

March 31, 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: L1202272  
Samples Received: 03/25/2020  
Project Number:  
Description: 7G secondary containment  
Site: 7G  
Report To: Blair Rollins  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:

*Chris Ward*

Chris Ward  
Project Manager

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



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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



20200324-7G CONTAIUNMENT L1202272-01 Solid

Collected by  
Blair K. Rollins

Collected date/time  
03/24/20 12:15

Received date/time  
03/25/20 08:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1450469	1	03/28/20 10:33	03/28/20 10:33	TRB	Mt. Juliet, TN
Calculated Results	WG1450316	1	03/25/20 19:51	03/28/20 17:46	MSP	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1450771	1	03/27/20 13:56	03/28/20 17:46	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1449915	1	03/25/20 16:00	03/25/20 20:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1452883	1	03/31/20 11:09	03/31/20 13:24	MJA	Mt. Juliet, TN
Mercury by Method 7471A	WG1450265	1	03/25/20 18:17	03/25/20 21:04	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1450316	1	03/25/20 19:51	03/26/20 01:59	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1450845	1	03/25/20 16:35	03/27/20 02:53	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1450503	1	03/25/20 16:35	03/26/20 11:11	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1450795	1	03/26/20 15:54	03/27/20 20:09	FM	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1450331	1	03/26/20 11:40	03/26/20 17:54	AAT	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



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



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.37		1	03/28/2020 10:33	WG1450469

<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

## Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	7.46		1.00	1	03/28/2020 17:46	<a href="#">WG1450316</a>

## Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	03/28/2020 17:46	<a href="#">WG1450771</a>

## Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	9.80	<a href="#">T8</a>	1	03/25/2020 20:00	<a href="#">WG1449915</a>

## Sample Narrative:

L1202272-01 WG1449915: 9.8 at 20.9C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	234		10.0	1	03/31/2020 13:24	<a href="#">WG1452883</a>

## Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	03/25/2020 21:04	<a href="#">WG1450265</a>

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.01		2.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Barium	175		0.500	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Cadmium	ND		0.500	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Chromium	7.46		1.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Copper	7.33		2.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Lead	4.23		0.500	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Nickel	7.70		2.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Selenium	ND		2.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Silver	ND		1.00	1	03/26/2020 01:59	<a href="#">WG1450316</a>
Zinc	19.8		5.00	1	03/26/2020 01:59	<a href="#">WG1450316</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	0.171		0.100	1	03/27/2020 02:53	<a href="#">WG1450845</a>
(S) a,a,a-Trifluorotoluene(FID)	90.2		77.0-120		03/27/2020 02:53	<a href="#">WG1450845</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	03/26/2020 11:11	<a href="#">WG1450503</a>
Toluene	ND		0.00500	1	03/26/2020 11:11	<a href="#">WG1450503</a>
Ethylbenzene	ND		0.00250	1	03/26/2020 11:11	<a href="#">WG1450503</a>
Total Xylenes	ND		0.00650	1	03/26/2020 11:11	<a href="#">WG1450503</a>
(S) Toluene-d8	103		75.0-131		03/26/2020 11:11	<a href="#">WG1450503</a>
(S) 4-Bromofluorobenzene	97.2		67.0-138		03/26/2020 11:11	<a href="#">WG1450503</a>
(S) 1,2-Dichloroethane-d4	113		70.0-130		03/26/2020 11:11	<a href="#">WG1450503</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	67.7	<a href="#">J3 J6</a>	4.00	1	03/27/2020 20:09	<a href="#">WG1450795</a>
(S) o-Terphenyl	53.9		18.0-148		03/27/2020 20:09	<a href="#">WG1450795</a>

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Acenaphthene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Acenaphthylene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Benzo(a)anthracene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Benzo(a)pyrene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Benzo(b)fluoranthene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Benzo(g,h,i)perylene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Benzo(k)fluoranthene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Chrysene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Dibenz(a,h)anthracene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Fluoranthene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Fluorene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Naphthalene	ND		0.0200	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Phenanthrene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
Pyrene	ND		0.00600	1	03/26/2020 17:54	<a href="#">WG1450331</a>
1-Methylnaphthalene	ND		0.0200	1	03/26/2020 17:54	<a href="#">WG1450331</a>
2-Methylnaphthalene	ND		0.0200	1	03/26/2020 17:54	<a href="#">WG1450331</a>
2-Chloronaphthalene	ND		0.0200	1	03/26/2020 17:54	<a href="#">WG1450331</a>
(S) p-Terphenyl-d14	75.8		23.0-120		03/26/2020 17:54	<a href="#">WG1450331</a>
(S) Nitrobenzene-d5	62.9		14.0-149		03/26/2020 17:54	<a href="#">WG1450331</a>
(S) 2-Fluorobiphenyl	71.2		34.0-125		03/26/2020 17:54	<a href="#">WG1450331</a>



Method Blank (MB)

(MB) R3513543-1 03/28/20 17:44

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1201833-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1201833-01 03/28/20 17:46 • (DUP) R3513543-3 03/28/20 17:46

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

Laboratory Control Sample (LCS)

(LCS) R3513543-2 03/28/20 17:44

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	23.9	99.7	80.0-120	

L1202272-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202272-01 03/28/20 17:46 • (MS) R3513543-4 03/28/20 17:47 • (MSD) R3513543-5 03/28/20 17:47

	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	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	17.6	17.0	88.2	84.9	1	75.0-125			3.86	20

L1202272-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1202272-01 03/28/20 17:46 • (MS) R3513543-6 03/28/20 17:47

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	737	ND	766	104	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1202272-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1202272-01 03/25/20 20:00 • (DUP) R3512523-2 03/25/20 20:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	9.80	9.77	1	0.307		1

Sample Narrative:  
OS: 9.8 at 20.9C  
DUP: 9.77 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3512523-1 03/25/20 20:00

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

Sample Narrative:  
LCS: 10.02 at 19.2C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc





Method Blank (MB)

(MB) R3514317-1 03/31/20 13:24

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

L1202272-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1202272-01 03/31/20 13:24 • (DUP) R3514317-3 03/31/20 13:24

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	234	229	1	2.29		20

Laboratory Control Sample (LCS)

(LCS) R3514317-2 03/31/20 13:24

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	445	444	99.8	85.0-115	

<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) R3512556-1 03/25/20 20:44

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.00280	0.0300

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

Laboratory Control Sample (LCS)

(LCS) R3512556-2 03/25/20 20:47

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.487	97.3	80.0-120	

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L1202410-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202410-01 03/25/20 22:10 • (MS) R3512556-7 03/25/20 22:13 • (MSD) R3512556-8 03/25/20 22:15

	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	%	%		%			%	%
Mercury	0.0100	37.8	25.9	50.3	0.000	2500	50	75.0-125	V	J3 V	64.1	20



Method Blank (MB)

(MB) R3512593-1 03/26/20 01:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Barium	U		0.170	0.500
Cadmium	U		0.0700	0.500
Chromium	U		0.140	1.00
Copper	U		0.530	2.00
Lead	U		0.190	0.500
Nickel	U		0.490	2.00
Selenium	U		0.620	2.00
Silver	U		0.120	1.00
Zinc	U		0.590	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3512593-2 03/26/20 01:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.5	91.5	80.0-120	
Barium	100	95.1	95.1	80.0-120	
Cadmium	100	92.3	92.3	80.0-120	
Chromium	100	90.8	90.8	80.0-120	
Copper	100	91.7	91.7	80.0-120	
Lead	100	92.3	92.3	80.0-120	
Nickel	100	95.0	95.0	80.0-120	
Selenium	100	92.5	92.5	80.0-120	
Silver	20.0	18.5	92.6	80.0-120	
Zinc	100	92.5	92.5	80.0-120	

L1202410-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202410-01 03/26/20 01:42 • (MS) R3512593-5 03/26/20 01:50 • (MSD) R3512593-6 03/26/20 01:53

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	1.95	88.2	90.7	86.2	88.7	1	75.0-125			2.75	20
Barium	100	46.6	143	145	96.4	98.7	1	75.0-125			1.58	20
Cadmium	100	0.310	88.3	91.3	88.0	90.9	1	75.0-125			3.29	20
Chromium	100	43.2	137	129	94.1	86.0	1	75.0-125			6.07	20
Copper	100	120	402	185	282	65.2	1	75.0-125	J5	J3 J6	73.8	20
Lead	100	2200	3340	1890	1130	0.000	1	75.0-125	V	J3 V	55.4	20
Nickel	100	28.7	997	123	968	94.4	1	75.0-125	J5	J3	156	20



L1202410-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202410-01 03/26/20 01:42 • (MS) R3512593-5 03/26/20 01:50 • (MSD) R3512593-6 03/26/20 01:53

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	U	85.8	89.5	85.8	89.5	1	75.0-125			4.24	20
Silver	20.0	7.67	137	26.1	646	92.3	1	75.0-125	J5	J3	136	20
Zinc	100	62.6	366	158	304	95.6	1	75.0-125	J5	J3	79.3	20

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3513080-2 03/26/20 21:57

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)	99.0			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3513080-1 03/26/20 21:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.02	109	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			116	77.0-120	

L1202410-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202410-03 03/27/20 03:34 • (MS) R3513080-3 03/27/20 04:56 • (MSD) R3513080-4 03/27/20 05:16

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	335	25.0	372	384	103	107	100	10.0-151			3.23	28
(S) a,a,a-Trifluorotoluene(FID)					117	117		77.0-120				

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc



Method Blank (MB)

(MB) R3513949-2 03/26/20 06:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	105			75.0-131
(S) 4-Bromofluorobenzene	93.4			67.0-138
(S) 1,2-Dichloroethane-d4	99.7			70.0-130

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

Laboratory Control Sample (LCS)

(LCS) R3513949-1 03/26/20 05:24

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.127	102	70.0-123	
Ethylbenzene	0.125	0.128	102	74.0-126	
Toluene	0.125	0.119	95.2	75.0-121	
Xylenes, Total	0.375	0.370	98.7	72.0-127	
(S) Toluene-d8			102	75.0-131	
(S) 4-Bromofluorobenzene			98.6	67.0-138	
(S) 1,2-Dichloroethane-d4			121	70.0-130	

6  
Qc

7  
Gl

8  
Al

9  
Sc



Method Blank (MB)

(MB) R3513382-1 03/27/20 10:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	0.873	⬇	0.769	4.00
(S) o-Terphenyl	73.3			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) R3513382-2 03/27/20 10:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	38.9	77.8	50.0-150	
(S) o-Terphenyl			53.5	18.0-148	

L1202272-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202272-01 03/27/20 20:09 • (MS) R3513382-3 03/27/20 20:21 • (MSD) R3513382-4 03/27/20 20:34

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	67.7	86.8	58.4	40.0	0.000	1	50.0-150	J6	J3 J6	39.1	20
(S) o-Terphenyl					37.6	42.5		18.0-148				

Method Blank (MB)

(MB) R3512973-2 03/26/20 16:26

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	71.7			14.0-149
(S) 2-Fluorobiphenyl	81.2			34.0-125
(S) p-Terphenyl-d14	84.4			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3512973-1 03/26/20 16:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0563	70.4	50.0-126	
Acenaphthene	0.0800	0.0576	72.0	50.0-120	
Acenaphthylene	0.0800	0.0588	73.5	50.0-120	
Benzo(a)anthracene	0.0800	0.0564	70.5	45.0-120	
Benzo(a)pyrene	0.0800	0.0466	58.3	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0547	68.4	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0570	71.3	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0562	70.3	49.0-125	
Chrysene	0.0800	0.0567	70.9	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0586	73.3	47.0-125	
Fluoranthene	0.0800	0.0603	75.4	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3512973-1 03/26/20 16:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0604	75.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0583	72.9	46.0-125	
Naphthalene	0.0800	0.0556	69.5	50.0-120	
Phenanthrene	0.0800	0.0571	71.4	47.0-120	
Pyrene	0.0800	0.0526	65.8	43.0-123	
1-Methylnaphthalene	0.0800	0.0579	72.4	51.0-121	
2-Methylnaphthalene	0.0800	0.0555	69.4	50.0-120	
2-Chloronaphthalene	0.0800	0.0570	71.3	50.0-120	
(S) Nitrobenzene-d5			66.9	14.0-149	
(S) 2-Fluorobiphenyl			73.9	34.0-125	
(S) p-Terphenyl-d14			75.8	23.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1202430-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1202430-01 03/26/20 20:07 • (MS) R3512973-3 03/26/20 20:29 • (MSD) R3512973-4 03/26/20 20:51

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	ND	0.0552	0.0559	69.0	69.9	1	10.0-145			1.26	30
Acenaphthene	0.0800	ND	0.0543	0.0542	67.9	67.8	1	14.0-127			0.184	27
Acenaphthylene	0.0800	ND	0.0576	0.0573	72.0	71.6	1	21.0-124			0.522	25
Benzo(a)anthracene	0.0800	ND	0.0615	0.0595	76.9	74.4	1	10.0-139			3.31	30
Benzo(a)pyrene	0.0800	ND	0.0594	0.0583	74.3	72.9	1	10.0-141			1.87	31
Benzo(b)fluoranthene	0.0800	0.00876	0.0608	0.0620	65.1	66.6	1	10.0-140			1.95	36
Benzo(g,h,i)perylene	0.0800	0.00783	0.0598	0.0601	65.0	65.3	1	10.0-140			0.500	33
Benzo(k)fluoranthene	0.0800	ND	0.0545	0.0520	68.1	65.0	1	10.0-137			4.69	31
Chrysene	0.0800	ND	0.0602	0.0588	75.3	73.5	1	10.0-145			2.35	30
Dibenz(a,h)anthracene	0.0800	ND	0.0554	0.0551	69.3	68.9	1	10.0-132			0.543	31
Fluoranthene	0.0800	0.00855	0.0684	0.0675	74.8	73.7	1	10.0-153			1.32	33
Fluorene	0.0800	ND	0.0571	0.0567	71.4	70.9	1	11.0-130			0.703	29
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0579	0.0580	72.4	72.5	1	10.0-137			0.173	32
Naphthalene	0.0800	ND	0.0534	0.0531	66.8	66.4	1	10.0-135			0.563	27
Phenanthrene	0.0800	ND	0.0562	0.0563	70.3	70.4	1	10.0-144			0.178	31
Pyrene	0.0800	0.00696	0.0610	0.0594	67.6	65.6	1	10.0-148			2.66	35
1-Methylnaphthalene	0.0800	ND	0.0557	0.0557	69.6	69.6	1	10.0-142			0.000	28
2-Methylnaphthalene	0.0800	ND	0.0534	0.0533	66.8	66.6	1	10.0-137			0.187	28
2-Chloronaphthalene	0.0800	ND	0.0536	0.0538	67.0	67.3	1	29.0-120			0.372	24
(S) Nitrobenzene-d5					66.4	66.4		14.0-149				
(S) 2-Fluorobiphenyl					69.7	70.4		34.0-125				
(S) p-Terphenyl-d14					74.8	76.3		23.0-120				



## 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

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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.



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