May 8, 2024
Kleinfelder Project No. 20234315.001A

Mr. Jake Janicek
Caerus Piceance, LLC
1001 17th Street #1600
Denver, Colorado 80202

SUBJECT: **Site Investigation Report**
Caerus Piceance, LLC
Plug And Abandonment Closure
Remediation Project Number: 32283
Keinath 33-9 (OP33) Wellhead (OP33 Pad)
Garfield County, Colorado

Dear Mr. Janicek:

Kleinfelder Inc. (Kleinfelder) performed soil sampling activities at the Keinath 33-9 (OP33) wellhead on the OP33 Pad in Garfield County, Colorado under contract by Caerus Piceance LLC (Caerus). Enclosed is the site investigation report for this effort.

Please do not hesitate to contact me at (970) 309-6553 or by email at JVeith@Kleinfelder.com should you have questions or concerns.

Respectfully submitted,
KLEINFELDER, INC.

Jordan Veith

Jordan Veith
Project Manager I

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SITE INVESTIGATION REPORT
CAERUS PICEANCE, LLC
PLUG AND ABANDONMENT CLOSURE
REMEDIATION PROJECT NUMBER: 32283
KEINATH 33-9 (OP33) WELLHEAD (OP33 PAD)
GARFIELD COUNTY, COLORADO

KLEINFELDER PROJECT NO. 20234315.001A

May 8, 2024

A Report Prepared for:

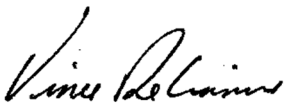
Caerus Piceance, LLC
1001 17th Street #1600
Denver, CO 80202

SITE INVESTIGATION REPORT
CAERUS PICEANCE, LLC
PLUG AND ABANDONMENT CLOSURE
REMEDIATION PROJECT NUMBER: 32283
KEINATH 33-9 (OP33) WELLHEAD (OP33 PAD)
GARFIELD COUNTY, COLORADO

Prepared by:

Trevor Lakin
Environmental Scientist/ Professional

Reviewed by:



Vince DeCianne
VP, Senior Principal Professional

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May 8, 2024
Kleinfelder Project No. 20234315.001A

Contents **Page**

FIGURES

TABLES

APPENDICES

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

SITE INVESTIGATION REPORT
CAERUS PICEANCE, LLC
PLUG AND ABANDONMENT CLOSURE
REMEDIATION PROJECT NUMBER: 32283
KEINATH 33-9 (OP33) WELLHEAD (OP33 PAD)
GARFIELD COUNTY, COLORADO

1 INTRODUCTION

This document was prepared by Kleinfelder Inc. (Kleinfelder) on behalf of Caerus Piceance, LLC (Caerus) to provide documentation of recent sampling support services conducted for the plugging and abandonment (P&A) of the Keinath 33-9 (OP33) wellhead located on the OP33 Pad in Garfield County, Colorado (**Figure 1**).

Kleinfelder has been contracted by Caerus to perform soil sampling support services to provide necessary information to complete the Colorado Energy and Carbon Management Commission (ECMC) Form 27 for their upstream oil and gas production facilities located in the Piceance Basin. Caerus is proceeding with the P&A and removal of the Keinath 33-9 (OP33) natural gas wellhead and associated flowlines.

Caerus submitted Approved ECMC Form 27 (Site Investigation and Remediation Workplan – Document #403538717) as an initial notification to abandon Keinath 33-9 (OP33) (API #045-12213) wellhead and associated flowlines. Caerus proposed field screening and the collection of soil samples as a part of the P&A assessment of the Keinath 33-9 (OP33) wellhead and its associated flowlines. Kleinfelder collected the soil samples on November 8, 2023, November 9, 2023, and January 18, 2024. Soil samples were analyzed by Pace Analytical National Laboratory (Pace) and the results are reported herein.

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2 SITE LOCATION AND GEOLOGIC SETTING

The OP33 Pad is located within the Piceance Basin in Garfield County, Colorado (SESE, Section 33, Township 7 South, Range 96 West) (**Figure 1**). The Piceance Basin is a geologic structural basin consisting of sandstones and siltstones, containing reserves of coal, natural gas, and oil shale.

No surface water or groundwater were encountered during Kleinfelder's soil sampling activities. Adjacent land was observed to be rangeland and residential properties. The general soil type within the wellhead P&A and flowline removal area was classified based on Kleinfelder's field observations using the Unified Soil Classification System (USCS) and were observed to be organic clays of medium to high plasticity and organic silts. Topographical information is provided on **Figure 1**.

3 FIELD ACTIVITIES

As prescribed within the approved ECMC Form 27 Site Investigation and Remediation Workplan, Kleinfelder performed the following field activities at the OP33 Pad on November 8, 2023, November 9, 2023, and January 18, 2024**:**

November 8, 2023

- Collected four (4) background grab soil samples from locations north [20231108-OUBG-(OP33-N)@1], east [20231108-OUBG-(OP33-E)@1], south [20231108-OUBG-(OP33-S)@1], and west [20231108-OUBG-(OP33-W)@1] of the OP33 Pad at 1 foot below ground surface (bgs); and
- Shipped background soil samples to Pace to analyze for the contaminants of concern listed within ECMC Table 915-1, excluding organics.

November 9, 2023

- Collected one (1) grab soil sample from the base of the hydrovac pothole directly adjacent to the Keinath 33-9 (OP33) wellhead line [20231109-OP33-(FC-WH-Keinath 33-9)@5] at 5 feet bgs;
- Collected one (1) grab soil sample from the base of the hydrovac pothole directly adjacent to the flowline as it ties into the separator [20231109-OP33-(FC-FL)@4] at 4 feet bgs;
- Field screened the soil using visual and olfactory senses and a photoionization detector (PID) at all soil sample locations; and
- Shipped site assessment soil samples to Pace to analyze for the contaminants of concern listed within ECMC Table 915-1.

January 18, 2024

- Collected one (1) grab soil sample from the base of the excavation of the former dumpline as it tied into the separator [20240118-OP33-(FC-DL)@5] at 5 feet bgs;
- Collected one (1) 5-point composite soil sample from the stockpile associated with the dumpline excavation [20240118-OP33-(STOCK02)];
- Collected one (1) grab soil sample from the base of the flowline excavation located northwest of the wellhead between the wellhead and the separator [20240118-OP33-(BASE01)@4] at 4 feet bgs;

- Field screened the soil at the base of the excavation adjacent to the former wellhead line [20240118-OP33-(FC-WH-Keinath 33-9)@4] at 4 feet bgs. Hydrocarbon odors and visible soil staining were not observed. No soil sample was collected for laboratory analysis as a closure soil sample was previously collected from this location on November 9, 2023 [20231109-OP33-(FC-WH-Keinath 33-9)@5];
- Collected one (1) 5-point composite soil sample from the stockpile associated with the wellhead excavation and the BASE01 excavation [20240118-OP33-(FC-WH-STOCK)];
- Field screened the soil at the base of the excavation at the former flowline as it tied into the separator [20240118-OP33-(FC-FL)@4] at 4 feet bgs. Hydrocarbon odors and visible soil staining were not observed. No soil sample was collected for laboratory analysis as a closure soil sample was previously collected from this location on November 9, 2023 [20231109-OP33-(FC-FL)@4];
- Field screened the soil using visual and olfactory senses and PID at all soil sample locations; and
- Shipped site assessment soil samples to Pace to analyze for the contaminants of concern listed within ECMC Table 915-1.

Prior to Kleinfelder's soil screening and sampling activities on November 8, 2023, November 9, 2023, and January 18, 2024, Caerus identified all soil sample locations. Hydrovac potholing was performed by MK Hydrovac (MK) on November 9, 2023. Soil samples were collected from a stainless-steel hand auger and stainless-steel shovel, and placed into laboratory-supplied, 9-ounce jars with Teflon lids per sample. Each sample was collected directly from the hand auger or shovel from the appropriate depth and placed into the glass jars. Each composite soil sample was individually homogenized prior to placement in the glass jars. The samples were immediately placed on ice in a cooler. Standard chain-of-custody (COC) procedures were used during sampling and transportation to Pace in Mount Juliet, Tennessee (via FEDEX). Site soil samples were analyzed for contaminants of concern listed in ECMC Table 915-1. Background soil samples were analyzed for contaminants of concern listed in ECMC Table 915-1, excluding organics. Kleinfelder used an EOS Arrow 100 Submeter Global Navigation Satellite System Receiver (GNSS) to record latitude and longitude the sample location. Sample locations are provided on **Figure 2.**

Sampling equipment (i.e., hand auger cutter head, soil sampler, etc.) was washed with a solution of Liquinox® detergent, rinsed with tap water, and then distilled water between samples. During soil sampling activities, Kleinfelder documented staining and/or odor observations, if any, and screened the soil with a PID. Kleinfelder placed the soil into a Ziploc® plastic bag directly from the hand auger for

screening with the PID. Prior to use, Kleinfelder calibrated the PID, which passed calibration. Soil sample conditions and locations are provided in **Table 1**.

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4 RESULTS

Kleinfelder observed soil conditions within the well P&A areas during the soil sampling activities. Hydrocarbon odors and soil staining were not observed at any of the sample locations. PID readings from all sample locations were less than 1 part per million (ppm). **Table 1** summarizes the samples and associated field observations.

Excluding arsenic and pH, the soil sample analytical results did not exceed the ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) in the six (6) assessment samples (**see Table 2**).

- Arsenic was detected at concentrations above the ECMC Table 915-1 RSSLs at all assessment sample locations.
- pH was detected at concentrations above the ECMC Table 915-1 at all assessment sample locations.

Analytical results are summarized in **Table 2** and were compared to ECMC Table 915-1 RSSLs as requested by Caerus. Site assessment and background laboratory reports are provided in **Appendix A**. Sample locations are provided on **Figure 2.**

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5 CONCLUSIONS AND RECOMMENDATIONS

Based on field assessment and desktop review of the area, it is believed there is no reasonable pathway for groundwater within the investigation area. The nearest registered water well (permit #268843-) is located approximately 0.37 miles southeast of the OP33 Pad and has a constructed depth of 120 feet and listed water level of 100+ feet. Therefore, Kleinfelder recommends Caerus request site assessment samples for this project be compared against ECMC Table 915-1 RSSLs.

In order to address the arsenic exceedances at all sample locations, Kleinfelder recommends Caerus request an alternative allowable limit of 4.21 mg/kg for arsenic per ECMC Table 915-1 Footnote 1. Analytical results of background samples collected as a part of this project indicate a range of background arsenic concentrations from 3.62 mg/kg to 4.21 mg/kg (**Table 2**). Arsenic concentrations exhibited in all site assessment soil samples collected on November 9, 2023, and January 18, 2024 are less than the background arsenic concentrations.

pH exceeded ECMC Table 915-1 at all site assessment sample locations. To address pH exceedances, Kleinfelder recommends Caerus request an alternative allowable limit of 9.53 for pH per ECMC Table 915-1 Footnote 1. Analytical results of background samples collected as a part of this project indicate a range of background pH concentrations from 8.34 to 9.53 (**Table 2**). pH concentrations exhibited in all site assessment soil samples collected on November 9, 2023, and January 18, 2024 are less than the background pH concentrations.

Per the Conditions of Approval (COA) in the Approved ECMC Form 27 (document #40358717), Kleinfelder will return to the OP33 Pad to collect a soil sample directly adjacent to the wellhead after it has been cut and capped. The sample will be analyzed for full ECMC Table 915-1 constituents.

6 LIMITATIONS

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that Caerus has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage, or treatment of hazardous materials within the meaning of any governmental statute, regulation, or order. Caerus is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. Caerus is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder’s services.

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FIGURES

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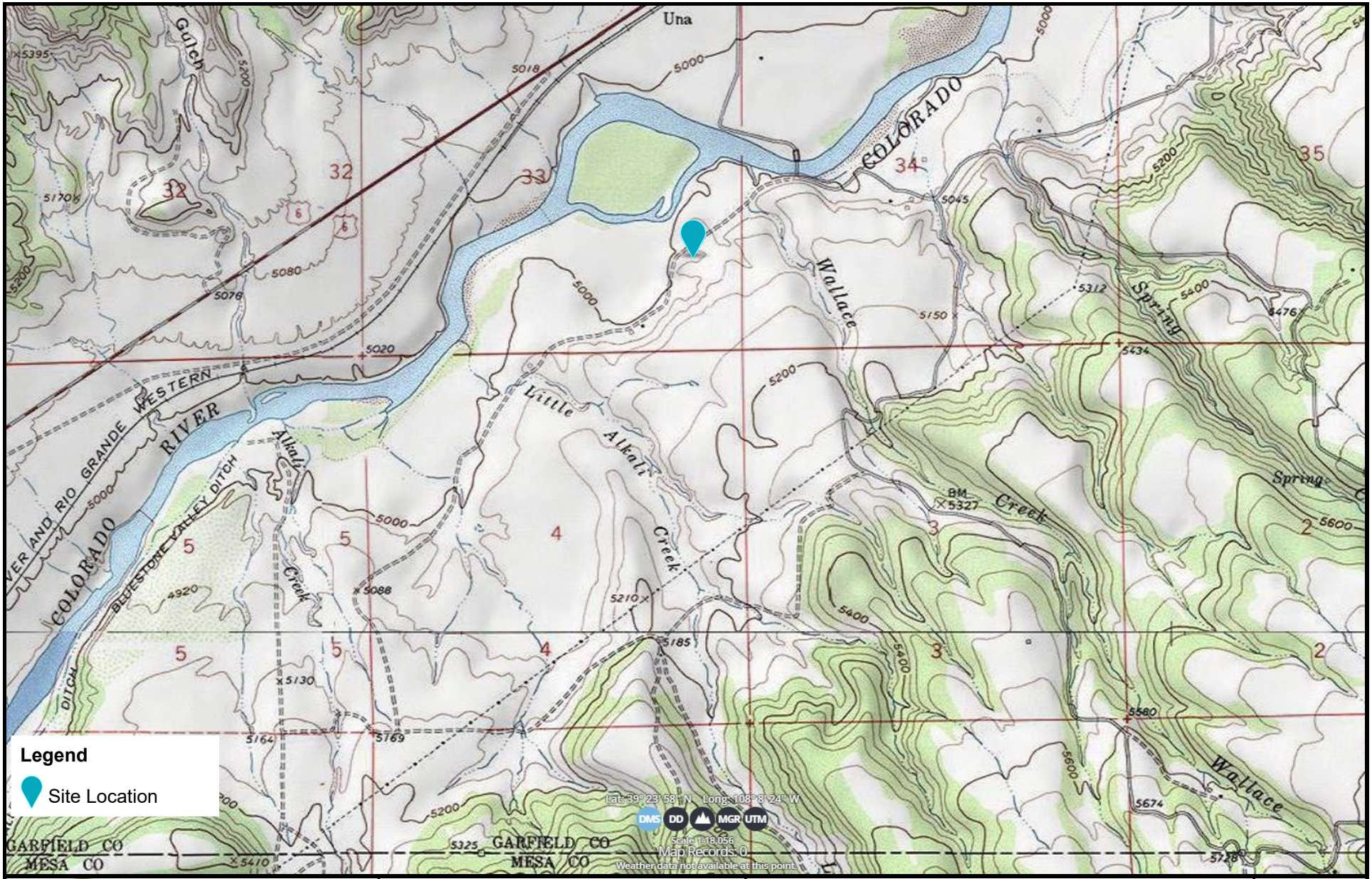

PROJECT NO.	20234315.001A
DRAWN:	12/20/2023
DRAWN BY:	K. Dwyer
CHECKED BY:	J. Veith
FILE NAME:	OP33_Topographical Map.pub

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Topographical Map

Caerus Piceance, LLC
Remediation Project Number: 32283
Keinath 33-9 (OP33) Wellhead (OP33 Pad)
SESE Sec. 33 T7S R96W
Garfield County, Colorado

FIGURE
1

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PROJECT NO.	20234315.001A
DRAWN:	11/9/2023
DRAWN BY:	T. Lakin
CHECKED BY:	J. Veith
FILE NAME:	OP33 Sample Map.pub

Sample Location Map

Caerus Piceance, LLC
Remediation Project Number: 32283
Keinath 33-9 (OP33) Wellhead (OP33 Pad)
SESE Sec. 33 T7S R96W
Garfield County, Colorado

FIGURE

2

TABLES

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TABLE 1 - SOIL SAMPLE SUMMARY
CAERUS PICEANCE, LLC
REMEDIATION PROJECT NUMBER: 32283
KEINATH 33-9 (OP33) WELLHEAD (OP33 PAD)
GARFIELD COUNTY, COLORADO

Sample ID	Sample Matrix	Latitude	Longitude	PID Reading (PPM)	Hydrocarbon Odor Detected (Y/N)	Soil Staining Observed (Y/N)	Comments
20231108-OUBG-(OP33-S)@1	Soil	39.38939402	-108.10754711	< 1	N	N	None
20231108-OUBG-(OP33-E)@1	Soil	39.38994229	-108.10686505	< 1	N	N	None
20231108-OUBG-(OP33-W)@1	Soil	39.38969092	-108.10809470	< 1	N	N	None
20231108-OUBG-(OP33-N)@1	Soil	39.39038069	-108.10741233	< 1	N	N	None
20231109-OP33-(FC-FL)@4	Soil	39.38997485	-108.10762162	< 1	N	N	None
20231109-OP33-(FC-WH-Keinath 33-9)@5	Soil	39.38983263	-108.10742939	< 1	N	N	None
20240118-OP33-(FC-WH-Keinath 33-9)@4	Soil	39.38983263	-108.10742939	< 1	N	N	No soil sample collected for laboratory analysis. Location previously sampled
20240118-OP33-(FC-FL)@4	Soil	39.38997485	-108.10762162	< 1	N	N	No soil sample collected for laboratory analysis. Location previously sampled
20240118-OP33-(FC-WH-STOCK)	Soil	39.38987663	-108.10752967	< 1	N	N	None
20240118-OP33-(BASE01)@4	Soil	39.38993161	-108.10751547	< 1	N	N	None
20240118-OP33-(FC-DL)@5	Soil	39.3899992	-108.10764576	< 1	N	N	None
20240118-OP33-(STOCK02)	Soil	39.38993688	-108.10761177	< 1	N	N	None

Notes:
PID = Photo-ionization Detector
PPM = Parts per million

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TABLE 2 - SOIL ANALYTICAL RESULTS
CAERUS PICEANCE, LLC
REMEDIATION PROJECT NUMBER: 32283
KEINATH 33-9 (OP33) WELLHEAD (OP33 PAD)
GARFIELD COUNTY, COLORADO

		Sample Objective	**Background**	**Background**	**Background**	**Background**	**Assessment**	**Assessment**	**Assessment**	**Assessment**	**Assessment**	**Assessment**
		Location ID	**OUBG-(OP33-S)**	**OUBG-(OP33-E)**	**OUBG-(OP33-W)**	**OUBG-(OP33-N)**	**OP33-(FC-FL)**	**OP33-(FC-WH-KEINATH 33-9)**	**OP33-(FC-WH-STOCK)**	**OP33-(BASE01)**	**OP33-(FC-DL)**	**OP33-(STOCK02)**
		Sample Date	**11/8/2023**	**11/8/2023**	**11/8/2023**	**11/8/2023**	**11/9/2023**	**11/9/2023**	**1/18/2024**	**1/18/2024**	**1/18/2024**	**1/18/2024**
		Sample ID	**20231108-OUBG-(OP33-S)@1**	**20231108-OUBG-(OP33-E)@1**	**20231108-OUBG-W)@1**	**20231108-OUBG-(OP33-N)@1**	**20231109-OP33-(FC-FL)@4**	**20231109-OP33-(FC-WH-KEINATH 33-9)@5**	**20240118-OP33-(FC-WH-STOCK)**	**20240118-OP33-(BASE01)@4**	**20240118-OP33-(FC-DL)@5**	**20240118-OP33-(STOCK02)**
		Sample Depth (ft bgs)	**1**	**1**	**1**	**1**	**4**	**5**	**N/A**	**4**	**5**	**N/A**
Contaminant of Concern	**Cleanup Concentration (mg/kg unless otherwise noted)**											
Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons)	500		NM	NM	NM	NM	90.80	<10.50	124.50	18.20	12.09 B	6.49
TPH Low Fraction GRO (C6-C10)			NM	NM	NM	NM	<2.50 ND	<2.50 ND	<0.100 ND	<0.100 ND	<0.100 ND	<0.100 ND
DRO (C10-C28)			NM	NM	NM	NM	30.6	<4.00 ND	43.0	4.00	7.62	<4.00 ND
MRO (C28-C36)			NM	NM	NM	NM	60.2	<4.00 ND	81.5	14.2	4.47 B	6.49
Soils and Groundwater - liquid hydrocarbons including condensate and oil	Below Visual Detection Limits		Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits
Electrical conductivity (EC) (by saturated paste method)	<4mmhos/cm		0.598	0.167	0.129	0.142	0.264	0.175	0.172	0.147	0.155	0.149
Sodium adsorption ratio (SAR) (by saturated paste method)	<6 SAR units		2.29	0.204	0.833	0.116	0.410	0.381	0.525	0.267	0.764	0.213
pH (by saturated paste method)	6–8.3 pH units		9.53 T8	8.34 T8	8.74 T8	8.37 T8	8.54 T8	8.74 T8	8.52 T8	8.65 T8	8.50 T8	8.60 T8
Boron (hot water soluble soil extract)	2 mg/L		<1.00 ND	0.269	0.347	0.209	0.201	0.226	<0.200 ND	<0.200 ND	<0.200 ND	<0.200 ND
Organic Compounds in Soils	**Residential Soil Screening Level Concentrations**	**Protection of Groundwater Soil Screening Level Concentrations Risk Based and MCL Based**										
benzene	1.2	0.0026	NM	NM	NM	NM	<0.00100 ND	<0.00100 ND	<0.00100 ND	<0.00100 ND	<0.00100 ND	<0.00100 ND
toluene	490	0.69	NM	NM	NM	NM	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND
ethylbenzene	5.8	0.78	NM	NM	NM	NM	<0.00250 ND	<0.00250 ND	<0.00250 ND	<0.00250 ND	<0.00250 ND	<0.00250 ND
xylenes (sum of o-, m- and p- isomers = total xylenes)	58	9.9	NM	NM	NM	NM	<0.00650 ND	<0.00650 ND	<0.00650 ND	<0.00650 ND	<0.00650 ND	<0.00650 ND
1,2,4-trimethylbenzene	30	0.0081	NM	NM	NM	NM	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND
1,3,5-trimethylbenzene	27	0.0087	NM	NM	NM	NM	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND	<0.00500 ND
acenaphthene	360	0.55	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
anthracene	1800	5.8	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
benz(a)anthracene	1.1	0.011	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
benzo(b)fluoranthene	1.1	0.3	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
benzo(k)fluoranthene	11	2.9	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
benzo(a)pyrene	0.11	0.24	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
chrysene	110	9	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
dibenz(a,h)anthracene	0.11	0.096	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
fluoranthene	240	8.9	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
fluorene	240	0.54	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
indeno(1,2,3-cd)pyrene	1.1	0.98	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
pyrene	180	1.3	NM	NM	NM	NM	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND	<0.00600 ND
1-methylnaphthalene	18	0.006	NM	NM	NM	NM	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND
2-methylnaphthalene	24	0.019	NM	NM	NM	NM	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND
naphthalene	2	0.0038	NM	NM	NM	NM	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND	<0.0200 ND
Metals in Soils	**Residential Soil Screening Level Concentrations**	**Protection of Groundwater Soil Screening Level Concentrations Risk Based and MCL Based**										
arsenic	0.68	0.29	4.21	3.62	4.00	4.16	2.67	3.03	3.77	3.33	3.47	3.92
barium	15000	82	187	160	194	159	470	145	170	134	167	202
cadmium	71	0.38	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND
chromium (VI)	1.00 *	1.00 *	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND J4	<1.00 ND J4	<1.00 ND	<1.00 ND	<1.00 ND	<1.00 ND
copper	3100	46	13.8	9.68	11.1	11.8	13.0	10.4	10.7	9.00	9.65	9.73
lead	400	14	11.3	8.99	10.3	10.5	18.2	7.85	9.27	7.52	7.63	8.16
nickel	1500	26	14.0	12.2	12.9	13.5	9.76	9.51	13.0	9.73	9.94	10.4
selenium	390	0.26	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND	<2.50 ND
silver	390	0.8	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND	<0.500 ND
zinc	23000	370	48.0	36.0	41.0	41.3	36.5	29.1	43.1	31.7	<35.7 ND	33.8

TABLE 2 NOTES:

Greater than Table 915-1 Residential Soil Screening Level (RSSL) Concentrations

Greater than Table 915-1 Standards, but less than adjusted standards (Highest background level is the adjusted standard for inorganics; 1.25X highest background level for metals).

* = Actual Table 915-1 Cleanup Concentration is 0.3 mg/kg, however, per Table 915-1 Footnote #9, the Practical Quantitation Limit (PQL) of 1.0 mg/kg may be used as a substitute
B = The same analyte is found in the associated blank.
DL = dumpline
E (sample ID) = East
E (data qualifier) = The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
FC = Facility Closure
FL = Flowline
ft bgs = feet below ground surface
GL = Gas Lift
GS = Ground surface
J = The identification of the analyte is acceptable: the reported value is an estimate
J1 = The identification of the analyte is acceptable; the reported value is an estimate.
J2 = The identification of the analyte is acceptable; the reported value is an estimate.
J3 = The associated batch quality control was outside the established quality control range for precision
J4 = The associated batch QC was outside the established quality control range for accuracy
J5 = The sample matrix interfered with the ability to make any accurate determination; spike value is high
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value low
J7 = Surrogate recovery cannot be used for control limit evaluation due to dilution
LH = Line Heater
MCL = maximum contaminant level
mg/kg = milligram per kilogram
mg/L = milligram per liter
MH = Meter House
mmhos/cm = millimhos per centimeter
MOI = material of interest
MW = monitoring well
N = North
N/A = Not applicable. No COGCC cleanup concentration provided
ND = Not detected at the Reporting Limit (or MDL where applicable).
NM = Not measured
NW = north wall
NWALL = north wall
O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference
P1 = RPD value not applicable for sample concentrations less than 5 times the reporting limit
PH = pothole
PIT = Pit
PL = Pipeline
POR = Point of release
S = South
SB = soil boring
SEP = Separator
SP = spring
ST = stream, surface water
STOCK = spoil pile / stockpile
SW = south wall
SWALL = south wall
T = Tank
T8 = Samples received past/too close to holding time expiration
U = Not detected at the Reporting Limit (or MDL where applicable)
V = The sample concentration is too high to evaluate accurate spike recoveries
W = West
WC = waste characterization sample for landfill disposal
WH = wellhead
WW = west wall
WWALL = west wall

APPENDIX A
LABORATORY ANALYTICAL RESULTS

KLEINFELDER 707 17th Street, Suite 3000, Denver, CO 80202 p | 303.237.6601 f | 303.237.6602

ANALYTICAL REPORT

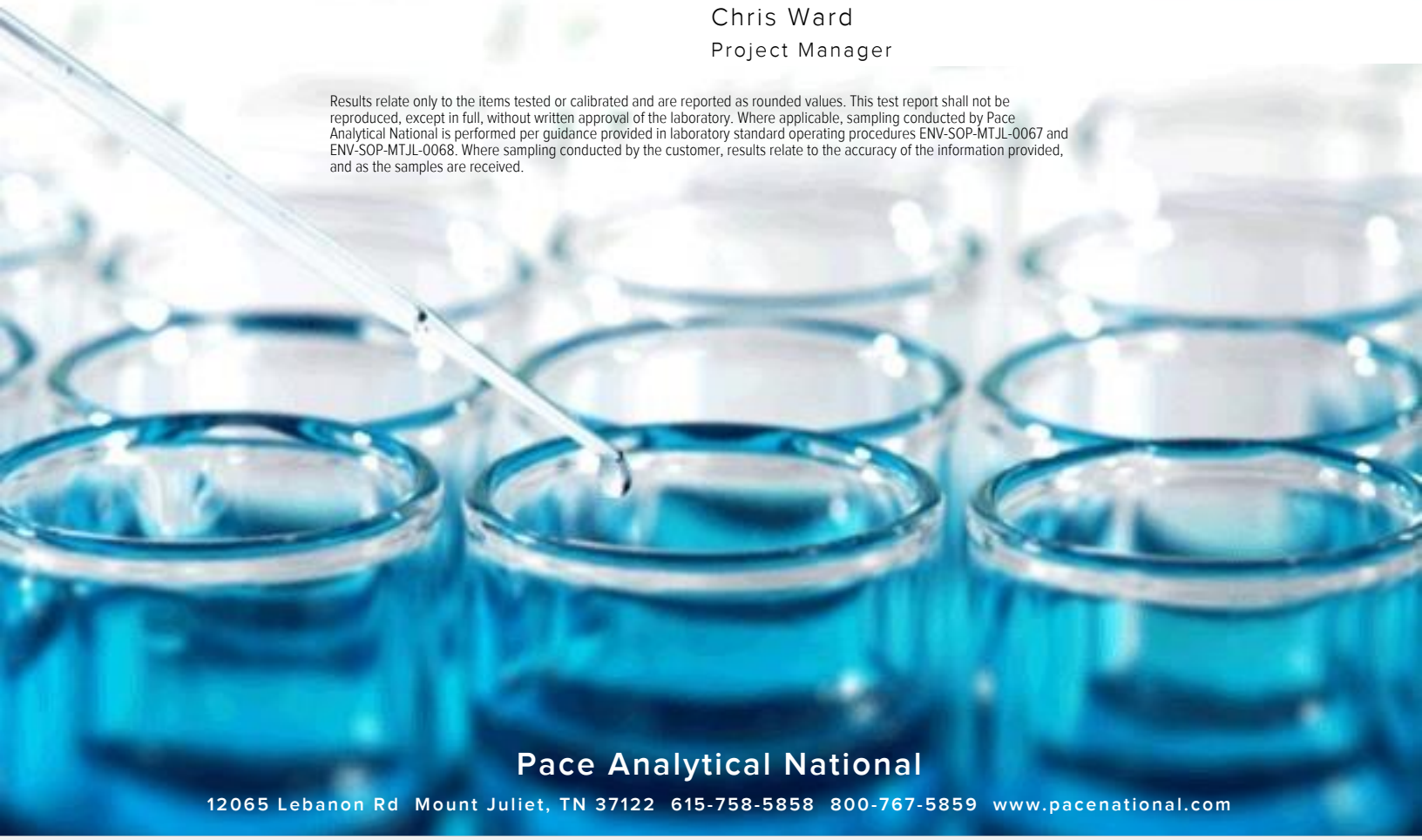
November 20, 2023

Caerus Oil and Gas

Sample Delivery Group:	L1676590
Samples Received:	11/09/2023
Project Number:	
Description:	OP33 P+A Investigation
Site:	OP33
Report To:	Jake J. / Brett M. / Blair R. / Andy V. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

20231108-OUBG-(OP33-S)@1 L1676590-01 Solid

Collected by: Trevor Lakin | Collected date/time: 11/08/23 11:50 | Received date/time: 11/09/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171622	1	11/16/23 11:30	11/16/23 11:30	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170207	1	11/13/23 10:54	11/17/23 13:25	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170173	1	11/13/23 10:14	11/14/23 11:58	SJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2169102	1	11/11/23 10:50	11/11/23 15:09	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171629	5	11/15/23 14:46	11/16/23 16:17	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169361	5	11/12/23 17:02	11/13/23 13:14	SJM	Mt. Juliet, TN

20231108-OUBG-(OP33-E)@1 L1676590-02 Solid

Collected by: Trevor Lakin | Collected date/time: 11/08/23 12:12 | Received date/time: 11/09/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171622	1	11/16/23 12:12	11/16/23 12:12	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170207	1	11/13/23 10:54	11/17/23 13:31	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170173	1	11/13/23 10:14	11/14/23 11:58	SJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2170234	1	11/14/23 07:15	11/14/23 11:27	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171629	1	11/15/23 14:46	11/16/23 16:20	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169361	5	11/12/23 17:02	11/13/23 13:17	SJM	Mt. Juliet, TN

20231108-OUBG-(OP33-W)@1 L1676590-03 Solid

Collected by: Trevor Lakin | Collected date/time: 11/08/23 12:34 | Received date/time: 11/09/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171622	1	11/16/23 11:41	11/16/23 11:41	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170207	1	11/13/23 10:54	11/17/23 13:46	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170173	1	11/13/23 10:14	11/14/23 11:58	SJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2170234	1	11/14/23 07:15	11/14/23 11:27	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171629	1	11/15/23 14:46	11/16/23 16:23	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169361	5	11/12/23 17:02	11/13/23 13:20	SJM	Mt. Juliet, TN

20231108-OUBG-(OP33-N)@1 L1676590-04 Solid

Collected by: Trevor Lakin | Collected date/time: 11/08/23 12:54 | Received date/time: 11/09/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171622	1	11/16/23 11:32	11/16/23 11:32	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170207	1	11/13/23 10:54	11/17/23 13:51	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170173	1	11/13/23 10:14	11/14/23 11:58	SJA	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2170234	1	11/14/23 07:15	11/14/23 11:27	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171629	1	11/15/23 14:46	11/16/23 16:26	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169361	5	11/12/23 17:02	11/13/23 13:24	SJM	Mt. Juliet, TN

CASE NARRATIVE

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

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	2.29		1	11/16/2023 11:30	WG2171622

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	11/17/2023 13:25	WG2170207

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	9.53	T8	1	11/14/2023 11:58	WG2170173

Sample Narrative:

L1676590-01 WG2170173: 9.53 at 21.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	598		10.0	1	11/11/2023 15:09	WG2169102

Sample Narrative:

L1676590-01 WG2169102: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	ND		1.00	5	11/16/2023 16:17	WG2171629

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	4.21		1.00	5	11/13/2023 13:14	WG2169361
Barium	187		2.50	5	11/13/2023 13:14	WG2169361
Cadmium	ND		1.00	5	11/13/2023 13:14	WG2169361
Copper	13.8		5.00	5	11/13/2023 13:14	WG2169361
Lead	11.3		2.00	5	11/13/2023 13:14	WG2169361
Nickel	14.0		2.50	5	11/13/2023 13:14	WG2169361
Selenium	ND		2.50	5	11/13/2023 13:14	WG2169361
Silver	ND		0.500	5	11/13/2023 13:14	WG2169361
Zinc	48.0		25.0	5	11/13/2023 13:14	WG2169361

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.204		1	11/16/2023 12:12	WG2171622

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	11/17/2023 13:31	WG2170207

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.34	T8	1	11/14/2023 11:58	WG2170173

Sample Narrative:

L1676590-02 WG2170173: 8.34 at 21.9C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	167		10.0	1	11/14/2023 11:27	WG2170234

Sample Narrative:

L1676590-02 WG2170234: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	0.269		0.200	1	11/16/2023 16:20	WG2171629

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.62		1.00	5	11/13/2023 13:17	WG2169361
Barium	160		2.50	5	11/13/2023 13:17	WG2169361
Cadmium	ND		1.00	5	11/13/2023 13:17	WG2169361
Copper	9.68		5.00	5	11/13/2023 13:17	WG2169361
Lead	8.99		2.00	5	11/13/2023 13:17	WG2169361
Nickel	12.2		2.50	5	11/13/2023 13:17	WG2169361
Selenium	ND		2.50	5	11/13/2023 13:17	WG2169361
Silver	ND		0.500	5	11/13/2023 13:17	WG2169361
Zinc	36.0		25.0	5	11/13/2023 13:17	WG2169361

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.833		1	11/16/2023 11:41	WG2171622

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	11/17/2023 13:46	WG2170207

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.74	T8	1	11/14/2023 11:58	WG2170173

Sample Narrative:

L1676590-03 WG2170173: 8.74 at 21.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	129		10.0	1	11/14/2023 11:27	WG2170234

Sample Narrative:

L1676590-03 WG2170234: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	0.347		0.200	1	11/16/2023 16:23	WG2171629

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	4.00		1.00	5	11/13/2023 13:20	WG2169361
Barium	194		2.50	5	11/13/2023 13:20	WG2169361
Cadmium	ND		1.00	5	11/13/2023 13:20	WG2169361
Copper	11.1		5.00	5	11/13/2023 13:20	WG2169361
Lead	10.3		2.00	5	11/13/2023 13:20	WG2169361
Nickel	12.9		2.50	5	11/13/2023 13:20	WG2169361
Selenium	ND		2.50	5	11/13/2023 13:20	WG2169361
Silver	ND		0.500	5	11/13/2023 13:20	WG2169361
Zinc	41.0		25.0	5	11/13/2023 13:20	WG2169361

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.116		1	11/16/2023 11:32	WG2171622

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	11/17/2023 13:51	WG2170207

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.37	T8	1	11/14/2023 11:58	WG2170173

Sample Narrative:

L1676590-04 WG2170173: 8.37 at 21.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	142		10.0	1	11/14/2023 11:27	WG2170234

Sample Narrative:

L1676590-04 WG2170234: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	0.209		0.200	1	11/16/2023 16:26	WG2171629

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	4.16		1.00	5	11/13/2023 13:24	WG2169361
Barium	159		2.50	5	11/13/2023 13:24	WG2169361
Cadmium	ND		1.00	5	11/13/2023 13:24	WG2169361
Copper	11.8		5.00	5	11/13/2023 13:24	WG2169361
Lead	10.5		2.00	5	11/13/2023 13:24	WG2169361
Nickel	13.5		2.50	5	11/13/2023 13:24	WG2169361
Selenium	ND		2.50	5	11/13/2023 13:24	WG2169361
Silver	ND		0.500	5	11/13/2023 13:24	WG2169361
Zinc	41.3		25.0	5	11/13/2023 13:24	WG2169361

Method Blank (MB)

(MB) R4001519-1 11/17/23 11:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L1676375-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1676375-05 11/17/23 12:23 • (DUP) R4001519-7 11/17/23 12:28

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

L1676526-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1676526-07 11/17/23 13:15 • (DUP) R4001519-8 11/17/23 13:20

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4001519-2 11/17/23 11:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	10.0	10.7	107	80.0-120	

L1676375-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676375-01 11/17/23 11:52 • (MS) R4001519-3 11/17/23 11:57 • (MSD) R4001519-4 11/17/23 12:02

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	ND	18.7	14.9	93.7	74.7	1	75.0-125		J3 J6	22.5	20

L1676375-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1676375-01 11/17/23 11:52 • (MS) R4001519-5 11/17/23 12:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	638	ND	743	117	50	75.0-125	

L1676017-27 Original Sample (OS) • Duplicate (DUP)

(OS) L1676017-27 11/14/23 11:58 • (DUP) R3999487-2 11/14/23 11:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.90	6.94	1	0.578		1

Sample Narrative:

OS: 6.9 at 22.5C

DUP: 6.94 at 22.4C

L1676590-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1676590-04 11/14/23 11:58 • (DUP) R3999487-3 11/14/23 11:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.37	8.39	1	0.239		1

Sample Narrative:

OS: 8.37 at 21.6C

DUP: 8.39 at 21.4C

Laboratory Control Sample (LCS)

(LCS) R3999487-1 11/14/23 11:58

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.5C

Method Blank (MB)

(MB) R3998621-1 11/11/23 15:09

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1675363-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1675363-02 11/11/23 15:09 • (DUP) R3998621-3 11/11/23 15:09

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	271	272	1	0.331		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1676196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1676196-01 11/11/23 15:09 • (DUP) R3998621-4 11/11/23 15:09

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	6230	6020	1	3.43		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3998621-2 11/11/23 15:09

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	340	104	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R3999463-1 11/14/23 11:27

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1676590-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1676590-04 11/14/23 11:27 • (DUP) R3999463-3 11/14/23 11:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	142	141	1	0.565		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1676604-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1676604-03 11/14/23 11:27 • (DUP) R3999463-4 11/14/23 11:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2080	2080	1	0.0960		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3999463-2 11/14/23 11:27

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	327	100	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R4000924-1 11/16/23 15:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4000924-2 11/16/23 15:29 • (LCSD) R4000924-3 11/16/23 15:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.06	1.09	106	109	80.0-120			2.91	20

Method Blank (MB)

(MB) R3999118-1 11/13/23 11:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R3999118-2 11/13/23 11:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	107	107	80.0-120	
Barium	100	99.3	99.3	80.0-120	
Cadmium	100	107	107	80.0-120	
Copper	100	102	102	80.0-120	
Lead	100	104	104	80.0-120	
Nickel	100	107	107	80.0-120	
Selenium	100	112	112	80.0-120	
Silver	20.0	22.2	111	80.0-120	
Zinc	100	104	104	80.0-120	

L1676586-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676586-01 11/13/23 11:57 • (MS) R3999118-5 11/13/23 12:07 • (MSD) R3999118-6 11/13/23 12:11

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	6.07	102	95.9	95.4	89.8	5	75.0-125			5.73	20
Barium	100	218	329	313	111	94.9	5	75.0-125			4.93	20
Cadmium	100	ND	95.4	97.4	95.0	97.1	5	75.0-125			2.10	20
Copper	100	11.8	94.3	94.4	82.5	82.6	5	75.0-125			0.114	20
Lead	100	7.80	98.8	103	91.0	94.8	5	75.0-125			3.72	20
Nickel	100	15.4	98.9	101	83.6	85.5	5	75.0-125			1.89	20
Selenium	100	ND	97.5	99.1	96.9	98.5	5	75.0-125			1.61	20
Silver	20.0	ND	19.3	19.6	96.7	98.2	5	75.0-125			1.56	20
Zinc	100	29.7	111	114	81.5	83.8	5	75.0-125			2.10	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

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

Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

Billing Information: SAME AS LEFT

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Jake Janicek

Email To: jjanicek@caerusoilandgas.com

Project Description: OP33 P&A Investigation

City/State Collected: Piceance Crk, CO

Please Circle: PT MT CT ET

Phone: (970) 778-2314

Client Project # –

Lab Project # –

SDG # G198

Collected by (print): Trevor Lakin

Site/Facility ID # OP33

P.O. # –

Acctnum:

Template:

Prelogin:

PM:

PB:

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # –

Date Results Needed: Standard TAT

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	COGCC Table 915-1 minus organics	EC, pH, SAR	Arsenic, Boron	COGCC Table 910-1	Remarks	Sample # (lab only)
20231108-OUBG-(OP33-S)@1	Grab	SS	1ft	11/08/23	11:50	4	X					-01
20231108-OUBG-(OP33-E)@1					12:12	4	X					-02
20231108-OUBG-(OP33-W)@1					12:34	4	X					-03
20231108-OUBG-(OP33-N)@1					12:54	4	X					-04

11/08/23

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 6525 5572 2913

Sample Receipt Checklist

COC Seal Present/Intact:	√NP	__Y __N
COC Signed/Accurate:		√Y __N
Bottles arrive intact:		√Y __N
Correct bottles used:		√Y __N
Sufficient volume sent:		√Y __N
If Applicable		
VOA Zero Headspace:		__Y __N
Preservation Correct/Checked:		√Y __N
RAD Screen <0.5 mR/hr:		√Y __N

Relinquished by: (Signature)	Date: 11/08/23	Time: 14:30	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by: (Signature)	Date: 11/8/23	Time: 1500	Received by: (Signature)	Temp: MSA 8°C 0.4+0=0.4 Bottles Received: 16
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11-9-23 Time: 900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

ANALYTICAL REPORT

November 22, 2023

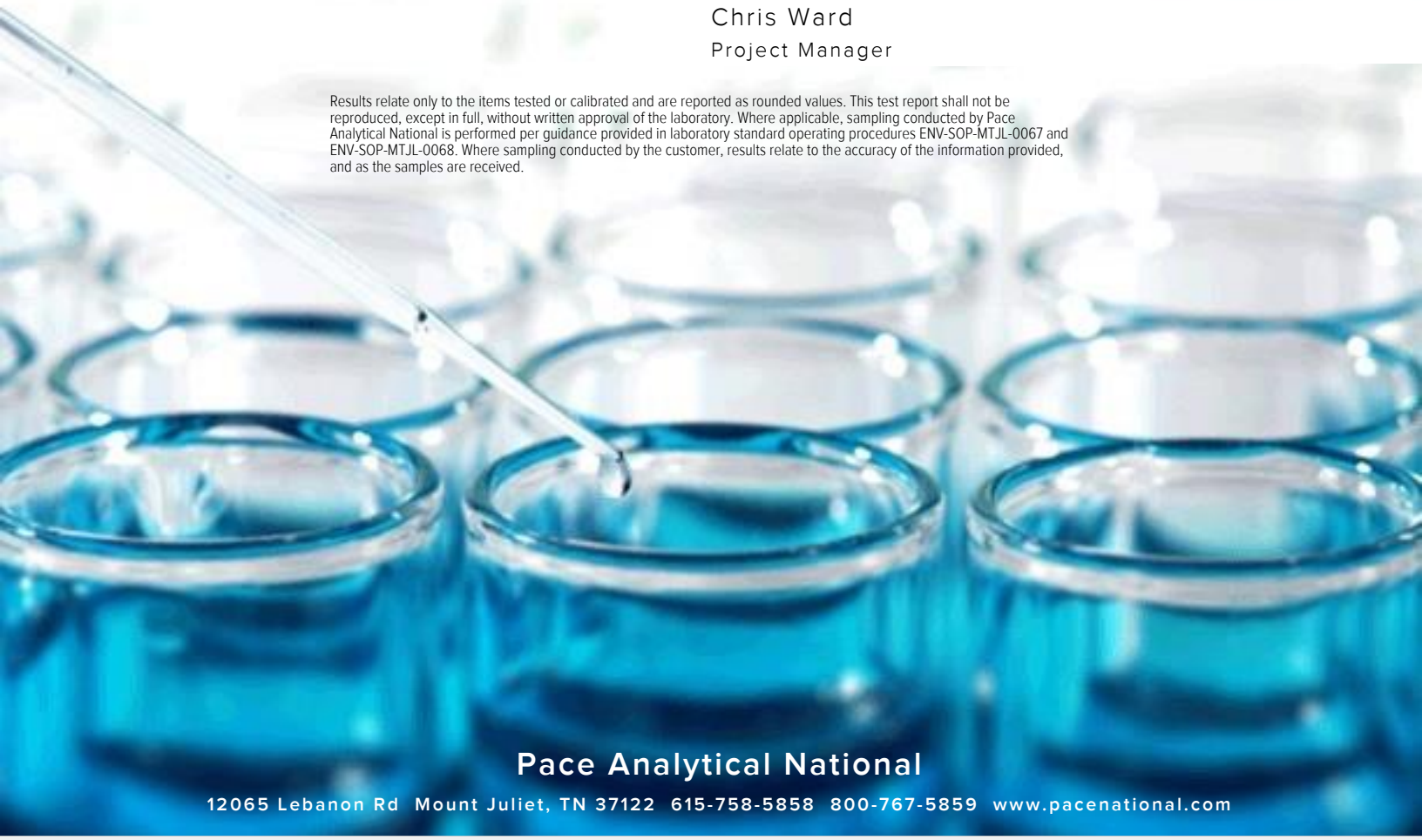
Caerus Oil and Gas

Sample Delivery Group:	L1676616
Samples Received:	11/10/2023
Project Number:	
Description:	OP33 P+A Investigation
Site:	OP33
Report To:	Jake J. / Brett M. / Blair R. / Andy V. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By:

Chris Ward

Project Manager



Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

SAMPLE SUMMARY

20231109-OP33-(FC-FL)@4 L1676616-01 Solid

Collected by: Trevor Lakin
Collected date/time: 11/09/23 11:29
Received date/time: 11/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171642	1	11/17/23 13:05	11/17/23 13:05	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170360	1	11/13/23 14:50	11/20/23 06:35	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170170	1	11/13/23 10:08	11/13/23 13:08	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2170234	1	11/14/23 07:15	11/14/23 11:27	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171645	1	11/16/23 12:38	11/16/23 21:08	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169616	5	11/13/23 16:29	11/13/23 20:23	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2171208	25	11/13/23 08:26	11/14/23 21:24	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2172428	1	11/13/23 08:26	11/18/23 01:06	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2170615	1	11/14/23 17:41	11/15/23 04:29	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2169996	1	11/13/23 16:28	11/14/23 16:23	ALM	Mt. Juliet, TN

20231109-OP33-(FC-WH-KEINATH 33-9)@5 L1676616-02 Solid

Collected by: Trevor Lakin
Collected date/time: 11/09/23 11:03
Received date/time: 11/10/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2171642	1	11/17/23 13:16	11/17/23 13:16	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2170360	1	11/13/23 14:50	11/20/23 06:40	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2170170	1	11/13/23 10:08	11/13/23 13:08	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2170247	1	11/14/23 07:15	11/14/23 09:55	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2171645	1	11/16/23 12:38	11/16/23 21:11	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2169616	5	11/13/23 16:29	11/13/23 20:48	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2171208	25	11/13/23 08:26	11/14/23 21:44	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2172428	1	11/13/23 08:26	11/18/23 01:25	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2170615	1	11/14/23 17:41	11/15/23 02:35	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2169996	1	11/13/23 16:28	11/14/23 16:41	ALM	Mt. Juliet, TN

CASE NARRATIVE

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

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.410		1	11/17/2023 13:05	WG2171642

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND	J4	1.00	1	11/20/2023 06:35	WG2170360

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.54	T8	1	11/13/2023 13:08	WG2170170

Sample Narrative:

L1676616-01 WG2170170: 8.54 at 20.3C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	264		10.0	1	11/14/2023 11:27	WG2170234

Sample Narrative:

L1676616-01 WG2170234: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	0.201		0.200	1	11/16/2023 21:08	WG2171645

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	2.67		1.00	5	11/13/2023 20:23	WG2169616
Barium	470		2.50	5	11/13/2023 20:23	WG2169616
Cadmium	ND		1.00	5	11/13/2023 20:23	WG2169616
Copper	13.0		5.00	5	11/13/2023 20:23	WG2169616
Lead	18.2		2.00	5	11/13/2023 20:23	WG2169616
Nickel	9.76		2.50	5	11/13/2023 20:23	WG2169616
Selenium	ND		2.50	5	11/13/2023 20:23	WG2169616
Silver	ND		0.500	5	11/13/2023 20:23	WG2169616
Zinc	36.5		25.0	5	11/13/2023 20:23	WG2169616

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		2.50	25	11/14/2023 21:24	WG2171208
(S) a,a,a-Trifluorotoluene(FID)	*96.6*		*77.0-120*		*11/14/2023 21:24*	WG2171208

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/18/2023 01:06	WG2172428
Toluene	ND		0.00500	1	11/18/2023 01:06	WG2172428
Ethylbenzene	ND		0.00250	1	11/18/2023 01:06	WG2172428
Xylenes, Total	ND		0.00650	1	11/18/2023 01:06	WG2172428
1,2,4-Trimethylbenzene	ND		0.00500	1	11/18/2023 01:06	WG2172428
1,3,5-Trimethylbenzene	ND		0.00500	1	11/18/2023 01:06	WG2172428
(S) Toluene-d8	*100*		*75.0-131*		*11/18/2023 01:06*	WG2172428
(S) 4-Bromofluorobenzene	*106*		*67.0-138*		*11/18/2023 01:06*	WG2172428
(S) 1,2-Dichloroethane-d4	*95.9*		*70.0-130*		*11/18/2023 01:06*	WG2172428

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	30.6		4.00	1	11/15/2023 04:29	WG2170615
C28-C36 Motor Oil Range	60.2		4.00	1	11/15/2023 04:29	WG2170615
(S) o-Terphenyl	*59.0*		*18.0-148*		*11/15/2023 04:29*	WG2170615

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Anthracene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Benzo(a)anthracene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Benzo(b)fluoranthene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Benzo(k)fluoranthene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Benzo(a)pyrene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Chrysene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Dibenz(a,h)anthracene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Fluoranthene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Fluorene	ND		0.00600	1	11/14/2023 16:23	WG2169996
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/14/2023 16:23	WG2169996
1-Methylnaphthalene	ND		0.0200	1	11/14/2023 16:23	WG2169996
2-Methylnaphthalene	ND		0.0200	1	11/14/2023 16:23	WG2169996
Naphthalene	ND		0.0200	1	11/14/2023 16:23	WG2169996
Pyrene	ND		0.00600	1	11/14/2023 16:23	WG2169996
(S) p-Terphenyl-d14	*64.9*		*23.0-120*		*11/14/2023 16:23*	WG2169996
(S) Nitrobenzene-d5	*46.8*		*14.0-149*		*11/14/2023 16:23*	WG2169996
(S) 2-Fluorobiphenyl	*49.1*		*34.0-125*		*11/14/2023 16:23*	WG2169996

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.381		1	11/17/2023 13:16	WG2171642

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND	J4	1.00	1	11/20/2023 06:40	WG2170360

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.74	T8	1	11/13/2023 13:08	WG2170170

Sample Narrative:

L1676616-02 WG2170170: 8.74 at 21C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	175		10.0	1	11/14/2023 09:55	WG2170247

Sample Narrative:

L1676616-02 WG2170247: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	0.226		0.200	1	11/16/2023 21:11	WG2171645

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.03		1.00	5	11/13/2023 20:48	WG2169616
Barium	145		2.50	5	11/13/2023 20:48	WG2169616
Cadmium	ND		1.00	5	11/13/2023 20:48	WG2169616
Copper	10.4		5.00	5	11/13/2023 20:48	WG2169616
Lead	7.85		2.00	5	11/13/2023 20:48	WG2169616
Nickel	9.51		2.50	5	11/13/2023 20:48	WG2169616
Selenium	ND		2.50	5	11/13/2023 20:48	WG2169616
Silver	ND		0.500	5	11/13/2023 20:48	WG2169616
Zinc	29.1		25.0	5	11/13/2023 20:48	WG2169616

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		2.50	25	11/14/2023 21:44	WG2171208
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*77.0-120*		*11/14/2023 21:44*	WG2171208

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/18/2023 01:25	WG2172428
Toluene	ND		0.00500	1	11/18/2023 01:25	WG2172428
Ethylbenzene	ND		0.00250	1	11/18/2023 01:25	WG2172428
Xylenes, Total	ND		0.00650	1	11/18/2023 01:25	WG2172428
1,2,4-Trimethylbenzene	ND		0.00500	1	11/18/2023 01:25	WG2172428
1,3,5-Trimethylbenzene	ND		0.00500	1	11/18/2023 01:25	WG2172428
(S) Toluene-d8	*105*		*75.0-131*		*11/18/2023 01:25*	WG2172428
(S) 4-Bromofluorobenzene	*114*		*67.0-138*		*11/18/2023 01:25*	WG2172428
(S) 1,2-Dichloroethane-d4	*97.0*		*70.0-130*		*11/18/2023 01:25*	WG2172428

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		4.00	1	11/15/2023 02:35	WG2170615
C28-C36 Motor Oil Range	ND		4.00	1	11/15/2023 02:35	WG2170615
(S) o-Terphenyl	*51.5*		*18.0-148*		*11/15/2023 02:35*	WG2170615

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Anthracene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Benzo(a)anthracene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Benzo(b)fluoranthene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Benzo(k)fluoranthene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Benzo(a)pyrene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Chrysene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Dibenz(a,h)anthracene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Fluoranthene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Fluorene	ND		0.00600	1	11/14/2023 16:41	WG2169996
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	11/14/2023 16:41	WG2169996
1-Methylnaphthalene	ND		0.0200	1	11/14/2023 16:41	WG2169996
2-Methylnaphthalene	ND		0.0200	1	11/14/2023 16:41	WG2169996
Naphthalene	ND		0.0200	1	11/14/2023 16:41	WG2169996
Pyrene	ND		0.00600	1	11/14/2023 16:41	WG2169996
(S) p-Terphenyl-d14	*58.8*		*23.0-120*		*11/14/2023 16:41*	WG2169996
(S) Nitrobenzene-d5	*56.0*		*14.0-149*		*11/14/2023 16:41*	WG2169996
(S) 2-Fluorobiphenyl	*50.1*		*34.0-125*		*11/14/2023 16:41*	WG2169996

Method Blank (MB)

(MB) R4002109-1 11/20/23 04:47

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L1676591-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1676591-07 11/20/23 05:04 • (DUP) R4002109-3 11/20/23 05:10

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

L1676652-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1676652-02 11/20/23 07:11 • (DUP) R4002109-8 11/20/23 07:16

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4002109-2 11/20/23 04:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	10.0	14.2	142	80.0-120	J4

L1676591-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676591-08 11/20/23 05:15 • (MS) R4002109-5 11/20/23 05:25 • (MSD) R4002109-6 11/20/23 05:30

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	ND	14.8	13.4	74.0	67.1	1	75.0-125	J6	J6	9.74	20

L1676591-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1676591-08 11/20/23 05:15 • (MS) R4002109-7 11/20/23 05:36

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	646	ND	212	32.8	50	75.0-125	J6

L1676591-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1676591-04 11/13/23 13:08 • (DUP) R3999104-2 11/13/23 13:08

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.64	8.65	1	0.116		1

Sample Narrative:

OS: 8.64 at 20.2C

DUP: 8.65 at 20.3C

L1676608-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1676608-01 11/13/23 13:08 • (DUP) R3999104-3 11/13/23 13:08

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.95	8.92	1	0.336		1

Sample Narrative:

OS: 8.95 at 20.7C

DUP: 8.92 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3999104-1 11/13/23 13:08

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 19.5C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3999463-1 11/14/23 11:27

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1676590-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1676590-04 11/14/23 11:27 • (DUP) R3999463-3 11/14/23 11:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	142	141	1	0.565		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1676604-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1676604-03 11/14/23 11:27 • (DUP) R3999463-4 11/14/23 11:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2080	2080	1	0.0960		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3999463-2 11/14/23 11:27

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	327	100	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R3999404-1 11/14/23 09:55

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1676616-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1676616-02 11/14/23 09:55 • (DUP) R3999404-3 11/14/23 09:55

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	175	180	1	2.88		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1676876-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1676876-05 11/14/23 09:55 • (DUP) R3999404-4 11/14/23 09:55

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	121	119	1	1.08		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3999404-2 11/14/23 09:55

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	346	106	85.0-115	

Sample Narrative:
LCS: at 25C

QUALITY CONTROL SUMMARY

L1676616-01,02

Method Blank (MB)

(MB) R4001200-1 11/16/23 20:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4001200-2 11/16/23 20:37 • (LCSD) R4001200-3 11/16/23 20:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.03	1.02	103	102	80.0-120			0.226	20

QUALITY CONTROL SUMMARY

L1676616-01,02

Method Blank (MB)

(MB) R3999274-1 11/13/23 19:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	0.445	J	0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R3999274-2 11/13/23 19:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.4	96.4	80.0-120	
Barium	100	95.4	95.4	80.0-120	
Cadmium	100	98.4	98.4	80.0-120	
Copper	100	97.2	97.2	80.0-120	
Lead	100	97.0	97.0	80.0-120	
Nickel	100	96.8	96.8	80.0-120	
Selenium	100	100	100	80.0-120	
Silver	20.0	19.2	96.1	80.0-120	
Zinc	100	91.0	91.0	80.0-120	

L1676645-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676645-02 11/13/23 19:59 • (MS) R3999274-5 11/13/23 20:09 • (MSD) R3999274-6 11/13/23 20:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	7.34	94.6	95.1	87.3	87.8	5	75.0-125			0.525	20
Barium	100	222	273	259	50.6	37.4	5	75.0-125	J6	J6	4.97	20
Cadmium	100	ND	92.2	91.9	91.9	91.6	5	75.0-125			0.393	20
Copper	100	11.4	100	98.9	88.6	87.5	5	75.0-125			1.13	20
Lead	100	10.2	96.6	99.6	86.4	89.4	5	75.0-125			3.01	20
Nickel	100	12.9	99.6	99.0	86.7	86.1	5	75.0-125			0.570	20
Selenium	100	ND	88.9	88.7	88.3	88.1	5	75.0-125			0.229	20
Silver	20.0	ND	18.1	18.3	90.3	91.6	5	75.0-125			1.40	20
Zinc	100	33.7	117	117	83.2	82.8	5	75.0-125			0.277	20

Method Blank (MB)

(MB) R4000177-3 11/14/23 12:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*95.0*			*77.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4000177-1 11/14/23 10:50 • (LCSD) R4000177-2 11/14/23 11:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.52	5.27	100	95.8	72.0-127			4.63	20
(S) a,a,a-Trifluorotoluene(FID)				*100*	*101*	*77.0-120*				

L1676608-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676608-01 11/14/23 20:46 • (MS) R4000177-4 11/14/23 23:01 • (MSD) R4000177-5 11/14/23 23:21

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	138	ND	128	125	91.4	89.2	25	10.0-151			2.37	28
(S) a,a,a-Trifluorotoluene(FID)					*103*	*103*		*77.0-120*				

Method Blank (MB)

(MB) R4002371-3 11/18/23 00:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	*98.8*			*75.0-131*
(S) 4-Bromofluorobenzene	*103*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*98.8*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4002371-1 11/17/23 22:53 • (LCSD) R4002371-2 11/17/23 23:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.140	0.134	112	107	70.0-123			4.38	20
Toluene	0.125	0.128	0.126	102	101	75.0-121			1.57	20
Ethylbenzene	0.125	0.131	0.128	105	102	74.0-126			2.32	20
Xylenes, Total	0.375	0.367	0.392	97.9	105	72.0-127			6.59	20
1,2,4-Trimethylbenzene	0.125	0.122	0.122	97.6	97.6	70.0-126			0.000	20
1,3,5-Trimethylbenzene	0.125	0.121	0.123	96.8	98.4	73.0-127			1.64	20
(S) Toluene-d8				*99.7*	*98.9*	*75.0-131*				
(S) 4-Bromofluorobenzene				*105*	*104*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*99.0*	*99.4*	*70.0-130*				

Method Blank (MB)

(MB) R4000111-1 11/15/23 01:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	*61.3*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4000111-2 11/15/23 01:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	29.2	58.4	50.0-150	
(S) o-Terphenyl			*56.6*	*18.0-148*	

L1676636-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676636-01 11/15/23 13:07 • (MS) R4000222-1 11/15/23 13:20 • (MSD) R4000222-2 11/15/23 13:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	48.2	ND	36.4	45.6	43.8	63.7	5	50.0-150	J6	J3	22.4	20
(S) o-Terphenyl					*39.3*	*55.0*		*18.0-148*				

Sample Narrative:

OS: Cannot run at lower dilution due to viscosity of extract

Method Blank (MB)

(MB) R3999716-2 11/14/23 14:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	0.00274	J	0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	*72.4*			*23.0-120*
(S) Nitrobenzene-d5	*56.4*			*14.0-149*
(S) 2-Fluorobiphenyl	*60.6*			*34.0-125*

Laboratory Control Sample (LCS)

(LCS) R3999716-1 11/14/23 13:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0634	79.3	50.0-120	
Anthracene	0.0800	0.0628	78.5	50.0-126	
Benzo(a)anthracene	0.0800	0.0684	85.5	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0668	83.5	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0635	79.4	49.0-125	
Benzo(a)pyrene	0.0800	0.0619	77.4	42.0-120	
Chrysene	0.0800	0.0711	88.9	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0666	83.3	47.0-125	
Fluoranthene	0.0800	0.0723	90.4	49.0-129	
Fluorene	0.0800	0.0659	82.4	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0737	92.1	46.0-125	
1-Methylnaphthalene	0.0800	0.0620	77.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0591	73.9	50.0-120	
Naphthalene	0.0800	0.0592	74.0	50.0-120	
Pyrene	0.0800	0.0757	94.6	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3999716-1 11/14/23 13:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			*81.2*	*23.0-120*	
(S) Nitrobenzene-d5			*59.2*	*14.0-149*	
(S) 2-Fluorobiphenyl			*60.6*	*34.0-125*	

L1676608-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1676608-01 11/14/23 15:31 • (MS) R3999716-3 11/14/23 15:48 • (MSD) R3999716-4 11/14/23 16:06

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.0760	ND	0.0374	0.0471	49.2	62.0	1	14.0-127			23.0	27
Anthracene	0.0760	ND	0.0371	0.0458	48.8	60.3	1	10.0-145			21.0	30
Benzo(a)anthracene	0.0760	ND	0.0437	0.0529	57.5	69.6	1	10.0-139			19.0	30
Benzo(b)fluoranthene	0.0760	ND	0.0380	0.0475	50.0	62.5	1	10.0-140			22.2	36
Benzo(k)fluoranthene	0.0760	ND	0.0403	0.0481	53.0	63.3	1	10.0-137			17.6	31
Benzo(a)pyrene	0.0760	ND	0.0443	0.0539	58.3	70.9	1	10.0-141			19.6	31
Chrysene	0.0760	ND	0.0462	0.0541	60.8	71.2	1	10.0-145			15.8	30
Dibenz(a,h)anthracene	0.0760	ND	0.0431	0.0511	56.7	67.2	1	10.0-132			17.0	31
Fluoranthene	0.0760	ND	0.0393	0.0500	51.7	65.8	1	10.0-153			24.0	33
Fluorene	0.0760	ND	0.0381	0.0473	50.1	62.2	1	11.0-130			21.5	29
Indeno(1,2,3-cd)pyrene	0.0760	ND	0.0444	0.0547	58.4	72.0	1	10.0-137			20.8	32
1-Methylnaphthalene	0.0760	ND	0.0386	0.0487	50.8	64.1	1	10.0-142			23.1	28
2-Methylnaphthalene	0.0760	ND	0.0366	0.0455	48.2	59.9	1	10.0-137			21.7	28
Naphthalene	0.0760	ND	0.0410	0.0490	53.9	64.5	1	10.0-135			17.8	27
Pyrene	0.0760	ND	0.0416	0.0529	54.7	69.6	1	10.0-148			23.9	35
(S) p-Terphenyl-d14					*67.4*	*71.2*		*23.0-120*				
(S) Nitrobenzene-d5					*49.5*	*53.3*		*14.0-149*				
(S) 2-Fluorobiphenyl					*50.8*	*53.5*		*34.0-125*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

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

Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

Billing Information: SAME AS LEFT

Report to: Jake Janicek

Email To: jjanicek@caerusoilandgas.com

Project Description: OP33 P+A Investigation

City/State Collected: Piceance Crk, CO

Please Circle: PT (MT) CT ET

Phone: (970) 778-2314

Client Project # –

Lab Project # –

Collected by (print): Trevor Lakin

Site/Facility ID # OP33

P.O. # –

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day

Quote # –

Date Results Needed: Standard TAT

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Pres Chk	COGCC Table 915-1	EC, pH, SAR	Arsenic, Boron	COGCC Table 910-1	Remarks	Sample # (lab only)
20231109-OP33-(FC-FL)@4	Grab	SS	4ft	11/09/23	11:29	4		X					-01
20231109-OP33-(FC-WH-Keinath 33-9)@5	↓	↓	5ft	↓	11:03	4		X					-02

11/9/23

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 6535 5572 2177

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/09/23	14:40	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/9/23	1600	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			(14)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 4°C 4°8 °C
0.8 to 0.8

Bottles Received: 8

Date: 11/10/23 Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1676616

K236

Acctnum:

Template:

Prelogin:

PM:

PB:

Shipped Via:

ANALYTICAL REPORT

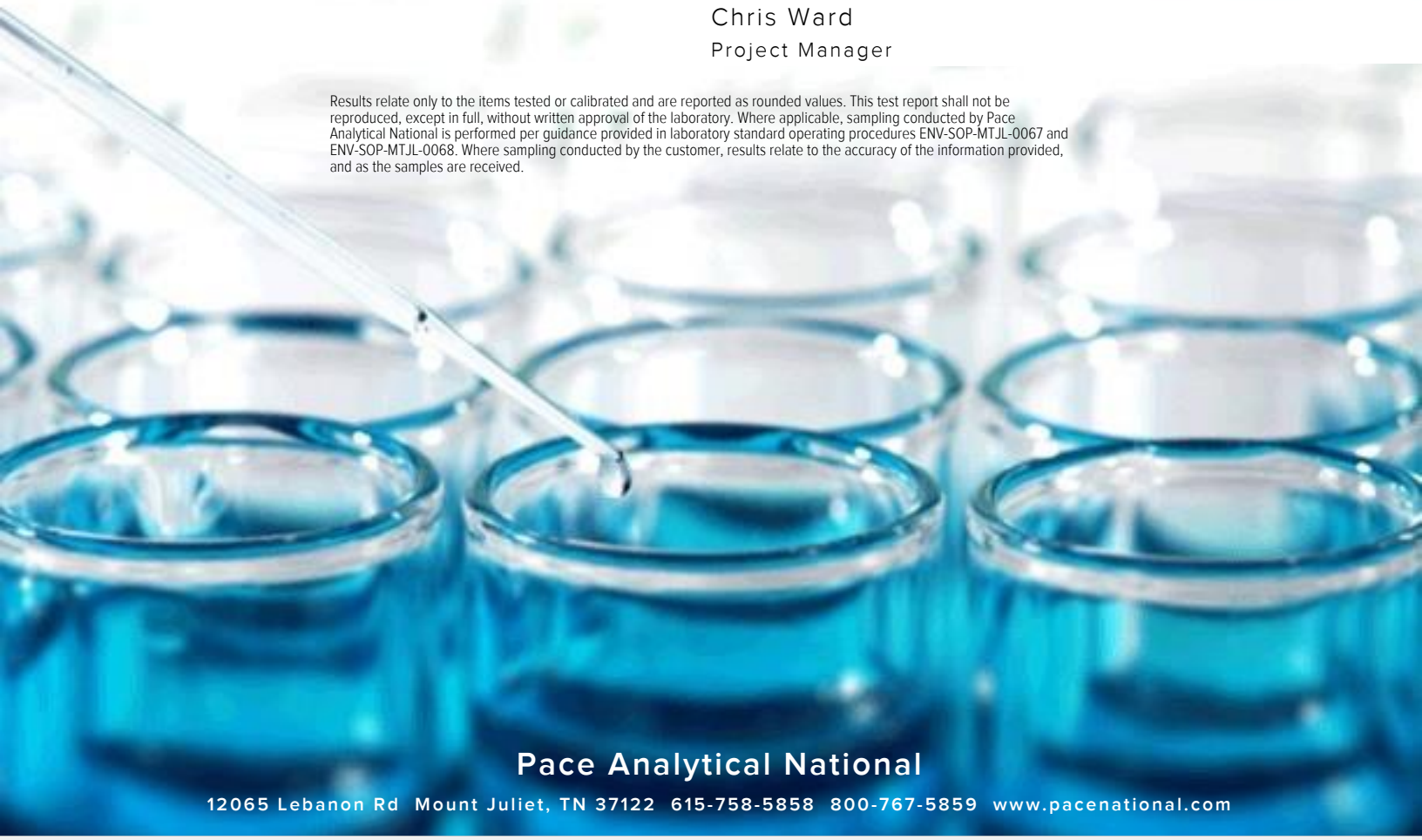
January 30, 2024

Caerus Oil and Gas

Sample Delivery Group:	L1698091
Samples Received:	01/23/2024
Project Number:	
Description:	OP33 P+A Investigation
Site:	OP33
Report To:	Jake J. / Brett M. / Blair R. / Andy V. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By:

Chris Ward
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

20240118-OP33-(FC-WH-STOCK) L1698091-01 Solid

Collected by: Trevor Lakin | Collected date/time: 01/18/24 11:53 | Received date/time: 01/23/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2213339	1	01/28/24 11:18	01/28/24 11:18	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2211966	1	01/24/24 17:22	01/25/24 09:10	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2212488	1	01/24/24 16:41	01/25/24 10:00	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2212092	1	01/24/24 09:49	01/25/24 16:33	BJM	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2213340	1	01/27/24 09:50	01/27/24 18:53	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2212508	5	01/24/24 16:25	01/25/24 00:02	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2213575	1	01/24/24 21:42	01/26/24 16:46	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2213023	1	01/24/24 21:42	01/25/24 13:48	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2211876	1	01/24/24 11:43	01/25/24 02:12	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2211913	1	01/24/24 16:59	01/25/24 19:02	MKM	Mt. Juliet, TN

20240118-OP33-(BASE01)@4 L1698091-02 Solid

Collected by: Trevor Lakin | Collected date/time: 01/18/24 12:15 | Received date/time: 01/23/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2213339	1	01/28/24 11:19	01/28/24 11:19	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2211966	1	01/24/24 17:22	01/25/24 09:16	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2212488	1	01/24/24 16:41	01/25/24 10:00	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2212092	1	01/24/24 09:49	01/25/24 16:33	BJM	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2213340	1	01/27/24 09:50	01/27/24 18:55	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2212508	5	01/24/24 16:25	01/25/24 00:18	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2213575	1	01/24/24 21:42	01/26/24 17:05	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2213023	1	01/24/24 21:42	01/25/24 14:07	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2211876	1	01/24/24 11:43	01/25/24 02:00	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2211913	1	01/24/24 16:59	01/25/24 19:20	MKM	Mt. Juliet, TN

20240118-OP33-(FC-DL)@5 L1698091-03 Solid

Collected by: Trevor Lakin | Collected date/time: 01/18/24 12:40 | Received date/time: 01/23/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2213339	1	01/28/24 11:21	01/28/24 11:21	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2211966	1	01/24/24 17:22	01/25/24 09:22	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2212488	1	01/24/24 16:41	01/25/24 10:00	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2212092	1	01/24/24 09:49	01/25/24 16:33	BJM	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2213340	1	01/27/24 09:50	01/27/24 18:56	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2212508	7.14	01/24/24 16:25	01/25/24 00:21	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2213575	1	01/24/24 21:42	01/26/24 17:24	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2213023	1	01/24/24 21:42	01/25/24 14:27	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2211876	1	01/24/24 11:43	01/25/24 00:33	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2211913	1	01/24/24 16:59	01/25/24 19:58	AGW	Mt. Juliet, TN

20240118-OP33-(STOCK02) L1698091-04 Solid

Collected by: Trevor Lakin | Collected date/time: 01/18/24 12:52 | Received date/time: 01/23/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2213339	1	01/28/24 11:23	01/28/24 11:23	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2211966	1	01/24/24 17:22	01/25/24 09:28	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2212488	1	01/24/24 16:41	01/25/24 10:00	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2212092	1	01/24/24 09:49	01/25/24 16:33	BJM	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2213340	1	01/27/24 09:50	01/27/24 18:58	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2212508	5	01/24/24 16:25	01/25/24 00:25	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2213575	1	01/24/24 21:42	01/26/24 17:44	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2213023	1	01/24/24 21:42	01/25/24 14:47	ACG	Mt. Juliet, TN

SAMPLE SUMMARY

20240118-OP33-(STOCK02) L1698091-04 Solid

Collected by: Trevor Lakin
Collected date/time: 01/18/24 12:52
Received date/time: 01/23/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2211903	1	01/24/24 15:54	01/25/24 07:55	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2211913	1	01/24/24 16:59	01/25/24 20:18	AGW	Mt. Juliet, TN

CASE NARRATIVE

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

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.525		1	01/28/2024 11:18	WG2213339

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	01/25/2024 09:10	WG2211966

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.52	T8	1	01/25/2024 10:00	WG2212488

Sample Narrative:

L1698091-01 WG2212488: 8.52 at 20.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	172		10.0	1	01/25/2024 16:33	WG2212092

Sample Narrative:

L1698091-01 WG2212092: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	ND		0.200	1	01/27/2024 18:53	WG2213340

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.77		1.00	5	01/25/2024 00:02	WG2212508
Barium	170		2.50	5	01/25/2024 00:02	WG2212508
Cadmium	ND		1.00	5	01/25/2024 00:02	WG2212508
Copper	10.7		5.00	5	01/25/2024 00:02	WG2212508
Lead	9.27		2.00	5	01/25/2024 00:02	WG2212508
Nickel	13.0		2.50	5	01/25/2024 00:02	WG2212508
Selenium	ND		2.50	5	01/25/2024 00:02	WG2212508
Silver	ND		0.500	5	01/25/2024 00:02	WG2212508
Zinc	43.1		25.0	5	01/25/2024 00:02	WG2212508

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		0.100	1	01/26/2024 16:46	WG2213575
(S) a,a,a-Trifluorotoluene(FID)	*83.3*		*77.0-120*		*01/26/2024 16:46*	WG2213575

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	01/25/2024 13:48	WG2213023
Toluene	ND		0.00500	1	01/25/2024 13:48	WG2213023
Ethylbenzene	ND		0.00250	1	01/25/2024 13:48	WG2213023
Xylenes, Total	ND		0.00650	1	01/25/2024 13:48	WG2213023
1,2,4-Trimethylbenzene	ND		0.00500	1	01/25/2024 13:48	WG2213023
1,3,5-Trimethylbenzene	ND		0.00500	1	01/25/2024 13:48	WG2213023
(S) Toluene-d8	*94.4*		*75.0-131*		*01/25/2024 13:48*	WG2213023
(S) 4-Bromofluorobenzene	*101*		*67.0-138*		*01/25/2024 13:48*	WG2213023
(S) 1,2-Dichloroethane-d4	*112*		*70.0-130*		*01/25/2024 13:48*	WG2213023

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	43.0		4.00	1	01/25/2024 02:12	WG2211876
C28-C36 Motor Oil Range	81.5		4.00	1	01/25/2024 02:12	WG2211876
(S) o-Terphenyl	*36.6*		*18.0-148*		*01/25/2024 02:12*	WG2211876

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Anthracene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Benzo(a)anthracene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Benzo(b)fluoranthene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Benzo(k)fluoranthene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Benzo(a)pyrene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Chrysene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Dibenz(a,h)anthracene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Fluoranthene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Fluorene	ND		0.00600	1	01/25/2024 19:02	WG2211913
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/25/2024 19:02	WG2211913
1-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:02	WG2211913
2-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:02	WG2211913
Naphthalene	ND		0.0200	1	01/25/2024 19:02	WG2211913
Pyrene	ND		0.00600	1	01/25/2024 19:02	WG2211913
(S) p-Terphenyl-d14	*60.5*		*23.0-120*		*01/25/2024 19:02*	WG2211913
(S) Nitrobenzene-d5	*74.6*		*14.0-149*		*01/25/2024 19:02*	WG2211913
(S) 2-Fluorobiphenyl	*54.4*		*34.0-125*		*01/25/2024 19:02*	WG2211913

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.267		1	01/28/2024 11:19	WG2213339

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	01/25/2024 09:16	WG2211966

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.65	T8	1	01/25/2024 10:00	WG2212488

Sample Narrative:

L1698091-02 WG2212488: 8.65 at 20.2C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	147		10.0	1	01/25/2024 16:33	WG2212092

Sample Narrative:

L1698091-02 WG2212092: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	ND		0.200	1	01/27/2024 18:55	WG2213340

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.33		1.00	5	01/25/2024 00:18	WG2212508
Barium	134		2.50	5	01/25/2024 00:18	WG2212508
Cadmium	ND		1.00	5	01/25/2024 00:18	WG2212508
Copper	9.00		5.00	5	01/25/2024 00:18	WG2212508
Lead	7.52		2.00	5	01/25/2024 00:18	WG2212508
Nickel	9.73		2.50	5	01/25/2024 00:18	WG2212508
Selenium	ND		2.50	5	01/25/2024 00:18	WG2212508
Silver	ND		0.500	5	01/25/2024 00:18	WG2212508
Zinc	31.7		25.0	5	01/25/2024 00:18	WG2212508

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		0.100	1	01/26/2024 17:05	WG2213575
(S) a,a,a-Trifluorotoluene(FID)	*85.1*		*77.0-120*		*01/26/2024 17:05*	WG2213575

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	01/25/2024 14:07	WG2213023
Toluene	ND		0.00500	1	01/25/2024 14:07	WG2213023
Ethylbenzene	ND		0.00250	1	01/25/2024 14:07	WG2213023
Xylenes, Total	ND		0.00650	1	01/25/2024 14:07	WG2213023
1,2,4-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:07	WG2213023
1,3,5-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:07	WG2213023
(S) Toluene-d8	*93.6*		*75.0-131*		*01/25/2024 14:07*	WG2213023
(S) 4-Bromofluorobenzene	*99.6*		*67.0-138*		*01/25/2024 14:07*	WG2213023
(S) 1,2-Dichloroethane-d4	*111*		*70.0-130*		*01/25/2024 14:07*	WG2213023

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	4.00		4.00	1	01/25/2024 02:00	WG2211876
C28-C36 Motor Oil Range	14.2		4.00	1	01/25/2024 02:00	WG2211876
(S) o-Terphenyl	*45.1*		*18.0-148*		*01/25/2024 02:00*	WG2211876

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Anthracene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Benzo(a)anthracene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Benzo(b)fluoranthene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Benzo(k)fluoranthene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Benzo(a)pyrene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Chrysene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Dibenz(a,h)anthracene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Fluoranthene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Fluorene	ND		0.00600	1	01/25/2024 19:20	WG2211913
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/25/2024 19:20	WG2211913
1-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:20	WG2211913
2-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:20	WG2211913
Naphthalene	ND		0.0200	1	01/25/2024 19:20	WG2211913
Pyrene	ND		0.00600	1	01/25/2024 19:20	WG2211913
(S) p-Terphenyl-d14	*38.9*		*23.0-120*		*01/25/2024 19:20*	WG2211913
(S) Nitrobenzene-d5	*44.2*		*14.0-149*		*01/25/2024 19:20*	WG2211913
(S) 2-Fluorobiphenyl	*34.9*		*34.0-125*		*01/25/2024 19:20*	WG2211913

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.764		1	01/28/2024 11:21	WG2213339

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	01/25/2024 09:22	WG2211966

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.50	T8	1	01/25/2024 10:00	WG2212488

Sample Narrative:

L1698091-03 WG2212488: 8.5 at 20.3C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	155		10.0	1	01/25/2024 16:33	WG2212092

Sample Narrative:

L1698091-03 WG2212092: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	ND		0.200	1	01/27/2024 18:56	WG2213340

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.47		1.43	7.14	01/25/2024 00:21	WG2212508
Barium	167		3.57	7.14	01/25/2024 00:21	WG2212508
Cadmium	ND		1.43	7.14	01/25/2024 00:21	WG2212508
Copper	9.65		7.14	7.14	01/25/2024 00:21	WG2212508
Lead	7.63		2.86	7.14	01/25/2024 00:21	WG2212508
Nickel	9.94		3.57	7.14	01/25/2024 00:21	WG2212508
Selenium	ND		3.57	7.14	01/25/2024 00:21	WG2212508
Silver	ND		0.714	7.14	01/25/2024 00:21	WG2212508
Zinc	ND		35.7	7.14	01/25/2024 00:21	WG2212508

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		0.100	1	01/26/2024 17:24	WG2213575
(S) a,a,a-Trifluorotoluene(FID)	*85.8*		*77.0-120*		*01/26/2024 17:24*	WG2213575

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	01/25/2024 14:27	WG2213023
Toluene	ND		0.00500	1	01/25/2024 14:27	WG2213023
Ethylbenzene	ND		0.00250	1	01/25/2024 14:27	WG2213023
Xylenes, Total	ND		0.00650	1	01/25/2024 14:27	WG2213023
1,2,4-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:27	WG2213023
1,3,5-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:27	WG2213023
(S) Toluene-d8	*94.1*		*75.0-131*		*01/25/2024 14:27*	WG2213023
(S) 4-Bromofluorobenzene	*100*		*67.0-138*		*01/25/2024 14:27*	WG2213023
(S) 1,2-Dichloroethane-d4	*104*		*70.0-130*		*01/25/2024 14:27*	WG2213023

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	7.62		4.00	1	01/25/2024 00:33	WG2211876
C28-C36 Motor Oil Range	4.47	B	4.00	1	01/25/2024 00:33	WG2211876
(S) o-Terphenyl	*35.7*		*18.0-148*		*01/25/2024 00:33*	WG2211876

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Anthracene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Benzo(a)anthracene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Benzo(b)fluoranthene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Benzo(k)fluoranthene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Benzo(a)pyrene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Chrysene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Dibenz(a,h)anthracene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Fluoranthene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Fluorene	ND		0.00600	1	01/25/2024 19:58	WG2211913
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/25/2024 19:58	WG2211913
1-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:58	WG2211913
2-Methylnaphthalene	ND		0.0200	1	01/25/2024 19:58	WG2211913
Naphthalene	ND		0.0200	1	01/25/2024 19:58	WG2211913
Pyrene	ND		0.00600	1	01/25/2024 19:58	WG2211913
(S) p-Terphenyl-d14	*53.3*		*23.0-120*		*01/25/2024 19:58*	WG2211913
(S) Nitrobenzene-d5	*54.6*		*14.0-149*		*01/25/2024 19:58*	WG2211913
(S) 2-Fluorobiphenyl	*48.1*		*34.0-125*		*01/25/2024 19:58*	WG2211913

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	0.213		1	01/28/2024 11:23	WG2213339

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	01/25/2024 09:28	WG2211966

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.60	T8	1	01/25/2024 10:00	WG2212488

Sample Narrative:

L1698091-04 WG2212488: 8.6 at 20.3C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	149		10.0	1	01/25/2024 16:33	WG2212092

Sample Narrative:

L1698091-04 WG2212092: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	ND		0.200	1	01/27/2024 18:58	WG2213340

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	3.92		1.00	5	01/25/2024 00:25	WG2212508
Barium	202		2.50	5	01/25/2024 00:25	WG2212508
Cadmium	ND		1.00	5	01/25/2024 00:25	WG2212508
Copper	9.73		5.00	5	01/25/2024 00:25	WG2212508
Lead	8.16		2.00	5	01/25/2024 00:25	WG2212508
Nickel	10.4		2.50	5	01/25/2024 00:25	WG2212508
Selenium	ND		2.50	5	01/25/2024 00:25	WG2212508
Silver	ND		0.500	5	01/25/2024 00:25	WG2212508
Zinc	33.8		25.0	5	01/25/2024 00:25	WG2212508

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	ND		0.100	1	01/26/2024 17:44	WG2213575
(S) a,a,a-Trifluorotoluene(FID)	*85.4*		*77.0-120*		*01/26/2024 17:44*	WG2213575

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	01/25/2024 14:47	WG2213023
Toluene	ND		0.00500	1	01/25/2024 14:47	WG2213023
Ethylbenzene	ND		0.00250	1	01/25/2024 14:47	WG2213023
Xylenes, Total	ND		0.00650	1	01/25/2024 14:47	WG2213023
1,2,4-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:47	WG2213023
1,3,5-Trimethylbenzene	ND		0.00500	1	01/25/2024 14:47	WG2213023
(S) Toluene-d8	*93.8*		*75.0-131*		*01/25/2024 14:47*	WG2213023
(S) 4-Bromofluorobenzene	*97.4*		*67.0-138*		*01/25/2024 14:47*	WG2213023
(S) 1,2-Dichloroethane-d4	*107*		*70.0-130*		*01/25/2024 14:47*	WG2213023

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		4.00	1	01/25/2024 07:55	WG2211903
C28-C36 Motor Oil Range	6.49		4.00	1	01/25/2024 07:55	WG2211903
(S) o-Terphenyl	*38.9*		*18.0-148*		*01/25/2024 07:55*	WG2211903

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Anthracene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Benzo(a)anthracene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Benzo(b)fluoranthene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Benzo(k)fluoranthene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Benzo(a)pyrene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Chrysene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Dibenz(a,h)anthracene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Fluoranthene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Fluorene	ND		0.00600	1	01/25/2024 20:18	WG2211913
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/25/2024 20:18	WG2211913
1-Methylnaphthalene	ND		0.0200	1	01/25/2024 20:18	WG2211913
2-Methylnaphthalene	ND		0.0200	1	01/25/2024 20:18	WG2211913
Naphthalene	ND		0.0200	1	01/25/2024 20:18	WG2211913
Pyrene	ND		0.00600	1	01/25/2024 20:18	WG2211913
(S) p-Terphenyl-d14	*39.0*		*23.0-120*		*01/25/2024 20:18*	WG2211913
(S) Nitrobenzene-d5	*41.9*		*14.0-149*		*01/25/2024 20:18*	WG2211913
(S) 2-Fluorobiphenyl	*35.1*		*34.0-125*		*01/25/2024 20:18*	WG2211913

Method Blank (MB)

(MB) R4026354-1 01/25/24 08:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Hexavalent Chromium	U		0.255	1.00

L1698107-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1698107-01 01/25/24 13:39 • (DUP) R4026354-3 01/25/24 13:45

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

L1698555-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1698555-02 01/25/24 15:06 • (DUP) R4026354-9 01/25/24 15:12

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R4026354-2 01/25/24 09:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	10.0	10.9	109	80.0-120	

L1698107-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1698107-02 01/25/24 13:51 • (MS) R4026354-4 01/25/24 13:57 • (MSD) R4026354-5 01/25/24 14:04

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	ND	9.94	13.1	49.7	65.3	1	75.0-125	J6	J3 J6	27.2	20

L1698107-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1698107-02 01/25/24 13:51 • (MS) R4026354-6 01/25/24 14:10

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	656	ND	759	116	50	75.0-125	

L1698104-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1698104-02 01/25/24 10:00 • (DUP) R4026120-2 01/25/24 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.55	8.55	1	0.000		1

Sample Narrative:

OS: 8.55 at 20.2C

DUP: 8.55 at 20.3C

L1698107-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1698107-02 01/25/24 10:00 • (DUP) R4026120-3 01/25/24 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	7.95	7.98	1	0.377		1

Sample Narrative:

OS: 7.95 at 20.4C

DUP: 7.98 at 20.4C

Laboratory Control Sample (LCS)

(LCS) R4026120-1 01/25/24 10:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.2C

Method Blank (MB)

(MB) R4026363-1 01/25/24 16:33

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:
BLANK: at 25C

L1697286-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1697286-08 01/25/24 16:33 • (DUP) R4026363-3 01/25/24 16:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	429	429	1	0.000		20

Sample Narrative:
OS: at 25C
DUP: at 25C

L1698091-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1698091-02 01/25/24 16:33 • (DUP) R4026363-4 01/25/24 16:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	147	146	1	0.889		20

Sample Narrative:
OS: at 25C
DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4026363-2 01/25/24 16:33

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	334	102	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R4026965-1 01/27/24 18:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4026965-2 01/27/24 18:50 • (LCSD) R4026965-3 01/27/24 18:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	0.998	1.04	99.8	104	80.0-120			3.72	20

Method Blank (MB)

(MB) R4026085-1 01/24/24 23:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R4026085-2 01/24/24 23:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.3	96.3	80.0-120	
Barium	100	88.6	88.6	80.0-120	
Cadmium	100	95.2	95.2	80.0-120	
Copper	100	94.2	94.2	80.0-120	
Lead	100	90.7	90.7	80.0-120	
Nickel	100	97.2	97.2	80.0-120	
Selenium	100	95.4	95.4	80.0-120	
Silver	20.0	18.4	91.9	80.0-120	
Zinc	100	93.6	93.6	80.0-120	

L1698091-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1698091-01 01/25/24 00:02 • (MS) R4026085-5 01/25/24 00:12 • (MSD) R4026085-6 01/25/24 00:15

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	3.77	96.0	100	92.3	96.3	5	75.0-125			4.14	20
Barium	100	170	257	264	87.3	94.6	5	75.0-125			2.78	20
Cadmium	100	ND	95.4	96.7	95.1	96.4	5	75.0-125			1.34	20
Copper	100	10.7	102	104	91.2	93.5	5	75.0-125			2.24	20
Lead	100	9.27	100	103	91.0	93.5	5	75.0-125			2.52	20
Nickel	100	13.0	102	106	88.6	93.1	5	75.0-125			4.30	20
Selenium	100	ND	94.7	93.5	94.0	92.9	5	75.0-125			1.20	20
Silver	20.0	ND	18.6	19.1	93.1	95.5	5	75.0-125			2.60	20
Zinc	100	43.1	131	133	87.6	90.1	5	75.0-125			1.86	20

Method Blank (MB)

(MB) R4027032-2 01/26/24 13:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*92.4*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R4027032-1 01/26/24 12:42

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.05	91.8	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*99.9*	*77.0-120*	

Method Blank (MB)

(MB) R4026351-3 01/25/24 11:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	0.00133	J	0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	0.00180	J	0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	*93.8*			*75.0-131*
(S) 4-Bromofluorobenzene	*97.4*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*109*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R4026351-1 01/25/24 08:37 • (LCSD) R4026351-2 01/25/24 08:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.129	0.131	103	105	70.0-123			1.54	20
Toluene	0.125	0.116	0.118	92.8	94.4	75.0-121			1.71	20
Ethylbenzene	0.125	0.107	0.112	85.6	89.6	74.0-126			4.57	20
Xylenes, Total	0.375	0.349	0.344	93.1	91.7	72.0-127			1.44	20
1,2,4-Trimethylbenzene	0.125	0.122	0.126	97.6	101	70.0-126			3.23	20
1,3,5-Trimethylbenzene	0.125	0.114	0.118	91.2	94.4	73.0-127			3.45	20
(S) Toluene-d8				*92.5*	*91.4*	*75.0-131*				
(S) 4-Bromofluorobenzene				*98.4*	*99.2*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*117*	*120*	*70.0-130*				

Method Blank (MB)

(MB) R4026077-1 01/24/24 22:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	1.16	J	0.274	4.00
(S) o-Terphenyl	*58.1*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4026077-2 01/24/24 22:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	34.9	69.8	50.0-150	
(S) o-Terphenyl			*49.7*	*18.0-148*	

L1697891-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1697891-16 01/24/24 23:07 • (MS) R4026077-3 01/24/24 23:19 • (MSD) R4026077-4 01/24/24 23:32

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	48.5	ND	30.5	27.2	62.9	56.0	1	50.0-150			11.4	20
(S) o-Terphenyl					*41.3*	*38.9*		*18.0-148*				

Method Blank (MB)

(MB) R4026083-1 01/25/24 06:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	*52.1*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4026083-2 01/25/24 07:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	33.7	67.4	50.0-150	
(S) o-Terphenyl			*58.0*	*18.0-148*	

L1697827-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1697827-01 01/25/24 11:34 • (MS) R4026083-3 01/25/24 11:49 • (MSD) R4026083-4 01/25/24 12:03

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	49.2	524	1220	892	1410	748	100	50.0-150	V	J3 V	31.1	20
(S) o-Terphenyl					*26.6*	*57.5*		*18.0-148*	J7	J7		

Method Blank (MB)

(MB) R4027701-2 01/25/24 10:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	*66.3*			*23.0-120*
(S) Nitrobenzene-d5	*34.7*			*14.0-149*
(S) 2-Fluorobiphenyl	*51.9*			*34.0-125*

Laboratory Control Sample (LCS)

(LCS) R4027701-1 01/25/24 10:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0424	53.0	50.0-120	
Anthracene	0.0800	0.0425	53.1	50.0-126	
Benzo(a)anthracene	0.0800	0.0438	54.8	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0427	53.4	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0413	51.6	49.0-125	
Benzo(a)pyrene	0.0800	0.0413	51.6	42.0-120	
Chrysene	0.0800	0.0446	55.8	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0467	58.4	47.0-125	
Fluoranthene	0.0800	0.0473	59.1	49.0-129	
Fluorene	0.0800	0.0460	57.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0496	62.0	46.0-125	
1-Methylnaphthalene	0.0800	0.0451	56.4	51.0-121	
2-Methylnaphthalene	0.0800	0.0439	54.9	50.0-120	
Naphthalene	0.0800	0.0423	52.9	50.0-120	
Pyrene	0.0800	0.0419	52.4	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R4027701-1 01/25/24 10:38

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			*65.9*	*23.0-120*	
(S) Nitrobenzene-d5			*39.1*	*14.0-149*	
(S) 2-Fluorobiphenyl			*49.3*	*34.0-125*	

L1697837-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1697837-10 01/25/24 17:33 • (MS) R4027750-1 01/25/24 17:51 • (MSD) R4027750-2 01/25/24 18:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.0776	ND	0.0443	0.0450	57.1	58.3	1	14.0-127			1.57	27
Anthracene	0.0776	ND	0.0501	0.0490	64.6	63.5	1	10.0-145			2.22	30
Benzo(a)anthracene	0.0776	ND	0.0501	0.0497	64.6	64.4	1	10.0-139			0.802	30
Benzo(b)fluoranthene	0.0776	ND	0.0440	0.0430	56.7	55.7	1	10.0-140			2.30	36
Benzo(k)fluoranthene	0.0776	ND	0.0411	0.0420	53.0	54.4	1	10.0-137			2.17	31
Benzo(a)pyrene	0.0776	ND	0.0457	0.0456	58.9	59.1	1	10.0-141			0.219	31
Chrysene	0.0776	ND	0.0464	0.0458	59.8	59.3	1	10.0-145			1.30	30
Dibenz(a,h)anthracene	0.0776	ND	0.0452	0.0451	58.2	58.4	1	10.0-132			0.221	31
Fluoranthene	0.0776	ND	0.0486	0.0481	62.6	62.3	1	10.0-153			1.03	33
Fluorene	0.0776	ND	0.0537	0.0519	69.2	67.2	1	11.0-130			3.41	29
Indeno(1,2,3-cd)pyrene	0.0776	ND	0.0470	0.0467	60.6	60.5	1	10.0-137			0.640	32
1-Methylnaphthalene	0.0776	ND	0.0464	0.0478	59.8	61.9	1	10.0-142			2.97	28
2-Methylnaphthalene	0.0776	ND	0.0465	0.0469	59.9	60.8	1	10.0-137			0.857	28
Naphthalene	0.0776	ND	0.0406	0.0415	52.3	53.8	1	10.0-135			2.19	27
Pyrene	0.0776	ND	0.0423	0.0421	54.5	54.5	1	10.0-148			0.474	35
(S) p-Terphenyl-d14					*0.0561*	*56.6*		*23.0-120*	J2			
(S) Nitrobenzene-d5					*0.000*	*74.0*		*14.0-149*	J2			
(S) 2-Fluorobiphenyl					*0.158*	*48.3*		*34.0-125*	J2			

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

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

Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

Billing Information: SAME AS LEFT

Report to: Jake Janicek

Email To: jjanicek@caerusoilandgas.com

Project Description: OP33 P+A Investigation

City/State Collected: Piceance Crk, CO

Please Circle: PT (MT) CT ET

Phone: (970) 778-2314

Client Project # –

Lab Project # –

Collected by (print): Trevor Lakin

Site/Facility ID # OP33

P.O. # –

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote # –

Date Results Needed: Standard TAT

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	COGCC Table 915-1	EC, pH, SAR	Arsenic, Boron	COGCC Table 910-1	Remarks	Sample # (lab only)
20240118-OP33-(FC-WH-STOCK)	Comp	SS	GS	1/18/24	11:53	4	X					-01
20240118-OP33-(BASE@1)@4	Grab		4ft		12:15	4	X					-02
20240118-OP33-(FC-DL)@5	Grab		5ft		12:40	4	X					-03
20240118-OP33-(STOCK@2)	Comp		GS		12:52	4	X					-04

1/18/24

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1698091

A047

Acctnum:
Template:
Prelogin:
PM:
PB:
Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 6525 6572 2501

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/22/24	14:10	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/22/24	1500	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			(14)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: DP2.6 °C Bottles Received: 16
0.5+0=0.5

Date: 1/23/24 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)