



## **VIA ELECTRONIC MAIL –**

October 20, 2021

Jake Janicek  
EH&S Specialist  
Caerus Oil and Gas LLC  
143 Diamond Avenue  
Parachute, Colorado 81635

**Subject: Report of Work Completed  
Dumpline Release  
H7  
Mamm Creek Field  
Garfield County, Colorado**

Dear Mr. Janicek:

WSP USA Inc. (WSP), on behalf of Caerus Oil and Gas LLC (Caerus), conducted background soil sampling and initial point of release (POR) soil sampling associated with production well KRK 7-7A dumpline release discovered at the KRK-67S92W7SENE (H7) (Facility ID: 334864) pad location (Site). These activities were completed in response to the failed dumpline at the Site. The initial POR sampling was requested after a Caerus inspector discovered the leak while completing Annual Pressure Testing at the Site. This document serves as a report of work completed (ROWC) under Spill/Release Point ID #480751. The Site is in the Caerus Mamm Creek area of operation in Garfield County, Colorado (Figure 1).

## **INITIAL SOIL SAMPLING ACTIVITIES – H7 DUMPLINE RELEASE**

On October 5, 2021, Western Slope Field Services, Inc. (WCO) personnel, contracted by Caerus, removed overburden material from the known POR location associated with the dumpline release. The production well KRK 7-7A dumpline release occurred at a longitude and latitude location of 39.4630612111, -107.702128473. Following the daylighting of the POR location, WSP personnel collected one soil sample directly beneath the POR location at 7.5 feet below ground surface (bgs). In addition, WSP personnel collected four background soil samples. The background soil samples were collected in each cardinal direction off the original pad disturbance in undisturbed, non-impacted, native soil for the purposed of establishing background soil conditions per Colorado Oil and Gas Conservation Commission (COGCC) Rule.(2).D. The soil sampling activities were conducted by a WSP geologist who inspected the soil samples for the presence or absence of petroleum hydrocarbons odor and/or staining. The soil samples were characterized by visually inspecting the confirmation soil samples and field screening the soil head space using a photoionization detector (PID) to monitor for the presence or absence of volatile organic vapors. All soil samples were submitted to Pace Analytical (Pace) of Mount Juliet, Tennessee for analysis of constituents listed in COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations risk based (R) and maximum containment level (MCL) based (M). A photolog depicting the POR location and POR soil sample is provided in Enclosure A. The laboratory analytical reports are provided in Enclosure B. The soil sample locations are depicted on the enclosed Figure 2.

## **ANALYTICAL RESULTS – H7 DUMPLINE RELEASE**

Laboratory analytical results for the POR soil sample collected on October 5, 2021 indicate that the soil sample exceeded the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (M) for arsenic [3.54 milligrams per kilogram (mg/kg)], barium (241 mg/kg), benzene (0.883 mg/kg), toluene (22.4 mg/kg),

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ethylbenzene (5.30 mg/kg), and total xylenes (89.9 mg/kg). In addition, the POR soil sample exceeded the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (R) for chromium (VI) (0.277 mg/kg), 1,2,4-trimethylbenzene (26.0 mg/kg), 1,3,5-trimethylbenzene (23.8 mg/kg), 1-methylnaphthalene (0.863 mg/kg), 2-methylnaphthalene (2.02 mg/kg), and naphthalene (1.02 mg/kg). The POR soil sample also exceeded the COGCC Table 915-1 Concentration Level for total petroleum hydrocarbons (TPH) (3,973.7 mg/kg). The POR soil sample exceeded the COGCC Table 915-1 Clean-up Concentration for sodium adsorption ratio (SAR) (18.3) and pH (8.38). All other analytes were either below the laboratory detection limit or within the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (R) and (M). The laboratory analytical results are included as Enclosure B and summarized in Table 1.

Laboratory analytical results of the background soil samples collected on October 5, 2021, indicate that all four samples exceeded the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (M) for arsenic and barium. Arsenic concentrations ranged from 1.72 mg/kg in background soil sample 20211005-H7(BGS) to 4.47 mg/kg in background soil sample 20211005-H7 (BGW). Barium concentrations ranged from 129 mg/kg in background soil sample 20211005-H7(BGS) to 173 mg/kg in background soil sample 20211005-H7(BGN). Background soil samples 20211005-H7(BGE) and 20211005-H7(BGN) exceed the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (M) for selenium with concentrations of 1.37 mg/kg and 1.19 mg/kg, respectively. Background soil sample 20211005-H7(BGW) exceeds the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentration (M) for cadmium with a concentration of 0.396 mg/kg. All other analytes were either below the laboratory detection limit or within the Table 915-1 Protection of Groundwater Soil Screening Level Concentrations (R) and (M). The laboratory analytical results are included as Enclosure B and summarized in Table 1.

## CONCLUSIONS – H7 DUMPINE RELEASE

Based on the summary of analytical data provided for the dumpine release, WSP recommends that Caerus start delineation activities beneath the POR piping infrastructure, which connects to the separator. Prior to the start of the delineation activities, Caerus should request a reduced analyte suite of barium, chromium (VI), TPH, benzene, toluene, ethylbenzene, and total xylenes (BTEX), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR and pH via COGCC Initial Form 27 Site Investigation Work Plan (Document Number 402845414).

Please contact us at (970) 618-4514 or (303) 548-5097 if you have any questions regarding this report or require additional information.

Kind regards,

Dustin Held  
Sr. Consultant, Environmental Geologist

Rob Rebel, P.E.  
Lead Consultant, Environmental Engineer

Encl.

## FIGURES

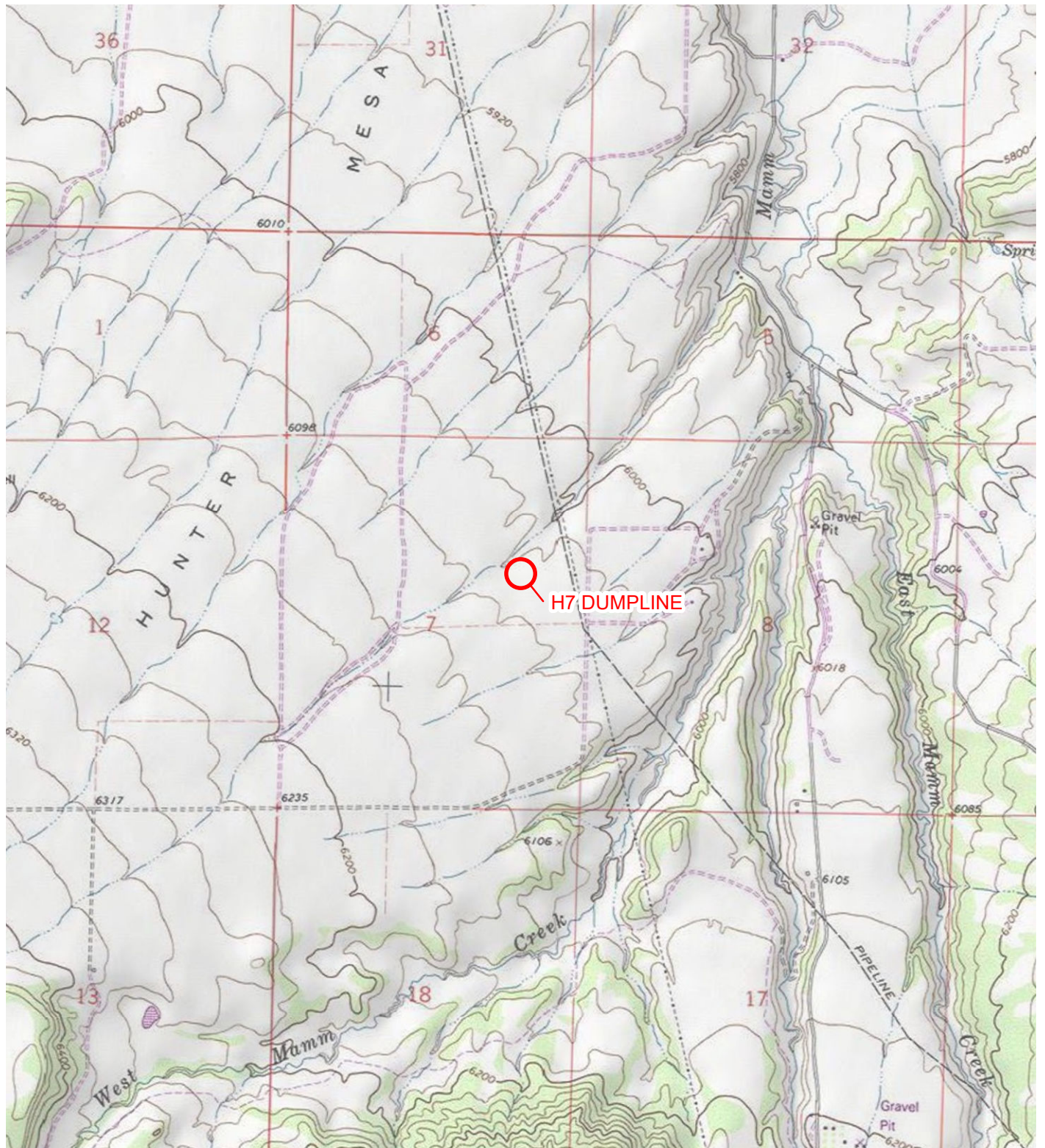


IMAGE COURTESY OF ESRI/USGS

# LEGEND

○ SITE LOCATION

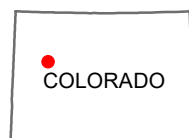
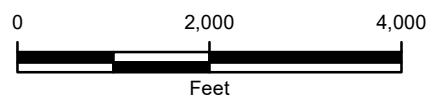


FIGURE 1  
SITE LOCATION MAP  
H7 DUMPLINE  
SENE SEC 7-T7S-R92W  
GARFIELD COUNTY, COLORADO  
CAERUS OIL AND GAS LLC







IMAGE COURTESY OF ESRI (MAXAR 2018)

## LEGEND

- X POINT OF RELEASE
- SOIL SAMPLE
- ▲ BACKGROUND SOIL SAMPLE

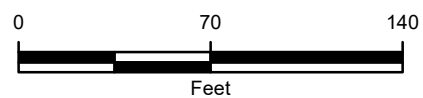


FIGURE 2  
SITE MAP  
H7 DUMPLINE  
SENE SEC 7-T7S-R92W  
GARFIELD COUNTY, COLORADO  
CAERUS OIL AND GAS LLC



TABLE

TABLE 1

SOIL ANALYTICAL RESULTS

H7 DUMPLINE

GARFIELD COUNTY, COLORADO

CAERUS OIL AND GAS LLC

PARAMETER	COGCC RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATIONS	COGCC PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATIONS	UNITS	CONFIRMATION SOIL SAMPLE	BACKGROUND SOIL SAMPLES				
				20211005-H7(POR)@7.5'	20211005-H7(BGS)	20211005-H7(BGE)	20211005-H7(BGN)	20211005-H7(BGW)	
Sample Date				10/5/2021	10/5/2021	10/5/2021	10/5/2021	10/5/2021	
Sample Depth (feet)				7.5		6	6	6	
Sample Type				Confirmation Sample	Background Sample	Background Sample	Background Sample	Background Sample	
Arsenic	0.68	0.29 (M)	mg/kg	3.54	1.72	2.03	4.11	4.47	
Barium	15,000	82 (M)	mg/kg	241	129	141	173	169	
Boron	2	2	mg/l	0.769	0.358	0.311	0.402	0.406	
Cadmium	71	0.38 (M)	mg/kg	0.236	0.259	0.203	0.246	0.396	
Chromium (VI)	0.3	0.00067 (R)	mg/kg	0.277	ND	ND	ND	ND	
Copper	3,100	46 (M)	mg/kg	10.6	11.0	11.8	12.8	13.9	
Lead	400	14 (M)	mg/kg	7.62	10.3	9.9	9.24	9.38	
Nickel	1,500	26 (R)	mg/kg	13.2	9.89	11.5	13.5	11.8	
Selenium	390	0.26 (M)	mg/kg	ND	ND	1.37	1.19	ND	
Silver	390	0.8 (R)	mg/kg	ND	ND	ND	ND	ND	
Zinc	23,000	370 (R)	mg/kg	27.9	21.4	22.5	28.99	28.6	
EC	<4	<4	mmhos/cm	0.252	0.160	0.109	0.354	0.153	
pH	6 - 8.3	6 - 8.3	SU	8.38	7.88	7.60	7.80	8.09	
SAR	<6	<6	unitless	18.3	0.271	0.191	0.0826	0.148	
TPH-GRO			mg/kg	3,310.0	0.0613	0.0559	0.0550	0.0863	
TPH-DRO			mg/kg	650.0	ND	ND	ND	ND	
TPH-ORO			mg/kg	13.7	0.45	ND	ND	0.955	
TPH	500	500	mg/kg	3,973.7	0.5143	0.0559	0.0550	1.0413	
Benzene	1.2	0.0026 (M)	mg/kg	0.883	NA	NA	NA	NA	
Toluene	490	0.69 (M)	mg/kg	22.4	NA	NA	NA	NA	
Ethylbenzene	5.8	0.78 (M)	mg/kg	5.30	NA	NA	NA	NA	
Total Xylenes	58	9.9 (M)	mg/kg	89.9	NA	NA	NA	NA	
1,2,4-trimethylbenzene	30	0.0081 (R)	mg/kg	26.0	NA	NA	NA	NA	
1,3,5-trimethylbenzene	27	0.0087 (R)	mg/kg	23.8	NA	NA	NA	NA	
Acenaphthene	360	5.8 (R)	mg/kg	0.0170	ND	ND	ND	ND	
Anthracene	1,800	0.55 (R)	mg/kg	ND	ND	ND	ND	ND	
Benzo(A)anthracene	1.1	0.011 (R)	mg/kg	ND	ND	ND	ND	ND	
Benzo(B)fluoranthene	1.1	0.3 (R)	mg/kg	ND	ND	ND	ND	ND	
Benzo(K)fluoranthene	11	2.9 (R)	mg/kg	ND	ND	ND	ND	ND	
Benzo(A)pyrene	0.11	0.24 (M)	mg/kg	ND	ND	ND	ND	ND	
Chrysene	110	9 (R)	mg/kg	ND	ND	ND	ND	ND	
Dibenzo(A,H)anthracene	0.11	0.11 (R)	mg/kg	ND	ND	ND	ND	ND	
Fluoranthene	240	0.096 (R)	mg/kg	ND	ND	ND	ND	ND	
Fluorene	240	0.54 (R)	mg/kg	0.0346	ND	ND	ND	ND	
Indeno(1,2,3,c-d)pyrene	1.1	0.98 (R)	mg/kg	ND	ND	ND	ND	ND	
1-methylnaphthalene	18	0.006 (R)	mg/kg	ND	ND	ND	ND	ND	
2-methylnaphthalene	24	0.019 (R)	mg/kg	ND	ND	ND	ND	ND	
Naphthalene	2	0.0038 (R)	mg/kg	1.02	ND	ND	ND	ND	
Pyrene	180	1.3 (R)	mg/kg	0.00253	ND	ND	ND	ND	

