Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

October 01, 2024

Andrew Fleming
Blackrock Energy
21515 Hawthrone Blvd
Torrance, CA 90503

RE: Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Dear Andrew Fleming:

Enclosed are the analytical results for sample(s) received by the laboratory on May 17, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace National - Mt. Juliet
- Pace Analytical Services - Minneapolis

This report was revised on June 20, 2024, to update the final report recipient.

This report was further revised on October 1, 2024, to include results for carbonate and bicarbonate by 2320B and to update the results for Fluoride by 300.0.

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

Sincerely,

Yeng Ozawa
yeng.ozawa@pacelabs.com
(612)607-1700
Project Manager

Enclosures

cc: Randy Evans, Wellington Operating Company

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
DoD Certification via A2LA #: 2926.01
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
GMP+ Certification #: GMP050884
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
ISO/IEC 17025 Certification via A2LA #: 2926.01
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification via A2LA #: 2926.01
USDA Permit #: P330-19-00208

Pace Analytical Services National
12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Pace Analytical Services National

Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: VT2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 998093910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10693415001	**CLSU Produced Water**	Water	05/16/24 10:20	05/17/24 08:50
10693415002	**Trip Blank**	Water		05/17/24 08:50

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10693415001	**CLSU Produced Water**	EPA 8015D Modified	TT2	3	PASI-M
		EPA 8015D	TM2	2	PASI-M
		EPA 200.8	NN2	10	PASI-M
		EPA 8260D	LPM	8	PASI-M
		SM 2320B	RM3	3	PASI-M
		SM 2540C	JKH	1	PASI-M
		SM 2540D	JKH	1	PASI-M
		EPA 300.0	JDG	1	PAN
		SM 4500-H+B	RM3	1	PASI-M
		SM 2510	RM3	1	PASI-M
		EPA 300.0	JFP	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		SM 4500-P F	EPT	1	PASI-M
10693415002	**Trip Blank**	EPA 8015D	TM2	2	PASI-M
		EPA 8260D	JEM	8	PASI-M

PAN = Pace National - Mt. Juliet
PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Sample: CLSU Produced Water **Lab ID: 10693415001** Collected: 05/16/24 10:20 Received: 05/17/24 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8015D GCS THC-Diesel	Analytical Method: EPA 8015D Modified Preparation Method: EPA 3510C Pace Analytical Services - Minneapolis								
C10-C36	**8.7**	mg/L	0.25	0.081	2	05/21/24 15:40	05/22/24 12:06		N2
Surrogates									
o-Terphenyl (S)	87	%.	30-150		2	05/21/24 15:40	05/22/24 12:06	84-15-1	
n-Triacontane (S)	86	%.	30-150		2	05/21/24 15:40	05/22/24 12:06		
8015D GCV GRO	Analytical Method: EPA 8015D Pace Analytical Services - Minneapolis								
Gasoline Range Organics	**22200**	ug/L	1000	192	10		05/30/24 19:14		
Surrogates									
a,a,a-Trifluorotoluene (S)	100	%.	72-125		10		05/30/24 19:14	98-08-8	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Minneapolis								
Barium	**1530**	ug/L	1.5	0.35	5	05/22/24 05:12	05/24/24 13:09	7440-39-3	
Boron	**8280**	ug/L	1000	449	100	05/22/24 05:12	05/24/24 13:12	7440-42-8	
Calcium	**29200**	ug/L	500	232	5	05/22/24 05:12	05/24/24 13:09	7440-70-2	
Iron	ND	ug/L	250	67.5	5	05/22/24 05:12	05/24/24 13:09	7439-89-6	D3
Magnesium	**4560**	ug/L	150	35.6	5	05/22/24 05:12	05/24/24 13:09	7439-95-4	
Manganese	**33.6**	ug/L	2.5	1.0	5	05/22/24 05:12	05/24/24 13:09	7439-96-5	
Potassium	**13200**	ug/L	500	72.0	5	05/22/24 05:12	05/24/24 13:09	7440-09-7	
Selenium	ND	ug/L	2.5	0.37	5	05/22/24 05:12	05/24/24 13:09	7782-49-2	D3
Sodium	**3160000**	ug/L	5000	1470	100	05/22/24 05:12	05/24/24 13:12	7440-23-5	
Strontium	**5240**	ug/L	50.0	22.7	100	05/22/24 05:12	05/24/24 13:12	7440-24-6	
8260D VOC	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	**2750**	ug/L	25.0	5.3	25		05/23/24 23:33	71-43-2	
Ethylbenzene	**278**	ug/L	25.0	2.7	25		05/23/24 23:33	100-41-4	
Naphthalene	**114**	ug/L	25.0	4.4	25		05/23/24 23:33	91-20-3	
Toluene	**3190**	ug/L	25.0	5.2	25		05/23/24 23:33	108-88-3	
Xylene (Total)	**1200**	ug/L	75.0	10.5	25		05/23/24 23:33	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	100	%.	75-125		25		05/23/24 23:33	2199-69-1	
4-Bromofluorobenzene (S)	102	%.	75-125		25		05/23/24 23:33	460-00-4	
Toluene-d8 (S)	106	%.	75-125		25		05/23/24 23:33	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Minneapolis								
Alkalinity, Total as CaCO3	**1040**	mg/L	5.0	1.4	1		05/21/24 16:15		
Alkalinity,Bicarbonate (CaCO3)	**1040**	mg/L	5.0	1.4	1		05/21/24 16:15		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	1.4	1		05/21/24 16:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Minneapolis								
Total Dissolved Solids	**7160**	mg/L	125	38.4	1		05/22/24 23:08		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Sample: CLSU Produced Water **Lab ID: 10693415001** Collected: 05/16/24 10:20 Received: 05/17/24 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540D Total Suspended Solids	Analytical Method: SM 2540D Pace Analytical Services - Minneapolis								
Total Suspended Solids	**3.1**	mg/L	2.6	0.42	1		05/23/24 21:25		
Wet Chemistry 300.0	Analytical Method: EPA 300.0 Preparation Method: 300.0 Pace National - Mt. Juliet								
Fluoride	**2040**	ug/L	1500	640	10	06/11/24 16:46	06/11/24 16:46	16984-48-8	
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Minneapolis								
pH at 25 Degrees C	**7.6**	Std. Units	0.10	0.10	1		05/21/24 13:00		H6
SM2510 Specific Conductance	Analytical Method: SM 2510 Pace Analytical Services - Minneapolis								
Specific Conductance	**13000**	umhos/cm	5.0	5.0	1		05/21/24 16:31		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Minneapolis								
Bromide	**26.0**	mg/L	4.0	0.80	50		05/21/24 11:14	24959-67-9	
Chloride	**3590**	mg/L	60.0	22.2	50		05/21/24 11:14	16887-00-6	
Sulfate	**38.5**	mg/L	1.2	0.47	1		05/20/24 21:01	14808-79-8	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.034	1		05/22/24 10:21		
SM4500P-F, Total Phosphorus	Analytical Method: SM 4500-P F Preparation Method: SM 4500-P B Pace Analytical Services - Minneapolis								
Phosphorus	**0.13**	mg/L	0.10	0.024	1	05/28/24 13:33	05/31/24 12:47	7723-14-0	

Sample: Trip Blank **Lab ID: 10693415002** Collected: Received: 05/17/24 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8015D GCV GRO	Analytical Method: EPA 8015D Pace Analytical Services - Minneapolis								
Gasoline Range Organics	ND	ug/L	100	19.2	1		05/17/24 22:23		
Surrogates									
a,a,a-Trifluorotoluene (S)	98	%.	72-125		1		05/17/24 22:23	98-08-8	
8260D VOC	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Benzene	ND	ug/L	1.0	0.21	1		05/28/24 13:56	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.11	1		05/28/24 13:56	100-41-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Sample: Trip Blank **Lab ID: 10693415002** Collected: Received: 05/17/24 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260D VOC	Analytical Method: EPA 8260D Pace Analytical Services - Minneapolis								
Naphthalene	ND	ug/L	1.0	0.18	1		05/28/24 13:56	91-20-3	
Toluene	ND	ug/L	1.0	0.21	1		05/28/24 13:56	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.42	1		05/28/24 13:56	1330-20-7	
Surrogates									
1,2-Dichlorobenzene-d4 (S)	99	%.	75-125		1		05/28/24 13:56	2199-69-1	
4-Bromofluorobenzene (S)	102	%.	75-125		1		05/28/24 13:56	460-00-4	
Toluene-d8 (S)	115	%.	75-125		1		05/28/24 13:56	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 946628
QC Batch Method: EPA 8015D
Analysis Method: EPA 8015D
Analysis Description: 8015D GAS
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415002

METHOD BLANK: 4952641 Matrix: Water
Associated Lab Samples: 10693415002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Gasoline Range Organics	ug/L	ND	100	19.2	05/17/24 18:31	
a,a,a-Trifluorotoluene (S)	%.	102	72-125		05/17/24 18:31	

LABORATORY CONTROL SAMPLE: 4952642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	ug/L	1000	880	88	70-125	
a,a,a-Trifluorotoluene (S)	%.			102	72-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4952643 4952644

Parameter	Units	10693581001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Gasoline Range Organics	ug/L	17200	1000	1000	18000	17900	80	64	44-138	1	20	E
a,a,a-Trifluorotoluene (S)	%.						101	100	72-125			

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 948625
QC Batch Method: EPA 8015D
Analysis Method: EPA 8015D
Analysis Description: 8015D GAS
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4962751 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Gasoline Range Organics	ug/L	ND	100	19.2	05/30/24 18:35	
a,a,a-Trifluorotoluene (S)	%.	101	72-125		05/30/24 18:35	

LABORATORY CONTROL SAMPLE: 4962752

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	ug/L	1000	877	88	70-125	
a,a,a-Trifluorotoluene (S)	%.			101	72-125	

MATRIX SPIKE SAMPLE: 4962754

Parameter	Units	10694327007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	ug/L	ND	1000	914	90	44-138	
a,a,a-Trifluorotoluene (S)	%.				96	72-125	

SAMPLE DUPLICATE: 4962753

Parameter	Units	10693415001 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	ug/L	22200	21800	2	20	
a,a,a-Trifluorotoluene (S)	%.	100	100			

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 946892
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4954219 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	ND	0.30	0.070	05/23/24 22:31	
Boron	ug/L	ND	10.0	4.5	05/23/24 22:31	
Calcium	ug/L	ND	100	46.3	05/23/24 22:31	
Iron	ug/L	ND	50.0	13.5	05/23/24 22:31	
Magnesium	ug/L	ND	30.0	7.1	05/23/24 22:31	
Manganese	ug/L	ND	0.50	0.21	05/23/24 22:31	
Potassium	ug/L	ND	100	14.4	05/23/24 22:31	
Selenium	ug/L	ND	0.50	0.074	05/23/24 22:31	
Sodium	ug/L	ND	50.0	14.7	05/23/24 22:31	
Strontium	ug/L	ND	0.50	0.23	05/23/24 22:31	

LABORATORY CONTROL SAMPLE: 4954220

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	100	98.0	98	85-115	
Boron	ug/L	100	99.4	99	85-115	
Calcium	ug/L	2000	2030	102	85-115	
Iron	ug/L	2000	2110	106	85-115	
Magnesium	ug/L	2000	2090	105	85-115	
Manganese	ug/L	100	97.8	98	85-115	
Potassium	ug/L	2000	2070	103	85-115	
Selenium	ug/L	100	98.6	99	85-115	
Sodium	ug/L	2000	2100	105	85-115	
Strontium	ug/L	100	98.1	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954221 4954222

Parameter	Units	10693173001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	22.8	100	100	124	121	101	99	70-130	2	20	
Boron	ug/L	286	100	100	379	378	93	92	70-130	0	20	
Calcium	ug/L	310000	2000	2000	309000	308000	-28	-110	70-130	1	20	P6
Iron	ug/L	371	2000	2000	2400	2400	102	101	70-130	0	20	
Magnesium	ug/L	231000	2000	2000	233000	235000	139	215	70-130	1	20	P6
Manganese	ug/L	508	100	100	535	554	27	46	70-130	3	20	P6
Potassium	ug/L	7340	2000	2000	9310	9300	99	98	70-130	0	20	
Selenium	ug/L	5.4	100	100	114	111	109	105	70-130	3	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954221 4954222

Parameter	Units	10693173001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sodium	ug/L	122000	2000	2000	124000	124000	112	88	70-130	0	20	
Strontium	ug/L	6560	100	100	6610	6650	52	93	70-130	1	20	P6

MATRIX SPIKE SAMPLE: 4954223

Parameter	Units	10693414001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	638	100	778	140	70-130	P6
Boron	ug/L	7860	100	8720	859	70-130	P6
Calcium	ug/L	24200	2000	31700	377	70-130	P6
Iron	ug/L	ND	2000	3290	160	70-130	M1
Magnesium	ug/L	4130	2000	7830	185	70-130	M1
Manganese	ug/L	22.6	100	904	882	70-130	P6
Potassium	ug/L	12300	2000	14900	131	70-130	P6
Selenium	ug/L	ND	100	65.8	66	70-130	M1
Sodium	ug/L	3110000	2000	3350000	12200	70-130	P6
Strontium	ug/L	4520	100	5460	942	70-130	P6

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947409
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV 465 W
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415002

METHOD BLANK: 4956395 Matrix: Water
Associated Lab Samples: 10693415002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.21	05/28/24 12:18	
Ethylbenzene	ug/L	ND	1.0	0.11	05/28/24 12:18	
Naphthalene	ug/L	ND	1.0	0.18	05/28/24 12:18	
Toluene	ug/L	ND	1.0	0.21	05/28/24 12:18	
Xylene (Total)	ug/L	ND	3.0	0.42	05/28/24 12:18	
1,2-Dichlorobenzene-d4 (S)	%.	99	75-125		05/28/24 12:18	
4-Bromofluorobenzene (S)	%.	101	75-125		05/28/24 12:18	
Toluene-d8 (S)	%.	110	75-125		05/28/24 12:18	

LABORATORY CONTROL SAMPLE & LCSD: 4956396 4956397

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	22.0	20.8	110	104	75-125	6	20	
Ethylbenzene	ug/L	20	20.3	18.9	101	94	75-125	7	20	
Naphthalene	ug/L	20	18.4	18.2	92	91	65-130	1	20	
Toluene	ug/L	20	21.9	20.5	109	102	75-125	7	20	
Xylene (Total)	ug/L	60	61.8	57.9	103	97	75-125	7	20	
1,2-Dichlorobenzene-d4 (S)	%.				99	99	75-125			
4-Bromofluorobenzene (S)	%.				102	103	75-125			
Toluene-d8 (S)	%.				104	103	75-125			

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947685
QC Batch Method: EPA 8260D
Analysis Method: EPA 8260D
Analysis Description: 8260D MSV 465 W
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4957826 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.21	05/23/24 20:57	
Ethylbenzene	ug/L	ND	1.0	0.11	05/23/24 20:57	
Naphthalene	ug/L	ND	1.0	0.18	05/23/24 20:57	
Toluene	ug/L	ND	1.0	0.21	05/23/24 20:57	
Xylene (Total)	ug/L	ND	3.0	0.42	05/23/24 20:57	
1,2-Dichlorobenzene-d4 (S)	%.	99	75-125		05/23/24 20:57	
4-Bromofluorobenzene (S)	%.	101	75-125		05/23/24 20:57	
Toluene-d8 (S)	%.	112	75-125		05/23/24 20:57	

LABORATORY CONTROL SAMPLE & LCSD: 4957827 4957828

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	18.5	18.9	92	95	75-125	2	20	
Ethylbenzene	ug/L	20	18.3	18.8	91	94	75-125	3	20	
Naphthalene	ug/L	20	18.0	18.3	90	92	65-130	2	20	
Toluene	ug/L	20	19.0	19.7	95	98	75-125	3	20	
Xylene (Total)	ug/L	60	55.4	56.2	92	94	75-125	1	20	
1,2-Dichlorobenzene-d4 (S)	%.				100	99	75-125			
4-Bromofluorobenzene (S)	%.				102	103	75-125			
Toluene-d8 (S)	%.				105	104	75-125			

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 946985
QC Batch Method: EPA 3510C
Analysis Method: EPA 8015D Modified
Analysis Description: 8015D GCS
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4954515 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
C10-C36	mg/L	ND	0.10	0.032	05/22/24 07:53	N2
n-Triacontane (S)	%.	76	30-150		05/22/24 07:53	
o-Terphenyl (S)	%.	87	30-150		05/22/24 07:53	

LABORATORY CONTROL SAMPLE: 4954516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
C10-C36	mg/L	2	1.7	87	41-125	N2
n-Triacontane (S)	%.			83	30-150	
o-Terphenyl (S)	%.			86	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954517 4954518

Parameter	Units	10693581001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
C10-C36	mg/L	0.46	1.9	1.9	1.7	1.7	66	65	70-130	1	30	M1,N2
n-Triacontane (S)	%.						70	73	30-150			
o-Terphenyl (S)	%.						75	78	30-150			

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 2302612
QC Batch Method: 300.0
Analysis Method: EPA 300.0
Analysis Description: Wet Chemistry 300.0
Laboratory: Pace National - Mt. Juliet
Associated Lab Samples: 10693415001

METHOD BLANK: R4083954-1 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	ug/L	ND	150	64.0	06/11/24 09:30	

LABORATORY CONTROL SAMPLE: R4083954-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	ug/L	8000	7950	99.4	90.0-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R4083954-8 R4083954-9

Parameter	Units	L1745125-05 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	ug/L	4150	8000	8000	11400	12100	90.4	99.7	80.0-120	6.27	15	

MATRIX SPIKE SAMPLE: R4083954-6

Parameter	Units	L1745174-02 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	ug/L	ND	8000	8150	102	80.0-120	

SAMPLE DUPLICATE: R4083954-5

Parameter	Units	L1745174-02 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	ug/L	ND	ND	0.00	15	

SAMPLE DUPLICATE: R4083954-7

Parameter	Units	L1745125-05 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	ug/L	4150	3470	17.9	15	D8

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947005
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4954660 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	1.4	05/21/24 14:02	
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	5.0	1.4	05/21/24 14:02	
Alkalinity,Carbonate (CaCO3)	mg/L	ND	5.0	1.4	05/21/24 14:02	

LABORATORY CONTROL SAMPLE & LCSD: 4954661 4954662

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	40.2	40.1	101	100	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954663 4954664

Parameter	Units	10693377001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	152	40	40	194	195	106	107	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954665 4954666

Parameter	Units	10693377002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	154	40	40	194	194	100	101	80-120	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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947231
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4955776 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	7.7	05/22/24 23:07	

LABORATORY CONTROL SAMPLE: 4955777

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 4955778

Parameter	Units	10693568012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	253	252	0	10	

SAMPLE DUPLICATE: 4955779

Parameter	Units	10693568013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	584	594	2	10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947489
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4956878 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	2.5	0.40	05/23/24 21:24	

LABORATORY CONTROL SAMPLE: 4956879

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	97.4	97	80-120	

SAMPLE DUPLICATE: 4956880

Parameter	Units	10693308001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	117	104	12	10	D6

SAMPLE DUPLICATE: 4956881

Parameter	Units	10693308002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	99.7	93.0	7	10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947000
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10693415001

LABORATORY CONTROL SAMPLE: 4954644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.1	101	98-102	H6

SAMPLE DUPLICATE: 4954645

Parameter	Units	10693377001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.7	1	3	H6

SAMPLE DUPLICATE: 4954646

Parameter	Units	10693410003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	3	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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 947002
QC Batch Method: SM 2510
Analysis Method: SM 2510
Analysis Description: SM2510 Specific Conductance
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4954650 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	5.0	5.0	05/21/24 14:51	

LABORATORY CONTROL SAMPLE: 4954651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1000	906	91	90-110	

SAMPLE DUPLICATE: 4954652

Parameter	Units	10694980002 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	293	292	0	20	

SAMPLE DUPLICATE: 4954653

Parameter	Units	10693410003 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	442	425	4	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 946634
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4952740 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Bromide	mg/L	ND	0.080	0.016	05/20/24 12:24	
Chloride	mg/L	ND	1.2	0.44	05/20/24 12:24	
Sulfate	mg/L	ND	1.2	0.47	05/20/24 12:24	

LABORATORY CONTROL SAMPLE: 4952741

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromide	mg/L	4	3.7	92	90-110	
Chloride	mg/L	50	49.2	98	90-110	
Sulfate	mg/L	50	49.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4952742 4952743

Parameter	Units	10692967001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromide	mg/L	0.33	8	8	7.3	7.3	87	87	80-120	0	20	
Chloride	mg/L	6.3	100	100	98.5	98.3	92	92	80-120	0	20	
Sulfate	mg/L	111	100	100	204	204	93	93	80-120	0	20	E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4952744 4952745

Parameter	Units	10692898002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromide	mg/L	0.25	4	4	3.7	3.5	85	82	80-120	4	20	
Chloride	mg/L	39.9	50	50	79.9	75.7	80	72	80-120	5	20	M1
Sulfate	mg/L	490	500	500	945	946	91	91	80-120	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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 946992
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4954577 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.034	05/22/24 09:59	FS

LABORATORY CONTROL SAMPLE: 4954578

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	103	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954579 4954580

Parameter	Units	10693188006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.31	1	1	1.4	1.3	104	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4954795 4954796

Parameter	Units	10693599001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.97	0.95	97	95	90-110	2	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

QC Batch: 948030
QC Batch Method: SM 4500-P B
Analysis Method: SM 4500-P F
Analysis Description: SM4500P-F, Total Phosphorus
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10693415001

METHOD BLANK: 4960118 Matrix: Water
Associated Lab Samples: 10693415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.10	0.024	05/29/24 14:48	

LABORATORY CONTROL SAMPLE: 4960119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.3	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4960120 4960121

Parameter	Units	10693308001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	1.4	5	5	6.2	6.9	96	111	80-120	11	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4960122 4960123

Parameter	Units	10693308002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	2.1	5	5	7.0	0.22	98	-37	80-120	188	20	M1,R1

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
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

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 adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 947409

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
[1]	The continuing calibration verification was above the method acceptance limit for methyl-tert-butyl ether, 2,2-dichloropropene, carbon tetrachloride, cis-1,3-dichloropropene, and dibromochloromethane. Any detection for the analytes in the associated samples may have a high bias.
[2]	The continuing calibration verification was below the method acceptance limit for hexachloro-1,3-butadiene. The analyte was not detected in the associated samples and the sensitivity of the instrument was verified with a reporting limit check standard.

Batch: 947685

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
[1]	The continuing calibration verification was above the method acceptance limit for carbon tetrachloride. Any detection for the analyte in the associated samples may have a high bias.
[2]	The continuing calibration verification was below the method acceptance limit for 2-butanone (MEK). The analyte was not detected in the associated samples and the sensitivity of the instrument was verified with a reporting limit check standard.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
D8	The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

ANALYTE QUALIFIERS

FS	The sample was filtered in the laboratory prior to analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 477219 CLSU Produced Water-Revised Report
Pace Project No.: 10693415

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10693415001	**CLSU Produced Water**	EPA 3510C	946985	EPA 8015D Modified	947284
10693415001	**CLSU Produced Water**	EPA 8015D	948625		
10693415002	**Trip Blank**	EPA 8015D	946628		
10693415001	**CLSU Produced Water**	EPA 200.8	946892	EPA 200.8	947326
10693415001	**CLSU Produced Water**	EPA 8260D	947685		
10693415002	**Trip Blank**	EPA 8260D	947409		
10693415001	**CLSU Produced Water**	SM 2320B	947005		
10693415001	**CLSU Produced Water**	SM 2540C	947231		
10693415001	**CLSU Produced Water**	SM 2540D	947489		
10693415001	**CLSU Produced Water**	300.0	2302612	EPA 300.0	2302612
10693415001	**CLSU Produced Water**	SM 4500-H+B	947000		
10693415001	**CLSU Produced Water**	SM 2510	947002		
10693415001	**CLSU Produced Water**	EPA 300.0	946634		
10693415001	**CLSU Produced Water**	EPA 353.2	946992		
10693415001	**CLSU Produced Water**	SM 4500-P B	948030	SM 4500-P F	948124

Pace® Location Requested (City/State):

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

WO# : 10693415

10693415

Company Name:	Blackrock Energy	Contact/Report To:	Randy Evans
Street Address:	242 Linden Street Fort Collins, CO 80524	Phone #:	970-402-0418
		E-Mail:	rgrevans477@gmail.com
		Cc E-Mail:	
Customer Project #:	CLSU Produced Water		
Project Name:	CLSU Produced Water	Invoice To:	Andrew Fleming
		Invoice E-Mail:	azf@blackrockenergy.us
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
Facility ID: 477219		Quote #:	00159235
Time Zone Collected: [ ] AK [ ] PT [X] MT [ ] CT [ ] ET		County / State origin of sample(s):	Larimer / Colorado

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [X] Yes [ ] No
Colorado ECMC Rule 909 j

Rush (Pre-approval required):
[ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other _____

DW PWSID # or WW Permit # as applicable:

Date Results Requested: 6/15/2024

Field Filtered (if applicable): [ ] Yes [X] No
Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	Radium 226 & 228	2540D Total Suspended Solids	Alkalinity, PH, Anions, Specific Conductance	8015D GCV GRO	8260D MSV UST	353.2 Nitrate + Nitrite	SM4500P-F, Total Phosphorus	200.8 MET ICPMS	8015D GCS THC-Diesel	2540C Total Dissolved Solids	Sample Comment
Specify Container Size **										1	1	1	6	6	3	3	3	1	2	
Identify Container Preservative Type***										2	1	1	4	4	3	3	2	1	1	
CLSU Produced Water	WW	Grab			5/16/24	1020	17			X	X	X	X	X	X	X	X	X	X	8015D 1liter bottles available filled with 500 ml PW

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only
Proj. Mgr:
AcctNum / Client ID:
Table #:
Profile / Template:
Prelog / Bottle Ord. ID:

Preservation non-conformance identified for sample.

Additional Instructions from Pace®:
FIELD pH 7.89

Collected By: (Printed Name) RANDY EVANS
Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:
	T9	-0.3	4.6	4.5	Y

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
BRE/RANDY EVANS	5/16/24/1600	FED EX	5/16/24 1600	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time: 5/17/24 850	Delivered by: [ ] In- Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

Page 2 of 4

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace® Terms and Conditions found at https://www.pacelabs.com/resource-library/resource/pace-terms-and-conditions/

ENV-FRM-CORQ-0019_v02_110123 ©

ENV-FRM-MIN4-0150 v17_Sample Condition Upon Receipt

CLIENT NAME: Blackrock Energy PROJECT #:

WO#: 10693415

PM: Y01 Due Date: 06/03/24

CLIENT: Blackrock

COURIER: ☐ Client ☐ Commercial ☑ FedEx ☐ Pace ☐ SpeeDee ☐ UPS ☐ USPS

TRACKING NUMBER: 771456160862 3 ☐ See Exceptions form ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present: ☑ YES ☐ NO Seals Intact: ☑ YES ☐ NO Biological Tissue Frozen: ☐ YES ☐ NO ☑ N/A

Packing Material: ☑ Bubble Bags ☑ Bubble Wrap ☐ None ☐ Other Temp Blank: ☑ YES ☐ NO Type of Ice: ☐ Blue ☐ Dry ☑ Wet ☐ Melted ☐ None

Thermometer: ☐ T1 (0461) ☐ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☑ T9 (0727) ☐ 01339252 (1710)

Did Samples Originate in West Virginia: ☐ YES ☑ NO	Were All Container Temps taken: ☐ YES ☐ NO ☑ N/A
Correction Factor: -0.3 Cooler Temp Read w/Temp Blank: 4.8 °C Cooler Temp Corrected w/Temp Blank: 4.5 °C	Average Corrected Temp (no Temp Blank Only): ____ °C
NOTE: Temp should be above freezing to 6°C.	☐ See Exceptions Form ENV-FRM-MIN4-0142 ☐ 1 Container
USDA Regulated Soil: ☑ N/A – Water Sample/Other (describe): ____	Initials & Date of Person Examining Contents: JMW 5/17/24
Did Samples originate from one of the following states (check maps) – AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA: ☐ YES ☑ NO	Did samples originate from a foreign source (international, including Hawaii and Puerto Rico): ☐ YES ☑ NO
NOTE: If YES to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.	

LOCATION (check one): ☐ DULUTH ☑ MINNEAPOLIS ☐ VIRGINIA	YES	NO	N/A	COMMENT(S)
Chain of Custody Present and Filled Out?	☑	☐		1.
Chain of Custody Relinquished?	☑	☐		2.
Sampler Name and/or Signature on COC?	☑	☐	☐	3.
Samples Arrived within Hold Time?	☑	☐		4. If Fecal: ☐ <8 hrs ☐ >8 hr, <24 hr ☐ No
Short Hold Time Analysis (<72 hr)?	☐	☑		5. ☐ BOD / cBOD ☐ Fecal coliform ☐ Hex Chrom ☐ HPC ☐ Nitrate ☐ Nitrite ☐ Ortho Phos ☐ Total coliform/*E. coli* ☐ Other: ____
Rush Turn Around Time Requested?	☐	☑		6.
Sufficient Sample Volume?	☑	☐		7.
Correct Containers Used?	☑	☐	☐	8.
– Pace Containers Used?	☑	☐		
Containers Intact?	☑	☐		9.
Field Filtered Volume Received for Dissolved Tests?	☐	☐	☐	10. Is sediment visible in the dissolved container: ☐ YES ☐ NO
Is sufficient information available to reconcile the samples to the COC? **NOTE:** If ID/Date/Time don't match fill out section 11. Matrix: ☐ Oil ☐ Soil ☑ Water ☐ Other	☑	☐		11. **If NO, write ID/Date/Time of container below:** ☐ See Exceptions form ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	☑	☐	☐	12. Sample #: 001
~~All containers needing preservation are found to be in compliance with EPA~~ recommendation? (HNO_3, H_2SO_4, < 2 pH, NaOH > 9 Sulfide, NaOH > 10 Cyanide) Radium	☐	☑	☐	☑ HNO_3 ☑ H_2SO_4 ☐ NaOH ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC, Oil & Grease, DRO/8015 (water) and Dioxins/PFAS	☑	☐	☐	Positive for Residual Chlorine: ☐ YES ☐ NO
NOTE: If adding preservation to the container, **verify with the PM first.** Clients may require adding preservative to the field and equipment blanks when this occurs.				**pH Paper Lot #**
				Residual Chlorine: ____ 0-6 Roll: 213923 0-6 Strip: ____ 0-14 Strip: ____
				☐ See Exceptions form ENV-FRM-MIN4-0142
Headspace in Methyl Mercury Container?	☐	☐	☑	13.
Extra labels present on soil VOA or WIDRO containers?	☐	☐	☑	14.
Headspace in VOA Vials (greater than 6mm)?	☐	☐	☑	☐ See Exceptions form ENV-FRM-MIN4-0140
Trip Blanks Present?	☑	☐	☐	15. 4 trip blanks expired 4207O7
Trip Blank Custody Seals Present?	☑	☐	☐	Pace Trip Blank Lot # (if purchased): 444814

CLIENT NOTIFICATION / RESOLUTION **FIELD DATA REQUIRED:** ☐ YES ☐ NO

Person Contacted: Randy Evans Date & Time: 5/17/24 16:19

Comments / Resolution: Ok to proceed with tests on expired trip blanks.

Project Manager Review: Yeng Ozawa **Date:** 5/17/24

NOTE: *When there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEQ Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).*

Labeled By: JMW **Line:** 5

Workorder #: _____

No Temp Blank		
Read Temp	Corrected Temp	Average temp

PM Notified of Out of Temp Cooler? ☐ YES ☐ NO

If yes, indicate who was contacted, date and time.
If no, indicate reason why.

_____

Multiple Cooler Project? ☐ YES ☐ NO

If anything is OVER 6.0°C, you MUST document containers in this section HERE

Tracking Number	Temperature

Out of Temp Sample ID	Container Type	# of Containers

pH Adjustment Log for Preserved Samples

Sample ID	Type Of Preserve	pH Upon Receipt	~~Date~~ Adjusted	~~Time~~ Adjusted	Amount Added (mL)	~~Lot #~~ Added	pH After	In Compliance After Addition? YES	In Compliance After Addition? NO	Initials
								☐	☐	
								☐	☐	
								☐	☐	
								☐	☐	
								☐	☐	
								☐	☐	
								☐	☐	
								☐	☐	

Comments:

Trip blanks received are expired Jan 24 444819 25-Jul-23 420707
~~Received 15 Sample Containers~~ JMW 5/17/24

Internal Transfer Chain of Custody

H248

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

State Of Origin: CO
Cert. Needed: ☐ Yes ☐ No

Workorder: 10693415 **Workorder Name:** 477219 CLSU Produced Water

Owner Received Date: 5/17/2024 **Results Requested By:** 6/3/2024

Report To	Subcontract To
Yeng Ozawa Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: BP1N HNO3 2	Requested Analysis: Radium 226/228	LAB USE ONLY
1	CLSU Produced Water	PS	5/16/2024 10:20	10693415001	Water	1	X	-01
2								
3								
4								
5								

L1758103

Transfers	Released By	Date/Time	Received By	Date/Time
1	Brian Geer/PACE	5/17/24 16:00	Easton Organ	5/18/24 0900
2				
3				

Comments

Cooler Temperature on Receipt _____ °C | **Custody Seal** Y or N | **Received on Ice** Y or N | **Samples Intact** Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

3.3+0.1 = 3.4 EOAL

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres. Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RA Screen <0.5 mR/hr:	Y N		

6776 5693 8270

Internal Transfer Chain of Custody

C048

Pace

☐ Rush Multiplier_____X
☐ Samples Pre-Logged into eCOC

State Of Origin: CO
Cert. Needed: ☐ Yes ☒ No

Workorder: 10693415 **Workorder Name:** 477219 CLSU Produced Water

Owner Received Date: 5/17/2024 **Results Requested By:** 6/3/2024

Report To	Subcontract To
Yeng Ozawa Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-1700	Pace National 12065 Lebanon Rd Mt. Juliet, TN 37122 Phone (615) 758-5858

Requested Analysis

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Unpreserved	BP2U				Fluoride by 300.0											LAB USE ONLY
1	CLSU Produced Water	PS	5/16/2024 10:20	10693415001	Water	1					X											L1740603 -01
2																						
3																						
4																						
5																						

Transfers	Released By	Date/Time	Received By	Date/Time
1	Brian Cecil/PACE	5/24/24 14:00	[signature]	5/25/24 1200
2				
3				

Comments

Please run Fluoride by 300.0.

Cooler Temperature on Receipt _____ °C | **Custody Seal Y or N** | **Received on Ice Y or N** | **Samples Intact Y or N**

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.*
This chain of custody is considered complete as is since this information is available in the owner laboratory.

647656439016

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres. Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RA Screen <0.5 mR/hr:	Y N		

EDA 0.1+0.1=0.2

ANALYTICAL REPORT

June 11, 2024

Pace Analytical - Minnesota

Sample Delivery Group:	L1738103
Samples Received:	05/18/2024
Project Number:	10693415
Description:	477219 CLSU Produced Water
Site:	001
Report To:	Yeng Ozawa 1700 Elm Street Suite 200 Minneapolis, MN 55414

Entire Report Reviewed By:

Naomi M Sackett
Project Manager

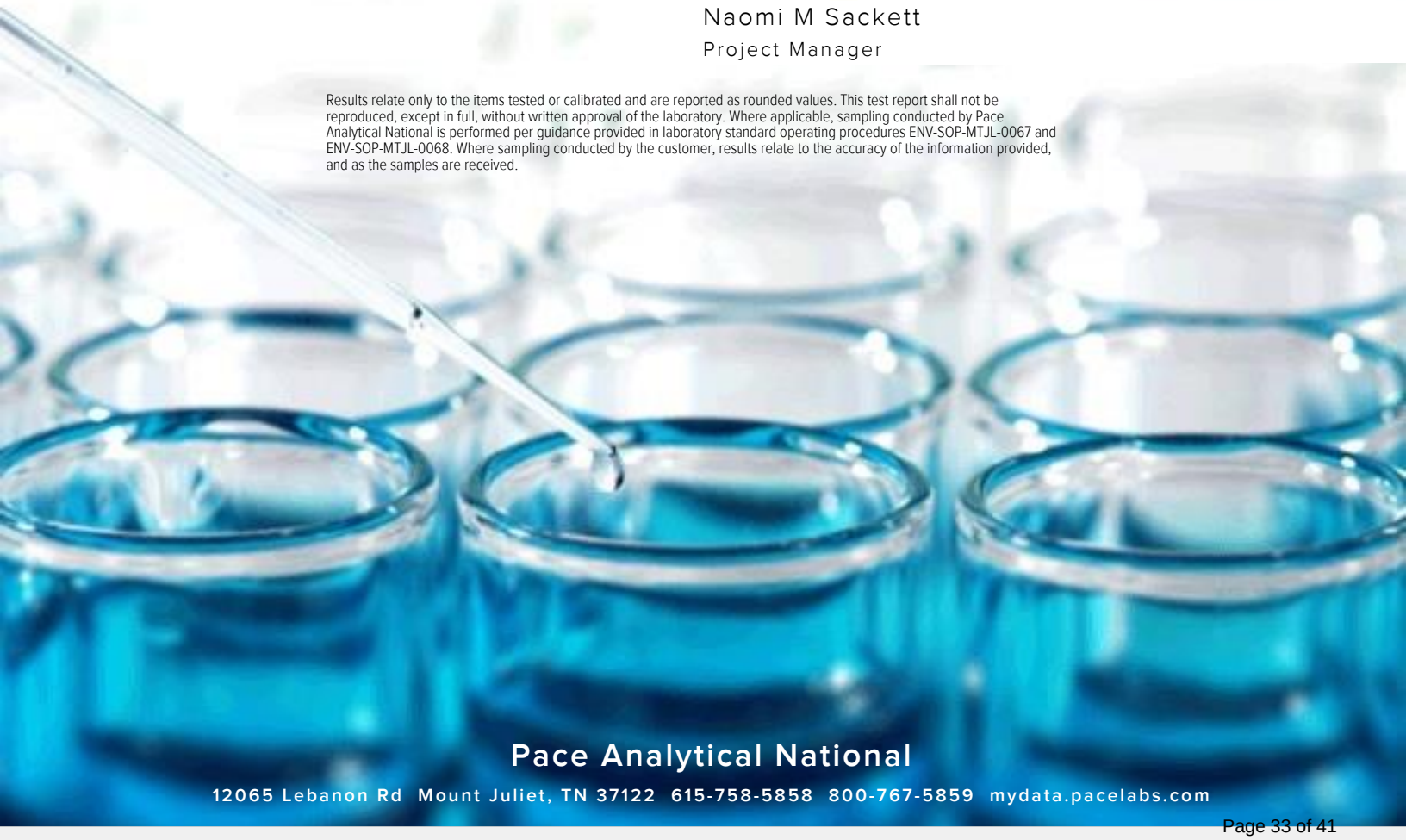

TABLE OF CONTENTS

CLSU PRODUCED WATER L1738103-01 Non-Potable Water

			Collected by	Collected date/time	Received date/time
				05/16/24 10:20	05/18/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2295984	1	05/31/24 14:06	06/06/24 22:11	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2297653	1	06/04/24 10:29	06/05/24 19:01	ZRG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Naomi M Sackett
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	4.36		0.285	0.384	0.389	0.205	06/06/2024 22:11	WG2295984
(T) Barium	*113*					*30.0-143*	*06/06/2024 22:11*	WG2295984
(T) Yttrium	*99.7*					*30.0-136*	*06/06/2024 22:11*	WG2295984

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	2.88		0.717	0.334	0.297	0.216	06/05/2024 19:01	WG2297653
(T) Barium-133	*87.5*					*30.0-143*	*06/05/2024 19:01*	WG2297653

QUALITY CONTROL SUMMARY

L1738103-01

Method Blank (MB)

(MB) R4079789-1 06/06/24 22:11

Analyte	MB Result	MB Qualifier	MB 2 sigma CE	MB MDA	MB Lc
	pCi/l		+ / -	pCi/l	pCi/l
Radium-228	0.294		0.144	0.264	0.139
(T) Barium	*110*		*110*		
(T) Yttrium	*94.2*		*94.2*		

L1738084-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1738084-01 06/06/24 22:11 • (DUP) R4079789-5 06/06/24 22:11

Analyte	Original Result	Original 2 sigma CE	Original MDA	Original Lc	DUP Result	DUP 2 sigma CE	DUP MDA	DUP Lc	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	pCi/l	+ / -	pCi/l	pCi/l	%			%	
Radium-228	0.758	0.268	0.483	0.252	0.258	0.265	0.496	0.263	98.5	1.33	J	20	3
(T) Barium	*108*				*102*	*102*							
(T) Yttrium	*106*				*108*	*108*							

Laboratory Control Sample (LCS)

(LCS) R4079789-2 06/06/24 22:11

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	4.58	91.7	80.0-120	
(T) Barium			*108*		
(T) Yttrium			*103*		

L1737007-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1737007-01 06/06/24 22:11 • (MS) R4079789-3 06/06/24 22:11 • (MSD) R4079789-4 06/06/24 22:11

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	16.7	0.899	16.4	16.1	92.9	91.1	1	70.0-130			1.91		20
(T) Barium		*126*			*125*	*131*							
(T) Yttrium		*96.9*			*119*	*97.8*							

Method Blank (MB)

(MB) R4078227-1 06/05/24 19:01

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0624	J	0.0769	0.107	0.0706
(T) Barium-133	*87.2*		*87.2*		

L1737007-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1737007-10 06/05/24 19:01 • (DUP) R4078227-5 06/05/24 19:01

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	-0.0371	0.199	0.419	0.279	0.0413	0.271	0.487	0.322	200	0.233	U	20	3
(T) Barium-133	*84.2*				*75.7*	*75.7*							

Laboratory Control Sample (LCS)

(LCS) R4078227-2 06/05/24 19:01

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	5.54	111	80.0-120	
(T) Barium-133			*78.4*		

L1738113-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1738113-08 06/05/24 19:02 • (MS) R4078227-3 06/05/24 19:01 • (MSD) R4078227-4 06/05/24 19:01

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.605	19.1	17.1	92.3	82.7	1	75.0-125			10.6		20
(T) Barium-133		*92.3*			*85.7*	*91.9*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.