ANALYTICAL REPORT

January 15, 2018

Crestone Peak Resources

Sample Delivery Group:	L962527
Samples Received:	01/11/2018
Project Number:	
Description:	Liberty 2F-21H

Report To: Tarah Garza
10188 E. Interstate 25 Frontage Rd.
Firestone, CO 80504

Entire Report Reviewed By:

Shane Gambill
Technical Service Representative

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LIBERTY2F-21H L962527-01 Solid

Collected by	Collected date/time	Received date/time
Tarah	01/08/18 15:45	01/11/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1061732	1	01/11/18 13:27	01/12/18 13:21	JDG
Calculated Results	WG1061726	1	01/11/18 11:22	01/11/18 15:01	TRB
Wet Chemistry by Method 3060A/7196A	WG1061743	1	01/11/18 11:03	01/11/18 15:01	ER
Wet Chemistry by Method 9045D	WG1062210	1	01/12/18 09:41	01/12/18 11:03	ER
Wet Chemistry by Method 9050AMod	WG1062012	1	01/11/18 22:58	01/12/18 00:50	JLJ
Mercury by Method 7471A	WG1062289	1	01/12/18 12:28	01/15/18 08:59	ABL
Metals (ICP) by Method 6010B	WG1061726	1	01/11/18 11:22	01/11/18 14:13	TRB
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1061990	1	01/11/18 13:36	01/12/18 01:48	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1062073	1	01/11/18 13:36	01/12/18 01:44	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1061817	1	01/11/18 16:09	01/12/18 01:33	ACM
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1061820	1	01/11/18 16:36	01/12/18 04:34	ADF

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 radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. 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.

Shane Gambill
Technical Service Representative

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	7.70		1	01/12/2018 13:21	WG1061732

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	11.9		1.00	1	01/11/2018 15:01	WG1061726

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	01/11/2018 15:01	WG1061743

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.10	T8	1	01/12/2018 11:03	WG1062210

Sample Narrative:
L962527-01 WG1062210: 8.1 at 20.5C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	847		10.0	1	01/12/2018 00:50	WG1062012

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	01/15/2018 08:59	WG1062289

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.13		2.00	1	01/11/2018 14:13	WG1061726
Barium	198		0.500	1	01/11/2018 14:13	WG1061726
Cadmium	ND		0.500	1	01/11/2018 14:13	WG1061726
Chromium	11.9		1.00	1	01/11/2018 14:13	WG1061726
Copper	14.5		2.00	1	01/11/2018 14:13	WG1061726
Lead	6.85		0.500	1	01/11/2018 14:13	WG1061726
Nickel	8.86		2.00	1	01/11/2018 14:13	WG1061726
Selenium	ND		2.00	1	01/11/2018 14:13	WG1061726
Silver	ND		1.00	1	01/11/2018 14:13	WG1061726
Zinc	33.7		5.00	1	01/11/2018 14:13	WG1061726

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	0.104		0.100	1	01/12/2018 01:48	WG1061990
(S) a,a,a-Trifluorotoluene(FID)	*93.2*		*77.0-120*		*01/12/2018 01:48*	WG1061990

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	1	01/12/2018 01:44	WG1062073
Toluene	ND		0.00500	1	01/12/2018 01:44	WG1062073
Ethylbenzene	ND		0.00250	1	01/12/2018 01:44	WG1062073
Total Xylenes	ND		0.00750	1	01/12/2018 01:44	WG1062073
(S) Toluene-d8	*120*		*80.0-120*		*01/12/2018 01:44*	WG1062073
(S) Dibromofluoromethane	*84.2*		*74.0-131*		*01/12/2018 01:44*	WG1062073
(S) a,a,a-Trifluorotoluene	*111*		*80.0-120*		*01/12/2018 01:44*	WG1062073
(S) 4-Bromofluorobenzene	*98.5*		*64.0-132*		*01/12/2018 01:44*	WG1062073

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	6.38		4.00	1	01/12/2018 01:33	WG1061817
(S) o-Terphenyl	*61.9*		*18.0-148*		*01/12/2018 01:33*	WG1061817

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	J4	0.00600	1	01/12/2018 04:34	WG1061820
Acenaphthene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Acenaphthylene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Benzo(a)anthracene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Benzo(a)pyrene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Benzo(b)fluoranthene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Benzo(g,h,i)perylene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Benzo(k)fluoranthene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Chrysene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Dibenz(a,h)anthracene	ND		0.00600	1	01/12/2018 04:34	WG1061820
Fluoranthene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Fluorene	ND	J3 J4	0.00600	1	01/12/2018 04:34	WG1061820
Indeno(1,2,3-cd)pyrene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Naphthalene	ND		0.0200	1	01/12/2018 04:34	WG1061820
Phenanthrene	ND	J4	0.00600	1	01/12/2018 04:34	WG1061820
Pyrene	ND		0.00600	1	01/12/2018 04:34	WG1061820
1-Methylnaphthalene	ND		0.0200	1	01/12/2018 04:34	WG1061820
2-Methylnaphthalene	ND		0.0200	1	01/12/2018 04:34	WG1061820
2-Chloronaphthalene	ND	J4	0.0200	1	01/12/2018 04:34	WG1061820
(S) p-Terphenyl-d14	*107*		*23.0-120*		*01/12/2018 04:34*	WG1061820
(S) Nitrobenzene-d5	*125*		*14.0-149*		*01/12/2018 04:34*	WG1061820
(S) 2-Fluorobiphenyl	*100*		*34.0-125*		*01/12/2018 04:34*	WG1061820

Method Blank (MB)

(MB) R3278827-1 01/11/18 14:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium,Hexavalent	U		0.64	2.00

L962512-09 Original Sample (OS) • Duplicate (DUP)

(OS) L962512-09 01/11/18 15:00 • (DUP) R3278827-8 01/11/18 15:00

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	0.000	1	0		20

L962527-01 Original Sample (OS) • Duplicate (DUP)

(OS) L962527-01 01/11/18 15:01 • (DUP) R3278827-9 01/11/18 15:01

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	0.000	1	0		20

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

(LCS) R3278827-2 01/11/18 14:53 • (LCSD) R3278827-3 01/11/18 14:54

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 %
Chromium,Hexavalent	56.9	37.6	38.8	66.1	68.2	30-170			3.14	20

L962512-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962512-05 01/11/18 14:56 • (MS) R3278827-4 01/11/18 14:58 • (MSD) R3278827-5 01/11/18 14:58

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 %
Chromium,Hexavalent	20.0	ND	19.2	19.5	96	97.6	1	75-125			1.65	20

L962303-19 Original Sample (OS) • Duplicate (DUP)

(OS) L962303-19 01/12/18 11:03 • (DUP) R3278990-3 01/12/18 11:03

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.95	8.00	1	0.627		1

Sample Narrative:

OS: 7.95 at 21.7C

DUP: 8 at 21.8C

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

(LCS) R3278990-1 01/12/18 11:03 • (LCSD) R3278990-2 01/12/18 11:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.38	6.39	6.39	100	100	98.4-102			0.000	1

Sample Narrative:

LCS: 6.39 at 17.7C

LCSD: 6.39 at 17.7C

Method Blank (MB)

(MB) WG1062012-1 01/12/18 00:50

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

L962527-01 Original Sample (OS) • Duplicate (DUP)

(OS) L962527-01 01/12/18 00:50 • (DUP) WG1062012-4 01/12/18 00:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	847	820	1	3.24		20

L962583-01 Original Sample (OS) • Duplicate (DUP)

(OS) L962583-01 01/12/18 00:50 • (DUP) WG1062012-5 01/12/18 00:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	189	182	1	3.77		20

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

(LCS) WG1062012-2 01/12/18 00:50 • (LCSD) WG1062012-3 01/12/18 00:50

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	559	556	557	99.5	99.6	85.0-115			0.180	20

Method Blank (MB)

(MB) R3279326-1 01/15/18 08:46

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	0.00339	J	0.0028	0.0200

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

(LCS) R3279326-2 01/15/18 08:48 • (LCSD) R3279326-3 01/15/18 08:50

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 %
Mercury	0.300	0.247	0.301	82.2	100	80-120			19.8	20

L962652-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962652-01 01/15/18 08:52 • (MS) R3279326-4 01/15/18 08:54 • (MSD) R3279326-5 01/15/18 08:57

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 %
Mercury	0.300	0.0251	0.314	0.313	96.4	96	1	75-125			0.405	20

Method Blank (MB)

(MB) R3278912-1 01/11/18 14:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Cadmium	0.0703	J	0.07	0.500
Chromium	U		0.14	1.00
Copper	U		0.53	2.00
Lead	U		0.19	0.500
Nickel	U		0.49	2.00
Selenium	U		0.74	2.00
Silver	U		0.28	1.00
Zinc	U		0.59	5.00

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

(LCS) R3278912-2 01/11/18 14:08 • (LCSD) R3278912-3 01/11/18 14:10

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	101	105	101	105	80-120			4.12	20
Barium	100	104	108	104	108	80-120			3.67	20
Cadmium	100	100	104	100	104	80-120			3.62	20
Chromium	100	101	104	101	104	80-120			3.45	20
Copper	100	104	109	104	109	80-120			4.39	20
Lead	100	102	106	102	106	80-120			3.91	20
Nickel	100	103	108	103	108	80-120			4.29	20
Selenium	100	101	105	101	105	80-120			4.1	20
Silver	20.0	18.7	19.6	93.7	97.8	80-120			4.19	20
Zinc	100	101	105	101	105	80-120			4.01	20

L962527-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962527-01 01/11/18 14:13 • (MS) R3278912-6 01/11/18 14:20 • (MSD) R3278912-7 01/11/18 14:23

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	3.13	101	99.8	97.8	96.7	1	75-125			1.09	20
Barium	100	198	288	313	90.1	114	1	75-125			8.13	20
Cadmium	100	ND	99.9	97.4	99.9	97.4	1	75-125			2.5	20
Chromium	100	11.9	112	110	100	98.2	1	75-125			1.68	20
Copper	100	14.5	122	120	107	105	1	75-125			1.68	20
Lead	100	6.85	110	109	103	102	1	75-125			0.835	20
Nickel	100	8.86	117	115	108	106	1	75-125			1.82	20

L962527-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962527-01 01/11/18 14:13 • (MS) R3278912-6 01/11/18 14:20 • (MSD) R3278912-7 01/11/18 14:23

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	ND	99.3	97.6	99.3	97.6	1	75-125			1.72	20
Silver	20.0	ND	18.6	18.3	92.9	91.3	1	75-125			1.8	20
Zinc	100	33.7	132	139	98.4	105	1	75-125			4.85	20

Method Blank (MB)

(MB) R3278896-5 01/11/18 13:20

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)	*93.4*			*77.0-120*

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

(LCS) R3278896-3 01/11/18 12:17 • (LCSD) R3278896-4 01/11/18 12:38

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	6.14	5.83	112	106	70.0-136			5.19	20
(S) a,a,a-Trifluorotoluene(FID)				*91.2*	*91.2*	*77.0-120*				

Method Blank (MB)

(MB) R3279193-3 01/11/18 23:20

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.00130	0.00250
Ethylbenzene	U		0.00129	0.00250
Toluene	U		0.00265	0.00500
Xylenes, Total	U		0.00478	0.00750
(S) Toluene-d8	*111*			*80.0-120*
(S) Dibromofluoromethane	*96.7*			*74.0-131*
(S) a,a,a-Trifluorotoluene	*109*			*80.0-120*
(S) 4-Bromofluorobenzene	*98.3*			*64.0-132*

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

(LCS) R3279193-1 01/11/18 22:04 • (LCSD) R3279193-2 01/11/18 22:23

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	0.625	0.601	0.598	96.2	95.7	71.0-124			0.468	20
Ethylbenzene	0.625	0.660	0.670	106	107	77.0-120			1.52	20
Toluene	0.625	0.647	0.658	104	105	70.0-120			1.61	20
Xylenes, Total	1.88	2.02	2.04	108	109	77.0-120			0.936	20
(S) Toluene-d8				*111*	*113*	*80.0-120*				
(S) Dibromofluoromethane				*98.7*	*97.6*	*74.0-131*				
(S) a,a,a-Trifluorotoluene				*109*	*108*	*80.0-120*				
(S) 4-Bromofluorobenzene				*98.1*	*97.4*	*64.0-132*				

L962527-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962527-01 01/12/18 01:44 • (MS) R3279193-4 01/12/18 06:47 • (MSD) R3279193-5 01/12/18 07:06

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.625	ND	0.433	0.464	69.3	74.2	1	13.0-146			6.83	27
Ethylbenzene	0.625	ND	0.567	0.591	90.7	94.6	1	10.0-147			4.16	31
Toluene	0.625	ND	0.562	0.583	89.9	93.3	1	10.0-144			3.67	28
Xylenes, Total	1.88	ND	1.69	1.78	90.2	94.7	1	10.0-150			4.90	31
(S) Toluene-d8					*116*	*115*		*80.0-120*				
(S) Dibromofluoromethane					*82.2*	*85.9*		*74.0-131*				
(S) a,a,a-Trifluorotoluene					*111*	*109*		*80.0-120*				
(S) 4-Bromofluorobenzene					*101*	*98.0*		*64.0-132*				

Method Blank (MB)

(MB) R3278986-1 01/11/18 23:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	*79.8*			*18.0-148*

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

(LCS) R3278986-2 01/11/18 23:33 • (LCSD) R3278986-3 01/11/18 23:44

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) High Fraction	60.0	55.3	55.8	92.1	93.0	50.0-150			0.961	20
(S) o-Terphenyl				*97.6*	*94.3*	*18.0-148*				

Method Blank (MB)

(MB) R3278968-3 01/11/18 23:37

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	*100*			*14.0-149*
(S) 2-Fluorobiphenyl	*112*			*34.0-125*
(S) p-Terphenyl-d14	*109*			*23.0-120*

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

(LCS) R3278968-1 01/11/18 22:55 • (LCSD) R3278968-2 01/11/18 23:16

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 %
Anthracene	0.0800	0.109	0.104	136	130	50.0-125	J4	J4	4.56	20
Acenaphthene	0.0800	0.0969	0.0936	121	117	52.0-120	J4		3.47	20
Acenaphthylene	0.0800	0.102	0.0976	128	122	51.0-120	J4	J4	4.60	20
Benzo(a)anthracene	0.0800	0.100	0.0944	125	118	46.0-121	J4		6.12	20
Benzo(a)pyrene	0.0800	0.103	0.0994	129	124	42.0-121	J4	J4	3.62	20
Benzo(b)fluoranthene	0.0800	0.0981	0.102	123	127	42.0-123		J4	3.53	20
Benzo(g,h,i)perylene	0.0800	0.107	0.104	133	130	43.0-128	J4	J4	2.78	20
Benzo(k)fluoranthene	0.0800	0.103	0.106	129	133	45.0-128	J4	J4	3.43	20
Chrysene	0.0800	0.103	0.0984	128	123	48.0-127	J4		4.12	20
Dibenz(a,h)anthracene	0.0800	0.106	0.103	132	129	43.0-132			2.19	20
Fluoranthene	0.0800	0.106	0.103	133	129	49.0-129	J4		2.78	20

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

(LCS) R3278968-1 01/11/18 22:55 • (LCSD) R3278968-2 01/11/18 23:16

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 %
Fluorene	0.0800	0.0975	0.0956	122	120	50.0-120	J4		1.96	20
Indeno(1,2,3-cd)pyrene	0.0800	0.107	0.105	134	131	44.0-131	J4		2.70	20
Naphthalene	0.0800	0.0934	0.0922	117	115	50.0-120			1.28	20
Phenanthrene	0.0800	0.0983	0.0949	123	119	48.0-120	J4		3.56	20
Pyrene	0.0800	0.102	0.0982	128	123	48.0-135			3.93	20
1-Methylnaphthalene	0.0800	0.0976	0.0892	122	111	52.0-122			9.03	20
2-Methylnaphthalene	0.0800	0.0935	0.0873	117	109	52.0-120			6.80	20
2-Chloronaphthalene	0.0800	0.0975	0.0951	122	119	50.0-120	J4		2.51	20
(S) Nitrobenzene-d5				*97.5*	*104*	*14.0-149*				
(S) 2-Fluorobiphenyl				*103*	*108*	*34.0-125*				
(S) p-Terphenyl-d14				*112*	*107*	*23.0-120*				

L962527-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962527-01 01/12/18 04:34 • (MS) R3278968-4 01/12/18 04:55 • (MSD) R3278968-5 01/12/18 05:16

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	0.0528	0.0558	66.0	69.8	1	20.0-136			5.62	24
Acenaphthene	0.0800	ND	0.0490	0.0519	61.2	64.9	1	29.0-124			5.76	20
Acenaphthylene	0.0800	ND	0.0506	0.0507	63.3	63.4	1	35.0-120			0.261	20
Benzo(a)anthracene	0.0800	ND	0.0490	0.0506	60.2	62.2	1	13.0-132			3.24	27
Benzo(a)pyrene	0.0800	ND	0.0512	0.0498	64.0	62.2	1	14.0-138			2.80	27
Benzo(b)fluoranthene	0.0800	ND	0.0402	0.0409	49.2	50.2	1	10.0-129			1.86	31
Benzo(g,h,i)perylene	0.0800	ND	0.0441	0.0452	55.1	56.5	1	10.0-133			2.38	30
Benzo(k)fluoranthene	0.0800	ND	0.0569	0.0509	71.2	63.6	1	15.0-131			11.2	27
Chrysene	0.0800	ND	0.0573	0.0555	70.8	68.5	1	15.0-137			3.20	25
Dibenz(a,h)anthracene	0.0800	ND	0.0581	0.0567	72.6	70.9	1	15.0-132			2.34	27
Fluoranthene	0.0800	ND	0.0486	0.0523	59.3	63.9	1	13.0-139			7.27	28
Fluorene	0.0800	ND	0.0411	0.0516	51.4	64.5	1	27.0-122		J3	22.6	22
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0477	0.0480	59.6	60.1	1	11.0-133			0.818	29
Naphthalene	0.0800	ND	0.0559	0.0586	67.2	70.6	1	18.0-136			4.74	21
Phenanthrene	0.0800	ND	0.0481	0.0531	58.4	64.7	1	15.0-133			9.97	25
Pyrene	0.0800	ND	0.0466	0.0521	57.0	63.8	1	11.0-146			11.1	29
1-Methylnaphthalene	0.0800	ND	0.0509	0.0500	63.7	62.5	1	24.0-137			1.87	22
2-Methylnaphthalene	0.0800	ND	0.0507	0.0495	60.8	59.3	1	23.0-136			2.41	22
2-Chloronaphthalene	0.0800	ND	0.0442	0.0484	55.3	60.5	1	36.0-120			8.97	20
(S) Nitrobenzene-d5					*104*	*97.4*		*14.0-149*				
(S) 2-Fluorobiphenyl					*45.2*	*54.0*		*34.0-125*				
(S) p-Terphenyl-d14					*57.0*	*61.0*		*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

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, 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.
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
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
T8	Sample(s) received past/too close to holding time expiration.

ESC Lab Sciences 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.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

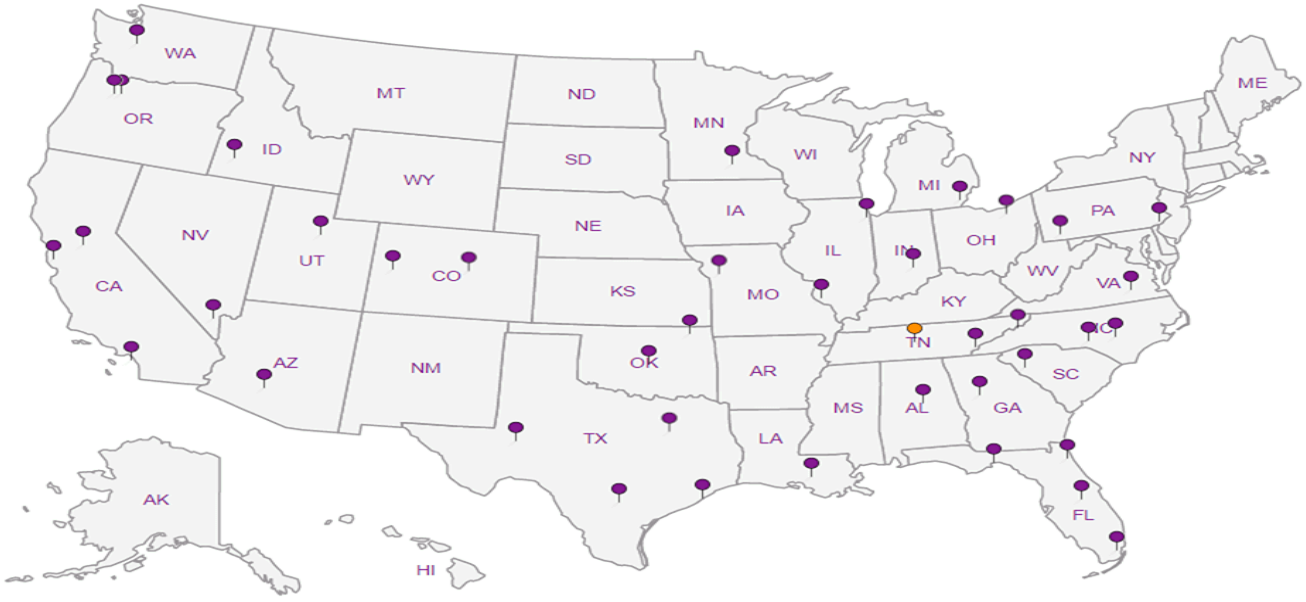
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences 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. **ESC Lab Sciences performs all testing at our central laboratory.**



H040

Chain of Custody Page___of___

Company Name/Address

Crestone Peak Resources

CPR
10188 E I-25 Frontage Road
Firestone, CO 80504
303-774-3900

Billing Address:

Crestone Peak Resources - Firestone, CO

Attn: Tarah Garza

Report to: T. Garza

E-mail: tarah.garza@crestonepr.com

Prepared by:

ENVIRONMENTAL Science corp
12065 Lebanon Road
Mt. Juliet TN 37122
Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

Project Description: LIBERTY 2F - 21H

PHONE: 720.402.9543 FAX:

Lab Project #

Collected by: Tarah G.

Site/Facility ID#

P.O.#

Collected by(signature):

Immediately Packed on Ice N___ Y___

Rush? (Lab MUST be Notified)
___Same Day.....200%
___Next Day.....100%
___Two Day.....50%

Date Results Needed

Email?___No___Yes
FAX?___No___Yes

CoCode (lab use only)

Template/Prelogin

Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	# of cntrs	BTEX	SV8270PAHSIM - 8270SIM	SPCON - 9050AMod	SAR - Calc.	RCRA8 Metals + Cu, Ni, and Zn - 6010/7470	CR6SS - 3060A/7196	CR3 - Calc.	GRO/DRO	Remarks/contaminant	Sample # (lab only)
LIBERTY 2F - 21H	Comp	SS	6"	1/8/18	3:45	3	X	X	X	X	X	X	X	X		L96527-01

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT- Other - Drill Cuttings

pH_____ Temp_____

Remarks: 4196 3257 1144

Flow_____ Other_____

Relinquisher by:(Signature)	Date:	Time:	Received by:(Signature)	Samples returned via: FedEx X UPS__Other__	Condition (lab use only)
Tarah Garza	1/10/18	1240			
Relinquisher by:(Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.2 Bottles Received: 3	COC Seals Intact ___Y ___N ___NA (OK)
Relinquisher by:(Signature	Date:	Time:	Received for lab by: (Signature)	Date: 1-11-18 Time: 845	pH Checked: NCF:

ESC LAB SCIENCES
Cooler Receipt Form

Client:	CREPEAFCO	SDG#	L962527
Cooler Received/Opened On: 01/11/18		Temperature:	2.2 °C
Received by : Jennifer Royal			
Signature: Jennifer Royal			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			