

CAERUS PICEANCE, LLC
Piceance Basin, Colorado

Drill Cuttings Waste Management Plan

This Waste Management Plan (WMP) outlines the operational requirements to be followed by Caerus Piceance, LLC (Caerus) when hauling drill cuttings (cuttings) created at the North Parachute Ranch UWF H04 596 well pad (COGCC Location ID 335907) (Drill Pad) to the Cuttings Area UWF H04 596 location (COGCC Location ID 433573) (Cuttings Vault).

No other waste will be stored or managed at the Cuttings Vault except for cuttings directly associated with the above-mentioned processes. Any changes made to this WMP will be provided to the Colorado Oil and Gas Conservation Commission (COGCC) via a Sundry Notice.

Transportation Operations to Cuttings Area UWF H04 596

Prior to leaving the Drill Pad, the cuttings will be dehydrated with amendments designed to dry out the cuttings to prevent accumulation of liquids greater than de minimis amounts. These cuttings will then be transported to the Cuttings Vault by contractors hired by Caerus. Personnel designated to handle these cuttings will be trained and informed of the nature and risks posed by this type of waste. In addition, these individuals shall be required to wear appropriate personal protective equipment while handling the cuttings. All employees involved with the handling of the cuttings will be trained to understand and implement the WMP components that are relevant to their responsibilities.

Any spills or releases occurring during transport will be reported to Caerus environmental staff immediately. Contractors hired to transport the cuttings to the Cuttings Vault will not be responsible for reporting spills or releases to the COGCC. This will be the responsibility of Caerus environmental staff.

Soil Sampling and Remediation

Once the cuttings have been transported to the Cuttings Vault, the cuttings will be staged there until all wells have been drilled on the Drill Pad. Once all wells have been drilled, the cuttings will be sampled for all constituents listed in COGCC Table 910-1. An initial baseline sampling event was conducted on April 9, 2018. The analytical results of that sampling event are attached to this document. The report includes sample results from the stockpiled cuttings material (20180409-H04-Cut1) and samples collected from the path of surface flow (20180409-H04-Cut2 and 20180409-H04-Cut3) downgradient of the stockpiled cuttings material.

All cuttings that do not meet Concentration Levels listed in COGCC Table 910-1 will be remediated to comply with COGCC Rule 907.e.(2)E. All personnel responsible for handling the cuttings, including those eventually responsible for reclaiming the Cuttings Vault, will be trained and made aware of this stipulation. Reclamation of the Cuttings Vault will not occur until all cuttings are compliant with COGCC Table 910-1 Concentration Levels.

Until all cuttings are deemed compliant with COGCC Table 910-1 Concentration Levels, the moisture content of cuttings being staged within the Cuttings Vault will be assessed at least monthly. If the moisture content of any cuttings is elevated enough to cause residual fluid originating within the cuttings to flow down the surface of the Cuttings Vault, then soil samples will be collected along the path of surface flow. These soil samples will be submitted for laboratory analysis of constituents listed in Table 910-1. Soil represented by soil samples that do not comply with COGCC Table 910-1 Concentration Levels will be remediated. Any free oil observed during these assessments will be removed from the Cuttings Vault.



20-Apr-2018

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

Re: **H04 Cuttings**

Work Order: **1804484**

Dear Jake,

ALS Environmental received 3 samples on 10-Apr-2018 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland 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:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

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

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

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Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Work Order: 1804484

Work Order Sample Summary

<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>
1804484-01	20180409-H04-Cut1	Soil		4/9/2018 13:00	4/10/2018 09:00	<input type="checkbox"/>
1804484-02	20180409-H04-Cut2	Soil		4/9/2018 13:10	4/10/2018 09:00	<input type="checkbox"/>
1804484-03	20180409-H04-Cut3	Soil		4/9/2018 13:20	4/10/2018 09:00	<input type="checkbox"/>

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Work Order: 1804484

Case Narrative

Batch 116664, Method ICP_6010_S, Sample 1804484-03A MS/MSD: The MS/MSD recovery was outside of the control limit for Barium; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required.

Batch 116664, Method ICP_6010_S, Sample 1804484-03A MSD: The MSD recovery was below the lower control limit for Lead. However, the MS recovery and the RPD between the MS and MSD were within control limits. No qualification is required.

Batch 116727, Method DRLVI_8015_S, Sample 1804484-01A: DRO surrogate recovery high due to matrix interference.

Batch 116849, Method CR6_7196_S, Sample 1804484-01A MS/MSD: The MS/MSD recovery was below the lower control limit for Hexavalent Chromium. The corresponding result in the parent sample may be biased low.

VOC and GRO samples were not preserved within 2 days of the collection date.

<u>Qualifier</u>	<u>Description</u>
*	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.

<u>Acronym</u>	<u>Description</u>
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

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
mg/Kg	Milligrams per Kilogram
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	
s.u.	Standard Units

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut1
Collection Date: 4/9/2018 01:00 PM

Work Order: 1804484
Lab ID: 1804484-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
			Method: SW8015C		Prep: SW3546 / 4/12/18		Analyst: MEB
DRO (C10-C28)	78		3.6	6.2	mg/Kg-dry	1	4/12/2018 17:57
Surr: 4-Terphenyl-d14	151	S		34-130	%REC	1	4/12/2018 17:57
GASOLINE RANGE ORGANICS BY GC-FID							
			Method: SW8015D		Prep: SW5035 / 4/11/18		Analyst: MEB
GRO (C6-C10)	82		3.2	7.7	mg/Kg	1	4/14/2018 19:07
Surr: Toluene-d8	79.9			71-123	%REC	1	4/14/2018 19:07
MERCURY BY CVAA							
			Method: SW7471B		Prep: SW7471 / 4/16/18		Analyst: RSB
Mercury	0.048		0.0023	0.023	mg/Kg-dry	1	4/19/2018 17:35
METALS ANALYSIS BY ICP							
			Method: SW846 6010C		Prep: SW3050B / 4/11/18		Analyst: HBA
Arsenic	5.5		0.11	0.43	mg/Kg-dry	1	4/11/2018 20:36
Barium	2,100		0.17	0.43	mg/Kg-dry	1	4/11/2018 20:36
Cadmium	0.20	J	0.041	0.86	mg/Kg-dry	1	4/11/2018 20:36
Chromium	35		0.024	0.43	mg/Kg-dry	1	4/11/2018 20:36
Copper	39		0.19	0.86	mg/Kg-dry	1	4/11/2018 20:36
Lead	12		0.091	0.43	mg/Kg-dry	1	4/11/2018 20:36
Nickel	18		0.17	0.43	mg/Kg-dry	1	4/11/2018 20:36
Selenium	3.6		0.24	0.86	mg/Kg-dry	1	4/11/2018 20:36
Silver	U		0.053	0.43	mg/Kg-dry	1	4/11/2018 20:36
Zinc	66		0.068	0.86	mg/Kg-dry	1	4/11/2018 20:36
SOLUBLE CATIONS FOR SAR							
			Method: SW6020A		Prep: USDA Method 20B / 4/12/18		Analyst: JF
Calcium	72		0.86	5.0	mg/L	10	4/12/2018 13:50
Magnesium	7.0		0.068	2.0	mg/L	10	4/12/2018 13:50
Sodium	1,300		0.34	2.0	mg/L	10	4/12/2018 13:50
SODIUM ADSORPTION RATIO							
			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: RH
Sodium Adsorption Ratio	39		0.010	0.010	none	1	4/12/2018
SEMI-VOLATILE ORGANIC COMPOUNDS							
			Method: SW846 8270D		Prep: SW3546 / 4/12/18		Analyst: RM
Acenaphthene	U		0.0037	0.052	mg/Kg-dry	1	4/12/2018 19:28
Anthracene	U		0.0019	0.052	mg/Kg-dry	1	4/12/2018 19:28
Benzo(a)anthracene	U		0.0032	0.052	mg/Kg-dry	1	4/12/2018 19:28
Benzo(a)pyrene	U		0.0013	0.052	mg/Kg-dry	1	4/12/2018 19:28
Benzo(b)fluoranthene	U		0.0020	0.052	mg/Kg-dry	1	4/12/2018 19:28
Benzo(k)fluoranthene	U		0.0027	0.052	mg/Kg-dry	1	4/12/2018 19:28
Chrysene	U		0.0020	0.052	mg/Kg-dry	1	4/12/2018 19:28
Dibenzo(a,h)anthracene	U		0.0017	0.052	mg/Kg-dry	1	4/12/2018 19:28
Fluoranthene	U		0.0015	0.052	mg/Kg-dry	1	4/12/2018 19:28

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

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut1
Collection Date: 4/9/2018 01:00 PM

Work Order: 1804484
Lab ID: 1804484-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0017	0.052	mg/Kg-dry	1	4/12/2018 19:28
Indeno(1,2,3-cd)pyrene	U		0.0016	0.052	mg/Kg-dry	1	4/12/2018 19:28
Naphthalene	0.19		0.0098	0.052	mg/Kg-dry	1	4/12/2018 19:28
Pyrene	U		0.0019	0.052	mg/Kg-dry	1	4/12/2018 19:28
Surr: 2-Fluorobiphenyl	46.7			20-140	%REC	1	4/12/2018 19:28
Surr: 4-Terphenyl-d14	49.1			22-172	%REC	1	4/12/2018 19:28
Surr: Nitrobenzene-d5	57.0			28-140	%REC	1	4/12/2018 19:28
VOLATILE ORGANIC COMPOUNDS			Method: SW8260B		Prep: SW5035 / 4/11/18		Analyst: LSY
Benzene	3.1		0.0079	0.046	mg/Kg	1	4/12/2018 12:45
Ethylbenzene	0.20		0.0097	0.046	mg/Kg	1	4/12/2018 12:45
m,p-Xylene	1.9		0.022	0.092	mg/Kg	1	4/12/2018 12:45
o-Xylene	0.26		0.018	0.046	mg/Kg	1	4/12/2018 12:45
Toluene	4.6		0.013	0.046	mg/Kg	1	4/12/2018 12:45
Xylenes, Total	2.2		0.040	0.14	mg/Kg	1	4/12/2018 12:45
Surr: 1,2-Dichloroethane-d4	100			70-130	%REC	1	4/12/2018 12:45
Surr: 4-Bromofluorobenzene	99.3			70-130	%REC	1	4/12/2018 12:45
Surr: Dibromofluoromethane	99.0			70-130	%REC	1	4/12/2018 12:45
Surr: Toluene-d8	99.8			70-130	%REC	1	4/12/2018 12:45
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: ED
Electrical Conductivity @ Saturation	6.9		0.011	0.10	mmhos/cm @25°	20	4/12/2018 21:50
CHROMIUM, TRIVALENT			Method: CALCULATION				Analyst: JB
Chromium, Trivalent	35		0.39	1.3	mg/Kg-dry	1	4/17/2018 08:00
CHROMIUM, HEXAVALENT			Method: SW7196A		Prep: SW3060A / 4/13/18		Analyst: RP
Chromium, Hexavalent	U		0.36	1.2	mg/Kg-dry	1	4/16/2018 12:45
MOISTURE			Method: SW3550C				Analyst: NW
Moisture	21		0.025	0.050	% of sample	1	4/11/2018 18:20
PH			Method: SW9045D		Prep: EXTRACT / 4/12/18		Analyst: RZM
pH	8.75		0.10	0.100	s.u.	1	4/13/2018 11:00

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

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut2
Collection Date: 4/9/2018 01:10 PM

Work Order: 1804484
Lab ID: 1804484-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
			Method: SW8015C		Prep: SW3546 / 4/12/18		Analyst: MEB
DRO (C10-C28)	270		3.5	6.1	mg/Kg-dry	1	4/12/2018 18:26
Surr: 4-Terphenyl-d14	46.5			34-130	%REC	1	4/12/2018 18:26
GASOLINE RANGE ORGANICS BY GC-FID							
			Method: SW8015D		Prep: SW5035 / 4/11/18		Analyst: MEB
GRO (C6-C10)	52		3.1	7.3	mg/Kg	1	4/14/2018 19:33
Surr: Toluene-d8	81.6			71-123	%REC	1	4/14/2018 19:33
MERCURY BY CVAA							
			Method: SW7471B		Prep: SW7471 / 4/16/18		Analyst: RSB
Mercury	0.062		0.0021	0.021	mg/Kg-dry	1	4/19/2018 17:38
METALS ANALYSIS BY ICP							
			Method: SW846 6010C		Prep: SW3050B / 4/11/18		Analyst: HBA
Arsenic	9.3		0.13	0.48	mg/Kg-dry	1	4/11/2018 20:43
Barium	1,800		0.19	0.48	mg/Kg-dry	1	4/11/2018 20:43
Cadmium	0.26	J	0.046	0.97	mg/Kg-dry	1	4/11/2018 20:43
Chromium	25		0.027	0.48	mg/Kg-dry	1	4/11/2018 20:43
Copper	39		0.21	0.97	mg/Kg-dry	1	4/11/2018 20:43
Lead	12		0.10	0.48	mg/Kg-dry	1	4/11/2018 20:43
Nickel	14		0.19	0.48	mg/Kg-dry	1	4/11/2018 20:43
Selenium	4.2		0.27	0.97	mg/Kg-dry	1	4/11/2018 20:43
Silver	U		0.060	0.48	mg/Kg-dry	1	4/11/2018 20:43
Zinc	57		0.077	0.97	mg/Kg-dry	1	4/11/2018 20:43
SOLUBLE CATIONS FOR SAR							
			Method: SW6020A		Prep: USDA Method 20B / 4/12/18		Analyst: JF
Calcium	110		0.86	5.0	mg/L	10	4/12/2018 13:51
Magnesium	11		0.068	2.0	mg/L	10	4/12/2018 13:51
Sodium	1,500		0.34	2.0	mg/L	10	4/12/2018 13:51
SODIUM ADSORPTION RATIO							
			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: RH
Sodium Adsorption Ratio	36		0.010	0.010	none	1	4/12/2018
SEMI-VOLATILE ORGANIC COMPOUNDS							
			Method: SW846 8270D		Prep: SW3546 / 4/12/18		Analyst: RM
Acenaphthene	U		0.0036	0.051	mg/Kg-dry	1	4/12/2018 19:42
Anthracene	U		0.0018	0.051	mg/Kg-dry	1	4/12/2018 19:42
Benzo(a)anthracene	U		0.0031	0.051	mg/Kg-dry	1	4/12/2018 19:42
Benzo(a)pyrene	U		0.0013	0.051	mg/Kg-dry	1	4/12/2018 19:42
Benzo(b)fluoranthene	U		0.0019	0.051	mg/Kg-dry	1	4/12/2018 19:42
Benzo(k)fluoranthene	U		0.0026	0.051	mg/Kg-dry	1	4/12/2018 19:42
Chrysene	U		0.0019	0.051	mg/Kg-dry	1	4/12/2018 19:42
Dibenzo(a,h)anthracene	U		0.0017	0.051	mg/Kg-dry	1	4/12/2018 19:42
Fluoranthene	U		0.0015	0.051	mg/Kg-dry	1	4/12/2018 19:42

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

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut2
Collection Date: 4/9/2018 01:10 PM

Work Order: 1804484
Lab ID: 1804484-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0017	0.051	mg/Kg-dry	1	4/12/2018 19:42
Indeno(1,2,3-cd)pyrene	U		0.0016	0.051	mg/Kg-dry	1	4/12/2018 19:42
Naphthalene	0.24		0.0095	0.051	mg/Kg-dry	1	4/12/2018 19:42
Pyrene	U		0.0018	0.051	mg/Kg-dry	1	4/12/2018 19:42
Surr: 2-Fluorobiphenyl	54.8			20-140	%REC	1	4/12/2018 19:42
Surr: 4-Terphenyl-d14	57.3			22-172	%REC	1	4/12/2018 19:42
Surr: Nitrobenzene-d5	68.9			28-140	%REC	1	4/12/2018 19:42
VOLATILE ORGANIC COMPOUNDS			Method: SW8260B		Prep: SW5035 / 4/11/18		Analyst: LSY
Benzene	U		0.0075	0.044	mg/Kg	1	4/12/2018 13:00
Ethylbenzene	U		0.0093	0.044	mg/Kg	1	4/12/2018 13:00
m,p-Xylene	0.046	J	0.021	0.088	mg/Kg	1	4/12/2018 13:00
o-Xylene	U		0.017	0.044	mg/Kg	1	4/12/2018 13:00
Toluene	0.021	J	0.012	0.044	mg/Kg	1	4/12/2018 13:00
Xylenes, Total	0.046	J	0.038	0.13	mg/Kg	1	4/12/2018 13:00
Surr: 1,2-Dichloroethane-d4	98.9			70-130	%REC	1	4/12/2018 13:00
Surr: 4-Bromofluorobenzene	101			70-130	%REC	1	4/12/2018 13:00
Surr: Dibromofluoromethane	96.6			70-130	%REC	1	4/12/2018 13:00
Surr: Toluene-d8	104			70-130	%REC	1	4/12/2018 13:00
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: ED
Electrical Conductivity @ Saturation	8.6		0.011	0.10	mmhos/cm @25°	20	4/12/2018 21:50
CHROMIUM, TRIVALENT			Method: CALCULATION				Analyst: JB
Chromium, Trivalent	25		0.38	1.2	mg/Kg-dry	1	4/17/2018 08:00
CHROMIUM, HEXAVALENT			Method: SW7196A		Prep: SW3060A / 4/13/18		Analyst: RP
Chromium, Hexavalent	U		0.35	1.1	mg/Kg-dry	1	4/16/2018 12:45
MOISTURE			Method: SW3550C				Analyst: NW
Moisture	19		0.025	0.050	% of sample	1	4/11/2018 18:20
PH			Method: SW9045D		Prep: EXTRACT / 4/12/18		Analyst: RZM
pH	9.75		0.10	0.100	s.u.	1	4/13/2018 11:00

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

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut3
Collection Date: 4/9/2018 01:20 PM

Work Order: 1804484
Lab ID: 1804484-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
			Method: SW8015C		Prep: SW3546 / 4/12/18		Analyst: MEB
DRO (C10-C28)	81		4.0	6.9	mg/Kg-dry	1	4/12/2018 18:55
Surr: 4-Terphenyl-d14	53.1			34-130	%REC	1	4/12/2018 18:55
GASOLINE RANGE ORGANICS BY GC-FID							
			Method: SW8015D		Prep: SW5035 / 4/11/18		Analyst: MEB
GRO (C6-C10)	50		3.8	9.1	mg/Kg	1	4/14/2018 19:59
Surr: Toluene-d8	82.6			71-123	%REC	1	4/14/2018 19:59
MERCURY BY CVAA							
			Method: SW7471B		Prep: SW7471 / 4/16/18		Analyst: RSH
Mercury	0.043		0.0024	0.024	mg/Kg-dry	1	4/19/2018 17:42
METALS ANALYSIS BY ICP							
			Method: SW846 6010C		Prep: SW3050B / 4/11/18		Analyst: HBA
Arsenic	6.6		0.13	0.50	mg/Kg-dry	1	4/11/2018 14:22
Barium	700		0.20	0.50	mg/Kg-dry	1	4/11/2018 14:22
Cadmium	0.083	J	0.048	1.0	mg/Kg-dry	1	4/11/2018 14:22
Chromium	40		0.028	0.50	mg/Kg-dry	1	4/11/2018 14:22
Copper	17		0.22	1.0	mg/Kg-dry	1	4/11/2018 14:22
Lead	8.0		0.11	0.50	mg/Kg-dry	1	4/11/2018 14:22
Nickel	18		0.20	0.50	mg/Kg-dry	1	4/11/2018 14:22
Selenium	4.6		0.28	1.0	mg/Kg-dry	1	4/11/2018 14:22
Silver	U		0.062	0.50	mg/Kg-dry	1	4/11/2018 14:22
Zinc	46		0.080	1.0	mg/Kg-dry	1	4/11/2018 14:22
SOLUBLE CATIONS FOR SAR							
			Method: SW6020A		Prep: USDA Method 20B / 4/12/18		Analyst: JF
Calcium	400		0.86	5.0	mg/L	10	4/12/2018 13:58
Magnesium	41		0.068	2.0	mg/L	10	4/12/2018 13:58
Sodium	1,300		0.34	2.0	mg/L	10	4/12/2018 13:58
SODIUM ADSORPTION RATIO							
			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: RH
Sodium Adsorption Ratio	16		0.010	0.010	none	1	4/12/2018
SEMI-VOLATILE ORGANIC COMPOUNDS							
			Method: SW846 8270D		Prep: SW3546 / 4/12/18		Analyst: RM
Acenaphthene	U		0.0041	0.057	mg/Kg-dry	1	4/12/2018 19:56
Anthracene	U		0.0021	0.057	mg/Kg-dry	1	4/12/2018 19:56
Benzo(a)anthracene	U		0.0035	0.057	mg/Kg-dry	1	4/12/2018 19:56
Benzo(a)pyrene	U		0.0014	0.057	mg/Kg-dry	1	4/12/2018 19:56
Benzo(b)fluoranthene	U		0.0022	0.057	mg/Kg-dry	1	4/12/2018 19:56
Benzo(k)fluoranthene	U		0.0030	0.057	mg/Kg-dry	1	4/12/2018 19:56
Chrysene	U		0.0022	0.057	mg/Kg-dry	1	4/12/2018 19:56
Dibenzo(a,h)anthracene	U		0.0019	0.057	mg/Kg-dry	1	4/12/2018 19:56
Fluoranthene	U		0.0017	0.057	mg/Kg-dry	1	4/12/2018 19:56

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

ALS Group, USA

Date: 20-Apr-18

Client: Caerus Oil and Gas LLC
Project: H04 Cuttings
Sample ID: 20180409-H04-Cut3
Collection Date: 4/9/2018 01:20 PM

Work Order: 1804484
Lab ID: 1804484-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		0.0019	0.057	mg/Kg-dry	1	4/12/2018 19:56
Indeno(1,2,3-cd)pyrene	U		0.0018	0.057	mg/Kg-dry	1	4/12/2018 19:56
Naphthalene	0.11		0.011	0.057	mg/Kg-dry	1	4/12/2018 19:56
Pyrene	U		0.0021	0.057	mg/Kg-dry	1	4/12/2018 19:56
Surr: 2-Fluorobiphenyl	76.1			20-140	%REC	1	4/12/2018 19:56
Surr: 4-Terphenyl-d14	64.1			22-172	%REC	1	4/12/2018 19:56
Surr: Nitrobenzene-d5	79.7			28-140	%REC	1	4/12/2018 19:56
VOLATILE ORGANIC COMPOUNDS			Method: SW8260B		Prep: SW5035 / 4/11/18		Analyst: LSY
Benzene	0.046	J	0.0093	0.055	mg/Kg	1	4/12/2018 13:16
Ethylbenzene	0.080		0.012	0.055	mg/Kg	1	4/12/2018 13:16
m,p-Xylene	0.25		0.026	0.11	mg/Kg	1	4/12/2018 13:16
o-Xylene	0.052	J	0.021	0.055	mg/Kg	1	4/12/2018 13:16
Toluene	0.16		0.015	0.055	mg/Kg	1	4/12/2018 13:16
Xylenes, Total	0.30		0.047	0.16	mg/Kg	1	4/12/2018 13:16
Surr: 1,2-Dichloroethane-d4	102			70-130	%REC	1	4/12/2018 13:16
Surr: 4-Bromofluorobenzene	101			70-130	%REC	1	4/12/2018 13:16
Surr: Dibromofluoromethane	94.5			70-130	%REC	1	4/12/2018 13:16
Surr: Toluene-d8	100			70-130	%REC	1	4/12/2018 13:16
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 4/12/18		Analyst: ED
Electrical Conductivity @ Saturation	9.7		0.011	0.10	mmhos/cm @25°	20	4/12/2018 21:50
CHROMIUM, TRIVALENT			Method: CALCULATION				Analyst: JB
Chromium, Trivalent	40		0.43	1.4	mg/Kg-dry	1	4/17/2018 08:00
CHROMIUM, HEXAVALENT			Method: SW7196A		Prep: SW3060A / 4/13/18		Analyst: RP
Chromium, Hexavalent	U		0.40	1.3	mg/Kg-dry	1	4/16/2018 12:45
MOISTURE			Method: SW3550C				Analyst: NW
Moisture	29		0.025	0.050	% of sample	1	4/11/2018 18:20
PH			Method: SW9045D		Prep: EXTRACT / 4/12/18		Analyst: RZM
pH	8.65		0.10	0.100	s.u.	1	4/13/2018 11:00

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116727** Instrument ID **GC8** Method: **SW8015C**

MBLK		Sample ID: DBLKS1-116727-116727				Units: mg/Kg		Analysis Date: 4/12/2018 03:01 PM		
Client ID:		Run ID: GC8_180412A				SeqNo: 4980352		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	U	5.0								
<i>Surr: 4-Terphenyl-d14</i>	2.117	0	3.33	0	63.6	34-130	0			

LCS		Sample ID: DLCSS1-116727-116727				Units: mg/Kg		Analysis Date: 4/12/2018 03:31 PM		
Client ID:		Run ID: GC8_180412A				SeqNo: 4980353		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	303.6	5.0	333	0	91.2	65-122	0			
<i>Surr: 4-Terphenyl-d14</i>	2.983	0	3.33	0	89.6	34-130	0			

MS		Sample ID: 1804605-05A MS				Units: mg/Kg		Analysis Date: 4/12/2018 04:29 PM		
Client ID:		Run ID: GC8_180412A				SeqNo: 4980355		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	312.9	4.9	326.5	0	95.8	65-122	0			
<i>Surr: 4-Terphenyl-d14</i>	3.22	0	3.265	0	98.6	34-130	0			

MSD		Sample ID: 1804605-05A MSD				Units: mg/Kg		Analysis Date: 4/12/2018 04:58 PM		
Client ID:		Run ID: GC8_180412A				SeqNo: 4980356		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	321.1	5.0	331.1	0	97	65-122	312.9	2.57	30	
<i>Surr: 4-Terphenyl-d14</i>	3.248	0	3.311	0	98.1	34-130	3.22	0.873	30	

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116691** Instrument ID **GC9** Method: **SW8015D**

MBLK		Sample ID: MBLK-116691-116691				Units: µg/Kg-dry		Analysis Date: 4/12/2018 12:17 PM		
Client ID:		Run ID: GC9_180412A				SeqNo: 4979305		Prep Date: 4/11/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	U	5,000								
Surr: Toluene-d8	5374	0	5000	0	107	71-123	0			

LCS		Sample ID: LCS-116691-116691				Units: µg/Kg-dry		Analysis Date: 4/12/2018 11:17 AM		
Client ID:		Run ID: GC9_180412A				SeqNo: 4979304		Prep Date: 4/11/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	586500	5,000	500000	0	117	71-123	0			
Surr: Toluene-d8	4606	0	5000	0	92.1	71-123	0			

MS		Sample ID: 1804541-01A MS				Units: µg/Kg-dry		Analysis Date: 4/13/2018 01:04 AM		
Client ID:		Run ID: GC9_180412A				SeqNo: 4980915		Prep Date: 4/11/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	695000	5,900	585800	56770	109	71-123	0			
Surr: Toluene-d8	5787	0	5858	0	98.8	71-123	0			

MSD		Sample ID: 1804541-01A MSD				Units: µg/Kg-dry		Analysis Date: 4/13/2018 01:34 AM		
Client ID:		Run ID: GC9_180412A				SeqNo: 4980916		Prep Date: 4/11/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	676800	5,900	585800	56770	106	71-123	695000	2.66	30	
Surr: Toluene-d8	6260	0	5858	0	107	71-123	5787	7.85	30	

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116858** Instrument ID **HG1** Method: **SW7471B**

MBLK		Sample ID: MBLK-116858-116858				Units: mg/Kg		Analysis Date: 4/19/2018 04:36 PM		
Client ID:		Run ID: HG1_180419A				SeqNo: 4990290		Prep Date: 4/16/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury U 0.020

LCS		Sample ID: LCS-116858-116858				Units: mg/Kg		Analysis Date: 4/19/2018 04:41 PM		
Client ID:		Run ID: HG1_180419A				SeqNo: 4990291		Prep Date: 4/16/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.195 0.020 0.1665 0 117 80-120 0

MS		Sample ID: 1804421-04BMS				Units: mg/Kg		Analysis Date: 4/20/2018 09:09 AM		
Client ID:		Run ID: HG1_180420A				SeqNo: 4991093		Prep Date: 4/16/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1309 0.017 0.1437 0.02947 70.6 75-125 0 S

MSD		Sample ID: 1804421-04BMSD				Units: mg/Kg		Analysis Date: 4/20/2018 09:12 AM		
Client ID:		Run ID: HG1_180420A				SeqNo: 4991094		Prep Date: 4/16/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.121 0.017 0.1448 0.02947 63.2 75-125 0.1309 7.88 35 S

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116664** Instrument ID **ICP2** Method: **SW846 6010C**

Sample ID: MBLK-116664-116664				Units: mg/Kg			Analysis Date: 4/11/2018 02:09 PM			
Client ID:		Run ID: ICP2_180411A			SeqNo: 4977020		Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								
Barium	U	0.25								
Cadmium	U	0.50								
Chromium	0.0171	0.25								J
Copper	U	0.50								
Lead	U	0.25								
Nickel	U	0.25								
Selenium	U	0.50								
Silver	U	0.25								
Zinc	U	0.50								

LCS				Sample ID: LCS-116664-116664				Units: mg/Kg			Analysis Date: 4/11/2018 02:16 PM		
Client ID:			Run ID: ICP2_180411A			SeqNo: 4977021			Prep Date: 4/11/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Arsenic	4.66	0.25	5	0	93.2	80-120	0						
Barium	4.987	0.25	5	0	99.7	80-120	0						
Cadmium	4.895	0.50	5	0	97.9	80-120	0						
Chromium	5.066	0.25	5	0	101	80-120	0						
Copper	4.82	0.50	5	0	96.4	80-120	0						
Lead	4.98	0.25	5	0	99.6	80-120	0						
Nickel	5.038	0.25	5	0	101	80-120	0						
Selenium	4.51	0.50	5	0	90.2	80-120	0						
Silver	4.775	0.25	5	0	95.5	80-120	0						
Zinc	4.848	0.50	5	0	97	80-120	0						

MS					Sample ID: 1804484-03AMS		Units: mg/Kg		Analysis Date: 4/11/2018 02:28 PM		
Client ID: 20180409-H04-Cut3			Run ID: ICP2_180411A			SeqNo: 4977024		Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	11.85	0.36	7.123	4.736	99.8	75-125	0				
Barium	385	0.36	7.123	502.1	-1640	75-125	0			SO	
Cadmium	6.66	0.71	7.123	0.05919	92.7	75-125	0				
Chromium	36.32	0.36	7.123	28.28	113	75-125	0				
Copper	19.57	0.71	7.123	12.32	102	75-125	0				
Lead	11.24	0.36	7.123	5.712	77.6	75-125	0				
Nickel	19.15	0.36	7.123	12.94	87.2	75-125	0				
Selenium	9.689	0.71	7.123	3.305	89.6	75-125	0				
Silver	7.001	0.36	7.123	-0.1197	100	75-125	0				
Zinc	40.77	0.71	7.123	32.85	111	75-125	0			O	

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116664** Instrument ID **ICP2** Method: **SW846 6010C**

MSD				Sample ID: 1804484-03AMSD			Units: mg/Kg		Analysis Date: 4/11/2018 02:34 PM		
Client ID: 20180409-H04-Cut3				Run ID: ICP2_180411A			SeqNo: 4977026		Prep Date: 4/11/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	10.86	0.36	7.153	4.736	85.6	75-125	11.85	8.68	20		
Barium	413.5	0.36	7.153	502.1	-1240	75-125	385	7.15	20	SO	
Cadmium	6.717	0.72	7.153	0.05919	93.1	75-125	6.66	0.855	20		
Chromium	35.25	0.36	7.153	28.28	97.5	75-125	36.32	2.99	20		
Copper	18.44	0.72	7.153	12.32	85.6	75-125	19.57	5.93	20		
Lead	11.03	0.36	7.153	5.712	74.4	75-125	11.24	1.87	20	S	
Nickel	18.68	0.36	7.153	12.94	80.3	75-125	19.15	2.46	20		
Selenium	9.776	0.72	7.153	3.305	90.5	75-125	9.689	0.894	20		
Silver	6.996	0.36	7.153	-0.1197	99.5	75-125	7.001	0.0817	20		
Zinc	38.7	0.72	7.153	32.85	81.9	75-125	40.77	5.21	20	O	

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116744** Instrument ID **ICPMS3** Method: **SW6020A**

DUP		Sample ID: 1804484-03ADUP				Units: mg/L		Analysis Date: 4/12/2018 02:00 PM		
Client ID: 20180409-H04-Cut3		Run ID: ICPMS3_180412A				SeqNo: 4978776		Prep Date: 4/12/2018		DF: 10
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	460.4	5.0	0	0	0	0-0	399.8	14.1		
Magnesium	45.8	2.0	0	0	0	0-0	41.01	11		
Sodium	1415	2.0	0	0	0	0-0	1259	11.7		

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

Batch ID: **116744** Instrument ID **SAR** Method: **USDA H60 Metho**

DUP		Sample ID: 1804484-03ADUP				Units: none		Analysis Date: 4/12/2018		
Client ID: 20180409-H04-Cut3		Run ID: SAR_180412A				SeqNo: 4980154		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	16.83	0.010	0	0	0		16.04	4.83	50	

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

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

Client: Caerus Oil and Gas LLC
 Work Order: 1804484
 Project: H04 Cuttings

QC BATCH REPORT

Batch ID: 116726 Instrument ID SVMS6 Method: SW846 8270D

MBLK		Sample ID: SBLKS1-116726-116726				Units: µg/Kg		Analysis Date: 4/12/2018 04:51 PM		
Client ID:		Run ID: SVMS6_180412A				SeqNo: 4980395		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	U	42								
Anthracene	U	42								
Benzo(a)anthracene	U	42								
Benzo(a)pyrene	U	42								
Benzo(b)fluoranthene	U	42								
Benzo(k)fluoranthene	U	42								
Chrysene	U	42								
Dibenzo(a,h)anthracene	U	42								
Fluoranthene	U	42								
Fluorene	U	42								
Indeno(1,2,3-cd)pyrene	U	42								
Naphthalene	U	42								
Pyrene	U	42								
Surr: 2-Fluorobiphenyl	2683	0	3333	0	80.5	20-140	0			
Surr: 4-Terphenyl-d14	2819	0	3333	0	84.6	22-172	0			
Surr: Nitrobenzene-d5	3002	0	3333	0	90.1	28-140	0			

LCS		Sample ID: SLCSS1-116726-116726				Units: µg/Kg		Analysis Date: 4/12/2018 05:05 PM		
Client ID:		Run ID: SVMS6_180412A				SeqNo: 4980396		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1057	42	1333	0	79.3	40-140	0			
Anthracene	1296	42	1333	0	97.2	40-140	0			
Benzo(a)anthracene	1152	42	1333	0	86.4	40-140	0			
Benzo(a)pyrene	1249	42	1333	0	93.7	40-140	0			
Benzo(b)fluoranthene	1102	42	1333	0	82.7	40-140	0			
Benzo(k)fluoranthene	1199	42	1333	0	89.9	40-140	0			
Chrysene	1260	42	1333	0	94.5	40-140	0			
Dibenzo(a,h)anthracene	1213	42	1333	0	91	40-140	0			
Fluoranthene	1324	42	1333	0	99.3	40-140	0			
Fluorene	1113	42	1333	0	83.5	40-140	0			
Indeno(1,2,3-cd)pyrene	1234	42	1333	0	92.6	40-140	0			
Naphthalene	1239	42	1333	0	92.9	40-140	0			
Pyrene	1138	42	1333	0	85.4	40-140	0			
Surr: 2-Fluorobiphenyl	2357	0	3333	0	70.7	20-140	0			
Surr: 4-Terphenyl-d14	2771	0	3333	0	83.1	22-172	0			
Surr: Nitrobenzene-d5	3212	0	3333	0	96.4	28-140	0			

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116726** Instrument ID **SVMS6** Method: **SW846 8270D**

MS				Sample ID: 1804605-05A MS			Units: µg/Kg		Analysis Date: 4/12/2018 05:19 PM	
Client ID:				Run ID: SVMS6_180412A			SeqNo: 4980397		Prep Date: 4/12/2018	
									DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1110	41	1314	0	84.4	40-140	0			
Anthracene	1333	41	1314	0	101	40-140	0			
Benzo(a)anthracene	1219	41	1314	0	92.7	40-140	0			
Benzo(a)pyrene	1316	41	1314	0	100	40-140	0			
Benzo(b)fluoranthene	1083	41	1314	0	82.4	40-140	0			
Benzo(k)fluoranthene	1278	41	1314	0	97.2	40-140	0			
Chrysene	1292	41	1314	0	98.3	40-140	0			
Dibenzo(a,h)anthracene	1256	41	1314	0	95.5	40-140	0			
Fluoranthene	1436	41	1314	0	109	40-140	0			
Fluorene	1302	41	1314	0	99.1	40-140	0			
Indeno(1,2,3-cd)pyrene	1253	41	1314	0	95.3	40-140	0			
Naphthalene	1217	41	1314	0	92.6	40-140	0			
Pyrene	1180	41	1314	0	89.8	40-140	0			
Surr: 2-Fluorobiphenyl	2854	0	3287	0	86.8	20-140	0			
Surr: 4-Terphenyl-d14	2906	0	3287	0	88.4	22-172	0			
Surr: Nitrobenzene-d5	3442	0	3287	0	105	28-140	0			

MSD				Sample ID: 1804605-05A MSD			Units: µg/Kg		Analysis Date: 4/12/2018 05:33 PM	
Client ID:				Run ID: SVMS6_180412A			SeqNo: 4980398		Prep Date: 4/12/2018	
									DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1013	40	1291	0	78.5	40-140	1110	9.1	30	
Anthracene	1215	40	1291	0	94.1	40-140	1333	9.28	30	
Benzo(a)anthracene	1078	40	1291	0	83.5	40-140	1219	12.2	30	
Benzo(a)pyrene	1168	40	1291	0	90.5	40-140	1316	11.9	30	
Benzo(b)fluoranthene	979.5	40	1291	0	75.9	40-140	1083	10.1	30	
Benzo(k)fluoranthene	1136	40	1291	0	88	40-140	1278	11.7	30	
Chrysene	1168	40	1291	0	90.4	40-140	1292	10.1	30	
Dibenzo(a,h)anthracene	1162	40	1291	0	90	40-140	1256	7.77	30	
Fluoranthene	1282	40	1291	0	99.3	40-140	1436	11.3	30	
Fluorene	1174	40	1291	0	90.9	40-140	1302	10.4	30	
Indeno(1,2,3-cd)pyrene	1225	40	1291	0	94.8	40-140	1253	2.29	30	
Naphthalene	1195	40	1291	0	92.6	40-140	1217	1.83	30	
Pyrene	1067	40	1291	0	82.6	40-140	1180	10.1	30	
Surr: 2-Fluorobiphenyl	2642	0	3229	0	81.8	20-140	2854	7.73	0	
Surr: 4-Terphenyl-d14	2611	0	3229	0	80.9	22-172	2906	10.7	0	
Surr: Nitrobenzene-d5	3489	0	3229	0	108	28-140	3442	1.38	0	

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116689** Instrument ID **VMS10** Method: **SW8260B**

MBLK				Sample ID: MBLK-116689-116689				Units: µg/Kg-dry			Analysis Date: 4/11/2018 11:31 AM			
Client ID:				Run ID: VMS10_180411A				SeqNo: 4977817			Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Benzene	U	30	0	0	0	0-0	0							
Ethylbenzene	U	30	0	0	0	0-0	0							
m,p-Xylene	U	60	0	0	0	0-0	0							
o-Xylene	U	30	0	0	0	0-0	0							
Toluene	U	30	0	0	0	0-0	0							
Xylenes, Total	U	90	0	0	0	0-0	0							
Surr: 1,2-Dichloroethane-d4	984	0	1000	0	98.4	70-130	0							
Surr: 4-Bromofluorobenzene	970.5	0	1000	0	97	70-130	0							
Surr: Dibromofluoromethane	833.5	0	1000	0	83.4	70-130	0							
Surr: Toluene-d8	1001	0	1000	0	100	70-130	0							

LCS				Sample ID: LCS-116689-116689				Units: µg/Kg-dry			Analysis Date: 4/11/2018 10:29 AM			
Client ID:				Run ID: VMS10_180411A				SeqNo: 4977816			Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Benzene	1124	30	1000	0	112	75-125	0							
Ethylbenzene	1200	30	1000	0	120	75-125	0							
m,p-Xylene	2454	60	2000	0	123	80-125	0							
o-Xylene	1249	30	1000	0	125	75-125	0							
Toluene	1164	30	1000	0	116	70-125	0							
Xylenes, Total	3702	90	3000	0	123	75-125	0							
Surr: 1,2-Dichloroethane-d4	946	0	1000	0	94.6	70-130	0							
Surr: 4-Bromofluorobenzene	1015	0	1000	0	102	70-130	0							
Surr: Dibromofluoromethane	935.5	0	1000	0	93.6	70-130	0							
Surr: Toluene-d8	1006	0	1000	0	101	70-130	0							

MS				Sample ID: 1804541-01A MS			Units: µg/Kg-dry		Analysis Date: 4/11/2018 05:56 PM		
Client ID:			Run ID: VMS10_180411A			SeqNo: 4977821		Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1251	35	1172	0	107	75-125	0				
Ethylbenzene	1357	35	1172	12.3	115	75-125	0				
m,p-Xylene	3076	70	2343	274.7	120	80-125	0				
o-Xylene	1474	35	1172	97.24	118	75-125	0				
Toluene	1366	35	1172	74.39	110	70-125	0				
Xylenes, Total	4550	110	3515	367	119	75-125	0				
Surr: 1,2-Dichloroethane-d4	1104	0	1172	0	94.2	70-130	0				
Surr: 4-Bromofluorobenzene	1170	0	1172	0	99.8	70-130	0				
Surr: Dibromofluoromethane	1033	0	1172	0	88.2	70-130	0				
Surr: Toluene-d8	1197	0	1172	0	102	70-130	0				

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116689** Instrument ID **VMS10** Method: **SW8260B**

MSD				Sample ID: 1804541-01A MSD				Units: µg/Kg-dry			Analysis Date: 4/11/2018 06:12 PM			
Client ID:				Run ID: VMS10_180411A				SeqNo: 4977822			Prep Date: 4/11/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Benzene	1302	35	1172	0	111	75-125	1251	4.04	30					
Ethylbenzene	1347	35	1172	12.3	114	75-125	1357	0.737	30					
m,p-Xylene	2911	70	2343	274.7	113	80-125	3076	5.5	30					
o-Xylene	1456	35	1172	97.24	116	75-125	1474	1.24	30					
Toluene	1343	35	1172	74.39	108	70-125	1366	1.73	30					
Xylenes, Total	4368	110	3515	367	114	75-125	4550	4.1	30					
Surr: 1,2-Dichloroethane-d4	1095	0	1172	0	93.4	70-130	1104	0.852	30					
Surr: 4-Bromofluorobenzene	1152	0	1172	0	98.3	70-130	1170	1.56	30					
Surr: Dibromofluoromethane	1050	0	1172	0	89.6	70-130	1033	1.69	30					
Surr: Toluene-d8	1157	0	1172	0	98.8	70-130	1197	3.43	30					

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116744** Instrument ID **Titrator 1** Method: **USDA H60 Metho**

DUP		Sample ID: 1804484-03ADUP				Units: mmhos/cm @25°		Analysis Date: 4/12/2018 09:50 PM		
Client ID: 20180409-H04-Cut3			Run ID: TITRATOR 1_180412I		SeqNo: 4979507		Prep Date: 4/12/2018		DF: 20	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	10.93	0.10	0	0	0		9.729	11.6	50	

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116774** Instrument ID **WETCHEM** Method: **SW9045D**

LCS		Sample ID: LCS-116774-116774					Units: s.u.		Analysis Date: 4/13/2018 11:00 AM		
Client ID:		Run ID: WETCHEM_180413E					SeqNo: 4980458		Prep Date: 4/12/2018		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

pH 3.96 0.10 4 0 99 90-110 0

DUP		Sample ID: 1804541-01A DUP					Units: s.u.		Analysis Date: 4/13/2018 11:00 AM		
Client ID:		Run ID: WETCHEM_180413E			SeqNo: 4980464		Prep Date: 4/12/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

pH 7.48 0.10 0 0 0 0-0 7.42 0.805 20

DUP		Sample ID: 1804596-02B DUP					Units: s.u.		Analysis Date: 4/13/2018 11:00 AM		
Client ID:			Run ID: WETCHEM_180413E			SeqNo: 4980469		Prep Date: 4/12/2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

pH 8.45 0.10 0 0 0 0-0 8.49 0.472 20

The following samples were analyzed in this batch:

1804484-01A 1804484-02A 1804484-03A

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

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **116849** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK		Sample ID: MBLK-116849-116849				Units: mg/Kg		Analysis Date: 4/16/2018 12:45 PM		
Client ID:		Run ID: WETCHEM_180416C		SeqNo: 4982706		Prep Date: 4/13/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent U 0.95

LCS		Sample ID: LCS-116849-116849				Units: mg/Kg		Analysis Date: 4/16/2018 12:45 PM		
Client ID:		Run ID: WETCHEM_180416C		SeqNo: 4982707		Prep Date: 4/13/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 5.35 0.97 4.854 0 110 80-120 0

MS		Sample ID: 1804484-01A MS				Units: mg/Kg		Analysis Date: 4/16/2018 12:45 PM		
Client ID: 20180409-H04-Cut1		Run ID: WETCHEM_180416C		SeqNo: 4982709		Prep Date: 4/13/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.519 0.93 4.63 0.08257 31 75-125 0 S

MS		Sample ID: 1804484-01A MSI				Units: mg/Kg		Analysis Date: 4/16/2018 12:45 PM		
Client ID: 20180409-H04-Cut1		Run ID: WETCHEM_180416C		SeqNo: 4982711		Prep Date: 4/13/2018		DF: 100		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1760 99 2787 0.08257 63.2 75-125 0 S

MSD		Sample ID: 1804484-01A MSD				Units: mg/Kg		Analysis Date: 4/16/2018 12:45 PM		
Client ID: 20180409-H04-Cut1		Run ID: WETCHEM_180416C		SeqNo: 4982710		Prep Date: 4/13/2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Chromium, Hexavalent 1.735 0.98 4.902 0.08257 33.7 75-125 1.519 13.3 20 S

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1804484
Project: H04 Cuttings

QC BATCH REPORT

Batch ID: **R233615** Instrument ID **MOIST** Method: **SW3550C**

MBLK		Sample ID: WBLKS-R233615				Units: % of sample		Analysis Date: 4/11/2018 06:20 PM		
Client ID:		Run ID: MOIST_180411D				SeqNo: 4978465		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.050

LCS		Sample ID: LCS-R233615				Units: % of sample		Analysis Date: 4/11/2018 06:20 PM		
Client ID:		Run ID: MOIST_180411D				SeqNo: 4978464		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

DUP		Sample ID: 1804509-03A DUP				Units: % of sample		Analysis Date: 4/11/2018 06:20 PM		
Client ID:		Run ID: MOIST_180411D				SeqNo: 4978455		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 8.47 0.050 0 0 0 0-0 8.62 1.76 10

DUP		Sample ID: 1804605-16A DUP				Units: % of sample		Analysis Date: 4/11/2018 06:20 PM		
Client ID:		Run ID: MOIST_180411D				SeqNo: 4978463		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 15.99 0.050 0 0 0 0-0 16.66 4.1 10

The following samples were analyzed in this batch:

1804484-01A	1804484-02A	1804484-03A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.



PROJECT NAME		H04 cuttings		SAMPLER		Brett Middleton		DATE		4/9/18		PAGE		1 of 1	
PROJECT No.				SITE ID				TURNAROUND		STD		DISPOSAL		By Lab or Return to Client	
COMPANY NAME		Caerus Piceance, LLC		BILL TO COMPANY		Caerus Piceance, LLC		TPH/GRO/DRO							
SEND REPORT TO		Jake Janicek		INVOICE ATTN TO		Jake Janicek		BTX							
ADDRESS		143 Diamond Ave		ADDRESS		143 Diamond Ave		Table 910 PAH's							
CITY/STATE/ZIP		Parachute Co 81635		CITY/STATE/ZIP		Parachute CO 81635		EC							
PHONE		970-285-9608		PHONE		970-285-9608		PH							
FAX				FAX				SAR							
E-MAIL		jjanicek@caerusoilandgas.com		E-MAIL		jjanicek@caerusoilandgas.com		Benzene							
								Table 910 Metals							
Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC								
1	20180409-H04-cut1	S	4/9/18	1300	2			X	X	X	X	X	X		
2	20180409-H04-cut2	S	4/9/18	1310	2			X	X	X	X	X	X		
3	20180409-H04-cut3	S	4/9/18	1320	2			X	X	X	X	X	X		

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	QC PACKAGE (check below)	
	X	LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035		

SIGNATURE	PRINTED NAME	DATE	TIME
	Brett Middleton	4/9/18	1500
RECEIVED BY	MM	4/9/18	1500
RECEIVED BY	MM	4/9/18	1830
RECEIVED BY	Diane F. Sha	4/10/18	0900
RECEIVED BY			

Sample Receipt Checklist

Client Name: **CAERUS**

Date/Time Received: **10-Apr-18 09:00**

Work Order: **1804484**

Received by: **DS**

Checklist completed by Diane Shaw 10-Apr-18
eSignature Date

Reviewed by: Chad Whelton 10-Apr-18
eSignature Date

Matrices: **Soil**

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>4.2/4.2 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>4/10/2018 12:32:56 PM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: