



12-Jan-2018

Jake Janicek  
Caerus Oil and Gas LLC  
143 Diamond Ave.  
Parachute, CO 81635

Re: **NPR Water**

Work Order: **1801157**

Dear Jake,

ALS Environmental received 2 samples on 04-Jan-2018 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 26.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton  
Project Manager

Certificate No: MN 998501

### Report of Laboratory Analysis

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**Client:** Caerus Oil and Gas LLC  
**Project:** NPR Water  
**Work Order:** 1801157

**Work Order Sample Summary**

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<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1801157-01	20180103-NPR3WW	Groundwater		1/3/2018 10:00	1/4/2018 10:30	<input type="checkbox"/>
1801157-02	20180103-NPR12ST	Groundwater		1/3/2018 13:00	1/4/2018 10:30	<input type="checkbox"/>

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**Client:** Caerus Oil and Gas LLC**Project:** NPR Water**Work Order:** 1801157**Case Narrative**

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Batch 112684, Method ICP\_6020\_WD, Sample 1801157-01E MSD: The MSD recovery was outside of the control limit for Sodium; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required.

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<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
µg/L	Micrograms per Liter
µmhos/cm	Micromhos per Centimeter
mg NH <sub>3</sub> -N/L	Milligrams Ammonia-Nitrogen per Liter
mg/L	Milligrams per Liter
s.u.	Standard Units

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# ALS Group, USA

Date: 12-Jan-18

**Client:** Caerus Oil and Gas LLC  
**Project:** NPR Water  
**Sample ID:** 20180103-NPR3WW  
**Collection Date:** 1/3/2018 10:00 AM

**Work Order:** 1801157  
**Lab ID:** 1801157-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASES IN WATER</b>						
			<b>RSK-175</b>			Analyst: <b>MEB</b>
<b>Ethane</b>	<b>3.8</b>	J	<b>5.0</b>	<b>µg/L</b>	1	1/8/2018 02:00 PM
Ethene	U		5.0	µg/L	1	1/8/2018 02:00 PM
<b>Methane</b>	<b>18</b>		<b>5.0</b>	<b>µg/L</b>	1	1/8/2018 02:00 PM
<b>Propane</b>	<b>6.1</b>		<b>5.0</b>	<b>µg/L</b>	1	1/8/2018 02:00 PM
<b>METALS BY ICP-MS (DISSOLVED)</b>						
			<b>SW6020A</b>		Prep: FILTER 1/9/18 09:17	Analyst: <b>JF</b>
Arsenic	U		0.0050	mg/L	1	1/9/2018 01:24 PM
<b>Barium</b>	<b>0.036</b>		<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
Cadmium	U		0.0020	mg/L	1	1/9/2018 01:24 PM
<b>Calcium</b>	<b>46</b>		<b>0.50</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
Chromium	U		0.0050	mg/L	1	1/9/2018 01:24 PM
<b>Iron</b>	<b>0.076</b>	J	<b>0.080</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
Lead	U		0.0050	mg/L	1	1/9/2018 01:24 PM
<b>Magnesium</b>	<b>16</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
<b>Manganese</b>	<b>0.11</b>		<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
<b>Potassium</b>	<b>0.22</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
Selenium	U		0.0050	mg/L	1	1/9/2018 01:24 PM
Silver	U		0.0050	mg/L	1	1/9/2018 01:24 PM
<b>Sodium</b>	<b>99</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:24 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW8260B</b>			Analyst: <b>EMR</b>
Benzene	U		1.0	µg/L	1	1/5/2018 06:10 PM
Ethylbenzene	U		1.0	µg/L	1	1/5/2018 06:10 PM
m,p-Xylene	U		2.0	µg/L	1	1/5/2018 06:10 PM
Methyl tert-butyl ether	U		1.0	µg/L	1	1/5/2018 06:10 PM
o-Xylene	U		1.0	µg/L	1	1/5/2018 06:10 PM
Toluene	U		1.0	µg/L	1	1/5/2018 06:10 PM
Xylenes, Total	U		3.0	µg/L	1	1/5/2018 06:10 PM
Surr: 1,2-Dichloroethane-d4	98.2		75-120	%REC	1	1/5/2018 06:10 PM
Surr: 4-Bromofluorobenzene	80.4		80-110	%REC	1	1/5/2018 06:10 PM
Surr: Dibromofluoromethane	106		85-115	%REC	1	1/5/2018 06:10 PM
Surr: Toluene-d8	95.6		85-110	%REC	1	1/5/2018 06:10 PM
<b>ALKALINITY</b>						
			<b>A2320 B-11</b>			Analyst: <b>ED</b>
<b>Alkalinity, Bicarbonate (as CaCO3)</b>	<b>260</b>		<b>10</b>	<b>mg/L</b>	1	1/4/2018 05:40 PM
Alkalinity, Carbonate (as CaCO3)	U		10	mg/L	1	1/4/2018 05:40 PM
<b>Alkalinity, Total (as CaCO3)</b>	<b>260</b>		<b>10</b>	<b>mg/L</b>	1	1/4/2018 05:40 PM
<b>ANIONS BY ION CHROMATOGRAPHY</b>						
			<b>SW9056A</b>			Analyst: <b>ED</b>
Bromide	U		0.20	mg/L	1	1/4/2018 06:51 PM
<b>Chloride</b>	<b>4.7</b>		<b>1.0</b>	<b>mg/L</b>	1	1/4/2018 06:51 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 12-Jan-18

**Client:** Caerus Oil and Gas LLC  
**Project:** NPR Water  
**Sample ID:** 20180103-NPR3WW  
**Collection Date:** 1/3/2018 10:00 AM

**Work Order:** 1801157  
**Lab ID:** 1801157-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Fluoride	0.12		0.10	mg/L	1	1/4/2018 06:51 PM
Sulfate	110		10	mg/L	10	1/4/2018 07:29 PM
<b>AMMONIA AS NITROGEN</b>			<b>A4500-NH3 G-11</b>	Prep: A4500-NH3 B 1/5/18 10:45		Analyst: <b>JJG</b>
Ammonia as Nitrogen	0.17		0.15	mg NH3-N/L	1	1/5/2018 10:53 AM
<b>NITROGEN, NITRITE</b>			<b>A4500-NO2 B-11</b>			Analyst: <b>STP</b>
Nitrogen, Nitrite	U		0.020	mg/L	1	1/4/2018 12:25 PM
<b>NITROGEN, NITRATE</b>			<b>E353.2 R2.0</b>			Analyst: <b>JJG</b>
Nitrogen, Nitrate	U		0.020	mg/L	1	1/10/2018 02:58 PM
<b>PH (LABORATORY)</b>			<b>SW9040C</b>			Analyst: <b>ED</b>
pH (laboratory)	8.0		0.10	s.u.	1	1/4/2018 05:40 PM
<b>SULFIDE</b>			<b>E376.1</b>			Analyst: <b>EE</b>
Sulfide	U		1.0	mg/L	1	1/9/2018 08:45 AM
<b>SPECIFIC CONDUCTANCE @ 25°C</b>			<b>A2510 B-11</b>			Analyst: <b>ED</b>
Specific Conductance	710		5.0	µmhos/cm	1	1/4/2018 05:40 PM
<b>TOTAL DISSOLVED SOLIDS</b>			<b>A2540 C-11</b>	Prep: FILTER 1/9/18 08:00		Analyst: <b>MT</b>
Total Dissolved Solids	430		10	mg/L	1	1/9/2018 01:57 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 12-Jan-18

**Client:** Caerus Oil and Gas LLC  
**Project:** NPR Water  
**Sample ID:** 20180103-NPR12ST  
**Collection Date:** 1/3/2018 01:00 PM

**Work Order:** 1801157  
**Lab ID:** 1801157-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASES IN WATER</b>			<b>RSK-175</b>			Analyst: <b>MEB</b>
Ethane	U		5.0	µg/L	1	1/8/2018 02:03 PM
Ethene	U		5.0	µg/L	1	1/8/2018 02:03 PM
<b>Methane</b>	<b>4.4</b>	J	<b>5.0</b>	<b>µg/L</b>	1	1/8/2018 02:03 PM
Propane	U		5.0	µg/L	1	1/8/2018 02:03 PM
<b>METALS BY ICP-MS (DISSOLVED)</b>			<b>SW6020A</b>		Prep: FILTER 1/9/18 09:17	Analyst: <b>JF</b>
<b>Arsenic</b>	<b>0.0040</b>	J	<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
<b>Barium</b>	<b>0.048</b>		<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
Cadmium	U		0.0020	mg/L	1	1/9/2018 01:33 PM
<b>Calcium</b>	<b>56</b>		<b>0.50</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
<b>Chromium</b>	<b>0.00080</b>	J	<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
Iron	U		0.080	mg/L	1	1/9/2018 01:33 PM
Lead	U		0.0050	mg/L	1	1/9/2018 01:33 PM
<b>Magnesium</b>	<b>41</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
Manganese	U		0.0050	mg/L	1	1/9/2018 01:33 PM
<b>Potassium</b>	<b>3.1</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
<b>Selenium</b>	<b>0.0034</b>	J	<b>0.0050</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
Silver	U		0.0050	mg/L	1	1/9/2018 01:33 PM
<b>Sodium</b>	<b>56</b>		<b>0.20</b>	<b>mg/L</b>	1	1/9/2018 01:33 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>			Analyst: <b>WH</b>
Benzene	U		1.0	µg/L	1	1/8/2018 09:14 PM
Ethylbenzene	U		1.0	µg/L	1	1/8/2018 09:14 PM
m,p-Xylene	U		2.0	µg/L	1	1/8/2018 09:14 PM
Methyl tert-butyl ether	U		1.0	µg/L	1	1/8/2018 09:14 PM
o-Xylene	U		1.0	µg/L	1	1/8/2018 09:14 PM
Toluene	U		1.0	µg/L	1	1/8/2018 09:14 PM
Xylenes, Total	U		3.0	µg/L	1	1/8/2018 09:14 PM
Surr: 1,2-Dichloroethane-d4	102		75-120	%REC	1	1/8/2018 09:14 PM
Surr: 4-Bromofluorobenzene	97.7		80-110	%REC	1	1/8/2018 09:14 PM
Surr: Dibromofluoromethane	105		85-115	%REC	1	1/8/2018 09:14 PM
Surr: Toluene-d8	102		85-110	%REC	1	1/8/2018 09:14 PM
<b>ALKALINITY</b>			<b>A2320 B-11</b>			Analyst: <b>ED</b>
<b>Alkalinity, Bicarbonate (as CaCO3)</b>	<b>270</b>		<b>10</b>	<b>mg/L</b>	1	1/4/2018 05:40 PM
<b>Alkalinity, Carbonate (as CaCO3)</b>	<b>11</b>		<b>10</b>	<b>mg/L</b>	1	1/4/2018 05:40 PM
<b>Alkalinity, Total (as CaCO3)</b>	<b>280</b>		<b>10</b>	<b>mg/L</b>	1	1/4/2018 05:40 PM
<b>ANIONS BY ION CHROMATOGRAPHY</b>			<b>SW9056A</b>			Analyst: <b>ED</b>
Bromide	U		0.20	mg/L	1	1/4/2018 07:10 PM
<b>Chloride</b>	<b>7.7</b>		<b>1.0</b>	<b>mg/L</b>	1	1/4/2018 07:10 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 12-Jan-18

**Client:** Caerus Oil and Gas LLC  
**Project:** NPR Water  
**Sample ID:** 20180103-NPR12ST  
**Collection Date:** 1/3/2018 01:00 PM

**Work Order:** 1801157  
**Lab ID:** 1801157-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Fluoride	0.69		0.10	mg/L	1	1/4/2018 07:10 PM
Sulfate	130		10	mg/L	10	1/4/2018 07:48 PM
<b>AMMONIA AS NITROGEN</b>			<b>A4500-NH3 G-11</b>	Prep: A4500-NH3 B 1/5/18 10:45		Analyst: <b>JJG</b>
Ammonia as Nitrogen	U		0.15	mg NH3-N/L	1	1/5/2018 10:53 AM
<b>NITROGEN, NITRITE</b>			<b>A4500-NO2 B-11</b>			Analyst: <b>STP</b>
Nitrogen, Nitrite	U		0.020	mg/L	1	1/4/2018 12:25 PM
<b>NITROGEN, NITRATE</b>			<b>E353.2 R2.0</b>			Analyst: <b>JJG</b>
Nitrogen, Nitrate	1.1		0.020	mg/L	1	1/10/2018 02:58 PM
<b>PH (LABORATORY)</b>			<b>SW9040C</b>			Analyst: <b>ED</b>
pH (laboratory)	8.4		0.10	s.u.	1	1/4/2018 05:40 PM
<b>SULFIDE</b>			<b>E376.1</b>			Analyst: <b>EE</b>
Sulfide	U		1.0	mg/L	1	1/9/2018 08:45 AM
<b>SPECIFIC CONDUCTANCE @ 25°C</b>			<b>A2510 B-11</b>			Analyst: <b>ED</b>
Specific Conductance	750		5.0	µmhos/cm	1	1/4/2018 05:40 PM
<b>TOTAL DISSOLVED SOLIDS</b>			<b>A2540 C-11</b>	Prep: FILTER 1/9/18 08:00		Analyst: <b>MT</b>
Total Dissolved Solids	460		10	mg/L	1	1/9/2018 01:57 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

**QC BATCH REPORT**

Batch ID: **R227807** Instrument ID **GC10** Method: **RSK-175**

<b>MBLK</b>		Sample ID: <b>BLK-180108-R227807</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/8/2018 01:54 PM</b>		
Client ID:		Run ID: <b>GC10_180108A</b>				SeqNo: <b>4841392</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ethane	U	5.0								
Ethene	U	5.0								
Methane	1.05	5.0								J
Propane	0.36	5.0								J

<b>LCS</b>		Sample ID: <b>LCS-180108-R227807</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/8/2018 01:57 PM</b>		
Client ID:		Run ID: <b>GC10_180108A</b>				SeqNo: <b>4841393</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ethane	36.36	5.0	36.1	0	101	75-125	0			
Ethene	34	5.0	33.7	0	101	75-125	0			
Methane	23.23	5.0	19.2	0	121	75-125	0			
Propane	54.33	5.0	52.8	0	103	75-125	0			

<b>MS</b>		Sample ID: <b>1801196-02A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/8/2018 02:38 PM</b>		
Client ID:		Run ID: <b>GC10_180108A</b>				SeqNo: <b>4841403</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ethane	32.07	5.0	36.1	0	88.8	70-130	0			
Ethene	29.98	5.0	33.7	0	89	70-130	0			
Methane	17.59	5.0	19.2	1.76	82.4	70-130	0			
Propane	48.55	5.0	52.8	0	92	70-130	0			

<b>MSD</b>		Sample ID: <b>1801196-02A MSD</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/8/2018 02:40 PM</b>		
Client ID:		Run ID: <b>GC10_180108A</b>				SeqNo: <b>4841404</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ethane	31.64	5.0	36.1	0	87.6	70-130	32.07	1.35	30	
Ethene	29.78	5.0	33.7	0	88.4	70-130	29.98	0.669	30	
Methane	20.47	5.0	19.2	1.76	97.4	70-130	17.59	15.1	30	
Propane	48.31	5.0	52.8	0	91.5	70-130	48.55	0.496	30	

The following samples were analyzed in this batch:

1801157-01A 1801157-02A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **112684** Instrument ID **ICPMS3** Method: **SW6020A** (Dissolve)

MBLK				Sample ID: MBLK-112684-112684				Units: mg/L			Analysis Date: 1/9/2018 12:46 PM		
Client ID:			Run ID: ICPMS3_180109A				SeqNo: 4842231		Prep Date: 1/9/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Arsenic	U	0.0050											
Barium	U	0.0050											
Cadmium	U	0.0020											
Calcium	U	0.50											
Chromium	U	0.0050											
Iron	U	0.080											
Lead	U	0.0050											
Magnesium	U	0.20											
Manganese	U	0.0050											
Potassium	U	0.20											
Selenium	U	0.0050											
Silver	U	0.0050											
Sodium	0.06276	0.20								J			

LCS				Sample ID: LCS-112684-112684				Units: mg/L		Analysis Date: 1/9/2018 01:21 PM	
Client ID:			Run ID: ICPMS3_180109A			SeqNo: 4842265		Prep Date: 1/9/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	0.08998	0.0050	0.1	0	90	80-120	0				
Barium	0.09271	0.0050	0.1	0	92.7	80-120	0				
Cadmium	0.09263	0.0020	0.1	0	92.6	80-120	0				
Calcium	9.431	0.50	10	0	94.3	80-120	0				
Chromium	0.08904	0.0050	0.1	0	89	80-120	0				
Iron	9.315	0.080	10	0	93.2	80-120	0				
Lead	0.09297	0.0050	0.1	0	93	80-120	0				
Magnesium	9.375	0.20	10	0	93.8	80-120	0				
Manganese	0.09444	0.0050	0.1	0	94.4	80-120	0				
Potassium	9.48	0.20	10	0	94.8	80-120	0				
Selenium	0.091	0.0050	0.1	0	91	80-120	0				
Silver	0.093	0.0050	0.1	0	93	80-120	0				
Sodium	9.533	0.20	10	0	95.3	80-120	0				

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

# QC BATCH REPORT

Batch ID: **112684** Instrument ID **ICPMS3** Method: **SW6020A (Dissolve)**

MS				Sample ID: 1801157-01EMS			Units: mg/L		Analysis Date: 1/9/2018 01:26 PM	
Client ID: 20180103-NPR3WW				Run ID: ICPMS3_180109A			SeqNo: 4842269		Prep Date: 1/9/2018	
							DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.101	0.0050	0.1	0.000198	101	75-125	0			
Barium	0.1355	0.0050	0.1	0.03646	99.1	75-125	0			
Cadmium	0.097	0.0020	0.1	0.000004	97	75-125	0			
Calcium	57.09	0.50	10	45.89	112	75-125	0			O
Chromium	0.09399	0.0050	0.1	-0.000034	94	75-125	0			
Iron	9.791	0.080	10	0.07572	97.2	75-125	0			
Lead	0.09717	0.0050	0.1	-0.000028	97.2	75-125	0			
Magnesium	25.88	0.20	10	16.29	95.9	75-125	0			
Manganese	0.2055	0.0050	0.1	0.1066	98.9	75-125	0			
Potassium	10.13	0.20	10	0.2231	99	75-125	0			
Selenium	0.1034	0.0050	0.1	-0.000148	104	75-125	0			
Silver	0.08333	0.0050	0.1	0.000001	83.3	75-125	0			
Sodium	106.6	0.20	10	98.52	80.5	75-125	0			O

MSD				Sample ID: 1801157-01EMSD			Units: mg/L		Analysis Date: 1/9/2018 01:31 PM	
Client ID: 20180103-NPR3WW				Run ID: ICPMS3_180109A			SeqNo: 4842965		Prep Date: 1/9/2018	
							DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1024	0.0050	0.1	0.000198	102	75-125	0.101	1.31	20	
Barium	0.1374	0.0050	0.1	0.03646	101	75-125	0.1355	1.41	20	
Cadmium	0.09875	0.0020	0.1	0.000004	98.7	75-125	0.097	1.79	20	
Calcium	57.58	0.50	10	45.89	117	75-125	57.09	0.856	20	O
Chromium	0.095	0.0050	0.1	-0.000034	95	75-125	0.09399	1.07	20	
Iron	9.899	0.080	10	0.07572	98.2	75-125	9.791	1.1	20	
Lead	0.09826	0.0050	0.1	-0.000028	98.3	75-125	0.09717	1.12	20	
Magnesium	25.85	0.20	10	16.29	95.5	75-125	25.88	0.124	20	
Manganese	0.206	0.0050	0.1	0.1066	99.4	75-125	0.2055	0.236	20	
Potassium	10.12	0.20	10	0.2231	99	75-125	10.13	0.0185	20	
Selenium	0.1074	0.0050	0.1	-0.000148	108	75-125	0.1034	3.78	20	
Silver	0.08499	0.0050	0.1	0.000001	85	75-125	0.08333	1.97	20	
Sodium	105.3	0.20	10	98.52	68.1	75-125	106.6	1.17	20	SO

The following samples were analyzed in this batch:

1801157-01E 1801157-02E

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227561** Instrument ID **VMS8** Method: **SW8260B**

MBLK		Sample ID: <b>VLKW1-180105-R227561</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/5/2018 01:51 PM</b>		
Client ID:		Run ID: <b>VMS8_180105A</b>				SeqNo: <b>4840480</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
Methyl tert-butyl ether	U	1.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	3.0								
Surr: 1,2-Dichloroethane-d4	17.85	0	20	0	89.2	75-120	0			
Surr: 4-Bromofluorobenzene	17.34	0	20	0	86.7	80-110	0			
Surr: Dibromofluoromethane	18.29	0	20	0	91.4	85-115	0			
Surr: Toluene-d8	18.84	0	20	0	94.2	85-110	0			

LCS		Sample ID: <b>VLCSW1-180105-R227561</b>				Units: <b>µg/L</b>		Analysis Date: <b>1/5/2018 01:10 PM</b>		
Client ID:		Run ID: <b>VMS8_180105A</b>				SeqNo: <b>4840479</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.89	1.0	20	0	94.4	85-125	0			
Ethylbenzene	20.21	1.0	20	0	101	78-113	0			
m,p-Xylene	36.27	2.0	40	0	90.7	75-130	0			
Methyl tert-butyl ether	17.51	1.0	20	0	87.6	68-129	0			
o-Xylene	18.61	1.0	20	0	93	80-125	0			
Toluene	19.03	1.0	20	0	95.2	85-125	0			
Xylenes, Total	54.88	3.0	60	0	91.5	80-126	0			
Surr: 1,2-Dichloroethane-d4	18.91	0	20	0	94.6	75-120	0			
Surr: 4-Bromofluorobenzene	21.18	0	20	0	106	80-110	0			
Surr: Dibromofluoromethane	19.2	0	20	0	96	85-115	0			
Surr: Toluene-d8	19.63	0	20	0	98.2	85-110	0			

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC  
 Work Order: 1801157  
 Project: NPR Water

## QC BATCH REPORT

Batch ID: **R227561** Instrument ID **VMS8** Method: **SW8260B**

MS				Sample ID: 1801122-12A MS			Units: µg/L		Analysis Date: 1/5/2018 06:41 PM		
Client ID:			Run ID: VMS8_180105A			SeqNo: 4840498		Prep Date:		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	2129	100	2000	0	106	85-125	0				
Ethylbenzene	1982	100	2000	0	99.1	78-113	0				
m,p-Xylene	3863	200	4000	193	91.8	75-130	0				
Methyl tert-butyl ether	1796	100	2000	0	89.8	68-129	0				
o-Xylene	1912	100	2000	115	89.8	80-125	0				
Toluene	2032	100	2000	0	102	85-125	0				
Xylenes, Total	5775	300	6000	308	91.1	80-126	0				
Surr: 1,2-Dichloroethane-d4	2075	0	2000	0	104	75-120	0				
Surr: 4-Bromofluorobenzene	2051	0	2000	0	103	80-110	0				
Surr: Dibromofluoromethane	2108	0	2000	0	105	85-115	0				
Surr: Toluene-d8	2018	0	2000	0	101	85-110	0				

MSD				Sample ID: 1801122-12A MSD				Units: µg/L		Analysis Date: 1/5/2018 06:57 PM	
Client ID:			Run ID: VMS8_180105A			SeqNo: 4840499		Prep Date:		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1933	100	2000	0	96.6	85-125	2129	9.65	30		
Ethylbenzene	1830	100	2000	0	91.5	78-113	1982	7.97	30		
m,p-Xylene	3549	200	4000	193	83.9	75-130	3863	8.47	30		
Methyl tert-butyl ether	1800	100	2000	0	90	68-129	1796	0.222	30		
o-Xylene	1783	100	2000	115	83.4	80-125	1912	6.98	30		
Toluene	1849	100	2000	0	92.4	85-125	2032	9.43	30		
Xylenes, Total	5332	300	6000	308	83.7	80-126	5775	7.98	30		
Surr: 1,2-Dichloroethane-d4	2024	0	2000	0	101	75-120	2075	2.49	30		
Surr: 4-Bromofluorobenzene	2042	0	2000	0	102	80-110	2051	0.44	30		
Surr: Dibromofluoromethane	2063	0	2000	0	103	85-115	2108	2.16	30		
Surr: Toluene-d8	1970	0	2000	0	98.5	85-110	2018	2.41	30		

The following samples were analyzed in this batch:

1801157-01B 1801157-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC  
 Work Order: 1801157  
 Project: NPR Water

## QC BATCH REPORT

Batch ID: **R227808a** Instrument ID **VMS9** Method: **SW8260B**

MBLK				Sample ID: VBLKW1-180108-R227808a				Units: µg/L			Analysis Date: 1/8/2018 03:37 PM		
Client ID:			Run ID: VMS9_180108A				SeqNo: 4842073			Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Benzene	U	1.0											
Ethylbenzene	U	1.0											
m,p-Xylene	U	2.0											
Methyl tert-butyl ether	U	1.0											
o-Xylene	U	1.0											
Toluene	U	1.0											
Xylenes, Total	U	3.0											
Surr: 1,2-Dichloroethane-d4	20.28	0	20	0	101	75-120		0					
Surr: 4-Bromofluorobenzene	19.77	0	20	0	98.8	80-110		0					
Surr: Dibromofluoromethane	19.95	0	20	0	99.8	85-115		0					
Surr: Toluene-d8	20.05	0	20	0	100	85-110		0					

LCS				Sample ID: VLCSW1-180108-R227808a				Units: µg/L		Analysis Date: 1/8/2018 02:36 PM		
Client ID:			Run ID: VMS9_180108A			SeqNo: 4842072		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
Benzene	19.46	1.0	20	0	97.3	85-125	0					
Ethylbenzene	17.82	1.0	20	0	89.1	78-113	0					
m,p-Xylene	35.63	2.0	40	0	89.1	75-130	0					
Methyl tert-butyl ether	17.59	1.0	20	0	88	68-129	0					
o-Xylene	17.73	1.0	20	0	88.6	80-125	0					
Toluene	17.99	1.0	20	0	90	85-125	0					
Xylenes, Total	53.36	3.0	60	0	88.9	80-126	0					
Surr: 1,2-Dichloroethane-d4	19.68	0	20	0	98.4	75-120	0					
Surr: 4-Bromofluorobenzene	20.19	0	20	0	101	80-110	0					
Surr: Dibromofluoromethane	21.23	0	20	0	106	85-115	0					
Surr: Toluene-d8	20.26	0	20	0	101	85-110	0					

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC  
 Work Order: 1801157  
 Project: NPR Water

## QC BATCH REPORT

Batch ID: **R227808a** Instrument ID **VMS9** Method: **SW8260B**

MS				Sample ID: 1801142-12A MS			Units: µg/L		Analysis Date: 1/9/2018 12:03 PM		
Client ID:		Run ID: VMS9_180108A			SeqNo: 4842086		Prep Date:		DF: 500		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	6045	500	6000	0	101	85-125	0				
Ethylbenzene	5520	500	6000	0	92	78-113	0				
m,p-Xylene	10960	1,000	12000	0	91.3	75-130	0				
Methyl tert-butyl ether	5920	500	6000	0	98.7	68-129	0				
o-Xylene	5415	500	6000	0	90.2	80-125	0				
Toluene	5755	500	6000	0	95.9	85-125	0				
Xylenes, Total	16380	1,500	18000	0	91	80-126	0				
Surr: 1,2-Dichloroethane-d4	10270	0	10000	0	103	75-120	0				
Surr: 4-Bromofluorobenzene	9805	0	10000	0	98	80-110	0				
Surr: Dibromofluoromethane	10440	0	10000	0	104	85-115	0				
Surr: Toluene-d8	10080	0	10000	0	101	85-110	0				

MSD				Sample ID: 1801142-12A MSD			Units: µg/L		Analysis Date: 1/9/2018 12:27 PM		
Client ID:			Run ID: VMS9_180108A			SeqNo: 4842087		Prep Date:		DF: 500	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	6970	500	6000	0	116	85-125	6045	14.2	30		
Ethylbenzene	6275	500	6000	0	105	78-113	5520	12.8	30		
m,p-Xylene	12800	1,000	12000	0	107	75-130	10960	15.5	30		
Methyl tert-butyl ether	6575	500	6000	0	110	68-129	5920	10.5	30		
o-Xylene	6355	500	6000	0	106	80-125	5415	16	30		
Toluene	6545	500	6000	0	109	85-125	5755	12.8	30		
Xylenes, Total	19160	1,500	18000	0	106	80-126	16380	15.6	30		
Surr: 1,2-Dichloroethane-d4	10170	0	10000	0	102	75-120	10270	0.978	30		
Surr: 4-Bromofluorobenzene	9985	0	10000	0	99.8	80-110	9805	1.82	30		
Surr: Dibromofluoromethane	10600	0	10000	0	106	85-115	10440	1.47	30		
Surr: Toluene-d8	10030	0	10000	0	100	85-110	10080	0.448	30		

The following samples were analyzed in this batch:

1801157-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **112594** Instrument ID **LACHAT2** Method: **A4500-NH3 G-11**

<b>MBLK</b>		Sample ID: <b>MBLK-112594-112594</b>				Units: <b>mg NH3-N/L</b>		Analysis Date: <b>1/5/2018 10:53 AM</b>		
Client ID:		Run ID: <b>LACHAT2_180105F</b>		SeqNo: <b>4840239</b>		Prep Date: <b>1/5/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ammonia as Nitrogen U 0.15

<b>LCS</b>		Sample ID: <b>LCS-112594-112594</b>				Units: <b>mg NH3-N/L</b>		Analysis Date: <b>1/5/2018 10:53 AM</b>		
Client ID:		Run ID: <b>LACHAT2_180105F</b>		SeqNo: <b>4840251</b>		Prep Date: <b>1/5/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ammonia as Nitrogen 1.086 0.15 1 0 109 80-120 0

<b>MS</b>		Sample ID: <b>1801018-34A MS</b>				Units: <b>mg NH3-N/L</b>		Analysis Date: <b>1/5/2018 10:53 AM</b>		
Client ID:		Run ID: <b>LACHAT2_180105F</b>		SeqNo: <b>4840242</b>		Prep Date: <b>1/5/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ammonia as Nitrogen 1.297 0.15 1 0.1883 111 75-125 0

<b>MSD</b>		Sample ID: <b>1801018-34A MSD</b>				Units: <b>mg NH3-N/L</b>		Analysis Date: <b>1/5/2018 10:53 AM</b>		
Client ID:		Run ID: <b>LACHAT2_180105F</b>		SeqNo: <b>4840243</b>		Prep Date: <b>1/5/2018</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ammonia as Nitrogen 1.285 0.15 1 0.1883 110 75-125 1.297 0.93 25

The following samples were analyzed in this batch:

1801157-01F 1801157-02F

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Caerus Oil and Gas LLC  
 Work Order: 1801157  
 Project: NPR Water

## QC BATCH REPORT

Batch ID: 112656 Instrument ID TDS Method: A2540 C-11

<b>MBLK</b>		Sample ID: <b>MBLK-112656-112656</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 01:57 PM</b>		
Client ID:		Run ID: <b>TDS_180109A</b>				SeqNo: <b>4842519</b>		Prep Date: <b>1/9/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids U 10

<b>LCS</b>		Sample ID: <b>LCS-112656-112656</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 01:57 PM</b>		
Client ID:		Run ID: <b>TDS_180109A</b>				SeqNo: <b>4842518</b>		Prep Date: <b>1/9/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 486 10 495 0 98.2 80-120 0

<b>DUP</b>		Sample ID: <b>1801157-01H DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 01:57 PM</b>		
Client ID: <b>20180103-NPR3WW</b>		Run ID: <b>TDS_180109A</b>				SeqNo: <b>4842498</b>		Prep Date: <b>1/9/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 437 10 0 0 0 0-0 430 1.61 10

<b>DUP</b>		Sample ID: <b>1801157-02H DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 01:57 PM</b>		
Client ID: <b>20180103-NPR12ST</b>		Run ID: <b>TDS_180109A</b>				SeqNo: <b>4842500</b>		Prep Date: <b>1/9/2018</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total Dissolved Solids 454 10 0 0 0 0-0 461 1.53 10

The following samples were analyzed in this batch:

1801157-01H 1801157-02H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227652** Instrument ID **WETCHEM** Method: **A4500-NO2 B-11**

<b>MBLK</b>		Sample ID: <b>MB-R227652-R227652</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 12:25 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180104I</b>		SeqNo: <b>4838296</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrite U 0.020

<b>LCS</b>		Sample ID: <b>LCS-R227652-R227652</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 12:25 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180104I</b>		SeqNo: <b>4838297</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrite 0.2008 0.020 0.2 0 100 80-120 0

<b>MS</b>		Sample ID: <b>1801011-05C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 12:25 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180104I</b>		SeqNo: <b>4838299</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrite 0.4047 0.020 0.2 0.2322 86.2 75-125 0 E

<b>MSD</b>		Sample ID: <b>1801011-05C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 12:25 PM</b>		
Client ID:		Run ID: <b>WETCHEM_180104I</b>		SeqNo: <b>4838300</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrite 0.4023 0.020 0.2 0.2322 85 75-125 0.4047 0.595 20 E

The following samples were analyzed in this batch:

1801157-01D 1801157-02D

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC

**Work Order:** 1801157

**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227661b** Instrument ID **Titration 1** Method: **SW9040C**

<b>LCS</b>		Sample ID: <b>WLCSW1-180104-R227661b</b>				Units: <b>s.u.</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104C</b>				SeqNo: <b>4838442</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	4.42	0.10	4.4	0	100	90-110	0			

**The following samples were analyzed in this batch:**

1801157-01H 1801157-02H

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227662a** Instrument ID **Titrator 1** Method: **A2510 B-11**

<b>MBLK</b>		Sample ID: <b>WBLKW1-180104-R227662a</b>				Units: <b>µmhos/cm</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104D</b>				SeqNo: <b>4838450</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Specific Conductance U 5.0

<b>DUP</b>		Sample ID: <b>1801114-01A DUP</b>				Units: <b>µmhos/cm</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104D</b>				SeqNo: <b>4838455</b>		Prep Date:		DF: <b>250</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Specific Conductance 575600 1,200 0 0 0 0-0 575600 0 5

<b>LCS1</b>		Sample ID: <b>WLCS1W1-180104-R227662a</b>				Units: <b>µmhos/cm</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104D</b>				SeqNo: <b>4838451</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Specific Conductance 14.72 5.0 14.9 0 98.8 85-107 0

<b>LCS2</b>		Sample ID: <b>WLCS2W1-180104-R227662a</b>				Units: <b>µmhos/cm</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104D</b>				SeqNo: <b>4838452</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Specific Conductance 577.2 5.0 592 0 97.5 85-107 0

The following samples were analyzed in this batch:

1801157-01H 1801157-02H

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227663** Instrument ID **Titrator 1** Method: **A2320 B-11**

<b>MBLK</b>		Sample ID: <b>WBLKW1-180104-R227663</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104E</b>				SeqNo: <b>4838467</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (as CaCO3)	U	10								
Alkalinity, Carbonate (as CaCO3)	U	10								
Alkalinity, Total (as CaCO3)	U	10								

<b>LCS</b>		Sample ID: <b>WLCSW1-180104-R227663</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104E</b>				SeqNo: <b>4838468</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (as CaCO3)	912.5	10	925	0	98.6	85-110	0			
Alkalinity, Total (as CaCO3)	976.6	10	1000	0	97.7	86-104	0			

<b>DUP</b>		Sample ID: <b>1801114-01A DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 05:40 PM</b>		
Client ID:		Run ID: <b>TITRATOR 1_180104E</b>				SeqNo: <b>4838471</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (as CaCO3)	33.07	10	0	0	0		31.67	4.32	20	
Alkalinity, Carbonate (as CaCO3)	U	10	0	0	0		0	0	20	
Alkalinity, Total (as CaCO3)	33.07	10	0	0	0		31.67	4.32	20	

The following samples were analyzed in this batch:

1801157-01G	1801157-02G
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

# QC BATCH REPORT

Batch ID: **R227696**      Instrument ID **IC4**      Method: **SW9056A**

<b>MBLK</b>		Sample ID: <b>CCB/MBLK-R227696</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 02:44 PM</b>		
Client ID:		Run ID: <b>IC4_180104B</b>				SeqNo: <b>4839267</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	U	0.20								
Chloride	0.4304	1.0								J
Fluoride	U	0.10								
Sulfate	U	1.0								

<b>LCS</b>		Sample ID: <b>LCS-R227696</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 06:12 PM</b>		
Client ID:		Run ID: <b>IC4_180104B</b>				SeqNo: <b>4839268</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.021	0.20	2	0	101	88-113	0			
Chloride	9.662	1.0	10	0	96.6	88-110	0			
Fluoride	1.914	0.10	2	0	95.7	86-111	0			
Sulfate	9.734	1.0	10	0	97.3	85-110	0			

<b>MS</b>		Sample ID: <b>1801111-01D MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 08:27 PM</b>		
Client ID:		Run ID: <b>IC4_180104B</b>				SeqNo: <b>4839275</b>		Prep Date:		DF: <b>4</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.065	0.80	2	0	103	75-125	0			
Chloride	16.08	4.0	10	7.382	87	75-125	0			
Fluoride	2.625	0.40	2	0.5868	102	75-125	0			
Sulfate	57.66	4.0	10	47.29	104	75-125	0			O

<b>MSD</b>		Sample ID: <b>1801111-01D MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/4/2018 08:46 PM</b>		
Client ID:		Run ID: <b>IC4_180104B</b>				SeqNo: <b>4839276</b>		Prep Date:		DF: <b>4</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.132	0.80	2	0	107	75-125	2.065	3.18	20	
Chloride	16.28	4.0	10	7.382	89	75-125	16.08	1.23	20	
Fluoride	2.587	0.40	2	0.5868	100	75-125	2.625	1.44	20	
Sulfate	56.49	4.0	10	47.29	92	75-125	57.66	2.05	20	O

The following samples were analyzed in this batch:      1801157-01D      1801157-02D

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

## QC BATCH REPORT

Batch ID: **R227868** Instrument ID **WETCHEM** Method: **E376.1**

<b>MBLK</b>		Sample ID: <b>MB-R227868-R227868</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 08:45 AM</b>		
Client ID:		Run ID: <b>WETCHEM_180109F</b>		SeqNo: <b>4842520</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	1.0								

<b>LCS</b>		Sample ID: <b>LCS-R227868-R227868</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/9/2018 08:45 AM</b>		
Client ID:		Run ID: <b>WETCHEM_180109F</b>		SeqNo: <b>4842521</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	7.44	1.0	10.75	0	69.2	60-140	0			

The following samples were analyzed in this batch:

1801157-01C 1801157-02C

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Caerus Oil and Gas LLC  
**Work Order:** 1801157  
**Project:** NPR Water

# QC BATCH REPORT

Batch ID: **R228002A**      Instrument ID **LACHAT2**      Method: **E353.2 R2.0**

<b>MBLK</b>		Sample ID: <b>MBLK-R228002A</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845192</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      U      0.020

<b>LCS</b>		Sample ID: <b>LCS-R228002A</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845193</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      5.142      0.020      5      0      103      90-110      0

<b>MS</b>		Sample ID: <b>1801011-06A MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845196</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      8.982      0.020      5      4.69      85.8      90-110      0      S

<b>MS</b>		Sample ID: <b>1801196-06F MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845210</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      5.815      0.020      5      1.097      94.4      90-110      0

<b>MSD</b>		Sample ID: <b>1801011-06A MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845197</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      8.953      0.020      5      4.69      85.3      90-110      8.982      0.323      20      S

<b>MSD</b>		Sample ID: <b>1801196-06F MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>1/10/2018 02:58 PM</b>		
Client ID:		Run ID: <b>LACHAT2_180110C</b>				SeqNo: <b>4845211</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Nitrogen, Nitrate      5.813      0.020      5      1.097      94.3      90-110      5.815      0.0344      20

The following samples were analyzed in this batch:

1801157-01F

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.





Sample Receipt Checklist

Client Name: **CAERUS**

Date/Time Received: **04-Jan-18 10:30**

Work Order: **1801157**

Received by: **DS**

Checklist completed by Diane Shaw 04-Jan-18  
eSignature Date

Reviewed by: Chad Whelton 05-Jan-18  
eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>3.0/3.0 c</u> <u>SR2</u>		
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>1/4/2018 4:07:49 PM</u>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

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Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: