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Report of Work Completed – Partially Buried Vessel Removal

ECMC Location Name (ID)	PUCKETT-67S96W/6SWNW (334977)
Client Location Name	Starkey 3
ECMC Remediation Project Number	30196
Legal Description	SWNW Sec. 6 T7S-96W
Coordinates (Lat/Long)	39.466670 / -108.158530
County	Garfield County, Colorado

Mr. Janicek,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document findings of site assessment activities associated with the removal of a partially buried vessel (PBV) at the Starkey 3 well pad (Location). The Location is 5.73 miles northwest of Parachute, Colorado in Garfield County, as illustrated in the attached Topographic Location Map. Additional information on the Location is provided in the title block above, attached Site Diagrams, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the investigation, results of the investigation, and recommendations for how to proceed with this information.

Background

On June 28, 2023, Energy & Carbon Management Commission (ECMC) Form 27 Document 403442325 was submitted as notification to remove the PBV and to open Remediation Project 30196. The form and associated investigation plan were approved on July 7, 2023.

Methodology

On December 19, 2023, following the removal of the PBV, Confluence completed an initial investigation of the excavation. One soil sample was collected from the base of the excavation at 9 feet below ground surface (bgs), and four samples were collected from the sidewalls of the excavation at 6 feet bgs. The soil samples were characterized using visual and olfactory observations and field screened using a photoionization detector (PID). Additionally, four background soil samples were collected from comparable, nearby, non-impacted soil to establish native levels of inorganic constituents.

All samples were collected in laboratory provided containers, immediately placed on ice, and shipped for laboratory analysis under a completed chain-of-custody to Pace Analytical Services (Pace). Excavation soil samples were analyzed for ECMC Table 915-1 soil constituents of

concern while background soil samples were analyzed for electrical conductivity (EC), sodium adsorption ratio (SAR), pH, boron, and Table 915-1 metals.

Results

These results summarize observations from onsite investigation efforts and associated laboratory analytical results. For organizational and presentation purposes, the results summary is divided between general observations of lithology and hydrogeology for the entire Location and site investigation activities. Collected spatial data are depicted in the attached Site Diagrams. Laboratory analytical reports are attached and summarized in the Laboratory Results Summary Table.

Lithology and Hydrogeology

Lithology at the Location is characterized as sandy clay with shale fragments. Groundwater is expected to flow southeast toward Starkey Gulch and ultimately to the Colorado River, located 5.8 miles southeast of the Location. No groundwater was observed during sampling activities. The closest surface water, Starkey Gulch, sits approximately 290 feet lower in elevation than the Location; therefore, groundwater at the Location is estimated to be greater than 100 feet bgs.

PBV Excavation Results

Field screening results indicate PID measurements ranging from 0.1 parts per million (ppm) to 77.0 ppm. Analytical results of excavation samples indicate compliance with Table 915-1 Residential Soil Screening Levels (RSSLs) except for benzo(a)pyrene, pH, and arsenic. The east sidewall of the excavation exceeds allowable limits for benzo(a)pyrene at 0.655 milligrams per kilogram (mg/kg) at 6 feet bgs. Exceedances of pH were reported at 8.35 in the north sidewall at 6 feet bgs and 8.37 at the base of the excavation at 9 feet bgs. Arsenic exceedances were found in all samples ranging from 5.37 to 16.8 mg/kg.

Background Results

Analytical results of background soil samples are within Table 915-1 RSSLs except for pH and arsenic. A pH exceedance of 8.42 was reported and arsenic exceeds in all samples with concentrations ranging from 5.11 to 12.3 mg/kg.

Analysis and Recommendations

Based on the estimated depth to groundwater of greater than 100 feet bgs, Confluence recommends that Caerus request to compare analytical results for the site assessment to Table 915-1 RSSLs as no reasonable pathway to groundwater appears to exist.

Although pH and arsenic values above Table 915-1 RSSLs are present in the investigation area, background data and produced water characterization data indicate these levels are not reasonably attributed to oil and gas operations at the Location.



Background soil samples and the investigation area share an identical soil type: Rock outcrop-Torriorthents complex with a stony colluvium derived from calcareous shale parent material. Despite the elevation difference of approximately 50 to 100 feet between the background and investigation samples, it is evident based on the consistent parent material that the lithology and soil type between the Location and background sampling area are comparable. Therefore, it is reasonable to conclude that background samples are representative of conditions at the Location. Based on this information, Confluence recommends Caerus request an alternative allowable limit for pH of 8.42 mg/kg, in accordance with Table 915-1 Footnote 1.

Produced water tank samples were obtained for separate investigations from the Starkey 7 (ECMC Location ID 335092), Mesa 17 (ECMC Location ID 335527), and Mesa 2 (ECMC Location ID 334633) well pads, which produce from the same formation as the Location: Williams Fork-Cameo. In reference to the Location, the Starkey 7 well pad is located 0.85 miles northeast, Mesa 17 is located 2.85 miles northwest, and Mesa 2 is located 1.10 miles southeast. Analytical results did not detect arsenic above the laboratory Reporting Detection Limits (RDL) for all samples. Based on the common production zone and consistent analytical data derived from the Williams-Fork Cameo formation, it is reasonable to conclude the produced water samples are representative of source characterization at the Location. For this reason, Confluence recommends Caerus request consideration of Rule 915.e.(2).C to remove arsenic as a constituent of concern for this remediation project.

Assuming the proposed requests are approved, levels of benzo(a)pyrene above Table 915-1 RSSLs remain in the investigation area. Confluence recommends additional investigation to delineate the extent of impacts east of the excavation. Prior to additional investigation, Confluence recommends that Caerus request a reduced analyte list of benzo(a)pyrene.

Confluence is grateful for the opportunity to support you with this project. If you have any questions about the methods, results or recommendations presented here, please do not hesitate to contact us.

Regards,

Steve Sivigliano

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Attachments

- Topographic Location Map
- Site Diagram – Initial Investigation
- Site Diagram – Background Samples
- Laboratory Results Summary Table – Soil
- Laboratory Results Summary Table – Produced Water
- Laboratory Reports



Topographic Location Map

Caerus Oil and Gas LLC

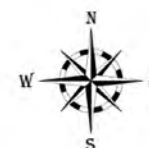
Starkey 3

(PUCKETT-67S96W/6SWNW)

ECMC Location ID: 334977

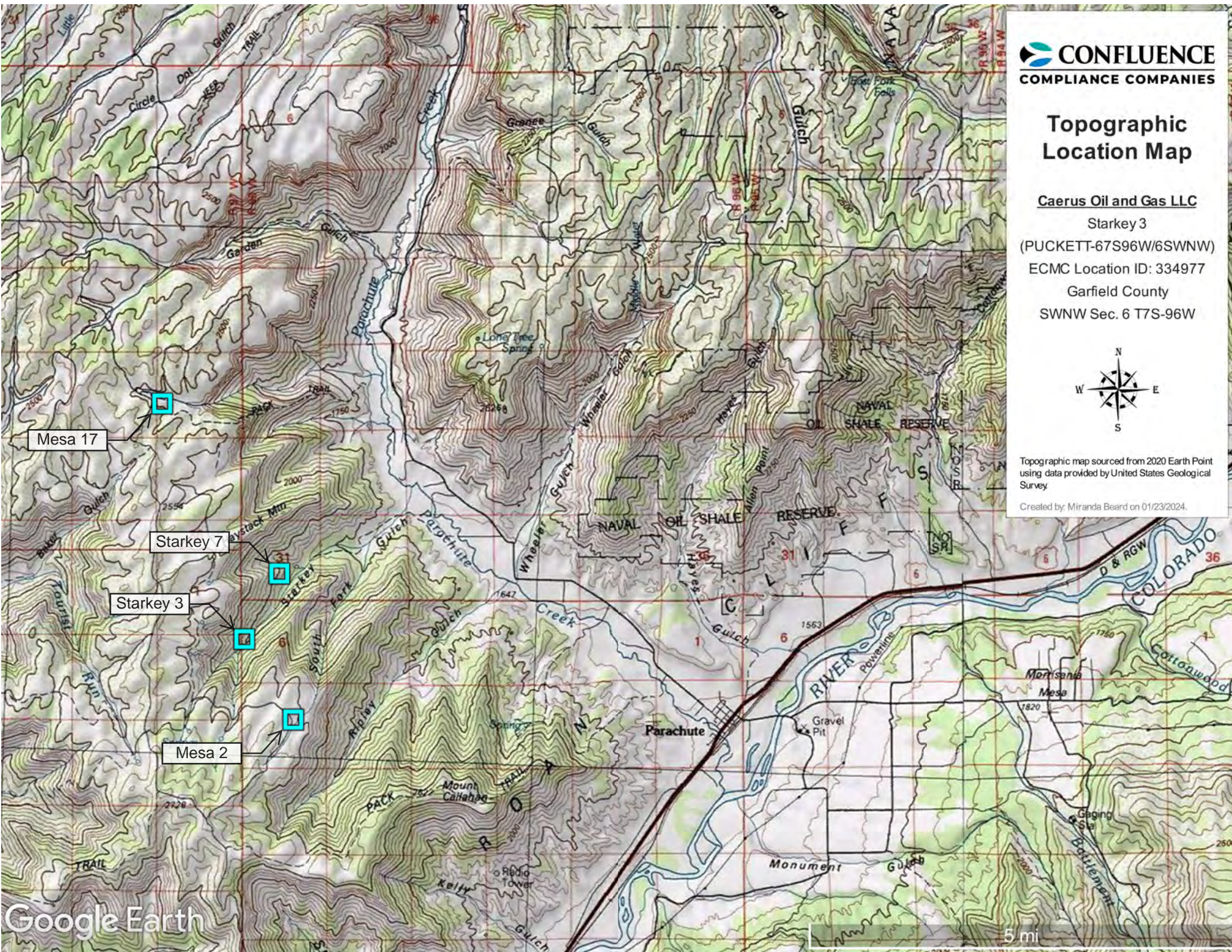
Garfield County

SWNW Sec. 6 T7S-96W



Topographic map sourced from 2020 Earth Point
using data provided by United States Geological
Survey

Created by: Miranda Beard on 01/23/2024.



Site Diagram Initial Investigation

Caerus Oil and Gas LLC

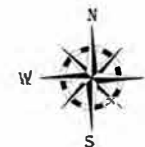
Starkey 3

(PUCKETT-67S96W/6SWNW)




ECMC Location ID: 334977

Garfield County

SWNW Sec. 6 T7S-96W



Legend

-  Soil Sample
-  Proposed Soil Sample
-  Excavation Extent – 12/19/2023

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by: Miranda Beard on 01/23/2024.

20231219-STARKEY 3-(BASE)@9

20231219-STARKEY 3-(NW)@6

20231219-STARKEY 3-(WW)@6

20231219-STARKEY 3-(SW)@6

20231219-STARKEY 3-(EW)@6

80 ft

Site Diagram Background Samples

Caerus Oil and Gas LLC

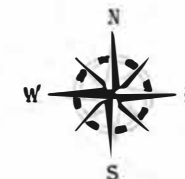
Starkey 3

(PUCKETT-67S96W 6SWNW)



ECMC Location ID: 334977

Garfield County

SWNW Sec. 6 T7S-R96W



Legend

-  Background Soil Sample
-  Excavation Extent 12/19/2023

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by: Miranda Beard on 12/21/2023.

20231219-LMBG-(STARKEY 3-N02)@0.5

20231219-LMBG-(STARKEY 3-N01)@0.5

20231219-LMBG-(STARKEY 3-N03)@0.5

20231219-LMBG-(STARKEY 3-N04)@0.5

200 ft

ECMC Soil Screening Levels					Organic Compounds (mg/kg [ppm])																									
ECMC Table 915-1 Residential -->					NA	500	NA	NA	NA	1.2	490	5.8	58	30	27	360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	18	24	2	180
Sample Date	Solid/Soil Source (Equipment [Vault/Sump, Separator, Tank Battery, Dump Ltr, Pit, Cuttings, Background, etc.])	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (lbs)	Sample ID	PID (ppm)	TPH (total volatile and extractable petroleum hydrocarbons) (GRO+DRO+ORO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	TPH-ORO (C28-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total (sum of o-, m-, p-Isomers)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(A)pyrene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Chrysene	Dibenz(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-C)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Pyrene	
12/19/2023	Vault	-9	20231219-STARKEY 3-(BASE)@9	0.5	19.4	0.242	8.31	10.8	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
12/19/2023	Vault	-6	20231219-STARKEY 3-(NW)@6	1.2	64.7	0.239	10.5	54.0	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	0.00953	0.0217	0.0456	0.0467	0.0652	0.0220	0.0434	0.00673	0.163	0.0133	0.0341	<0.0200	<0.0200	<0.0200	<0.00600	
12/19/2023	Vault	-6	20231219-STARKEY 3-(EW)@6	4.6	40.8	0.241	19.3	21.3	<0.00100	<0.00500	<0.00250	<0.00650	0.00595	0.0288	0.0173	0.369	0.850	0.655	0.788	0.303	0.644	0.0982	1.48	0.0619	0.389	<0.0200	<0.0200	<0.0200	1.03	
12/19/2023	Vault	-6	20231219-STARKEY 3-(SW)@6	0.1	41.4	0.193	9.94	31.3	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600		
12/19/2023	Vault	-6	20231219-STARKEY 3-(WW)@6	77	58.9	1.99	27.1	29.8	<0.00100	0.00958	0.00450	0.278	0.155	0.179	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600		
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N01)@0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N02)@0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N03)@0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N04)@0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

ECMC Soil Screening Levels					Soil Suitability for Reclamation				Metals (mg/kg [ppm])									
ECMC Table 915-1 Residential -->				NA	4	6	6-8.3	2	0.68	15000	71	0.3	3100	400	1500	390	390	23000
Sample Date	Solid/Soil Source (Equipment) [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (bgs)	Sample ID	PID (ppm)	EC (Specific Conductance) (millimhos/centimeter) (by saturated paste method)	SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)	pH (pH Units) (by saturated paste method)	Boron - Hot Water Soluble (mg/L)	Arsenic	Barium	Cadmium (mg/kg)	Chromium (VI)	Copper	Lead	Nickel	Selenium	Silver	Zinc
12/19/2023	Vault	-9	20231219-STARKEY 3-(BASE)@9	0.5	0.222	0.241	8.37	0.214	16.8	238	<1.00	<1.00	22.2	15.2	17.9	<2.50	<0.500	48.9
12/19/2023	Vault	-6	20231219-STARKEY 3-(NW)@6	1.2	0.225	0.239	8.35	0.341	5.37	585	<1.00	<1.00	7.76	12.2	8.53	<2.50	<0.500	55
12/19/2023	Vault	-6	20231219-STARKEY 3-(EW)@6	4.6	0.160	0.153	8.22	<0.200	7.49	236	<1.00	<1.00	12.6	8.80	14.3	<2.50	<0.500	52.6
12/19/2023	Vault	-6	20231219-STARKEY 3-(SW)@6	0.1	0.186	0.267	8.23	0.409	9.36	244	<1.00	<1.00	12.9	9.62	16.1	<2.50	<0.500	49.9
12/19/2023	Vault	-6	20231219-STARKEY 3-(WW)@6	77	0.227	0.263	8.28	0.280	10.8	230	<1.00	<1.00	14.5	9.46	16.0	<2.50	<0.500	53.2
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N01)@0.5	NA	0.299	0.0554	7.41	0.590	7.60	293	<1.00	<1.00	12.3	10.3	13.5	<2.50	<0.500	51.3
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N02)@0.5	NA	0.203	0.113	7.91	0.606	12.3	218	<1.00	<1.00	7.12	5.79	10.3	<2.50	<0.500	27.7
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N03)@0.5	NA	0.191	0.0933	8.24	0.913	5.11	279	<1.00	<1.00	6.80	6.29	11.0	<2.50	<0.500	34.7
12/19/2023	Background	-0.5	20231219-LMBG-(STARKEY 3-N04)@0.5	NA	0.117	0.184	8.42	0.235	7.29	211	<1.00	<1.00	12.4	9.00	13.5	<2.50	<0.500	47.8

ECMC Allowable Concentration (915-Groundwater)			ECMC Standard Not Applicable
Location	Sample Date	Sample ID	Arsenic, dissolved (mg/L)
Starkey 7	12/4/23	20231204-LMSOURCE-(STARKEY 7-T)	<0.0200
Mesa 17	8/31/22	20220831-MESA17(PW01)	<0.0100
Mesa 2	8/17/22	20220817-MESA 2 (PW-01)	<1.00



ANALYTICAL REPORT

January 02, 2024

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Caerus Oil and Gas

Sample Delivery Group: L1690201
Samples Received: 12/20/2023
Project Number:
Description: Starkey 3
Site: STARKEY 3
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

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

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

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	5
Sr: Sample Results	6
20231219-STARKEY 3-(BASE)@9 L1690201-01	6
20231219-STARKEY 3-(NW)@6 L1690201-02	8
20231219-STARKEY 3-(EW)@6 L1690201-03	10
20231219-STARKEY 3-(SW)@6 L1690201-04	12
20231219-STARKEY 3-(WW)@6 L1690201-05	14
Qc: Quality Control Summary	16
Wet Chemistry by Method 7199	16
Wet Chemistry by Method 9045D	18
Wet Chemistry by Method 9050AMod	20
Metals (ICP) by Method 6010B-NE493 Ch 2	22
Metals (ICPMS) by Method 6020	23
Volatile Organic Compounds (GC) by Method 8015D/GRO	24
Volatile Organic Compounds (GC/MS) by Method 8260B	25
Semi-Volatile Organic Compounds (GC) by Method 8015M	26
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	27
Gl: Glossary of Terms	29
Al: Accreditations & Locations	30
Sc: Sample Chain of Custody	31



SAMPLE SUMMARY

20231219-STARKEY 3-(BASE)@9 L1690201-01 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:40
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:21	12/28/23 11:21	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2194724	1	12/22/23 11:03	12/27/23 15:25	VSS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:37	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194557	5	12/23/23 07:18	01/02/24 12:20	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2195643	1	12/24/23 08:47	12/25/23 06:28	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2195486	1	12/24/23 08:47	12/24/23 12:45	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2194461	1	12/22/23 16:08	12/23/23 02:45	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2194472	1	12/22/23 16:45	12/23/23 01:40	MBE	Mt. Juliet, TN

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

20231219-STARKEY 3-(NW)@6 L1690201-02 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:45
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:24	12/28/23 11:24	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:40	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:42	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194557	5	12/23/23 07:18	01/02/24 12:24	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2195643	1	12/24/23 08:47	12/25/23 06:53	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2195486	1	12/24/23 08:47	12/24/23 13:04	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2194461	1	12/22/23 16:08	12/23/23 03:36	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2194472	1	12/22/23 16:45	12/23/23 06:16	MBE	Mt. Juliet, TN

⁷ Gl

⁸ Al

⁹ Sc

20231219-STARKEY 3-(EW)@6 L1690201-03 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:50
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:38	12/28/23 11:38	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:46	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 13:02	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194557	5	12/23/23 07:18	01/02/24 12:27	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2195643	1	12/24/23 08:47	12/25/23 07:17	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2195486	1	12/24/23 08:47	12/24/23 13:23	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2194461	1	12/22/23 16:08	12/23/23 02:58	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2194472	1	12/22/23 16:45	12/23/23 06:50	MBE	Mt. Juliet, TN

20231219-STARKEY 3-(SW)@6 L1690201-04 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 11:00
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:41	12/28/23 11:41	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:52	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195274	1	12/24/23 10:21	12/26/23 09:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194655	1	12/23/23 08:00	12/23/23 11:22	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 13:08	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194557	5	12/23/23 07:18	01/02/24 12:40	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2195643	1	12/24/23 08:47	12/25/23 07:42	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2195486	1	12/24/23 08:47	12/24/23 13:42	JHH	Mt. Juliet, TN

SAMPLE SUMMARY

20231219-STARKEY 3-(SW)@6 L1690201-04 Solid

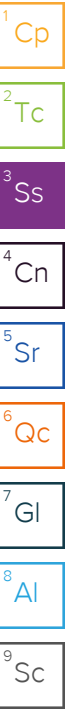
Collected by Alexis Hitzeroth
Collected date/time 12/19/23 11:00
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2194461	1	12/22/23 16:08	12/23/23 03:11	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2194472	1	12/22/23 16:45	12/23/23 01:57	MBE	Mt. Juliet, TN

20231219-STARKEY 3-(WW)@6 L1690201-05 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:55
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:44	12/28/23 11:44	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:59	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195274	1	12/24/23 10:21	12/26/23 09:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:59	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194557	5	12/23/23 07:18	01/02/24 12:43	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2195643	1	12/24/23 08:47	12/25/23 08:06	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2195486	1	12/24/23 08:47	12/24/23 14:01	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2194461	1	12/22/23 16:08	12/23/23 03:24	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2194472	1	12/22/23 16:45	12/23/23 02:15	MBE	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
Sodium Adsorption Ratio	0.241		1	12/28/2023 11:21	WG2195416

¹ Cp

² Tc

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/27/2023 15:25	WG2194724

³ Ss

⁴ Cn

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.37	T8	1	12/24/2023 11:30	WG2195272

⁵ Sr

⁶ Qc

Sample Narrative:

L1690201-01 WG2195272: 8.37 at 19.8C

⁷ Gl

⁸ Al

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	222		10.0	1	12/23/2023 12:29	WG2194996

⁹ Sc

Sample Narrative:

L1690201-01 WG2194996: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.214		0.200	1	12/28/2023 12:37	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	16.8		1.00	5	01/02/2024 12:20	WG2194557
Barium	238		2.50	5	01/02/2024 12:20	WG2194557
Cadmium	ND		1.00	5	01/02/2024 12:20	WG2194557
Copper	22.2		5.00	5	01/02/2024 12:20	WG2194557
Lead	15.2		2.00	5	01/02/2024 12:20	WG2194557
Nickel	17.9		2.50	5	01/02/2024 12:20	WG2194557
Selenium	ND		2.50	5	01/02/2024 12:20	WG2194557
Silver	ND		0.500	5	01/02/2024 12:20	WG2194557
Zinc	48.9		25.0	5	01/02/2024 12:20	WG2194557

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.242		0.100	1	12/25/2023 06:28	WG2195643
(S) a,a,a-Trifluorotoluene(FID)	87.8		77.0-120		12/25/2023 06:28	WG2195643

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	12/24/2023 12:45	WG2195486
Toluene	ND		0.00500	1	12/24/2023 12:45	WG2195486
Ethylbenzene	ND		0.00250	1	12/24/2023 12:45	WG2195486
Xylenes, Total	ND		0.00650	1	12/24/2023 12:45	WG2195486
1,2,4-Trimethylbenzene	ND		0.00500	1	12/24/2023 12:45	WG2195486
1,3,5-Trimethylbenzene	ND		0.00500	1	12/24/2023 12:45	WG2195486
(S) Toluene-d8	102		75.0-131		12/24/2023 12:45	WG2195486
(S) 4-Bromofluorobenzene	101		67.0-138		12/24/2023 12:45	WG2195486
(S) 1,2-Dichloroethane-d4	107		70.0-130		12/24/2023 12:45	WG2195486

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	8.31		4.00	1	12/23/2023 02:45	WG2194461
C28-C36 Motor Oil Range	10.8		4.00	1	12/23/2023 02:45	WG2194461
(S) o-Terphenyl	27.7		18.0-148		12/23/2023 02:45	WG2194461

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	12/23/2023 01:40	WG2194472
Anthracene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Benzo(a)anthracene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Benzo(b)fluoranthene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Benzo(k)fluoranthene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Benzo(a)pyrene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Chrysene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Dibenz(a,h)anthracene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Fluoranthene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Fluorene	ND		0.00600	1	12/23/2023 01:40	WG2194472
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/23/2023 01:40	WG2194472
1-Methylnaphthalene	ND		0.0200	1	12/23/2023 01:40	WG2194472
2-Methylnaphthalene	ND		0.0200	1	12/23/2023 01:40	WG2194472
Naphthalene	ND		0.0200	1	12/23/2023 01:40	WG2194472
Pyrene	ND		0.00600	1	12/23/2023 01:40	WG2194472
(S) p-Terphenyl-d14	51.0		23.0-120		12/23/2023 01:40	WG2194472
(S) Nitrobenzene-d5	54.0		14.0-149		12/23/2023 01:40	WG2194472
(S) 2-Fluorobiphenyl	43.5		34.0-125		12/23/2023 01:40	WG2194472

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.239		1	12/28/2023 11:24	WG2195416

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:40	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.35	T8	1	12/24/2023 11:30	WG2195272

Sample Narrative:

L1690201-02 WG2195272: 8.35 at 20.1C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	225		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:

L1690201-02 WG2194996: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.341		0.200	1	12/28/2023 12:42	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	5.37		1.00	5	01/02/2024 12:24	WG2194557
Barium	585		2.50	5	01/02/2024 12:24	WG2194557
Cadmium	ND		1.00	5	01/02/2024 12:24	WG2194557
Copper	7.76		5.00	5	01/02/2024 12:24	WG2194557
Lead	12.2		2.00	5	01/02/2024 12:24	WG2194557
Nickel	8.53		2.50	5	01/02/2024 12:24	WG2194557
Selenium	ND		2.50	5	01/02/2024 12:24	WG2194557
Silver	ND		0.500	5	01/02/2024 12:24	WG2194557
Zinc	55.0		25.0	5	01/02/2024 12:24	WG2194557

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.239		0.100	1	12/25/2023 06:53	WG2195643
(S) a,a,a-Trifluorotoluene(FID)	88.3		77.0-120		12/25/2023 06:53	WG2195643

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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	12/24/2023 13:04	WG2195486
Toluene	ND		0.00500	1	12/24/2023 13:04	WG2195486
Ethylbenzene	ND		0.00250	1	12/24/2023 13:04	WG2195486
Xylenes, Total	ND		0.00650	1	12/24/2023 13:04	WG2195486
1,2,4-Trimethylbenzene	ND		0.00500	1	12/24/2023 13:04	WG2195486
1,3,5-Trimethylbenzene	ND		0.00500	1	12/24/2023 13:04	WG2195486
(S) Toluene-d8	102		75.0-131		12/24/2023 13:04	WG2195486
(S) 4-Bromofluorobenzene	98.9		67.0-138		12/24/2023 13:04	WG2195486
(S) 1,2-Dichloroethane-d4	110		70.0-130		12/24/2023 13:04	WG2195486

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	10.5		4.00	1	12/23/2023 03:36	WG2194461
C28-C36 Motor Oil Range	54.0		4.00	1	12/23/2023 03:36	WG2194461
(S) o-Terphenyl	32.7		18.0-148		12/23/2023 03:36	WG2194461

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	0.00953		0.00600	1	12/23/2023 06:16	WG2194472
Anthracene	0.0217		0.00600	1	12/23/2023 06:16	WG2194472
Benzo(a)anthracene	0.0456		0.00600	1	12/23/2023 06:16	WG2194472
Benzo(b)fluoranthene	0.0652		0.00600	1	12/23/2023 06:16	WG2194472
Benzo(k)fluoranthene	0.0220		0.00600	1	12/23/2023 06:16	WG2194472
Benzo(a)pyrene	0.0467		0.00600	1	12/23/2023 06:16	WG2194472
Chrysene	0.0434		0.00600	1	12/23/2023 06:16	WG2194472
Dibenz(a,h)anthracene	0.00673		0.00600	1	12/23/2023 06:16	WG2194472
Fluoranthene	0.163		0.00600	1	12/23/2023 06:16	WG2194472
Fluorene	0.0133		0.00600	1	12/23/2023 06:16	WG2194472
Indeno(1,2,3-cd)pyrene	0.0341		0.00600	1	12/23/2023 06:16	WG2194472
1-Methylnaphthalene	ND		0.0200	1	12/23/2023 06:16	WG2194472
2-Methylnaphthalene	ND		0.0200	1	12/23/2023 06:16	WG2194472
Naphthalene	ND		0.0200	1	12/23/2023 06:16	WG2194472
Pyrene	0.101		0.00600	1	12/23/2023 06:16	WG2194472
(S) p-Terphenyl-d14	73.7		23.0-120		12/23/2023 06:16	WG2194472
(S) Nitrobenzene-d5	59.8		14.0-149		12/23/2023 06:16	WG2194472
(S) 2-Fluorobiphenyl	69.4		34.0-125		12/23/2023 06:16	WG2194472

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.153		1	12/28/2023 11:38	WG2195416

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:46	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.22	T8	1	12/24/2023 11:30	WG2195272

Sample Narrative:
L1690201-03 WG2195272: 8.22 at 19.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	160		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:
L1690201-03 WG2194996: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	12/28/2023 13:02	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	7.49		1.00	5	01/02/2024 12:27	WG2194557
Barium	236		2.50	5	01/02/2024 12:27	WG2194557
Cadmium	ND		1.00	5	01/02/2024 12:27	WG2194557
Copper	12.6		5.00	5	01/02/2024 12:27	WG2194557
Lead	8.80		2.00	5	01/02/2024 12:27	WG2194557
Nickel	14.3		2.50	5	01/02/2024 12:27	WG2194557
Selenium	ND		2.50	5	01/02/2024 12:27	WG2194557
Silver	ND		0.500	5	01/02/2024 12:27	WG2194557
Zinc	52.6		25.0	5	01/02/2024 12:27	WG2194557

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.241		0.100	1	12/25/2023 07:17	WG2195643
(S) a,a,a-Trifluorotoluene(FID)	86.9		77.0-120		12/25/2023 07:17	WG2195643

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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	12/24/2023 13:23	WG2195486
Toluene	ND		0.00500	1	12/24/2023 13:23	WG2195486
Ethylbenzene	ND		0.00250	1	12/24/2023 13:23	WG2195486
Xylenes, Total	ND		0.00650	1	12/24/2023 13:23	WG2195486
1,2,4-Trimethylbenzene	0.00595		0.00500	1	12/24/2023 13:23	WG2195486
1,3,5-Trimethylbenzene	0.0288		0.00500	1	12/24/2023 13:23	WG2195486
(S) Toluene-d8	101		75.0-131		12/24/2023 13:23	WG2195486
(S) 4-Bromofluorobenzene	95.6		67.0-138		12/24/2023 13:23	WG2195486
(S) 1,2-Dichloroethane-d4	108		70.0-130		12/24/2023 13:23	WG2195486

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	19.3		4.00	1	12/23/2023 02:58	WG2194461
C28-C36 Motor Oil Range	21.3		4.00	1	12/23/2023 02:58	WG2194461
(S) o-Terphenyl	41.2		18.0-148		12/23/2023 02:58	WG2194461

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	0.0173		0.00600	1	12/23/2023 06:50	WG2194472
Anthracene	0.369		0.00600	1	12/23/2023 06:50	WG2194472
Benzo(a)anthracene	0.850		0.00600	1	12/23/2023 06:50	WG2194472
Benzo(b)fluoranthene	0.788		0.00600	1	12/23/2023 06:50	WG2194472
Benzo(k)fluoranthene	0.303		0.00600	1	12/23/2023 06:50	WG2194472
Benzo(a)pyrene	0.655		0.00600	1	12/23/2023 06:50	WG2194472
Chrysene	0.644		0.00600	1	12/23/2023 06:50	WG2194472
Dibenz(a,h)anthracene	0.0982		0.00600	1	12/23/2023 06:50	WG2194472
Fluoranthene	1.48		0.00600	1	12/23/2023 06:50	WG2194472
Fluorene	0.0619		0.00600	1	12/23/2023 06:50	WG2194472
Indeno(1,2,3-cd)pyrene	0.389		0.00600	1	12/23/2023 06:50	WG2194472
1-Methylnaphthalene	ND		0.0200	1	12/23/2023 06:50	WG2194472
2-Methylnaphthalene	ND		0.0200	1	12/23/2023 06:50	WG2194472
Naphthalene	ND		0.0200	1	12/23/2023 06:50	WG2194472
Pyrene	1.03		0.00600	1	12/23/2023 06:50	WG2194472
(S) p-Terphenyl-d14	69.4		23.0-120		12/23/2023 06:50	WG2194472
(S) Nitrobenzene-d5	58.2		14.0-149		12/23/2023 06:50	WG2194472
(S) 2-Fluorobiphenyl	63.7		34.0-125		12/23/2023 06:50	WG2194472

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.267		1	12/28/2023 11:41	WG2195416

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:52	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.23	T8	1	12/26/2023 09:00	WG2195274

Sample Narrative:

L1690201-04 WG2195274: 8.23 at 19.9C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	186		10.0	1	12/23/2023 11:22	WG2194655

Sample Narrative:

L1690201-04 WG2194655: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.409		0.200	1	12/28/2023 13:08	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	9.36		1.00	5	01/02/2024 12:40	WG2194557
Barium	244		2.50	5	01/02/2024 12:40	WG2194557
Cadmium	ND		1.00	5	01/02/2024 12:40	WG2194557
Copper	12.9		5.00	5	01/02/2024 12:40	WG2194557
Lead	9.62		2.00	5	01/02/2024 12:40	WG2194557
Nickel	16.1		2.50	5	01/02/2024 12:40	WG2194557
Selenium	ND		2.50	5	01/02/2024 12:40	WG2194557
Silver	ND		0.500	5	01/02/2024 12:40	WG2194557
Zinc	49.9		25.0	5	01/02/2024 12:40	WG2194557

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.193	B	0.100	1	12/25/2023 07:42	WG2195643
(S) a,a,a-Trifluorotoluene(FID)	87.4		77.0-120		12/25/2023 07:42	WG2195643

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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	12/24/2023 13:42	WG2195486
Toluene	ND		0.00500	1	12/24/2023 13:42	WG2195486
Ethylbenzene	ND		0.00250	1	12/24/2023 13:42	WG2195486
Xylenes, Total	ND		0.00650	1	12/24/2023 13:42	WG2195486
1,2,4-Trimethylbenzene	ND		0.00500	1	12/24/2023 13:42	WG2195486
1,3,5-Trimethylbenzene	ND		0.00500	1	12/24/2023 13:42	WG2195486
(S) Toluene-d8	103		75.0-131		12/24/2023 13:42	WG2195486
(S) 4-Bromofluorobenzene	101		67.0-138		12/24/2023 13:42	WG2195486
(S) 1,2-Dichloroethane-d4	108		70.0-130		12/24/2023 13:42	WG2195486

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	9.94		4.00	1	12/23/2023 03:11	WG2194461
C28-C36 Motor Oil Range	31.3		4.00	1	12/23/2023 03:11	WG2194461
(S) o-Terphenyl	33.1		18.0-148		12/23/2023 03:11	WG2194461

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	12/23/2023 01:57	WG2194472
Anthracene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Benzo(a)anthracene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Benzo(b)fluoranthene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Benzo(k)fluoranthene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Benzo(a)pyrene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Chrysene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Dibenz(a,h)anthracene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Fluoranthene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Fluorene	ND		0.00600	1	12/23/2023 01:57	WG2194472
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/23/2023 01:57	WG2194472
1-Methylnaphthalene	ND		0.0200	1	12/23/2023 01:57	WG2194472
2-Methylnaphthalene	ND		0.0200	1	12/23/2023 01:57	WG2194472
Naphthalene	ND		0.0200	1	12/23/2023 01:57	WG2194472
Pyrene	ND		0.00600	1	12/23/2023 01:57	WG2194472
(S) p-Terphenyl-d14	45.9		23.0-120		12/23/2023 01:57	WG2194472
(S) Nitrobenzene-d5	57.9		14.0-149		12/23/2023 01:57	WG2194472
(S) 2-Fluorobiphenyl	44.6		34.0-125		12/23/2023 01:57	WG2194472

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.263		1	12/28/2023 11:44	WG2195416

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:59	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.28	T8	1	12/26/2023 09:00	WG2195274

Sample Narrative:

L1690201-05 WG2195274: 8.28 at 19.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	227		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:

L1690201-05 WG2194996: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.280		0.200	1	12/28/2023 12:59	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	10.8		1.00	5	01/02/2024 12:43	WG2194557
Barium	230		2.50	5	01/02/2024 12:43	WG2194557
Cadmium	ND		1.00	5	01/02/2024 12:43	WG2194557
Copper	14.5		5.00	5	01/02/2024 12:43	WG2194557
Lead	9.46		2.00	5	01/02/2024 12:43	WG2194557
Nickel	16.0		2.50	5	01/02/2024 12:43	WG2194557
Selenium	ND		2.50	5	01/02/2024 12:43	WG2194557
Silver	ND		0.500	5	01/02/2024 12:43	WG2194557
Zinc	53.2		25.0	5	01/02/2024 12:43	WG2194557

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.99		0.100	1	12/25/2023 08:06	WG2195643
(S) a,a,a-Trifluorotoluene(FID)	88.1		77.0-120		12/25/2023 08:06	WG2195643

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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	12/24/2023 14:01	WG2195486
Toluene	0.00958		0.00500	1	12/24/2023 14:01	WG2195486
Ethylbenzene	0.00450		0.00250	1	12/24/2023 14:01	WG2195486
Xylenes, Total	0.278		0.00650	1	12/24/2023 14:01	WG2195486
1,2,4-Trimethylbenzene	0.155		0.00500	1	12/24/2023 14:01	WG2195486
1,3,5-Trimethylbenzene	0.179		0.00500	1	12/24/2023 14:01	WG2195486
(S) Toluene-d8	104		75.0-131		12/24/2023 14:01	WG2195486
(S) 4-Bromofluorobenzene	97.2		67.0-138		12/24/2023 14:01	WG2195486
(S) 1,2-Dichloroethane-d4	110		70.0-130		12/24/2023 14:01	WG2195486

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	27.1		4.00	1	12/23/2023 03:24	WG2194461
C28-C36 Motor Oil Range	29.8		4.00	1	12/23/2023 03:24	WG2194461
(S) o-Terphenyl	45.3		18.0-148		12/23/2023 03:24	WG2194461

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	12/23/2023 02:15	WG2194472
Anthracene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Benzo(a)anthracene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Benzo(b)fluoranthene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Benzo(k)fluoranthene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Benzo(a)pyrene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Chrysene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Dibenz(a,h)anthracene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Fluoranthene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Fluorene	ND		0.00600	1	12/23/2023 02:15	WG2194472
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/23/2023 02:15	WG2194472
1-Methylnaphthalene	ND		0.0200	1	12/23/2023 02:15	WG2194472
2-Methylnaphthalene	ND		0.0200	1	12/23/2023 02:15	WG2194472
Naphthalene	ND		0.0200	1	12/23/2023 02:15	WG2194472
Pyrene	ND		0.00600	1	12/23/2023 02:15	WG2194472
(S) p-Terphenyl-d14	74.2		23.0-120		12/23/2023 02:15	WG2194472
(S) Nitrobenzene-d5	56.9		14.0-149		12/23/2023 02:15	WG2194472
(S) 2-Fluorobiphenyl	70.4		34.0-125		12/23/2023 02:15	WG2194472

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R4017335-1 12/27/23 14:58

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

L1690278-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1690278-10 12/27/23 16:27 • (DUP) R4017335-3 12/27/23 16:33

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	ND	ND	1	8.83		20

L1690278-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1690278-14 12/27/23 16:52 • (DUP) R4017335-4 12/27/23 16:58

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

Laboratory Control Sample (LCS)

(LCS) R4017335-2 12/27/23 15:06

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	9.90	99.0	80.0-120	

L1690278-18 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1690278-18 12/27/23 17:29 • (MS) R4017335-5 12/27/23 17:35 • (MSD) R4017335-6 12/27/23 17:41

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	21.6	19.3	104	93.1	1	75.0-125			10.9	20

L1690278-18 Original Sample (OS) • Matrix Spike (MS)

(OS) L1690278-18 12/27/23 17:29 • (MS) R4017335-7 12/27/23 17:47

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	646	ND	817	127	50	75.0-125	J5

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4018125-1 12/29/23 08:46

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1690035-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1690035-12 12/29/23 10:03 • (DUP) R4018125-7 12/29/23 10:09

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	3.20	2.52	1	23.8	P1	20

L1690206-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1690206-01 12/29/23 11:23 • (DUP) R4018125-8 12/29/23 11:30

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

Laboratory Control Sample (LCS)

(LCS) R4018125-2 12/29/23 08:55

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

L1689673-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1689673-05 12/29/23 09:19 • (MS) R4018125-3 12/29/23 09:26 • (MSD) R4018125-4 12/29/23 09:32

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	19.2	18.2	94.0	89.5	1	75.0-125			4.87	20

L1689673-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1689673-05 12/29/23 09:19 • (MS) R4018125-10 12/29/23 09:38

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	7080	ND	690	9.75	50	75.0-125	J6

L1689159-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1689159-07 12/24/23 11:30 • (DUP) R4016368-2 12/24/23 11:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.85	7.90	1	0.635	T8	1

Sample Narrative:

OS: 7.85 at 20.2C

DUP: 7.9 at 20.3C

L1689198-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1689198-07 12/24/23 11:30 • (DUP) R4016368-3 12/24/23 11:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.84	7.85	1	0.127	T8	1

Sample Narrative:

OS: 7.84 at 19.9C

DUP: 7.85 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R4016368-1 12/24/23 11:30

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

Sample Narrative:

LCS: 10 at 20.3C

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

L1690224-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1690224-02 12/26/23 09:00 • (DUP) R4016534-2 12/26/23 09:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.74	7.75	1	0.129		1

Sample Narrative:

OS: 7.74 at 20C

DUP: 7.75 at 20C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1690372-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1690372-04 12/26/23 09:00 • (DUP) R4016534-3 12/26/23 09:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.93	7.96	1	0.378		1

Sample Narrative:

OS: 7.93 at 20C

DUP: 7.96 at 19.8C

Laboratory Control Sample (LCS)

(LCS) R4016534-1 12/26/23 09:00

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

Sample Narrative:

LCS: 10 at 20.5C

Method Blank (MB)

(MB) R4016208-1 12/23/23 11:22

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

L1689218-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1689218-14 12/23/23 11:22 • (DUP) R4016208-3 12/23/23 11:22

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	12000	12100	1	0.499		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1690206-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1690206-02 12/23/23 11:22 • (DUP) R4016208-4 12/23/23 11:22

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	3040	2990	1	1.66		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4016208-2 12/23/23 11:22

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	326	99.7	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R4016227-1 12/23/23 12:29

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

L1689218-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1689218-09 12/23/23 12:29 • (DUP) R4016227-3 12/23/23 12:29

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	9840	9860	1	0.203		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1690457-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1690457-01 12/23/23 12:29 • (DUP) R4016227-4 12/23/23 12:29

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	233	231	1	0.734		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4016227-2 12/23/23 12:29

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	323	98.8	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4017614-1 12/28/23 12:20

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

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

(LCS) R4017614-2 12/28/23 12:23 • (LCSD) R4017614-3 12/28/23 12:25

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Hot Water Sol. Boron	1.00	1.03	1.07	103	107	80.0-120			4.09	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4018743-1 01/02/24 11:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	0.237	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

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

Laboratory Control Sample (LCS)

(LCS) R4018743-2 01/02/24 12:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	100	100	80.0-120	
Barium	100	95.0	95.0	80.0-120	
Cadmium	100	101	101	80.0-120	
Copper	100	95.3	95.3	80.0-120	
Lead	100	98.4	98.4	80.0-120	
Nickel	100	103	103	80.0-120	
Selenium	100	105	105	80.0-120	
Silver	20.0	20.6	103	80.0-120	
Zinc	100	98.6	98.6	80.0-120	

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L1690278-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1690278-05 01/02/24 12:04 • (MS) R4018743-5 01/02/24 12:14 • (MSD) R4018743-6 01/02/24 12:17

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	99.8	1.42	79.5	85.9	78.0	84.5	5	75.0-125			7.80	20
Barium	99.8	63.3	164	166	101	103	5	75.0-125			1.20	20
Cadmium	99.8	ND	87.1	93.5	87.1	93.5	5	75.0-125			7.10	20
Copper	99.8	8.95	86.5	95.1	77.5	86.2	5	75.0-125			9.54	20
Lead	99.8	23.2	104	101	81.2	78.2	5	75.0-125			2.91	20
Nickel	99.8	8.49	92.5	100	84.0	91.7	5	75.0-125			8.07	20
Selenium	99.8	ND	84.0	92.5	83.8	92.3	5	75.0-125			9.57	20
Silver	20.0	ND	17.1	18.2	85.7	91.2	5	75.0-125			6.21	20
Zinc	99.8	34.4	116	124	81.8	90.1	5	75.0-125			6.82	20

Method Blank (MB)

(MB) R4016999-3 12/24/23 22:06

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0226	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	94.9			77.0-120

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

(LCS) R4016999-1 12/24/23 20:52 • (LCSD) R4016999-2 12/24/23 21:17

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	6.31	6.23	115	113	72.0-127			1.28	20
(S) a,a,a-Trifluorotoluene(FID)				103	102	77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4017599-2 12/24/23 12:26

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	105			75.0-131
(S) 4-Bromofluorobenzene	98.2			67.0-138
(S) 1,2-Dichloroethane-d4	106			70.0-130

Laboratory Control Sample (LCS)

(LCS) R4017599-1 12/24/23 11:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.109	87.2	70.0-123	
Toluene	0.125	0.115	92.0	75.0-121	
Ethylbenzene	0.125	0.113	90.4	74.0-126	
Xylenes, Total	0.375	0.350	93.3	72.0-127	
1,2,4-Trimethylbenzene	0.125	0.118	94.4	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.122	97.6	73.0-127	
(S) Toluene-d8			102	75.0-131	
(S) 4-Bromofluorobenzene			98.7	67.0-138	
(S) 1,2-Dichloroethane-d4			113	70.0-130	

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Method Blank (MB)

(MB) R4016183-1 12/23/23 01:01

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	56.0			18.0-148

Laboratory Control Sample (LCS)

(LCS) R4016183-2 12/23/23 01:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	35.5	71.0	50.0-150	
(S) o-Terphenyl			55.9	18.0-148	

L1688310-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1688310-11 12/23/23 01:27 • (MS) R4016183-3 12/23/23 01:40 • (MSD) R4016183-4 12/23/23 01:53

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	50.0	ND	27.1	25.9	54.2	51.8	1	50.0-150			4.53	20
(S) o-Terphenyl					41.9	40.2		18.0-148				

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Method Blank (MB)

(MB) R4017712-2 12/23/23 00:31

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	73.6			23.0-120
(S) Nitrobenzene-d5	47.2			14.0-149
(S) 2-Fluorobiphenyl	65.1			34.0-125

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Laboratory Control Sample (LCS)

(LCS) R4017712-1 12/23/23 00:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0539	67.4	50.0-120	
Anthracene	0.0800	0.0610	76.3	50.0-126	
Benzo(a)anthracene	0.0800	0.0609	76.1	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0602	75.3	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0562	70.3	49.0-125	
Benzo(a)pyrene	0.0800	0.0525	65.6	42.0-120	
Chrysene	0.0800	0.0615	76.9	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0646	80.7	47.0-125	
Fluoranthene	0.0800	0.0648	81.0	49.0-129	
Fluorene	0.0800	0.0635	79.4	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0642	80.3	46.0-125	
1-Methylnaphthalene	0.0800	0.0545	68.1	51.0-121	
2-Methylnaphthalene	0.0800	0.0575	71.9	50.0-120	
Naphthalene	0.0800	0.0532	66.5	50.0-120	
Pyrene	0.0800	0.0578	72.3	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R4017712-1 12/23/23 00:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			73.1	23.0-120	
(S) Nitrobenzene-d5			56.5	14.0-149	
(S) 2-Fluorobiphenyl			69.1	34.0-125	

L1690212-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1690212-01 12/23/23 02:49 • (MS) R4017712-3 12/23/23 03:06 • (MSD) R4017712-4 12/23/23 03:24

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Acenaphthene	0.0787	ND	0.0426	0.0499	54.1	63.3	1	14.0-127			15.8	27
Anthracene	0.0787	ND	0.0479	0.0586	60.8	74.4	1	10.0-145			20.1	30
Benzo(a)anthracene	0.0787	ND	0.0634	0.0846	76.2	103	1	10.0-139			28.6	30
Benzo(b)fluoranthene	0.0787	ND	0.0796	0.108	101	137	1	10.0-140			30.3	36
Benzo(k)fluoranthene	0.0787	ND	0.0565	0.0709	71.7	90.0	1	10.0-137			22.6	31
Benzo(a)pyrene	0.0787	ND	0.0666	0.0869	79.6	105	1	10.0-141			26.4	31
Chrysene	0.0787	ND	0.0741	0.0981	89.6	120	1	10.0-145			27.9	30
Dibenz(a,h)anthracene	0.0787	ND	0.0532	0.0641	67.5	81.3	1	10.0-132			18.6	31
Fluoranthene	0.0787	0.00989	0.116	0.173	135	207	1	10.0-153		J3 J5	39.4	33
Fluorene	0.0787	ND	0.0490	0.0586	62.2	74.4	1	11.0-130			17.8	29
Indeno(1,2,3-cd)pyrene	0.0787	ND	0.0723	0.0944	88.0	116	1	10.0-137			26.5	32
1-Methylnaphthalene	0.0787	ND	0.0446	0.0502	56.6	63.7	1	10.0-142			11.8	28
2-Methylnaphthalene	0.0787	ND	0.0452	0.0514	57.4	65.2	1	10.0-137			12.8	28
Naphthalene	0.0787	ND	0.0428	0.0484	54.3	61.4	1	10.0-135			12.3	27
Pyrene	0.0787	0.00707	0.0856	0.123	99.7	147	1	10.0-148		J3	35.9	35
(S) p-Terphenyl-d14					57.0	65.2		23.0-120				
(S) Nitrobenzene-d5					39.1	49.6		14.0-149				
(S) 2-Fluorobiphenyl					52.7	63.8		34.0-125				

Cp

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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.

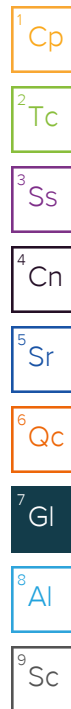
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location.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

B	The same analyte is found in the associated blank.
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.
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 is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
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.



Type of Ice Used: <input checked="" type="radio"/> Wet <input type="radio"/> Blue <input type="radio"/> Dry <input type="radio"/> None		SHORT HOLDS PRESENT (<72 hours): Y <input checked="" type="radio"/> N/A		LAB Sample Temperature Info: Temp Blank Received: Y N NA Therm ID#: _____ Cooler 1 Temp Upon Receipt: _____ Cooler 1 Therm Cert. Factors: _____ Cooler 1 Corrected Temp: _____ Comments:	
Packing Material Used:		Lab Tracking #: 6426 8306 8002		Samples received via:	
Radchem sample(s) screened (<500 cpm): Y <input checked="" type="radio"/> N <input type="radio"/> NA		<input checked="" type="radio"/> FEDEX <input type="radio"/> UPS <input type="radio"/> Client <input type="radio"/> Courier <input type="radio"/> Pace Courier		Comments: DP48 1.8+0=1.8	
Relinquished by/Company: (Signature) 	Date/Time: 12/19/23 500	Received by/Company: (Signature) 	Date/Time: H114	Trip Blank Received: Y N NA HCL MeOH TSP Other	
Relinquished by/Company: (Signature) 	Date/Time: 12/19/23 1600	Received by/Company: (Signature)	Date/Time:	Acctnum: Template: Prelogin:	Non Conformance(s): _____ Page: <u>1</u> YES / NO of: <u>1</u>
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature) 	Date/Time: 12/20/23 1000	PM: PB:	



ANALYTICAL REPORT

January 02, 2024

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Caerus Oil and Gas

Sample Delivery Group: L1690199
Samples Received: 12/20/2023
Project Number:
Description: Starkey 3
Site: STARKEY 3
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

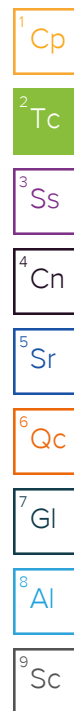
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

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

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
20231219-LMBG-(STARKEY 3-N01)@0.5 L1690199-01	5
20231219-LMBG-(STARKEY 3-N02)@0.5 L1690199-02	6
20231219-LMBG-(STARKEY 3-N03)@0.5 L1690199-03	7
20231219-LMBG-(STARKEY 3-N04)@0.5 L1690199-04	8
Qc: Quality Control Summary	9
Wet Chemistry by Method 7199	9
Wet Chemistry by Method 9045D	10
Wet Chemistry by Method 9050AMod	11
Metals (ICP) by Method 6010B-NE493 Ch 2	13
Metals (ICPMS) by Method 6020	14
Gl: Glossary of Terms	15
Al: Accreditations & Locations	16
Sc: Sample Chain of Custody	17

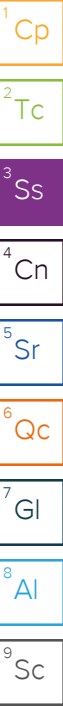


SAMPLE SUMMARY

20231219-LMBG-(STARKEY 3-N01)@0.5 L1690199-01 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 09:55
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:09	12/28/23 11:09	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:15	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194655	1	12/23/23 08:00	12/23/23 11:22	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:34	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194558	5	12/23/23 07:17	12/31/23 14:37	LD	Mt. Juliet, TN



20231219-LMBG-(STARKEY 3-N02)@0.5 L1690199-02 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:05
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:12	12/28/23 11:12	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:21	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:28	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194558	5	12/23/23 07:17	12/31/23 14:40	LD	Mt. Juliet, TN

20231219-LMBG-(STARKEY 3-N03)@0.5 L1690199-03 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:25
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:15	12/28/23 11:15	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:28	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:31	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194558	5	12/23/23 07:17	12/31/23 14:50	LD	Mt. Juliet, TN

20231219-LMBG-(STARKEY 3-N04)@0.5 L1690199-04 Solid

Collected by Alexis Hitzeroth
Collected date/time 12/19/23 10:30
Received date/time 12/20/23 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2195416	1	12/28/23 11:18	12/28/23 11:18	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2197171	1	12/28/23 09:52	12/29/23 10:34	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2195272	1	12/24/23 11:15	12/24/23 11:30	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2194996	1	12/23/23 08:00	12/23/23 12:29	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2195417	1	12/27/23 10:31	12/28/23 12:39	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2194558	5	12/23/23 07:17	12/31/23 14:54	LD	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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.0554		1	12/28/2023 11:09	WG2195416

¹ Cp

² Tc

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:15	WG2197171

³ Ss

⁴ Cn

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.41	T8	1	12/24/2023 11:30	WG2195272

⁵ Sr

⁶ Qc

Sample Narrative:

L1690199-01 WG2195272: 7.41 at 20C

⁷ Gl

⁸ Al

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	299		10.0	1	12/23/2023 11:22	WG2194655

⁹ Sc

Sample Narrative:

L1690199-01 WG2194655: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.590		0.200	1	12/28/2023 12:34	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	7.60		1.00	5	12/31/2023 14:37	WG2194558
Barium	293		2.50	5	12/31/2023 14:37	WG2194558
Cadmium	ND		1.00	5	12/31/2023 14:37	WG2194558
Copper	12.3		5.00	5	12/31/2023 14:37	WG2194558
Lead	10.3		2.00	5	12/31/2023 14:37	WG2194558
Nickel	13.5		2.50	5	12/31/2023 14:37	WG2194558
Selenium	ND		2.50	5	12/31/2023 14:37	WG2194558
Silver	ND		0.500	5	12/31/2023 14:37	WG2194558
Zinc	51.3		25.0	5	12/31/2023 14:37	WG2194558

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.113		1	12/28/2023 11:12	WG2195416

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:21	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	7.91	T8	1	12/24/2023 11:30	WG2195272

Sample Narrative:

L1690199-02 WG2195272: 7.91 at 19.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	203		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:

L1690199-02 WG2194996: at 25C

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.606		0.200	1	12/28/2023 12:28	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.3		1.00	5	12/31/2023 14:40	WG2194558
Barium	218		2.50	5	12/31/2023 14:40	WG2194558
Cadmium	ND		1.00	5	12/31/2023 14:40	WG2194558
Copper	7.12		5.00	5	12/31/2023 14:40	WG2194558
Lead	5.79		2.00	5	12/31/2023 14:40	WG2194558
Nickel	10.3		2.50	5	12/31/2023 14:40	WG2194558
Selenium	ND		2.50	5	12/31/2023 14:40	WG2194558
Silver	ND		0.500	5	12/31/2023 14:40	WG2194558
Zinc	27.7		25.0	5	12/31/2023 14:40	WG2194558

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.0933		1	12/28/2023 11:15	WG2195416

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:28	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	8.24	T8	1	12/24/2023 11:30	WG2195272

Sample Narrative:
L1690199-03 WG2195272: 8.24 at 19.9C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	191		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:
L1690199-03 WG2194996: at 25C

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.913		0.200	1	12/28/2023 12:31	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.11		1.00	5	12/31/2023 14:50	WG2194558
Barium	279		2.50	5	12/31/2023 14:50	WG2194558
Cadmium	ND		1.00	5	12/31/2023 14:50	WG2194558
Copper	6.80		5.00	5	12/31/2023 14:50	WG2194558
Lead	6.29		2.00	5	12/31/2023 14:50	WG2194558
Nickel	11.0		2.50	5	12/31/2023 14:50	WG2194558
Selenium	ND		2.50	5	12/31/2023 14:50	WG2194558
Silver	ND		0.500	5	12/31/2023 14:50	WG2194558
Zinc	34.7		25.0	5	12/31/2023 14:50	WG2194558

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.184		1	12/28/2023 11:18	WG2195416

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	12/29/2023 10:34	WG2197171

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.42	T8	1	12/24/2023 11:30	WG2195272

Sample Narrative:
L1690199-04 WG2195272: 8.42 at 19.8C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	117		10.0	1	12/23/2023 12:29	WG2194996

Sample Narrative:
L1690199-04 WG2194996: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.235		0.200	1	12/28/2023 12:39	WG2195417

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	7.29		1.00	5	12/31/2023 14:54	WG2194558
Barium	211		2.50	5	12/31/2023 14:54	WG2194558
Cadmium	ND		1.00	5	12/31/2023 14:54	WG2194558
Copper	12.4		5.00	5	12/31/2023 14:54	WG2194558
Lead	9.00		2.00	5	12/31/2023 14:54	WG2194558
Nickel	13.5		2.50	5	12/31/2023 14:54	WG2194558
Selenium	ND		2.50	5	12/31/2023 14:54	WG2194558
Silver	ND		0.500	5	12/31/2023 14:54	WG2194558
Zinc	47.8		25.0	5	12/31/2023 14:54	WG2194558

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4018125-1 12/29/23 08:46

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

L1690035-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1690035-12 12/29/23 10:03 • (DUP) R4018125-7 12/29/23 10:09

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	3.20	2.52	1	23.8	P1	20

L1690206-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1690206-01 12/29/23 11:23 • (DUP) R4018125-8 12/29/23 11:30

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

Laboratory Control Sample (LCS)

(LCS) R4018125-2 12/29/23 08:55

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

L1689673-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1689673-05 12/29/23 09:19 • (MS) R4018125-3 12/29/23 09:26 • (MSD) R4018125-4 12/29/23 09:32

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	19.2	18.2	94.0	89.5	1	75.0-125			4.87	20

L1689673-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1689673-05 12/29/23 09:19 • (MS) R4018125-10 12/29/23 09:38

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	7080	ND	690	9.75	50	75.0-125	J6

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1689159-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1689159-07 12/24/23 11:30 • (DUP) R4016368-2 12/24/23 11:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.85	7.90	1	0.635	T8	1

Sample Narrative:

OS: 7.85 at 20.2C

DUP: 7.9 at 20.3C

L1689198-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1689198-07 12/24/23 11:30 • (DUP) R4016368-3 12/24/23 11:30

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.84	7.85	1	0.127	T8	1

Sample Narrative:

OS: 7.84 at 19.9C

DUP: 7.85 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R4016368-1 12/24/23 11:30

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

Sample Narrative:

LCS: 10 at 20.3C

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R4016208-1 12/23/23 11:22

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

L1689218-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1689218-14 12/23/23 11:22 • (DUP) R4016208-3 12/23/23 11:22

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	12000	12100	1	0.499		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1690206-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1690206-02 12/23/23 11:22 • (DUP) R4016208-4 12/23/23 11:22

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	3040	2990	1	1.66		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4016208-2 12/23/23 11:22

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	326	99.7	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R4016227-1 12/23/23 12:29

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

L1689218-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1689218-09 12/23/23 12:29 • (DUP) R4016227-3 12/23/23 12:29

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	9840	9860	1	0.203		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1690457-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1690457-01 12/23/23 12:29 • (DUP) R4016227-4 12/23/23 12:29

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	233	231	1	0.734		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4016227-2 12/23/23 12:29

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	323	98.8	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4017614-1 12/28/23 12:20

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) R4017614-2 12/28/23 12:23 • (LCSD) R4017614-3 12/28/23 12:25

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	1.07	103	107	80.0-120			4.09	20

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R4018559-1 12/31/23 14:10

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) R4018559-2 12/31/23 14:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	99.8	99.8	80.0-120	
Barium	100	95.9	95.9	80.0-120	
Cadmium	100	101	101	80.0-120	
Copper	100	95.0	95.0	80.0-120	
Lead	100	99.7	99.7	80.0-120	
Nickel	100	102	102	80.0-120	
Selenium	100	105	105	80.0-120	
Silver	20.0	20.1	100	80.0-120	
Zinc	100	96.5	96.5	80.0-120	

L1690278-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1690278-16 12/31/23 14:17 • (MS) R4018559-5 12/31/23 14:27 • (MSD) R4018559-6 12/31/23 14:30

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 %
Arsenic	99.6	1.35	88.4	82.3	87.1	90.7	5	75.0-125			7.18	20
Barium	99.6	56.1	176	167	120	124	5	75.0-125			5.24	20
Cadmium	99.6	ND	108	93.2	108	104	5	75.0-125			14.5	20
Copper	99.6	13.3	108	97.3	94.3	94.1	5	75.0-125			10.0	20
Lead	99.6	32.7	119	106	86.1	81.7	5	75.0-125			11.7	20
Nickel	99.6	18.1	118	112	100	106	5	75.0-125			5.15	20
Selenium	99.6	ND	105	91.2	104	102	5	75.0-125			13.9	20
Silver	20.0	ND	20.5	18.4	103	103	5	75.0-125			11.0	20
Zinc	99.6	32.0	124	120	92.3	98.7	5	75.0-125			3.44	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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.





Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: <https://info.pacelabs.com/hubfs/pas-standard-terms.pdf>
Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

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

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or
MTJL Log-in Number Here

ALL BOLD OUTLINED AREAS are for LAB USE ONLY

Container Preservative Type **

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other

Analyses


Lab Profile/Line:

Lab Sample Receipt Checklist:	
Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signatures Present	Y N NA
Bottles Intact	Y N NA
Torment Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Packaged on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
DOA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl-Stripper	Y N NA
Sample pH Acceptable	Y N NA
pH Strips	Y N NA
Sulfide Present	Y N NA
Lead Acetate Strip	Y N NA

LAB USE ONLY:
Lab Sample # / Component:

L1690199

1	0
1	0
5	03
1	00

Company: Confluence Compliance Companies		Billing Information: Info on file		
Address: Info on file				
Report To: Jake Janicek, Brett Middleton, Blair Rollins, Andy Verbonitz		Email To: Info on file		
Copy To: remediation@confluence-cc.com		Site Collection Info/Address:		
Customer Project Name/Number: Starkey 3		State: County/City: Time Zone Collected:		
		/ PT X MT CT ET		
Phone:	Site/Facility ID #: Starkey 3	Compliance Monitoring?		Plastic (P) or Glass (G)
Email:		[] Yes [X] No		
Collected By (print): Alexis Hitzeroth	Purchase Order #:	DW PWS ID #:		
	Quote #:	DW Location Code:		
Collected By (signature): 	Turnaround Date Required: Standard	Immediately Packed on Ice:		
Sample Disposal:	Rush: (Expedite Charges Apply)	Field Filtered (if applicable):		
[] Dispose as appropriate	[] Same Day [] Next Day	[] Yes [] No		
[] Return	[] 2 Day [] 3 Day			
[] Archive:	[] 4 Day [] 5 Day	Analysis: _____		
[] Hold				

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

[illegible]

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: ☒ Wet ☐ Blue ☐ Dry ☐ None

Packing Material Used:

SHORT HOLDS PRESENT (<72 hours): Y ☒ N ☐ N/A

Lab Tracking #:

ing #: 6426 8306 8002





~~[Samples received via~~

FEDEX UPS Client Courier Pace Courier

Radchem sample(s) screened (<500 cpm): ☒ Y ☐ N ☐ NA

LAB Sample Temperature Info:

Temp Blank Received: Y N NA
Therm ID#:
Cooler 1 Temp Upon Receipt: 0C
Cooler 1 Therm Corr. Factor: 0
Cooler 1 Corrected Temp: 0C
Comments:

Relinquished by/Company: (Signature)		Date/Time:	12/19/23 1500	Received by/Company: (Signature)	
Relinquished by/Company: (Signature)		Date/Time:	12/19/23 1600	Received by/Company: (Signature)	
Relinquished by/Company: (Signature)		Date/Time:		Received by/Company: (Signature)	

Date/Time: H115

Template:
Prelogin:

PM:
PR:

Trip Blank Received: Y N NA			
HCL	MeOH	TSP	Other

Non Conformance(s): YES / NO	Page: ____1____ of: 1
---------------------------------	--------------------------



ANALYTICAL REPORT

December 13, 2023

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Caerus Oil and Gas

Sample Delivery Group: L1684964
Samples Received: 12/06/2023
Project Number:
Description: Starkey 7-T
Site: STARKEY 7-T
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

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

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

TABLE OF CONTENTS

Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
20231204-LMSOURCE-(STARKEY 7-T) L1684964-01	5	
Qc: Quality Control Summary	6	⁴ Cn
Wet Chemistry by Method 3500Cr C-2011	6	⁵ Sr
Wet Chemistry by Method 9040C	7	
Wet Chemistry by Method 9050A	8	⁶ Qc
Metals (ICPMS) by Method 6020	9	⁷ Gl
Gl: Glossary of Terms	11	
Al: Accreditations & Locations	12	⁸ Al
Sc: Sample Chain of Custody	13	⁹ Sc

SAMPLE SUMMARY

20231204-LMSOURCE-(STARKEY 7-T) L1684964-01 GW

Collected by
Dennis Lytle

Collected date/time
12/04/23 09:00

Received date/time
12/06/23 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2185145	1	12/08/23 22:21	12/08/23 22:21	JPD	Mt. Juliet, TN
Wet Chemistry by Method 3500Cr C-2011	WG2184238	1	12/09/23 12:57	12/09/23 12:57	SJC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2185328	1	12/08/23 12:15	12/08/23 12:15	EPW	Mt. Juliet, TN
Wet Chemistry by Method 9050A	WG2186244	1	12/11/23 15:04	12/11/23 15:04	NTG	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2185145	10	12/08/23 03:49	12/08/23 22:21	JPD	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

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.

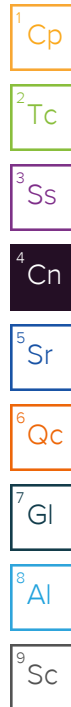


Chris Ward
Project Manager

Sample Delivery Group (SDG) Narrative

The following analysis were performed from an unpreserved, insufficiently or inadequately preserved sample.

<u>Lab Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L1684964-01	20231204-LMSOURCE-(STARKE Y 7-T)	3500Cr C-2011



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	87.8		1	12/08/2023 22:21	WG2185145

1
Cp

2
Tc

Wet Chemistry by Method 3500Cr C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		0.000500	1	12/09/2023 12:57	WG2184238

3
Ss

4
Cn

Wet Chemistry by Method 9040C

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	6.99	T8	1	12/08/2023 12:15	WG2185328

5
Sr

6
Qc

Sample Narrative:

L1684964-01 WG2185328: 6.99 at 19.3C

7
Gl

8
Al

Wet Chemistry by Method 9050A

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	20100		10.0	1	12/11/2023 15:04	WG2186244

9
Sc

Sample Narrative:

L1684964-01 WG2186244: at 25C

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.0200	10	12/08/2023 22:21	WG2185145
Barium	29.1		0.0200	10	12/08/2023 22:21	WG2185145
Cadmium	ND		0.0100	10	12/08/2023 22:21	WG2185145
Calcium	133		10.0	10	12/08/2023 22:21	WG2185145
Copper	ND		0.0500	10	12/08/2023 22:21	WG2185145
Lead	ND		0.0200	10	12/08/2023 22:21	WG2185145
Magnesium	15.8		10.0	10	12/08/2023 22:21	WG2185145
Nickel	ND		0.0200	10	12/08/2023 22:21	WG2185145
Selenium	ND		0.0200	10	12/08/2023 22:21	WG2185145
Silver	ND		0.0200	10	12/08/2023 22:21	WG2185145
Sodium	4020		20.0	10	12/08/2023 22:21	WG2185145
Zinc	ND		0.250	10	12/08/2023 22:21	WG2185145

Method Blank (MB)

(MB) R4010235-1 12/09/23 10:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Hexavalent Chromium	U		0.000150	0.000500

L1684304-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1684304-01 12/09/23 11:08 • (DUP) R4010235-3 12/09/23 11:19

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

Laboratory Control Sample (LCS)

(LCS) R4010235-2 12/09/23 10:46

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Hexavalent Chromium	0.00200	0.00205	102	90.0-110	

L1684610-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1684610-01 12/09/23 11:52 • (MS) R4010235-4 12/09/23 12:03 • (MSD) R4010235-5 12/09/23 12:14

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Hexavalent Chromium	0.0500	0.00923	0.0601	0.0593	102	100	1	90.0-110			1.32	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1684262-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1684262-01 12/08/23 12:15 • (DUP) R4009986-2 12/08/23 12:15

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.60	7.59	1	0.132		1

Sample Narrative:

OS: 7.6 at 19.6C

DUP: 7.59 at 19.4C

L1685226-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1685226-01 12/08/23 12:15 • (DUP) R4009986-3 12/08/23 12:15

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.99	7.96	1	0.376		1

Sample Narrative:

OS: 7.99 at 18.5C

DUP: 7.96 at 18.7C

Laboratory Control Sample (LCS)

(LCS) R4009986-1 12/08/23 12:15

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

Sample Narrative:

LCS: 10.02 at 20C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4010785-1 12/11/23 15:04

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

L1684005-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1684005-02 12/11/23 15:04 • (DUP) R4010785-3 12/11/23 15:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1620	1600	1	1.68		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1684964-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1684964-01 12/11/23 15:04 • (DUP) R4010785-4 12/11/23 15:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	20100	19800	1	1.76		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4010785-2 12/11/23 15:04

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	315	96.3	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R4010151-1 12/08/23 21:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	0.000237	U	0.000180	0.00200
Barium	0.000713	U	0.000381	0.00200
Cadmium	U		0.000150	0.00100
Calcium	U		0.0936	1.00
Copper	U		0.00151	0.00500
Lead	U		0.000849	0.00200
Magnesium	U		0.0735	1.00
Nickel	U		0.000816	0.00200
Selenium	U		0.000300	0.00200
Silver	U		0.0000700	0.00200
Sodium	2.17		0.376	2.00
Zinc	U		0.00302	0.0250

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R4010151-2 12/08/23 21:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	0.0500	0.0529	106	80.0-120	
Barium	0.0500	0.0509	102	80.0-120	
Cadmium	0.0500	0.0552	110	80.0-120	
Calcium	5.00	5.29	106	80.0-120	
Copper	0.0500	0.0488	97.7	80.0-120	
Lead	0.0500	0.0522	104	80.0-120	
Magnesium	5.00	5.37	107	80.0-120	
Nickel	0.0500	0.0542	108	80.0-120	
Selenium	0.0500	0.0538	108	80.0-120	
Silver	0.0500	0.0534	107	80.0-120	
Sodium	5.00	5.95	119	80.0-120	
Zinc	0.0500	0.0535	107	80.0-120	

L1684918-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1684918-01 12/08/23 21:38 • (MS) R4010151-4 12/08/23 21:44 • (MSD) R4010151-5 12/08/23 21:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	0.0500	ND	0.0530	0.0525	105	104	1	75.0-125			1.02	20
Barium	0.0500	0.00701	0.0563	0.0562	98.5	98.4	1	75.0-125			0.127	20
Cadmium	0.0500	ND	0.0545	0.0549	109	110	1	75.0-125			0.703	20

L1684918-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1684918-01 12/08/23 21:38 • (MS) R4010151-4 12/08/23 21:44 • (MSD) R4010151-5 12/08/23 21:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	5.00	ND	5.65	5.54	104	101	1	75.0-125			1.89	20
Copper	0.0500	ND	0.0518	0.0506	98.8	96.3	1	75.0-125			2.35	20
Lead	0.0500	ND	0.0529	0.0541	103	105	1	75.0-125			2.07	20
Magnesium	5.00	ND	5.37	5.34	104	103	1	75.0-125			0.416	20
Nickel	0.0500	ND	0.0543	0.0540	106	105	1	75.0-125			0.422	20
Selenium	0.0500	ND	0.0532	0.0532	106	106	1	75.0-125			0.0597	20
Silver	0.0500	ND	0.0524	0.0517	105	103	1	75.0-125			1.41	20
Sodium	5.00	6.87	12.1	11.8	105	99.2	1	75.0-125			2.61	20
Zinc	0.0500	ND	0.0639	0.0626	97.7	95.1	1	75.0-125			2.06	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

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Qc

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Gl

8

Al

9

Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

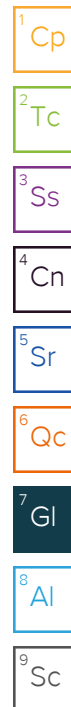
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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
J	The identification of the analyte is acceptable; the reported value is an estimate.
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

Sample Delivery Group: L1532612
Samples Received: 09/03/2022
Project Number:
Description: Mesa 17
Site: MESA17
Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National

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

TABLE OF CONTENTS

Cp: Cover Page	1	<div><div>1</div>Cp</div>
Tc: Table of Contents	2	
Ss: Sample Summary	3	<div><div>2</div>Tc</div>
Cn: Case Narrative	4	
Sr: Sample Results	5	<div><div>3</div>Ss</div>
20220831-MESA17(PW01) L1532612-01	5	
Qc: Quality Control Summary	6	<div><div>4</div>Cn</div>
Wet Chemistry by Method 9040C	6	<div><div>5</div>Sr</div>
Metals (ICPMS) by Method 6020	7	
Gl: Glossary of Terms	8	<div><div>6</div>Qc</div>
Al: Accreditations & Locations	9	<div><div>7</div>Gl</div>
Sc: Sample Chain of Custody	10	<div><div>8</div>Al</div>
		<div><div>9</div>Sc</div>

SAMPLE SUMMARY

20220831-MESA17(PW01) L1532612-01 GW

Collected by
Chad Dodge

Collected date/time
08/31/22 13:20

Received date/time
09/03/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9040C	WG1926330	1	09/14/22 17:00	09/14/22 17:00	SGB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1926320	5	09/15/22 09:14	09/15/22 17:33	LD	Mt. Juliet, TN

¹Cp

²Tc

³Ss

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⁶Qc

⁷Gl

⁸Al

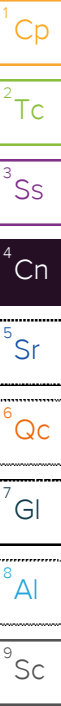
⁹Sc

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



Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	6.70	T8	1	09/14/2022 17:00	WG1926330

Sample Narrative:

L1532612-01 WG1926330: 6.7 at 19C

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	ND		0.0100	5	09/15/2022 17:33	WG1926320

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1532438-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1532438-01 09/14/22 17:00 • (DUP) R3837310-2 09/14/22 17:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.60	7.63	1	0.394		1

Sample Narrative:

OS: 7.6 at 19.9C

DUP: 7.63 at 20C

L1532830-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1532830-03 09/14/22 17:00 • (DUP) R3837310-3 09/14/22 17:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	4.55	4.55	1	0.000		1

Sample Narrative:

OS: 4.55 at 19C

DUP: 4.55 at 19.2C

Laboratory Control Sample (LCS)

(LCS) R3837310-1 09/14/22 17:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.90	99.0	99.0-101	

Sample Narrative:

LCS: 9.9 at 20.1C



Method Blank (MB)

(MB) R3837780-1 09/15/22 16:37

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Arsenic	U		0.000180	0.00200

Laboratory Control Sample (LCS)

(LCS) R3837780-2 09/15/22 16:40

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Arsenic	0.0500	0.0496	99.1	80.0-120	

L1533905-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1533905-11 09/15/22 16:44 • (MS) R3837780-4 09/15/22 16:50 • (MSD) R3837780-5 09/15/22 16:54

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	0.0500	0.00921	0.0607	0.0582	103	97.9	1	75.0-125			4.26	20

1

Cp

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Tc

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Ss

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Cn

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Sr

6

Qc

7

Gl

8

Al

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Sc

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.
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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

T8	Sample(s) received past/too close to holding time expiration.
----	---

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

ACCREDITATIONS & LOCATIONS

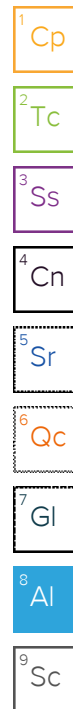
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Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	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

Sample Delivery Group: L1527445
Samples Received: 08/19/2022
Project Number:
Description: Mesa 2
Site: MESA 2
Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

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

TABLE OF CONTENTS

Cp: Cover Page	1	<div><div>1</div>Cp</div>
Tc: Table of Contents	2	
Ss: Sample Summary	3	<div><div>2</div>Tc</div>
Cn: Case Narrative	4	
Sr: Sample Results	5	<div><div>3</div>Ss</div>
20220817-MESA 2 (PW-01) L1527445-01	5	
20220817-MESA 2 (PW-01) L1527445-02	6	<div><div>4</div>Cn</div>
Qc: Quality Control Summary	7	<div><div>5</div>Sr</div>
Wet Chemistry by Method 7196A	7	
Metals (ICPMS) by Method 6020	8	<div><div>6</div>Qc</div>
Gl: Glossary of Terms	9	<div><div>7</div>Gl</div>
Al: Accreditations & Locations	10	<div><div>8</div>Al</div>
Sc: Sample Chain of Custody	11	<div><div>9</div>Sc</div>

SAMPLE SUMMARY

20220817-MESA 2 (PW-01) L1527445-01 GW

Collected by
Chad Dodge

Collected date/time
08/17/22 11:20

Received date/time
08/19/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 7196A	WG1913935	1	08/20/22 19:29	08/20/22 19:29	JAR	Mt. Juliet, TN

20220817-MESA 2 (PW-01) L1527445-02 Solid

Collected by
Chad Dodge

Collected date/time
08/17/22 11:20

Received date/time
08/19/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG1918761	5	08/30/22 17:42	08/31/22 11:34	SJM	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

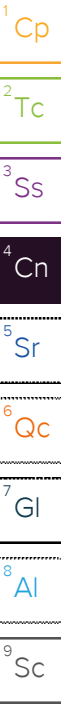
⁹Sc

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



Wet Chemistry by Method 7196A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	0.0120	T8	0.0100	1	08/20/2022 19:29	WG1913935

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	ND		1.00	5	08/31/2022 11:34	WG1918761

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3828545-1 08/20/22 19:24

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Chromium,Hexavalent	U		0.00300	0.0100

L1527346-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1527346-01 08/20/22 19:26 • (DUP) R3828545-5 08/20/22 19:26

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

Laboratory Control Sample (LCS)

(LCS) R3828545-2 08/20/22 19:24

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Chromium,Hexavalent	0.500	0.565	113	80.0-120	

L1527090-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1527090-01 08/20/22 19:25 • (MS) R3828545-3 08/20/22 19:25 • (MSD) R3828545-4 08/20/22 19:25

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chromium,Hexavalent	0.500	ND	0.444	0.464	88.8	92.8	1	85.0-115			4.41	20

1
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Gl

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Al

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Sc

Method Blank (MB)

(MB) R3832398-1 08/31/22 11:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3832398-2 08/31/22 11:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.9	91.9	80.0-120	

L1527414-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1527414-01 08/31/22 11:14 • (MS) R3832398-5 08/31/22 11:24 • (MSD) R3832398-6 08/31/22 11:27

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	2.31	73.9	64.3	71.6	62.0	5	75.0-125	J6	J6	13.9	20

1
Cp

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Tc

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Qc

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Gl

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Al

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Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

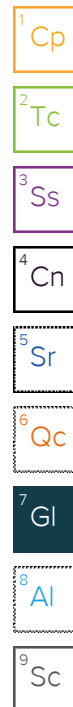
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Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These 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
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

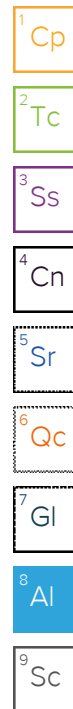
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122


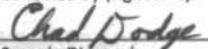



Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	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.



<div>CHAIN-OF-CUSTODY Analytical Request Document</div> <div>Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields</div>										<div>LAB USE ONLY- Affix Workorder/Login Label Here or List Pa MTJL Log-in Number Here</div> <div>Number or D084</div>														
Company: Campos EPC					Billing Information: Caerus Oil and Gas, LLC Account: CAERUSPCO					ALL SHADED AREAS are for LAB USE ONLY														
Address: 1401 Blake St. Denver, CO 80202					Email To: bmiddleton@caerusoilandgas.com					Container Preservative Type **					Lab Project Manager:									
Report To: Brett Middleton					Site Collection Info/Address:					** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other														
Copy To: jjanicek@caerusoilandgas.com					State: County/City: Time Zone Collected:					Analyses					Lab Profile/Line:									
Customer Project Name/Number: Mesa 2					CO / [] PT [x] MT [] CT [] ET					<div>Arsenic, Hexavalent Chromium</div>					Lab Sample Receipt Checklist:									
Phone: 970-619-0600					Site/Facility ID #: Mesa 2										Compliance Monitoring? [] Yes [] No					Custody Seals Present/Intact Y N [x] NA				
Email: same as above					Purchase Order #: Quote #:										DW PWS ID #: DW Location Code:					Custody Signatures Present Y N NA				
Collected By (print): Chad Dodge					Turnaround Date Required: standard										Immediately Packed on Ice: [x] Yes [] No					Collector Signature Present Y N NA				
Collected By (signature): 					Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [x] 5 Day (Expedite Charges Apply)										Field Filtered (if applicable): [] Yes [] No					Bottles Intact Y N NA				
Sample Disposal: [x] Dispose as appropriate [] Return [] Archive: [] Hold:					Analysis:										Correct Bottles Y N NA									
* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)																				Sufficient Volume Y N NA				
Customer Sample ID		Matrix *		Comp / Grab		Collected (or Composite Start)		Composite End		Res Cl		# of Ctns		<div>LAB USE ONLY: Lab Sample # / Comments: L1527445</div>										
						Date Time		Date Time																
20220817-Mesa 2 (PW-01)		P				8/17/22 1120		-		3hd 5														
Customer Remarks / Special Conditions / Possible Hazards:										Type of Ice Used: Wet Blue Dry None					SHORT HOLDS PRESENT (<72 hours): Y N N/A									
										Packing Material Used:					Lab Tracking #:									
										Radchem sample(s) screened (<500 cpm): Y N NA					Samples received via: FEDEX UPS Client Courier Pace Courier									
Relinquished by/Company: (Signature) 					Date/Time: 8/18/22-1200					Received by/Company: (Signature) 					Date/Time:									
Relinquished by/Company: (Signature) 					Date/Time: 8/18 1500					Received by/Company: (Signature)					Date/Time:									
Relinquished by/Company: (Signature)					Date/Time:					Received by/Company: (Signature) D. Ramsey					Date/Time: 08/19 0900									
															MTJL LAB USE ONLY									
															Table #:									
															Acctnum:									
															Template:									
															Prelogin:									
															PM:									
															PB:									
															Lab Sample Temperature Info:									
															Temp Blank Received: Y N NA									
															Therm ID#:									
															Cooler 1 Temp Upon Receipt: oC									
															Cooler 1 Therm Corr. Factor: oC									
															Cooler 1 Corrected Temp: oC									
															Comments:									
															Trip Blank Received: Y N NA									
															HCL MeOH TSP Other									
															Non Conformance(s):									
															YES / NO									
															Page: of:									