

## Caerus Oil and Gas

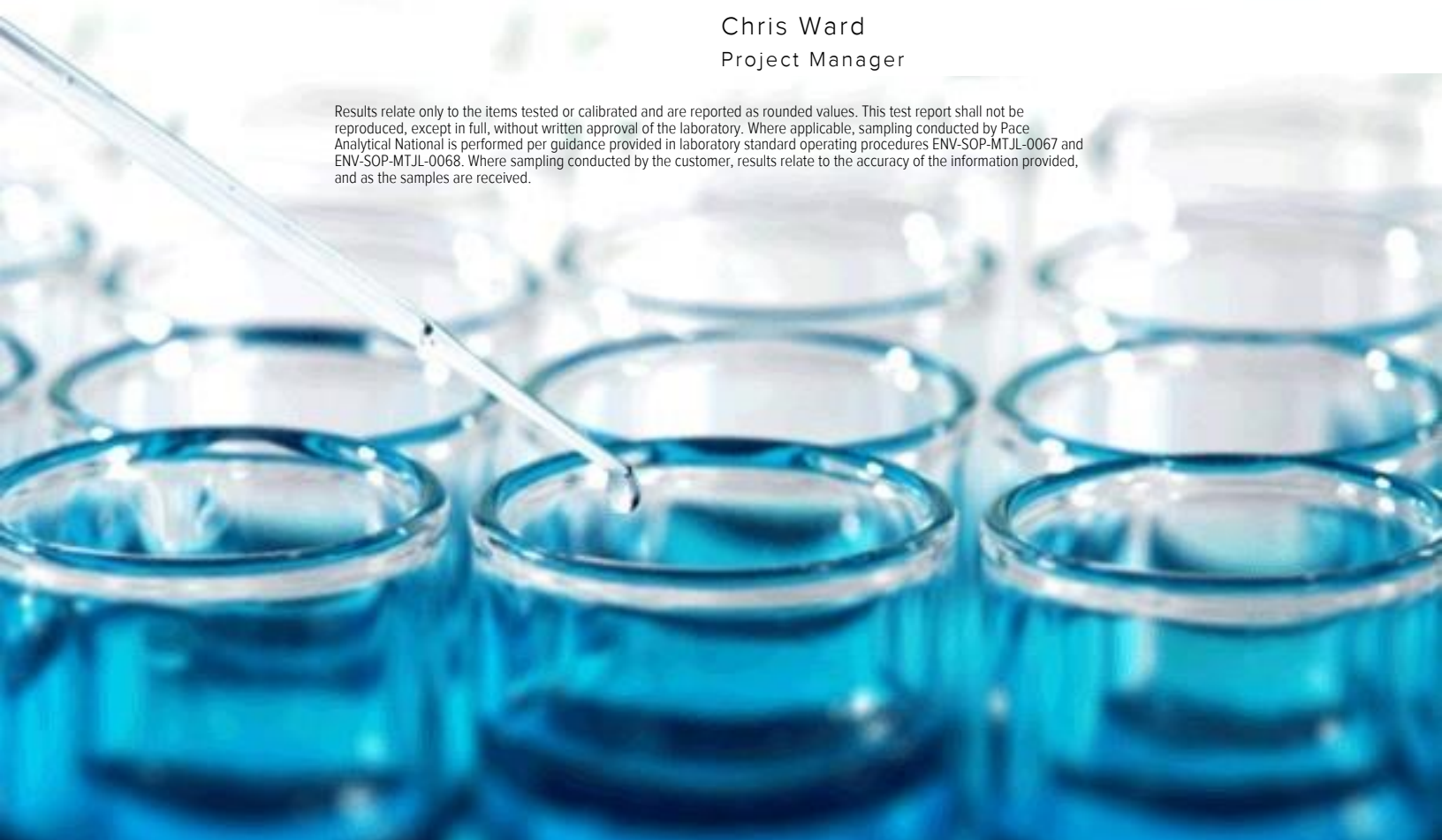
Sample Delivery Group: L1248948  
Samples Received: 08/11/2020  
Project Number: C28MF  
Description: C28MF

Report To: Jake Janicek  
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

0200810-C28MF-POR-5'-1045 L1248948-01 Solid

Collected by: Chance Holder  
 Collected date/time: 08/10/20 10:45  
 Received date/time: 08/11/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1525126	1	08/15/20 13:50	08/15/20 13:50	EL	Mt. Juliet, TN
Calculated Results	WG1526317	1	08/14/20 19:10	08/17/20 17:32	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1525751	1	08/17/20 09:00	08/17/20 17:32	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1526291	1	08/17/20 14:00	08/17/20 15:30	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1524265	1	08/12/20 11:55	08/12/20 15:00	SRG	Mt. Juliet, TN
Mercury by Method 7471A	WG1525729	1	08/13/20 20:58	08/14/20 08:54	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1526317	1	08/14/20 19:10	08/17/20 12:23	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1526807	5	08/16/20 20:37	08/17/20 21:03	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1526324	1	08/13/20 20:24	08/15/20 03:44	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1525740	1	08/13/20 20:24	08/14/20 00:38	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1526573	1	08/15/20 17:03	08/16/20 19:43	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1526225	1	08/14/20 18:56	08/15/20 14:15	DMG	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 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: 08/10/20 10:45

L1248948

## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	24.1		1	08/15/2020 13:50	WG1525126

1 Cp

2 Tc

## Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	15.7		1.00	1	08/17/2020 17:32	<a href="#">WG1526317</a>

3 Ss

4 Cn

## Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	08/17/2020 17:32	<a href="#">WG1525751</a>

5 Sr

6 Qc

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.75	T8	1	08/17/2020 15:30	<a href="#">WG1526291</a>

7 Gl

8 Al

## Sample Narrative:

L1248948-01 WG1526291: 8.75 at 22.4C

9 Sc

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1230		10.0	1	08/12/2020 15:00	<a href="#">WG1524265</a>

## Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	08/14/2020 08:54	<a href="#">WG1525729</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	1050		0.500	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Cadmium	0.546		0.500	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Chromium	15.7		1.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Copper	16.2		2.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Lead	11.5		0.500	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Nickel	18.9		2.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Selenium	ND		2.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Silver	ND		1.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>
Zinc	62.7		5.00	1	08/17/2020 12:23	<a href="#">WG1526317</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	4.95		1.00	5	08/17/2020 21:03	<a href="#">WG1526807</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	4.90		0.100	1	08/15/2020 03:44	<a href="#">WG1526324</a>



Collected date/time: 08/10/20 10:45

L1248948

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	92.6		77.0-120		08/15/2020 03:44	<a href="#">WG1526324</a>

1 Cp

2 Tc

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00666		0.00100	1	08/14/2020 00:38	<a href="#">WG1525740</a>
Toluene	0.00540		0.00500	1	08/14/2020 00:38	<a href="#">WG1525740</a>
Ethylbenzene	0.00614		0.00250	1	08/14/2020 00:38	<a href="#">WG1525740</a>
Total Xylenes	0.0436		0.00650	1	08/14/2020 00:38	<a href="#">WG1525740</a>
(S) Toluene-d8	104		75.0-131		08/14/2020 00:38	<a href="#">WG1525740</a>
(S) 4-Bromofluorobenzene	100		67.0-138		08/14/2020 00:38	<a href="#">WG1525740</a>
(S) 1,2-Dichloroethane-d4	105		70.0-130		08/14/2020 00:38	<a href="#">WG1525740</a>

3 Ss

4 Cn

5 Sr

6 Qc

## 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	14.6		4.00	1	08/16/2020 19:43	<a href="#">WG1526573</a>
(S) <i>o</i> -Terphenyl	45.0		18.0-148		08/16/2020 19:43	<a href="#">WG1526573</a>

7 Gl

8 Al

9 Sc

## 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	08/15/2020 14:15	<a href="#">WG1526225</a>
Acenaphthene	ND		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Acenaphthylene	ND		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Benzo(a)anthracene	0.00941		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Benzo(a)pyrene	0.00708		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Benzo(b)fluoranthene	0.0251		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Benzo(g,h,i)perylene	0.0131		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Benzo(k)fluoranthene	0.00659		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Chrysene	0.00985		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Dibenz(a,h)anthracene	ND		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Fluoranthene	0.00986		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Fluorene	ND		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Indeno(1,2,3-cd)pyrene	0.0113		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Naphthalene	0.0395		0.0200	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Phenanthrene	0.0148		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
Pyrene	ND		0.00600	1	08/15/2020 14:15	<a href="#">WG1526225</a>
1-Methylnaphthalene	0.0321		0.0200	1	08/15/2020 14:15	<a href="#">WG1526225</a>
2-Methylnaphthalene	0.0705		0.0200	1	08/15/2020 14:15	<a href="#">WG1526225</a>
2-Chloronaphthalene	ND		0.0200	1	08/15/2020 14:15	<a href="#">WG1526225</a>
(S) <i>p</i> -Terphenyl-d14	72.0		23.0-120		08/15/2020 14:15	<a href="#">WG1526225</a>
(S) Nitrobenzene-d5	77.9		14.0-149		08/15/2020 14:15	<a href="#">WG1526225</a>
(S) 2-Fluorobiphenyl	69.3		34.0-125		08/15/2020 14:15	<a href="#">WG1526225</a>



Method Blank (MB)

(MB) R3560783-1 08/17/20 17:27

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

<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

L1248588-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1248588-02 08/17/20 17:29 • (DUP) R3560783-3 08/17/20 17:29

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Chromium,Hexavalent	ND	ND	1	0.000		20

L1249526-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1249526-02 08/17/20 18:00 • (DUP) R3560783-8 08/17/20 18:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Chromium,Hexavalent	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3560783-2 08/17/20 17:27

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Chromium,Hexavalent	24.0	25.2	105	80.0-120	

L1249095-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1249095-06 08/17/20 17:39 • (MS) R3560783-4 08/17/20 17:40 • (MSD) R3560783-5 08/17/20 17:40

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Chromium,Hexavalent	20.0	ND	3.04	3.08	15.2	15.4	1	75.0-125	<u>J6</u>	<u>J6</u>	1.31	20

Sample Narrative:

OS: sample is a reducer



L1249043-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1249043-01 08/17/20 15:30 • (DUP) R3560707-3 08/17/20 15:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
su	su			%		%
pH	7.97	8.00	1	0.376		1

Sample Narrative:

OS: 7.97 at 21.9C

DUP: 8 at 22C

L1250141-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1250141-02 08/17/20 15:30 • (DUP) R3560707-4 08/17/20 15:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
su	su			%		%
pH	8.60	8.54	1	0.700		1

Sample Narrative:

OS: 8.6 at 22.6C

DUP: 8.54 at 22.5C

Laboratory Control Sample (LCS)

(LCS) R3560707-1 08/17/20 15:30

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

Sample Narrative:

LCS: 10.04 at 22.5C

<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) R3559093-1 08/12/20 15:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Specific Conductance	U		10.0	10.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

L1249095-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1249095-02 08/12/20 15:00 • (DUP) R3559093-3 08/12/20 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	3130	3010	1	3.91		20

7 Gl

8 Al

9 Sc

L1249095-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1249095-08 08/12/20 15:00 • (DUP) R3559093-4 08/12/20 15:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	1390	1430	1	2.70		20

Laboratory Control Sample (LCS)

(LCS) R3559093-2 08/12/20 15:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Specific Conductance	483	478	99.0	85.0-115	



Method Blank (MB)

(MB) R3559738-1 08/14/20 08:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.0180	0.0400

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

Laboratory Control Sample (LCS)

(LCS) R3559738-2 08/14/20 08:34

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Mercury	0.500	0.534	107	80.0-120	

<sup>4</sup> Cn

<sup>5</sup> Sr

L1248441-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1248441-01 08/14/20 10:06 • (MS) R3559738-3 08/14/20 10:18 • (MSD) R3559738-4 08/14/20 10:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.500	0.844	1.64	1.95	159	222	1	75.0-125	<u>E J5</u>	<u>E J5</u>	17.3	20

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3560824-1 08/17/20 12:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Barium	U		0.240	0.500
Cadmium	U		0.0810	0.500
Chromium	U		0.250	1.00
Copper	U		0.506	2.00
Lead	U		0.208	0.500
Nickel	U		0.490	2.00
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Zinc	U		0.939	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

Laboratory Control Sample (LCS)

(LCS) R3560824-2 08/17/20 12:05

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	
Barium	100	105	105	80.0-120	
Cadmium	100	101	101	80.0-120	
Chromium	100	104	104	80.0-120	
Copper	100	104	104	80.0-120	
Lead	100	103	103	80.0-120	
Nickel	100	104	104	80.0-120	
Selenium	100	101	101	80.0-120	
Silver	20.0	18.7	93.4	80.0-120	
Zinc	100	101	101	80.0-120	

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L1249408-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1249408-08 08/17/20 12:07 • (MS) R3560824-5 08/17/20 12:15 • (MSD) R3560824-6 08/17/20 12:18

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	%	%		%			%	%
Barium	99.9	157	424	401	267	244	1	75.0-125	<u>J5</u>	<u>J5</u>	5.61	20
Cadmium	99.9	ND	89.4	91.9	89.4	91.9	1	75.0-125			2.68	20
Chromium	99.9	29.8	119	121	88.9	91.0	1	75.0-125			1.80	20
Copper	99.9	12.6	109	112	96.7	99.3	1	75.0-125			2.32	20
Lead	99.9	8.38	125	116	117	108	1	75.0-125			7.45	20
Nickel	99.9	16.1	133	126	117	110	1	75.0-125			5.78	20
Selenium	99.9	ND	87.5	88.7	87.5	88.7	1	75.0-125			1.31	20
Silver	20.0	ND	14.9	16.1	74.6	80.4	1	75.0-125	<u>J6</u>		7.54	20
Zinc	99.9	51.5	140	140	88.4	88.5	1	75.0-125			0.0371	20



Method Blank (MB)

(MB) R3560820-1 08/17/20 20:40

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.422	1.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

Laboratory Control Sample (LCS)

(LCS) R3560820-7 08/17/20 22:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.9	95.9	80.0-120	

<sup>5</sup>Sr

<sup>6</sup>Qc

L1251103-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1251103-07 08/17/20 20:47 • (MS) R3560820-5 08/17/20 20:57 • (MSD) R3560820-6 08/17/20 21:00

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	20.0	1.75	84.6	85.1	82.8	83.4	5	75.0-125			0.636	20

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3560160-2 08/15/20 00:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
TPH (GC/FID) Low Fraction	U		0.0217	0.100
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)	101			77.0-120

1 Cp

2 Tc

3 Ss

4 Cn

Laboratory Control Sample (LCS)

(LCS) R3560160-1 08/15/20 00:01

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.50	100	72.0-127	
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)			100	77.0-120	

5 Sr

6 Qc

7 Gl

L1250075-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1250075-01 08/15/20 10:08 • (MS) R3560160-3 08/15/20 10:31 • (MSD) R3560160-4 08/15/20 10:53

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
TPH (GC/FID) Low Fraction	8480	9470	12300	9920	51.5	8.18	1000	10.0-151	E	J6	21.4	28
<sup>(S)</sup> a,a,a-Trifluorotoluene(FID)					105	103		77.0-120				

8 Al

9 Sc



Method Blank (MB)

(MB) R3559908-2 08/13/20 18:34

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	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	103			75.0-131
(S) 4-Bromofluorobenzene	98.3			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) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3559908-1 08/13/20 17:37 • (LCSD) R3559908-3 08/14/20 09:01

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Benzene	0.125	0.102	0.119	81.6	95.2	70.0-123			15.4	20
Ethylbenzene	0.125	0.110	0.115	88.0	92.0	74.0-126			4.44	20
Toluene	0.125	0.105	0.122	84.0	97.6	75.0-121			15.0	20
Xylenes, Total	0.375	0.324	0.346	86.4	92.3	72.0-127			6.57	20
(S) Toluene-d8				102	103	75.0-131				
(S) 4-Bromofluorobenzene				97.3	92.4	67.0-138				
(S) 1,2-Dichloroethane-d4				107	112	70.0-130				

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L1248588-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1248588-01 08/14/20 11:59 • (MS) R3559908-4 08/14/20 12:18 • (MSD) R3559908-5 08/14/20 12:37

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	%	%		%			%	%
Benzene	10.0	0.132	13.0	12.8	129	127	80	10.0-149			1.55	37
Ethylbenzene	10.0	7.03	22.8	23.9	158	169	80	10.0-160		J5	4.71	38
Toluene	10.0	23.3	51.1	56.3	278	330	80	10.0-156	J5	J5	9.68	38
Xylenes, Total	30.0	107	205	223	327	387	80	10.0-160	J5	J5	8.41	38
(S) Toluene-d8					94.5	96.3		75.0-131				
(S) 4-Bromofluorobenzene					109	104		67.0-138				
(S) 1,2-Dichloroethane-d4					120	120		70.0-130				



Method Blank (MB)

(MB) R3560287-1 08/16/20 12:47

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
<i>(S) o-Terphenyl</i>	63.5			18.0-148

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3560287-2 08/16/20 13:00

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	40.2	80.4	50.0-150	
<i>(S) o-Terphenyl</i>			63.8	18.0-148	

4 Cn

5 Sr

6 Qc

L1248918-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1248918-05 08/16/20 18:25 • (MS) R3560287-3 08/16/20 18:38 • (MSD) R3560287-4 08/16/20 18:51

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 %
TPH (GC/FID) High Fraction	48.5	ND	31.8	28.5	65.6	59.4	1	50.0-150			10.9	20
<i>(S) o-Terphenyl</i>					46.9	37.3		18.0-148				

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3560212-2 08/15/20 07:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	95.0			14.0-149
(S) 2-Fluorobiphenyl	93.2			34.0-125
(S) p-Terphenyl-d14	101			23.0-120

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3560212-1 08/15/20 07:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0688	86.0	50.0-126	
Acenaphthene	0.0800	0.0728	91.0	50.0-120	
Acenaphthylene	0.0800	0.0740	92.5	50.0-120	
Benzo(a)anthracene	0.0800	0.0752	94.0	45.0-120	
Benzo(a)pyrene	0.0800	0.0654	81.8	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0726	90.8	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0746	93.3	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0704	88.0	49.0-125	
Chrysene	0.0800	0.0733	91.6	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0718	89.8	47.0-125	
Fluoranthene	0.0800	0.0727	90.9	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3560212-1 08/15/20 07:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0744	93.0	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0703	87.9	46.0-125	
Naphthalene	0.0800	0.0705	88.1	50.0-120	
Phenanthrene	0.0800	0.0718	89.8	47.0-120	
Pyrene	0.0800	0.0751	93.9	43.0-123	
1-Methylnaphthalene	0.0800	0.0743	92.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0696	87.0	50.0-120	
2-Chloronaphthalene	0.0800	0.0750	93.8	50.0-120	
(S) Nitrobenzene-d5			94.6	14.0-149	
(S) 2-Fluorobiphenyl			91.7	34.0-125	
(S) p-Terphenyl-d14			93.9	23.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1249148-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1249148-02 08/15/20 16:27 • (MS) R3560233-1 08/15/20 16:48 • (MSD) R3560233-2 08/15/20 17:08

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0780	ND	0.0530	0.0509	67.9	65.3	1	10.0-145			4.04	30
Acenaphthene	0.0780	ND	0.0535	0.0539	68.6	69.1	1	14.0-127			0.745	27
Acenaphthylene	0.0780	ND	0.0290	0.0547	37.2	70.1	1	21.0-124		J3	61.4	25
Benzo(a)anthracene	0.0780	ND	0.0509	0.0505	65.3	64.7	1	10.0-139			0.789	30
Benzo(a)pyrene	0.0780	ND	0.0451	0.0449	57.8	57.6	1	10.0-141		V3	0.444	31
Benzo(b)fluoranthene	0.0780	ND	0.0532	0.0557	68.2	71.4	1	10.0-140		V3	4.59	36
Benzo(g,h,i)perylene	0.0780	ND	0.0206	0.0205	26.4	26.3	1	10.0-140		V3	0.487	33
Benzo(k)fluoranthene	0.0780	ND	0.0616	0.0587	79.0	75.3	1	10.0-137		V3	4.82	31
Chrysene	0.0780	ND	0.0501	0.0512	64.2	65.6	1	10.0-145			2.17	30
Dibenz(a,h)anthracene	0.0780	ND	0.0219	0.0224	28.1	28.7	1	10.0-132		V3	2.26	31
Fluoranthene	0.0780	ND	0.0456	0.0452	58.5	57.9	1	10.0-153			0.881	33
Fluorene	0.0780	ND	0.0544	0.0519	69.7	66.5	1	11.0-130			4.70	29
Indeno(1,2,3-cd)pyrene	0.0780	ND	0.0217	0.0217	27.8	27.8	1	10.0-137		V3	0.000	32
Naphthalene	0.0780	ND	0.0537	0.0526	68.8	67.4	1	10.0-135			2.07	27
Phenanthrene	0.0780	ND	0.0549	0.0563	70.4	72.2	1	10.0-144			2.52	31
Pyrene	0.0780	ND	0.0569	0.0586	72.9	75.1	1	10.0-148			2.94	35
1-Methylnaphthalene	0.0780	ND	0.0562	0.0560	72.1	71.8	1	10.0-142			0.357	28
2-Methylnaphthalene	0.0780	ND	0.0549	0.0527	70.4	67.6	1	10.0-137			4.09	28
2-Chloronaphthalene	0.0780	ND	0.0566	0.0564	72.6	72.3	1	29.0-120			0.354	24
(S) Nitrobenzene-d5					87.8	81.1		14.0-149				
(S) 2-Fluorobiphenyl					73.1	76.4		34.0-125				
(S) p-Terphenyl-d14					70.8	80.7		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

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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
V3	The internal standard exhibited poor recovery due to sample matrix interference. The analytical results will be biased high. BDL results will be unaffected.

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

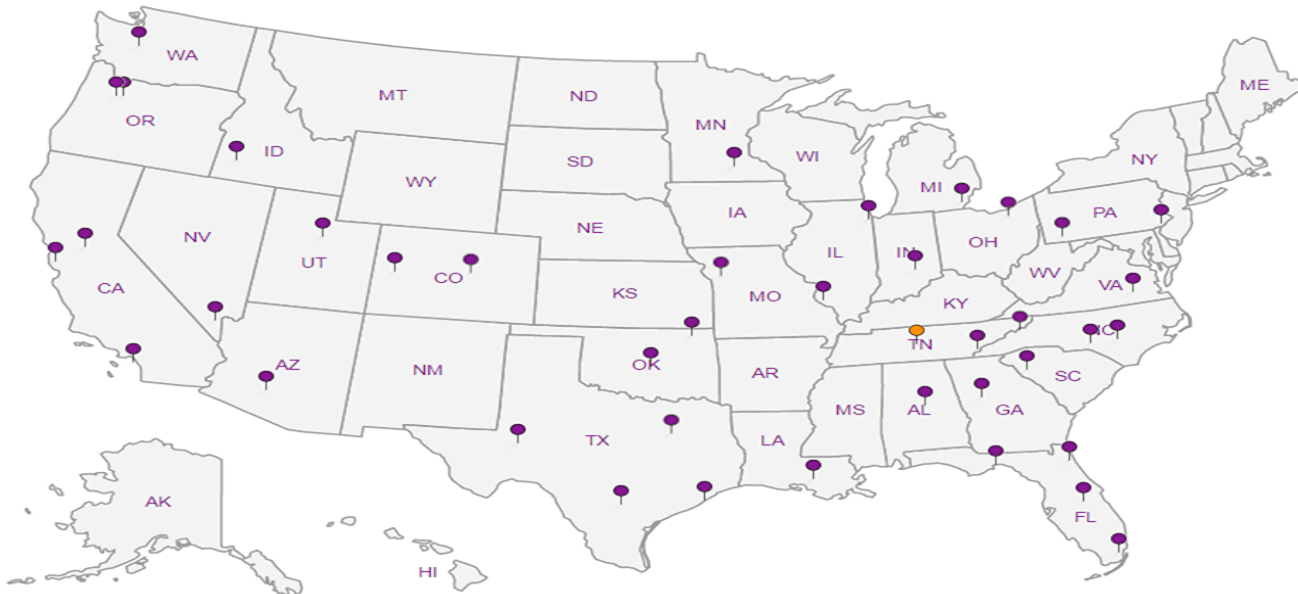
## Third Party Federal Accreditations

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.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

