

October 18, 2019

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laramie Energy - Grand Junction, CO

Sample Delivery Group: L1148616

Samples Received: 10/10/2019

Project Number:

Description: Kobe Flange

Report To: Stuart Hall

760 Horizon Dr., Ste. 101

Grand Junction, CO 81506

Entire Report Reviewed By:

Chris Ward

Chris Ward

Project Manager

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



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



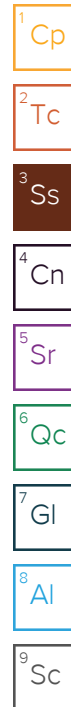
KOBE FLANGE POR L1148616-01 Solid

Collected by
Stuart Hall

Collected date/time
10/09/19 11:50

Received date/time
10/10/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 21:47	10/16/19 21:47	EL	Mt. Juliet, TN
Calculated Results	WG1361801	1	10/12/19 11:43	10/14/19 00:24	JIC	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361793	1	10/12/19 10:13	10/12/19 22:50	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361058	1	10/10/19 20:02	10/10/19 22:15	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1361949	1	10/12/19 13:05	10/12/19 17:46	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1362428	1	10/14/19 12:32	10/14/19 18:40	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1361801	1	10/12/19 11:43	10/14/19 00:24	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362540	1	10/11/19 12:17	10/14/19 14:02	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1363818	1	10/11/19 12:17	10/17/19 13:24	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1362447	5	10/14/19 12:31	10/14/19 23:55	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1363536	1	10/15/19 21:33	10/16/19 20:46	DMG	Mt. Juliet, TN



KOBE FLANGE S1 L1148616-02 Solid

Collected by
Stuart Hall

Collected date/time
10/09/19 12:00

Received date/time
10/10/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/17/19 04:32	10/17/19 04:32	EL	Mt. Juliet, TN
Calculated Results	WG1361801	1	10/12/19 11:43	10/14/19 00:26	JIC	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1361793	1	10/12/19 10:13	10/12/19 22:51	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361058	1	10/10/19 20:02	10/10/19 22:15	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1361949	1	10/12/19 13:05	10/12/19 17:46	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1362428	1	10/14/19 12:32	10/14/19 18:43	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1361801	1	10/12/19 11:43	10/14/19 00:26	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362540	1	10/11/19 12:17	10/14/19 14:22	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1363818	1	10/11/19 12:17	10/17/19 13:44	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1362447	1	10/14/19 12:31	10/14/19 22:52	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1363536	1	10/15/19 21:33	10/16/19 21:08	DMG	Mt. Juliet, TN

KOBE FLANGE S2 L1148616-03 Solid

Collected by
Stuart Hall

Collected date/time
10/09/19 12:15

Received date/time
10/10/19 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1362697	1	10/16/19 21:53	10/16/19 21:53	EL	Mt. Juliet, TN
Calculated Results	WG1361801	1	10/12/19 11:43	10/14/19 01:09	ANP	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1362268	1	10/13/19 16:44	10/14/19 01:09	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1361258	1	10/11/19 15:00	10/11/19 16:05	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1361949	1	10/12/19 15:01	10/12/19 17:46	AKA	Mt. Juliet, TN
Mercury by Method 7471A	WG1362428	1	10/14/19 12:32	10/14/19 18:45	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1361801	1	10/12/19 11:43	10/14/19 00:29	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1362540	1	10/11/19 12:17	10/14/19 14:43	JAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1363818	1	10/11/19 12:17	10/17/19 14:05	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1362447	5	10/14/19 12:31	10/15/19 00:59	KME	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1363536	1	10/15/19 21:33	10/17/19 01:31	DMG	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	30.2		1	10/16/2019 21:47	WG1362697

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	6.67		1.00	1	10/14/2019 00:24	WG1361801

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	10/12/2019 22:50	WG1361793

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.89	T8	1	10/10/2019 22:15	WG1361058

Sample Narrative:

L1148616-01 WG1361058: 8.89 at 21.3C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1630		10.0	1	10/12/2019 17:46	WG1361949

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/14/2019 18:40	WG1362428

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.17		2.00	1	10/14/2019 00:24	WG1361801
Barium	304		0.500	1	10/14/2019 00:24	WG1361801
Cadmium	ND		0.500	1	10/14/2019 00:24	WG1361801
Chromium	6.67		1.00	1	10/14/2019 00:24	WG1361801
Copper	6.73		2.00	1	10/14/2019 00:24	WG1361801
Lead	5.47		0.500	1	10/14/2019 00:24	WG1361801
Nickel	7.29		2.00	1	10/14/2019 00:24	WG1361801
Selenium	ND		2.00	1	10/14/2019 00:24	WG1361801
Silver	ND		1.00	1	10/14/2019 00:24	WG1361801
Zinc	27.2		5.00	1	10/14/2019 00:24	WG1361801

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.284		0.100	1	10/14/2019 14:02	WG1362540
(S) a,a,a-Trifluorotoluene(FID)	94.9		77.0-120		10/14/2019 14:02	WG1362540



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/17/2019 13:24	WG1363818
Toluene	ND		0.00500	1	10/17/2019 13:24	WG1363818
Ethylbenzene	ND		0.00250	1	10/17/2019 13:24	WG1363818
Total Xylenes	ND		0.00650	1	10/17/2019 13:24	WG1363818
Methyl tert-butyl ether	ND		0.00100	1	10/17/2019 13:24	WG1363818
(S) Toluene-d8	103		75.0-131		10/17/2019 13:24	WG1363818
(S) 4-Bromofluorobenzene	98.9		67.0-138		10/17/2019 13:24	WG1363818
(S) 1,2-Dichloroethane-d4	102		70.0-130		10/17/2019 13:24	WG1363818

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	63.1	J3 J5	20.0	5	10/14/2019 23:55	WG1362447
(S) o-Terphenyl	65.7		18.0-148		10/14/2019 23:55	WG1362447

6 Qc

7 Gl

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	10/16/2019 20:46	WG1363536
Acenaphthene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Acenaphthylene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Benzo(a)anthracene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Benzo(a)pyrene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Benzo(b)fluoranthene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Benzo(g,h,i)perylene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Benzo(k)fluoranthene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Chrysene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Dibenz(a,h)anthracene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Fluoranthene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Fluorene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Naphthalene	ND		0.0200	1	10/16/2019 20:46	WG1363536
Phenanthrene	ND		0.00600	1	10/16/2019 20:46	WG1363536
Pyrene	ND		0.00600	1	10/16/2019 20:46	WG1363536
1-Methylnaphthalene	ND		0.0200	1	10/16/2019 20:46	WG1363536
2-Methylnaphthalene	ND		0.0200	1	10/16/2019 20:46	WG1363536
2-Chloronaphthalene	ND		0.0200	1	10/16/2019 20:46	WG1363536
(S) p-Terphenyl-d14	90.2		23.0-120		10/16/2019 20:46	WG1363536
(S) Nitrobenzene-d5	55.3		14.0-149		10/16/2019 20:46	WG1363536
(S) 2-Fluorobiphenyl	84.9		34.0-125		10/16/2019 20:46	WG1363536

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	42.7		1	10/17/2019 04:32	WG1362697

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	5.97		1.00	1	10/14/2019 00:26	WG1361801

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	10/12/2019 22:51	WG1361793

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.98	J3 T8	1	10/10/2019 22:15	WG1361058

Sample Narrative:

L1148616-02 WG1361058: 7.98 at 21.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	9520		10.0	1	10/12/2019 17:46	WG1361949

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/14/2019 18:43	WG1362428

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	2.54		2.00	1	10/14/2019 00:26	WG1361801
Barium	289		0.500	1	10/14/2019 00:26	WG1361801
Cadmium	ND		0.500	1	10/14/2019 00:26	WG1361801
Chromium	5.97		1.00	1	10/14/2019 00:26	WG1361801
Copper	7.48		2.00	1	10/14/2019 00:26	WG1361801
Lead	5.29		0.500	1	10/14/2019 00:26	WG1361801
Nickel	5.59		2.00	1	10/14/2019 00:26	WG1361801
Selenium	ND		2.00	1	10/14/2019 00:26	WG1361801
Silver	ND		1.00	1	10/14/2019 00:26	WG1361801
Zinc	23.5		5.00	1	10/14/2019 00:26	WG1361801

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.195		0.100	1	10/14/2019 14:22	WG1362540
(S) a,a,a-Trifluorotoluene(FID)	96.2		77.0-120		10/14/2019 14:22	WG1362540



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/17/2019 13:44	WG1363818
Toluene	ND		0.00500	1	10/17/2019 13:44	WG1363818
Ethylbenzene	ND		0.00250	1	10/17/2019 13:44	WG1363818
Total Xylenes	ND		0.00650	1	10/17/2019 13:44	WG1363818
Methyl tert-butyl ether	ND		0.00100	1	10/17/2019 13:44	WG1363818
(S) Toluene-d8	101		75.0-131		10/17/2019 13:44	WG1363818
(S) 4-Bromofluorobenzene	99.2		67.0-138		10/17/2019 13:44	WG1363818
(S) 1,2-Dichloroethane-d4	107		70.0-130		10/17/2019 13:44	WG1363818

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	19.9		4.00	1	10/14/2019 22:52	WG1362447
(S) o-Terphenyl	77.4		18.0-148		10/14/2019 22:52	WG1362447

6 Qc

7 Gl

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	10/16/2019 21:08	WG1363536
Acenaphthene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Acenaphthylene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Benzo(a)anthracene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Benzo(a)pyrene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Benzo(b)fluoranthene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Benzo(g,h,i)perylene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Benzo(k)fluoranthene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Chrysene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Dibenz(a,h)anthracene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Fluoranthene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Fluorene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Naphthalene	ND		0.0200	1	10/16/2019 21:08	WG1363536
Phenanthrene	ND		0.00600	1	10/16/2019 21:08	WG1363536
Pyrene	ND		0.00600	1	10/16/2019 21:08	WG1363536
1-Methylnaphthalene	ND		0.0200	1	10/16/2019 21:08	WG1363536
2-Methylnaphthalene	ND		0.0200	1	10/16/2019 21:08	WG1363536
2-Chloronaphthalene	ND		0.0200	1	10/16/2019 21:08	WG1363536
(S) p-Terphenyl-d14	103		23.0-120		10/16/2019 21:08	WG1363536
(S) Nitrobenzene-d5	64.0		14.0-149		10/16/2019 21:08	WG1363536
(S) 2-Fluorobiphenyl	89.9		34.0-125		10/16/2019 21:08	WG1363536

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	32.7		1	10/16/2019 21:53	WG1362697

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	11.4		1.00	1	10/14/2019 01:09	WG1361801

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND	J5	2.00	1	10/14/2019 01:09	WG1362268

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.09	T8	1	10/11/2019 16:05	WG1361258

Sample Narrative:

L1148616-03 WG1361258: 8.09 at 20.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	1350		10.0	1	10/12/2019 17:46	WG1361949

Mercury by Method 7471A

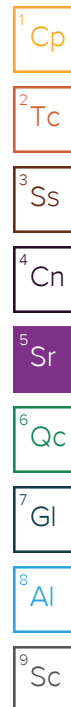
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0300	1	10/14/2019 18:45	WG1362428

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.49		2.00	1	10/14/2019 00:29	WG1361801
Barium	343		0.500	1	10/14/2019 00:29	WG1361801
Cadmium	ND		0.500	1	10/14/2019 00:29	WG1361801
Chromium	11.4		1.00	1	10/14/2019 00:29	WG1361801
Copper	11.8		2.00	1	10/14/2019 00:29	WG1361801
Lead	7.61		0.500	1	10/14/2019 00:29	WG1361801
Nickel	11.2		2.00	1	10/14/2019 00:29	WG1361801
Selenium	ND		2.00	1	10/14/2019 00:29	WG1361801
Silver	ND		1.00	1	10/14/2019 00:29	WG1361801
Zinc	36.2		5.00	1	10/14/2019 00:29	WG1361801

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.377		0.100	1	10/14/2019 14:43	WG1362540
(S) a, a, a-Trifluorotoluene(FID)	95.9		77.0-120		10/14/2019 14:43	WG1362540





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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	10/17/2019 14:05	WG1363818
Toluene	ND		0.00500	1	10/17/2019 14:05	WG1363818
Ethylbenzene	ND		0.00250	1	10/17/2019 14:05	WG1363818
Total Xylenes	0.0110		0.00650	1	10/17/2019 14:05	WG1363818
Methyl tert-butyl ether	ND		0.00100	1	10/17/2019 14:05	WG1363818
(S) Toluene-d8	103		75.0-131		10/17/2019 14:05	WG1363818
(S) 4-Bromofluorobenzene	97.9		67.0-138		10/17/2019 14:05	WG1363818
(S) 1,2-Dichloroethane-d4	107		70.0-130		10/17/2019 14:05	WG1363818

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	41.2		20.0	5	10/15/2019 00:59	WG1362447
(S) o-Terphenyl	89.3		18.0-148		10/15/2019 00:59	WG1362447

6 Qc

7 Gl

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	10/17/2019 01:31	WG1363536
Acenaphthene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Acenaphthylene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Benzo(a)anthracene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Benzo(a)pyrene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Benzo(b)fluoranthene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Benzo(g,h,i)perylene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Benzo(k)fluoranthene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Chrysene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Dibenz(a,h)anthracene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Fluoranthene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Fluorene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Naphthalene	ND		0.0200	1	10/17/2019 01:31	WG1363536
Phenanthrene	ND		0.00600	1	10/17/2019 01:31	WG1363536
Pyrene	ND		0.00600	1	10/17/2019 01:31	WG1363536
1-Methylnaphthalene	ND		0.0200	1	10/17/2019 01:31	WG1363536
2-Methylnaphthalene	ND		0.0200	1	10/17/2019 01:31	WG1363536
2-Chloronaphthalene	ND		0.0200	1	10/17/2019 01:31	WG1363536
(S) p-Terphenyl-d14	107		23.0-120		10/17/2019 01:31	WG1363536
(S) Nitrobenzene-d5	63.6		14.0-149		10/17/2019 01:31	WG1363536
(S) 2-Fluorobiphenyl	87.7		34.0-125		10/17/2019 01:31	WG1363536

8 Al

9 Sc



Method Blank (MB)

(MB) R3460448-1 10/12/19 22:47

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1148616-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1148616-02 10/12/19 22:51 • (DUP) R3460448-3 10/12/19 22:51

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

L1149042-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1149042-05 10/12/19 22:53 • (DUP) R3460448-4 10/12/19 22:54

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	2.53	2.64	1	4.12		20

Laboratory Control Sample (LCS)

(LCS) R3460448-2 10/12/19 22:47

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	25.0	104	80.0-120	

L1149042-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1149042-07 10/12/19 22:55 • (MS) R3460448-5 10/12/19 22:58 • (MSD) R3460448-6 10/12/19 22:58

	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	9.65	9.37	42.9	41.5	1	75.0-125	J6	J6	2.92	20

Sample Narrative:

OS: Sample is a reducer

MS: Sample is a reducer



L1149042-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1149042-07 10/12/19 22:55 • (MS) R3460448-7 10/12/19 22:59

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Chromium,Hexavalent	651	ND	463	71.1	50	75.0-125	<u>J6</u>

Sample Narrative:

OS: Sample is a reducer

MS: Sample is a reducer

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3460616-1 10/14/19 01:08

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1149400-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1149400-02 10/14/19 01:19 • (DUP) R3460616-7 10/14/19 01:20

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

Laboratory Control Sample (LCS)

(LCS) R3460616-2 10/14/19 01:09

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Chromium,Hexavalent	24.0	23.2	96.5	80.0-120	

L1148616-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148616-03 10/14/19 01:09 • (MS) R3460616-3 10/14/19 01:10 • (MSD) R3460616-4 10/14/19 01:10

	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	15.2	16.0	75.9	80.0	1	75.0-125			5.25	20

L1148616-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1148616-03 10/14/19 01:09 • (MS) R3460616-5 10/14/19 01:11

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Chromium,Hexavalent	726	ND	980	135	50	75.0-125	J5

L1148235-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1148235-01 10/10/19 22:15 • (DUP) R3459935-2 10/10/19 22:15

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.23	8.30	1	0.847		1

Sample Narrative:

OS: 8.23 at 24.6C
DUP: 8.3 at 24.8C

L1148616-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1148616-02 10/10/19 22:15 • (DUP) R3459935-3 10/10/19 22:15

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.98	8.07	1	1.12	J3	1

Sample Narrative:

OS: 7.98 at 21.2C
DUP: 8.07 at 21.2C

Laboratory Control Sample (LCS)

(LCS) R3459935-1 10/10/19 22:15

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.95	99.5	99.0-101	

Sample Narrative:

LCS: 9.95 at 21.2C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L1148616-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1148616-03 10/11/19 16:05 • (DUP) R3460331-2 10/11/19 16:05

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.09	8.10	1	0.124		1

Sample Narrative:

OS: 8.09 at 20.5C

DUP: 8.1 at 20.8C

L1148798-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1148798-01 10/11/19 16:05 • (DUP) R3460331-3 10/11/19 16:05

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	9.37	9.35	1	0.214		1

Sample Narrative:

OS: 9.37 at 19.4C

DUP: 9.35 at 19.7C

Laboratory Control Sample (LCS)

(LCS) R3460331-1 10/11/19 16:05

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

Sample Narrative:

LCS: 10 at 20.5C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3460432-1 10/12/19 17:46

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

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1147498-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1147498-07 10/12/19 17:46 • (DUP) R3460432-3 10/12/19 17:46

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	4360	4360	1	0.000		20

L1148263-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1148263-01 10/12/19 17:46 • (DUP) R3460432-4 10/12/19 17:46

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	182	182	1	0.110		20

Laboratory Control Sample (LCS)

(LCS) R3460432-2 10/12/19 17:46

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	393	389	99.0	85.0-115	



Method Blank (MB)

(MB) R3460955-1 10/14/19 18:01

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

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

(LCS) R3460955-2 10/14/19 18:03 • (LCSD) R3460955-5 10/14/19 19:05

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.500	0.443	0.443	88.7	88.7	80.0-120			0.000	20

L1148589-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148589-01 10/14/19 18:07 • (MS) R3460955-3 10/14/19 18:10 • (MSD) R3460955-4 10/14/19 18:12

	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	0.0417	0.466	0.468	84.9	85.3	1	75.0-125			0.472	20

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3460610-1 10/13/19 23:35

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) R3460610-2 10/13/19 23:37 • (LCSD) R3460610-3 10/13/19 23:40

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	99.7	99.6	99.7	99.6	80.0-120			0.155	20
Barium	100	110	110	110	110	80.0-120			0.00813	20
Cadmium	100	103	103	103	103	80.0-120			0.00223	20
Chromium	100	109	109	109	109	80.0-120			0.118	20
Copper	100	110	110	110	110	80.0-120			0.359	20
Lead	100	102	102	102	102	80.0-120			0.0271	20
Nickel	100	105	104	105	104	80.0-120			0.238	20
Selenium	100	105	104	105	104	80.0-120			0.225	20
Silver	20.0	19.9	19.9	99.7	99.5	80.0-120			0.194	20
Zinc	100	107	107	107	107	80.0-120			0.0167	20

L1148591-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148591-24 10/13/19 23:42 • (MS) R3460610-6 10/13/19 23:50 • (MSD) R3460610-7 10/13/19 23:53

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.37	85.2	91.3	82.8	89.0	1	75.0-125			6.99	20
Barium	100	121	209	216	87.6	95.2	1	75.0-125			3.59	20
Cadmium	100	ND	87.5	94.3	87.3	94.0	1	75.0-125			7.39	20
Chromium	100	19.8	109	117	89.3	97.5	1	75.0-125			7.20	20
Copper	100	16.3	112	119	95.6	103	1	75.0-125			6.21	20
Lead	100	8.86	99.4	106	90.5	97.5	1	75.0-125			6.80	20
Nickel	100	17.0	110	117	93.2	100	1	75.0-125			6.23	20



L1148591-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148591-24 10/13/19 23:42 • (MS) R3460610-6 10/13/19 23:50 • (MSD) R3460610-7 10/13/19 23:53

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Selenium	100	ND	86.4	93.5	86.4	93.5	1	75.0-125			7.86	20
Silver	20.0	ND	17.2	18.6	85.8	93.0	1	75.0-125			8.12	20
Zinc	100	52.3	136	143	84.1	90.6	1	75.0-125			4.71	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3461150-2 10/14/19 12:23

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	100			77.0-120

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3461150-1 10/14/19 11:25

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.96	108	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			108	77.0-120	

L1148966-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148966-01 10/14/19 20:00 • (MS) R3461150-3 10/14/19 20:21 • (MSD) R3461150-4 10/14/19 20:41

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	117	U	120	127	102	108	25	10.0-151			5.67	28
(S) a,a,a-Trifluorotoluene(FID)					107	109		77.0-120				



Method Blank (MB)

(MB) R3462278-3 10/17/19 07:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Methyl tert-butyl ether	U		0.000295	0.00100
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	99.1			75.0-131
(S) 4-Bromofluorobenzene	96.8			67.0-138
(S) 1,2-Dichloroethane-d4	105			70.0-130

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) R3462278-1 10/17/19 06:08 • (LCSD) R3462278-2 10/17/19 06:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.133	0.133	106	106	70.0-123			0.000	20
Ethylbenzene	0.125	0.129	0.126	103	101	74.0-126			2.35	20
Methyl tert-butyl ether	0.125	0.108	0.118	86.4	94.4	66.0-132			8.85	20
Toluene	0.125	0.118	0.116	94.4	92.8	75.0-121			1.71	20
Xylenes, Total	0.375	0.322	0.323	85.9	86.1	72.0-127			0.310	20
(S) Toluene-d8				102	100	75.0-131				
(S) 4-Bromofluorobenzene				100	101	67.0-138				
(S) 1,2-Dichloroethane-d4				104	111	70.0-130				

L1148616-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148616-03 10/17/19 14:05 • (MS) R3462278-4 10/17/19 14:47 • (MSD) R3462278-5 10/17/19 15:08

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 %
Benzene	0.125	ND	0.103	0.108	82.4	86.4	1	10.0-149			4.74	37
Ethylbenzene	0.125	ND	0.104	0.116	83.2	92.8	1	10.0-160			10.9	38
Methyl tert-butyl ether	0.125	ND	0.0669	0.0619	53.5	49.5	1	11.0-147			7.76	35
Toluene	0.125	ND	0.111	0.113	88.8	90.4	1	10.0-156			1.79	38
Xylenes, Total	0.375	0.0110	0.406	0.432	105	112	1	10.0-160			6.21	38
(S) Toluene-d8					98.3	103		75.0-131				
(S) 4-Bromofluorobenzene					96.3	99.2		67.0-138				
(S) 1,2-Dichloroethane-d4					105	100		70.0-130				

Method Blank (MB)

(MB) R3461012-1 10/14/19 20:08

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	75.7			18.0-148

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3461012-2 10/14/19 20:21

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	
TPH (GC/FID) High Fraction	50.0	40.2	80.4	50.0-150	
(S) o-Terphenyl			97.6	18.0-148	

L1148616-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148616-01 10/14/19 23:55 • (MS) R3461012-3 10/15/19 00:08 • (MSD) R3461012-4 10/15/19 00:21

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	%	%		%			%	%
TPH (GC/FID) High Fraction	50.0	63.1	111	147	95.8	168	5	50.0-150		J3 J5	27.9	20
(S) o-Terphenyl					83.5	77.3		18.0-148				

Method Blank (MB)

(MB) R3461865-2 10/16/19 19:18

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) Nitrobenzene-d5	71.0			14.0-149
(S) 2-Fluorobiphenyl	93.2			34.0-125
(S) p-Terphenyl-d14	102			23.0-120

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3461865-1 10/16/19 18:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0715	89.4	50.0-126	
Acenaphthene	0.0800	0.0680	85.0	50.0-120	
Acenaphthylene	0.0800	0.0723	90.4	50.0-120	
Benzo(a)anthracene	0.0800	0.0659	82.4	45.0-120	
Benzo(a)pyrene	0.0800	0.0633	79.1	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0732	91.5	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0814	102	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0697	87.1	49.0-125	
Chrysene	0.0800	0.0658	82.3	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0797	99.6	47.0-125	
Fluoranthene	0.0800	0.0658	82.3	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3461865-1 10/16/19 18:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0694	86.8	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0801	100	46.0-125	
Naphthalene	0.0800	0.0710	88.8	50.0-120	
Phenanthrene	0.0800	0.0731	91.4	47.0-120	
Pyrene	0.0800	0.0669	83.6	43.0-123	
1-Methylnaphthalene	0.0800	0.0706	88.3	51.0-121	
2-Methylnaphthalene	0.0800	0.0676	84.5	50.0-120	
2-Chloronaphthalene	0.0800	0.0679	84.9	50.0-120	
(S) Nitrobenzene-d5			67.6	14.0-149	
(S) 2-Fluorobiphenyl			90.6	34.0-125	
(S) p-Terphenyl-d14			103	23.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1148653-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1148653-01 10/16/19 19:40 • (MS) R3461865-3 10/16/19 20:02 • (MSD) R3461865-4 10/16/19 20:24

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	0.00193	0.0758	0.131	92.3	161	1	10.0-145		J3 J5	53.4	30
Acenaphthene	0.0800	0.000686	0.0691	0.0866	85.5	107	1	14.0-127			22.5	27
Acenaphthylene	0.0800	U	0.0716	0.0715	89.5	89.4	1	21.0-124			0.140	25
Benzo(a)anthracene	0.0800	0.00713	0.0817	0.190	93.2	229	1	10.0-139		J3 J5	79.7	30
Benzo(a)pyrene	0.0800	0.00764	0.0873	0.182	99.6	218	1	10.0-141		J3 J5	70.3	31
Benzo(b)fluoranthene	0.0800	0.00886	0.0860	0.188	96.4	224	1	10.0-140		J3 J5	74.5	36
Benzo(g,h,i)perylene	0.0800	0.00662	0.0951	0.159	111	190	1	10.0-140		J3 J5	50.3	33
Benzo(k)fluoranthene	0.0800	0.00328	0.0786	0.121	94.2	147	1	10.0-137		J3 J5	42.5	31
Chrysene	0.0800	0.00756	0.0798	0.186	90.3	223	1	10.0-145		J3 J5	79.9	30
Dibenz(a,h)anthracene	0.0800	0.00154	0.0813	0.100	99.7	123	1	10.0-132			20.6	31
Fluoranthene	0.0800	0.0141	0.0967	0.331	103	396	1	10.0-153		J3 J5	110	33
Fluorene	0.0800	U	0.0713	0.0839	89.1	105	1	11.0-130			16.2	29
Indeno(1,2,3-cd)pyrene	0.0800	0.00481	0.0896	0.141	106	170	1	10.0-137		J3 J5	44.6	32
Naphthalene	0.0800	U	0.0691	0.0700	86.4	87.5	1	10.0-135			1.29	27
Phenanthrene	0.0800	0.00982	0.0937	0.335	105	406	1	10.0-144		J3 J5	113	31
Pyrene	0.0800	0.0171	0.104	0.344	109	409	1	10.0-148		J3 J5	107	35
1-Methylnaphthalene	0.0800	U	0.0709	0.0726	88.6	90.8	1	10.0-142			2.37	28
2-Methylnaphthalene	0.0800	U	0.0678	0.0692	84.8	86.5	1	10.0-137			2.04	28
2-Chloronaphthalene	0.0800	U	0.0664	0.0648	83.0	81.0	1	29.0-120			2.44	24
(S) Nitrobenzene-d5					66.1	67.6		14.0-149				
(S) 2-Fluorobiphenyl					88.2	93.3		34.0-125				
(S) p-Terphenyl-d14					96.4	104		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

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.

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.



[illegible]

Pace Analytical National Center for Testing & Innovation Cooler Receipt Form

Client: <i>Oxy GCO</i>	1148616	
Cooler Received/Opened On:	Temperature: <i>0.1</i>	
Received By: <i>10/18/19 Clark Davis</i>		
Signature: <i>[Signature]</i>		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC Signed / Accurate?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bottles arrive intact?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Correct bottles used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sufficient volume sent?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If Applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VOA Zero headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preservation Correct / Checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>