

Entrada Consulting Group

Sample Delivery Group: L1116500
Samples Received: 07/09/2019
Project Number:
Description: 12-13 Annex Spill

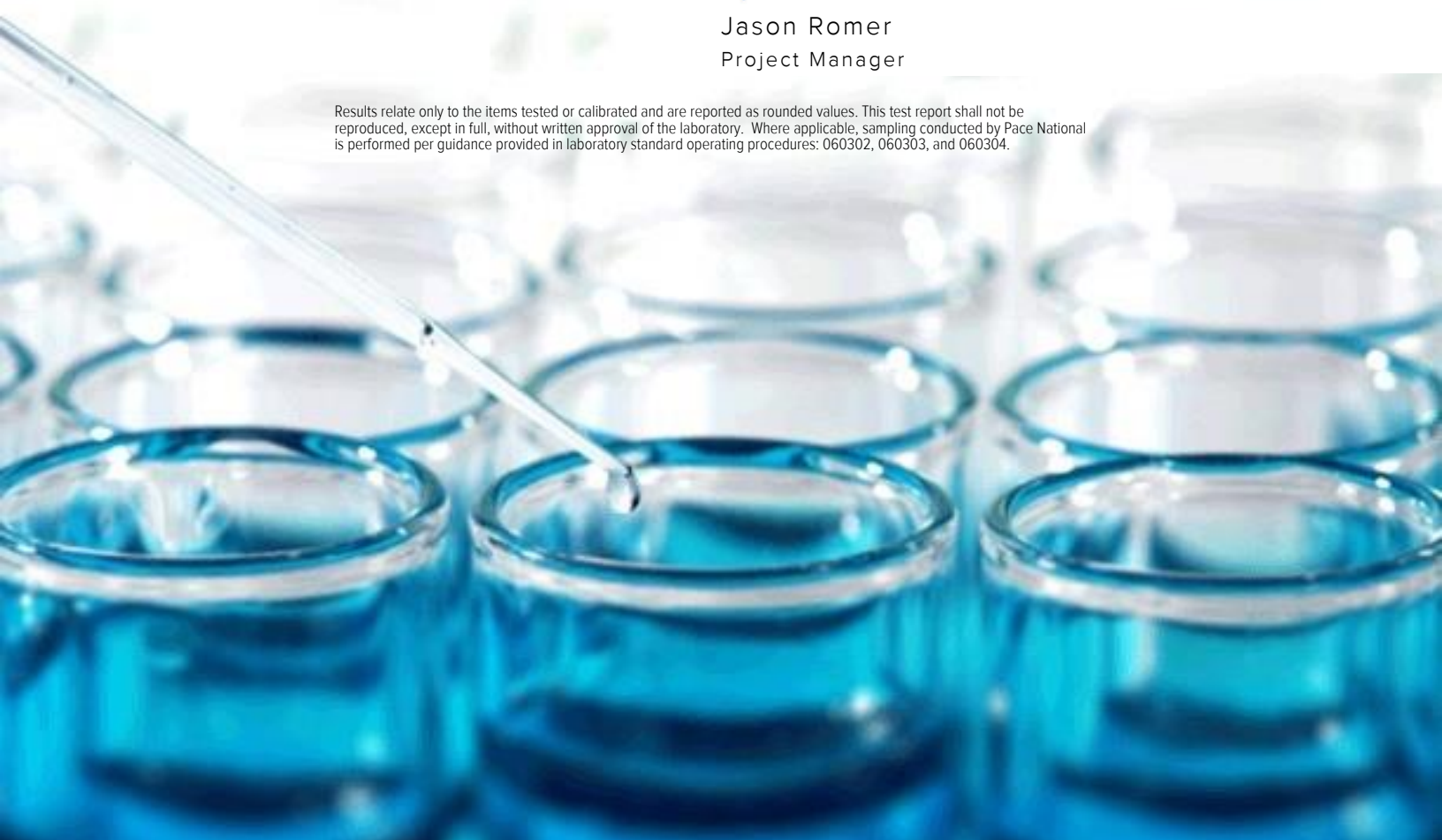
Report To: Stuart Hall
240 Mesa Avenue
Grand Junction, CO 81501

Entire Report Reviewed By:



Jason Romer
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 National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.





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

SAMPLE SUMMARY

12-13 SS1 L1116500-01 Solid

Collected by: Stuart Hall
 Collected date/time: 07/08/19 15:40
 Received date/time: 07/09/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1308748	1	07/11/19 09:49	07/11/19 09:49	CCE	Mt. Juliet, TN
Calculated Results	WG1310204	1	07/12/19 09:21	07/16/19 16:15	JIC	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1311436	1	07/16/19 08:52	07/16/19 16:15	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1310690	1	07/13/19 16:00	07/13/19 17:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1310360	1	07/12/19 10:50	07/12/19 11:58	MJA	Mt. Juliet, TN
Mercury by Method 7471A	WG1310312	1	07/12/19 10:18	07/14/19 20:44	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1310204	1	07/12/19 09:21	07/12/19 12:04	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1310749	1	07/12/19 09:12	07/13/19 00:12	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1310578	1	07/12/19 18:09	07/14/19 04:06	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1310175	1	07/14/19 08:05	07/14/19 20:19	JF	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

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Gl

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Al

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Sc

12-13 SS2 L1116500-02 Solid

Collected by: Stuart Hall
 Collected date/time: 07/08/19 16:00
 Received date/time: 07/09/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1308748	1	07/11/19 09:52	07/11/19 09:52	CCE	Mt. Juliet, TN
Calculated Results	WG1310204	1	07/12/19 09:21	07/16/19 16:16	JIC	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1311436	1	07/16/19 08:52	07/16/19 16:16	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1310690	1	07/13/19 16:00	07/13/19 17:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1310360	1	07/12/19 10:50	07/12/19 11:58	MJA	Mt. Juliet, TN
Mercury by Method 7471A	WG1310312	1	07/12/19 10:18	07/14/19 20:47	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1310204	1	07/12/19 09:21	07/12/19 12:06	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015/8021	WG1310749	1	07/12/19 09:12	07/13/19 00:33	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1310578	5	07/12/19 18:09	07/14/19 04:49	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1310175	1	07/14/19 08:05	07/14/19 20:40	JF	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.

Jason Romer
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	34.3		1	07/11/2019 09:49	WG1308748

1 Cp

2 Tc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	14.0		1.00	1	07/16/2019 16:15	WG1310204

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	07/16/2019 16:15	WG1311436

5 Sr

6 Qc

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.28	<u>T8</u>	1	07/13/2019 17:00	WG1310690

7 Gl

8 Al

Sample Narrative:

L1116500-01 WG1310690: 9.28 at 26.3C

9 Sc

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1850		10.0	1	07/12/2019 11:58	WG1310360

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	0.0202	<u>B</u>	0.0200	1	07/14/2019 20:44	WG1310312

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	2.09		2.00	1	07/12/2019 12:04	WG1310204
Barium	609		0.500	1	07/12/2019 12:04	WG1310204
Cadmium	0.679		0.500	1	07/12/2019 12:04	WG1310204
Chromium	14.0		1.00	1	07/12/2019 12:04	WG1310204
Copper	9.65		2.00	1	07/12/2019 12:04	WG1310204
Lead	7.50		0.500	1	07/12/2019 12:04	WG1310204
Nickel	10.3		2.00	1	07/12/2019 12:04	WG1310204
Selenium	ND		2.00	1	07/12/2019 12:04	WG1310204
Silver	ND		1.00	1	07/12/2019 12:04	WG1310204
Zinc	28.7		5.00	1	07/12/2019 12:04	WG1310204

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.00241		0.000500	1	07/13/2019 00:12	WG1310749
Toluene	0.00549		0.00500	1	07/13/2019 00:12	WG1310749
Ethylbenzene	0.00146	<u>J3</u>	0.000500	1	07/13/2019 00:12	WG1310749
Total Xylene	0.00383	<u>J3 J6</u>	0.00150	1	07/13/2019 00:12	WG1310749
TPH (GC/FID) Low Fraction	0.144	<u>B</u>	0.100	1	07/13/2019 00:12	WG1310749



Collected date/time: 07/08/19 15:40

L1116500

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	98.5		77.0-120		07/13/2019 00:12	WG1310749
(S) <i>a,a,a</i> -Trifluorotoluene(PID)	90.8		72.0-128		07/13/2019 00:12	WG1310749

1 Cp

2 Tc

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	90.6		4.00	1	07/14/2019 04:06	WG1310578
(S) <i>o</i> -Terphenyl	74.1		18.0-148		07/14/2019 04:06	WG1310578

3 Ss

4 Cn

5 Sr

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	07/14/2019 20:19	WG1310175
Acenaphthene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Acenaphthylene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Benzo(a)anthracene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Benzo(a)pyrene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Benzo(b)fluoranthene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Benzo(g,h,i)perylene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Benzo(k)fluoranthene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Chrysene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Dibenz(a,h)anthracene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Fluoranthene	0.00924		0.00600	1	07/14/2019 20:19	WG1310175
Fluorene	0.0156		0.00600	1	07/14/2019 20:19	WG1310175
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/14/2019 20:19	WG1310175
Naphthalene	0.0235		0.0200	1	07/14/2019 20:19	WG1310175
Phenanthrene	0.0304		0.00600	1	07/14/2019 20:19	WG1310175
Pyrene	0.0185		0.00600	1	07/14/2019 20:19	WG1310175
1-Methylnaphthalene	0.0290		0.0200	1	07/14/2019 20:19	WG1310175
2-Methylnaphthalene	0.0653		0.0200	1	07/14/2019 20:19	WG1310175
2-Chloronaphthalene	ND		0.0200	1	07/14/2019 20:19	WG1310175
(S) <i>p</i> -Terphenyl-d14	80.5		23.0-120		07/14/2019 20:19	WG1310175
(S) Nitrobenzene-d5	94.4		14.0-149		07/14/2019 20:19	WG1310175
(S) 2-Fluorobiphenyl	88.1		34.0-125		07/14/2019 20:19	WG1310175

6 Qc

7 Gl

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	18.9		1	07/11/2019 09:52	WG1308748

1 Cp

2 Tc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	14.3		1.00	1	07/16/2019 16:16	WG1310204

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	07/16/2019 16:16	WG1311436

5 Sr

6 Qc

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.20	<u>T8</u>	1	07/13/2019 17:00	WG1310690

7 Gl

8 Al

Sample Narrative:

L1116500-02 WG1310690: 9.2 at 25.4C

9 Sc

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1590		10.0	1	07/12/2019 11:58	WG1310360

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	0.0253	<u>B</u>	0.0200	1	07/14/2019 20:47	WG1310312

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	4.22		2.00	1	07/12/2019 12:06	WG1310204
Barium	773		0.500	1	07/12/2019 12:06	WG1310204
Cadmium	ND		0.500	1	07/12/2019 12:06	WG1310204
Chromium	14.3		1.00	1	07/12/2019 12:06	WG1310204
Copper	20.1		2.00	1	07/12/2019 12:06	WG1310204
Lead	9.18		0.500	1	07/12/2019 12:06	WG1310204
Nickel	11.7		2.00	1	07/12/2019 12:06	WG1310204
Selenium	ND		2.00	1	07/12/2019 12:06	WG1310204
Silver	ND		1.00	1	07/12/2019 12:06	WG1310204
Zinc	43.5		5.00	1	07/12/2019 12:06	WG1310204

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.00194		0.000500	1	07/13/2019 00:33	WG1310749
Toluene	0.00516		0.00500	1	07/13/2019 00:33	WG1310749
Ethylbenzene	0.00210		0.000500	1	07/13/2019 00:33	WG1310749
Total Xylene	0.00327		0.00150	1	07/13/2019 00:33	WG1310749
TPH (GC/FID) Low Fraction	0.159	<u>B</u>	0.100	1	07/13/2019 00:33	WG1310749



Collected date/time: 07/08/19 16:00

L1116500

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)	93.1		77.0-120		07/13/2019 00:33	WG1310749
(S) a,a,a-Trifluorotoluene(PID)	86.2		72.0-128		07/13/2019 00:33	WG1310749

1 Cp

2 Tc

3 Ss

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	248		20.0	5	07/14/2019 04:49	WG1310578
(S) o-Terphenyl	185	J1	18.0-148		07/14/2019 04:49	WG1310578

4 Cn

5 Sr

Sample Narrative:

L1116500-02 WG1310578: High surrogate due to sampl matrix impact.

6 Qc

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	0.00912		0.00600	1	07/14/2019 20:40	WG1310175
Acenaphthene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Acenaphthylene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Benzo(a)anthracene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Benzo(a)pyrene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Benzo(b)fluoranthene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Benzo(g,h,i)perylene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Benzo(k)fluoranthene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Chrysene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Dibenz(a,h)anthracene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Fluoranthene	0.00815		0.00600	1	07/14/2019 20:40	WG1310175
Fluorene	0.0138		0.00600	1	07/14/2019 20:40	WG1310175
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	07/14/2019 20:40	WG1310175
Naphthalene	0.0408		0.0200	1	07/14/2019 20:40	WG1310175
Phenanthrene	0.0532		0.00600	1	07/14/2019 20:40	WG1310175
Pyrene	0.0390		0.00600	1	07/14/2019 20:40	WG1310175
1-Methylnaphthalene	0.0404		0.0200	1	07/14/2019 20:40	WG1310175
2-Methylnaphthalene	0.104		0.0200	1	07/14/2019 20:40	WG1310175
2-Chloronaphthalene	ND		0.0200	1	07/14/2019 20:40	WG1310175
(S) p-Terphenyl-d14	77.6		23.0-120		07/14/2019 20:40	WG1310175
(S) Nitrobenzene-d5	92.4		14.0-149		07/14/2019 20:40	WG1310175
(S) 2-Fluorobiphenyl	86.5		34.0-125		07/14/2019 20:40	WG1310175

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3431200-1 07/16/19 16:14

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

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1116500-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1116500-01 07/16/19 16:15 • (DUP) R3431200-3 07/16/19 16:15

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

L1117293-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1117293-01 07/16/19 16:31 • (DUP) R3431200-4 07/16/19 16:31

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

Laboratory Control Sample (LCS)

(LCS) R3431200-2 07/16/19 16:14

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Chromium,Hexavalent	24.0	21.1	87.9	80.0-120	

L1117293-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1117293-03 07/16/19 16:32 • (MS) R3431200-5 07/16/19 16:32 • (MSD) R3431200-6 07/16/19 16:32

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	U	18.4	19.4	92.1	97.2	1	75.0-125			5.35	20



L1116254-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1116254-01 07/13/19 17:00 • (DUP) R3430360-2 07/13/19 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	12.0	12.0	1	0.417		1

Sample Narrative:

OS: 11.96 at 30.1C
DUP: 12.01 at 30.2C

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L1116929-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1116929-04 07/13/19 17:00 • (DUP) R3430360-3 07/13/19 17:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.38	8.41	1	0.357		1

Sample Narrative:

OS: 8.38 at 23.4C
DUP: 8.41 at 23.5C

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS)

(LCS) R3430360-1 07/13/19 17:00

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: 10.03 at 23.2C



Method Blank (MB)

(MB) R3430088-1 07/12/19 11:58

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

1 Cp

2 Tc

3 Ss

L1116500-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1116500-01 07/12/19 11:58 • (DUP) R3430088-3 07/12/19 11:58

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits
Specific Conductance	1850	1990	1	7.14		20

4 Cn

5 Sr

Laboratory Control Sample (LCS)

(LCS) R3430088-2 07/12/19 11:58

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	877	873	99.5	85.0-115	

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3430469-1 07/14/19 20:22

Analyte	MB Result mg/kg	MB Qualifier mg/kg	MB MDL mg/kg	MB RDL mg/kg
Mercury	0.00967	<u>J</u>	0.00280	0.0200

1 Cp

2 Tc

3 Ss

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

(LCS) R3430469-2 07/14/19 20:25 • (LCSD) R3430469-3 07/14/19 20:27

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury	0.500	0.545	0.482	109	96.3	80.0-120			12.3	20

4 Cn

5 Sr

L1116616-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116616-04 07/14/19 20:29 • (MS) R3430469-4 07/14/19 20:31 • (MSD) R3430469-5 07/14/19 20:33

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 %
Mercury	0.618	0.0139	0.254	0.169	38.8	25.0	1	75.0-125	<u>J6</u>	<u>J3 J6</u>	40.3	20

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3430149-1 07/12/19 11:27

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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3430149-2 07/12/19 11:29 • (LCSD) R3430149-3 07/12/19 11:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	95.1	91.8	95.1	91.8	80.0-120			3.60	20
Barium	100	103	99.2	103	99.2	80.0-120			3.92	20
Cadmium	100	97.8	94.1	97.8	94.1	80.0-120			3.91	20
Chromium	100	98.1	94.7	98.1	94.7	80.0-120			3.48	20
Copper	100	102	98.0	102	98.0	80.0-120			4.02	20
Lead	100	97.1	93.6	97.1	93.6	80.0-120			3.64	20
Nickel	100	100	96.5	100	96.5	80.0-120			3.71	20
Selenium	100	94.5	90.9	94.5	90.9	80.0-120			3.83	20
Silver	20.0	19.8	19.0	98.8	94.8	80.0-120			4.14	20
Zinc	100	97.0	93.5	97.0	93.5	80.0-120			3.61	20

L1116554-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116554-02 07/12/19 11:35 • (MS) R3430149-6 07/12/19 11:43 • (MSD) R3430149-7 07/12/19 11:46

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 %
Arsenic	115	3.40	128	122	108	103	1	75.0-125			4.72	20
Barium	115	205	360	321	135	101	1	75.0-125	<u>J5</u>		11.5	20
Cadmium	115	0.224	127	121	110	105	1	75.0-125			4.67	20
Chromium	115	6.93	122	117	100	95.3	1	75.0-125			4.63	20
Copper	115	8.39	136	132	111	107	1	75.0-125			3.47	20
Lead	115	5.33	127	122	105	102	1	75.0-125			3.52	20



L1116554-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116554-02 07/12/19 11:35 • (MS) R3430149-6 07/12/19 11:43 • (MSD) R3430149-7 07/12/19 11:46

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 %
Nickel	115	6.58	132	126	109	104	1	75.0-125			4.70	20
Selenium	115	0.889	126	119	109	103	1	75.0-125			5.49	20
Silver	23.1	U	26.5	25.4	115	110	1	75.0-125			4.24	20
Zinc	115	17.4	128	124	95.9	92.0	1	75.0-125			3.59	20

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



Method Blank (MB)

(MB) R3430425-5 07/12/19 23:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000398	↓	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0269	↓	0.0217	0.100
^(S) a,a,a-Trifluorotoluene(FID)	104			77.0-120
^(S) a,a,a-Trifluorotoluene(PID)	95.3			72.0-128

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3430425-1 07/12/19 21:49 • (LCSD) R3430425-2 07/12/19 22:09

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0501	0.0531	100	106	76.0-121			5.78	20
Toluene	0.0500	0.0480	0.0510	96.1	102	80.0-120			5.95	20
Ethylbenzene	0.0500	0.0464	0.0498	92.7	99.7	80.0-124			7.21	20
Total Xylene	0.150	0.133	0.141	88.5	93.9	37.0-160			5.92	20
^(S) a,a,a-Trifluorotoluene(FID)				106	106	77.0-120				
^(S) a,a,a-Trifluorotoluene(PID)				104	106	72.0-128				

7 Gl

8 Al

9 Sc

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

(LCS) R3430425-3 07/12/19 22:30 • (LCSD) R3430425-4 07/12/19 22:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.56	5.36	101	97.4	72.0-127			3.67	20
^(S) a,a,a-Trifluorotoluene(FID)				94.8	95.1	77.0-120				
^(S) a,a,a-Trifluorotoluene(PID)				115	115	72.0-128				



L1116500-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116500-01 07/13/19 00:12 • (MS) R3430425-6 07/13/19 04:19 • (MSD) R3430425-7 07/13/19 04:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.00241	0.0395	0.0300	74.2	55.1	1	10.0-155			27.5	32
Toluene	0.0500	0.00549	0.0327	0.0242	54.3	37.5	1	10.0-160			29.6	34
Ethylbenzene	0.0500	0.00146	0.0224	0.0142	41.9	25.5	1	10.0-160		J3	44.8	32
Total Xylene	0.150	0.00383	0.0537	0.0320	33.2	18.8	1	10.0-160	J6	J3 J6	50.6	32
(S) a,a,a-Trifluorotoluene(FID)					98.1	98.9		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					98.9	96.8		72.0-128				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L1116500-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116500-01 07/13/19 00:12 • (MS) R3430425-8 07/13/19 05:00 • (MSD) R3430425-9 07/13/19 05:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	0.144	2.99	3.25	51.7	56.5	1	10.0-151			8.50	28
(S) a,a,a-Trifluorotoluene(FID)					94.4	93.4		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					110	110		72.0-128				

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3430398-1 07/13/19 23:59

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>	96.8			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3430398-2 07/14/19 00:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) High Fraction	50.0	45.2	90.4	50.0-150	
<i>(S) o-Terphenyl</i>			86.8	18.0-148	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3430543-2 07/14/19 19:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00600	0.00600
Acenaphthene	U		0.00600	0.00600
Acenaphthylene	U		0.00600	0.00600
Benzo(a)anthracene	U		0.00600	0.00600
Benzo(a)pyrene	U		0.00600	0.00600
Benzo(b)fluoranthene	U		0.00600	0.00600
Benzo(g,h,i)perylene	U		0.00600	0.00600
Benzo(k)fluoranthene	U		0.00600	0.00600
Chrysene	U		0.00600	0.00600
Dibenz(a,h)anthracene	U		0.00600	0.00600
Fluoranthene	U		0.00600	0.00600
Fluorene	U		0.00600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.00600	0.00600
Pyrene	U		0.00600	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	102			14.0-149
(S) 2-Fluorobiphenyl	93.2			34.0-125
(S) p-Terphenyl-d14	87.4			23.0-120

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3430543-1 07/14/19 18:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0618	77.3	50.0-126	
Acenaphthene	0.0800	0.0656	82.0	50.0-120	
Acenaphthylene	0.0800	0.0701	87.6	50.0-120	
Benzo(a)anthracene	0.0800	0.0574	71.8	45.0-120	
Benzo(a)pyrene	0.0800	0.0558	69.8	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0640	80.0	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0603	75.4	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0626	78.3	49.0-125	
Chrysene	0.0800	0.0616	77.0	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0605	75.6	47.0-125	
Fluoranthene	0.0800	0.0636	79.5	49.0-129	



Laboratory Control Sample (LCS)

(LCS) R3430543-1 07/14/19 18:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0629	78.6	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0616	77.0	46.0-125	
Naphthalene	0.0800	0.0573	71.6	50.0-120	
Phenanthrene	0.0800	0.0582	72.8	47.0-120	
Pyrene	0.0800	0.0622	77.8	43.0-123	
1-Methylnaphthalene	0.0800	0.0598	74.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0572	71.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0610	76.3	50.0-120	
(S) Nitrobenzene-d5			101	14.0-149	
(S) 2-Fluorobiphenyl			91.6	34.0-125	
(S) p-Terphenyl-d14			81.7	23.0-120	

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

L1116670-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116670-01 07/14/19 21:43 • (MS) R3430543-3 07/14/19 22:04 • (MSD) R3430543-4 07/14/19 22:26

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	0.0592	0.0642	74.0	80.3	1	10.0-145			8.10	30
Acenaphthene	0.0800	ND	0.0608	0.0655	76.0	81.9	1	14.0-127			7.44	27
Acenaphthylene	0.0800	ND	0.0662	0.0714	82.8	89.3	1	21.0-124			7.56	25
Benzo(a)anthracene	0.0800	ND	0.0534	0.0585	66.8	73.1	1	10.0-139			9.12	30
Benzo(a)pyrene	0.0800	ND	0.0553	0.0611	69.1	76.4	1	10.0-141			9.97	31
Benzo(b)fluoranthene	0.0800	ND	0.0504	0.0547	63.0	68.4	1	10.0-140			8.18	36
Benzo(g,h,i)perylene	0.0800	ND	0.0519	0.0585	64.9	73.1	1	10.0-140			12.0	33
Benzo(k)fluoranthene	0.0800	ND	0.0573	0.0641	71.6	80.1	1	10.0-137			11.2	31
Chrysene	0.0800	ND	0.0550	0.0616	68.8	77.0	1	10.0-145			11.3	30
Dibenz(a,h)anthracene	0.0800	ND	0.0506	0.0598	63.3	74.8	1	10.0-132			16.7	31
Fluoranthene	0.0800	ND	0.0567	0.0619	70.9	77.4	1	10.0-153			8.77	33
Fluorene	0.0800	ND	0.0571	0.0623	71.4	77.9	1	11.0-130			8.71	29
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0508	0.0584	63.5	73.0	1	10.0-137			13.9	32
Naphthalene	0.0800	ND	0.0550	0.0592	68.8	74.0	1	10.0-135			7.36	27
Phenanthrene	0.0800	ND	0.0525	0.0570	65.6	71.3	1	10.0-144			8.22	31
Pyrene	0.0800	ND	0.0575	0.0629	71.9	78.6	1	10.0-148			8.97	35
1-Methylnaphthalene	0.0800	ND	0.0573	0.0616	71.6	77.0	1	10.0-142			7.23	28
2-Methylnaphthalene	0.0800	ND	0.0548	0.0594	68.5	74.3	1	10.0-137			8.06	28
2-Chloronaphthalene	0.0800	ND	0.0564	0.0607	70.5	75.9	1	29.0-120			7.34	24
(S) Nitrobenzene-d5					97.4	101		14.0-149				
(S) 2-Fluorobiphenyl					81.4	87.1		34.0-125				
(S) p-Terphenyl-d14					73.0	80.1		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.

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.

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

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
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.



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

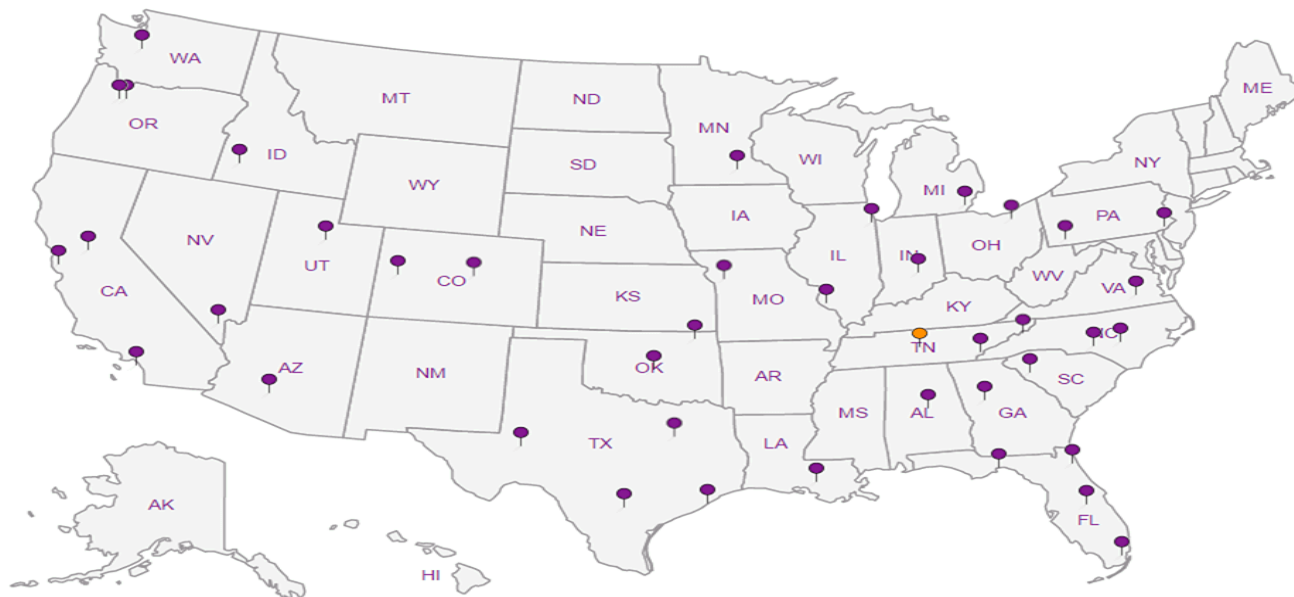
Third Party Federal Accreditations

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.



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

