

December 14, 2020



Blair Rollins  
Environmental Specialist  
Caerus Oil & Gas LLC  
[brollins@caerusoilandgas.com](mailto:brollins@caerusoilandgas.com)

**RE: DRILLING ASSESSMENT – REPORT OF WORK COMPLETED**

<b>COGCC Location Name/No</b>	UNOCAL-66S96W/4NESW (Unocal 4)
<b>Location ID</b>	335778
<b>Remediation ID</b>	15947
<b>Legal Description</b>	NESW, Section 4, T6S-R96W
<b>Coordinates (Lat/Long)</b>	39.55158/-108.11544 (WGS 84)
<b>County</b>	Garfield County, Colorado

Mr. Rollins,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document findings of a drilling assessment conducted to delineate the vertical extent of soil impacts resulting from a produced water spill at the Caerus Unocal 4 (K04) well pad (Location). The Location is 7.5 miles north-northwest of the Town of Parachute, Colorado in Garfield County. Additional information on the Location and associated remediation project is provided in the title block above and in the attached topographic location map and site diagram. The ROWC provides background on the incident and remediation project, methods used to complete the drilling assessment, results of the assessment, and recommendations for how to proceed with this information.

## Background

In June 2020, during regularly scheduled pressure testing, Caerus personnel identified a failed fluid dumphine between the separators and tank battery at the Location. In response to the probable environmental release, onsite wells were shut-in, and a remedial excavation was initiated to determine vertical and horizontal extents of soil impacts and remove impacted material. In accordance with applicable reporting requirements, the incident was reported to the Colorado Oil & Gas Conservation Commission (COGCC) and the Garfield County designee.

Confluence understands that the horizontal extents of soil impacts were delineated during the excavation, but that the vertical extent could not be safely determined through excavation. Following that conclusion, the excavation was backfilled with clean native fill and a proposal was prepared to complete the vertical assessment by advancing soil borings. The soil boring approach and a reduced analytical suite were approved by the COGCC in September 2020. The approved analytical suite included organic and inorganic constituents of concern, including: total petroleum hydrocarbons (TPH) [gasoline and diesel range organics (GRO+DRO)]; benzene, toluene, ethylbenzene, and total xylenes (BTEX); electrical conductivity (EC); and sodium adsorption ratio (SAR).

## Methodology

In preparation for the drilling assessment at the Location, between October 30 and November 9, 2020 Confluence coordinated with Caerus and the drilling contractor to complete required utility clearance, including notification of Colorado 811, confirmation of Tier 1 responses, and potholing to six to eight feet.

Between November 9 and 16, 2020 Confluence provided onsite support of soil boring efforts with the drilling contractor to evaluate vertical extent of soil impacts for the approved constituents of concern (TPH, BTEX, EC, and SAR). Three 4-inch soil borings were advanced with a solid-stem auger to a total depth of 60 feet below ground surface (bgs). The soil boring (SB) locations were selected to provide vertical definition of soil impacts within the former excavation footprint (SB01) and evaluate/demonstrate horizontal definition with two down-gradient boring locations (SB02, SB03). Samples were collected on a 10-foot interval with a split-spoon beginning at 15 feet bgs, and field-screened with a photoionization detector (PID) and visual and olfactory observations. Subsurface conditions were logged and collected samples were packed on ice and delivered to a laboratory for analysis of the remaining constituents of concern (TPH, BTEX, EC, and SAR).

In addition to sample collection and lithology characterization, 2-inch soil vapor extraction (SVE) wells were installed at each boring location to support monitoring of subsurface impacts, mass removal through vapor extraction, and/or augmented bioremediation.

## Results

The lithology at the spill site is characterized by sediments composed primarily of light to dark brown clays with some sandy and silty clays. Angular gravel of shale and sandstone noted in all three borings, with tough drilling and no split spoon recovery at 40 to 45 feet in SB01. SVE wells with screening from 30 to 60 feet were installed and named to correspond with the soil borings (SVE01, SVE02, SVE03). Groundwater was not encountered in any of the soil borings. These locations are illustrated in the attached site diagram, and details on site lithology are provided in the attached boring logs.

Field-screening results in SB01 indicated soils with elevated organic constituent (TPH, BTEX) concentrations remain below the excavation, with PID readings jumping to greater than 1000 parts per million (ppm) between 30 and 35 feet along with a noted odor. Little to no odor was noted in SB02 and SB03 and PID readings were relatively low with several readings above 200 ppm in SB03 between 35 and 50 feet.

Submitted samples confirm field observations, with organic constituent concentrations (TPH, BTEX) exceeding allowable concentrations beneath the former excavation in SB01 between 30 and 50 feet bgs. The exceedances at 30 to 35 feet (3,890 TPH / 0.364 benzene) and 35 to 40 feet (5,440 TPH / 0.175 benzene) improve quickly at 45 to 50 feet (688 TPH / 0.383 benzene) and are below the allowable concentration at 50 feet. All organic constituent levels are in compliance with allowable concentrations in SB02 and SB03. Inorganic constituent levels are above allowable limits in SB01 between 30 and 60 feet for SAR, and 45 and 55 feet for EC, but are below allowable limits at all depths in SB02 and SB03.



## Recommendations and Analysis

As previously indicated, Confluence understands that horizontal definition of soil impacts was achieved within the remedial excavation conducted in response to the discovered dumphline failure. Based on that information and the results of the drilling assessment detailed here, vertical and horizontal definition have been achieved at the Location for this remediation project.

With the presence of light-end hydrocarbons in TPH-GRO, including benzene, within the excavation footprint, Confluence recommends Caerus evaluate the radius of influence on the installed SVE wells to determine the potential efficacy of that technology with existing infrastructure and monitor mass removal into 2021 for evaluation of remediation progress.

Though inorganic constituents (SAR, EC) are above allowable limits in SB01 at 30 feet bgs and deeper, these constituents present specific risk to revegetation efforts when present in the top three feet of soil and pose no environmental risk at this depth. With that consideration, Confluence always recommends Caerus comply with the standard reclamation practice of ensuring all working surface be buried beneath at least three feet of clean native fill and topsoil during final reclamation.

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

Regards,



Christopher C. Hines  
Senior Managing Scientist  
970-261-1127  
[chris.hines@confluence-cc.com](mailto:chris.hines@confluence-cc.com)

## Attachments

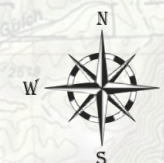
- Topographic Location Map
- Site Diagram
- Laboratory Results Summary Tables
- Soil Boring Logs
- Laboratory Reports





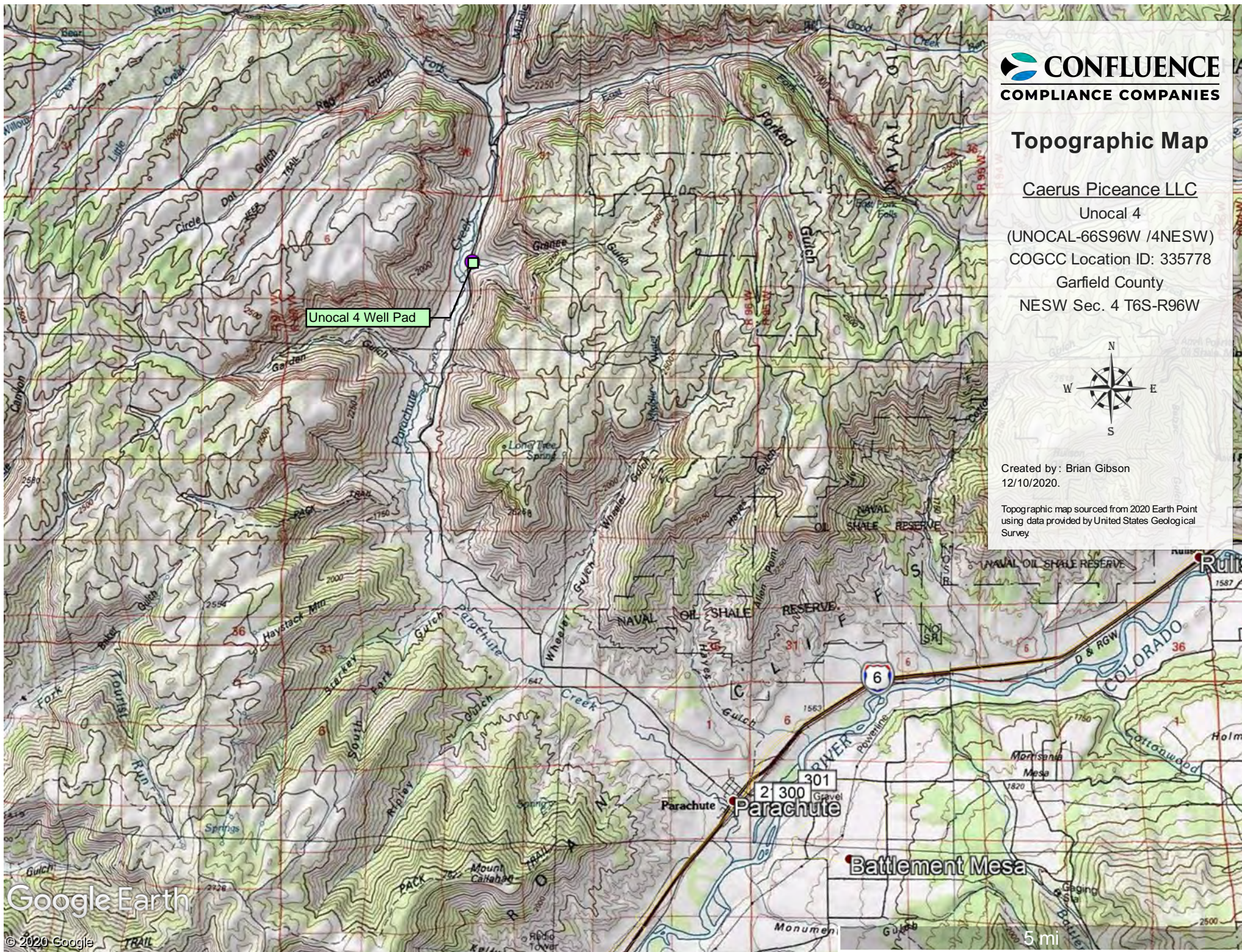
## Topographic Map

Caerus Piceance LLC  
Unocal 4  
(UNOCAL-66S96W /4NESW)  
COGCC Location ID: 335778  
Garfield County  
NESW Sec. 4 T6S-R96W



Created by : Brian Gibson  
12/10/2020.

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





## Site Diagram

### Caerus Piceance LLC

Unocal 4

(UNOCAL-66S96W /4NESW)


COGCC Location ID: 335778


Garfield County


NESW Sec. 4 T6S-R96W



### Legend

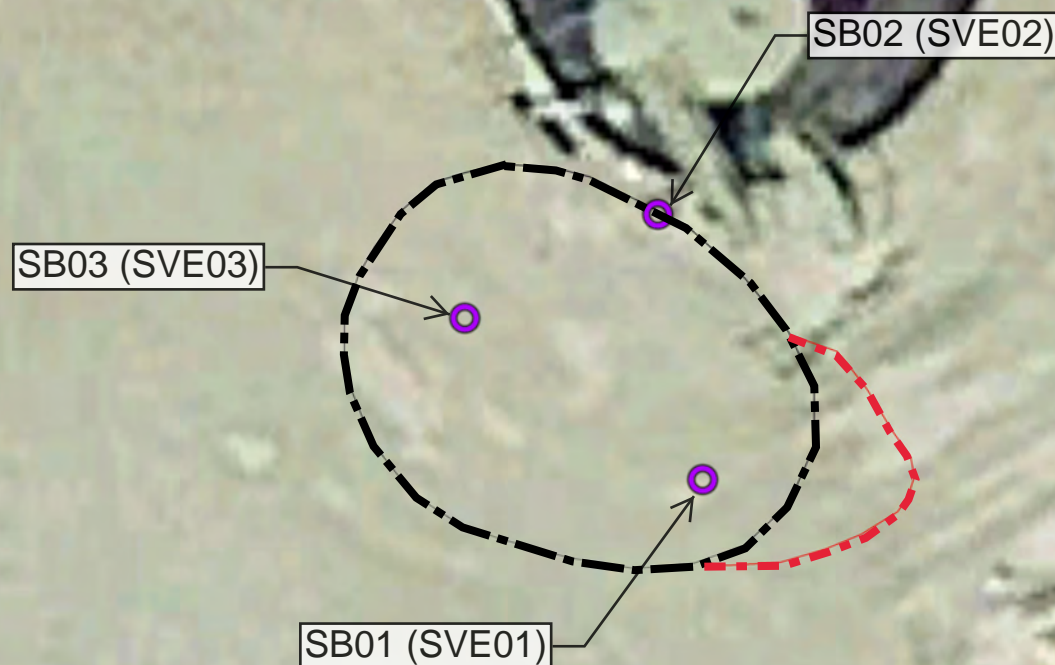
 Soil Vapor Extraction Well

 Excavation Extent - 07/20/2020

 Excavation Extent - 08/07/2020

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

Map created by: Brian Gibson on 12/14/2020.



**UNOCAL 4 SPILL**  
**SOIL BORING ANALYTICAL RESULTS**  
**CAERUS OIL AND GAS LLC**  
**PICEANCE BASIN, COLORADO**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	20201109-Unocal 4 SB01 6-10'	20201109-Unocal 4 SB01 10-15'	20201109-Unocal 4 SB01 15-20'	20201109-Unocal 4 SB01 20-25'	20201109-Unocal 4 SB01 25-30'	20201109-Unocal 4 SB01 30-35'	20201109-Unocal 4 SB01 35-40'	20201109-Unocal 4 SB01 45-50'	20201109-Unocal 4 SB01 50-55'
Sample Date			11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020
Sample Matix			Spill	Spill	Spill	Spill	Spill	Spill	Spill	Spill	Spill
Arsenic	0.39	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	15,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	70	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	390	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
EC	4 or 2x background	mmhos/cm	1.35	1.59	1.2	1.4	1.37	2.74	2.6	30.1	30
pH	6-9	SU	NA	NA	NA	NA	NA	NA	NA	NA	NA
SAR	12	unitless	9.35	3.35	2.69	1.73	2.09	34.4	37.7	36.9	32.9
TPH-DRO			331	163	122	137	62	1140	1610	262	114
TPH-GRO			4.59	3.15	2.79	4.54	8.72	2750	3830	426	10.1
TPH	500	mg/kg	335.59	166.15	124.79	141.54	70.72	3890	5440	688	124.1
Benzene	0.17	mg/kg	0.00138	0.00418	0.0153	0.0368	0.0282	0.364	0.175	0.383	0.0309
Toluene	85	mg/kg	0.0132	0.124	0.573	0.856	1.24	12.1	10.7	4.62	0.767
Ethylbenzene	100	mg/kg	<0.00250	0.0162	0.0693	0.106	0.251	2.71	3.09	0.642	0.176
Total Xylenes	175	mg/kg	0.124	0.585	1.25	1.62	3.89	44.8	49.9	9.23	2.69
Acenaphthene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	2.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.022	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.022	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3,c,d)pyrene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

< - less than the stated reporting limit

Highlight - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

EC - electrical conductivity

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed

ND - non detect

SAR - sodium adsorption ratio

SU - standard unit

TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO

**UNOCAL 4 SPILL**  
**SOIL BORING ANALYTICAL RESULTS**  
**CAERUS OIL AND GAS LLC**  
**PICEANCE BASIN, COLORADO**

PARAMETER	COGCC CONCENTRATION LEVELS	UNITS	20201109-Unocal 4 SB01 55-60'	20201112-Unocal 4 SB02 15-20'	20201112-Unocal 4 SB02 30-35'	20201112-Unocal 4 SB02 45-50'	20201112-Unocal 4 SB02 59-61'	20201112-Unocal 4 SB03 15-17'	20201112-Unocal 4 SB03 35-37'	20201112-Unocal 4 SB03 50-52'	20201112-Unocal 4 SB03 59-61'
Sample Date			11/9/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020
Sample Matrix			Spill	Spill	Spill	Spill	Spill	Spill	Spill	Spill	Spill
Arsenic	0.39	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	15,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	70	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (III)	120,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (VI)	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	390	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
EC	4 or 2x background	mmhos/cm	2.66	0.957	0.705	0.467	0.838	0.66	0.524	0.944	0.554
pH	6-9	SU	NA	NA	NA	NA	NA	NA	NA	NA	NA
SAR	12	unitless	24.3	2.75	2.08	2.82	3.33	1.96	2.32	3.15	2.66
TPH-DRO			162	173	176	52.9	68	169	115	325	171
TPH-GRO			6.52	0.607	0.622	0.56	1.71	1.13	1.62	3.37	0.685
TPH	500	mg/kg	168.52	173.607	176.622	53.46	69.71	170.13	116.62	328.37	171.685
Benzene	0.17	mg/kg	0.0616	<0.00100	0.00178	<0.00100	<0.00100	0.00258	0.00455	0.0197	0.00153
Toluene	85	mg/kg	0.595	<0.00500	0.00915	<0.00500	<0.00500	0.0266	0.0345	0.0985	0.0165
Ethylbenzene	100	mg/kg	0.0678	<0.00250	<0.00250	<0.00250	<0.00250	0.0057	0.0075	0.0106	0.00358
Total Xylenes	175	mg/kg	1.18	0.0117	0.0298	<0.00650	0.0135	0.124	0.0562	0.297	0.059
Acenaphthene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	2.2	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.022	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.022	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3,c,d)pyrene	0.22	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	23	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,000	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

< - less than the stated reporting limit

Highlight - indicates result exceeds the COGCC concentration level

COGCC - Colorado Oil and Gas Conservation Commission

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TPH-GRO - total petroleum hydrocarbons-gasoline range organics

TPH-DRO - total petroleum hydrocarbons-diesel range organics

TPH - combination of TPH-GRO and TPH-DRO

Location Map						Confluence Compliance			
						Boring Name		Project NP DRILLING	
						Date 11/9/2020 - 11/10/2020		Project Number UNOCAL 4	
						Logged By B. COCINA		Drilled By DAKOTA DRILLING	
Elevation		Detector PID MINI RAE		Drilling Method AUGER		Sampling Method CUTTINGS / SPUT SPOND			
Depth to Liquid -	Depth to Water -	Total Depth 60'				Hole Diameter 4" - FINALIZED a 2" WELL		Grout	
Penetration Resistance	Moisture Content	PID (ppm)	Time	Depth (ft. bgs)	Sample Run	Soil/Rock Type	Lithology Remarks	Well Construction	
-	-	-	-	5	-	-	Cleared w/ Hydrovac to 6'		
-	SL. MOIST	151.7	1417	10	X	CL	6-10' bgs. Brown clay with sands and few silts. Few pebbles, HC odor, no staining, slightly moist malleable clays.		
-	DRY	134.4	1420	15	X	CL	10-15' bgs. SAA		
-	DRY	61.2	1428	20	X	SM	15-20' bgs, Drier sands and silts w/ pebbles. slight HC odor, no staining. Brown.		
-	DRY	72.8	1432	25	X	SM	20-25' bgs. SAA		
-	DRY	369.2	1445	30	X	SM	25-30' bgs. SAA, strong HC odor.		
-	SL. MOIST	1,833	1500	35	X	CL	30-35' bgs. Dark brown, clay w/ sands. Strong HC odor. some gray staining, malleable clays.		
-	SL. MOIST	4,219	1515	40	X	CL	35-40' bgs. SAA		
-	-	-	-	45	-	-	40-45' bgs. Very hard drilling. No cuttings to sample.		
-	SL. MOIST	1,318	1555	50	X	CL	45-50' bgs. Dark brown clays w/ sands. Strong HC odor. Some gray staining, malleable clays.		
-	DRY	206.9	0921	55	X	SM	50-55' bgs.		
✓	DRY	60.7	0950	60	X	SM	55-60' bgs.		



Project: NP DRILLING ASSESSMENT

Project Location: UNOCAL 4

Project Number:

Log of Boring ~~NEW~~ 1X

Sheet 1 of 2 1 OF 2

Date(s) Drilled 11-12-20

Logged By CHRIS HINES

Checked By

Drilling Method SOLID-STEM AUGER  
CMEDrill Bit  
Size/TypeTotal Depth  
of BoreholeDrill Rig  
TypeDrilling  
ContractorApproximate  
Surface ElevationGroundwater Level  
and Date MeasuredSampling  
Method(s)Hammer  
DataBorehole  
Backfill

Location

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
	0							
	5							
	10		10'				26.2	3-4" FROM SPLIT SPOON W/ REMAINDER FROM OUTSIDE OF AUGER
0845	15		15'				31.8	6"-8" FROM S-S
0850	20		20'				CLAY (24.5)	10-12" RECOVERY
0905	25		25'				BROWN CLAY W/ SHALE FRAGMENTS (21.9) LIGHT DROR 22.6	10-12" RECOVERY FROM S-S SUPPLEMENTED
0910	30							



Project:

Project Location: UNOCAL 4

Log of Boring ~~PH~~ 4Sheet ~~201~~ 202

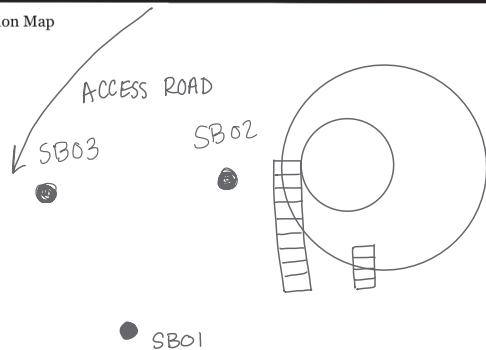
Project Number:

Date(s) Drilled	Logged By CHRIS HINES	Checked By
Drilling Method SOLID-STEM	Drill Bit Size/Type	Total Depth of Borehole
Drill Rig Type CME 75	Drilling Contractor	Approximate Surface Elevation
Groundwater Level and Date Measured	Sampling Method(s)	Hammer Data
Borehole Backfill WELL SET	Location	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
09:30	30	X	30'	NA			IF IMPACTS ARE PRESENT, THEY SHOULD START HERE VARYING MATERIAL + MORE COMPETENT. FULL CLAY W/ GRAVEL + SAND. (37.8)	REMEDIAL EXCAVATION ENDED @ 30' FULL S-S RECOVERY 24"
09:50	35						ALL CLAY LITTLE TO NO ODOR (6.2)	24" S-S RECOVERY FULL "
10:15	40						YELLOWISH REDDISH-BROWN SANDY CLAY INTERBEDDED W/ GRAYISH-BROWN CLAY + SHALE, COBBLES, + GRAVEL. (26.5)	24" S-S (FULL) RECOVERY LITTLE TO NO ODOR
10:40	45	X					LIGHT BROWN CLAY W/ SANDY GRAVEL GRAY-BLACK SHALE + RED SANDSTONE. (67)	24" S-S (FULL) RECOVERY LITTLE TO NO ODOR.
11:20	50						BROWN CLAY, malleable crumbly some sands & small pebbles. Gray shale (48.3)	Full recovery 24" No staining / odor.
11:45	55						Brown clay, competent w/ small red shale + sandstone pieces. No odor, staining (35.7)	Full recovery 24". No staining no odor
12:10	60	X					SAA. (18.7)	Full recovery 24" No staining / odor



Location Map



# Confluence Compliance


Boring Name SB03 (SVE03)	Project NP Drilling
Date 11/12/2020	Project Number UNOCAL 4
Logged By B. COCINA	Drilled By Dakota Drilling
Drilling Method Solid Stem Auger	Sampling Method Split Spoon
Hole Diameter 4"	Grout -

Recovery Penetration Resistance	Moisture Content	PID (ppm)	Time	Depth (ft. bgs)	Sample Run	Soil/Rock Type	Lithology Remarks	Well Construction
6" of S.S.				5			0-6' cleared w/ hydrovac	
14" of S.S.	Dry	12.7	1245	10		CL	10-12' bgs. Brown fine-grained clay w/ shale gravel sized pieces. No staining / odor.	
Full 24" recovery	DRY	24.4	1250	15	X	CL	15-17' bgs. SAA	
Full 24" recovery	DRY	40.6	1255	20		CL	20-22' bgs. SAA	
Full 24" recovery	DRY	182.1	1337	25		CL	25-27' bgs. Brown to lt brown sandy clay. few gravels. slight odor, no staining	
20"	DRY	97.6	1345	30		CL	30-32' bgs. SAA, more gravels. of shales and sandstone.	
18"	DRY	266.2	1400	35	X	CL	35-37' bgs. SAA.	
Full 24" recovery	DRY	242.8	1417	40		CL	40-42' bgs. lt brown sandy clay. Crumby, some shale gravels. No staining, odor present.	
Full 24" recovery	DRY	226.7	1430	45		CL	45-47' bgs. SAA.	
18"	DRY	128.0	1450	50	(X)	CL	50-52' bgs. Brown stiff silty clay with smaller gravel shale pieces. Few sandstones. No staining, slight odor	
Full 24" recovery	DRY	91.0	1510	55		CL	55-57' bgs. SAA	
Full 24" recovery	DRY	22.6	1530	60	X	CL	59-61' bgs SAA, no staining / odor  Well set w/ TD: 60' bgs.	

## Caerus Oil and Gas

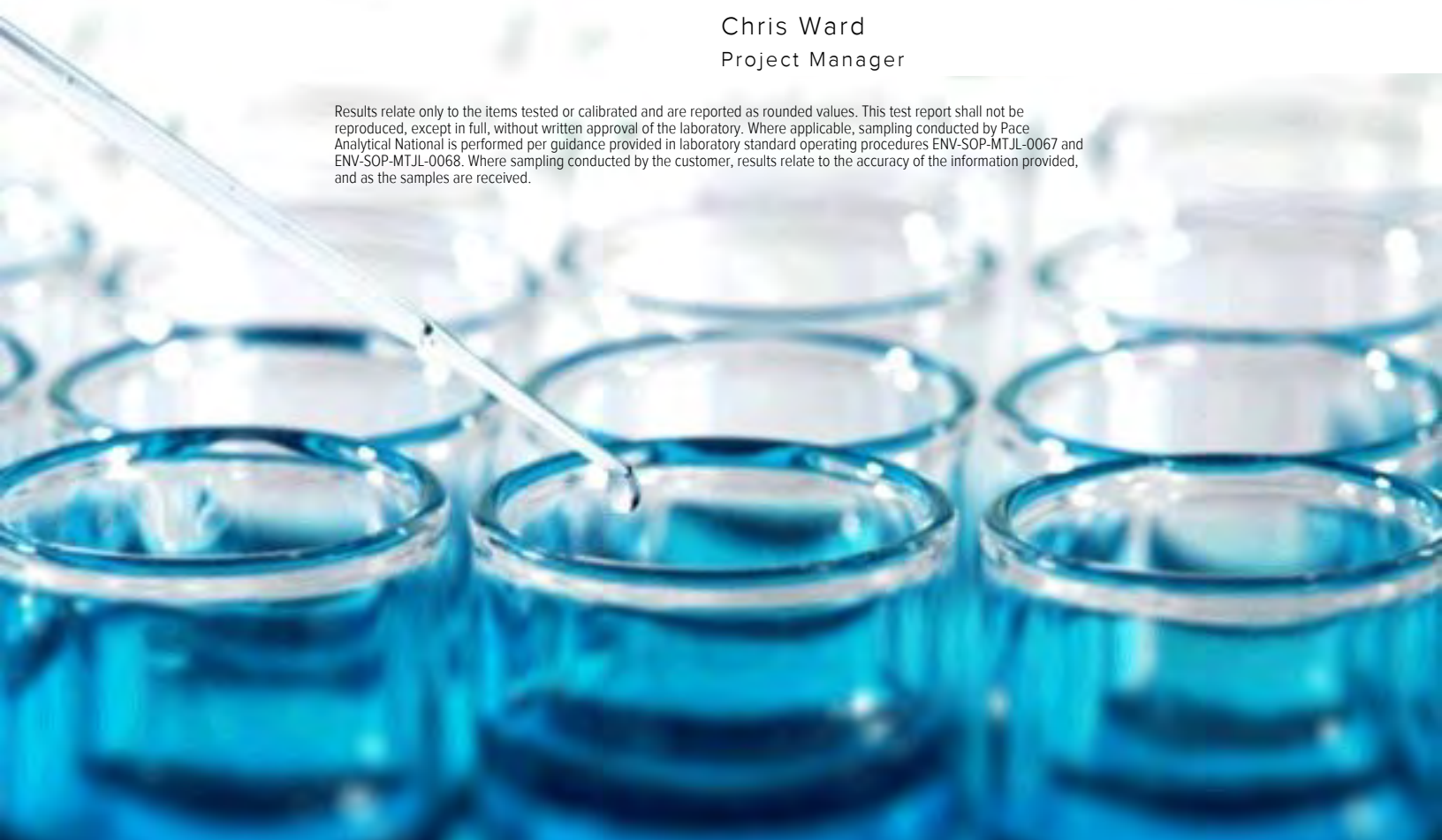
Sample Delivery Group: L1284966  
Samples Received: 11/12/2020  
Project Number: UNOCAL 4  
Description:  
Site: UNOCAL 4 UNOCAL 4  
Report To: Chris Hines  
143 Diamond Avenue  
Parachute, CO 81635

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.







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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## 20201109-UNOCAL4-SB01-6-10' L1284966-01 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 14:17  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:21	11/19/20 12:21	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	1	11/17/20 11:01	11/18/20 03:45	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/18/20 23:54	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578504	2	11/20/20 10:45	11/21/20 23:49	JN	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

## 20201109-UNOCAL4-SB01-10-15' L1284966-02 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 14:20  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:24	11/19/20 12:24	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	1	11/17/20 11:01	11/18/20 04:33	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 00:13	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578504	2	11/20/20 10:45	11/22/20 00:02	JN	Mt. Juliet, TN

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

## 20201109-UNOCAL4-SB01-15-20' L1284966-03 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 14:28  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:27	11/19/20 12:27	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	1	11/17/20 11:01	11/18/20 04:54	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 00:32	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578504	2	11/20/20 10:45	11/22/20 00:15	JN	Mt. Juliet, TN

<sup>9</sup> Sc

## 20201109-UNOCAL4-SB01-20-25' L1284966-04 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 14:32  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:29	11/19/20 12:29	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	1	11/17/20 11:01	11/18/20 05:14	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 00:51	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578504	2	11/20/20 10:45	11/22/20 00:29	JN	Mt. Juliet, TN

## 20201109-UNOCAL4-SB01-25-30' L1284966-05 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 14:45  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:32	11/19/20 12:32	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	1	11/17/20 11:01	11/18/20 05:35	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 01:10	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 03:35	DMG	Mt. Juliet, TN



# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## 20201109-UNOCAL4-SB01-30-35' L1284966-06 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 15:00  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:35	11/19/20 12:35	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	500	11/17/20 11:01	11/18/20 06:38	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	40	11/17/20 11:01	11/19/20 04:39	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 03:49	DMG	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

## 20201109-UNOCAL4-SB01-35-40' L1284966-07 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 15:15  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:37	11/19/20 12:37	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1579462	2000	11/17/20 11:01	11/19/20 19:35	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	20	11/17/20 11:01	11/19/20 04:58	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 04:02	DMG	Mt. Juliet, TN

5 Sr

6 Qc

7 Gl

8 Al

## 20201109-UNOCAL4-SB01-45-50' L1284966-08 Solid

Collected by B. Cocina  
Collected date/time 11/09/20 15:55  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:40	11/19/20 12:40	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577975	100	11/17/20 11:01	11/18/20 05:56	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	8	11/17/20 11:01	11/19/20 05:17	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 04:15	DMG	Mt. Juliet, TN

9 Sc

## 20201110-UNOCAL4-SB01-50-55' L1284966-09 Solid

Collected by B. Cocina  
Collected date/time 11/10/20 09:21  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:43	11/19/20 12:43	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1579434	25	11/17/20 11:01	11/19/20 19:12	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 01:29	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 04:29	DMG	Mt. Juliet, TN

## 20201110-UNOCAL4-SB01-55-60' L1284966-10 Solid

Collected by B. Cocina  
Collected date/time 11/10/20 09:50  
Received date/time 11/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1575967	1	11/19/20 12:11	11/19/20 12:11	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1577977	1	11/17/20 11:01	11/18/20 06:35	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1578787	1	11/17/20 11:01	11/19/20 01:48	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1578865	10	11/19/20 12:04	11/20/20 05:08	DMG	Mt. Juliet, TN



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

<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





Collected date/time: 11/09/20 14:17

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	9.35		1	11/19/2020 12:21	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1350		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

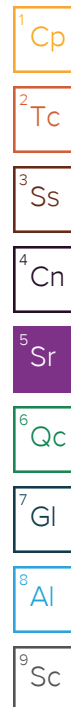
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	4.59		0.100	1	11/18/2020 03:45	<a href="#">WG1577975</a>
(S) a,a,a-Trifluorotoluene(FID)	90.2		77.0-120		11/18/2020 03:45	<a href="#">WG1577975</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00138		0.00100	1	11/18/2020 23:54	<a href="#">WG1578787</a>
Toluene	0.0132		0.00500	1	11/18/2020 23:54	<a href="#">WG1578787</a>
Ethylbenzene	ND		0.00250	1	11/18/2020 23:54	<a href="#">WG1578787</a>
Total Xylenes	0.124		0.00650	1	11/18/2020 23:54	<a href="#">WG1578787</a>
(S) Toluene-d8	112		75.0-131		11/18/2020 23:54	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	118		67.0-138		11/18/2020 23:54	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane-d4	114		70.0-130		11/18/2020 23:54	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	331		8.00	2	11/21/2020 23:49	<a href="#">WG1578504</a>
(S) o-Terphenyl	133		18.0-148		11/21/2020 23:49	<a href="#">WG1578504</a>





Collected date/time: 11/09/20 14:20

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.35		1	11/19/2020 12:24	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1590		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3.15		0.100	1	11/18/2020 04:33	<a href="#">WG1577975</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	88.2		77.0-120		11/18/2020 04:33	<a href="#">WG1577975</a>

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

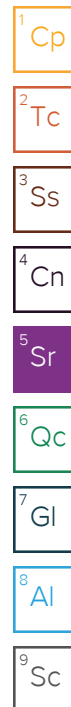
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00418		0.00100	1	11/19/2020 00:13	<a href="#">WG1578787</a>
Toluene	0.124		0.00500	1	11/19/2020 00:13	<a href="#">WG1578787</a>
Ethylbenzene	0.0162		0.00250	1	11/19/2020 00:13	<a href="#">WG1578787</a>
Total Xylenes	0.585		0.00650	1	11/19/2020 00:13	<a href="#">WG1578787</a>
(S) Toluene- <i>d</i> 8	113		75.0-131		11/19/2020 00:13	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	94.3		67.0-138		11/19/2020 00:13	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane- <i>d</i> 4	105		70.0-130		11/19/2020 00:13	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	163		8.00	2	11/22/2020 00:02	<a href="#">WG1578504</a>
(S) <i>o</i> -Terphenyl	173	<a href="#">J1</a>	18.0-148		11/22/2020 00:02	<a href="#">WG1578504</a>

## Sample Narrative:

L1284966-02 WG1578504: Surrogate failure due to matrix interference





Collected date/time: 11/09/20 14:28

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.69		1	11/19/2020 12:27	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1200		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	2.79		0.100	1	11/18/2020 04:54	<a href="#">WG1577975</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	88.3		77.0-120		11/18/2020 04:54	<a href="#">WG1577975</a>

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

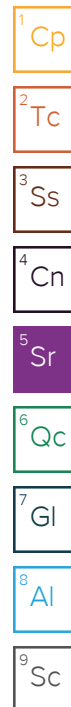
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0153		0.00100	1	11/19/2020 00:32	<a href="#">WG1578787</a>
Toluene	0.573		0.00500	1	11/19/2020 00:32	<a href="#">WG1578787</a>
Ethylbenzene	0.0693		0.00250	1	11/19/2020 00:32	<a href="#">WG1578787</a>
Total Xylenes	1.25		0.00650	1	11/19/2020 00:32	<a href="#">WG1578787</a>
(S) <i>Toluene-d8</i>	115		75.0-131		11/19/2020 00:32	<a href="#">WG1578787</a>
(S) <i>4-Bromofluorobenzene</i>	95.1		67.0-138		11/19/2020 00:32	<a href="#">WG1578787</a>
(S) <i>1,2-Dichloroethane-d4</i>	108		70.0-130		11/19/2020 00:32	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	122		8.00	2	11/22/2020 00:15	<a href="#">WG1578504</a>
(S) <i>o</i> -Terphenyl	163	<a href="#">J1</a>	18.0-148		11/22/2020 00:15	<a href="#">WG1578504</a>

## Sample Narrative:

L1284966-03 WG1578504: Surrogate failure due to matrix interference







Collected date/time: 11/09/20 14:32

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.73		1	11/19/2020 12:29	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1400		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	4.54		0.100	1	11/18/2020 05:14	<a href="#">WG1577975</a>
(S) a,a,a-Trifluorotoluene(FID)	89.5		77.0-120		11/18/2020 05:14	<a href="#">WG1577975</a>

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

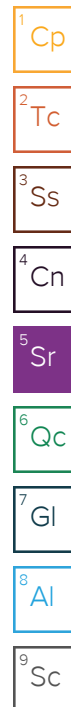
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0368		0.00100	1	11/19/2020 00:51	<a href="#">WG1578787</a>
Toluene	0.856		0.00500	1	11/19/2020 00:51	<a href="#">WG1578787</a>
Ethylbenzene	0.106		0.00250	1	11/19/2020 00:51	<a href="#">WG1578787</a>
Total Xylenes	1.62		0.00650	1	11/19/2020 00:51	<a href="#">WG1578787</a>
(S) Toluene-d8	112		75.0-131		11/19/2020 00:51	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	96.7		67.0-138		11/19/2020 00:51	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane-d4	104		70.0-130		11/19/2020 00:51	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	137		8.00	2	11/22/2020 00:29	<a href="#">WG1578504</a>
(S) o-Terphenyl	154	J1	18.0-148		11/22/2020 00:29	<a href="#">WG1578504</a>

## Sample Narrative:

L1284966-04 WG1578504: Surrogate failure due to matrix interference





Collected date/time: 11/09/20 14:45

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.09		1	11/19/2020 12:32	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1370		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

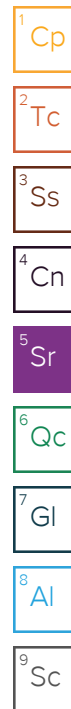
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	8.72		0.100	1	11/18/2020 05:35	<a href="#">WG1577975</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	86.1		77.0-120		11/18/2020 05:35	<a href="#">WG1577975</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0282		0.00100	1	11/19/2020 01:10	<a href="#">WG1578787</a>
Toluene	1.24		0.00500	1	11/19/2020 01:10	<a href="#">WG1578787</a>
Ethylbenzene	0.251		0.00250	1	11/19/2020 01:10	<a href="#">WG1578787</a>
Total Xylenes	3.89		0.00650	1	11/19/2020 01:10	<a href="#">WG1578787</a>
(S) <i>Toluene-d8</i>	114		75.0-131		11/19/2020 01:10	<a href="#">WG1578787</a>
(S) <i>4-Bromofluorobenzene</i>	97.6		67.0-138		11/19/2020 01:10	<a href="#">WG1578787</a>
(S) <i>1,2-Dichloroethane-d4</i>	103		70.0-130		11/19/2020 01:10	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	62.0		40.0	10	11/20/2020 03:35	<a href="#">WG1578865</a>
(S) <i>o</i> -Terphenyl	104		18.0-148		11/20/2020 03:35	<a href="#">WG1578865</a>





Collected date/time: 11/09/20 15:00

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	34.4		1	11/19/2020 12:35	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2740		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	2750		50.0	500	11/18/2020 06:38	<a href="#">WG1577975</a>
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		11/18/2020 06:38	<a href="#">WG1577975</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.364		0.0400	40	11/19/2020 04:39	<a href="#">WG1578787</a>
Toluene	12.1		0.200	40	11/19/2020 04:39	<a href="#">WG1578787</a>
Ethylbenzene	2.71		0.100	40	11/19/2020 04:39	<a href="#">WG1578787</a>
Total Xylenes	44.8		0.260	40	11/19/2020 04:39	<a href="#">WG1578787</a>
(S) Toluene-d8	108		75.0-131		11/19/2020 04:39	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	106		67.0-138		11/19/2020 04:39	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane-d4	112		70.0-130		11/19/2020 04:39	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1140		40.0	10	11/20/2020 03:49	<a href="#">WG1578865</a>
(S) o-Terphenyl	106		18.0-148		11/20/2020 03:49	<a href="#">WG1578865</a>

<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





Collected date/time: 11/09/20 15:15

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	37.7		1	11/19/2020 12:37	WG1575967

<sup>1</sup> Cp<sup>2</sup> Tc

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2600		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

<sup>3</sup> Ss<sup>4</sup> Cn

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3830		200	2000	11/19/2020 19:35	<a href="#">WG1579462</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	95.0		77.0-120		11/19/2020 19:35	<a href="#">WG1579462</a>

<sup>5</sup> Sr<sup>6</sup> Qc<sup>7</sup> Gl

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.175		0.0200	20	11/19/2020 04:58	<a href="#">WG1578787</a>
Toluene	10.7		0.100	20	11/19/2020 04:58	<a href="#">WG1578787</a>
Ethylbenzene	3.09		0.0500	20	11/19/2020 04:58	<a href="#">WG1578787</a>
Total Xylenes	49.9		0.130	20	11/19/2020 04:58	<a href="#">WG1578787</a>
(S) <i>Toluene-d8</i>	114		75.0-131		11/19/2020 04:58	<a href="#">WG1578787</a>
(S) <i>4-Bromofluorobenzene</i>	115		67.0-138		11/19/2020 04:58	<a href="#">WG1578787</a>
(S) <i>1,2-Dichloroethane-d4</i>	105		70.0-130		11/19/2020 04:58	<a href="#">WG1578787</a>

<sup>8</sup> Al<sup>9</sup> Sc

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1610		40.0	10	11/20/2020 04:02	<a href="#">WG1578865</a>
(S) <i>o</i> -Terphenyl	76.4		18.0-148		11/20/2020 04:02	<a href="#">WG1578865</a>



Collected date/time: 11/09/20 15:55

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	36.9		1	11/19/2020 12:40	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	30100		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	426		10.0	100	11/18/2020 05:56	<a href="#">WG1577975</a>
(S) a,a,a-Trifluorotoluene(FID)	100		77.0-120		11/18/2020 05:56	<a href="#">WG1577975</a>

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

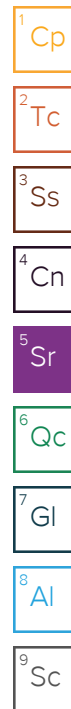
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.383		0.00800	8	11/19/2020 05:17	<a href="#">WG1578787</a>
Toluene	4.62		0.0400	8	11/19/2020 05:17	<a href="#">WG1578787</a>
Ethylbenzene	0.642		0.0200	8	11/19/2020 05:17	<a href="#">WG1578787</a>
Total Xylenes	9.23		0.0520	8	11/19/2020 05:17	<a href="#">WG1578787</a>
(S) Toluene-d8	109		75.0-131		11/19/2020 05:17	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	102		67.0-138		11/19/2020 05:17	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane-d4	110		70.0-130		11/19/2020 05:17	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	262		40.0	10	11/20/2020 04:15	<a href="#">WG1578865</a>
(S) o-Terphenyl	160	<a href="#">J1</a>	18.0-148		11/20/2020 04:15	<a href="#">WG1578865</a>

## Sample Narrative:

L1284966-08 WG1578865: Surrogate failure due to matrix interference





Collected date/time: 11/10/20 09:21

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	32.9		1	11/19/2020 12:43	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	30000		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

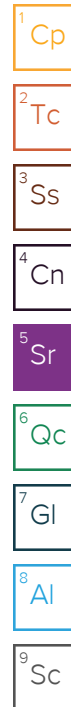
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	10.1		2.50	25	11/19/2020 19:12	<a href="#">WG1579434</a>
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	94.7		77.0-120		11/19/2020 19:12	<a href="#">WG1579434</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0309		0.00100	1	11/19/2020 01:29	<a href="#">WG1578787</a>
Toluene	0.767		0.00500	1	11/19/2020 01:29	<a href="#">WG1578787</a>
Ethylbenzene	0.176		0.00250	1	11/19/2020 01:29	<a href="#">WG1578787</a>
Total Xylenes	2.69		0.00650	1	11/19/2020 01:29	<a href="#">WG1578787</a>
(S) Toluene- <i>d</i> 8	114		75.0-131		11/19/2020 01:29	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	101		67.0-138		11/19/2020 01:29	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane- <i>d</i> 4	108		70.0-130		11/19/2020 01:29	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	114	<a href="#">J3 J6</a>	40.0	10	11/20/2020 04:29	<a href="#">WG1578865</a>
(S) <i>o</i> -Terphenyl	110		18.0-148		11/20/2020 04:29	<a href="#">WG1578865</a>







Collected date/time: 11/10/20 09:50

L1284966

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	24.3		1	11/19/2020 12:11	WG1575967

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2660		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	6.52		0.100	1	11/18/2020 06:35	<a href="#">WG1577977</a>
(S) a,a,a-Trifluorotoluene(FID)	72.2	<a href="#">J2</a>	77.0-120		11/18/2020 06:35	<a href="#">WG1577977</a>

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

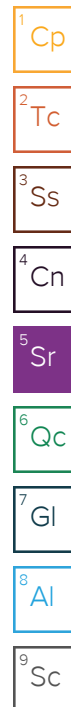
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0616		0.00100	1	11/19/2020 01:48	<a href="#">WG1578787</a>
Toluene	0.595		0.00500	1	11/19/2020 01:48	<a href="#">WG1578787</a>
Ethylbenzene	0.0678		0.00250	1	11/19/2020 01:48	<a href="#">WG1578787</a>
Total Xylenes	1.18		0.00650	1	11/19/2020 01:48	<a href="#">WG1578787</a>
(S) Toluene-d8	114		75.0-131		11/19/2020 01:48	<a href="#">WG1578787</a>
(S) 4-Bromofluorobenzene	98.1		67.0-138		11/19/2020 01:48	<a href="#">WG1578787</a>
(S) 1,2-Dichloroethane-d4	99.1		70.0-130		11/19/2020 01:48	<a href="#">WG1578787</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	162		40.0	10	11/20/2020 05:08	<a href="#">WG1578865</a>
(S) o-Terphenyl	155	<a href="#">J1</a>	18.0-148		11/20/2020 05:08	<a href="#">WG1578865</a>

## Sample Narrative:

L1284966-10 WG1578865: Surrogate failure due to matrix interference





Method Blank (MB)

(MB) R3595218-1 11/19/20 20:05

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

<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

L1284966-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1284966-10 11/19/20 20:05 • (DUP) R3595218-3 11/19/20 20:05

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2660	2660	1	0.0752		20

L1286058-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1286058-08 11/19/20 20:05 • (DUP) R3595218-4 11/19/20 20:05

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	554	557	1	0.540		20

Laboratory Control Sample (LCS)

(LCS) R3595218-2 11/19/20 20:05

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	483	480	99.4	85.0-115	



Method Blank (MB)

(MB) R3595180-2 11/17/20 22:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	107			77.0-120

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Laboratory Control Sample (LCS)

(LCS) R3595180-1 11/17/20 21:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.11	111	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			107	77.0-120	

L1284966-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1284966-08 11/18/20 05:56 • (MS) R3595180-3 11/18/20 06:59 • (MSD) R3595180-4 11/18/20 07:19

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	550	426	1090	946	121	94.5	100	10.0-151			14.1	28
(S) a,a,a-Trifluorotoluene(FID)					105	104		77.0-120				



Method Blank (MB)

(MB) R3595161-2 11/18/20 01:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0220	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	95.0			77.0-120

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Laboratory Control Sample (LCS)

(LCS) R3595161-1 11/18/20 00:34

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)			111	77.0-120	

L1284969-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1284969-01 11/18/20 06:56 • (MS) R3595161-3 11/18/20 20:02 • (MSD) R3595161-4 11/18/20 20:22

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	103	ND	96.9	94.8	93.0	91.0	25	10.0-151			2.19	28
(S) a,a,a-Trifluorotoluene(FID)					112	105		77.0-120				

Method Blank (MB)

(MB) R3595390-2 11/19/20 18:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	105			77.0-120

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

Laboratory Control Sample (LCS)

(LCS) R3595390-1 11/19/20 17:27

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.67	103	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			102	77.0-120	

Method Blank (MB)

(MB) R3595392-2 11/19/20 18:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	105			77.0-120

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Laboratory Control Sample (LCS)

(LCS) R3595392-1 11/19/20 17:27

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.67	103	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			102	77.0-120	



Method Blank (MB)

(MB) R3595468-2 11/18/20 22:18

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
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	107			75.0-131
(S) 4-Bromofluorobenzene	94.7			67.0-138
(S) 1,2-Dichloroethane-d4	111			70.0-130

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

Laboratory Control Sample (LCS)

(LCS) R3595468-1 11/18/20 21:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.130	104	70.0-123	
Ethylbenzene	0.125	0.134	107	74.0-126	
Toluene	0.125	0.125	100	75.0-121	
Xylenes, Total	0.375	0.415	111	72.0-127	
(S) Toluene-d8			105	75.0-131	
(S) 4-Bromofluorobenzene			103	67.0-138	
(S) 1,2-Dichloroethane-d4			121	70.0-130	

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc





Method Blank (MB)

(MB) R3595919-1 11/21/20 00:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	89.9			18.0-148

<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) R3595919-2 11/21/20 00:28

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	44.2	88.4	50.0-150	
(S) o-Terphenyl			112	18.0-148	



Method Blank (MB)

(MB) R3595626-1 11/20/20 00:03

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	73.0			18.0-148

<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) R3595626-2 11/20/20 00:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	36.0	72.0	50.0-150	
(S) o-Terphenyl			90.5	18.0-148	

L1284966-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1284966-09 11/20/20 04:29 • (MS) R3595626-3 11/20/20 04:42 • (MSD) R3595626-4 11/20/20 04:55

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	47.3	114	137	180	48.6	140	10	50.0-150	J6	J3	27.1	20
(S) o-Terphenyl					45.2	162		18.0-148		J1		



## 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.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
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.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* 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 National.

## State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico <sup>1</sup>	n/a
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>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

## Third Party Federal Accreditations

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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.





CAERUS OIL & GAS  
143 Diamond Ave  
Parachute, CO

Billing Information:

SAME

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page \_\_\_ of \_\_\_



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

L# 4781966

Table # B213

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks Sample # (lab only)

Report to:  
Brett Middleton, Blair Rollins

Email To: CAERUS GROUP &  
REMEDIATION @ CONFLUENCE-CC

Project  
Description: UNOCAL 4

City/State  
Collected: Parachute,  
CO

Phone:  
Fax:  
Client Project #  
UNOCAL 4

Lab Project #

Collected by (print):  
B. COCINA

Site/Facility ID #  
UNOCAL 4

P.O. #

Collected by (signature):  
Brett Corina

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

STD TAT

No.  
of  
Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH (GRO/DRO)	BTEX	EC, SAR
20201109-UNOCAL 4-SB01@6-10'	G	SS	6-10'	11/9/20	1417	3	X	X	X
20201109-UNOCAL 4-SB01@10-15'			10-15'		1420	3	X	X	X
20201109-UNOCAL 4-SB01@15-20'			15-20'		1428	3	X	X	X
20201109-UNOCAL 4-SB01@20-25'			20-25'		1432	3	X	X	X
20201109-UNOCAL 4-SB01@25-30'			25-30'		1445	3	X	X	X
20201109-UNOCAL 4-SB01@30-35'			30-35'		1500	2	X	X	X
20201109-UNOCAL 4-SB01@35-40'			35-40'		1515	2	X	X	X
20201109-UNOCAL 4-SB01@45-50'			45-50'	↓	1555	2	X	X	X
20201110-UNOCAL 4-SB01@50-55'			50-55'	11/10/20	0921	2	X	X	X
20201110-UNOCAL 4-SB01@55-60'	↓	↓	55-60'	↓	0950	2	X	X	X

\* 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 #

Relinquished by: (Signature)

Brett Corina

Date:  
11/11/2020

Time:  
1300

Received by: (Signature)

Received by: (Signature)

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

Temp: 15.10°C  
Bottles Received: 35

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

If preservation required by Login: Date/Time

Relinquished by: (Signature)

Date:  
11/11/2020

Time:  
1700

Received for lab by: (Signature)

Date:  
11/12/20

Time:  
9:00

Hold:

Condition:  
NCF / OK

November 25, 2020

<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

## Caerus Oil and Gas

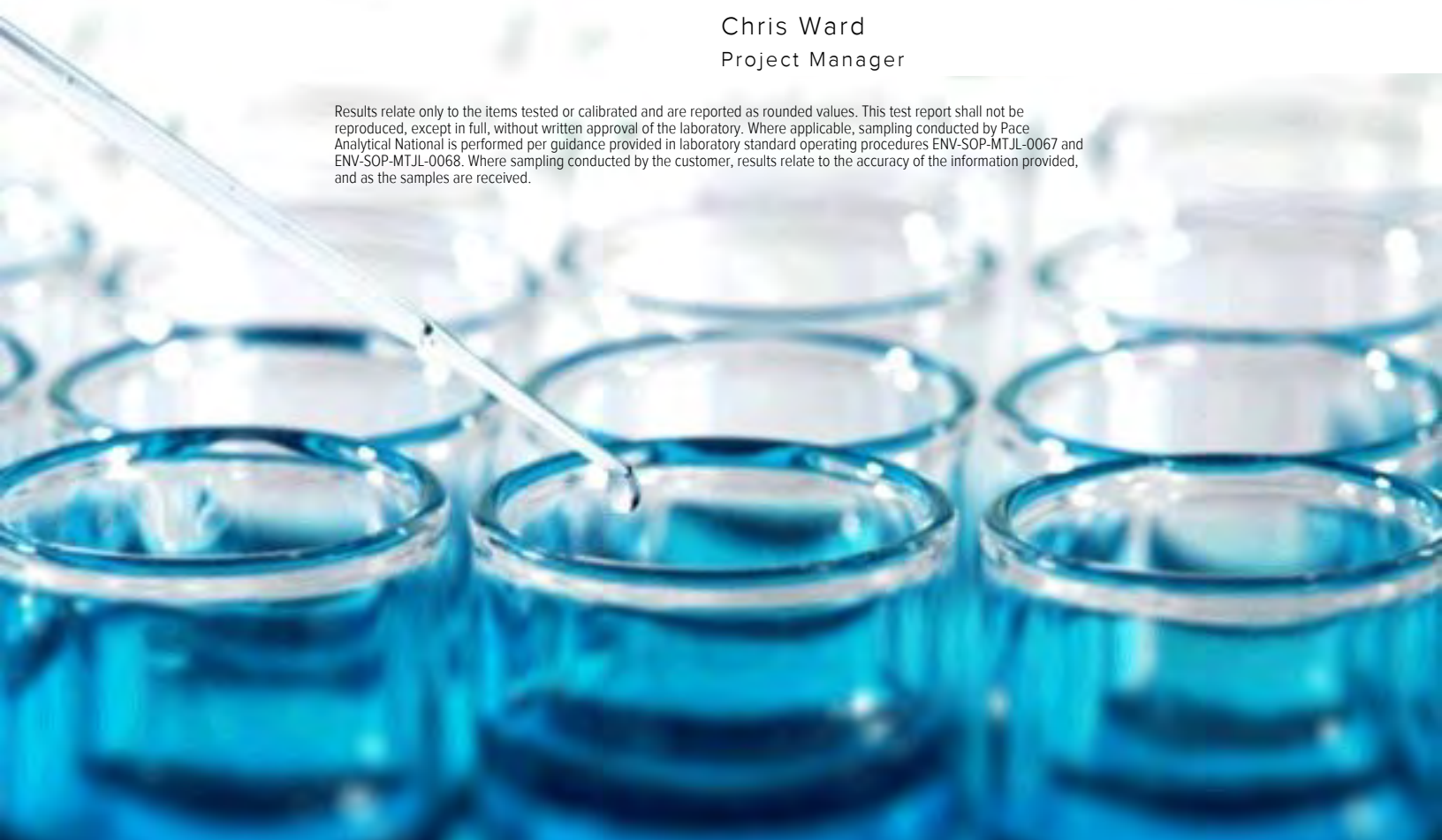
Sample Delivery Group: L1286058  
Samples Received: 11/14/2020  
Project Number: UNOCAL 4  
Description:  
Site: UNOCAL 4  
Report To: Chris Hines  
143 Diamond Avenue  
Parachute, CO 81635

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.





<b>Cp: Cover Page</b>	<b>1</b>
<b>Tc: Table of Contents</b>	<b>2</b>
<b>Ss: Sample Summary</b>	<b>3</b>
<b>Cn: Case Narrative</b>	<b>5</b>
<b>Sr: Sample Results</b>	<b>6</b>
20201112-UNOCAL4-SB02@15-20' L1286058-01	6
20201112-UNOCAL4-SB02@30-35' L1286058-02	7
20201112-UNOCAL4-SB02@45-50' L1286058-03	8
20201112-UNOCAL4-SB02@59-61' L1286058-04	9
20201112-UNOCAL4-SB03@15-17' L1286058-05	10
20201112-UNOCAL4-SB03@35-37' L1286058-06	11
20201112-UNOCAL4-SB03@50-52' L1286058-07	12
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<b>Qc: Quality Control Summary</b>	<b>14</b>
Wet Chemistry by Method 9050AMod	14
Volatile Organic Compounds (GC) by Method 8015D/GRO	16
Volatile Organic Compounds (GC/MS) by Method 8260B	18
Semi-Volatile Organic Compounds (GC) by Method 8015	19
<b>Gl: Glossary of Terms</b>	<b>21</b>
<b>Al: Accreditations &amp; Locations</b>	<b>22</b>
<b>Sc: Sample Chain of Custody</b>	<b>23</b>





## 20201112-UNOCAL4-SB02@15-20' L1286058-01 Solid

Collected by B. Cocina  
Collected date/time 11/12/20 08:50  
Received date/time 11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:00	11/23/20 13:00	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1580088	1	11/21/20 15:10	11/21/20 15:54	KLS	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 10:26	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 03:04	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1580903	2	11/24/20 09:24	11/24/20 18:29	TJD	Mt. Juliet, TN

<sup>1</sup> Cp<sup>2</sup> Tc<sup>3</sup> Ss<sup>4</sup> Cn

## 20201112-UNOCAL4-SB02@30-35' L1286058-02 Solid

Collected by B. Cocina  
Collected date/time 11/12/20 09:30  
Received date/time 11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:03	11/23/20 13:03	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 10:47	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 03:23	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1580903	2	11/24/20 09:24	11/24/20 18:42	TJD	Mt. Juliet, TN

<sup>5</sup> Sr<sup>6</sup> Qc<sup>7</sup> Gl<sup>8</sup> Al

## 20201112-UNOCAL4-SB02@45-50' L1286058-03 Solid

Collected by B. Cocina  
Collected date/time 11/12/20 10:40  
Received date/time 11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:05	11/23/20 13:05	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 11:07	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 03:42	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	1	11/24/20 09:23	11/24/20 20:41	TJD	Mt. Juliet, TN

<sup>9</sup> Sc

## 20201112-UNOCAL4-SB02@59-61' L1286058-04 Solid

Collected by B. Cocina  
Collected date/time 11/12/20 12:10  
Received date/time 11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:08	11/23/20 13:08	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 11:28	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 04:01	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	1	11/24/20 09:23	11/24/20 20:54	TJD	Mt. Juliet, TN

## 20201112-UNOCAL4-SB03@15-17' L1286058-05 Solid

Collected by B. Cocina  
Collected date/time 11/12/20 12:50  
Received date/time 11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:11	11/23/20 13:11	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 11:48	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 04:21	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	10	11/24/20 09:23	11/24/20 21:45	TJD	Mt. Juliet, TN



## 20201112-UNOCAL4-SB03@35-37' L1286058-06 Solid

Collected by  
B. Cocina

Collected date/time  
11/12/20 14:00

Received date/time  
11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:14	11/23/20 13:14	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 12:09	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 04:40	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	1	11/24/20 09:23	11/24/20 21:07	TJD	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

## 20201112-UNOCAL4-SB03@50-52' L1286058-07 Solid

Collected by  
B. Cocina

Collected date/time  
11/12/20 14:50

Received date/time  
11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:17	11/23/20 13:17	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581215	1	11/20/20 11:40	11/24/20 12:30	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 04:59	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	20	11/24/20 09:23	11/24/20 21:32	TJD	Mt. Juliet, TN

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

## 20201112-UNOCAL4-SB03@59-61' L1286058-08 Solid

Collected by  
B. Cocina

Collected date/time  
11/12/20 15:30

Received date/time  
11/14/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1579937	1	11/23/20 13:20	11/23/20 13:20	CCE	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1578696	1	11/19/20 19:00	11/19/20 20:05	JIC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1581216	1	11/20/20 11:40	11/24/20 08:39	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1580786	1	11/20/20 11:40	11/23/20 05:18	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1581254	1	11/24/20 09:23	11/24/20 21:19	TJD	Mt. Juliet, TN

<sup>9</sup> Sc





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

<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



Collected date/time: 11/12/20 08:50

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.75		1	11/23/2020 13:00	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	957		10.0	1	11/21/2020 15:54	<a href="#">WG1580088</a>

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

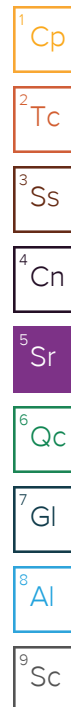
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.607		0.100	1	11/24/2020 10:26	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	92.1		77.0-120		11/24/2020 10:26	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/23/2020 03:04	<a href="#">WG1580786</a>
Toluene	ND	<a href="#">J5</a>	0.00500	1	11/23/2020 03:04	<a href="#">WG1580786</a>
Ethylbenzene	ND		0.00250	1	11/23/2020 03:04	<a href="#">WG1580786</a>
Total Xylenes	0.0117	<a href="#">J5</a>	0.00650	1	11/23/2020 03:04	<a href="#">WG1580786</a>
(S) Toluene-d8	113		75.0-131		11/23/2020 03:04	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	93.1		67.0-138		11/23/2020 03:04	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	100		70.0-130		11/23/2020 03:04	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	173		8.00	2	11/24/2020 18:29	<a href="#">WG1580903</a>
(S) o-Terphenyl	76.7		18.0-148		11/24/2020 18:29	<a href="#">WG1580903</a>





Collected date/time: 11/12/20 09:30

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.08		1	11/23/2020 13:03	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	705		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

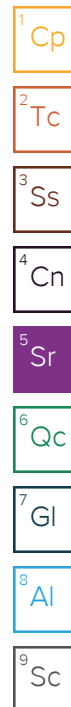
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.622		0.100	1	11/24/2020 10:47	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	90.9		77.0-120		11/24/2020 10:47	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00178		0.00100	1	11/23/2020 03:23	<a href="#">WG1580786</a>
Toluene	0.00915		0.00500	1	11/23/2020 03:23	<a href="#">WG1580786</a>
Ethylbenzene	ND		0.00250	1	11/23/2020 03:23	<a href="#">WG1580786</a>
Total Xylenes	0.0298		0.00650	1	11/23/2020 03:23	<a href="#">WG1580786</a>
(S) Toluene-d8	114		75.0-131		11/23/2020 03:23	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	90.1		67.0-138		11/23/2020 03:23	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	103		70.0-130		11/23/2020 03:23	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	176		8.00	2	11/24/2020 18:42	<a href="#">WG1580903</a>
(S) o-Terphenyl	98.8		18.0-148		11/24/2020 18:42	<a href="#">WG1580903</a>





Collected date/time: 11/12/20 10:40

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.82		1	11/23/2020 13:05	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	467		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

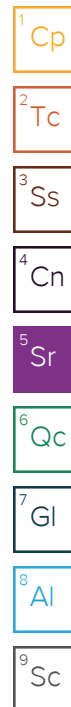
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.560		0.100	1	11/24/2020 11:07	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	88.3		77.0-120		11/24/2020 11:07	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/23/2020 03:42	<a href="#">WG1580786</a>
Toluene	ND		0.00500	1	11/23/2020 03:42	<a href="#">WG1580786</a>
Ethylbenzene	ND		0.00250	1	11/23/2020 03:42	<a href="#">WG1580786</a>
Total Xylenes	ND		0.00650	1	11/23/2020 03:42	<a href="#">WG1580786</a>
(S) Toluene-d8	113		75.0-131		11/23/2020 03:42	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	90.8		67.0-138		11/23/2020 03:42	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	103		70.0-130		11/23/2020 03:42	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	52.9		4.00	1	11/24/2020 20:41	<a href="#">WG1581254</a>
(S) o-Terphenyl	64.3		18.0-148		11/24/2020 20:41	<a href="#">WG1581254</a>





Collected date/time: 11/12/20 12:10

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.33		1	11/23/2020 13:08	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	838		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

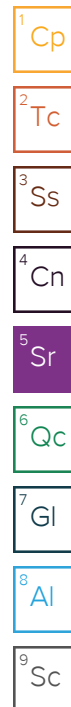
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.71		0.100	1	11/24/2020 11:28	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	81.9		77.0-120		11/24/2020 11:28	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/23/2020 04:01	<a href="#">WG1580786</a>
Toluene	ND		0.00500	1	11/23/2020 04:01	<a href="#">WG1580786</a>
Ethylbenzene	ND		0.00250	1	11/23/2020 04:01	<a href="#">WG1580786</a>
Total Xylenes	0.0135		0.00650	1	11/23/2020 04:01	<a href="#">WG1580786</a>
(S) Toluene-d8	114		75.0-131		11/23/2020 04:01	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	87.9		67.0-138		11/23/2020 04:01	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	105		70.0-130		11/23/2020 04:01	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	68.0		4.00	1	11/24/2020 20:54	<a href="#">WG1581254</a>
(S) o-Terphenyl	48.8		18.0-148		11/24/2020 20:54	<a href="#">WG1581254</a>







Collected date/time: 11/12/20 12:50

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.96		1	11/23/2020 13:11	WG1579937

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	660		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.13		0.100	1	11/24/2020 11:48	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	87.0		77.0-120		11/24/2020 11:48	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00258		0.00100	1	11/23/2020 04:21	<a href="#">WG1580786</a>
Toluene	0.0266		0.00500	1	11/23/2020 04:21	<a href="#">WG1580786</a>
Ethylbenzene	0.00570		0.00250	1	11/23/2020 04:21	<a href="#">WG1580786</a>
Total Xylenes	0.124		0.00650	1	11/23/2020 04:21	<a href="#">WG1580786</a>
(S) Toluene-d8	111		75.0-131		11/23/2020 04:21	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	90.5		67.0-138		11/23/2020 04:21	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	107		70.0-130		11/23/2020 04:21	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	169		40.0	10	11/24/2020 21:45	<a href="#">WG1581254</a>
(S) o-Terphenyl	152	J1	18.0-148		11/24/2020 21:45	<a href="#">WG1581254</a>

## Sample Narrative:

L1286058-05 WG1581254: Surrogate failure due to matrix interference



Collected date/time: 11/12/20 14:00

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.32		1	11/23/2020 13:14	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	524		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

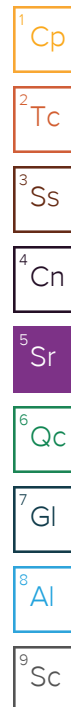
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.62		0.100	1	11/24/2020 12:09	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	87.3		77.0-120		11/24/2020 12:09	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00455		0.00100	1	11/23/2020 04:40	<a href="#">WG1580786</a>
Toluene	0.0345		0.00500	1	11/23/2020 04:40	<a href="#">WG1580786</a>
Ethylbenzene	0.00750		0.00250	1	11/23/2020 04:40	<a href="#">WG1580786</a>
Total Xylenes	0.0562		0.00650	1	11/23/2020 04:40	<a href="#">WG1580786</a>
(S) Toluene-d8	112		75.0-131		11/23/2020 04:40	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	90.4		67.0-138		11/23/2020 04:40	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	107		70.0-130		11/23/2020 04:40	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	115		4.00	1	11/24/2020 21:07	<a href="#">WG1581254</a>
(S) o-Terphenyl	70.6		18.0-148		11/24/2020 21:07	<a href="#">WG1581254</a>





Collected date/time: 11/12/20 14:50

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.15		1	11/23/2020 13:17	WG1579937

<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

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	944		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	3.37		0.100	1	11/24/2020 12:30	<a href="#">WG1581215</a>
(S) a,a,a-Trifluorotoluene(FID)	75.1	<a href="#">J2</a>	77.0-120		11/24/2020 12:30	<a href="#">WG1581215</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0197		0.00100	1	11/23/2020 04:59	<a href="#">WG1580786</a>
Toluene	0.0985		0.00500	1	11/23/2020 04:59	<a href="#">WG1580786</a>
Ethylbenzene	0.0106		0.00250	1	11/23/2020 04:59	<a href="#">WG1580786</a>
Total Xylenes	0.297		0.00650	1	11/23/2020 04:59	<a href="#">WG1580786</a>
(S) Toluene-d8	110		75.0-131		11/23/2020 04:59	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	91.6		67.0-138		11/23/2020 04:59	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	105		70.0-130		11/23/2020 04:59	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	325		80.0	20	11/24/2020 21:32	<a href="#">WG1581254</a>
(S) o-Terphenyl	0.000	<a href="#">J7</a>	18.0-148		11/24/2020 21:32	<a href="#">WG1581254</a>



Collected date/time: 11/12/20 15:30

L1286058

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.66		1	11/23/2020 13:20	WG1579937

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	554		10.0	1	11/19/2020 20:05	<a href="#">WG1578696</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.685		0.100	1	11/24/2020 08:39	<a href="#">WG1581216</a>
(S) a,a,a-Trifluorotoluene(FID)	88.0		77.0-120		11/24/2020 08:39	<a href="#">WG1581216</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00153		0.00100	1	11/23/2020 05:18	<a href="#">WG1580786</a>
Toluene	0.0165		0.00500	1	11/23/2020 05:18	<a href="#">WG1580786</a>
Ethylbenzene	0.00358		0.00250	1	11/23/2020 05:18	<a href="#">WG1580786</a>
Total Xylenes	0.0590		0.00650	1	11/23/2020 05:18	<a href="#">WG1580786</a>
(S) Toluene-d8	114		75.0-131		11/23/2020 05:18	<a href="#">WG1580786</a>
(S) 4-Bromofluorobenzene	93.3		67.0-138		11/23/2020 05:18	<a href="#">WG1580786</a>
(S) 1,2-Dichloroethane-d4	106		70.0-130		11/23/2020 05:18	<a href="#">WG1580786</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	171		4.00	1	11/24/2020 21:19	<a href="#">WG1581254</a>
(S) o-Terphenyl	77.7		18.0-148		11/24/2020 21:19	<a href="#">WG1581254</a>

<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) R3595218-1 11/19/20 20:05

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

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1284966-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1284966-10 11/19/20 20:05 • (DUP) R3595218-3 11/19/20 20:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	2660	2660	1	0.0752		20

L1286058-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1286058-08 11/19/20 20:05 • (DUP) R3595218-4 11/19/20 20:05

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	554	557	1	0.540		20

Laboratory Control Sample (LCS)

(LCS) R3595218-2 11/19/20 20:05

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	umhos/cm	umhos/cm	%	%	
Specific Conductance	483	480	99.4	85.0-115	





Method Blank (MB)

(MB) R3595907-1 11/21/20 15:54

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

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

L1286058-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1286058-01 11/21/20 15:54 • (DUP) R3595907-3 11/21/20 15:54

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	957	947	1	1.05		20

Laboratory Control Sample (LCS)

(LCS) R3595907-2 11/21/20 15:54

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	483	480	99.4	85.0-115	

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3596927-2 11/24/20 05:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0304	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	96.3			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

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

(LCS) R3596927-1 11/24/20 04:21 • (LCSD) R3596927-3 11/24/20 13:52

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	6.42	6.36	117	116	72.0-127			0.939	20
(S) a,a,a-Trifluorotoluene(FID)				114	113	77.0-120				



Method Blank (MB)

(MB) R3596984-2 11/24/20 06:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	104			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3596984-1 11/24/20 06:04

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.88	107	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			103	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3596566-2 11/23/20 01:20

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
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	111			75.0-131
(S) 4-Bromofluorobenzene	90.6			67.0-138
(S) 1,2-Dichloroethane-d4	106			70.0-130

<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) R3596566-1 11/23/20 00:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.123	98.4	70.0-123	
Ethylbenzene	0.125	0.120	96.0	74.0-126	
Toluene	0.125	0.122	97.6	75.0-121	
Xylenes, Total	0.375	0.353	94.1	72.0-127	
(S) Toluene-d8			105	75.0-131	
(S) 4-Bromofluorobenzene			91.9	67.0-138	
(S) 1,2-Dichloroethane-d4			114	70.0-130	

L1286058-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1286058-01 11/23/20 03:04 • (MS) R3596566-3 11/23/20 08:46 • (MSD) R3596566-4 11/23/20 09:06

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	ND	0.111	0.130	88.8	104	1	10.0-149			15.8	37
Ethylbenzene	0.125	ND	0.123	0.140	98.4	112	1	10.0-160			12.9	38
Toluene	0.125	ND	0.292	0.295	234	236	1	10.0-156	J5	J5	1.02	38
Xylenes, Total	0.375	0.0117	2.08	2.06	552	546	1	10.0-160	J5	J5	0.966	38
(S) Toluene-d8					114	112		75.0-131				
(S) 4-Bromofluorobenzene					118	116		67.0-138				
(S) 1,2-Dichloroethane-d4					104	107		70.0-130				

Method Blank (MB)

(MB) R3597124-1 11/24/20 13:37

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	86.2			18.0-148

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

Laboratory Control Sample (LCS)

(LCS) R3597124-2 11/24/20 13:50

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	
TPH (GC/FID) High Fraction	50.0	45.5	91.0	50.0-150	
(S) o-Terphenyl			107	18.0-148	

L1286041-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1286041-01 11/24/20 17:36 • (MS) R3597124-3 11/24/20 17:49 • (MSD) R3597124-4 11/24/20 18:02

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
TPH (GC/FID) High Fraction	48.9	32.3	64.4	65.5	65.6	67.8	1	50.0-150			1.69	20
(S) o-Terphenyl					73.2	88.5		18.0-148				

7Gl

8Al

9Sc





Method Blank (MB)

(MB) R3597139-1 11/24/20 16:52

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	83.8			18.0-148

<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) R3597139-2 11/24/20 17:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	41.6	83.2	50.0-150	
(S) o-Terphenyl			88.7	18.0-148	

L1286703-18 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1286703-18 11/24/20 19:50 • (MS) R3597139-3 11/24/20 17:56 • (MSD) R3597139-4 11/24/20 18:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	47.7	ND	43.1	40.2	90.4	84.8	1	50.0-150			6.96	20
(S) o-Terphenyl					92.0	88.6		18.0-148				



## 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.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

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



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* 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 National.

## State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico <sup>1</sup>	n/a
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>	90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

## Third Party Federal Accreditations

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

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



