

Caerus Oil and Gas

Sample Delivery Group: L1241740

Samples Received: 07/21/2020

Project Number:

Description: Unocal 4

Report To: Jake Janicek
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.



Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	5
Sr: Sample Results	6
0200720-UNOCAL 4 N WALL L1241740-01	6
0200720-UNOCAL 4 BOTTOM L1241740-02	8
0200720-UNOCAL 4 W WALL L1241740-03	10
0200720-UNOCAL 4 S WALL L1241740-04	12
0200720-UNOCAL 4 E WALL L1241740-05	14
Qc: Quality Control Summary	16
Wet Chemistry by Method 3060A/7196A	16
Wet Chemistry by Method 9045D	17
Wet Chemistry by Method 9050AMod	19
Mercury by Method 7471A	20
Metals (ICP) by Method 6010B	21
Volatile Organic Compounds (GC) by Method 8015/8021	23
Semi-Volatile Organic Compounds (GC) by Method 8015	26
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	27
Gl: Glossary of Terms	29
Al: Accreditations & Locations	30
Sc: Sample Chain of Custody	31



SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



0200720-UNOCAL 4 N WALL L1241740-01 Solid

Collected by Blair K. Rollins
Collected date/time 07/20/20 10:00
Received date/time 07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1513744	1	07/26/20 16:01	07/26/20 16:01	CCE	Mt. Juliet, TN
Calculated Results	WG1513008	1	07/22/20 06:26	07/22/20 21:37	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1513163	1	07/22/20 15:30	07/22/20 21:37	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1512850	1	07/22/20 12:30	07/23/20 15:01	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1513493	1	07/22/20 17:08	07/23/20 06:53	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1513053	1	07/22/20 07:53	07/22/20 19:04	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1513008	1	07/22/20 06:26	07/22/20 19:18	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1515140	1	07/22/20 13:39	07/25/20 13:18	TPR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1514788	1	07/24/20 20:46	07/26/20 02:44	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	1	07/23/20 22:44	07/24/20 10:26	AO	Mt. Juliet, TN

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

0200720-UNOCAL 4 BOTTOM L1241740-02 Solid

Collected by Blair K. Rollins
Collected date/time 07/20/20 10:10
Received date/time 07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1513744	1	07/26/20 16:04	07/26/20 16:04	CCE	Mt. Juliet, TN
Calculated Results	WG1513008	1	07/22/20 06:26	07/22/20 21:38	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1513163	1	07/22/20 15:30	07/22/20 21:38	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1515082	1	07/28/20 09:00	07/28/20 12:01	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1513493	1	07/22/20 17:08	07/23/20 06:53	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1513053	1	07/22/20 07:53	07/22/20 19:07	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1513008	1	07/22/20 06:26	07/22/20 19:26	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1515140	1000	07/22/20 13:39	07/25/20 18:50	TPR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1514788	40	07/24/20 20:46	07/26/20 04:14	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	1	07/23/20 22:44	07/24/20 10:47	AO	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	10	07/23/20 22:44	07/26/20 19:11	DMG	Mt. Juliet, TN

⁷ Gl

⁸ Al

⁹ Sc

0200720-UNOCAL 4 W WALL L1241740-03 Solid

Collected by Blair K. Rollins
Collected date/time 07/20/20 10:20
Received date/time 07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1513744	1	07/26/20 16:06	07/26/20 16:06	CCE	Mt. Juliet, TN
Calculated Results	WG1513008	1	07/22/20 06:26	07/22/20 21:39	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1513163	1	07/22/20 15:30	07/22/20 21:39	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1515082	1	07/28/20 09:00	07/28/20 12:01	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1513493	1	07/22/20 17:08	07/23/20 06:53	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1513053	1	07/22/20 07:53	07/22/20 18:32	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1513008	1	07/22/20 06:26	07/22/20 18:58	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1515140	1	07/22/20 13:39	07/25/20 13:39	TPR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1514788	5	07/24/20 20:46	07/26/20 04:01	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	1	07/23/20 22:44	07/24/20 11:09	AO	Mt. Juliet, TN

0200720-UNOCAL 4 S WALL L1241740-04 Solid

Collected by Blair K. Rollins
Collected date/time 07/20/20 10:30
Received date/time 07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1513744	1	07/26/20 16:09	07/26/20 16:09	CCE	Mt. Juliet, TN
Calculated Results	WG1513008	1	07/22/20 06:26	07/22/20 21:39	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1513163	1	07/22/20 15:30	07/22/20 21:39	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1515082	1	07/28/20 09:00	07/28/20 12:01	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1513493	1	07/22/20 17:08	07/23/20 06:53	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1513053	1	07/22/20 07:53	07/22/20 19:09	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1513008	1	07/22/20 06:26	07/22/20 19:29	EL	Mt. Juliet, TN



0200720-UNOCAL 4 S WALL L1241740-04 Solid

Collected by
Blair K. RollinsCollected date/time
07/20/20 10:30Received date/time
07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method 8015/8021	WG1515826	1	07/22/20 13:39	07/28/20 15:35	TPR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1514788	1	07/24/20 20:46	07/26/20 02:57	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	1	07/23/20 22:44	07/24/20 11:30	AO	Mt. Juliet, TN

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

0200720-UNOCAL 4 E WALL L1241740-05 Solid

Collected by
Blair K. RollinsCollected date/time
07/20/20 10:40Received date/time
07/21/20 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1513744	1	07/26/20 16:12	07/26/20 16:12	CCE	Mt. Juliet, TN
Calculated Results	WG1513008	1	07/22/20 06:26	07/22/20 21:40	EL	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1513163	1	07/22/20 15:30	07/22/20 21:40	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1515082	1	07/28/20 09:00	07/28/20 12:01	KEG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1513493	1	07/22/20 17:08	07/23/20 06:53	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1513053	1	07/22/20 07:53	07/22/20 19:11	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1513008	1	07/22/20 06:26	07/22/20 19:32	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1515140	500	07/22/20 13:39	07/25/20 18:29	TPR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1514788	2	07/24/20 20:46	07/26/20 03:10	JN	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1514399	1	07/23/20 22:44	07/24/20 11:52	AO	Mt. Juliet, TN



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

Chris Ward
Project Manager

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	2.14		1	07/26/2020 16:01	WG1513744

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	17.9		1.00	1	07/22/2020 21:37	WG1513008

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	07/22/2020 21:37	WG1513163

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.39	T8	1	07/23/2020 15:01	WG1512850

Sample Narrative:

L1241740-01 WG1512850: 8.39 at 23.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	716		10.0	1	07/23/2020 06:53	WG1513493

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	07/22/2020 19:04	WG1513053

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	12.2		2.00	1	07/22/2020 19:18	WG1513008
Barium	284		0.500	1	07/22/2020 19:18	WG1513008
Cadmium	0.507		0.500	1	07/22/2020 19:18	WG1513008
Chromium	17.9		1.00	1	07/22/2020 19:18	WG1513008
Copper	19.4		2.00	1	07/22/2020 19:18	WG1513008
Lead	10.6		0.500	1	07/22/2020 19:18	WG1513008
Nickel	17.2		2.00	1	07/22/2020 19:18	WG1513008
Selenium	ND		2.00	1	07/22/2020 19:18	WG1513008
Silver	ND		1.00	1	07/22/2020 19:18	WG1513008
Zinc	48.8		5.00	1	07/22/2020 19:18	WG1513008

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0338		0.000500	1	07/25/2020 13:18	WG1515140
Toluene	0.0303		0.00500	1	07/25/2020 13:18	WG1515140
Ethylbenzene	0.00769		0.000500	1	07/25/2020 13:18	WG1515140
Total Xylene	0.0277		0.00150	1	07/25/2020 13:18	WG1515140
TPH (GC/FID) Low Fraction	1.68		0.100	1	07/25/2020 13:18	WG1515140



Collected date/time: 07/20/20 10:00

L1241740

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	85.8		77.0-120		07/25/2020 13:18	WG1515140
(S) a,a,a-Trifluorotoluene(PID)	94.2		72.0-128		07/25/2020 13:18	WG1515140

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

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	35.8		4.00	1	07/26/2020 02:44	WG1514788
(S) o-Terphenyl	63.9		18.0-148		07/26/2020 02:44	WG1514788

6 Qc

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	07/24/2020 10:26	WG1514399
Acenaphthene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Acenaphthylene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Benzo(a)anthracene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Benzo(a)pyrene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Benzo(b)fluoranthene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Benzo(g,h,i)perylene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Benzo(k)fluoranthene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Chrysene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Dibenz(a,h)anthracene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Fluoranthene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Fluorene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Naphthalene	ND		0.0200	1	07/24/2020 10:26	WG1514399
Phenanthrene	ND		0.00600	1	07/24/2020 10:26	WG1514399
Pyrene	ND		0.00600	1	07/24/2020 10:26	WG1514399
1-Methylnaphthalene	ND		0.0200	1	07/24/2020 10:26	WG1514399
2-Methylnaphthalene	ND		0.0200	1	07/24/2020 10:26	WG1514399
2-Chloronaphthalene	ND		0.0200	1	07/24/2020 10:26	WG1514399
(S) p-Terphenyl-d14	78.0		23.0-120		07/24/2020 10:26	WG1514399
(S) Nitrobenzene-d5	76.8		14.0-149		07/24/2020 10:26	WG1514399
(S) 2-Fluorobiphenyl	75.2		34.0-125		07/24/2020 10:26	WG1514399



Collected date/time: 07/20/20 10:10

L1241740

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	25.0		1	07/26/2020 16:04	WG1513744

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	20.4		1.00	1	07/22/2020 21:38	WG1513008

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	07/22/2020 21:38	WG1513163

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.50	T8	1	07/28/2020 12:01	WG1515082

Sample Narrative:

L1241740-02 WG1515082: 8.5 at 24.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2740		10.0	1	07/23/2020 06:53	WG1513493

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	07/22/2020 19:07	WG1513053

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	16.7		2.00	1	07/22/2020 19:26	WG1513008
Barium	300		0.500	1	07/22/2020 19:26	WG1513008
Cadmium	ND		0.500	1	07/22/2020 19:26	WG1513008
Chromium	20.4		1.00	1	07/22/2020 19:26	WG1513008
Copper	23.3		2.00	1	07/22/2020 19:26	WG1513008
Lead	11.9		0.500	1	07/22/2020 19:26	WG1513008
Nickel	18.5		2.00	1	07/22/2020 19:26	WG1513008
Selenium	ND		2.00	1	07/22/2020 19:26	WG1513008
Silver	ND		1.00	1	07/22/2020 19:26	WG1513008
Zinc	44.7		5.00	1	07/22/2020 19:26	WG1513008

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	18.4		0.500	1000	07/25/2020 18:50	WG1515140
Toluene	172		5.00	1000	07/25/2020 18:50	WG1515140
Ethylbenzene	21.5		0.500	1000	07/25/2020 18:50	WG1515140
Total Xylene	273		1.50	1000	07/25/2020 18:50	WG1515140
TPH (GC/FID) Low Fraction	3480		100	1000	07/25/2020 18:50	WG1515140



Collected date/time: 07/20/20 10:10

L1241740

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	80.9		77.0-120		07/25/2020 18:50	WG1515140
(S) a,a,a-Trifluorotoluene(PID)	100		72.0-128		07/25/2020 18:50	WG1515140

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

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	1420		160	40	07/26/2020 04:14	WG1514788
(S) o-Terphenyl	0.000	J7	18.0-148		07/26/2020 04:14	WG1514788

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	07/24/2020 10:47	WG1514399
Acenaphthene	0.0385		0.00600	1	07/24/2020 10:47	WG1514399
Acenaphthylene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Benzo(a)anthracene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Benzo(a)pyrene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Benzo(b)fluoranthene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Benzo(g,h,i)perylene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Benzo(k)fluoranthene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Chrysene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Dibenz(a,h)anthracene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Fluoranthene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Fluorene	0.106		0.00600	1	07/24/2020 10:47	WG1514399
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/24/2020 10:47	WG1514399
Naphthalene	1.50		0.0200	1	07/24/2020 10:47	WG1514399
Phenanthrene	0.0923		0.00600	1	07/24/2020 10:47	WG1514399
Pyrene	ND		0.00600	1	07/24/2020 10:47	WG1514399
1-Methylnaphthalene	1.58		0.0200	1	07/24/2020 10:47	WG1514399
2-Methylnaphthalene	4.39		0.200	10	07/26/2020 19:11	WG1514399
2-Chloronaphthalene	ND		0.0200	1	07/24/2020 10:47	WG1514399
(S) p-Terphenyl-d14	84.3		23.0-120		07/24/2020 10:47	WG1514399
(S) p-Terphenyl-d14	101		23.0-120		07/26/2020 19:11	WG1514399
(S) Nitrobenzene-d5	802	J1	14.0-149		07/24/2020 10:47	WG1514399
(S) Nitrobenzene-d5	1350	J1	14.0-149		07/26/2020 19:11	WG1514399
(S) 2-Fluorobiphenyl	82.3		34.0-125		07/24/2020 10:47	WG1514399
(S) 2-Fluorobiphenyl	115		34.0-125		07/26/2020 19:11	WG1514399

6 Qc

7 Gl

8 Al

9 Sc

Sample Narrative:

L1241740-02 WG1514399: Surrogate failure due to matrix interference



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.66		1	07/26/2020 16:06	WG1513744

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	22.2		1.00	1	07/22/2020 21:39	WG1513008

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	07/22/2020 21:39	WG1513163

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.29	T8	1	07/28/2020 12:01	WG1515082

Sample Narrative:

L1241740-03 WG1515082: 8.29 at 24.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	942		10.0	1	07/23/2020 06:53	WG1513493

Mercury by Method 7471A

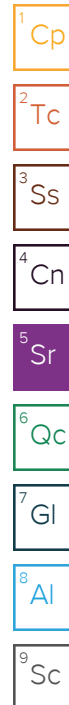
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	07/22/2020 18:32	WG1513053

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	15.9		2.00	1	07/22/2020 18:58	WG1513008
Barium	290	J6 Q1	0.500	1	07/22/2020 18:58	WG1513008
Cadmium	0.541		0.500	1	07/22/2020 18:58	WG1513008
Chromium	22.2	Q1	1.00	1	07/22/2020 18:58	WG1513008
Copper	23.5		2.00	1	07/22/2020 18:58	WG1513008
Lead	13.8	Q1	0.500	1	07/22/2020 18:58	WG1513008
Nickel	19.9		2.00	1	07/22/2020 18:58	WG1513008
Selenium	ND		2.00	1	07/22/2020 18:58	WG1513008
Silver	ND		1.00	1	07/22/2020 18:58	WG1513008
Zinc	51.0	J6 Q1	5.00	1	07/22/2020 18:58	WG1513008

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.0203		0.000500	1	07/25/2020 13:39	WG1515140
Toluene	0.0202		0.00500	1	07/25/2020 13:39	WG1515140
Ethylbenzene	0.00565		0.000500	1	07/25/2020 13:39	WG1515140
Total Xylene	0.0385		0.00150	1	07/25/2020 13:39	WG1515140
TPH (GC/FID) Low Fraction	1.56		0.100	1	07/25/2020 13:39	WG1515140





Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	81.3		77.0-120		07/25/2020 13:39	WG1515140
(S) a,a,a-Trifluorotoluene(PID)	94.3		72.0-128		07/25/2020 13:39	WG1515140

1
Cp2
Tc3
Ss4
Cn5
Sr

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	141		20.0	5	07/26/2020 04:01	WG1514788
(S) o-Terphenyl	139		18.0-148		07/26/2020 04:01	WG1514788

6
Qc7
Gl8
Al9
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	07/24/2020 11:09	WG1514399
Acenaphthene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Acenaphthylene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Benzo(a)anthracene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Benzo(a)pyrene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Benzo(b)fluoranthene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Benzo(g,h,i)perylene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Benzo(k)fluoranthene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Chrysene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Dibenz(a,h)anthracene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Fluoranthene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Fluorene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Naphthalene	ND		0.0200	1	07/24/2020 11:09	WG1514399
Phenanthrene	ND		0.00600	1	07/24/2020 11:09	WG1514399
Pyrene	ND		0.00600	1	07/24/2020 11:09	WG1514399
1-Methylnaphthalene	ND		0.0200	1	07/24/2020 11:09	WG1514399
2-Methylnaphthalene	ND		0.0200	1	07/24/2020 11:09	WG1514399
2-Chloronaphthalene	ND		0.0200	1	07/24/2020 11:09	WG1514399
(S) p-Terphenyl-d14	84.7		23.0-120		07/24/2020 11:09	WG1514399
(S) Nitrobenzene-d5	72.9		14.0-149		07/24/2020 11:09	WG1514399
(S) 2-Fluorobiphenyl	76.8		34.0-125		07/24/2020 11:09	WG1514399



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.17		1	07/26/2020 16:09	WG1513744

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	18.2		1.00	1	07/22/2020 21:39	WG1513008

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	07/22/2020 21:39	WG1513163

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.49	T8	1	07/28/2020 12:01	WG1515082

Sample Narrative:

L1241740-04 WG1515082: 8.49 at 24.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	851		10.0	1	07/23/2020 06:53	WG1513493

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	07/22/2020 19:09	WG1513053

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	16.1		2.00	1	07/22/2020 19:29	WG1513008
Barium	334		0.500	1	07/22/2020 19:29	WG1513008
Cadmium	0.514		0.500	1	07/22/2020 19:29	WG1513008
Chromium	18.2		1.00	1	07/22/2020 19:29	WG1513008
Copper	21.4		2.00	1	07/22/2020 19:29	WG1513008
Lead	10.4		0.500	1	07/22/2020 19:29	WG1513008
Nickel	18.2		2.00	1	07/22/2020 19:29	WG1513008
Selenium	ND		2.00	1	07/22/2020 19:29	WG1513008
Silver	ND		1.00	1	07/22/2020 19:29	WG1513008
Zinc	46.5		5.00	1	07/22/2020 19:29	WG1513008

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00819		0.000500	1	07/28/2020 15:35	WG1515826
Toluene	0.00929		0.00500	1	07/28/2020 15:35	WG1515826
Ethylbenzene	0.00194		0.000500	1	07/28/2020 15:35	WG1515826
Total Xylene	0.00488		0.00150	1	07/28/2020 15:35	WG1515826
TPH (GC/FID) Low Fraction	0.250		0.100	1	07/28/2020 15:35	WG1515826



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	94.5		77.0-120		07/28/2020 15:35	WG1515826
(S) a,a,a-Trifluorotoluene(PID)	99.8		72.0-128		07/28/2020 15:35	WG1515826

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

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	42.8		4.00	1	07/26/2020 02:57	WG1514788
(S) o-Terphenyl	74.2		18.0-148		07/26/2020 02:57	WG1514788

6 Qc

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	07/24/2020 11:30	WG1514399
Acenaphthene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Acenaphthylene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Benzo(a)anthracene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Benzo(a)pyrene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Benzo(b)fluoranthene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Benzo(g,h,i)perylene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Benzo(k)fluoranthene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Chrysene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Dibenz(a,h)anthracene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Fluoranthene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Fluorene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Naphthalene	ND		0.0200	1	07/24/2020 11:30	WG1514399
Phenanthrene	ND		0.00600	1	07/24/2020 11:30	WG1514399
Pyrene	ND		0.00600	1	07/24/2020 11:30	WG1514399
1-Methylnaphthalene	ND		0.0200	1	07/24/2020 11:30	WG1514399
2-Methylnaphthalene	ND		0.0200	1	07/24/2020 11:30	WG1514399
2-Chloronaphthalene	ND		0.0200	1	07/24/2020 11:30	WG1514399
(S) p-Terphenyl-d14	88.6		23.0-120		07/24/2020 11:30	WG1514399
(S) Nitrobenzene-d5	78.2		14.0-149		07/24/2020 11:30	WG1514399
(S) 2-Fluorobiphenyl	82.0		34.0-125		07/24/2020 11:30	WG1514399



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.04		1	07/26/2020 16:12	WG1513744

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	20.0		1.00	1	07/22/2020 21:40	WG1513008

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	07/22/2020 21:40	WG1513163

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.72	T8	1	07/28/2020 12:01	WG1515082

Sample Narrative:

L1241740-05 WG1515082: 8.72 at 24.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	326		10.0	1	07/23/2020 06:53	WG1513493

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0400	1	07/22/2020 19:11	WG1513053

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	21.5		2.00	1	07/22/2020 19:32	WG1513008
Barium	2870		0.500	1	07/22/2020 19:32	WG1513008
Cadmium	ND		0.500	1	07/22/2020 19:32	WG1513008
Chromium	20.0		1.00	1	07/22/2020 19:32	WG1513008
Copper	19.2		2.00	1	07/22/2020 19:32	WG1513008
Lead	12.2		0.500	1	07/22/2020 19:32	WG1513008
Nickel	16.4		2.00	1	07/22/2020 19:32	WG1513008
Selenium	ND		2.00	1	07/22/2020 19:32	WG1513008
Silver	ND		1.00	1	07/22/2020 19:32	WG1513008
Zinc	40.7		5.00	1	07/22/2020 19:32	WG1513008

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.250	500	07/25/2020 18:29	WG1515140
Toluene	8.00		2.50	500	07/25/2020 18:29	WG1515140
Ethylbenzene	ND		0.250	500	07/25/2020 18:29	WG1515140
Total Xylene	80.8		0.750	500	07/25/2020 18:29	WG1515140
TPH (GC/FID) Low Fraction	1790		50.0	500	07/25/2020 18:29	WG1515140



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		07/25/2020 18:29	WG1515140
(S) a,a,a-Trifluorotoluene(PID)	103		72.0-128		07/25/2020 18:29	WG1515140

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

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	271		8.00	2	07/26/2020 03:10	WG1514788
(S) o-Terphenyl	94.9		18.0-148		07/26/2020 03:10	WG1514788

6 Qc

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	07/24/2020 11:52	WG1514399
Acenaphthene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Acenaphthylene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Benzo(a)anthracene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Benzo(a)pyrene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Benzo(b)fluoranthene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Benzo(g,h,i)perylene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Benzo(k)fluoranthene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Chrysene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Dibenz(a,h)anthracene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Fluoranthene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Fluorene	0.0103		0.00600	1	07/24/2020 11:52	WG1514399
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/24/2020 11:52	WG1514399
Naphthalene	0.126		0.0200	1	07/24/2020 11:52	WG1514399
Phenanthrene	0.00731		0.00600	1	07/24/2020 11:52	WG1514399
Pyrene	ND		0.00600	1	07/24/2020 11:52	WG1514399
1-Methylnaphthalene	0.161		0.0200	1	07/24/2020 11:52	WG1514399
2-Methylnaphthalene	0.338		0.0200	1	07/24/2020 11:52	WG1514399
2-Chloronaphthalene	ND		0.0200	1	07/24/2020 11:52	WG1514399
(S) p-Terphenyl-d14	69.0		23.0-120		07/24/2020 11:52	WG1514399
(S) Nitrobenzene-d5	212	J1	14.0-149		07/24/2020 11:52	WG1514399
(S) 2-Fluorobiphenyl	66.5		34.0-125		07/24/2020 11:52	WG1514399

Sample Narrative:

L1241740-05 WG1514399: Surrogate failure due to matrix interference



Method Blank (MB)

(MB) R3552204-1 07/22/20 21:36

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

L1241740-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1241740-01 07/22/20 21:37 • (DUP) R3552204-3 07/22/20 21:38

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

Laboratory Control Sample (LCS)

(LCS) R3552204-2 07/22/20 21:37

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	26.1	109	80.0-120	

L1241961-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241961-01 07/22/20 21:42 • (MS) R3552204-4 07/22/20 21:47 • (MSD) R3552204-5 07/22/20 21:48

	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	10.1	9.96	50.7	49.8	1	75.0-125	J6	J6	1.74	20

L1241961-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1241961-01 07/22/20 21:42 • (MS) R3552204-6 07/22/20 21:49

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	692	ND	657	94.9	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1241740-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1241740-01 07/23/20 15:01 • (DUP) R3552503-2 07/23/20 15:01

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.39	8.38	1	0.119		1

Sample Narrative:

OS: 8.39 at 23.1C

DUP: 8.38 at 23.2C

L1241817-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1241817-06 07/23/20 15:01 • (DUP) R3552503-3 07/23/20 15:01

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.71	8.68	1	0.345		1

Sample Narrative:

OS: 8.71 at 23.3C

DUP: 8.68 at 23.1C

Laboratory Control Sample (LCS)

(LCS) R3552503-1 07/23/20 15:01

	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: 10.03 at 22.4C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1241740-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1241740-04 07/28/20 12:01 • (DUP) R3553904-2 07/28/20 12:01

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.49	8.45	1	0.472		1

Sample Narrative:
OS: 8.49 at 24.7C
DUP: 8.45 at 24.8C

L1243461-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1243461-01 07/28/20 12:01 • (DUP) R3553904-3 07/28/20 12:01

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.22	8.20	1	0.244		1

Sample Narrative:
OS: 8.22 at 24.3C
DUP: 8.2 at 24.2C

Laboratory Control Sample (LCS)

(LCS) R3553904-1 07/28/20 12:01

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:
LCS: 10.05 at 23.1C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3552251-1 07/23/20 06:53

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1241740-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1241740-03 07/23/20 06:53 • (DUP) R3552251-3 07/23/20 06:53

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	942	939	1	0.319		20

L1242186-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1242186-05 07/23/20 06:53 • (DUP) R3552251-4 07/23/20 06:53

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	21.5	21.5	1	0.419		20

Laboratory Control Sample (LCS)

(LCS) R3552251-2 07/23/20 06:53

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	268	100	85.0-115	



Method Blank (MB)

(MB) R3552196-1 07/22/20 18:27

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Mercury	U		0.0180	0.0400

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

Laboratory Control Sample (LCS)

(LCS) R3552196-2 07/22/20 18:29

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Mercury	0.500	0.523	105	80.0-120	

⁷Gl

⁸Al

⁹Sc

L1241740-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241740-03 07/22/20 18:32 • (MS) R3552196-3 07/22/20 18:34 • (MSD) R3552196-4 07/22/20 18:36

	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	0.500	ND	0.546	0.554	109	111	1	75.0-125			1.35	20



Method Blank (MB)

(MB) R3552215-1 07/22/20 18:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3552215-2 07/22/20 18:55

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.6	91.6	80.0-120	
Barium	100	97.1	97.1	80.0-120	
Cadmium	100	92.3	92.3	80.0-120	
Chromium	100	95.1	95.1	80.0-120	
Copper	100	94.3	94.3	80.0-120	
Lead	100	92.5	92.5	80.0-120	
Nickel	100	94.9	94.9	80.0-120	
Selenium	100	92.8	92.8	80.0-120	
Silver	20.0	17.2	86.1	80.0-120	
Zinc	100	91.6	91.6	80.0-120	

L1241740-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241740-03 07/22/20 18:58 • (MS) R3552215-5 07/22/20 19:07 • (MSD) R3552215-6 07/22/20 19:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	15.9	105	96.1	88.8	80.2	1	75.0-125			8.52	20
Barium	100	290	323	338	33.4	47.9	1	75.0-125	J6	J6	4.38	20
Cadmium	100	0.541	88.2	84.5	87.6	84.0	1	75.0-125			4.25	20
Chromium	100	22.2	103	98.5	80.8	76.3	1	75.0-125			4.46	20
Copper	100	23.5	110	107	86.2	83.3	1	75.0-125			2.70	20
Lead	100	13.8	102	96.4	87.7	82.5	1	75.0-125			5.22	20
Nickel	100	19.9	111	106	90.8	85.8	1	75.0-125			4.65	20



L1241740-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241740-03 07/22/20 18:58 • (MS) R3552215-5 07/22/20 19:07 • (MSD) R3552215-6 07/22/20 19:09

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	ND	85.7	81.7	85.7	81.7	1	75.0-125			4.72	20
Silver	20.0	ND	16.3	15.9	81.3	79.3	1	75.0-125			2.49	20
Zinc	100	51.0	127	126	76.1	74.8	1	75.0-125		J6	1.04	20

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3553489-3 07/25/20 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	U		0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(PID)	104			72.0-128
(S) a,a,a-Trifluorotoluene(FID)	110			77.0-120

1
Cp

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Tc

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Ss

4
Cn

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Sr

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Qc

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Gl

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Al

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Sc

Method Blank (MB)

(MB) R3553489-4 07/25/20 11:45

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	U		0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(PID)	104			72.0-128
(S) a,a,a-Trifluorotoluene(FID)	110			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3553489-1 07/25/20 10:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0500	0.0492	98.4	76.0-121	
Toluene	0.0500	0.0538	108	80.0-120	
Ethylbenzene	0.0500	0.0551	110	80.0-124	
Total Xylene	0.150	0.163	109	37.0-160	
(S) a,a,a-Trifluorotoluene(PID)			103	72.0-128	
(S) a,a,a-Trifluorotoluene(FID)			110	77.0-120	



Laboratory Control Sample (LCS)

(LCS) R3553489-2 07/25/20 10:43

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
TPH (GC/FID) Low Fraction	5.50	5.94	108	72.0-127	
(S) a,a,a-Trifluorotoluene(PID)			111	72.0-128	
(S) a,a,a-Trifluorotoluene(FID)			101	77.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3554048-3 07/28/20 11:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	U		0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	100			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	102			72.0-128

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3554048-1 07/28/20 10:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0500	0.0486	97.2	76.0-121	
Toluene	0.0500	0.0502	100	80.0-120	
Ethylbenzene	0.0500	0.0524	105	80.0-124	
Total Xylene	0.150	0.157	105	37.0-160	
(S) a,a,a-Trifluorotoluene(FID)			99.5	77.0-120	
(S) a,a,a-Trifluorotoluene(PID)			102	72.0-128	

Laboratory Control Sample (LCS)

(LCS) R3554048-2 07/28/20 10:26

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.00	109	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			101	77.0-120	
(S) a,a,a-Trifluorotoluene(PID)			108	72.0-128	



Method Blank (MB)

(MB) R3553262-1 07/25/20 22:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	53.3			18.0-148

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3553262-2 07/25/20 22:40

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	30.5	61.0	50.0-150	
(S) o-Terphenyl			71.8	18.0-148	

L1241833-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241833-01 07/26/20 01:40 • (MS) R3553262-3 07/26/20 01:53 • (MSD) R3553262-4 07/26/20 02:06

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	49.4	7.96	28.7	27.8	42.0	40.2	1	50.0-150	J6	J6	3.19	20
(S) o-Terphenyl					49.1	51.8		18.0-148				

Method Blank (MB)

(MB) R3553113-2 07/24/20 07:58

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	75.2			14.0-149
(S) 2-Fluorobiphenyl	80.1			34.0-125
(S) p-Terphenyl-d14	84.5			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3553113-1 07/24/20 07:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0681	85.1	50.0-126	
Acenaphthene	0.0800	0.0663	82.9	50.0-120	
Acenaphthylene	0.0800	0.0617	77.1	50.0-120	
Benzo(a)anthracene	0.0800	0.0704	88.0	45.0-120	
Benzo(a)pyrene	0.0800	0.0604	75.5	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0678	84.8	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0685	85.6	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0705	88.1	49.0-125	
Chrysene	0.0800	0.0700	87.5	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0687	85.9	47.0-125	
Fluoranthene	0.0800	0.0675	84.4	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3553113-1 07/24/20 07:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0706	88.3	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0694	86.8	46.0-125	
Naphthalene	0.0800	0.0629	78.6	50.0-120	
Phenanthrene	0.0800	0.0691	86.4	47.0-120	
Pyrene	0.0800	0.0684	85.5	43.0-123	
1-Methylnaphthalene	0.0800	0.0669	83.6	51.0-121	
2-Methylnaphthalene	0.0800	0.0640	80.0	50.0-120	
2-Chloronaphthalene	0.0800	0.0650	81.3	50.0-120	
(S) Nitrobenzene-d5			77.5	14.0-149	
(S) 2-Fluorobiphenyl			79.1	34.0-125	
(S) p-Terphenyl-d14			79.0	23.0-120	

L1241605-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241605-01 07/24/20 09:01 • (MS) R3553113-3 07/24/20 09:22 • (MSD) R3553113-4 07/24/20 09:43

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	0.0788	ND	0.0436	0.0457	55.3	58.6	1	10.0-145			4.70	30
Acenaphthene	0.0788	ND	0.0463	0.0479	58.8	61.4	1	14.0-127			3.40	27
Acenaphthylene	0.0788	ND	0.0444	0.0455	56.3	58.3	1	21.0-124			2.45	25
Benzo(a)anthracene	0.0788	ND	0.0396	0.0428	50.3	54.9	1	10.0-139			7.77	30
Benzo(a)pyrene	0.0788	ND	0.0332	0.0374	42.1	47.9	1	10.0-141			11.9	31
Benzo(b)fluoranthene	0.0788	ND	0.0354	0.0395	44.9	50.6	1	10.0-140			10.9	36
Benzo(g,h,i)perylene	0.0788	ND	0.0329	0.0385	41.8	49.4	1	10.0-140			15.7	33
Benzo(k)fluoranthene	0.0788	ND	0.0347	0.0386	44.0	49.5	1	10.0-137			10.6	31
Chrysene	0.0788	ND	0.0385	0.0419	48.9	53.7	1	10.0-145			8.46	30
Dibenz(a,h)anthracene	0.0788	ND	0.0306	0.0364	38.8	46.7	1	10.0-132			17.3	31
Fluoranthene	0.0788	ND	0.0399	0.0422	50.6	54.1	1	10.0-153			5.60	33
Fluorene	0.0788	ND	0.0468	0.0485	59.4	62.2	1	11.0-130			3.57	29
Indeno(1,2,3-cd)pyrene	0.0788	ND	0.0319	0.0376	40.5	48.2	1	10.0-137			16.4	32
Naphthalene	0.0788	ND	0.0485	0.0508	61.5	65.1	1	10.0-135			4.63	27
Phenanthrene	0.0788	ND	0.0446	0.0465	56.6	59.6	1	10.0-144			4.17	31
Pyrene	0.0788	ND	0.0446	0.0460	56.6	59.0	1	10.0-148			3.09	35
1-Methylnaphthalene	0.0788	ND	0.0517	0.0525	65.6	67.3	1	10.0-142			1.54	28
2-Methylnaphthalene	0.0788	ND	0.0502	0.0510	63.7	65.4	1	10.0-137			1.58	28
2-Chloronaphthalene	0.0788	ND	0.0469	0.0492	59.5	63.1	1	29.0-120			4.79	24
(S) Nitrobenzene-d5					55.8	62.2		14.0-149				
(S) 2-Fluorobiphenyl					60.4	65.7		34.0-125				
(S) p-Terphenyl-d14					46.9	52.6		23.0-120				

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Cp

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Tc

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Ss

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Cn

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Sr

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Qc

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Gl

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Al

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Sc



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

J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
T8	Sample(s) received past/too close to holding time expiration.

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 ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	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 ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	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 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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



