

## Caerus Oil and Gas

Sample Delivery Group: L1485085  
Samples Received: 04/21/2022  
Project Number:  
Description: Garden Gulch 8" Water Line Release  
Site: LATHAM LAYDOWN YARD  
Report To: Brett Middleton  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward  
Project Manager

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## Pace Analytical National

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# SAMPLE SUMMARY

20220419-GARDEN\_GULCH\_8"-SSW@7' L1485085-01 Solid

Collected by  
Alex Slorby

Collected date/time  
04/19/22 10:30

Received date/time  
04/21/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1853666	1	04/29/22 21:27	04/29/22 21:27	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1853625	1	04/27/22 18:30	04/28/22 15:58	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1855618	1	04/28/22 11:00	04/28/22 13:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1853898	1	04/27/22 10:02	04/28/22 09:48	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1853591	1	04/25/22 16:49	04/27/22 17:51	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1853680	1	04/27/22 16:45	04/29/22 20:21	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1853592	5	04/25/22 16:54	04/26/22 15:53	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1853596	1	04/24/22 08:21	04/25/22 13:55	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1853543	1	04/24/22 08:21	04/24/22 15:53	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1855179	1	04/28/22 08:19	04/28/22 11:57	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1854729	1	04/27/22 03:33	04/27/22 16:55	AMG	Mt. Juliet, TN

20220419-GARDEN\_GULCH\_8"-WSW@6.5' L1485085-02 Solid

Collected by  
Alex Slorby

Collected date/time  
04/19/22 10:50

Received date/time  
04/21/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1853666	1	04/29/22 21:30	04/29/22 21:30	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1853625	1	04/27/22 18:30	04/28/22 16:24	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1855618	1	04/28/22 11:00	04/28/22 13:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1853898	1	04/27/22 10:02	04/28/22 09:48	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1853591	1	04/25/22 16:49	04/27/22 17:59	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1853680	1	04/27/22 16:45	04/29/22 20:24	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1853592	5	04/25/22 16:54	04/26/22 15:57	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1853596	1	04/24/22 08:21	04/25/22 14:15	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1853543	1	04/24/22 08:21	04/24/22 16:12	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1855179	1	04/28/22 08:19	04/28/22 11:45	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1854729	1	04/27/22 03:33	04/27/22 14:36	AMG	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

# CASE NARRATIVE

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



Chris Ward  
Project Manager



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.874		1	04/29/2022 21:27	WG1853666

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	2.94		1.00	1	04/28/2022 15:58	<a href="#">WG1853625</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.69	<a href="#">T8</a>	1	04/28/2022 13:00	<a href="#">WG1855618</a>

## Sample Narrative:

L1485085-01 WG1855618: 7.69 at 20.1C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	103		10.0	1	04/28/2022 09:48	<a href="#">WG1853898</a>

## Sample Narrative:

L1485085-01 WG1853898: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	634		0.500	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Cadmium	0.674		0.500	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Copper	50.2		2.00	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Lead	29.3		0.500	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Nickel	37.1		2.00	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Selenium	ND		2.00	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Silver	ND		1.00	1	04/27/2022 17:51	<a href="#">WG1853591</a>
Zinc	62.9		5.00	1	04/27/2022 17:51	<a href="#">WG1853591</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.204		0.200	1	04/29/2022 20:21	<a href="#">WG1853680</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	50.4		1.00	5	04/26/2022 15:53	<a href="#">WG1853592</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	04/25/2022 13:55	<a href="#">WG1853596</a>
(S) a,a,a-Trifluorotoluene(FID)	91.7		77.0-120		04/25/2022 13:55	<a href="#">WG1853596</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	04/24/2022 15:53	<a href="#">WG1853543</a>
Toluene	ND		0.00500	1	04/24/2022 15:53	<a href="#">WG1853543</a>
Ethylbenzene	ND		0.00250	1	04/24/2022 15:53	<a href="#">WG1853543</a>
Xylenes, Total	ND		0.00650	1	04/24/2022 15:53	<a href="#">WG1853543</a>
1,2,4-Trimethylbenzene	ND		0.00500	1	04/24/2022 15:53	<a href="#">WG1853543</a>
1,3,5-Trimethylbenzene	ND		0.00500	1	04/24/2022 15:53	<a href="#">WG1853543</a>
(S) Toluene-d8	91.8		75.0-131		04/24/2022 15:53	<a href="#">WG1853543</a>
(S) 4-Bromofluorobenzene	109		67.0-138		04/24/2022 15:53	<a href="#">WG1853543</a>
(S) 1,2-Dichloroethane-d4	107		70.0-130		04/24/2022 15:53	<a href="#">WG1853543</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	18.8		4.00	1	04/28/2022 11:57	<a href="#">WG1855179</a>
C28-C36 Motor Oil Range	78.4		4.00	1	04/28/2022 11:57	<a href="#">WG1855179</a>
(S) o-Terphenyl	44.1		18.0-148		04/28/2022 11:57	<a href="#">WG1855179</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Anthracene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Benzo(a)anthracene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Benzo(b)fluoranthene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Benzo(k)fluoranthene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Benzo(a)pyrene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Chrysene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Dibenz(a,h)anthracene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Fluoranthene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Fluorene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
1-Methylnaphthalene	ND		0.0200	1	04/27/2022 16:55	<a href="#">WG1854729</a>
2-Methylnaphthalene	ND		0.0200	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Naphthalene	0.0213		0.0200	1	04/27/2022 16:55	<a href="#">WG1854729</a>
Pyrene	ND		0.00600	1	04/27/2022 16:55	<a href="#">WG1854729</a>
(S) p-Terphenyl-d14	88.8		23.0-120		04/27/2022 16:55	<a href="#">WG1854729</a>
(S) Nitrobenzene-d5	79.4		14.0-149		04/27/2022 16:55	<a href="#">WG1854729</a>
(S) 2-Fluorobiphenyl	74.5		34.0-125		04/27/2022 16:55	<a href="#">WG1854729</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.983		1	04/29/2022 21:30	WG1853666

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	04/28/2022 16:24	<a href="#">WG1853625</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.66	<a href="#">T8</a>	1	04/28/2022 13:00	<a href="#">WG1855618</a>

## Sample Narrative:

L1485085-02 WG1855618: 7.66 at 19.9C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	402		10.0	1	04/28/2022 09:48	<a href="#">WG1853898</a>

## Sample Narrative:

L1485085-02 WG1853898: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	208		0.500	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Cadmium	ND		0.500	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Copper	16.5		2.00	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Lead	13.3		0.500	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Nickel	19.1		2.00	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Selenium	ND		2.00	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Silver	ND		1.00	1	04/27/2022 17:59	<a href="#">WG1853591</a>
Zinc	52.7		5.00	1	04/27/2022 17:59	<a href="#">WG1853591</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	04/29/2022 20:24	<a href="#">WG1853680</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	7.32		1.00	5	04/26/2022 15:57	<a href="#">WG1853592</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	04/25/2022 14:15	<a href="#">WG1853596</a>
(S) a,a,a-Trifluorotoluene(FID)	94.5		77.0-120		04/25/2022 14:15	<a href="#">WG1853596</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## 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	04/24/2022 16:12	<a href="#">WG1853543</a>
Toluene	ND		0.00500	1	04/24/2022 16:12	<a href="#">WG1853543</a>
Ethylbenzene	ND		0.00250	1	04/24/2022 16:12	<a href="#">WG1853543</a>
Xylenes, Total	ND		0.00650	1	04/24/2022 16:12	<a href="#">WG1853543</a>
1,2,4-Trimethylbenzene	ND		0.00500	1	04/24/2022 16:12	<a href="#">WG1853543</a>
1,3,5-Trimethylbenzene	ND		0.00500	1	04/24/2022 16:12	<a href="#">WG1853543</a>
(S) Toluene-d8	91.9		75.0-131		04/24/2022 16:12	<a href="#">WG1853543</a>
(S) 4-Bromofluorobenzene	106		67.0-138		04/24/2022 16:12	<a href="#">WG1853543</a>
(S) 1,2-Dichloroethane-d4	105		70.0-130		04/24/2022 16:12	<a href="#">WG1853543</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		4.00	1	04/28/2022 11:45	<a href="#">WG1855179</a>
C28-C36 Motor Oil Range	7.87	<a href="#">B</a>	4.00	1	04/28/2022 11:45	<a href="#">WG1855179</a>
(S) o-Terphenyl	38.6		18.0-148		04/28/2022 11:45	<a href="#">WG1855179</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Anthracene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Benzo(a)anthracene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Benzo(b)fluoranthene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Benzo(k)fluoranthene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Benzo(a)pyrene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Chrysene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Dibenz(a,h)anthracene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Fluoranthene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Fluorene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
1-Methylnaphthalene	ND		0.0200	1	04/27/2022 14:36	<a href="#">WG1854729</a>
2-Methylnaphthalene	ND		0.0200	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Naphthalene	ND		0.0200	1	04/27/2022 14:36	<a href="#">WG1854729</a>
Pyrene	ND		0.00600	1	04/27/2022 14:36	<a href="#">WG1854729</a>
(S) p-Terphenyl-d14	89.2		23.0-120		04/27/2022 14:36	<a href="#">WG1854729</a>
(S) Nitrobenzene-d5	80.1		14.0-149		04/27/2022 14:36	<a href="#">WG1854729</a>
(S) 2-Fluorobiphenyl	74.1		34.0-125		04/27/2022 14:36	<a href="#">WG1854729</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3786426-1 04/28/22 13:40

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

L1485055-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1485055-01 04/28/22 14:09 • (DUP) R3786426-3 04/28/22 14:14

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

L1485077-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1485077-07 04/28/22 15:06 • (DUP) R3786426-4 04/28/22 15:11

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

Laboratory Control Sample (LCS)

(LCS) R3786426-2 04/28/22 13:48

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	9.73	97.3	80.0-120	

L1485085-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485085-01 04/28/22 15:58 • (MS) R3786426-5 04/28/22 16:03 • (MSD) R3786426-6 04/28/22 16:08

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	2.94	22.1	18.5	95.8	77.6	1	75.0-125			17.9	20

L1485085-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1485085-01 04/28/22 15:58 • (MS) R3786426-7 04/28/22 16:13

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	636	2.94	620	97.5	50	75.0-125	

<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

L1485077-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1485077-13 04/28/22 13:00 • (DUP) R3786033-2 04/28/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	9.36	9.36	1	0.000		1

Sample Narrative:

OS: 9.36 at 20C

DUP: 9.36 at 20C

L1485085-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1485085-02 04/28/22 13:00 • (DUP) R3786033-3 04/28/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.66	7.66	1	0.000		1

Sample Narrative:

OS: 7.66 at 19.9C

DUP: 7.66 at 20C

Laboratory Control Sample (LCS)

(LCS) R3786033-1 04/28/22 13:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.94	99.4	99.0-101	

Sample Narrative:

LCS: 9.94 at 20C

<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) R3785900-1 04/28/22 09:48

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

Sample Narrative:

BLANK: at 25C

L1485077-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1485077-12 04/28/22 09:48 • (DUP) R3785900-3 04/28/22 09:48

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	849	884	1	4.04		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1485550-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1485550-03 04/28/22 09:48 • (DUP) R3785900-4 04/28/22 09:48

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1880	1980	1	4.97		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3785900-2 04/28/22 09:48

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	284	106	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3785755-1 04/27/22 16:50

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	0.259	J	0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3785755-2 04/27/22 16:53

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	105	105	80.0-120	
Cadmium	100	99.0	99.0	80.0-120	
Copper	100	102	102	80.0-120	
Lead	100	101	101	80.0-120	
Nickel	100	102	102	80.0-120	
Selenium	100	98.9	98.9	80.0-120	
Silver	20.0	19.1	95.6	80.0-120	
Zinc	100	96.6	96.6	80.0-120	

L1485077-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485077-08 04/27/22 16:56 • (MS) R3785755-5 04/27/22 17:04 • (MSD) R3785755-6 04/27/22 17:07

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	319	497	481	178	162	1	75.0-125	J5	J5	3.13	20
Cadmium	100	ND	108	105	108	105	1	75.0-125			2.81	20
Copper	100	30.2	142	138	112	108	1	75.0-125			2.75	20
Lead	100	14.8	122	120	108	105	1	75.0-125			1.98	20
Nickel	100	17.7	127	125	109	107	1	75.0-125			1.10	20
Selenium	100	ND	107	105	107	105	1	75.0-125			2.07	20
Silver	20.0	ND	21.2	20.7	106	103	1	75.0-125			2.55	20
Zinc	100	49.2	143	143	93.7	93.5	1	75.0-125			0.114	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3786851-1 04/29/22 19:29

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

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

(LCS) R3786851-2 04/29/22 19:31 • (LCSD) R3786851-3 04/29/22 19:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.04	1.03	104	103	80.0-120			1.08	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3785197-1 04/26/22 14:34

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

Laboratory Control Sample (LCS)

(LCS) R3785197-2 04/26/22 14:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.1	95.1	80.0-120	

L1485077-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485077-08 04/26/22 14:40 • (MS) R3785197-5 04/26/22 14:50 • (MSD) R3785197-6 04/26/22 14:54

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	19.4	121	119	102	99.1	5	75.0-125			2.47	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3784867-2 04/25/22 06:16

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)	94.8			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3784867-1 04/25/22 05:17

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.67	121	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			103	77.0-120	

L1485076-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485076-03 04/25/22 06:36 • (MS) R3784867-3 04/25/22 14:36 • (MSD) R3784867-4 04/25/22 14:56

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	5.56	0.605	5.78	6.26	93.1	104	1.01	10.0-151			7.97	28
(S) a,a,a-Trifluorotoluene(FID)					101	103		77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3785117-3 04/24/22 08:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	91.8			75.0-131
(S) 4-Bromofluorobenzene	107			67.0-138
(S) 1,2-Dichloroethane-d4	107			70.0-130

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

(LCS) R3785117-1 04/24/22 07:02 • (LCSD) R3785117-2 04/24/22 07:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.132	0.136	106	109	70.0-123			2.99	20
Toluene	0.125	0.117	0.120	93.6	96.0	75.0-121			2.53	20
Ethylbenzene	0.125	0.108	0.115	86.4	92.0	74.0-126			6.28	20
Xylenes, Total	0.375	0.335	0.347	89.3	92.5	72.0-127			3.52	20
1,2,4-Trimethylbenzene	0.125	0.118	0.121	94.4	96.8	70.0-126			2.51	20
1,3,5-Trimethylbenzene	0.125	0.113	0.117	90.4	93.6	73.0-127			3.48	20
(S) Toluene-d8				90.1	91.2	75.0-131				
(S) 4-Bromofluorobenzene				104	105	67.0-138				
(S) 1,2-Dichloroethane-d4				110	111	70.0-130				

L1485084-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485084-05 04/24/22 14:56 • (MS) R3785117-4 04/24/22 19:04 • (MSD) R3785117-5 04/24/22 19:22

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 %
Benzene	0.130	ND	0.121	0.119	96.2	94.6	1	10.0-149			1.67	37
Toluene	0.130	ND	0.109	0.105	85.7	82.5	1	10.0-156			3.74	38
Ethylbenzene	0.130	ND	0.104	0.102	82.6	81.0	1	10.0-160			1.94	38
Xylenes, Total	0.391	ND	0.313	0.305	82.6	80.5	1	10.0-160			2.59	38
1,2,4-Trimethylbenzene	0.130	ND	0.108	0.106	84.2	82.6	1	10.0-160			1.87	36
1,3,5-Trimethylbenzene	0.130	ND	0.107	0.105	85.6	84.0	1	10.0-160			1.89	38
(S) Toluene-d8					91.6	91.3		75.0-131				
(S) 4-Bromofluorobenzene					106	106		67.0-138				
(S) 1,2-Dichloroethane-d4					109	107		70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3786095-1 04/28/22 11:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	1.04	J	0.274	4.00
(S) o-Terphenyl	75.7			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3786095-2 04/28/22 11:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	31.5	63.0	50.0-150	
(S) o-Terphenyl			69.7	18.0-148	

L1485550-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1485550-01 04/28/22 15:53 • (MS) R3786095-3 04/28/22 16:06 • (MSD) R3786095-4 04/28/22 16:19

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 %
C10-C28 Diesel Range	49.8	173	158	156	0.000	0.000	5	50.0-150	J6	J6	1.27	20
(S) o-Terphenyl					106	112		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3785928-1 04/27/22 09:38

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	102			23.0-120
(S) Nitrobenzene-d5	88.7			14.0-149
(S) 2-Fluorobiphenyl	85.1			34.0-125

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS)

(LCS) R3785928-2 04/27/22 09:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0668	83.5	50.0-120	
Anthracene	0.0800	0.0654	81.8	50.0-126	
Benzo(a)anthracene	0.0800	0.0674	84.3	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0720	90.0	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0707	88.4	49.0-125	
Benzo(a)pyrene	0.0800	0.0624	78.0	42.0-120	
Chrysene	0.0800	0.0710	88.8	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0702	87.8	47.0-125	
Fluoranthene	0.0800	0.0697	87.1	49.0-129	
Fluorene	0.0800	0.0692	86.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0680	85.0	46.0-125	
1-Methylnaphthalene	0.0800	0.0680	85.0	51.0-121	
2-Methylnaphthalene	0.0800	0.0643	80.4	50.0-120	
Naphthalene	0.0800	0.0693	86.6	50.0-120	
Pyrene	0.0800	0.0680	85.0	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3785928-2 04/27/22 09:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			103	23.0-120	
(S) Nitrobenzene-d5			93.8	14.0-149	
(S) 2-Fluorobiphenyl			89.7	34.0-125	

L1484853-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1484853-01 04/27/22 10:17 • (MS) R3785928-3 04/27/22 10:37 • (MSD) R3785928-4 04/27/22 10:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Acenaphthene	0.0800	ND	0.0534	0.0547	66.8	68.4	1	14.0-127			2.41	27
Anthracene	0.0800	ND	0.0520	0.0558	65.0	69.8	1	10.0-145			7.05	30
Benzo(a)anthracene	0.0800	ND	0.0533	0.0594	66.6	74.3	1	10.0-139			10.8	30
Benzo(b)fluoranthene	0.0800	ND	0.0554	0.0587	69.3	73.4	1	10.0-140			5.78	36
Benzo(k)fluoranthene	0.0800	ND	0.0551	0.0588	68.9	73.5	1	10.0-137			6.50	31
Benzo(a)pyrene	0.0800	ND	0.0528	0.0576	66.0	72.0	1	10.0-141			8.70	31
Chrysene	0.0800	ND	0.0570	0.0610	71.3	76.3	1	10.0-145			6.78	30
Dibenz(a,h)anthracene	0.0800	ND	0.0547	0.0583	68.4	72.9	1	10.0-132			6.37	31
Fluoranthene	0.0800	ND	0.0553	0.0600	69.1	75.0	1	10.0-153			8.15	33
Fluorene	0.0800	ND	0.0546	0.0579	68.3	72.4	1	11.0-130			5.87	29
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0535	0.0581	66.9	72.6	1	10.0-137			8.24	32
1-Methylnaphthalene	0.0800	ND	0.0654	0.0718	68.9	76.9	1	10.0-142			9.33	28
2-Methylnaphthalene	0.0800	ND	0.0664	0.0766	62.3	75.0	1	10.0-137			14.3	28
Naphthalene	0.0800	ND	0.0708	0.0778	67.1	75.9	1	10.0-135			9.42	27
Pyrene	0.0800	ND	0.0522	0.0565	65.3	70.6	1	10.0-148			7.91	35
(S) p-Terphenyl-d14					88.7	88.8		23.0-120				
(S) Nitrobenzene-d5					86.2	82.6		14.0-149				
(S) 2-Fluorobiphenyl					79.7	76.4		34.0-125				

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

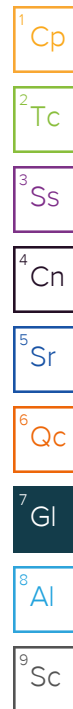
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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

### Abbreviations and Definitions

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.



# ACCREDITATIONS & LOCATIONS

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

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

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

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

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



PM:  
PB: