VIA ELECTRONIC MAIL –

February 19, 2024

Jake Janicek
EH&S Specialist
Environmental Health and Safety
Caerus Piceance LLC
143 Diamond Avenue
Parachute, Colorado 81635

Subject: **Report of Work Completed**
N36NWB Dumpline Release
Mamm Creek Field
Garfield County, Colorado

Dear Mr. Janicek:

WSP USA Inc. (WSP), on behalf of Caerus Piceance LLC (Caerus), completed initial point of release (POR) characterization soil sampling associated with the dumpline release at the BENZEL-66S93W/36SESWN36NWB (Facility ID: 334967) (N36NWB) pad location (Site). The release was discovered by a Caerus lease operator while conducting routine route services at the Site on January 30, 2024. The release was observed pooling at the pad surface from the vertical section of dumpline on the south end of the tank battery containment. The initial spill release information can be referenced under the Spill/Release Point ID: 485969. All initial POR field characterization work was completed per ECMC Rule 913.C.(3*) Remediation of Spill and Releases pursuant to Rule 912*. This report of work completed (ROWC) documents the initial release characterization field investigative work completed at the Site. The Site is in the Caerus' Mamm Creek area of operation in Garfield County, Colorado (Figure 1).

SOIL SAMPLING ACTIVITIES – N36NWB DUMPLINE RELEASE

On January 30, 2024, Western Slope Field Services, Inc. (WCO) personnel, contracted by Caerus, hydro-excavated overburden material from the known POR location associated with the dumpline release. The N36NWB dumpline release occurred at a longitude and latitude location of 39.478109°, -107.727602°. Following the daylighting of the release location, WSP personnel collected one confirmation soil sample directly beneath the POR location at 7.5 feet below ground surface (bgs) using a decontaminated hand auger. The soil sampling activities were conducted by a WSP geologist who inspected the soil sample for the presence or absence of petroleum hydrocarbons odor and/or staining. The soils were characterized by visually inspecting the confirmation soil sample and field screening the soil head space using a photoionization detector (PID) to monitor for the presence or absence of volatile organic compounds (VOCs). The below table summarizes the field screening observations.

POR Field Soil Screening Results – January 30, 2024

Sample ID	PID (ppm)	Notes	Submitted for Analysis
20240130-N36NWB-(POR)@7.5	1,685	Odor/no staining	Full Table 915-1

ppm – parts per million

The POR confirmation soil sample was submitted to Pace Analytical (Pace) of Mount Juliet, Tennessee for analysis of ECMC full list Table 915-1 constituents. The POR soil analytical results will be evaluated under the Protection of Groundwater Soil Screening Level Concentrations (PGSSLCs). A photolog depicting the POR soil sampling activities is provided in Enclosure A. The laboratory analytical report is provided in Enclosure B. The POR location is shown on Figure 2.

ANALYTICAL RESULTS – N36NWB DUMPLINE RELEASE

Laboratory analytical results of the POR confirmation soil sample collected on January 30, 2024 indicate exceedances of ECMC Table 915-1 Cleanup Concentrations (CCs) and Table 915-1 PGSSLCs. The documented exceedances are summarized in the table below.

Summary of POR Confirmation Soil Analytical Exceedances – January 30, 2024

Confirmation Soil Sample ID	ECMC Table 915-1 Contaminants of Concern	Units	ECMC Protection of Groundwater Soil Screening Level Concentrations	Confirmation Soil Sample Concentration
20240130-N36NWB-(POR)@7.5	Arsenic	mg/kg	0.29 (M)	**4.65**
	Barium	mg/kg	82 (M)	**196**
	SAR	unitless	<6	**44.8**
	TPH	mg/kg	500	**7,588**
	Benzene	mg/kg	0.0026 (M)	**6.94**
	Toluene	mg/kg	0.69 (M)	**122**
	Ethylbenzene	mg/kg	0.78 (M)	**31.9**
	Total Xylenes	mg/kg	9.9 (M)	**565**
	1,2,4-trimethylbenzene	mg/kg	0.0081 (R)	**85.7**
	1,3,5-trimethylbenzene	mg/kg	0.0087 (R)	**68.5**
	1-methylnaphthalene	mg/kg	0.006 (R)	**0.527**
	2-methylnaphthalene	mg/kg	0.019 (R)	**1.56**
	Naphthalene	mg/kg	0.0038 (R)	**0.779**

Key:
ECMC – Colorado Energy and Carbon Management Commission
mg/kg – milligram per kilogram
R – risk based value
mg/l – milligram per liter
< – less than
M – method based value
***BOLD** – indicates exceeding ECMC standard*

All other analytes were either below the laboratory reporting detection limit (RDL) or within the ECMC Table 915-1 PGSSLCs. The laboratory analytical reports are included in Enclosure B. The results are summarized in Table 1 and on Figure 3.

CONCLUSIONS – N36NWB DUMPLINE RELEASE

Based on the analytical data provided herein, there are remaining ECMC Table 915-1 exceedances of arsenic, barium, sodium adsorption ratio (SAR), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, total xylenes (BTEX), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1-methylnapthalene, 2-methylnapthalene, and naphthalene associated with POR confirmation soil sample 20240130-N36NWB-(POR)@7.5 collected at the Site on January 30, 2024.

WSP recommends that Caerus complete a subsurface investigation using an environmental drill rig equipped with solid-stem drilling technology. WSP recommends that a minimum of five soil borings be advanced; one located immediately adjacent to POR location and one in each cardinal direction of the POR location. If vertical and/or lateral impacts are observed beyond the four advanced soil borings surrounding the POR location, subsequent soil borings will be advanced in each cardinal direction until impacts are defined. These soil borings will be advanced up to five feet past field observed hydrocarbon impacts and the total depth of the soil borings will be determined based on the vertical extent of impacts observed at the POR location. The proposed soil boring locations are illustrated on the enclosed Figure 4. The laboratory analytical report is included in Enclosure B and the results are summarized in Table 1.

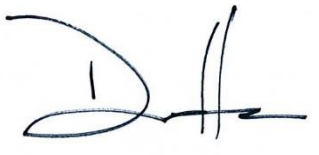
Please reference the "Remediation Summary" of ECMC Initial Form 27 Document Number (DN) 403685297 on how Caerus plans to address the documented arsenic exceedance per ECMC Table 915-1, Footnote 1. A geographic proximity location map showing the referenced H7 [Facility ID: 334864] background soil boring location with

respect to the Site is shown on the enclosed Figure 5. The H7 background soil boring analytical report can be referenced in Enclosure B.

Additionally, WSP recommends that Caerus requests the ECMC Director per ECMC Rule 915.e.(2).C to sample under a reduced suite of barium, SAR, TPH, BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene for all future soil sampling associated with the investigation N36NWB dumpline release.

Please contact us at (970) 618-4514 or (970) 658-7025 if you have any questions regarding this report or require additional information.

Kind regards,



Dustin Held
Lead Consultant, Environmental Geologist

Parker Coit, P.G.
Lead Consultant, Geologist

Encl.

FIGURES

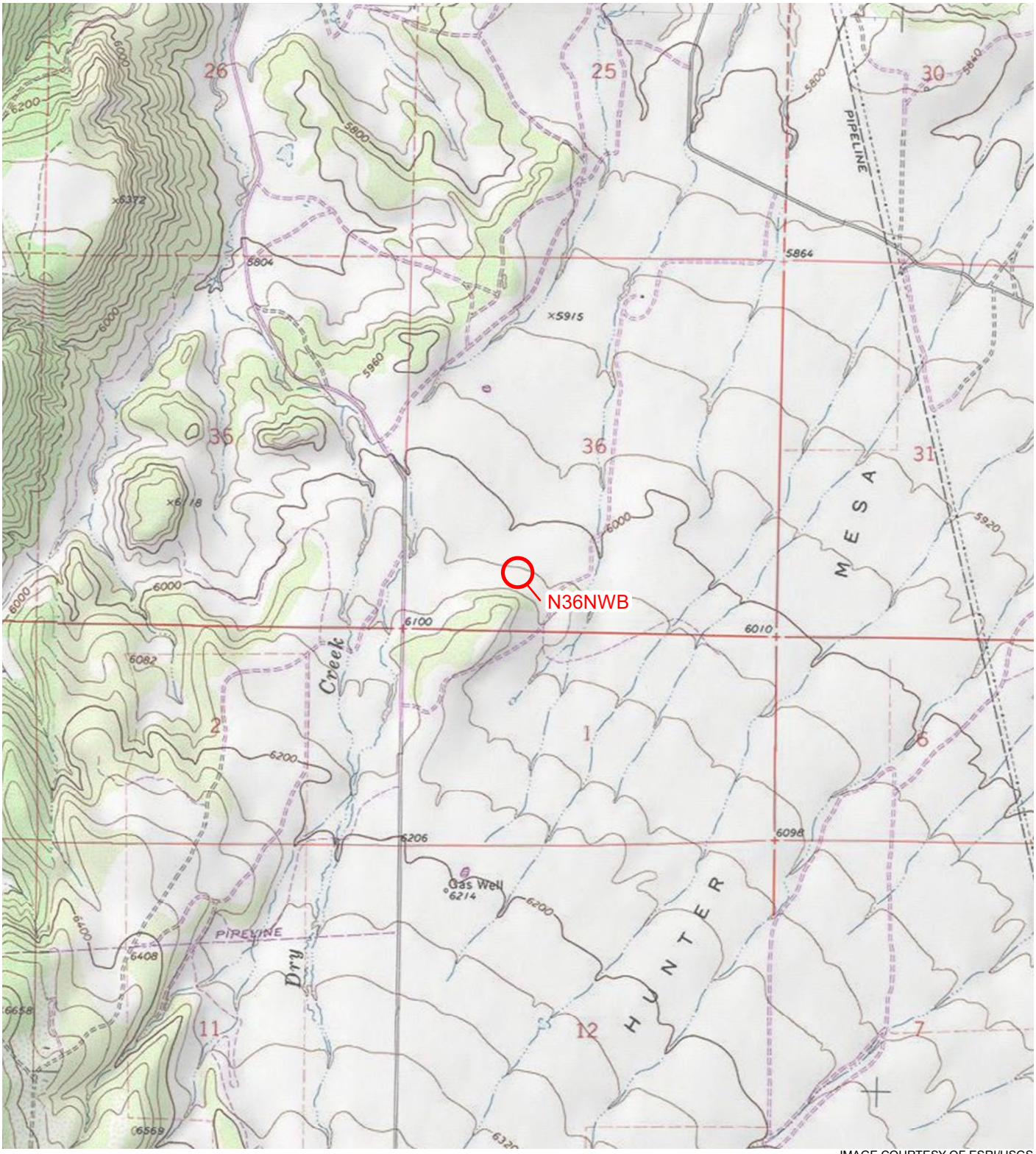


IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

COLORADO

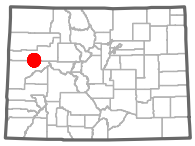


FIGURE 1
SITE LOCATION MAP
N36NWB
SESW SEC 36 T6S R93W
GARFIELD COUNTY, COLORADO

CAERUS PICEANCE LLC

wsp

T:\Standard\gis\CaerusPiceanceLLC\N36NWB\Maps\MXDs\FIG01_SL.mxd

BACKGROUND IMAGERY COURTESY OF GOOGLE EARTH (2022)

LEGEND

- POINT OF RELEASE
- SAMPLE LOCATION

0 100 200

Feet

N

FIGURE 2
SITE MAP
N36NWB
SESW SEC 36 T6S R93W
GARFIELD COUNTY, COLORADO

CAERUS PICEANCE LLC

T:\Standard\gis\CaerusPiceanceLLC\N36NWB\Maps\MXDs\FIG02_SPILL_MAP_020124.mxd

SAMPLE NAME
SAMPLE DATE
AS: ARSENIC (mg/kg)
BA: BARIUM (mg/kg)
SAR: SODIUM ADSORPTION RATIO (unitless)
TPH: TOTAL PETROLEUM HYDROCARBONS (mg/kg)
B: BENZENE (mg/kg)
T: TOLUENE (mg/kg)
E: ETHYLBENZENE (mg/kg)
X: TOTAL XYLENES (mg/kg)
1,2,4-TRIMETH: 1,2,4-TRIMETHYLBENZENE (mg/kg)
1,3,5-TRIMETH: 1,3,5-TRIMETHYLBENZENE (mg/kg)
1-METH: 1-METHYLNAPHTHALENE (mg/kg)
2-METH: 2-METHYLNAPHTHALENE (mg/kg)
NAPH: NAPHTHALENE (mg/kg)
BOLD: INIDCATES RESULT EXCEEDS THE ECMC CONCENTRATION LEVEL
ECMC: ENERGY AND CARBON MANAGEMENT COMMISSION
mg/kg: MILLIGRAMS PER KILOGRAM

BACKGROUND IMAGERY COURTESY OF GOOGLE EARTH (2023)

LEGEND

- POINT OF RELEASE
- SAMPLE LOCATION

0 50 100
Feet

N

FIGURE 3
SOIL ANALYTICAL EXCEEDANCE MAP
N36NWB
SESW SEC 36 T6S R93W
GARFIELD COUNTY, COLORADO

CAERUS PICEANCE LLC

T:\Standard\gis\CaerusPiceanceLLC\N36NWB\Maps\MXDs\FIG03_SOIL_ANALYTICAL_MAP_021424.mxd

BACKGROUND IMAGERY COURTESY OF GOOGLE EARTH (2022)

LEGEND

- POINT OF RELEASE
- SAMPLE LOCATION
- PROPOSED SOIL BORINGS

0 100 200

Feet

N

FIGURE 4
PROPOSED SOIL BORING LOCATION MAP
N36NWB
SESW SEC 36 T6S R93W
GARFIELD COUNTY, COLORADO

CAERUS PICEANCE LLC

T:\Standard\gis\CaerusPiceanceLLC\N36NWB\Maps\MXDs\FIG04_PROP_SOIL_BORING_MAP_021424.mxd

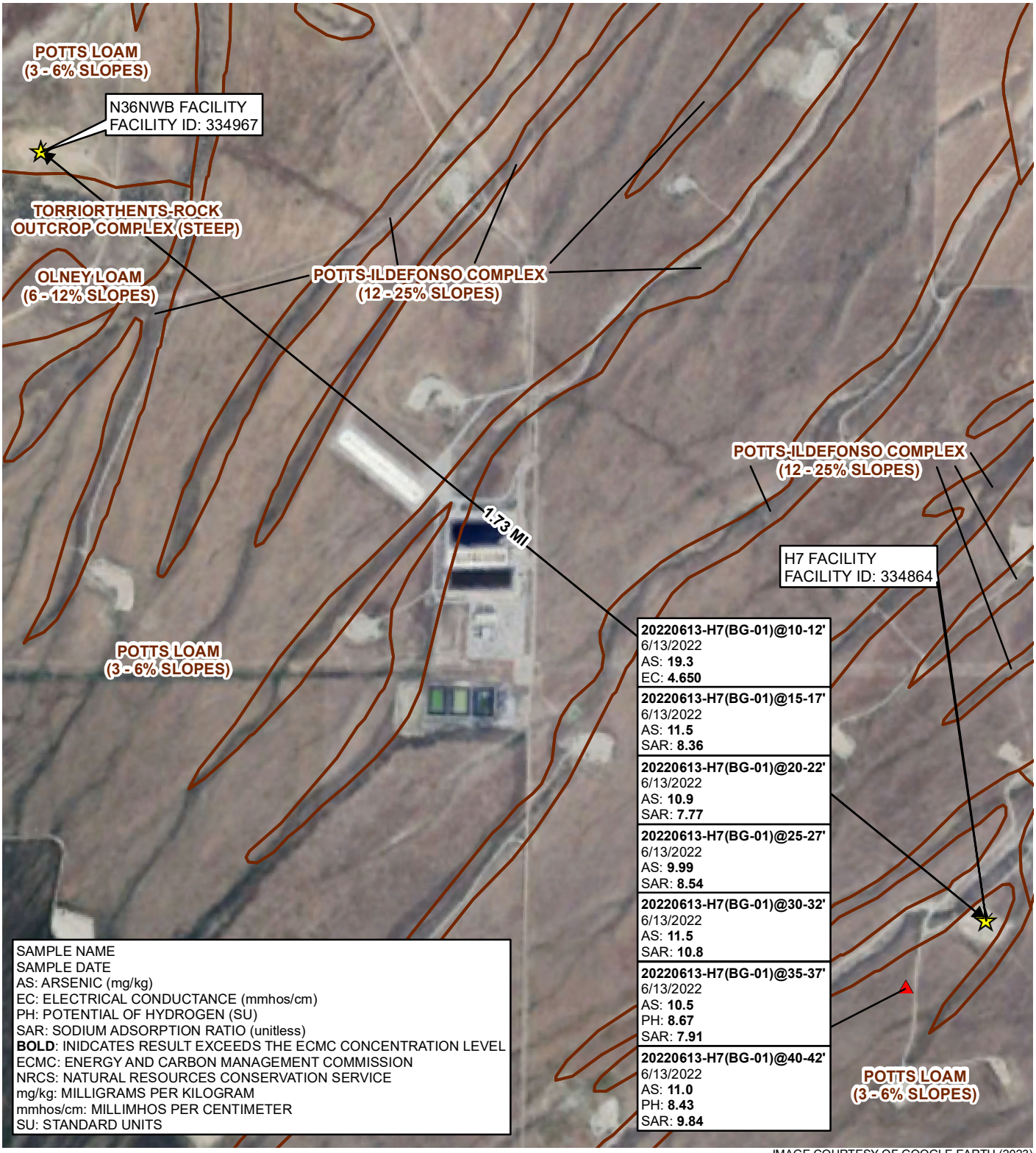


IMAGE COURTESY OF GOOGLE EARTH (2023)

LEGEND

- FACILITY LOCATION
- BACKGROUND SAMPLE LOCATION
- NRCS SSURGO SOIL

0 1,000 2,000
Feet

N

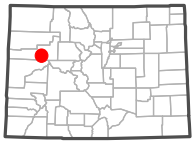


FIGURE 5
GEOGRAPHIC PROXIMITY MAP
N36NWB
SESW SEC 36 T6S R93W
GARFIELD COUNTY, COLORADO

CAERUS PICEANCE LLC

T:\Standard\gis\CaerusPiceanceLLC\N36NWB\Maps\MXDs\FIG05_GEO_PROX_MAP_021424.mxd

TABLE

TABLE 1

SOIL ANALYTICAL RESULTS
N36NWB
GARFIELD COUNTY, COLORADO
CAERUS PICEANCE LLC

PARAMETER	ECMC RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATIONS	ECMC PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATIONS	UNITS	CONFIRMATION SOIL SAMPLE	BACKGROUND SOIL SAMPLES			
				20240130-N36NWB-(POR)@7.5	20220613-H7(BG-01)@10-12'	20220613-H7(BG-01)@15-17'	20220613-H7(BG-01)@20-22'	20220613-H7(BG-01)@25-27'
Sample Date				1/30/2024	6/13/2022	6/13/2022	6/13/2022	6/13/2022
Sample Depth (feet)				7.5	10-12	15-17	20-22	25-27
Sample Type				Confirmation	Background	Background	Background	Background
Arsenic	0.68	0.29 (M)	mg/kg	**4.65**	**19.3**	**11.5**	**10.9**	**9.99**
Barium	15,000	82 (M)	mg/kg	**196**	NA	NA	NA	NA
Boron	2	2	mg/l	1.24	0.658	0.465	0.372	0.299
Cadmium	71	0.38 (M)	mg/kg	<1.00	NA	NA	NA	NA
Chromium (VI)	0.3	0.00067 (R)	mg/kg	<1.00	NA	NA	NA	NA
Copper	3,100	46 (M)	mg/kg	8.83	NA	NA	NA	NA
Lead	400	14 (M)	mg/kg	9.17	NA	NA	NA	NA
Nickel	1,500	26 (R)	mg/kg	11.9	NA	NA	NA	NA
Selenium	390	0.26 (M)	mg/kg	<2.50	NA	NA	NA	NA
Silver	390	0.8 (R)	mg/kg	<0.500	NA	NA	NA	NA
Zinc	23,000	370 (R)	mg/kg	44.2	NA	NA	NA	NA
EC	<4	<4	mmhos/cm	2.760	**4.650**	3.730	3.680	3.350
pH	6 - 8.3	6 - 8.3	SU	7.93	7.49	7.98	8.22	8.19
SAR	<6	<6	unitless	**44.8**	4.45	**8.36**	**7.77**	**8.54**
TPH-GRO			mg/kg	6,890	NA	NA	NA	NA
TPH-DRO			mg/kg	698	NA	NA	NA	NA
TPH-ORO			mg/kg	<20.0	NA	NA	NA	NA
TPH	500	500	mg/kg	**7,588**	NA	NA	NA	NA
Benzene	1.2	0.0026 (M)	mg/kg	**6.94**	NA	NA	NA	NA
Toluene	490	0.69 (M)	mg/kg	**122**	NA	NA	NA	NA
Ethylbenzene	5.8	0.78 (M)	mg/kg	**31.9**	NA	NA	NA	NA
Total Xylenes	58	9.9 (M)	mg/kg	**565**	NA	NA	NA	NA
1,2,4-trimethylbenzene	30	0.0081 (R)	mg/kg	**85.7**	NA	NA	NA	NA
1,3,5-trimethylbenzene	27	0.0087 (R)	mg/kg	**68.5**	NA	NA	NA	NA
Acenaphthene	360	0.55 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Anthracene	1,800	5.8 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Benzo(A)anthracene	1.1	0.011 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Benzo(B)fluoranthene	1.1	0.3 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Benzo(K)fluoranthene	11	2.9 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Benzo(A)pyrene	0.11	0.24 (M)	mg/kg	<0.00600	NA	NA	NA	NA
Chrysene	110	9 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.11	0.096 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Fluoranthene	240	8.9 (R)	mg/kg	<0.00600	NA	NA	NA	NA
Fluorene	240	0.54 (R)	mg/kg	0.0262	NA	NA	NA	NA
Indeno(1,2,3,c-d)pyrene	1.1	0.98 (R)	mg/kg	<0.00600	NA	NA	NA	NA
1-methylnaphthalene	18	0.006 (R)	mg/kg	**0.527**	NA	NA	NA	NA
2-methylnaphthalene	24	0.019 (R)	mg/kg	**1.56**	NA	NA	NA	NA
Naphthalene	2	0.0038 (R)	mg/kg	**0.779**	NA	NA	NA	NA
Pyrene	180	1.3 (R)	mg/kg	<0.00600	NA	NA	NA	NA

NOTES:
BOLD - indicates result exceeds the ECMC protection of groudnwater soil screening level concentrations
ECMC - Colorado Energy and Carbon Management Commission
EC - electrical conductivity
mg/l - milligrams per liter
mg/kg - milligrams per kilogram
mmhos/cm - millimhos per centimeter
SAR - sodium adsorption ratio
SU - standard unit
TPH-ORO - total petroleum hydrocarbons- oil range organics
TPH-GRO - total petroleum hydrocarbons-gasoline range organics
TPH-DRO - total petroleum hydrocarbons-diesel range organics
TPH - combination of TPH-GRO, TPH-DRO, and TPH-ORO
NA - analyte not analyzed
< - concentration less than the laboratory detectable limit
R - risk based
MDL - method detection limit
MCL - maximum contaminant level (M
M- based MCL

TABLE 1

SOIL ANALYTICAL RESULTS
N36NWB
GARFIELD COUNTY, COLORADO
CAERUS PICEANCE LLC

PARAMETER	ECMC RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATIONS	ECMC PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATIONS	BACKGROUND SOIL SAMPLES			
			20220613-H7(BG-01)@30-32'	20220613-H7(BG-01)@35-37'	20220613-H7(BG-01)@40-42'	20220613-H7(BG-02)@10-12'
Sample Date			6/13/2022	6/13/2022	6/13/2022	6/13/2022
Sample Depth (feet)			30-32	35-37	40-42	10-12
Sample Type			Background	Background	Background	Background
Arsenic	0.68	0.29 (M)	**11.5**	**10.5**	**11.0**	**16.9**
Barium	15,000	82 (M)	NA	NA	NA	NA
Boron	2	2	0.270	0.228	0.208	0.300
Cadmium	71	0.38 (M)	NA	NA	NA	NA
Chromium (VI)	0.3	0.00067 (R)	NA	NA	NA	NA
Copper	3,100	46 (M)	NA	NA	NA	NA
Lead	400	14 (M)	NA	NA	NA	NA
Nickel	1,500	26 (R)	NA	NA	NA	NA
Selenium	390	0.26 (M)	NA	NA	NA	NA
Silver	390	0.8 (R)	NA	NA	NA	NA
Zinc	23,000	370 (R)	NA	NA	NA	NA
EC	<4	<4	3.040	1.200	1.660	2.200
pH	6 - 8.3	6 - 8.3	7.46	**8.67**	**8.43**	**8.42**
SAR	<6	<6	**10.8**	**7.91**	**9.84**	**8.51**
TPH-GRO			NA	NA	NA	NA
TPH-DRO			NA	NA	NA	NA
TPH-ORO			NA	NA	NA	NA
TPH	500	500	NA	NA	NA	NA
Benzene	1.2	0.0026 (M)	NA	NA	NA	NA
Toluene	490	0.69 (M)	NA	NA	NA	NA
Ethylbenzene	5.8	0.78 (M)	NA	NA	NA	NA
Total Xylenes	58	9.9 (M)	NA	NA	NA	NA
1,2,4-trimethylbenzene	30	0.0081 (R)	NA	NA	NA	NA
1,3,5-trimethylbenzene	27	0.0087 (R)	NA	NA	NA	NA
Acenaphthene	360	0.55 (R)	NA	NA	NA	NA
Anthracene	1,800	5.8 (R)	NA	NA	NA	NA
Benzo(A)anthracene	1.1	0.011 (R)	NA	NA	NA	NA
Benzo(B)fluoranthene	1.1	0.3 (R)	NA	NA	NA	NA
Benzo(K)fluoranthene	11	2.9 (R)	NA	NA	NA	NA
Benzo(A)pyrene	0.11	0.24 (M)	NA	NA	NA	NA
Chrysene	110	9 (R)	NA	NA	NA	NA
Dibenzo(A,H)anthracene	0.11	0.096 (R)	NA	NA	NA	NA
Fluoranthene	240	8.9 (R)	NA	NA	NA	NA
Fluorene	240	0.54 (R)	NA	NA	NA	NA
Indeno(1,2,3,c-d)pyrene	1.1	0.98 (R)	NA	NA	NA	NA
1-methylnaphthalene	18	0.006 (R)	NA	NA	NA	NA
2-methylnaphthalene	24	0.019 (R)	NA	NA	NA	NA
Naphthalene	2	0.0038 (R)	NA	NA	NA	NA
Pyrene	180	1.3 (R)	NA	NA	NA	NA

NOTES:
BOLD - indicates result exceeds the ECMC protection of groudnwater soil screening level concentrations
ECMC - Colorado Energy and Carbon Management Commission
EC - electrical conductivity
mg/l - milligrams per liter
mg/kg - milligrams per kilogram
mmhos/cm - millimhos per centimeter
SAR - sodium adsorption ratio
SU - standard unit
TPH-ORO - total petroleum hydrocarbons- oil range organics
TPH-GRO - total petroleum hydrocarbons-gasoline range organics
TPH-DRO - total petroleum hydrocarbons-diesel range organics
TPH - combination of TPH-GRO, TPH-DRO, and TPH-ORO
NA - analyte not analyzed
< - concentration less than the laboratory detectable limit
R - risk based
MDL - method detection limit
MCL - maximum contaminant level (M
M- based MCL

ENCLOSURE A – SOIL SCREENING PHOTOLOG

PHOTOGRAPHIC LOG

Caerus Piceance LLC	N36NWB – Dumpline Release	3140629.023

Photo No.	Date
1	1/30/2024

HVAC crew daylighting the surrounding area of the point of release (POR).

View west

Photo No.	Date
2	1/30/2024

View of the daylighted POR and associated dumpline.

PHOTOGRAPHIC LOG

Caerus Piceance LLC	N36NWB - Dumpline	3140629.023

Photo No.	Date
3	1/30/2024

POR sampling location and associated sample ID 20240130-N36NWB-(POR)@7.5.

POR release coordinates 39.477974, -107.727563

View north

ENCLOSURE B – LABORATORY ANALYTICAL RESULTS

ANALYTICAL REPORT

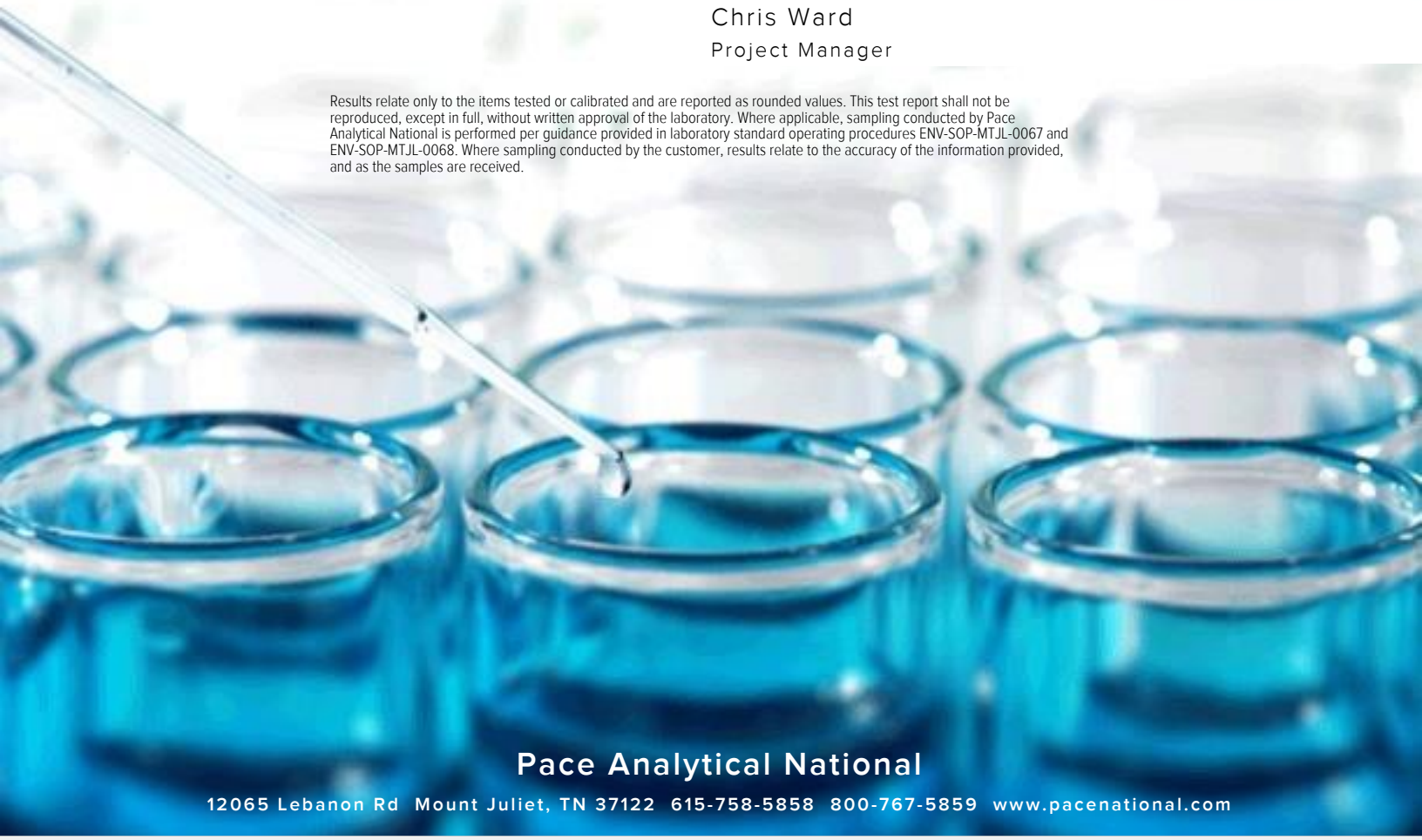
February 09, 2024

Caerus Oil and Gas

Sample Delivery Group:	L1701342
Samples Received:	02/01/2024
Project Number:	N36NWB
Description:	N36NWB Dumpline Release
Site:	N36NWB
Report To:	Jake J. / Brett M. / Blair R. / Andy V. 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager



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

TABLE OF CONTENTS

SAMPLE SUMMARY

20240130-N36NWB-(POR)@7.5 L1701342-01 Solid

Collected by: Ben Herrmann
Collected date/time: 01/30/24 15:40
Received date/time: 02/01/24 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2220814	1	02/09/24 12:10	02/09/24 12:10	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2219925	1	02/05/24 05:03	02/06/24 01:22	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2219020	1	02/02/24 15:58	02/06/24 09:50	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2219345	1	02/03/24 10:08	02/07/24 11:02	BJM	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2220816	1	02/08/24 09:12	02/08/24 13:02	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2220639	5	02/06/24 08:12	02/07/24 13:17	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2220226	1000	02/03/24 22:48	02/05/24 18:17	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2219720	80	02/03/24 22:48	02/04/24 17:31	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2220678	800	02/03/24 22:48	02/06/24 16:42	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2219614	5	02/04/24 08:53	02/04/24 22:57	JSS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2218989	1	02/02/24 19:30	02/03/24 04:38	MKM	Mt. Juliet, TN

CASE NARRATIVE

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

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	44.8		1	02/09/2024 12:10	WG2220814

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Hexavalent Chromium	ND		1.00	1	02/06/2024 01:22	WG2219925

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	7.93	T8	1	02/06/2024 09:50	WG2219020

Sample Narrative:

L1701342-01 WG2219020: 7.93 at 19.4C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	2760		10.0	1	02/07/2024 11:02	WG2219345

Sample Narrative:

L1701342-01 WG2219345: at 25C

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l			
Hot Water Sol. Boron	1.24		0.200	1	02/08/2024 13:02	WG2220816

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
Arsenic	4.65		1.00	5	02/07/2024 13:17	WG2220639
Barium	196		2.50	5	02/07/2024 13:17	WG2220639
Cadmium	ND		1.00	5	02/07/2024 13:17	WG2220639
Copper	8.83		5.00	5	02/07/2024 13:17	WG2220639
Lead	9.17		2.00	5	02/07/2024 13:17	WG2220639
Nickel	11.9		2.50	5	02/07/2024 13:17	WG2220639
Selenium	ND		2.50	5	02/07/2024 13:17	WG2220639
Silver	ND		0.500	5	02/07/2024 13:17	WG2220639
Zinc	44.2		25.0	5	02/07/2024 13:17	WG2220639

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg			
TPH (GC/FID) Low Fraction	6890	J3	100	1000	02/05/2024 18:17	WG2220226
(S) a,a,a-Trifluorotoluene(FID)	*84.4*		*77.0-120*		*02/05/2024 18:17*	WG2220226

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	6.94		0.0800	80	02/04/2024 17:31	WG2219720
Toluene	122		0.400	80	02/04/2024 17:31	WG2219720
Ethylbenzene	31.9		0.200	80	02/04/2024 17:31	WG2219720
Xylenes, Total	565		5.20	800	02/06/2024 16:42	WG2220678
1,2,4-Trimethylbenzene	85.7		0.400	80	02/04/2024 17:31	WG2219720
1,3,5-Trimethylbenzene	68.5		0.400	80	02/04/2024 17:31	WG2219720
(S) Toluene-d8	*102*		*75.0-131*		*02/04/2024 17:31*	WG2219720
(S) Toluene-d8	*94.9*		*75.0-131*		*02/06/2024 16:42*	WG2220678
(S) 4-Bromofluorobenzene	*133*		*67.0-138*		*02/04/2024 17:31*	WG2219720
(S) 4-Bromofluorobenzene	*99.9*		*67.0-138*		*02/06/2024 16:42*	WG2220678
(S) 1,2-Dichloroethane-d4	*97.2*		*70.0-130*		*02/04/2024 17:31*	WG2219720
(S) 1,2-Dichloroethane-d4	*92.4*		*70.0-130*		*02/06/2024 16:42*	WG2220678

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	698		20.0	5	02/04/2024 22:57	WG2219614
C28-C36 Motor Oil Range	ND		20.0	5	02/04/2024 22:57	WG2219614
(S) o-Terphenyl	*47.1*		*18.0-148*		*02/04/2024 22:57*	WG2219614

Sample Narrative:

L1701342-01 WG2219614: Dilution due to matrix.

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	02/03/2024 04:38	WG2218989
Anthracene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Benzo(a)anthracene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Benzo(b)fluoranthene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Benzo(k)fluoranthene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Benzo(a)pyrene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Chrysene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Dibenz(a,h)anthracene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Fluoranthene	ND		0.00600	1	02/03/2024 04:38	WG2218989
Fluorene	0.0262		0.00600	1	02/03/2024 04:38	WG2218989
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	02/03/2024 04:38	WG2218989
1-Methylnaphthalene	0.527		0.0200	1	02/03/2024 04:38	WG2218989
2-Methylnaphthalene	1.56		0.0200	1	02/03/2024 04:38	WG2218989
Naphthalene	0.779		0.0200	1	02/03/2024 04:38	WG2218989
Pyrene	ND		0.00600	1	02/03/2024 04:38	WG2218989
(S) p-Terphenyl-d14	*88.7*		*23.0-120*		*02/03/2024 04:38*	WG2218989
(S) Nitrobenzene-d5	*0.000*	J2	*14.0-149*		*02/03/2024 04:38*	WG2218989
(S) 2-Fluorobiphenyl	*67.7*		*34.0-125*		*02/03/2024 04:38*	WG2218989

Sample Narrative:

L1701342-01 WG2218989: Surrogate failure due to matrix interference

Method Blank (MB)

(MB) R4030090-1 02/06/24 00:31

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

L1701379-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1701379-11 02/06/24 02:12 • (DUP) R4030090-7 02/06/24 02:18

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

L1701379-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1701379-14 02/06/24 02:37 • (DUP) R4030090-8 02/06/24 02:43

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hexavalent Chromium	ND	ND	1	8.10		20

Laboratory Control Sample (LCS)

(LCS) R4030090-2 02/06/24 00:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Hexavalent Chromium	10.0	11.1	111	80.0-120	

L1701217-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1701217-02 02/06/24 00:51 • (MS) R4030090-4 02/06/24 01:04 • (MSD) R4030090-5 02/06/24 01:10

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	ND	17.1	18.1	85.4	90.3	1	75.0-125			5.57	20

L1701636-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1701636-03 02/06/24 03:14 • (MS) R4030090-10 02/06/24 03:26 • (MSD) R4030090-11 02/06/24 03:32

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hexavalent Chromium	20.0	ND	17.5	17.6	87.7	88.2	1	75.0-125			0.581	20

L1701217-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1701217-02 02/06/24 00:51 • (MS) R4030090-6 02/06/24 01:16

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	654	ND	633	96.8	50	75.0-125	

L1701636-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1701636-03 02/06/24 03:14 • (MS) R4030090-12 02/06/24 03:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Hexavalent Chromium	654	ND	603	92.2	50	75.0-125	

L1701335-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1701335-01 02/06/24 09:50 • (DUP) R4030176-3 02/06/24 09:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.25	7.28	1	0.413		1

Sample Narrative:

OS: 7.25 at 19.5C

DUP: 7.28 at 19.4C

Laboratory Control Sample (LCS)

(LCS) R4030176-1 02/06/24 09:50

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 20.2C

Method Blank (MB)

(MB) R4030784-1 02/07/24 11:02

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

L1700878-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1700878-01 02/07/24 11:02 • (DUP) R4030784-3 02/07/24 11:02

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	4220	4220	1	0.000		20

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

L1701342-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1701342-01 02/07/24 11:02 • (DUP) R4030784-4 02/07/24 11:02

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2760	2760	1	0.290		20

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

Laboratory Control Sample (LCS)

(LCS) R4030784-2 02/07/24 11:02

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	327	331	101	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R4031465-1 02/08/24 12:57

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) R4031465-2 02/08/24 12:58 • (LCSD) R4031465-3 02/08/24 13:00

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	1.07	1.04	107	104	80.0-120			3.64	20

Method Blank (MB)

(MB) R4030873-1 02/07/24 12:54

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) R4030873-2 02/07/24 12:58

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	97.6	97.6	80.0-120	
Barium	100	96.3	96.3	80.0-120	
Cadmium	100	98.5	98.5	80.0-120	
Copper	100	103	103	80.0-120	
Lead	100	103	103	80.0-120	
Nickel	100	99.9	99.9	80.0-120	
Selenium	100	97.1	97.1	80.0-120	
Silver	20.0	19.8	98.9	80.0-120	
Zinc	100	94.4	94.4	80.0-120	

L1702047-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1702047-08 02/07/24 13:01 • (MS) R4030873-5 02/07/24 13:11 • (MSD) R4030873-6 02/07/24 13:14

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	6.54	90.9	94.5	84.3	88.0	5	75.0-125			3.95	20
Barium	100	112	164	199	52.3	86.9	5	75.0-125	J6		19.1	20
Cadmium	100	ND	89.9	94.7	89.8	94.6	5	75.0-125			5.24	20
Copper	100	11.7	92.0	105	80.3	93.7	5	75.0-125			13.6	20
Lead	100	8.14	95.0	106	86.8	98.3	5	75.0-125			11.4	20
Nickel	100	9.02	95.9	101	86.9	92.0	5	75.0-125			5.24	20
Selenium	100	ND	90.9	93.3	89.7	92.1	5	75.0-125			2.63	20
Silver	20.0	ND	17.9	18.6	89.3	93.0	5	75.0-125			4.10	20
Zinc	100	34.3	117	123	83.0	88.4	5	75.0-125			4.53	20

Method Blank (MB)

(MB) R4030218-3 02/05/24 13:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	1.96	J	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	*91.9*			*77.0-120*

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

(LCS) R4030218-1 02/05/24 11:43 • (LCSD) R4030218-2 02/05/24 12:10

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	6.08	4.71	111	85.6	72.0-127		J3	25.4	20
(S) a,a,a-Trifluorotoluene(FID)				*98.9*	*98.3*	*77.0-120*				

Method Blank (MB)

(MB) R4030100-3 02/04/24 10:53

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
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	*95.6*			*75.0-131*
(S) 4-Bromofluorobenzene	*103*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*107*			*70.0-130*

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

(LCS) R4030100-1 02/04/24 09:14 • (LCSD) R4030100-2 02/04/24 09:34

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.129	0.121	103	96.8	70.0-123			6.40	20
Toluene	0.125	0.115	0.118	92.0	94.4	75.0-121			2.58	20
Ethylbenzene	0.125	0.115	0.116	92.0	92.8	74.0-126			0.866	20
1,2,4-Trimethylbenzene	0.125	0.115	0.111	92.0	88.8	70.0-126			3.54	20
1,3,5-Trimethylbenzene	0.125	0.0992	0.103	79.4	82.4	73.0-127			3.76	20
(S) Toluene-d8				*92.7*	*91.6*	*75.0-131*				
(S) 4-Bromofluorobenzene				*102*	*101*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*115*	*108*	*70.0-130*				

Method Blank (MB)

(MB) R4030786-3 02/06/24 10:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	*94.1*			*75.0-131*
(S) 4-Bromofluorobenzene	*96.2*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*97.6*			*70.0-130*

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

(LCS) R4030786-1 02/06/24 09:09 • (LCSD) R4030786-2 02/06/24 09:28

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 %
Xylenes, Total	0.375	0.324	0.314	86.4	83.7	72.0-127			3.13	20
(S) Toluene-d8				*92.4*	*92.4*	*75.0-131*				
(S) 4-Bromofluorobenzene				*95.2*	*102*	*67.0-138*				
(S) 1,2-Dichloroethane-d4				*94.7*	*95.7*	*70.0-130*				

Method Blank (MB)

(MB) R4029668-1 02/04/24 17:16

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	*57.2*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R4029668-2 02/04/24 17:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	34.4	68.8	50.0-150	
(S) o-Terphenyl			*60.8*	*18.0-148*	

L1701403-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1701403-01 02/04/24 17:42 • (MS) R4029668-3 02/04/24 17:55 • (MSD) R4029668-4 02/04/24 18:08

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	49.2	ND	30.9	31.3	62.8	63.4	1	50.0-150			1.29	20
(S) o-Terphenyl					*51.5*	*51.4*		*18.0-148*				

Method Blank (MB)

(MB) R4029870-2 02/03/24 00:32

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	*92.9*			*23.0-120*
(S) Nitrobenzene-d5	*61.2*			*14.0-149*
(S) 2-Fluorobiphenyl	*77.0*			*34.0-125*

Laboratory Control Sample (LCS)

(LCS) R4029870-1 02/03/24 00:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0644	80.5	50.0-120	
Anthracene	0.0800	0.0673	84.1	50.0-126	
Benzo(a)anthracene	0.0800	0.0658	82.3	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0685	85.6	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0683	85.4	49.0-125	
Benzo(a)pyrene	0.0800	0.0584	73.0	42.0-120	
Chrysene	0.0800	0.0713	89.1	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0685	85.6	47.0-125	
Fluoranthene	0.0800	0.0722	90.3	49.0-129	
Fluorene	0.0800	0.0692	86.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0664	83.0	46.0-125	
1-Methylnaphthalene	0.0800	0.0704	88.0	51.0-121	
2-Methylnaphthalene	0.0800	0.0671	83.9	50.0-120	
Naphthalene	0.0800	0.0643	80.4	50.0-120	
Pyrene	0.0800	0.0727	90.9	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R4029870-1 02/03/24 00:14

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			*90.0*	*23.0-120*	
(S) Nitrobenzene-d5			*84.7*	*14.0-149*	
(S) 2-Fluorobiphenyl			*89.1*	*34.0-125*	

L1701325-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1701325-01 02/03/24 01:24 • (MS) R4029870-3 02/03/24 01:42 • (MSD) R4029870-4 02/03/24 01:59

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.0792	ND	0.0518	0.0538	65.4	67.9	1	14.0-127			3.79	27
Anthracene	0.0792	ND	0.0577	0.0560	72.9	70.7	1	10.0-145			2.99	30
Benzo(a)anthracene	0.0792	ND	0.0593	0.0579	74.9	73.1	1	10.0-139			2.39	30
Benzo(b)fluoranthene	0.0792	ND	0.0608	0.0634	76.8	80.1	1	10.0-140			4.19	36
Benzo(k)fluoranthene	0.0792	ND	0.0626	0.0592	79.0	74.7	1	10.0-137			5.58	31
Benzo(a)pyrene	0.0792	ND	0.0607	0.0590	76.6	74.5	1	10.0-141			2.84	31
Chrysene	0.0792	ND	0.0658	0.0651	83.1	82.2	1	10.0-145			1.07	30
Dibenz(a,h)anthracene	0.0792	ND	0.0633	0.0618	79.9	78.0	1	10.0-132			2.40	31
Fluoranthene	0.0792	ND	0.0596	0.0593	75.3	74.9	1	10.0-153			0.505	33
Fluorene	0.0792	ND	0.0610	0.0566	77.0	71.5	1	11.0-130			7.48	29
Indeno(1,2,3-cd)pyrene	0.0792	ND	0.0580	0.0572	73.2	72.2	1	10.0-137			1.39	32
1-Methylnaphthalene	0.0792	ND	0.0556	0.0567	70.2	71.6	1	10.0-142			1.96	28
2-Methylnaphthalene	0.0792	ND	0.0512	0.0513	64.6	64.8	1	10.0-137			0.195	28
Naphthalene	0.0792	ND	0.0501	0.0500	63.3	63.1	1	10.0-135			0.200	27
Pyrene	0.0792	ND	0.0653	0.0692	82.4	87.4	1	10.0-148			5.80	35
(S) p-Terphenyl-d14					*87.4*	*82.4*		*23.0-120*				
(S) Nitrobenzene-d5					*84.1*	*66.6*		*14.0-149*				
(S) 2-Fluorobiphenyl					*71.9*	*62.7*		*34.0-125*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
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 Piceance LLC
143 Diamond Avenue
Parachute, CO 81635
970-285-9606

Billing Information: **Same as above**

Report to: **bmiddleton@caerusoilandgas.com**

Email To: **bmiddleton@caerusoilandgas.com**

Project Description: **N36NWB Dumpline Release**

City/State Collected: **West Mamm Creek, CO**

Phone:
Fax:

Client Project # **N36NWB**

Lab Project # **N36NWB**

Collected by (print): Ben Herrmann

Site/Facility ID # **N36NWB**

P.O. # **N36NWB**

Collected by (signature): **Ben Herrmann**

Immediately Packed on Ice N ____ Y X

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

Quote #

Date Results Needed: **Standard TAT**

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH- GRO,DRO,ORO	BTEX , 1,2,4-TMB, 1,3,5-TMB	TABLE 915-1- PAH's	SAR , EC, pH, water soluable Boron	TABLE 915-1- Metals	Remarks	Sample # (lab only)
20240130-N36NWB-(POR)@7.5	Grab	SS	7.5	1/30/2024	1540	3	X	X	X	X	X		-01

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ____

Tracking # 6193 3527 1852

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

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

L# L1701342
H248

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample Receipt Checklist
COC Seal Present/Intact: NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/30/2024	1645	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/31/24	1500	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 0.0 °C Bottles Received: 3
0.8 to 0.8

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Date: 2/1/24 Time: 930

ANALYTICAL REPORT

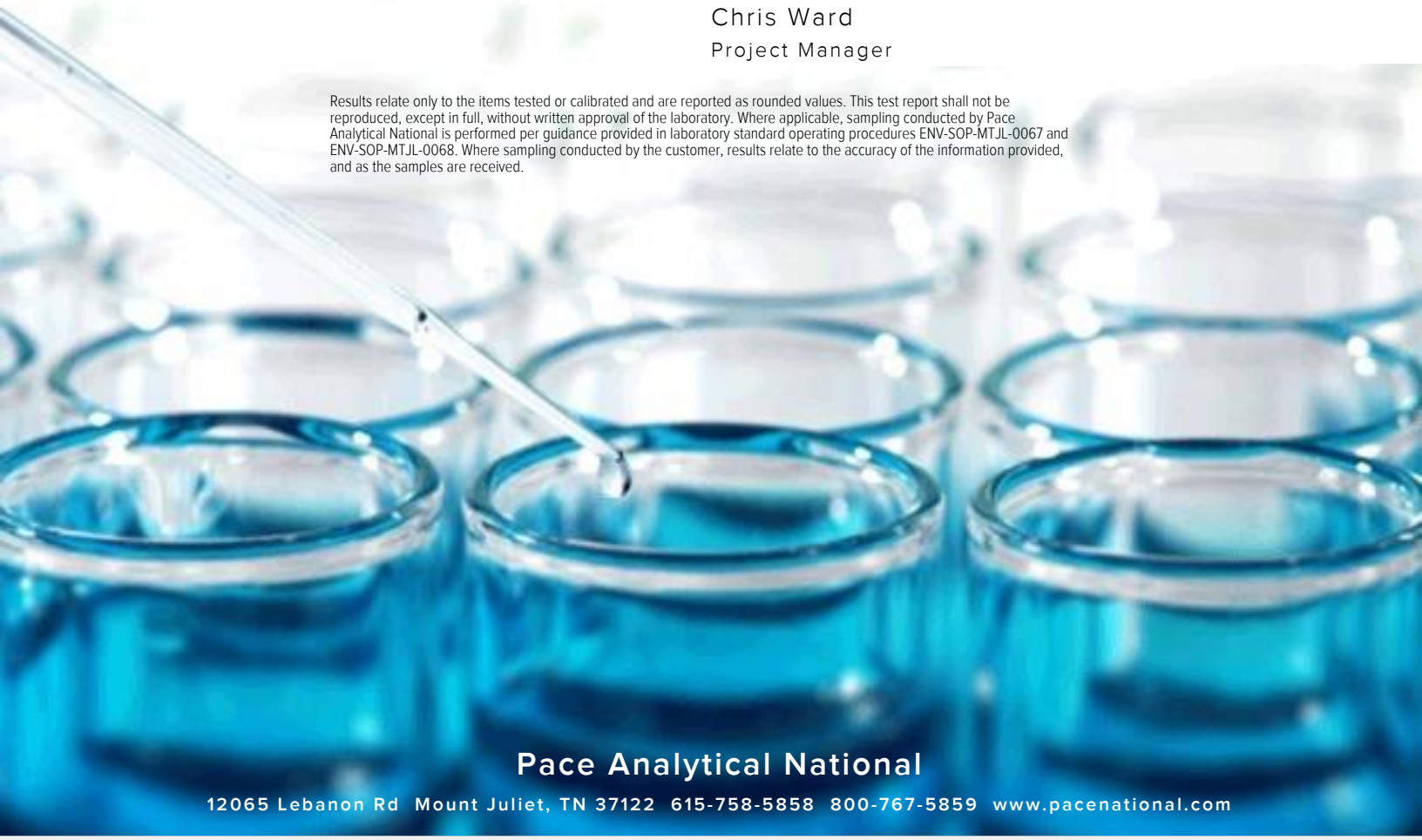
July 07, 2022

Caerus Oil and Gas

Sample Delivery Group:	L1505173
Samples Received:	06/15/2022
Project Number:	H7
Description:	H7-Dumpline
Site:	H7
Report To:	Brett Middleton 143 Diamond Avenue Parachute, CO 81635

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager



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

TABLE OF CONTENTS

20220613-H7 (BG-01) @ 10-12' L1505173-01 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 09:05 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:03	07/06/22 20:03	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1881766	1	06/19/22 07:53	06/20/22 12:45	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:31	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 16:36	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 15-17' L1505173-02 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 09:30 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:06	07/06/22 20:06	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1881766	1	06/19/22 07:53	06/20/22 12:45	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:33	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:11	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 20-22' L1505173-03 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 10:00 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:08	07/06/22 20:08	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:36	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:15	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 25-27' L1505173-04 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 10:30 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:11	07/06/22 20:11	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:39	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:18	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 30-32' L1505173-05 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 11:00 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:14	07/06/22 20:14	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:42	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:21	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 35-37' L1505173-06 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 11:30 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:16	07/06/22 20:16	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:45	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:24	JPD	Mt. Juliet, TN

20220613-H7 (BG-01) @ 40-42' L1505173-07 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 12:15 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:19	07/06/22 20:19	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:53	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:28	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 10-12' L1505173-08 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 12:55 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 20:22	07/06/22 20:22	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:56	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:31	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 15-17' L1505173-09 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 13:20 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887986	1	07/06/22 19:16	07/06/22 19:16	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887982	1	06/30/22 20:55	07/06/22 19:59	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:34	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 20-22' L1505173-10 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 13:30 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887990	1	07/06/22 20:33	07/06/22 20:33	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887992	1	07/04/22 00:04	07/07/22 13:04	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:37	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 25-27' L1505173-11 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 13:55 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887990	1	07/06/22 20:36	07/06/22 20:36	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887992	1	07/04/22 00:04	07/07/22 13:06	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 17:57	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 30-32' L1505173-12 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 14:15 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887990	1	07/06/22 20:38	07/06/22 20:38	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887992	1	07/04/22 00:04	07/07/22 13:09	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 18:00	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 35-37' L1505173-13 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 14:45 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887990	1	07/06/22 20:41	07/06/22 20:41	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887992	1	07/04/22 00:04	07/07/22 13:12	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 18:03	JPD	Mt. Juliet, TN

20220613-H7 (BG-02) @ 40-42' L1505173-14 Solid

Collected by: Kevin Fletcher | Collected date/time: 06/13/22 15:15 | Received date/time: 06/15/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1887990	1	07/06/22 20:44	07/06/22 20:44	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1883093	1	06/21/22 08:00	06/23/22 09:05	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1882850	1	06/21/22 12:40	06/21/22 14:33	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1887992	1	07/04/22 00:04	07/07/22 13:15	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1883072	5	06/23/22 17:02	06/24/22 18:07	JPD	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	4.45		1	07/06/2022 20:03	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.49	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-01 WG1883093: 7.49 at 22.3C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	4650		10.0	1	06/20/2022 12:45	WG1881766

Sample Narrative:
L1505173-01 WG1881766: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.658		0.0167	0.200	1	07/06/2022 19:31	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	19.3		0.100	1.00	5	06/24/2022 16:36	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.36		1	07/06/2022 20:06	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.98	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:

L1505173-02 WG1883093: 7.98 at 22.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	3730		10.0	1	06/20/2022 12:45	WG1881766

Sample Narrative:

L1505173-02 WG1881766: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.465		0.0167	0.200	1	07/06/2022 19:33	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	11.5		0.100	1.00	5	06/24/2022 17:11	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	7.77		1	07/06/2022 20:08	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.22	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-03 WG1883093: 8.22 at 22.4C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	3680		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-03 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.372		0.0167	0.200	1	07/06/2022 19:36	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	10.9		0.100	1.00	5	06/24/2022 17:15	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	8.54		1	07/06/2022 20:11	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.19	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:

L1505173-04 WG1883093: 8.19 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	3350		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:

L1505173-04 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.299		0.0167	0.200	1	07/06/2022 19:39	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	9.99		0.100	1.00	5	06/24/2022 17:18	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	10.8		1	07/06/2022 20:14	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.46	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-05 WG1883093: 7.46 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	3040		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-05 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.270		0.0167	0.200	1	07/06/2022 19:42	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	11.5		0.100	1.00	5	06/24/2022 17:21	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	7.91		1	07/06/2022 20:16	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.67	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:

L1505173-06 WG1883093: 8.67 at 22.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	1200		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:

L1505173-06 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.228		0.0167	0.200	1	07/06/2022 19:45	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	10.5		0.100	1.00	5	06/24/2022 17:24	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	9.84		1	07/06/2022 20:19	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.43	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-07 WG1883093: 8.43 at 22.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	1660		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-07 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.208		0.0167	0.200	1	07/06/2022 19:53	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	11.0		0.100	1.00	5	06/24/2022 17:28	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	8.51		1	07/06/2022 20:22	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.42	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-08 WG1883093: 8.42 at 22.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	2200		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-08 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.300		0.0167	0.200	1	07/06/2022 19:56	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	16.9		0.100	1.00	5	06/24/2022 17:31	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.83		1	07/06/2022 19:16	WG1887986

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.90	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-09 WG1883093: 7.9 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	4720		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-09 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.227		0.0167	0.200	1	07/06/2022 19:59	WG1887982

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	19.3		0.100	1.00	5	06/24/2022 17:34	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.71		1	07/06/2022 20:33	WG1887990

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.96	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-10 WG1883093: 7.96 at 22.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	3070		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-10 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.237		0.0167	0.200	1	07/07/2022 13:04	WG1887992

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	14.3		0.100	1.00	5	06/24/2022 17:37	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	6.05		1	07/06/2022 20:36	WG1887990

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.15	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:

L1505173-11 WG1883093: 8.15 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	1390		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:

L1505173-11 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.222		0.0167	0.200	1	07/07/2022 13:06	WG1887992

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	6.69		0.100	1.00	5	06/24/2022 17:57	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	6.56		1	07/06/2022 20:38	WG1887990

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.48	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-12 WG1883093: 8.48 at 22.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	1010		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-12 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.178	J	0.0167	0.200	1	07/07/2022 13:09	WG1887992

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	22.2		0.100	1.00	5	06/24/2022 18:00	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.81		1	07/06/2022 20:41	WG1887990

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.22	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:
L1505173-13 WG1883093: 8.22 at 22.7C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	1410		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:
L1505173-13 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.216		0.0167	0.200	1	07/07/2022 13:12	WG1887992

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	7.77		0.100	1.00	5	06/24/2022 18:03	WG1883072

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	SAR				
Sodium Adsorption Ratio	5.02		1	07/06/2022 20:44	WG1887990

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	pH				
pH	8.33	T8	1	06/23/2022 09:05	WG1883093

Sample Narrative:

L1505173-14 WG1883093: 8.33 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
	umhos/cm		umhos/cm			
Specific Conductance	919		10.0	1	06/21/2022 14:33	WG1882850

Sample Narrative:

L1505173-14 WG1882850: at 25C

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/l		mg/l	mg/l			
Hot Water Sol. Boron	0.206		0.0167	0.200	1	07/07/2022 13:15	WG1887992

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
Arsenic	10.3		0.100	1.00	5	06/24/2022 18:07	WG1883072

L1503726-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1503726-01 06/23/22 09:05 • (DUP) R3806454-2 06/23/22 09:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	4.61	4.60	1	0.217		1

Sample Narrative:

OS: 4.61 at 22.7C

DUP: 4.6 at 22.7C

L1505173-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1505173-03 06/23/22 09:05 • (DUP) R3806454-3 06/23/22 09:05

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	pH	su		%		%
pH	8.22	8.23	1	0.122		1

Sample Narrative:

OS: 8.22 at 22.4C

DUP: 8.23 at 22.5C

Laboratory Control Sample (LCS)

(LCS) R3806454-1 06/23/22 09:05

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

Sample Narrative:

LCS: 9.9 at 22.9C

Method Blank (MB)

(MB) R3805020-1 06/20/22 12:45

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

L1504999-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1504999-05 06/20/22 12:45 • (DUP) R3805020-3 06/20/22 12:45

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	225	233	1	3.76		20

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

L1505001-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1505001-08 06/20/22 12:45 • (DUP) R3805020-4 06/20/22 12:45

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	5070	5010	1	1.19		20

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

Laboratory Control Sample (LCS)

(LCS) R3805020-2 06/20/22 12:45

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	288	107	85.0-115	

Sample Narrative:
LCS: at 25C

Method Blank (MB)

(MB) R3805607-1 06/21/22 14:33

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

Sample Narrative:
BLANK: at 25C

L1505173-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1505173-12 06/21/22 14:33 • (DUP) R3805607-3 06/21/22 14:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1010	998	1	1.39		20

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

L1506388-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1506388-01 06/21/22 14:33 • (DUP) R3805607-4 06/21/22 14:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	52.0	51.7	1	0.579		20

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

Laboratory Control Sample (LCS)

(LCS) R3805607-2 06/21/22 14:33

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	282	105	85.0-115	

Sample Narrative:
LCS: at 25C

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

QUALITY CONTROL SUMMARY

L1505173-01,02,03,04,05,06,07,08,09

Method Blank (MB)

(MB) R3811663-1 07/06/22 18:45

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) R3811663-2 07/06/22 18:48 • (LCSD) R3811663-3 07/06/22 18:50

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	1.09	1.09	109	109	80.0-120			0.152	20

Method Blank (MB)

(MB) R3812039-1 07/07/22 12:56

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

Method Blank (MB)

(MB) R3807339-1 06/24/22 16:29

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) R3807339-2 06/24/22 16:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.6	96.6	80.0-120	

L1505173-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1505173-01 06/24/22 16:36 • (MS) R3807339-5 06/24/22 16:46 • (MSD) R3807339-6 06/24/22 16:49

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	19.3	120	114	101	95.2	5	75.0-125			4.69	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

MDL	Method Detection Limit.
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 & Gas LLC
143 Diamond Avenue
Parachute, CO 81635
970-285-9606

Billing Information: **Same as above**

Report to: **bmiddleton@caerusoilandgas.com**

Email To: **bmiddleton@caerusoilandgas.com**

Project Description: **H7-Dumpline**

City/State Collected: **Mamm Creek, CO**

Phone:
Fax:

Client Project # **H7**

Lab Project # **H7**

Collected by (print): **Kevin Fletcher**

Site/Facility ID # **H7**

P.O. # **H7**

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed: **Standard TAT**

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	pH, EC, SAR, Boron	Arsenic	Remarks	Sample # (lab only)
20220613-H7(BG-01)@10-12'	Grab	SS	10-12'	6/13/22	905	2	X	X		-01
20220613-H7(BG-01)@15-17'			15-17'		930					-02
20220613-H7(BG-01)@20-22'			20-22'		1000					-03
20220613-H7(BG-01)@25-27'			25-27'		1030					-04
20220613-H7(BG-01)@30-32'			30-32'		1100					-05
20220613-H7(BG-01)@35-37'			35-37'		1130					-06
20220613-H7(BG-01)@40-42'			40-42'		1215					-07
20220613-H7(BG-02)@10-12'			10-12'		1255					-08
20220613-H7(BG-02)@15-17'			15-17'		1320					-09
20220613-H7(BG-02)@20-22'			20-22'		1330					-10

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 5755 8084 8133

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/14/22	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/14/22	1700	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Matt Elv

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: DRAFT 1.3+0=1.3 Bottles Received: 28

Date: 6/15/22 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Chain of Custody Page 1 of 2

Pace Analytical®
National Center for Testing & Innovation

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

L# L505173
D142

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Caerus Oil & Gas LLC
143 Diamond Avenue
Parachute, CO 81635
970-285-9606

Billing Information: **Same as above**

Report to: **bmiddleton@caerusoilandgas.com**

Email To: **bmiddleton@caerusoilandgas.com**

Project Description: **H7-Dumpline**

City/State Collected: **Mamm Creek, CO**

Phone:
Fax:

Client Project # **H7**

Lab Project # **H7**

Collected by (print): Kevin Fletcher

Site/Facility ID # **H7**

P.O. # **H7**

Collected by (signature):

Quote #

Immediately Packed on Ice N ___ Y X

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

~~Date Results Needed~~ **Standard TAT**

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	pH, EC, SAR, Boron	Arsenic	Remarks	Sample # (lab only)
20220613-H7(BG-02)@25-27'	Grab	SS	25-27'	6/13/22	1355	2	X	X		-11
20220613-H7(BG-02) @30-32'			30-32'		1415					-12
20220613-H7(BG-02)@35-37'			35-37'		1445					-13
20220613-H7(BG-02)@40-42'			40-42'		1515					-14

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

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

L# L605173

Table #

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 5755 8084 8433

Sample Receipt Checklist

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

Relinquished by : (Signature)	Date: 6/14/22	Time: 1500	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	Date: 6/14/22	Time: 1720	Received by: (Signature)	Temp: DRAFT °C Bottles Received: 1.3 +0 = 1.3 28
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/15/22 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK