

Laramie Energy - Grand Junction, CO

Sample Delivery Group: L1789570
Samples Received: 10/16/2024
Project Number: CC4"
Description: Cascade Pipeline
Site: CC4"
Report To: Matt Kasten
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Entire Report Reviewed By:



Chris Ward
Project Manager

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

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

TABLE OF CONTENTS

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
CC4 POR L1789570-01	5
Qc: Quality Control Summary	7
Wet Chemistry by Method 7199	7
Wet Chemistry by Method 9045D	8
Wet Chemistry by Method 9050AMod	9
Metals (ICP) by Method 6010B-NE493 Ch 2	10
Metals (ICPMS) by Method 6020	11
Volatile Organic Compounds (GC) by Method 8015D/GRO	12
Volatile Organic Compounds (GC/MS) by Method 8260B	13
Semi-Volatile Organic Compounds (GC) by Method 8015M	14
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	15
Gl: Glossary of Terms	17
Al: Accreditations & Locations	18
Sc: Sample Chain of Custody	19

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

SAMPLE SUMMARY

CC4 POR L1789570-01 Solid

Collected by
Matt Kasten

Collected date/time
10/15/24 11:00

Received date/time
10/16/24 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2385518	1	10/24/24 22:45	10/24/24 22:45	MAP	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2384516	1	10/22/24 13:55	10/23/24 00:56	VSS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2388801	1	10/24/24 14:35	10/24/24 17:10	KRB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2388813	1	10/24/24 14:37	10/24/24 15:07	KA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2385532	1	10/22/24 20:14	10/23/24 08:32	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2384851	5	10/23/24 22:29	10/24/24 11:05	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2386130	1.01	10/18/24 22:36	10/22/24 12:08	CDD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2389073	1.01	10/18/24 22:36	10/25/24 16:04	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2389238	1	10/25/24 15:04	10/26/24 15:55	KDB	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2389462	1	10/26/24 09:39	10/27/24 22:58	MBE	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

ACCOUNT:

Laramie Energy - Grand Junction, CO

PROJECT:

CC4"

SDG:

L1789570

DATE/TIME:

10/31/24 16:37

PAGE:

3 of 19

CASE NARRATIVE

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



Calculated Results

Table with 6 columns: Analyte, Result, Qualifier, Dilution, Analysis date / time, Batch. Row 1: Sodium Adsorption Ratio, 43.4, 1, 10/24/2024 22:45, WG2385518.

Wet Chemistry by Method 7199

Table with 8 columns: Analyte, Result mg/kg, Qualifier, MDL mg/kg, RDL mg/kg, Dilution, Analysis date / time, Batch. Row 1: Hexavalent Chromium, U, 0.255, 1.00, 1, 10/23/2024 00:56, WG2384516.

Wet Chemistry by Method 9045D

Table with 8 columns: Analyte, Result su, Qualifier, Dilution, Analysis date / time, Batch. Row 1: pH, 8.09, T8, 1, 10/24/2024 17:10, WG2388801.

Sample Narrative:
L1789570-01 WG2388801: 8.09 at 20.7C

Wet Chemistry by Method 9050AMod

Table with 8 columns: Analyte, Result, Units, Qualifier, RDL, Dilution, Analysis date / time, Batch. Row 1: Specific Conductance, 17700, umhos/cm, 10.0, 1, 10/24/2024 15:07, WG2388813.

Sample Narrative:
L1789570-01 WG2388813: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Table with 8 columns: Analyte, Result mg/l, Qualifier, MDL mg/l, RDL mg/l, Dilution, Analysis date / time, Batch. Row 1: Hot Water Sol. Boron, 3.07, 0.0167, 0.200, 1, 10/23/2024 08:32, WG2385532.

Metals (ICPMS) by Method 6020

Table with 8 columns: Analyte, Result mg/kg, Qualifier, MDL mg/kg, RDL mg/kg, Dilution, Analysis date / time, Batch. Rows include Arsenic, Barium, Cadmium, Copper, Lead, Nickel, Selenium, Silver, Zinc with various results and qualifiers.

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

Table with 8 columns: Analyte, Result mg/kg, Qualifier, MDL mg/kg, RDL mg/kg, Dilution, Analysis date / time, Batch. Rows include TPH (GC/FID) Low Fraction and a,a,a-Trifluorotoluene(FID).

Vertical sidebar with 9 colored boxes containing element symbols: 1 Cp, 2 Tc, 3 Ss, 4 Cn, 5 Sr, 6 Qc, 7 Gl, 8 Al, 9 Sc.

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000472	0.00101	1.01	10/25/2024 16:04	WG2389073
Toluene	0.00755	B	0.00131	0.00505	1.01	10/25/2024 16:04	WG2389073
Ethylbenzene	0.00119	U	0.000744	0.00253	1.01	10/25/2024 16:04	WG2389073
Xylenes, Total	0.0240		0.000889	0.00656	1.01	10/25/2024 16:04	WG2389073
1,2,4-Trimethylbenzene	0.00901		0.00160	0.00505	1.01	10/25/2024 16:04	WG2389073
1,3,5-Trimethylbenzene	0.00813		0.00202	0.00505	1.01	10/25/2024 16:04	WG2389073
(S) Toluene-d8	100			75.0-131		10/25/2024 16:04	WG2389073
(S) 4-Bromofluorobenzene	101			67.0-138		10/25/2024 16:04	WG2389073
(S) 1,2-Dichloroethane-d4	80.9			70.0-130		10/25/2024 16:04	WG2389073

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	15.9		1.61	4.00	1	10/26/2024 15:55	WG2389238
C28-C36 Motor Oil Range	41.7		0.274	4.00	1	10/26/2024 15:55	WG2389238
(S) o-Terphenyl	34.7			18.0-148		10/26/2024 15:55	WG2389238

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/27/2024 22:58	WG2389462
Anthracene	U		0.00230	0.00600	1	10/27/2024 22:58	WG2389462
Benzo(a)anthracene	U		0.00173	0.00600	1	10/27/2024 22:58	WG2389462
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/27/2024 22:58	WG2389462
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/27/2024 22:58	WG2389462
Benzo(a)pyrene	U		0.00179	0.00600	1	10/27/2024 22:58	WG2389462
Chrysene	U		0.00232	0.00600	1	10/27/2024 22:58	WG2389462
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/27/2024 22:58	WG2389462
Fluoranthene	U		0.00227	0.00600	1	10/27/2024 22:58	WG2389462
Fluorene	U		0.00205	0.00600	1	10/27/2024 22:58	WG2389462
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/27/2024 22:58	WG2389462
1-Methylnaphthalene	U		0.00449	0.0200	1	10/27/2024 22:58	WG2389462
2-Methylnaphthalene	0.00909	U	0.00427	0.0200	1	10/27/2024 22:58	WG2389462
Naphthalene	0.00595	U	0.00408	0.0200	1	10/27/2024 22:58	WG2389462
Pyrene	U		0.00200	0.00600	1	10/27/2024 22:58	WG2389462
(S) p-Terphenyl-d14	99.1			23.0-120		10/27/2024 22:58	WG2389462
(S) Nitrobenzene-d5	73.2			14.0-149		10/27/2024 22:58	WG2389462
(S) 2-Fluorobiphenyl	80.0			34.0-125		10/27/2024 22:58	WG2389462

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4136193-1 10/23/24 00:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1789677-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1789677-03 10/23/24 01:14 • (DUP) R4136193-3 10/23/24 01:21

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

L1789878-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1789878-05 10/23/24 03:37 • (DUP) R4136193-8 10/23/24 03:43

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	0.456	0.406	1	11.7	⬇	20

Laboratory Control Sample (LCS)

(LCS) R4136193-2 10/23/24 00:43

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.6	106	80.0-120	

L1789878-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1789878-01 10/23/24 02:35 • (MS) R4136193-4 10/23/24 02:41 • (MSD) R4136193-5 10/23/24 02:47

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	U	20.4	20.7	102	103	1	75.0-125			1.15	20

L1789878-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1789878-01 10/23/24 02:35 • (MS) R4136193-6 10/23/24 03:06

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	656	U	595	90.7	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1789495-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1789495-03 10/24/24 17:10 • (DUP) R4137327-2 10/24/24 17:10

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	9.41	9.44	1	0.318		1

Sample Narrative:

OS: 9.41 at 20.8C

DUP: 9.44 at 20.7C

L1789677-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1789677-08 10/24/24 17:10 • (DUP) R4137327-3 10/24/24 17:10

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.80	7.80	1	0.000		1

Sample Narrative:

OS: 7.8 at 20C

DUP: 7.8 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R4137327-1 10/24/24 17:10

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 19.2C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4137210-1 10/24/24 15:07

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

Sample Narrative:

BLANK: at 25C

L1789570-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1789570-01 10/24/24 15:07 • (DUP) R4137210-3 10/24/24 15:07

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	17700	17700	1	0.000		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1789873-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1789873-03 10/24/24 15:07 • (DUP) R4137210-4 10/24/24 15:07

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1230	1210	1	1.31		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R4137210-2 10/24/24 15:07

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	733	732	99.9	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4136682-1 10/23/24 08:18

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R4136682-2 10/23/24 08:21 • (LCSD) R4136682-3 10/23/24 08:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.01	1.03	101	103	80.0-120			1.77	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R4137032-1 10/24/24 10:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	0.278	U	0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	1.17	U	0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R4137032-2 10/24/24 10:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	103	103	80.0-120	
Barium	100	101	101	80.0-120	
Cadmium	100	104	104	80.0-120	
Copper	100	102	102	80.0-120	
Lead	100	99.5	99.5	80.0-120	
Nickel	100	106	106	80.0-120	
Selenium	100	101	101	80.0-120	
Silver	20.0	20.2	101	80.0-120	
Zinc	100	105	105	80.0-120	

L1789878-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1789878-05 10/24/24 10:49 • (MS) R4137032-5 10/24/24 10:58 • (MSD) R4137032-6 10/24/24 11:01

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	4.92	95.3	109	90.4	104	5	75.0-125			13.0	20
Barium	100	328	327	428	0.000	101	5	75.0-125	J6	J3	27.0	20
Cadmium	100	0.143	93.0	106	92.9	106	5	75.0-125			13.3	20
Copper	100	10.0	99.7	114	89.6	103	5	75.0-125			13.0	20
Lead	100	14.6	102	118	87.1	103	5	75.0-125			14.9	20
Nickel	100	18.1	109	124	90.9	106	5	75.0-125			13.1	20
Selenium	100	U	89.1	102	89.1	102	5	75.0-125			13.9	20
Silver	20.0	U	18.2	20.9	91.1	105	5	75.0-125			13.7	20
Zinc	100	45.9	129	149	83.1	103	5	75.0-125			14.4	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4136619-2 10/22/24 04:13

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)	102			77.0-120

Laboratory Control Sample (LCS)

(LCS) R4136619-1 10/22/24 03:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.00	5.69	114	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			113	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4137854-2 10/25/24 12:14

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	0.00133	U	0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	100			75.0-131
(S) 4-Bromofluorobenzene	100			67.0-138
(S) 1,2-Dichloroethane-d4	82.5			70.0-130

Laboratory Control Sample (LCS)

(LCS) R4137854-1 10/25/24 10:57

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.135	108	70.0-123	
Toluene	0.125	0.124	99.2	75.0-121	
Ethylbenzene	0.125	0.120	96.0	74.0-126	
Xylenes, Total	0.375	0.350	93.3	72.0-127	
1,2,4-Trimethylbenzene	0.125	0.100	80.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.105	84.0	73.0-127	
(S) Toluene-d8			98.8	75.0-131	
(S) 4-Bromofluorobenzene			99.7	67.0-138	
(S) 1,2-Dichloroethane-d4			93.7	70.0-130	

L1790641-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1790641-01 10/25/24 19:09 • (MS) R4137854-3 10/25/24 21:03 • (MSD) R4137854-4 10/25/24 21:21

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	0.262	U	0.318	0.331	140	146	1.81	10.0-149			4.01	37
Toluene	0.262	U	0.288	0.305	127	134	1.81	10.0-156			5.73	38
Ethylbenzene	0.262	U	0.278	0.288	122	127	1.81	10.0-160			3.53	38
Xylenes, Total	0.785	U	0.801	0.826	118	121	1.81	10.0-160			3.07	38
1,2,4-Trimethylbenzene	0.262	U	0.228	0.237	100	104	1.81	10.0-160			3.87	36
1,3,5-Trimethylbenzene	0.262	U	0.233	0.238	103	105	1.81	10.0-160			2.12	38
(S) Toluene-d8					98.8	98.6		75.0-131				
(S) 4-Bromofluorobenzene					99.0	98.5		67.0-138				
(S) 1,2-Dichloroethane-d4					91.9	85.6		70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R4138087-1 10/26/24 10:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	78.1			18.0-148

Laboratory Control Sample (LCS)

(LCS) R4138087-2 10/26/24 10:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	39.4	78.8	50.0-150	
(S) o-Terphenyl			86.3	18.0-148	

L1789197-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1789197-20 10/26/24 11:24 • (MS) R4138087-3 10/26/24 11:38 • (MSD) R4138087-4 10/26/24 11:52

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 %
C10-C28 Diesel Range	50.0	U	40.7	35.1	81.4	70.2	1	50.0-150			14.8	20
(S) o-Terphenyl					63.7	61.9		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) R4139943-2 10/27/24 17:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	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
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	91.1			23.0-120
(S) Nitrobenzene-d5	71.2			14.0-149
(S) 2-Fluorobiphenyl	78.9			34.0-125

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R4139943-1 10/27/24 17:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0665	83.1	50.0-120	
Anthracene	0.0800	0.0638	79.8	50.0-126	
Benzo(a)anthracene	0.0800	0.0608	76.0	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0745	93.1	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0794	99.3	49.0-125	
Benzo(a)pyrene	0.0800	0.0650	81.3	42.0-120	
Chrysene	0.0800	0.0729	91.1	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0703	87.9	47.0-125	
Fluoranthene	0.0800	0.0730	91.3	49.0-129	
Fluorene	0.0800	0.0696	87.0	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0599	74.9	46.0-125	
1-Methylnaphthalene	0.0800	0.0694	86.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0631	78.9	50.0-120	
Naphthalene	0.0800	0.0657	82.1	50.0-120	
Pyrene	0.0800	0.0784	98.0	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R4139943-1 10/27/24 17:41

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			104	23.0-120	
(S) Nitrobenzene-d5			77.9	14.0-149	
(S) 2-Fluorobiphenyl			89.9	34.0-125	

L1789482-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1789482-12 10/27/24 23:16 • (MS) R4139943-3 10/27/24 23:34 • (MSD) R4139943-4 10/27/24 23:51

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acenaphthene	0.0796	0.0117	0.0716	0.0733	75.3	79.8	1	14.0-127			2.35	27
Anthracene	0.0796	0.00310	0.0657	0.0654	78.6	80.7	1	10.0-145			0.458	30
Benzo(a)anthracene	0.0796	0.00436	0.0671	0.0707	78.8	85.9	1	10.0-139			5.22	30
Benzo(b)fluoranthene	0.0796	0.00823	0.0779	0.0757	87.5	87.4	1	10.0-140			2.86	36
Benzo(k)fluoranthene	0.0796	U	0.0633	0.0662	79.5	85.8	1	10.0-137			4.48	31
Benzo(a)pyrene	0.0796	0.00297	0.0705	0.0687	84.8	85.1	1	10.0-141			2.59	31
Chrysene	0.0796	0.00538	0.0781	0.0780	91.4	94.1	1	10.0-145			0.128	30
Dibenz(a,h)anthracene	0.0796	U	0.0660	0.0663	82.9	85.9	1	10.0-132			0.454	31
Fluoranthene	0.0796	0.0218	0.0980	0.101	95.7	103	1	10.0-153			3.02	33
Fluorene	0.0796	0.00953	0.0771	0.0785	84.9	89.3	1	11.0-130			1.80	29
Indeno(1,2,3-cd)pyrene	0.0796	0.00304	0.0629	0.0668	75.2	82.6	1	10.0-137			6.01	32
1-Methylnaphthalene	0.0796	2.85	3.31	3.70	578	1100	1	10.0-142	V	V	11.1	28
2-Methylnaphthalene	0.0796	3.51	4.00	4.86	616	1750	1	10.0-137	E V	E V	19.4	28
Naphthalene	0.0796	U	1.95	2.17	2450	2810	1	10.0-135	J5	J5	10.7	27
Pyrene	0.0796	0.0260	0.105	0.107	99.2	105	1	10.0-148			1.89	35
(S) p-Terphenyl-d14					94.2	95.3		23.0-120				
(S) Nitrobenzene-d5					0.000	0.000		14.0-149	J2	J2		
(S) 2-Fluorobiphenyl					92.4	96.3		34.0-125				

Sample Narrative:
OS: Surrogate failure due to matrix interference

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

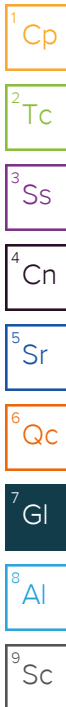
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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.
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
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower 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.
V	The sample concentration is too high to evaluate accurate spike recoveries.



ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
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}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
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

* 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 Analytical.



[illegible]