NOTES:  
ND - less than the stated reporting limi  
**BOLD** - indicates result exceeds the COGCC concentration leve  
COGCC - Colorado Oil and Gas Conservation Commission  
EC- electrical conductivity  
mg/kg - milligrams per kilogram  
mg/l - milligrams per liter  
mmhos/cm - millimhos per centimete  
SAR - sodium adsorption ratic  
SU - standard unit  
TPH-ORO - total petroleum hydrocarbons- oil range orgaine  
TPH-GRO - total petroleum hydrocarbons-gasoline range organic  
TPH-DRO - total petroleum hydrocarbons-diesel range organic  
TPH - combination of TPH-GRO, TPH-DRO, and TPH-ORO  
NA - analyte not analyzece  
ND - analyte not detectec  
R - risk based  
MCL - maxium containment level (M)

## ENCLOSURE A – POINT OF RELEASE PHOTOLOG



# PHOTOGRAPHIC LOG

Caerus Oil and Gas LLC	H7 Dumpline	31403501.013
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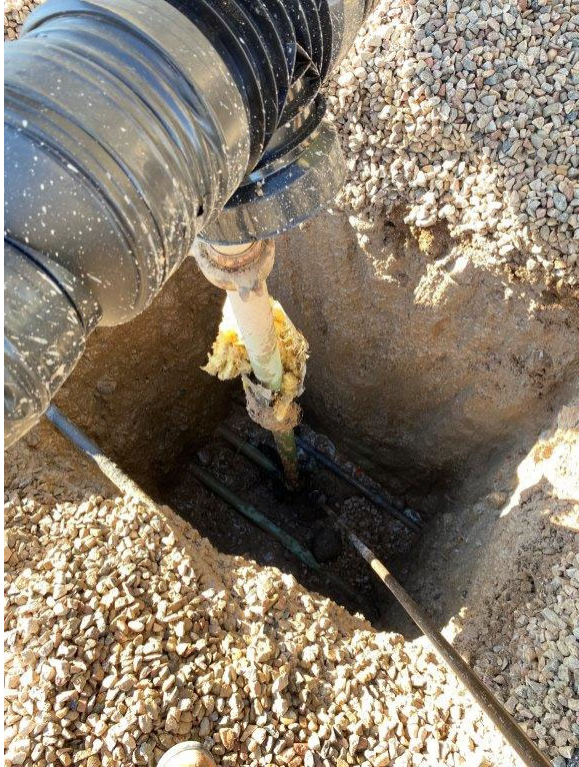
Photo No.	Date	
1	October 5, 2021	
KRK 7-7A Dumpline point of release (POR) location. Located behind separator production equipment; View southeast		

Photo No.	Date	
2	October 5, 2021	
KRK 7-7A Dumpline POR soil sample and POR location. Located behind separator production equipment; View southwest		

## ENCLOSURE B – LABORATORY ANALYTICAL REPORTS

October 18, 2021

## Caerus Oil and Gas

Sample Delivery Group: L1414279  
Samples Received: 10/06/2021  
Project Number: H7  
Description: H7 Dumpline Release  
Site: H7  
Report To: Blair Rollins  
143 Diamond Avenue  
Parachute, CO 81635

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Entire Report Reviewed By:



Chris Ward  
Project Manager

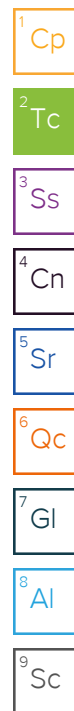
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory 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](http://www.pacenational.com)

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# SAMPLE SUMMARY

20211005-H7(POR)@7.5' L1414279-01 Solid

Collected by  
DH

Collected date/time  
10/05/21 09:25

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1754553	1	10/13/21 12:50	10/13/21 12:50	CCE	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1754567	1	10/14/21 18:00	10/15/21 12:45	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1755574	1	10/12/21 10:00	10/13/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1754502	1	10/11/21 11:22	10/11/21 14:15	AMH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1755041	1	10/11/21 17:15	10/12/21 19:31	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1754552	1	10/12/21 11:34	10/13/21 11:32	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1755039	5	10/11/21 16:49	10/12/21 10:19	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1757330	1000	10/09/21 16:42	10/14/21 18:01	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1753971	20	10/09/21 16:42	10/12/21 00:29	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756688	1	10/13/21 20:21	10/14/21 05:33	JN	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756688	5	10/13/21 20:21	10/14/21 09:27	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1757077	1	10/14/21 12:10	10/14/21 18:19	AAT	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

# 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	18.3		1	10/13/2021 12:50	WG1754553

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	0.277	J	0.255	1.00	1	10/15/2021 12:45	<a href="#">WG1754567</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.38	T8	1	10/13/2021 12:00	<a href="#">WG1755574</a>

## Sample Narrative:

L1414279-01 WG1755574: 8.38 at 20.7C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2520		10.0	1	10/11/2021 14:15	<a href="#">WG1754502</a>

## Sample Narrative:

L1414279-01 WG1754502: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	241		0.0852	0.500	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Cadmium	0.236	J	0.0471	0.500	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Copper	10.6		0.400	2.00	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Lead	7.62		0.208	0.500	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Nickel	13.2		0.132	2.00	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Selenium	U		0.764	2.00	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Silver	U		0.127	1.00	1	10/12/2021 19:31	<a href="#">WG1755041</a>
Zinc	27.9		0.832	5.00	1	10/12/2021 19:31	<a href="#">WG1755041</a>

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

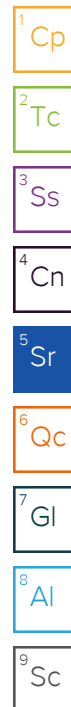
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.769		0.0167	0.200	1	10/13/2021 11:32	<a href="#">WG1754552</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.54		0.100	1.00	5	10/12/2021 10:19	<a href="#">WG1755039</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3310		21.7	100	1000	10/14/2021 18:01	<a href="#">WG1757330</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	95.3			77.0-120		10/14/2021 18:01	<a href="#">WG1757330</a>



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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.883		0.00934	0.0200	20	10/12/2021 00:29	<a href="#">WG1753971</a>
Toluene	22.4		0.0260	0.100	20	10/12/2021 00:29	<a href="#">WG1753971</a>
Ethylbenzene	5.30		0.0147	0.0500	20	10/12/2021 00:29	<a href="#">WG1753971</a>
Xylenes, Total	89.9		0.0176	0.130	20	10/12/2021 00:29	<a href="#">WG1753971</a>
1,2,4-Trimethylbenzene	26.0		0.0316	0.100	20	10/12/2021 00:29	<a href="#">WG1753971</a>
1,3,5-Trimethylbenzene	23.8		0.0400	0.100	20	10/12/2021 00:29	<a href="#">WG1753971</a>
(S) Toluene-d8	88.8			75.0-131		10/12/2021 00:29	<a href="#">WG1753971</a>
(S) 4-Bromofluorobenzene	99.7			67.0-138		10/12/2021 00:29	<a href="#">WG1753971</a>
(S) 1,2-Dichloroethane-d4	107			70.0-130		10/12/2021 00:29	<a href="#">WG1753971</a>

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

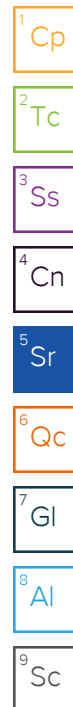
Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	650		8.05	20.0	5	10/14/2021 09:27	<a href="#">WG1756688</a>
C28-C36 Motor Oil Range	13.7		0.274	4.00	1	10/14/2021 05:33	<a href="#">WG1756688</a>
(S) o-Terphenyl	57.4			18.0-148		10/14/2021 05:33	<a href="#">WG1756688</a>
(S) o-Terphenyl	56.3			18.0-148		10/14/2021 09:27	<a href="#">WG1756688</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Acenaphthene	0.0170		0.00209	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Acenaphthylene	U		0.00216	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Chrysene	U		0.00232	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Fluoranthene	U		0.00227	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Fluorene	0.0346		0.00205	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Naphthalene	1.02		0.00408	0.0200	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Phenanthrene	0.0331		0.00231	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
Pyrene	0.00253	<a href="#">J</a>	0.00200	0.00600	1	10/14/2021 18:19	<a href="#">WG1757077</a>
1-Methylnaphthalene	0.863		0.00449	0.0200	1	10/14/2021 18:19	<a href="#">WG1757077</a>
2-Methylnaphthalene	2.02		0.00427	0.0200	1	10/14/2021 18:19	<a href="#">WG1757077</a>
2-Chloronaphthalene	U		0.00466	0.0200	1	10/14/2021 18:19	<a href="#">WG1757077</a>
(S) p-Terphenyl-d14	83.6			23.0-120		10/14/2021 18:19	<a href="#">WG1757077</a>
(S) Nitrobenzene-d5	0.000	<a href="#">J2</a>		14.0-149		10/14/2021 18:19	<a href="#">WG1757077</a>
(S) 2-Fluorobiphenyl	63.6			34.0-125		10/14/2021 18:19	<a href="#">WG1757077</a>

## Sample Narrative:

L1414279-01 WG1757077: Surrogate failure due to matrix interference





Method Blank (MB)

(MB) R3717096-1 10/15/21 12:03

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

L1414226-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1414226-05 10/15/21 12:24 • (DUP) R3717096-3 10/15/21 12:29

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	0.453	0.983	1	73.9	J P1	20

L1415068-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1415068-01 10/15/21 13:52 • (DUP) R3717096-8 10/15/21 13:58

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

Laboratory Control Sample (LCS)

(LCS) R3717096-2 10/15/21 12:09

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	8.92	89.2	80.0-120	

L1414808-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1414808-01 10/15/21 13:26 • (MS) R3717096-9 10/15/21 15:49

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	644	U	627	97.3	50	75.0-125	

L1414808-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414808-01 10/15/21 13:26 • (MS) R3717096-4 10/15/21 13:32 • (MSD) R3717096-5 10/15/21 13:37

	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	U	19.4	19.8	96.8	99.2	1	75.0-125			2.47	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1411924-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1411924-03 10/13/21 12:00 • (DUP) R3715821-2 10/13/21 12:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.03	8.03	1	0.000		1

Sample Narrative:

OS: 8.03 at 20.7C

DUP: 8.03 at 20.8C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1414274-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414274-02 10/13/21 12:00 • (DUP) R3715821-3 10/13/21 12:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.05	8.03	1	0.249		1

Sample Narrative:

OS: 8.05 at 20.6C

DUP: 8.03 at 20.6C

Laboratory Control Sample (LCS)

(LCS) R3715821-1 10/13/21 12:00

	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: 10.03 at 20.7C

Method Blank (MB)

(MB) R3714817-1 10/11/21 14:15

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

L1414272-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414272-02 10/11/21 14:15 • (DUP) R3714817-3 10/11/21 14:15

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	173	174	1	0.634		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1414808-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414808-02 10/11/21 14:15 • (DUP) R3714817-4 10/11/21 14:15

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	291	293	1	0.650		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3714817-2 10/11/21 14:15

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	275	103	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3715626-1 10/12/21 19:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3715626-2 10/12/21 19:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	98.5	98.5	80.0-120	
Cadmium	100	93.1	93.1	80.0-120	
Copper	100	96.1	96.1	80.0-120	
Lead	100	94.8	94.8	80.0-120	
Nickel	100	96.1	96.1	80.0-120	
Selenium	100	94.1	94.1	80.0-120	
Silver	20.0	17.1	85.3	80.0-120	
Zinc	100	93.8	93.8	80.0-120	

L1414270-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414270-01 10/12/21 19:15 • (MS) R3715626-5 10/12/21 19:23 • (MSD) R3715626-6 10/12/21 19:25

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 %
Barium	100	248	364	360	116	112	1	75.0-125			1.29	20
Cadmium	100	0.247	94.5	90.4	94.2	90.2	1	75.0-125			4.38	20
Copper	100	11.1	110	104	98.5	92.5	1	75.0-125			5.62	20
Lead	100	8.63	106	102	97.6	93.4	1	75.0-125			4.01	20
Nickel	100	30.2	130	114	99.4	83.6	1	75.0-125			12.9	20
Selenium	100	1.09	84.7	75.7	83.7	74.6	1	75.0-125		J6	11.3	20
Silver	20.0	U	17.5	16.8	87.5	84.2	1	75.0-125			3.76	20
Zinc	100	37.4	134	128	96.3	90.8	1	75.0-125			4.20	20



Method Blank (MB)

(MB) R3715882-1 10/13/21 10:51

	MB Result	<u>MB Qualifier</u>	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) R3715882-2 10/13/21 10:54 • (LCSD) R3715882-3 10/13/21 10:57

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Hot Water Sol. Boron	1.00	0.956	1.05	95.6	105	80.0-120			9.02	20

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3715250-1 10/12/21 09:54

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) R3715250-2 10/12/21 09:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	84.0	84.0	80.0-120	

L1414270-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414270-01 10/12/21 10:01 • (MS) R3715250-5 10/12/21 10:10 • (MSD) R3715250-6 10/12/21 10:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	6.30	91.3	81.9	84.9	75.6	5	75.0-125			10.8	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3716577-3 10/14/21 11:30

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.685	⬇	0.543	2.50
(S) a,a,a-Trifluorotoluene(FID)	95.1			77.0-120

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

(LCS) R3716577-2 10/14/21 10:01 • (LCSD) R3716577-4 10/14/21 17:07

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	6.01	5.47	109	99.5	72.0-127			9.41	20
(S) a,a,a-Trifluorotoluene(FID)				104	99.5	77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3715158-3 10/11/21 17:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Toluene	U		0.00130	0.00500
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	98.4			75.0-131
(S) 4-Bromofluorobenzene	96.0			67.0-138
(S) 1,2-Dichloroethane-d4	99.2			70.0-130

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

(LCS) R3715158-1 10/11/21 15:30 • (LCSD) R3715158-2 10/11/21 15:50

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	0.148	0.144	118	115	70.0-123			2.74	20
Ethylbenzene	0.125	0.127	0.125	102	100	74.0-126			1.59	20
Toluene	0.125	0.128	0.124	102	99.2	75.0-121			3.17	20
1,2,4-Trimethylbenzene	0.125	0.121	0.120	96.8	96.0	70.0-126			0.830	20
1,3,5-Trimethylbenzene	0.125	0.114	0.109	91.2	87.2	73.0-127			4.48	20
Xylenes, Total	0.375	0.385	0.365	103	97.3	72.0-127			5.33	20
(S) Toluene-d8				97.1	95.8	75.0-131				
(S) 4-Bromofluorobenzene				98.3	98.6	67.0-138				
(S) 1,2-Dichloroethane-d4				108	110	70.0-130				

L1412491-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1412491-01 10/11/21 18:24 • (MS) R3715158-4 10/12/21 00:48 • (MSD) R3715158-5 10/12/21 01:07

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 %
Benzene	5.00	U	5.20	2.74	104	54.8	40	10.0-149		J3	62.0	37
Ethylbenzene	5.00	U	4.70	2.35	94.0	47.0	40	10.0-160		J3	66.7	38
Toluene	5.00	U	4.58	2.33	91.6	46.6	40	10.0-156		J3	65.1	38
1,2,4-Trimethylbenzene	5.00	0.420	4.92	2.59	98.4	51.8	40	10.0-160		J3	62.1	36
1,3,5-Trimethylbenzene	5.00	U	4.44	2.22	88.8	44.4	40	10.0-160		J3	66.7	38
Xylenes, Total	15.0	0.183	14.4	7.41	96.0	49.4	40	10.0-160		J3	64.1	38
(S) Toluene-d8					96.6	94.3		75.0-131				
(S) 4-Bromofluorobenzene					76.4	68.3		67.0-138				
(S) 1,2-Dichloroethane-d4					112	110		70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3716328-1 10/14/21 04:28

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	74.0			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3716328-2 10/14/21 04:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	37.9	75.8	50.0-150	
(S) o-Terphenyl			75.1	18.0-148	

L1417385-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1417385-02 10/14/21 08:48 • (MS) R3716328-3 10/14/21 09:01 • (MSD) R3716328-4 10/14/21 09:14

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 %
C10-C28 Diesel Range	50.0	2.18	42.9	34.5	81.4	64.6	1	50.0-150		J3	21.7	20
(S) o-Terphenyl					75.5	64.4		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3716725-2 10/14/21 17:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	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
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	89.9			14.0-149
(S) 2-Fluorobiphenyl	87.8			34.0-125
(S) p-Terphenyl-d14	111			23.0-120

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3716725-1 10/14/21 17:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0689	86.1	50.0-126	
Acenaphthene	0.0800	0.0670	83.8	50.0-120	
Acenaphthylene	0.0800	0.0752	94.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0698	87.3	45.0-120	
Benzo(a)pyrene	0.0800	0.0638	79.8	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0594	74.3	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0576	72.0	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0622	77.8	49.0-125	
Chrysene	0.0800	0.0658	82.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0573	71.6	47.0-125	
Fluoranthene	0.0800	0.0667	83.4	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3716725-1 10/14/21 17:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0686	85.8	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0593	74.1	46.0-125	
Naphthalene	0.0800	0.0669	83.6	50.0-120	
Phenanthrene	0.0800	0.0663	82.9	47.0-120	
Pyrene	0.0800	0.0691	86.4	43.0-123	
1-Methylnaphthalene	0.0800	0.0684	85.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0644	80.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0651	81.4	50.0-120	
(S) Nitrobenzene-d5			95.8	14.0-149	
(S) 2-Fluorobiphenyl			94.0	34.0-125	
(S) p-Terphenyl-d14			113	23.0-120	

L1414283-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414283-01 10/15/21 00:34 • (MS) R3716725-3 10/15/21 00:53 • (MSD) R3716725-4 10/15/21 01:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.00376	0.0628	0.0607	73.8	71.2	1	10.0-145			3.40	30
Acenaphthene	0.0800	U	0.0590	0.0584	73.8	73.0	1	14.0-127			1.02	27
Acenaphthylene	0.0800	0.00284	0.0685	0.0675	82.1	80.8	1	21.0-124			1.47	25
Benzo(a)anthracene	0.0800	0.0259	0.0747	0.0753	61.0	61.8	1	10.0-139			0.800	30
Benzo(a)pyrene	0.0800	0.0289	0.0696	0.0702	50.9	51.6	1	10.0-141			0.858	31
Benzo(b)fluoranthene	0.0800	0.0345	0.0678	0.0665	41.6	40.0	1	10.0-140			1.94	36
Benzo(g,h,i)perylene	0.0800	0.0247	0.0614	0.0614	45.9	45.9	1	10.0-140			0.000	33
Benzo(k)fluoranthene	0.0800	0.0124	0.0578	0.0560	56.8	54.5	1	10.0-137			3.16	31
Chrysene	0.0800	0.0346	0.0771	0.0762	53.1	52.0	1	10.0-145			1.17	30
Dibenz(a,h)anthracene	0.0800	0.00531	0.0510	0.0495	57.1	55.2	1	10.0-132			2.99	31
Fluoranthene	0.0800	0.0401	0.0820	0.0791	52.4	48.7	1	10.0-153			3.60	33
Fluorene	0.0800	U	0.0624	0.0618	78.0	77.3	1	11.0-130			0.966	29
Indeno(1,2,3-cd)pyrene	0.0800	0.0244	0.0620	0.0607	47.0	45.4	1	10.0-137			2.12	32
Naphthalene	0.0800	0.0122	0.0761	0.0752	79.9	78.8	1	10.0-135			1.19	27
Phenanthrene	0.0800	0.0164	0.0736	0.0711	71.5	68.4	1	10.0-144			3.46	31
Pyrene	0.0800	0.0415	0.0811	0.0788	49.5	46.6	1	10.0-148			2.88	35
1-Methylnaphthalene	0.0800	0.0102	0.0721	0.0711	77.4	76.1	1	10.0-142			1.40	28
2-Methylnaphthalene	0.0800	0.0128	0.0713	0.0703	73.1	71.9	1	10.0-137			1.41	28
2-Chloronaphthalene	0.0800	U	0.0553	0.0543	69.1	67.9	1	29.0-120			1.82	24
(S) Nitrobenzene-d5					81.9	84.8		14.0-149				
(S) 2-Fluorobiphenyl					78.1	79.1		34.0-125				
(S) p-Terphenyl-d14					94.0	92.9		23.0-120				

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.
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.
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.

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> 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 <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

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

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

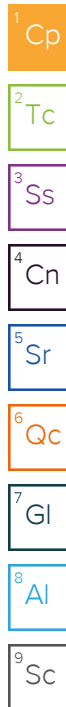
\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.





Condition:  
NCF / OK

October 18, 2021



## Caerus Oil and Gas

Sample Delivery Group: L1414281  
Samples Received: 10/06/2021  
Project Number: H7  
Description: H7  
Site: H7  
Report To: Blair Rollins  
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](http://www.pacenational.com)

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# SAMPLE SUMMARY

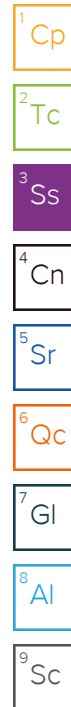
## 20211005-H7(BGS) L1414281-01 Solid

Collected by  
DH

Collected date/time  
10/05/21 08:35

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1754553	1	10/13/21 13:02	10/13/21 13:02	CCE	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1754567	1	10/14/21 18:00	10/15/21 12:50	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1755574	1	10/12/21 10:00	10/13/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1754502	1	10/11/21 11:22	10/11/21 14:15	AMH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1755041	1	10/11/21 17:15	10/12/21 19:33	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1754552	1	10/12/21 11:34	10/13/21 11:45	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1755039	5	10/11/21 16:49	10/12/21 10:23	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1756775	1	10/09/21 16:42	10/14/21 23:47	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756888	1	10/14/21 12:50	10/15/21 04:30	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1757077	1	10/14/21 12:10	10/14/21 18:39	AAT	Mt. Juliet, TN



## 20211005-H7(BGE) L1414281-02 Solid

Collected by  
DH

Collected date/time  
10/05/21 08:45

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1754553	1	10/13/21 13:05	10/13/21 13:05	CCE	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1754567	1	10/14/21 18:00	10/15/21 12:55	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1755574	1	10/12/21 10:00	10/13/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1754502	1	10/11/21 11:22	10/11/21 14:15	AMH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1755041	1	10/11/21 17:15	10/12/21 19:41	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1754552	1	10/12/21 11:34	10/13/21 11:48	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1755039	5	10/11/21 16:49	10/12/21 10:37	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1756775	1	10/09/21 16:42	10/15/21 00:09	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756888	1	10/14/21 12:50	10/15/21 03:49	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1757077	1	10/14/21 12:10	10/14/21 18:58	AAT	Mt. Juliet, TN

## 20211005-H7(BGN) L1414281-03 Solid

Collected by  
DH

Collected date/time  
10/05/21 08:55

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1754553	1	10/13/21 13:08	10/13/21 13:08	CCE	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1754567	1	10/14/21 18:00	10/15/21 13:00	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1755574	1	10/12/21 10:00	10/13/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1754502	1	10/11/21 11:22	10/11/21 14:15	AMH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1755041	1	10/11/21 17:15	10/12/21 19:44	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1754552	1	10/12/21 11:34	10/13/21 11:51	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1755039	5	10/11/21 16:49	10/12/21 10:40	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1756775	1	10/09/21 16:42	10/15/21 00:31	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756888	1	10/14/21 12:50	10/15/21 04:02	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1757077	1	10/14/21 12:10	10/14/21 19:18	AAT	Mt. Juliet, TN

## 20211005-H7(BGW) L1414281-04 Solid

Collected by  
DH

Collected date/time  
10/05/21 09:00

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1754553	1	10/13/21 13:11	10/13/21 13:11	CCE	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1754567	1	10/14/21 18:00	10/15/21 13:06	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1755574	1	10/12/21 10:00	10/13/21 12:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1754502	1	10/11/21 11:22	10/11/21 14:15	AMH	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1755041	1	10/11/21 17:15	10/12/21 19:47	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1754552	1	10/12/21 11:34	10/13/21 11:54	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1755039	5	10/11/21 16:49	10/12/21 10:43	LAT	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1756775	1	10/09/21 16:42	10/15/21 00:53	BMB	Mt. Juliet, TN

# SAMPLE SUMMARY

20211005-H7(BGW) L1414281-04 Solid

Collected by  
DH

Collected date/time  
10/05/21 09:00

Received date/time  
10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1756888	1	10/14/21 12:50	10/15/21 06:05	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1757077	1	10/14/21 12:10	10/14/21 19:38	AAT	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

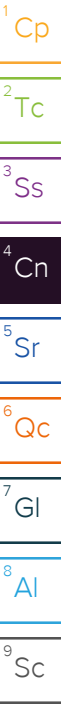
<sup>9</sup>Sc

# 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	0.271		1	10/13/2021 13:02	WG1754553

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/15/2021 12:50	<a href="#">WG1754567</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.88	<a href="#">T8</a>	1	10/13/2021 12:00	<a href="#">WG1755574</a>

## Sample Narrative:

L1414281-01 WG1755574: 7.88 at 20.7C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	160		10.0	1	10/11/2021 14:15	<a href="#">WG1754502</a>

## Sample Narrative:

L1414281-01 WG1754502: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	129		0.0852	0.500	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Cadmium	0.259	<a href="#">J</a>	0.0471	0.500	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Copper	11.0		0.400	2.00	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Lead	10.3		0.208	0.500	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Nickel	9.89		0.132	2.00	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Selenium	U		0.764	2.00	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Silver	U		0.127	1.00	1	10/12/2021 19:33	<a href="#">WG1755041</a>
Zinc	21.4		0.832	5.00	1	10/12/2021 19:33	<a href="#">WG1755041</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.358		0.0167	0.200	1	10/13/2021 11:45	<a href="#">WG1754552</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	1.72		0.100	1.00	5	10/12/2021 10:23	<a href="#">WG1755039</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0613	<a href="#">B J</a>	0.0217	0.100	1	10/14/2021 23:47	<a href="#">WG1756775</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	99.6			77.0-120		10/14/2021 23:47	<a href="#">WG1756775</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	10/15/2021 04:30	<a href="#">WG1756888</a>
C28-C36 Motor Oil Range	0.453	<u>J</u>	0.274	4.00	1	10/15/2021 04:30	<a href="#">WG1756888</a>
(S) o-Terphenyl	38.5			18.0-148		10/15/2021 04:30	<a href="#">WG1756888</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Acenaphthene	U		0.00209	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Acenaphthylene	U		0.00216	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Chrysene	U		0.00232	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Fluoranthene	U		0.00227	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Fluorene	U		0.00205	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Naphthalene	U		0.00408	0.0200	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Phenanthrene	U		0.00231	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
Pyrene	U		0.00200	0.00600	1	10/14/2021 18:39	<a href="#">WG1757077</a>
1-Methylnaphthalene	U		0.00449	0.0200	1	10/14/2021 18:39	<a href="#">WG1757077</a>
2-Methylnaphthalene	U		0.00427	0.0200	1	10/14/2021 18:39	<a href="#">WG1757077</a>
2-Chloronaphthalene	U		0.00466	0.0200	1	10/14/2021 18:39	<a href="#">WG1757077</a>
(S) p-Terphenyl-d14	98.5			23.0-120		10/14/2021 18:39	<a href="#">WG1757077</a>
(S) Nitrobenzene-d5	70.0			14.0-149		10/14/2021 18:39	<a href="#">WG1757077</a>
(S) 2-Fluorobiphenyl	72.9			34.0-125		10/14/2021 18:39	<a href="#">WG1757077</a>

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	0.191		1	10/13/2021 13:05	WG1754553

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/15/2021 12:55	<a href="#">WG1754567</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.60	<a href="#">T8</a>	1	10/13/2021 12:00	<a href="#">WG1755574</a>

## Sample Narrative:

L1414281-02 WG1755574: 7.6 at 20.7C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	109		10.0	1	10/11/2021 14:15	<a href="#">WG1754502</a>

## Sample Narrative:

L1414281-02 WG1754502: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	141		0.0852	0.500	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Cadmium	0.203	<a href="#">J</a>	0.0471	0.500	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Copper	11.8		0.400	2.00	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Lead	9.93		0.208	0.500	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Nickel	11.5		0.132	2.00	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Selenium	1.37	<a href="#">J</a>	0.764	2.00	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Silver	U		0.127	1.00	1	10/12/2021 19:41	<a href="#">WG1755041</a>
Zinc	22.5		0.832	5.00	1	10/12/2021 19:41	<a href="#">WG1755041</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.311		0.0167	0.200	1	10/13/2021 11:48	<a href="#">WG1754552</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.03		0.100	1.00	5	10/12/2021 10:37	<a href="#">WG1755039</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0559	<a href="#">B J</a>	0.0217	0.100	1	10/15/2021 00:09	<a href="#">WG1756775</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	99.6			77.0-120		10/15/2021 00:09	<a href="#">WG1756775</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	10/15/2021 03:49	<a href="#">WG1756888</a>
C28-C36 Motor Oil Range	U		0.274	4.00	1	10/15/2021 03:49	<a href="#">WG1756888</a>
(S) o-Terphenyl	39.3			18.0-148		10/15/2021 03:49	<a href="#">WG1756888</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Acenaphthene	U		0.00209	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Acenaphthylene	U		0.00216	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Chrysene	U		0.00232	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Fluoranthene	U		0.00227	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Fluorene	U		0.00205	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Naphthalene	U		0.00408	0.0200	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Phenanthrene	U		0.00231	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
Pyrene	U		0.00200	0.00600	1	10/14/2021 18:58	<a href="#">WG1757077</a>
1-Methylnaphthalene	U		0.00449	0.0200	1	10/14/2021 18:58	<a href="#">WG1757077</a>
2-Methylnaphthalene	U		0.00427	0.0200	1	10/14/2021 18:58	<a href="#">WG1757077</a>
2-Chloronaphthalene	U		0.00466	0.0200	1	10/14/2021 18:58	<a href="#">WG1757077</a>
(S) p-Terphenyl-d14	110			23.0-120		10/14/2021 18:58	<a href="#">WG1757077</a>
(S) Nitrobenzene-d5	90.4			14.0-149		10/14/2021 18:58	<a href="#">WG1757077</a>
(S) 2-Fluorobiphenyl	87.3			34.0-125		10/14/2021 18:58	<a href="#">WG1757077</a>

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	0.0826		1	10/13/2021 13:08	WG1754553

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/15/2021 13:00	<a href="#">WG1754567</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.80	<a href="#">T8</a>	1	10/13/2021 12:00	<a href="#">WG1755574</a>

## Sample Narrative:

L1414281-03 WG1755574: 7.8 at 20.6C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	354		10.0	1	10/11/2021 14:15	<a href="#">WG1754502</a>

## Sample Narrative:

L1414281-03 WG1754502: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	173		0.0852	0.500	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Cadmium	0.246	<a href="#">J</a>	0.0471	0.500	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Copper	12.8		0.400	2.00	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Lead	9.24		0.208	0.500	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Nickel	13.5		0.132	2.00	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Selenium	1.19	<a href="#">J</a>	0.764	2.00	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Silver	U		0.127	1.00	1	10/12/2021 19:44	<a href="#">WG1755041</a>
Zinc	28.9		0.832	5.00	1	10/12/2021 19:44	<a href="#">WG1755041</a>

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

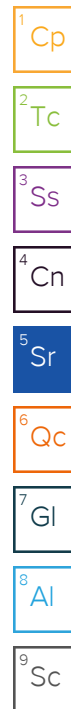
Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.402		0.0167	0.200	1	10/13/2021 11:51	<a href="#">WG1754552</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.11		0.100	1.00	5	10/12/2021 10:40	<a href="#">WG1755039</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0550	<a href="#">B J</a>	0.0217	0.100	1	10/15/2021 00:31	<a href="#">WG1756775</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	99.4			77.0-120		10/15/2021 00:31	<a href="#">WG1756775</a>



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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	10/15/2021 04:02	<a href="#">WG1756888</a>
C28-C36 Motor Oil Range	U		0.274	4.00	1	10/15/2021 04:02	<a href="#">WG1756888</a>
(S) o-Terphenyl	34.6			18.0-148		10/15/2021 04:02	<a href="#">WG1756888</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Acenaphthene	U		0.00209	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Acenaphthylene	U		0.00216	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Chrysene	U		0.00232	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Fluoranthene	U		0.00227	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Fluorene	U		0.00205	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Naphthalene	U		0.00408	0.0200	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Phenanthrene	U		0.00231	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
Pyrene	U		0.00200	0.00600	1	10/14/2021 19:18	<a href="#">WG1757077</a>
1-Methylnaphthalene	U		0.00449	0.0200	1	10/14/2021 19:18	<a href="#">WG1757077</a>
2-Methylnaphthalene	U		0.00427	0.0200	1	10/14/2021 19:18	<a href="#">WG1757077</a>
2-Chloronaphthalene	U		0.00466	0.0200	1	10/14/2021 19:18	<a href="#">WG1757077</a>
(S) p-Terphenyl-d14	102			23.0-120		10/14/2021 19:18	<a href="#">WG1757077</a>
(S) Nitrobenzene-d5	79.3			14.0-149		10/14/2021 19:18	<a href="#">WG1757077</a>
(S) 2-Fluorobiphenyl	80.2			34.0-125		10/14/2021 19:18	<a href="#">WG1757077</a>

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	0.148		1	10/13/2021 13:11	WG1754553

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/15/2021 13:06	<a href="#">WG1754567</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.09	<a href="#">T8</a>	1	10/13/2021 12:00	<a href="#">WG1755574</a>

## Sample Narrative:

L1414281-04 WG1755574: 8.09 at 20.6C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	153		10.0	1	10/11/2021 14:15	<a href="#">WG1754502</a>

## Sample Narrative:

L1414281-04 WG1754502: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	169		0.0852	0.500	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Cadmium	0.396	<a href="#">J</a>	0.0471	0.500	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Copper	13.9		0.400	2.00	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Lead	9.38		0.208	0.500	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Nickel	11.8		0.132	2.00	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Selenium	U		0.764	2.00	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Silver	U		0.127	1.00	1	10/12/2021 19:47	<a href="#">WG1755041</a>
Zinc	28.6		0.832	5.00	1	10/12/2021 19:47	<a href="#">WG1755041</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.406		0.0167	0.200	1	10/13/2021 11:54	<a href="#">WG1754552</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.47		0.100	1.00	5	10/12/2021 10:43	<a href="#">WG1755039</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0863	<a href="#">B J</a>	0.0217	0.100	1	10/15/2021 00:53	<a href="#">WG1756775</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	97.5			77.0-120		10/15/2021 00:53	<a href="#">WG1756775</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	U		1.61	4.00	1	10/15/2021 06:05	<a href="#">WG1756888</a>
C28-C36 Motor Oil Range	0.955	<u>J</u>	0.274	4.00	1	10/15/2021 06:05	<a href="#">WG1756888</a>
(S) o-Terphenyl	34.6			18.0-148		10/15/2021 06:05	<a href="#">WG1756888</a>

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	U		0.00230	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Acenaphthene	U		0.00209	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Acenaphthylene	U		0.00216	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Benzo(a)anthracene	U		0.00173	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Benzo(a)pyrene	U		0.00179	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Benzo(g,h,i)perylene	U		0.00177	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Chrysene	U		0.00232	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Fluoranthene	U		0.00227	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Fluorene	U		0.00205	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Naphthalene	U		0.00408	0.0200	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Phenanthrene	U		0.00231	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
Pyrene	U		0.00200	0.00600	1	10/14/2021 19:38	<a href="#">WG1757077</a>
1-Methylnaphthalene	U		0.00449	0.0200	1	10/14/2021 19:38	<a href="#">WG1757077</a>
2-Methylnaphthalene	U		0.00427	0.0200	1	10/14/2021 19:38	<a href="#">WG1757077</a>
2-Chloronaphthalene	U		0.00466	0.0200	1	10/14/2021 19:38	<a href="#">WG1757077</a>
(S) p-Terphenyl-d14	103			23.0-120		10/14/2021 19:38	<a href="#">WG1757077</a>
(S) Nitrobenzene-d5	77.2			14.0-149		10/14/2021 19:38	<a href="#">WG1757077</a>
(S) 2-Fluorobiphenyl	81.1			34.0-125		10/14/2021 19:38	<a href="#">WG1757077</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3717096-1 10/15/21 12:03

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

Laboratory Control Sample (LCS)

(LCS) R3717096-2 10/15/21 12:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Hexavalent Chromium	10.0	8.92	89.2	80.0-120	

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1411924-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1411924-03 10/13/21 12:00 • (DUP) R3715821-2 10/13/21 12:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.03	8.03	1	0.000		1

Sample Narrative:

OS: 8.03 at 20.7C

DUP: 8.03 at 20.8C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1414274-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1414274-02 10/13/21 12:00 • (DUP) R3715821-3 10/13/21 12:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.05	8.03	1	0.249		1

Sample Narrative:

OS: 8.05 at 20.6C

DUP: 8.03 at 20.6C

Laboratory Control Sample (LCS)

(LCS) R3715821-1 10/13/21 12:00

	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: 10.03 at 20.7C

Method Blank (MB)

(MB) R3714817-1 10/11/21 14:15

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

Laboratory Control Sample (LCS)

(LCS) R3714817-2 10/11/21 14:15

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	275	103	85.0-115	

Sample Narrative:

LCS: at 25C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3715626-1 10/12/21 19:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3715626-2 10/12/21 19:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	98.5	98.5	80.0-120	
Cadmium	100	93.1	93.1	80.0-120	
Copper	100	96.1	96.1	80.0-120	
Lead	100	94.8	94.8	80.0-120	
Nickel	100	96.1	96.1	80.0-120	
Selenium	100	94.1	94.1	80.0-120	
Silver	20.0	17.1	85.3	80.0-120	
Zinc	100	93.8	93.8	80.0-120	

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3715882-1 10/13/21 10:51

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) R3715882-2 10/13/21 10:54 • (LCSD) R3715882-3 10/13/21 10:57

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	0.956	1.05	95.6	105	80.0-120			9.02	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3715250-1 10/12/21 09:54

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) R3715250-2 10/12/21 09:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	84.0	84.0	80.0-120	

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3717602-2 10/14/21 20:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0256	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	100			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3717602-1 10/14/21 18:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.73	104	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			115	77.0-120	

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Method Blank (MB)

(MB) R3716897-1 10/15/21 03:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	52.9			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3716897-2 10/15/21 03:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	28.5	57.0	50.0-150	
(S) o-Terphenyl			55.3	18.0-148	

L1412747-25 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1412747-25 10/15/21 06:59 • (MS) R3716897-3 10/15/21 07:13 • (MSD) R3716897-4 10/15/21 07:26

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	49.7	23.1	122	209	199	372	1	50.0-150	J5	J3 J5	52.6	20
(S) o-Terphenyl					51.8	57.8		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3716725-2 10/14/21 17:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	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
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	89.9			14.0-149
(S) 2-Fluorobiphenyl	87.8			34.0-125
(S) p-Terphenyl-d14	111			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3716725-1 10/14/21 17:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0689	86.1	50.0-126	
Acenaphthene	0.0800	0.0670	83.8	50.0-120	
Acenaphthylene	0.0800	0.0752	94.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0698	87.3	45.0-120	
Benzo(a)pyrene	0.0800	0.0638	79.8	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0594	74.3	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0576	72.0	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0622	77.8	49.0-125	
Chrysene	0.0800	0.0658	82.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0573	71.6	47.0-125	
Fluoranthene	0.0800	0.0667	83.4	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3716725-1 10/14/21 17:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0686	85.8	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0593	74.1	46.0-125	
Naphthalene	0.0800	0.0669	83.6	50.0-120	
Phenanthrene	0.0800	0.0663	82.9	47.0-120	
Pyrene	0.0800	0.0691	86.4	43.0-123	
1-Methylnaphthalene	0.0800	0.0684	85.5	51.0-121	
2-Methylnaphthalene	0.0800	0.0644	80.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0651	81.4	50.0-120	
(S) Nitrobenzene-d5			95.8	14.0-149	
(S) 2-Fluorobiphenyl			94.0	34.0-125	
(S) p-Terphenyl-d14			113	23.0-120	

L1414283-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1414283-01 10/15/21 00:34 • (MS) R3716725-3 10/15/21 00:53 • (MSD) R3716725-4 10/15/21 01:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	0.00376	0.0628	0.0607	73.8	71.2	1	10.0-145			3.40	30
Acenaphthene	0.0800	U	0.0590	0.0584	73.8	73.0	1	14.0-127			1.02	27
Acenaphthylene	0.0800	0.00284	0.0685	0.0675	82.1	80.8	1	21.0-124			1.47	25
Benzo(a)anthracene	0.0800	0.0259	0.0747	0.0753	61.0	61.8	1	10.0-139			0.800	30
Benzo(a)pyrene	0.0800	0.0289	0.0696	0.0702	50.9	51.6	1	10.0-141			0.858	31
Benzo(b)fluoranthene	0.0800	0.0345	0.0678	0.0665	41.6	40.0	1	10.0-140			1.94	36
Benzo(g,h,i)perylene	0.0800	0.0247	0.0614	0.0614	45.9	45.9	1	10.0-140			0.000	33
Benzo(k)fluoranthene	0.0800	0.0124	0.0578	0.0560	56.8	54.5	1	10.0-137			3.16	31
Chrysene	0.0800	0.0346	0.0771	0.0762	53.1	52.0	1	10.0-145			1.17	30
Dibenz(a,h)anthracene	0.0800	0.00531	0.0510	0.0495	57.1	55.2	1	10.0-132			2.99	31
Fluoranthene	0.0800	0.0401	0.0820	0.0791	52.4	48.7	1	10.0-153			3.60	33
Fluorene	0.0800	U	0.0624	0.0618	78.0	77.3	1	11.0-130			0.966	29
Indeno(1,2,3-cd)pyrene	0.0800	0.0244	0.0620	0.0607	47.0	45.4	1	10.0-137			2.12	32
Naphthalene	0.0800	0.0122	0.0761	0.0752	79.9	78.8	1	10.0-135			1.19	27
Phenanthrene	0.0800	0.0164	0.0736	0.0711	71.5	68.4	1	10.0-144			3.46	31
Pyrene	0.0800	0.0415	0.0811	0.0788	49.5	46.6	1	10.0-148			2.88	35
1-Methylnaphthalene	0.0800	0.0102	0.0721	0.0711	77.4	76.1	1	10.0-142			1.40	28
2-Methylnaphthalene	0.0800	0.0128	0.0713	0.0703	73.1	71.9	1	10.0-137			1.41	28
2-Chloronaphthalene	0.0800	U	0.0553	0.0543	69.1	67.9	1	29.0-120			1.82	24
(S) Nitrobenzene-d5					81.9	84.8		14.0-149				
(S) 2-Fluorobiphenyl					78.1	79.1		34.0-125				
(S) p-Terphenyl-d14					94.0	92.9		23.0-120				

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.

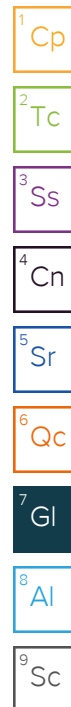
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location.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

### Abbreviations and Definitions

MDL	Method Detection Limit.
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.
T8	Sample(s) received past/too close to holding time expiration.





# ACCREDITATIONS & LOCATIONS

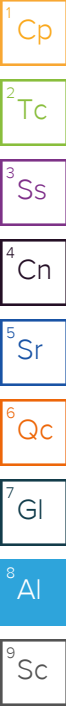
## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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 <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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.





L# 1414281  
J231

Accnum:  
Template:  
Prelogin:  
TSR:  
PB:  
Shipped Via:

Analysis / Container / Preservative

Pres  
Chk

Billing Information:  
Same as above

Email To:  
bmiddleton@caerusoilandgas.com

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

Report to:  
bmiddleton@caerusoilandgas.com

Project Description:  
H7 Dumpline Release

Phone:  
Fax:

Collected by (print):  
Collected by (signature):

Immediately  
Packed on Ice N Y X

City/State  
Collected: Mamm Crk, CO  
Lab Project #  
H7  
P.O. #  
H7  
Quote #  
Date Results Needed  
Standard TAT  
No. of  
Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH- GRO,DRO,ORO	BTEX	TABLE 915-1- PAH's	SAR, EC, pH, Boron	TABLE 915-1- Metals
20211005-H7(BGS)	Grab	SS	NA	10/5/2021	835	3	X		X	X	X
20211005-H7(BGE)	Grab	SS	NA	10/5/2021	845	3	X		X	X	X
20211005-H7(BGN)	Grab	SS	NA	10/5/2021	855	3	X		X	X	X
20211005-H7(BGW)	Grab	SS	NA	10/5/2021	900	3	X		X	X	X

Remarks  
Sample # (lab only)  
-01  
-02  
-03  
-04

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

Remarks:

Samples returned via:  
UPS FedEx Courier

Tracking # 501612322713

pH Temp  
Flow Other

Sample Receipt Checklist  
COC Seal Present/Intact: 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: 10/5/21 Time: 1100  
Relinquished by: (Signature)  
Date: 10/5/21 Time: 1500  
Relinquished by: (Signature)  
Date: Time:

Received by: (Signature)  
Received by: (Signature)  
Received for lab by: (Signature)  
Trip Blank Received: Yes / No  
HCL / MeOH  
TBR  
Bottles Received: 12  
Temp: 13.1°C  
Date: 10/6/21 Time: 945

If preservation required by Login: Date/Time  
Hold:  
Condition:  
NCF / OK