16/19 10:22	
Sulfate	mg/L	<1.0	3.0	04/16/19 10:22	

LABORATORY CONTROL SAMPLE: 1848306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.6	108	90-110	
Fluoride	mg/L	2	2.0	98	90-110	
Sulfate	mg/L	20	21.7	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848307 1848308

Parameter	Units	40185204004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	43.0	100	100	149	148	106	105	90-110	1	15	
Fluoride	mg/L	<0.50	10	10	10.3	10.4	103	104	90-110	1	15	
Sulfate	mg/L	<5.0	100	100	109	109	105	105	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848309 1848310

Parameter	Units	40185260002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	229	200	200	439	425	105	98	90-110	3	15	
Fluoride	mg/L	<0.10	2	2	1.9	2.0	97	99	90-110	2	15	
Sulfate	mg/L	201	200	200	411	397	105	98	90-110	3	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Sample: MW-301 **Lab ID: 40185256001** Collected: 04/02/19 17:20 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.278 (0.565) C:NA T:94%**	pCi/L	04/22/19 23:16	13982-63-3	
Radium-228	EPA 904.0	**0.552 ± 0.391 (0.759) C:75% T:91%**	pCi/L	04/19/19 12:45	15262-20-1	
Total Radium	Total Radium Calculation	**0.552 ± 0.669 (1.32)**	pCi/L	04/25/19 11:01	7440-14-4	

Sample: MW-84A **Lab ID: 40185256002** Collected: 04/03/19 09:40 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.199 ± 0.391 (0.715) C:NA T:93%**	pCi/L	04/22/19 23:16	13982-63-3	
Radium-228	EPA 904.0	**0.482 ± 0.511 (1.07) C:72% T:80%**	pCi/L	04/19/19 12:45	15262-20-1	
Total Radium	Total Radium Calculation	**0.681 ± 0.902 (1.79)**	pCi/L	04/25/19 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 338211 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1646527 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0681 ± 0.343 (0.816) C:74% T:84%	pCi/L	04/19/19 12:45	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 338210 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1646526 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.212 ± 0.323 (0.520) C:NA T:90%	pCi/L	04/22/19 22:44	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

DEFINITIONS

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

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

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40185256001	**MW-301**	EPA 3010	317485	EPA 6020	317570
40185256002	**MW-84A**	EPA 3010	317485	EPA 6020	317570
40185256001	**MW-301**	EPA 7470	318138	EPA 7470	318191
40185256002	**MW-84A**	EPA 7470	318138	EPA 7470	318191
40185256001	**MW-301**				
40185256002	**MW-84A**				
40185256001	**MW-301**	EPA 903.1	338210		
40185256002	**MW-84A**	EPA 903.1	338210		
40185256001	**MW-301**	EPA 904.0	338211		
40185256002	**MW-84A**	EPA 904.0	338211		
40185256001	**MW-301**	Total Radium Calculation	339896		
40185256002	**MW-84A**	Total Radium Calculation	339897		
40185256001	**MW-301**	SM 2540C	317813		
40185256002	**MW-84A**	SM 2540C	317813		
40185256001	**MW-301**	EPA 9040	317619		
40185256002	**MW-84A**	EPA 9040	317619		
40185256001	**MW-301**	EPA 300.0	317955		
40185256002	**MW-84A**	EPA 300.0	317955		

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison WI
Project Contact:	Meg Blodgett
Phone:	608 216 7362
Project Number:	25219067
Project Name:	Alliant - Columbia
Project State:	WI
Sampled By (Print):	Adam Watson
Sampled By (Sign):	Paul A. Grow for Adam Watson
PO #:	Regulatory Program:

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Page 1 of

MH

40185256

CHAIN OF CUSTODY

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

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

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

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

Matrix Codes

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX ①	FILTERED? (YES/NO)	PRESERVATION (CODE)*	Analyses Requested: Cl, Fluoride, PH, SO4, TDS	Metals	Radium 226	Radium 228
	Y/N						NS	ND	ND	ND
	Pick Letter						A	C	C	C
001	MW 301	4/3/19	1720	W			X	X	X	X
002	MW 84A	4/3/19	0940				X	X	X	X
003	MW 303	4/1/19	1800				X	X	X	X
004	MW 304	4/2/19	1230							
005	MW 305	4/1/19	1410							
006	MW-4R	4/1/19	1515							
007	Field Blank Pond	4/2/19	1230				↓	↓	↓	↓

CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #

① Filled in by Lab from labels 4/4/19 SNW

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

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Grow	4-3-19 19:00		
Fed Ex	4/4/19 0930	[illegible] Paul	4/4/19 0930

PACE Project No.: 40185256
Receipt Temp = ROI °C
Sample Receipt pH: (OK) / Adjusted
Cooler Custody Seal: Present / (Not Present)
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

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www.pacelabs.com

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

Page 1 of

40185256

CHAIN OF CUSTODY

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

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison WI
Project Contact:	Meg Blodgett
Phone:	608 216 7362
Project Number:	25219067
Project Name:	Alliant - Columbia
Project State:	WI
Sampled By (Print):	Adam Watson
Sampled By (Sign):	Paul A. Brown for Adam Watson
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

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

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

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO)	PRESERVATION (CODE)*	Analyses Requested: Cl, Floride, PH, SO4, TDS	Metals	Radium 226	Radium 228	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
					Y/N	Pick Letter							
					N	A	X	X	X	X			
	MW 301	4-2-19	17:20	GW									
	MW 84A	4-3-19	9:40	GW	N	C	X	X	X	X			
					N	C	X	X	X	X			
					N	C	X	X	X	X			
	MW 303	4-1-19	18:00	GW									
	MW 304	4-2-19	12:30										
	MW 305	4-1-19	14:10										
	M-4R	4-1-19	15:15										
	Field Blank Pond	4-2-19	12:30	DI									

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

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

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Brown	4-3-19 19:00		
Relinquished By:	Date/Time:	Received By:	Date/Time:
Fed Ex	4/4/19 0930	Fed Ex	4/4/19 0930
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

PACE Project No.
40185256

Receipt Temp = °C

Sample Receipt pH
OK / Adjusted

Cooler Custody Seal
Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

ORIGINAL

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

Sample Preservation Receipt Form

Client Name: SCS

Project # 40185256

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

Initial when completed: SKW Date/ Time:

Lab Lot# of pH paper: 10453581 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	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN							
001									4		2		1																	X		2.5 / 5 / 10
002									4		2		1																	X		2.5 / 5 / 10
003									4		2		1																	X		2.5 / 5 / 10
004									4		2		1																	X		2.5 / 5 / 10
005									4		2		1																	X		2.5 / 5 / 10
006									4		2		1																	X		2.5 / 5 / 10
007									4		2		1																	X		2.5 / 5 / 10
008																																2.5 / 5 / 10
009																																2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																																2.5 / 5 / 10
014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

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

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: 25Apr2018
	Document No.: **F-GB-C-031-Rev.07**	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS

Project #: **WO# : 40185256**

40185256

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

Tracking #: 786437200524

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

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

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

Thermometer Used SR - N/A **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: RCI /Corr:

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

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 4-4-19
Initials: SKL

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No PO # - Mail, Ivone Collect 4-4-19 SKL
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3. date & time + Lab added to COC SKL
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4. Recieved updated COC via email from client 4-4-19 SKL
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☑Yes ☐No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD:	☐Yes ☑No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☑Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: AL for DM **Date:** 4/4/19

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

May 03, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report: Anions for MW-303 were reanalyzed at a lesser dilution.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Pennsylvania Certification IDs

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

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40185256003	**MW-303**	Water	04/01/19 18:00	04/04/19 09:30
40185256004	**MW-304**	Water	04/02/19 12:30	04/04/19 09:30
40185256005	**MW-305**	Water	04/01/19 14:10	04/04/19 09:30
40185256006	**M-4R**	Water	04/01/19 15:15	04/04/19 09:30
40185256007	**FIELD BLANK PPOND**	Water	04/02/19 12:30	04/04/19 09:30

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

SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40185256003	**MW-303**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40185256004	**MW-304**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40185256005	**MW-305**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40185256006	**M-4R**	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40185256007	**FIELD BLANK PPOND**	EPA 6020	KXS	14	PASI-G

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

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

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

ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: MW-303 **Lab ID: 40185256003** Collected: 04/01/19 18:00 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.29J**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:09	7440-36-0	
Arsenic	**33.2**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 07:09	7440-38-2	
Barium	**6.5**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 07:09	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 07:09	7440-41-7	
Boron	**2770**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 07:09	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:09	7440-43-9	
Calcium	**9290**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 07:09	7440-70-2	
Chromium	**71.2**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 07:09	7440-47-3	
Cobalt	**0.54J**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 07:09	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 07:09	7439-92-1	
Lithium	**0.74J**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 07:09	7439-93-2	
Molybdenum	**106**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 07:09	7439-98-7	
Selenium	**36.5**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 07:09	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 07:09	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:09	7439-97-6	
Field Data	Analytical Method:								
Field pH	**9.92**	Std. Units			1		04/01/19 18:00		
Field Specific Conductance	**1176**	umhos/cm			1		04/01/19 18:00		
Oxygen, Dissolved	**5.59**	mg/L			1		04/01/19 18:00	7782-44-7	
REDOX	**19.9**	mV			1		04/01/19 18:00		
Turbidity	**2.40**	NTU			1		04/01/19 18:00		
Static Water Level	**786.52**	feet			1		04/01/19 18:00		
Temperature, Water (C)	**10.8**	deg C			1		04/01/19 18:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**726**	mg/L	20.0	8.7	1		04/08/19 15:37		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**9.1**	Std. Units	0.10	0.010	1		04/08/19 11:39		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**3.7J**	mg/L	4.0	1.0	2		04/30/19 11:19	16887-00-6	D3
Fluoride	**0.54J**	mg/L	0.60	0.20	2		04/30/19 11:19	16984-48-8	D3
Sulfate	**390**	mg/L	30.0	10.0	10		04/17/19 11:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: MW-304 **Lab ID: 40185256004** Collected: 04/02/19 12:30 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:16	7440-36-0	
Arsenic	**0.63J**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 07:16	7440-38-2	
Barium	**26.7**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 07:16	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 07:16	7440-41-7	
Boron	**413**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 07:16	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:16	7440-43-9	
Calcium	**88300**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 07:16	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 07:16	7440-47-3	
Cobalt	**0.67J**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 07:16	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 07:16	7439-92-1	
Lithium	**<0.19**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 07:16	7439-93-2	
Molybdenum	**3.0**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 07:16	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 07:16	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 07:16	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:12	7439-97-6	
Field Data	Analytical Method:								
Field pH	**7.28**	Std. Units			1		04/02/19 12:30		
Field Specific Conductance	**747.0**	umhos/cm			1		04/02/19 12:30		
Oxygen, Dissolved	**0.30**	mg/L			1		04/02/19 12:30	7782-44-7	
REDOX	**14.2**	mV			1		04/02/19 12:30		
Turbidity	**5.27**	NTU			1		04/02/19 12:30		
Static Water Level	**789.72**	feet			1		04/02/19 12:30		
Temperature, Water (C)	**8.3**	deg C			1		04/02/19 12:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**394**	mg/L	20.0	8.7	1		04/09/19 12:34		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		04/08/19 11:41		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**30.8**	mg/L	2.0	0.50	1		04/16/19 20:28	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/16/19 20:28	16984-48-8	
Sulfate	**33.1**	mg/L	3.0	1.0	1		04/16/19 20:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: MW-305 **Lab ID: 40185256005** Collected: 04/01/19 14:10 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.16J**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:23	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 07:23	7440-38-2	
Barium	**8.4**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 07:23	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 07:23	7440-41-7	
Boron	**692**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 07:23	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:23	7440-43-9	
Calcium	**74700**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 07:23	7440-70-2	
Chromium	**1.3J**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 07:23	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 07:23	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 07:23	7439-92-1	
Lithium	**<0.19**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 07:23	7439-93-2	
Molybdenum	**47.7**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 07:23	7439-98-7	
Selenium	**3.2**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 07:23	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 07:23	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:14	7439-97-6	
Field Data	Analytical Method:								
Field pH	**8.04**	Std. Units			1		04/01/19 14:10		
Field Specific Conductance	**683**	umhos/cm			1		04/01/19 14:10		
Oxygen, Dissolved	**5.14**	mg/L			1		04/01/19 14:10	7782-44-7	
REDOX	**164.8**	mV			1		04/01/19 14:10		
Turbidity	**1.34**	NTU			1		04/01/19 14:10		
Static Water Level	**790.07**	feet			1		04/01/19 14:10		
Temperature, Water (C)	**11.8**	deg C			1		04/01/19 14:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**418**	mg/L	20.0	8.7	1		04/08/19 15:38		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		04/08/19 11:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**35.8**	mg/L	2.0	0.50	1		04/16/19 21:17	16887-00-6	
Fluoride	**0.33**	mg/L	0.30	0.10	1		04/16/19 21:17	16984-48-8	
Sulfate	**200**	mg/L	30.0	10.0	10		04/16/19 21:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: M-4R **Lab ID: 40185256006** Collected: 04/01/19 15:15 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:30	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 07:30	7440-38-2	
Barium	**24.1**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 07:30	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 07:30	7440-41-7	
Boron	**788**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 07:30	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 07:30	7440-43-9	
Calcium	**106000**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 07:30	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 07:30	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 07:30	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 07:30	7439-92-1	
Lithium	**1.8**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 07:30	7439-93-2	
Molybdenum	**29.4**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 07:30	7439-98-7	
Selenium	**12.6**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 07:30	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 07:30	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:16	7439-97-6	
Field Data	Analytical Method:								
Field pH	**7.24**	Std. Units			1		04/01/19 15:15		
Field Specific Conductance	**888**	umhos/cm			1		04/01/19 15:15		
Oxygen, Dissolved	**1.21**	mg/L			1		04/01/19 15:15	7782-44-7	
REDOX	**190.4**	mV			1		04/01/19 15:15		
Turbidity	**1.56**	NTU			1		04/01/19 15:15		
Static Water Level	**789.44**	feet			1		04/01/19 15:15		
Temperature, Water (C)	**11.2**	deg C			1		04/01/19 15:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**524**	mg/L	20.0	8.7	1		04/08/19 15:38		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/08/19 11:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**31.4**	mg/L	2.0	0.50	1		04/16/19 21:41	16887-00-6	
Fluoride	**0.17J**	mg/L	0.30	0.10	1		04/16/19 21:41	16984-48-8	
Sulfate	**149**	mg/L	30.0	10.0	10		04/17/19 12:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: FIELD BLANK PPOND **Lab ID: 40185256007** Collected: 04/02/19 12:30 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 04:54	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 04:54	7440-38-2	
Barium	**<1.5**	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 04:54	7440-39-3	
Beryllium	**<0.18**	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 04:54	7440-41-7	
Boron	**<3.3**	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 04:54	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 04:54	7440-43-9	
Calcium	**<69.8**	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 04:54	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 04:54	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 04:54	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 04:54	7439-92-1	
Lithium	**<0.19**	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 04:54	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 04:54	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 04:54	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 04:54	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:19	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		04/09/19 12:35		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/08/19 11:48		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.50**	mg/L	2.0	0.50	1		04/16/19 21:53	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/16/19 21:53	16984-48-8	
Sulfate	**<1.0**	mg/L	3.0	1.0	1		04/16/19 21:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 318138 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

METHOD BLANK: 1849587 Matrix: Water
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	04/15/19 09:25	

LABORATORY CONTROL SAMPLE: 1849588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.3	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1849589 1849590

Parameter	Units	40185483005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.00016J mg/L	5	5	5.4	5.2	105	101	85-115	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 317485 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

METHOD BLANK: 1846066 Matrix: Water
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/09/19 04:47	
Arsenic	ug/L	<0.28	1.0	04/09/19 04:47	
Barium	ug/L	<1.5	4.9	04/09/19 04:47	
Beryllium	ug/L	<0.18	1.0	04/09/19 04:47	
Boron	ug/L	<3.3	11.0	04/09/19 04:47	
Cadmium	ug/L	<0.15	1.0	04/09/19 04:47	
Calcium	ug/L	<69.8	250	04/09/19 04:47	
Chromium	ug/L	<1.0	3.4	04/09/19 04:47	
Cobalt	ug/L	<0.12	1.0	04/09/19 04:47	
Lead	ug/L	<0.24	1.0	04/09/19 04:47	
Lithium	ug/L	<0.19	1.0	04/09/19 04:47	
Molybdenum	ug/L	<0.44	1.5	04/09/19 04:47	
Selenium	ug/L	<0.32	1.1	04/09/19 04:47	
Thallium	ug/L	<0.14	1.0	04/09/19 04:47	

LABORATORY CONTROL SAMPLE: 1846067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	500	100	80-120	
Arsenic	ug/L	500	474	95	80-120	
Barium	ug/L	500	487	97	80-120	
Beryllium	ug/L	500	492	98	80-120	
Boron	ug/L	500	486	97	80-120	
Cadmium	ug/L	500	500	100	80-120	
Calcium	ug/L	5000	4990	100	80-120	
Chromium	ug/L	500	492	98	80-120	
Cobalt	ug/L	500	485	97	80-120	
Lead	ug/L	500	463	93	80-120	
Lithium	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	465	93	80-120	
Selenium	ug/L	500	508	102	80-120	
Thallium	ug/L	500	464	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.32J	500	500	496	496	99	99	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	0.40J	500	500	480	478	96	95	75-125	0	20	
Barium	ug/L	11.8	500	500	496	498	97	97	75-125	0	20	
Beryllium	ug/L	0.28J	500	500	481	480	96	96	75-125	0	20	
Boron	ug/L	26.9	500	500	492	498	93	94	75-125	1	20	
Cadmium	ug/L	0.21J	500	500	491	490	98	98	75-125	0	20	
Calcium	ug/L	126000	5000	5000	126000	123000	12	-46	75-125	2	20	P6
Chromium	ug/L	<1.0	500	500	484	483	97	96	75-125	0	20	
Cobalt	ug/L	0.35J	500	500	476	473	95	95	75-125	1	20	
Lead	ug/L	0.30J	500	500	467	468	93	94	75-125	0	20	
Lithium	ug/L	0.90J	500	500	463	463	92	92	75-125	0	20	
Molybdenum	ug/L	<0.44	500	500	465	464	93	93	75-125	0	20	
Selenium	ug/L	0.49J	500	500	512	513	102	103	75-125	0	20	
Thallium	ug/L	0.48J	500	500	474	476	95	95	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 317697 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40185256003, 40185256005, 40185256006

METHOD BLANK: 1847172 Matrix: Water
Associated Lab Samples: 40185256003, 40185256005, 40185256006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/08/19 15:37	

LABORATORY CONTROL SAMPLE: 1847173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	550	95	80-120	

SAMPLE DUPLICATE: 1847174

Parameter	Units	40185256003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	726	726	0	5	

SAMPLE DUPLICATE: 1847175

Parameter	Units	40185155001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	576	580	1	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 317813 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40185256004, 40185256007

METHOD BLANK: 1847582 Matrix: Water
Associated Lab Samples: 40185256004, 40185256007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/09/19 12:32	

LABORATORY CONTROL SAMPLE: 1847583

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	552	96	80-120	

SAMPLE DUPLICATE: 1847584

Parameter	Units	40185256001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	462	0	5	

SAMPLE DUPLICATE: 1847585

Parameter	Units	40185260001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	290	284	2	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 317619 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

SAMPLE DUPLICATE: 1846956

Parameter	Units	40185113001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	1.1	1.1	7	20	H6

SAMPLE DUPLICATE: 1846957

Parameter	Units	40185204001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 317955 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

METHOD BLANK: 1848305 Matrix: Water
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	0.52J	2.0	04/16/19 10:22	
Fluoride	mg/L	<0.10	0.30	04/16/19 10:22	
Sulfate	mg/L	<1.0	3.0	04/16/19 10:22	

LABORATORY CONTROL SAMPLE: 1848306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.6	108	90-110	
Fluoride	mg/L	2	2.0	98	90-110	
Sulfate	mg/L	20	21.7	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848307 1848308

Parameter	Units	40185204004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	43.0	100	100	149	148	106	105	90-110	1	15	
Fluoride	mg/L	<0.50	10	10	10.3	10.4	103	104	90-110	1	15	
Sulfate	mg/L	<5.0	100	100	109	109	105	105	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848309 1848310

Parameter	Units	40185260002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	229	200	200	439	425	105	98	90-110	3	15	
Fluoride	mg/L	<0.10	2	2	1.9	2.0	97	99	90-110	2	15	
Sulfate	mg/L	201	200	200	411	397	105	98	90-110	3	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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: MW-303 **Lab ID: 40185256003** Collected: 04/01/19 18:00 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.390 ± 0.331 (0.410) C:NA T:98%**	pCi/L	04/22/19 23:16	13982-63-3	
Radium-228	EPA 904.0	**0.287 ± 0.396 (0.848) C:70% T:86%**	pCi/L	04/19/19 12:45	15262-20-1	
Total Radium	Total Radium Calculation	**0.677 ± 0.727 (1.26)**	pCi/L	04/25/19 11:01	7440-14-4	

Sample: MW-304 **Lab ID: 40185256004** Collected: 04/02/19 12:30 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.703 ± 0.484 (0.517) C:NA T:87%**	pCi/L	04/22/19 23:16	13982-63-3	
Radium-228	EPA 904.0	**0.208 ± 0.356 (0.776) C:74% T:88%**	pCi/L	04/19/19 12:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.911 ± 0.840 (1.29)**	pCi/L	04/25/19 11:01	7440-14-4	

Sample: MW-305 **Lab ID: 40185256005** Collected: 04/01/19 14:10 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.390 ± 0.407 (0.574) C:NA T:75%**	pCi/L	04/22/19 23:16	13982-63-3	
Radium-228	EPA 904.0	**0.409 ± 0.412 (0.849) C:72% T:77%**	pCi/L	04/19/19 12:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.799 ± 0.819 (1.42)**	pCi/L	04/25/19 11:01	7440-14-4	

Sample: M-4R **Lab ID: 40185256006** Collected: 04/01/19 15:15 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.211 ± 0.322 (0.518) C:NA T:84%**	pCi/L	04/22/19 23:30	13982-63-3	
Radium-228	EPA 904.0	**0.549 ± 0.385 (0.737) C:75% T:85%**	pCi/L	04/19/19 12:46	15262-20-1	
Total Radium	Total Radium Calculation	**0.760 ± 0.707 (1.26)**	pCi/L	04/25/19 11:01	7440-14-4	

Sample: FIELD BLANK PPOND **Lab ID: 40185256007** Collected: 04/02/19 12:30 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.241 ± 0.291 (0.443) C:NA T:104%**	pCi/L	04/22/19 23:30	13982-63-3	
Radium-228	EPA 904.0	**-0.0384 ± 0.337 (0.793) C:75% T:89%**	pCi/L	04/19/19 12:46	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Sample: FIELD BLANK PPOND **Lab ID: 40185256007** Collected: 04/02/19 12:30 Received: 04/04/19 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.241 ± 0.628 (1.24)**	pCi/L	04/25/19 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 338211 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

METHOD BLANK: 1646527 Matrix: Water
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0681 ± 0.343 (0.816) C:74% T:84%	pCi/L	04/19/19 12:45	

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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: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

QC Batch: 338210 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

METHOD BLANK: 1646526 Matrix: Water
Associated Lab Samples: 40185256003, 40185256004, 40185256005, 40185256006, 40185256007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.212 ± 0.323 (0.520) C:NA T:90%	pCi/L	04/22/19 22:44	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

DEFINITIONS

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

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

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
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: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40185256003	**MW-303**	EPA 3010	317485	EPA 6020	317570
40185256004	**MW-304**	EPA 3010	317485	EPA 6020	317570
40185256005	**MW-305**	EPA 3010	317485	EPA 6020	317570
40185256006	**M-4R**	EPA 3010	317485	EPA 6020	317570
40185256007	**FIELD BLANK PPOND**	EPA 3010	317485	EPA 6020	317570
40185256003	**MW-303**	EPA 7470	318138	EPA 7470	318191
40185256004	**MW-304**	EPA 7470	318138	EPA 7470	318191
40185256005	**MW-305**	EPA 7470	318138	EPA 7470	318191
40185256006	**M-4R**	EPA 7470	318138	EPA 7470	318191
40185256007	**FIELD BLANK PPOND**	EPA 7470	318138	EPA 7470	318191
40185256003	**MW-303**				
40185256004	**MW-304**				
40185256005	**MW-305**				
40185256006	**M-4R**				
40185256003	**MW-303**	EPA 903.1	338210		
40185256004	**MW-304**	EPA 903.1	338210		
40185256005	**MW-305**	EPA 903.1	338210		
40185256006	**M-4R**	EPA 903.1	338210		
40185256007	**FIELD BLANK PPOND**	EPA 903.1	338210		
40185256003	**MW-303**	EPA 904.0	338211		
40185256004	**MW-304**	EPA 904.0	338211		
40185256005	**MW-305**	EPA 904.0	338211		
40185256006	**M-4R**	EPA 904.0	338211		
40185256007	**FIELD BLANK PPOND**	EPA 904.0	338211		
40185256003	**MW-303**	Total Radium Calculation	339897		
40185256004	**MW-304**	Total Radium Calculation	339897		
40185256005	**MW-305**	Total Radium Calculation	339897		
40185256006	**M-4R**	Total Radium Calculation	339897		
40185256007	**FIELD BLANK PPOND**	Total Radium Calculation	339897		
40185256003	**MW-303**	SM 2540C	317697		
40185256004	**MW-304**	SM 2540C	317813		
40185256005	**MW-305**	SM 2540C	317697		
40185256006	**M-4R**	SM 2540C	317697		
40185256007	**FIELD BLANK PPOND**	SM 2540C	317813		
40185256003	**MW-303**	EPA 9040	317619		
40185256004	**MW-304**	EPA 9040	317619		
40185256005	**MW-305**	EPA 9040	317619		
40185256006	**M-4R**	EPA 9040	317619		
40185256007	**FIELD BLANK PPOND**	EPA 9040	317619		
40185256003	**MW-303**	EPA 300.0	317955		
40185256004	**MW-304**	EPA 300.0	317955		
40185256005	**MW-305**	EPA 300.0	317955		
40185256006	**M-4R**	EPA 300.0	317955		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185520

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40185256007	**FIELD BLANK PPOND**	EPA 300.0	317955		

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www.pacelabs.com

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

Page 1 of

MH

CHAIN OF CUSTODY

4018256

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

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison WI
Project Contact:	Meg Blodgett
Phone:	608 216 7362
Project Number:	25219067
Project Name:	Alliant - Columbia
Project State:	WI
Sampled By (Print):	Adam Watson
Sampled By (Sign):	Paul A. Groon for Adam Watson
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

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

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

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO)	Analyses Requested: Cl, Fluoride, PH, SO4, TDS	Metals	Radium 226	Radium 228	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	Y/N					N5	ND	ND	ND			
	Pick Letter				PRESERVATION (CODE)*	A	C	C	C			
001	MW 301	4/3/19	1720	W		X	X	X	X			
002	MW 84A	4/3/19	0940			X	X	X	X			
003	MW 303	4/1/19	1800			X	X	X	X			
004	MW 304	4/2/19	1230									
005	MW 305	4/1/19	1410									
006	M-4R	4/1/19	1515									
007	Field Blank Pond	4/2/19	1230									

① Filled in by Lab from labels 4/4/19 SNW

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

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Groon	4-3-19 19:00		
Fed Ex	4/4/19 0930	Susan Kuffel	4/4/19 0930
		Paul	

PACE Project No.: 4018256
Receipt Temp = ROI °C
Sample Receipt pH: (OK) / Adjusted
Cooler Custody Seal: Present / (Not Present)
Intact / Not Intact

C019a(27Jun2006)
Version 6.0 06/14/06
ORIGINAL

(Please Print Clearly)

Company Name:	SCS
Branch/Location:	Madison WI
Project Contact:	Meg Blodgett
Phone:	608 216 7362
Project Number:	25219067
Project Name:	Alliant - Columbia
Project State:	WI
Sampled By (Print):	Adam Watson
Sampled By (Sign):	Paul A. Groom for Adam Watson
PO #:	Regulatory Program:

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CHAIN OF COUSTODY

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

Page 1 of

40185256

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

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

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

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

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

					FILTERED? (YES/NO) Y/N	No	No	No	No							
					PRESERVATION (CODE)* Pick Letter	A	C	C	C							
PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested	Cl, Floride, Ph, SO4, TDS	Metals	Radium 226	Radium 228					CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	MW 301	4-2-19	17:20	GW		X	X	X	X							
	MW 84A	4-3-19	9:40	GW		X	X	X	X							
	MW 303	4-1-19	18:00	GW		X	X	X	X							
	MW 304	4-2-19	12:30	↓		↓	↓	↓	↓							
	MW 305	4-1-19	14:10	↓		↓	↓	↓	↓							
	M-4R	4-1-19	15:15	↓		↓	↓	↓	↓							
	Field Blank PPond	4-2-19	12:30	DI		↓	↓	↓	↓							

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

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

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Groom	4-3-19 19:00		
Fed Ex	4/4/19 0930	[illegible] Pace	4/4/19 0930

PACE Project No. 40185256

Receipt Temp = °C

Sample Receipt pH
OK / Adjusted

Cooler Custody Seal
Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

ORIGINAL

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

Sample Preservation Receipt Form

Client Name: SCS Project # 40185256

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

Lab Lot# of pH paper: 10453581 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	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN							
001									4		2		1																	X		2.5 / 5 / 10
002									4		2		1																	X		2.5 / 5 / 10
003									4		2		1																	X		2.5 / 5 / 10
004									4		2		1																	X		2.5 / 5 / 10
005									4		2		1																	X		2.5 / 5 / 10
006									4		2		1																	X		2.5 / 5 / 10
007									4		2		1																	X		2.5 / 5 / 10
008																																2.5 / 5 / 10
009																																2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																																2.5 / 5 / 10
014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

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

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: 25Apr2018
	Document No.: **F-GB-C-031-Rev.07**	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS

Project #: **WO# : 40185256**

40185256

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

Tracking #: 786437200524

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

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

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

Thermometer Used SR - N/A **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: RCI /Corr:

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

Person examining contents:
Date: 4-4-19
Initials: SKV

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No PO # - Mail Invoice Collect 4-4-19 SKV
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3. date & time + Lab added to COC SKV
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4. Recieved updated COC via email from client 4-4-19 SKV
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☑Yes ☐No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☑Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: AL for DM **Date:** 4/4/19

A2 Assessment Monitoring Resample Event, June 2019

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

June 27, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on June 20, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40189799001	**MW-303**	Water	06/19/19 12:50	06/20/19 09:15
40189799002	**FIELD BLANK**	Water	06/19/19 12:50	06/20/19 09:15

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

SAMPLE ANALYTE COUNT

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40189799001	**MW-303**	EPA 6020	KXS	2
			RMW	7
40189799002	**FIELD BLANK**	EPA 6020	KXS	2

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

ANALYTICAL RESULTS

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Sample: MW-303 **Lab ID: 40189799001** Collected: 06/19/19 12:50 Received: 06/20/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Arsenic	**5.3**	ug/L	1.0	0.28	1	06/24/19 08:09	06/25/19 05:23	7440-38-2	
Molybdenum	**64.1**	ug/L	1.5	0.44	1	06/24/19 08:09	06/25/19 05:23	7439-98-7	
Field Data	Analytical Method:								
Field pH	**8.98**	Std. Units			1		06/19/19 12:50		
Field Specific Conductance	**712**	umhos/cm			1		06/19/19 12:50		
Oxygen, Dissolved	**7.21**	mg/L			1		06/19/19 12:50	7782-44-7	
REDOX	**206.4**	mV			1		06/19/19 12:50		
Turbidity	**2.24**	NTU			1		06/19/19 12:50		
Static Water Level	**786.81**	feet			1		06/19/19 12:50		
Temperature, Water (C)	**13.0**	deg C			1		06/19/19 12:50		

Sample: FIELD BLANK **Lab ID: 40189799002** Collected: 06/19/19 12:50 Received: 06/20/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Arsenic	**<0.28**	ug/L	1.0	0.28	1	06/24/19 08:09	06/25/19 03:27	7440-38-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	06/24/19 08:09	06/25/19 03:27	7439-98-7	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

QC Batch: 325373 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40189799001, 40189799002

METHOD BLANK: 1889559 Matrix: Water
Associated Lab Samples: 40189799001, 40189799002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	ug/L	<0.28	1.0	06/25/19 03:14	
Molybdenum	ug/L	<0.44	1.5	06/25/19 03:14	

LABORATORY CONTROL SAMPLE: 1889560

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	476	95	80-120	
Molybdenum	ug/L	500	456	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1889561 1889562

Parameter	Units	40189826017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	<0.00028 mg/L	500	500	473	474	95	95	75-125	0	20	
Molybdenum	ug/L	0.56J	500	500	466	464	93	93	75-125	0	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

DEFINITIONS

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ALLIANT COLUMBIA CCR
Pace Project No.: 40189799

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40189799001	**MW-303**	EPA 3010	325373	EPA 6020	325499
40189799002	**FIELD BLANK**	EPA 3010	325373	EPA 6020	325499
40189799001	**MW-303**				

40189799

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page : 1 Of 1

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

Regulatory Agency

State / Location

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals (As/Mo 6020)	Residual Chlorine (Y/N)	
1	MW-303	WT		6/19	12:50							X							X		001
2	FIELD BLANK	WT		6/19	12:50							X							X		002
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

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

MH

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	CS Logistics	06/20/19	09:15	Pace	06/20/19	0945	ICE	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Adam Watson

SIGNATURE of SAMPLER:

DATE Signed: 6/19/19

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

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

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40189799

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

Lab Lot# of pH paper: 10053581 Lab Std #ID of preservation (if pH adjusted):

	Glass							Plastic							Vials						Jars			General							
Pace Lab #	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001													1																	✓		2.5 / 5 / 10
002													1																	✓		2.5 / 5 / 10
003																																2.5 / 5 / 10
004																																2.5 / 5 / 10
005																																2.5 / 5 / 10
006																																2.5 / 5 / 10
007																																2.5 / 5 / 10
008																																2.5 / 5 / 10
009																																2.5 / 5 / 10
010																																2.5 / 5 / 10
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014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

MSE 06/20/19

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	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical™ 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: WO# : 40189799

40189799

Client Name: ~~MSC~~ SCS Engineers

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

Tracking #: 1980 0619 19

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

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

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

Thermometer Used SR - N/A **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROI /Corr:

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

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 06/20/19
Initials: MSC

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

Project Manager Review: Ryan for DM **Date:** 06/20/19

A3 Assessment Monitoring Event Round 2, October 2019

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

November 04, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Pennsylvania Certification IDs

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

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

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

SAMPLE SUMMARY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40196967001	**MW-303**	Water	10/07/19 16:30	10/10/19 09:15
40196967002	**MW-304**	Water	10/07/19 15:05	10/10/19 09:15
40196967003	**MW-305**	Water	10/07/19 11:25	10/10/19 09:15
40196967004	**MW-4R**	Water	10/07/19 12:40	10/10/19 09:15
40196967005	**FIELD BLANK P POND**	Water	10/07/19 12:40	10/10/19 09:15

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

SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40196967001	**MW-303**	EPA 6020	DS1	14	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40196967002	**MW-304**	EPA 6020	DS1	14	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40196967003	**MW-305**	EPA 6020	DS1	14	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40196967004	**MW-4R**	EPA 6020	DS1	14	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40196967005	**FIELD BLANK P POND**	EPA 6020	DS1	14	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G

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

SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

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

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1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: MW-303 **Lab ID: 40196967001** Collected: 10/07/19 16:30 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.31J**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 22:57	7440-36-0	
Arsenic	**10.2**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:29	7440-38-2	
Barium	**11.4**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 22:57	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:29	7440-41-7	
Boron	**2560**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:29	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 22:57	7440-43-9	
Calcium	**22300**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:29	7440-70-2	
Chromium	**62.0**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:29	7440-47-3	
Cobalt	**0.51J**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:29	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 22:57	7439-92-1	
Lithium	**1.0**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:29	7439-93-2	
Molybdenum	**87.0**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 22:57	7439-98-7	
Selenium	**16.4**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:29	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 22:57	7440-28-0	
Field Data	Analytical Method:								
Field pH	**9.33**	Std. Units			1		10/07/19 16:30		
Field Specific Conductance	**865**	umhos/cm			1		10/07/19 16:30		
Oxygen, Dissolved	**7.93**	mg/L			1		10/07/19 16:30	7782-44-7	
REDOX	**65.9**	mV			1		10/07/19 16:30		
Turbidity	**3.31**	NTU			1		10/07/19 16:30		
Static Water Level	**787.02**	feet			1		10/07/19 16:30		
Temperature, Water (C)	**12.4**	deg C			1		10/07/19 16:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**574**	mg/L	20.0	8.7	1		10/11/19 18:19		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**8.8**	Std. Units	0.10	0.010	1		10/15/19 11:50		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**2.7**	mg/L	2.0	0.50	1		10/21/19 17:05	16887-00-6	
Fluoride	**0.19J**	mg/L	0.30	0.10	1		10/21/19 17:05	16984-48-8	
Sulfate	**299**	mg/L	60.0	20.0	20		10/22/19 13:10	14808-79-8	

Sample: MW-304 **Lab ID: 40196967002** Collected: 10/07/19 15:05 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.29J**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:04	7440-36-0	
Arsenic	**3.2**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:36	7440-38-2	
Barium	**34.8**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:04	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:36	7440-41-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: MW-304 **Lab ID: 40196967002** Collected: 10/07/19 15:05 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**613**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:36	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:04	7440-43-9	
Calcium	**82900**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:36	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:36	7440-47-3	
Cobalt	**0.92J**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:36	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:04	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:36	7439-93-2	
Molybdenum	**4.8**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 23:04	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:36	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:04	7440-28-0	
Field Data	Analytical Method:								
Field pH	**7.35**	Std. Units			1		10/07/19 15:05		
Field Specific Conductance	**729**	umhos/cm			1		10/07/19 15:05		
Oxygen, Dissolved	**0.28**	mg/L			1		10/07/19 15:05	7782-44-7	
REDOX	**-97.0**	mV			1		10/07/19 15:05		
Turbidity	**2.61**	NTU			1		10/07/19 15:05		
Static Water Level	**790.41**	feet			1		10/07/19 15:05		
Temperature, Water (C)	**18.5**	deg C			1		10/07/19 15:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**428**	mg/L	20.0	8.7	1		10/11/19 18:19		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		10/18/19 09:28		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**29.4**	mg/L	2.0	0.50	1		10/21/19 17:18	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/21/19 17:18	16984-48-8	
Sulfate	**40.0**	mg/L	3.0	1.0	1		10/21/19 17:18	14808-79-8	

Sample: MW-305 **Lab ID: 40196967003** Collected: 10/07/19 11:25 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.46J**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:11	7440-36-0	
Arsenic	**0.49J**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:43	7440-38-2	
Barium	**15.0**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:11	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:43	7440-41-7	
Boron	**1430**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:43	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:11	7440-43-9	
Calcium	**93000**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:43	7440-70-2	
Chromium	**1.1J**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:43	7440-47-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: MW-305 **Lab ID: 40196967003** Collected: 10/07/19 11:25 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:43	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:11	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:43	7439-93-2	
Molybdenum	**56.2**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 23:11	7439-98-7	
Selenium	**7.7**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:43	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:11	7440-28-0	
Field Data	Analytical Method:								
Field pH	**7.75**	Std. Units			1		10/07/19 11:25		
Field Specific Conductance	**751**	umhos/cm			1		10/07/19 11:25		
Oxygen, Dissolved	**3.53**	mg/L			1		10/07/19 11:25	7782-44-7	
REDOX	**165.5**	mV			1		10/07/19 11:25		
Turbidity	**1.97**	NTU			1		10/07/19 11:25		
Static Water Level	**790.36**	feet			1		10/07/19 11:25		
Temperature, Water (C)	**23.4**	deg C			1		10/07/19 11:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**496**	mg/L	20.0	8.7	1		10/11/19 18:19		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/18/19 09:31		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**29.3**	mg/L	2.0	0.50	1		10/21/19 17:31	16887-00-6	
Fluoride	**0.36**	mg/L	0.30	0.10	1		10/21/19 17:31	16984-48-8	
Sulfate	**480**	mg/L	60.0	20.0	20		10/22/19 13:23	14808-79-8	

Sample: MW-4R **Lab ID: 40196967004** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:18	7440-36-0	
Arsenic	**0.37J**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:50	7440-38-2	
Barium	**21.0**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:18	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:50	7440-41-7	
Boron	**1120**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:50	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:18	7440-43-9	
Calcium	**82400**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:50	7440-70-2	
Chromium	**1.4J**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:50	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:50	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:18	7439-92-1	
Lithium	**1.8**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:50	7439-93-2	
Molybdenum	**27.6**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 23:18	7439-98-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: MW-4R **Lab ID: 40196967004** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Selenium	**1.8**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:50	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:18	7440-28-0	
Field Data	Analytical Method:								
Field pH	**7.44**	Std. Units			1		10/07/19 12:40		
Field Specific Conductance	**705**	umhos/cm			1		10/07/19 12:40		
Oxygen, Dissolved	**2.65**	mg/L			1		10/07/19 12:40	7782-44-7	
REDOX	**177.4**	mV			1		10/07/19 12:40		
Turbidity	**1.60**	NTU			1		10/07/19 12:40		
Static Water Level	**790.65**	feet			1		10/07/19 12:40		
Temperature, Water (C)	**15.0**	deg C			1		10/07/19 12:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**432**	mg/L	20.0	8.7	1		10/11/19 18:19		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		10/18/19 09:32		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**33.9**	mg/L	2.0	0.50	1		10/21/19 17:44	16887-00-6	
Fluoride	**0.17J**	mg/L	0.30	0.10	1		10/21/19 17:44	16984-48-8	
Sulfate	**128**	mg/L	15.0	5.0	5		10/22/19 14:16	14808-79-8	

Sample: FIELD BLANK P POND **Lab ID: 40196967005** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 19:08	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/14/19 07:07	10/14/19 19:08	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 19:08	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/14/19 19:08	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	10/14/19 07:07	10/14/19 19:08	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 19:08	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	10/14/19 07:07	10/14/19 19:08	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/14/19 07:07	10/14/19 19:08	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/14/19 07:07	10/14/19 19:08	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 19:08	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	10/14/19 07:07	10/14/19 19:08	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 19:08	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/14/19 07:07	10/14/19 19:08	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 19:08	7440-28-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: FIELD BLANK P POND **Lab ID: 40196967005** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		10/11/19 18:20		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.5**	Std. Units	0.10	0.010	1		10/18/19 09:38		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**<0.50**	mg/L	2.0	0.50	1		10/21/19 17:57	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/21/19 17:57	16984-48-8	
Sulfate	**<1.0**	mg/L	3.0	1.0	1		10/21/19 17:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 337277 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

METHOD BLANK: 1959950 Matrix: Water
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/14/19 18:40	
Arsenic	ug/L	<0.28	1.0	10/14/19 18:40	
Barium	ug/L	<0.70	2.3	10/14/19 18:40	
Beryllium	ug/L	<0.25	1.0	10/14/19 18:40	
Boron	ug/L	<3.0	10.0	10/14/19 18:40	
Cadmium	ug/L	<0.15	1.0	10/14/19 18:40	
Calcium	ug/L	<76.2	254	10/14/19 18:40	
Chromium	ug/L	<1.0	3.4	10/14/19 18:40	
Cobalt	ug/L	<0.12	1.0	10/14/19 18:40	
Lead	ug/L	<0.24	1.0	10/14/19 18:40	
Lithium	ug/L	<0.22	1.0	10/14/19 18:40	
Molybdenum	ug/L	<0.44	1.5	10/14/19 18:40	
Selenium	ug/L	<0.32	1.1	10/14/19 18:40	
Thallium	ug/L	<0.14	1.0	10/14/19 18:40	

LABORATORY CONTROL SAMPLE: 1959951

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	497	99	80-120	
Arsenic	ug/L	500	478	96	80-120	
Barium	ug/L	500	477	95	80-120	
Beryllium	ug/L	500	488	98	80-120	
Boron	ug/L	500	464	93	80-120	
Cadmium	ug/L	500	501	100	80-120	
Calcium	ug/L	5000	5080	102	80-120	
Chromium	ug/L	500	478	96	80-120	
Cobalt	ug/L	500	467	93	80-120	
Lead	ug/L	500	470	94	80-120	
Lithium	ug/L	500	477	95	80-120	
Molybdenum	ug/L	500	452	90	80-120	
Selenium	ug/L	500	494	99	80-120	
Thallium	ug/L	500	476	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959952 1959953

Parameter	Units	40196861005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	500	500	513	510	103	102	75-125	1	20	

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

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959952 1959953

Parameter	Units	40196861005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	2.4	500	500	512	504	102	100	75-125	2	20	
Barium	ug/L	169	500	500	671	672	100	101	75-125	0	20	
Beryllium	ug/L	<0.25	500	500	513	469	103	94	75-125	9	20	
Boron	ug/L	73.0	500	500	582	529	102	91	75-125	10	20	
Cadmium	ug/L	<0.15	500	500	514	512	103	102	75-125	0	20	
Calcium	ug/L	90300	5000	5000	96800	99900	130	192	75-125	3	20	P6
Chromium	ug/L	<1.0	500	500	492	486	98	97	75-125	1	20	
Cobalt	ug/L	<0.12	500	500	488	484	98	97	75-125	1	20	
Lead	ug/L	<0.24	500	500	489	489	98	98	75-125	0	20	
Lithium	ug/L	12.4	500	500	518	476	101	93	75-125	8	20	
Molybdenum	ug/L	2.6	500	500	477	476	95	95	75-125	0	20	
Selenium	ug/L	<0.32	500	500	524	521	105	104	75-125	1	20	
Thallium	ug/L	<0.14	500	500	502	502	100	100	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 337218 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

METHOD BLANK: 1959158 Matrix: Water
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/11/19 18:18	

LABORATORY CONTROL SAMPLE: 1959159

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	547	560	102	80-120	

SAMPLE DUPLICATE: 1959160

Parameter	Units	40196967001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	574	564	2	10	

SAMPLE DUPLICATE: 1959161

Parameter	Units	40196971001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	274	278	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 337490
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Associated Lab Samples: 40196967001

SAMPLE DUPLICATE: 1960489

Parameter	Units	40196734001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	20	H6

SAMPLE DUPLICATE: 1960490

Parameter	Units	40196949002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.4	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 337952 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40196967002, 40196967003, 40196967004, 40196967005

SAMPLE DUPLICATE: 1962801

Parameter	Units	40196967002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 337822 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

METHOD BLANK: 1962191 Matrix: Water
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	10/21/19 11:34	
Fluoride	mg/L	<0.10	0.30	10/21/19 11:34	
Sulfate	mg/L	<1.0	3.0	10/21/19 11:34	

LABORATORY CONTROL SAMPLE: 1962192

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962193 1962194

Parameter	Units	40196954007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	14.1	20	20	33.8	33.6	99	98	90-110	1	15	
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	7.2	20	20	27.0	26.9	99	98	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962195 1962196

Parameter	Units	40196971011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.6J	20	20	20.9	21.3	97	99	90-110	2	15	
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	<1.0	20	20	20.6	20.4	102	101	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: MW-303 **Lab ID: 40196967001** Collected: 10/07/19 16:30 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0995 ± 0.227 (0.366) C:NA T:99%**	pCi/L	10/31/19 12:20	13982-63-3	
Radium-228	EPA 904.0	**0.322 ± 0.354 (0.739) C:78% T:92%**	pCi/L	10/30/19 14:33	15262-20-1	
Total Radium	Total Radium Calculation	**0.422 ± 0.581 (1.11)**	pCi/L	11/01/19 15:00	7440-14-4	

Sample: MW-304 **Lab ID: 40196967002** Collected: 10/07/19 15:05 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.154 ± 0.334 (0.769) C:NA T:97%**	pCi/L	10/31/19 12:20	13982-63-3	
Radium-228	EPA 904.0	**0.443 ± 0.395 (0.797) C:78% T:86%**	pCi/L	10/30/19 14:33	15262-20-1	
Total Radium	Total Radium Calculation	**0.443 ± 0.729 (1.57)**	pCi/L	11/01/19 14:59	7440-14-4	

Sample: MW-305 **Lab ID: 40196967003** Collected: 10/07/19 11:25 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.232 ± 0.483 (0.871) C:NA T:85%**	pCi/L	10/31/19 12:20	13982-63-3	
Radium-228	EPA 904.0	**0.495 ± 0.400 (0.799) C:78% T:87%**	pCi/L	10/30/19 14:33	15262-20-1	
Total Radium	Total Radium Calculation	**0.727 ± 0.883 (1.67)**	pCi/L	11/01/19 14:59	7440-14-4	

Sample: MW-4R **Lab ID: 40196967004** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.103 ± 0.236 (0.140) C:NA T:97%**	pCi/L	10/31/19 12:36	13982-63-3	
Radium-228	EPA 904.0	**0.141 ± 0.533 (1.20) C:78% T:76%**	pCi/L	10/30/19 14:33	15262-20-1	
Total Radium	Total Radium Calculation	**0.244 ± 0.769 (1.34)**	pCi/L	11/01/19 14:59	7440-14-4	

Sample: FIELD BLANK P POND **Lab ID: 40196967005** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0533 ± 0.243 (0.392) C:NA T:96%**	pCi/L	10/31/19 12:36	13982-63-3	
Radium-228	EPA 904.0	**0.248 ± 0.423 (0.922) C:81% T:78%**	pCi/L	10/30/19 14:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Sample: FIELD BLANK P POND **Lab ID: 40196967005** Collected: 10/07/19 12:40 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Total Radium	Total Radium Calculation	**0.301 ± 0.666 (1.31)**	pCi/L	11/01/19 14:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 366494 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

METHOD BLANK: 1777728 Matrix: Water
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0468 ± 0.331 (0.660) C:NA T:87%	pCi/L	10/31/19 12:20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

QC Batch: 366493 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

METHOD BLANK: 1777725 Matrix: Water
Associated Lab Samples: 40196967001, 40196967002, 40196967003, 40196967004, 40196967005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.00340 ± 0.362 (0.843) C:80% T:79%	pCi/L	10/30/19 14:21	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

DEFINITIONS

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

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

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196967

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40196967001	**MW-303**	EPA 3010	337277	EPA 6020	337400
40196967002	**MW-304**	EPA 3010	337277	EPA 6020	337400
40196967003	**MW-305**	EPA 3010	337277	EPA 6020	337400
40196967004	**MW-4R**	EPA 3010	337277	EPA 6020	337400
40196967005	**FIELD BLANK P POND**	EPA 3010	337277	EPA 6020	337400
40196967001	**MW-303**				
40196967002	**MW-304**				
40196967003	**MW-305**				
40196967004	**MW-4R**				
40196967001	**MW-303**	EPA 903.1	366494		
40196967002	**MW-304**	EPA 903.1	366494		
40196967003	**MW-305**	EPA 903.1	366494		
40196967004	**MW-4R**	EPA 903.1	366494		
40196967005	**FIELD BLANK P POND**	EPA 903.1	366494		
40196967001	**MW-303**	EPA 904.0	366493		
40196967002	**MW-304**	EPA 904.0	366493		
40196967003	**MW-305**	EPA 904.0	366493		
40196967004	**MW-4R**	EPA 904.0	366493		
40196967005	**FIELD BLANK P POND**	EPA 904.0	366493		
40196967001	**MW-303**	Total Radium Calculation	369027		
40196967002	**MW-304**	Total Radium Calculation	369028		
40196967003	**MW-305**	Total Radium Calculation	369028		
40196967004	**MW-4R**	Total Radium Calculation	369028		
40196967005	**FIELD BLANK P POND**	Total Radium Calculation	369028		
40196967001	**MW-303**	SM 2540C	337218		
40196967002	**MW-304**	SM 2540C	337218		
40196967003	**MW-305**	SM 2540C	337218		
40196967004	**MW-4R**	SM 2540C	337218		
40196967005	**FIELD BLANK P POND**	SM 2540C	337218		
40196967001	**MW-303**	EPA 9040	337490		
40196967002	**MW-304**	EPA 9040	337952		
40196967003	**MW-305**	EPA 9040	337952		
40196967004	**MW-4R**	EPA 9040	337952		
40196967005	**FIELD BLANK P POND**	EPA 9040	337952		
40196967001	**MW-303**	EPA 300.0	337822		
40196967002	**MW-304**	EPA 300.0	337822		
40196967003	**MW-305**	EPA 300.0	337822		
40196967004	**MW-4R**	EPA 300.0	337822		
40196967005	**FIELD BLANK P POND**	EPA 300.0	337822		

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI.
Project Contact:	Tom Karwoski
Phone:	608-224-2830
Project Number:	25219067.00
Project Name:	Columbia
Project State:	Wisconsin
Sampled By (Print):	Adam Watson
Sampled By (Sign):	
PO #:	Regulatory Program:

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

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

Matrix Codes

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

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

Page 1 of

CHAIN OF CUSTODY

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

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested	FILTERED? (YES/NO) Y/N			
						N	N	N	N
						PRESERVATION (CODE)* Pick Letter			
						D	D	A	A
							Radium 226 & 228	pH	TDS CL F SO4
							See attached Metals Table		
001	MW-303	10/7/19	1630	W			X X	X	X
002	MW-304	10/7/19	1505	W			X X	X	X
003	MW-305	10/7/19	1125	W			X X	X	X
004	MW-4R	1	1240	W			X X	X	X
005	~~FB01~~ Field blank PBmd	↓	1240	W			X X	X	X

CLIENT COMMENTS: pH

LAB COMMENTS (Lab Use Only):

Profile #:

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

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
	10/9/19 1600		
CS Logistics	10/10/19 0915	Johnt.Brunette Pace	10/10/19 0915
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

PACE Project No.: 40196967

Receipt Temp = 2.01 °C

Sample Receipt pH: (OK) Adjusted

Cooler Custody Seal: Present / ~~Not Present~~ Intact / ~~Not Intact~~

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Table 2. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Columbia Energy Center / SCS Engineers Project #25219067

		COC #1 - Background Wells		COC #2 - Landfill Modules 1-3				COC #3 - Landfill Module 4				COC #4 - Primary Pond					COC #5 - Secondary Pond			
	Parameter	MW-301	MW-84A	MW-302	MW-33AR	MW-34A	FIELD BLANK - MOD1-3LF	MW-309	MW-310	MW-311	FIELD BLANK-MOD4	MW-303	MW-304	MW-305	MW-4R	FIELD BLANK - PPOND	MW-306	MW-307	MW-308	FIELD BLANK - SCPOND
Appendix III Parameters (Detection Monitoring)	Boron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	TDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Appendix IV Parameters (Assessment Monitoring)	Antimony	X	X									X	X	X	X	X				
	Arsenic	X	X									X	X	X	X	X				
	Barium	X	X									X	X	X	X	X				
	Beryllium	X	X									X	X	X	X	X				
	Cadmium	X	X									X	X	X	X	X				
	Chromium	X	X									X	X	X	X	X				
	Cobalt	X	X									X	X	X	X	X				
	Fluoride	X	X									X	X	X	X	X				
	Lead	X	X									X	X	X	X	X				
	Lithium	X	X									X	X	X	X	X				
	Mercury	X	X									X	X	X	X	X				
	Molybdenum	X	X									X	X	X	X	X				
	Selenium	X	X									X	X	X	X	X				
	Thallium	X	X									X	X	X	X	X				
	Radium 226+228	X	X									X	X	X	X	X				
CCR Rule Field Parameters	Groundwater Elevation	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	pH	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
Low-Flow Sampling Field Parameters	Well Depth	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Specific Conductance	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Dissolved Oxygen	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	ORP	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Temperature	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Turbidity	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Color	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	
	Odor	X	X	X	X	X		X	X	X		X	X	X	X		X	X	X	

Notes: All samples are unfiltered (total).

I:\25219067.00\Data and Calculations\Tables\Lab Bottle Orders\[2019 April_COL CCR.xls]Sheet1

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

Sample Preservation Receipt Form

Client Name: SCS Project # 40R6967

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

Lab Lot# of pH paper: 10050891 Lab Std #ID of preservation (if pH adjusted):

	Glass							Plastic							Vials						Jars			General								
Pace Lab #	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001											2		1													2					✓		2.5 / 5 / 10
002											2		1													2					✓		2.5 / 5 / 10
003											2		1													2					✓		2.5 / 5 / 10
004											2		1													2					✓		2.5 / 5 / 10
005											2		1													2					✓		2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																											JTB 10/10/18						2.5 / 5 / 10

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

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	1 liter plastic HNO3

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: WO#: 40196967

40196967

Client Name: SCS

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

Tracking #: N/A

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 Ziploc Bags 10/10/19

Thermometer Used SR - N/A **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: R01 /Corr:

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

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 10/10/19
Initials: JTB

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: BB for DM **Date:** 10-10-19

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

November 01, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

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

Enclosures

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

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

CERTIFICATIONS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Pennsylvania Certification IDs

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

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40196970001	**MW-301**	Water	10/09/19 12:00	10/10/19 09:15
40196970002	**MW-84A**	Water	10/09/19 13:10	10/10/19 09:15

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40196970001	**MW-301**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40196970002	**MW-84A**	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

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

ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Sample: MW-301 **Lab ID: 40196970001** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:25	7440-36-0	
Arsenic	**0.42J**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:57	7440-38-2	
Barium	**10**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:25	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:57	7440-41-7	
Boron	**35.9**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:57	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:25	7440-43-9	
Calcium	**114000**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:57	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:57	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:57	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:25	7439-92-1	
Lithium	**0.61J**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:57	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 23:25	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:57	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:25	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	10/22/19 14:50	10/23/19 09:18	7439-97-6	
Field Data	Analytical Method:								
Field pH	**6.67**	Std. Units			1		10/09/19 12:00		
Field Specific Conductance	**801**	umhos/cm			1		10/09/19 12:00		
Oxygen, Dissolved	**1.67**	mg/L			1		10/09/19 12:00	7782-44-7	
REDOX	**173.0**	mV			1		10/09/19 12:00		
Turbidity	**2.12**	NTU			1		10/09/19 12:00		
Static Water Level	**788.47**	feet			1		10/09/19 12:00		
Temperature, Water (C)	**11.3**	deg C			1		10/09/19 12:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**418**	mg/L	20.0	8.7	1		10/15/19 16:41		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		10/18/19 09:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**1.7J**	mg/L	2.0	0.50	1		10/21/19 18:26	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/21/19 18:26	16984-48-8	
Sulfate	**8.4**	mg/L	3.0	1.0	1		10/21/19 18:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Sample: MW-84A **Lab ID: 40196970002** Collected: 10/09/19 13:10 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:46	7440-36-0	
Arsenic	**0.46J**	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 13:34	7440-38-2	
Barium	**13.2**	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:46	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 13:34	7440-41-7	
Boron	**12.0**	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 13:34	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/14/19 07:07	10/15/19 13:34	7440-43-9	
Calcium	**73500**	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 13:34	7440-70-2	
Chromium	**1.6J**	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 13:34	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 13:34	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:46	7439-92-1	
Lithium	**0.52J**	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 13:34	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/14/19 07:07	10/15/19 13:34	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 13:34	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:46	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.084**	ug/L	0.28	0.084	1	10/22/19 14:50	10/23/19 09:25	7439-97-6	
Field Data	Analytical Method:								
Field pH	**7.23**	Std. Units			1		10/09/19 13:10		
Field Specific Conductance	**614.1**	umhos/cm			1		10/09/19 13:10		
Oxygen, Dissolved	**11.36**	mg/L			1		10/09/19 13:10	7782-44-7	
REDOX	**181.7**	mV			1		10/09/19 13:10		
Turbidity	**2.41**	NTU			1		10/09/19 13:10		
Static Water Level	**787.79**	feet			1		10/09/19 13:10		
Temperature, Water (C)	**11.8**	deg C			1		10/09/19 13:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**310**	mg/L	20.0	8.7	1		10/15/19 16:41		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.5**	Std. Units	0.10	0.010	1		10/18/19 09:44		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**3.9**	mg/L	2.0	0.50	1		10/21/19 19:19	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/21/19 19:19	16984-48-8	
Sulfate	**1.3J**	mg/L	3.0	1.0	1		10/21/19 19:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 338359 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1964880 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	10/23/19 09:14	

LABORATORY CONTROL SAMPLE: 1964881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.3	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1964882 1964883

Parameter	Units	40196970001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.084	5	5	5.1	5.0	101	100	85-115	1	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337277 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1959950 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/14/19 18:40	
Arsenic	ug/L	<0.28	1.0	10/14/19 18:40	
Barium	ug/L	<0.70	2.3	10/14/19 18:40	
Beryllium	ug/L	<0.25	1.0	10/14/19 18:40	
Boron	ug/L	<3.0	10.0	10/14/19 18:40	
Cadmium	ug/L	<0.15	1.0	10/14/19 18:40	
Calcium	ug/L	<76.2	254	10/14/19 18:40	
Chromium	ug/L	<1.0	3.4	10/14/19 18:40	
Cobalt	ug/L	<0.12	1.0	10/14/19 18:40	
Lead	ug/L	<0.24	1.0	10/14/19 18:40	
Lithium	ug/L	<0.22	1.0	10/14/19 18:40	
Molybdenum	ug/L	<0.44	1.5	10/14/19 18:40	
Selenium	ug/L	<0.32	1.1	10/14/19 18:40	
Thallium	ug/L	<0.14	1.0	10/14/19 18:40	

LABORATORY CONTROL SAMPLE: 1959951

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	497	99	80-120	
Arsenic	ug/L	500	478	96	80-120	
Barium	ug/L	500	477	95	80-120	
Beryllium	ug/L	500	488	98	80-120	
Boron	ug/L	500	464	93	80-120	
Cadmium	ug/L	500	501	100	80-120	
Calcium	ug/L	5000	5080	102	80-120	
Chromium	ug/L	500	478	96	80-120	
Cobalt	ug/L	500	467	93	80-120	
Lead	ug/L	500	470	94	80-120	
Lithium	ug/L	500	477	95	80-120	
Molybdenum	ug/L	500	452	90	80-120	
Selenium	ug/L	500	494	99	80-120	
Thallium	ug/L	500	476	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959952 1959953

Parameter	Units	40196861005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	500	500	513	510	103	102	75-125	1	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959952 1959953

Parameter	Units	40196861005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	2.4	500	500	512	504	102	100	75-125	2	20	
Barium	ug/L	169	500	500	671	672	100	101	75-125	0	20	
Beryllium	ug/L	<0.25	500	500	513	469	103	94	75-125	9	20	
Boron	ug/L	73.0	500	500	582	529	102	91	75-125	10	20	
Cadmium	ug/L	<0.15	500	500	514	512	103	102	75-125	0	20	
Calcium	ug/L	90300	5000	5000	96800	99900	130	192	75-125	3	20	P6
Chromium	ug/L	<1.0	500	500	492	486	98	97	75-125	1	20	
Cobalt	ug/L	<0.12	500	500	488	484	98	97	75-125	1	20	
Lead	ug/L	<0.24	500	500	489	489	98	98	75-125	0	20	
Lithium	ug/L	12.4	500	500	518	476	101	93	75-125	8	20	
Molybdenum	ug/L	2.6	500	500	477	476	95	95	75-125	0	20	
Selenium	ug/L	<0.32	500	500	524	521	105	104	75-125	1	20	
Thallium	ug/L	<0.14	500	500	502	502	100	100	75-125	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: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337571 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1960873 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/19 16:39	

LABORATORY CONTROL SAMPLE: 1960874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	547	558	102	80-120	

SAMPLE DUPLICATE: 1960875

Parameter	Units	40196939001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	354	368	4	10	

SAMPLE DUPLICATE: 1960876

Parameter	Units	40196970001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	418	406	3	10	

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

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337952 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40196970001, 40196970002

SAMPLE DUPLICATE: 1962801

Parameter	Units	40196967002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337822
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1962191 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	10/21/19 11:34	
Fluoride	mg/L	<0.10	0.30	10/21/19 11:34	
Sulfate	mg/L	<1.0	3.0	10/21/19 11:34	

LABORATORY CONTROL SAMPLE: 1962192

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962193 1962194

Parameter	Units	40196954007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	14.1	20	20	33.8	33.6	99	98	90-110	1	15	
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	7.2	20	20	27.0	26.9	99	98	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962195 1962196

Parameter	Units	40196971011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.6J	20	20	20.9	21.3	97	99	90-110	2	15	
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	<1.0	20	20	20.6	20.4	102	101	90-110	1	15	

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

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Sample: MW-301 **Lab ID: 40196970001** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.252 ± 0.351 (0.585) C:NA T:83%**	pCi/L	10/31/19 12:20	13982-63-3	
Radium-228	EPA 904.0	**0.449 ± 0.363 (0.723) C:77% T:95%**	pCi/L	10/30/19 14:23	15262-20-1	
Total Radium	Total Radium Calculation	**0.701 ± 0.714 (1.31)**	pCi/L	11/01/19 15:00	7440-14-4	

Sample: MW-84A **Lab ID: 40196970002** Collected: 10/09/19 13:10 Received: 10/10/19 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.247 ± 0.292 (0.459) C:NA T:101%**	pCi/L	10/31/19 12:20	13982-63-3	
Radium-228	EPA 904.0	**-0.0240 ± 0.355 (0.827) C:78% T:89%**	pCi/L	10/30/19 14:24	15262-20-1	
Total Radium	Total Radium Calculation	**0.247 ± 0.647 (1.29)**	pCi/L	11/01/19 15:00	7440-14-4	

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 366494 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1777728 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0468 ± 0.331 (0.660) C:NA T:87%	pCi/L	10/31/19 12:20	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 366493 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1777725 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.00340 ± 0.362 (0.843) C:80% T:79%	pCi/L	10/30/19 14:21	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALIFIERS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

DEFINITIONS

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

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

ANALYTE QUALIFIERS

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

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40196970001	**MW-301**	EPA 3010	337277	EPA 6020	337400
40196970002	**MW-84A**	EPA 3010	337277	EPA 6020	337400
40196970001	**MW-301**	EPA 7470	338359	EPA 7470	338406
40196970002	**MW-84A**	EPA 7470	338359	EPA 7470	338406
40196970001	**MW-301**				
40196970002	**MW-84A**				
40196970001	**MW-301**	EPA 903.1	366494		
40196970002	**MW-84A**	EPA 903.1	366494		
40196970001	**MW-301**	EPA 904.0	366493		
40196970002	**MW-84A**	EPA 904.0	366493		
40196970001	**MW-301**	Total Radium Calculation	369027		
40196970002	**MW-84A**	Total Radium Calculation	369027		
40196970001	**MW-301**	SM 2540C	337571		
40196970002	**MW-84A**	SM 2540C	337571		
40196970001	**MW-301**	EPA 9040	337952		
40196970002	**MW-84A**	EPA 9040	337952		
40196970001	**MW-301**	EPA 300.0	337822		
40196970002	**MW-84A**	EPA 300.0	337822		

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

Page 1 of

CHAIN OF CUSTODY

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

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI
Project Contact:	Tom Karwoski
Phone:	608-224-2830
Project Number:	25219067.00
Project Name:	Columbia
Project State:	Wisconsin
Sampled By (Print):	Adam Watson
Sampled By (Sign):	
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	2830 Daisy Dr. Madison WI 53718
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

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

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

Matrix Codes

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested: FILTERED? (YES/NO)	Y/N	N	N	N	N
						Pick Letter	D	D	A	A
							Radium 226 & 228	Metals see attached table	pH	TDS, Cl, F, SO4
001	MW-301	10/9/19	1200	GW	PRESERVATION (CODE)*		X	X	X	X
002	MW-84A	10/9/19	1316	GW			X	X	X	X

CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	001	
	002	

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

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

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

Relinquished By:	Date/Time:	Received By:	Date/Time:
	10/9/19 1600		
CS Logistics	10/10/19 0915	FAX	10/10/19 0915

PACE Project No.: 40196970

Receipt Temp = 2.0 °C

Sample Receipt pH: (OK) Adjusted

Cooler Custody Seal: Present / (Not Present)

Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

40196970

Table 2. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Columbia Energy Center / SCS Engineers Project #25219067

		COC #1 - Background Wells		COC #2 - Landfill Modules 1-3				COC #3 - Landfill Module 4				COC #4 - Primary Pond					COC #5 - Secondary Pond			
	Parameter	MW-301	MW-84A	MW-302	MW-33AR	MW-34A	FIELD BLANK - MOD1-3LF	MW-309	MW-310	MW-311	FIELD BLANK-MOD4	MW-303	MW-304	MW-305	MW-4R	FIELD BLANK - PPOND	MW-306	MW-307	MW-308	FIELD BLANK - SCPOND
Appendix III Parameters (Detection Monitoring)	Boron	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Calcium	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Chloride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Fluoride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	pH	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Sulfate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	TDS	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Appendix IV Parameters (Assessment Monitoring)	Antimony	x	x									x	x	x	x	x				
	Arsenic	x	x									x	x	x	x	x				
	Barium	x	x									x	x	x	x	x				
	Beryllium	x	x									x	x	x	x	x				
	Cadmium	x	x									x	x	x	x	x				
	Chromium	x	x									x	x	x	x	x				
	Cobalt	x	x									x	x	x	x	x				
	Fluoride	x	x									x	x	x	x	x				
	Lead	x	x									x	x	x	x	x				
	Lithium	x	x									x	x	x	x	x				
	Mercury	x	x									x	x	x	x	x				
	Molybdenum	x	x									x	x	x	x	x				
	Selenium	x	x									x	x	x	x	x				
	Thallium	x	x									x	x	x	x	x				
	Radium 226+228	x	x									x	x	x	x	x				
CCR Rule Field Parameters	Groundwater Elevation	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	pH	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
Low-Flow Sampling Field Parameters	Well Depth	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Specific Conductance	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Dissolved Oxygen	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	ORP	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Temperature	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Turbidity	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Color	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	
	Odor	x	x	x	x	x		x	x	x		x	x	x	x		x	x	x	

Notes: All samples are unfiltered (total).

I:\25219067.00\Data and Calculations\Tables\Lab Bottle Orders\[2019 April_COL CCR.xls]Sheet1

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

Sample Preservation Receipt Form

Client Name: SC Engineers Project # 40196970

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

Lab Lot# of pH paper: 1 0450891 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: JD Date/ Time:

	Glass							Plastic							Vials						Jars			General			VOA Vials (>6mm) *						
Pace Lab #	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN		H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001											2		1													2					X		2.5 / 5 / 10
002											2		1													2					X		2.5 / 5 / 10
003																																	2.5 / 5 / 10
004																																	2.5 / 5 / 10
005																																	2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

10/10/17 JD

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

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	1 liter plastic HNO3 pres

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: 25Apr2018
	Document No.: **F-GB-C-031-Rev.07**	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40196970

40196970

Client Name: SCS Engineers

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

Tracking #: 2120.100919

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 Zip lock / plastic bag

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

Cooler Temperature Uncorr: 20.1 /Corr: —

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

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 10/10/19
Initials: SW

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. Invoice details not documented 10/10/19 SW
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume:		8.
For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: for DM **Date:** 10-10-19