ANALYTICAL REPORT

September 01, 2016

Linn Energy - Parachute, CO

Sample Delivery Group:	L855711
Samples Received:	08/25/2016
Project Number:	
Description:	Pit Reclamation

Report To:

Tom Hogelin
235 Callahan Avenue
Parachute, CO 81635

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

J15-P-1 L855711-01 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:10
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG902700	1	08/29/16 14:47	09/01/16 09:35	CCE
Mercury by Method 7471A	WG902397	1	08/25/16 18:10	08/26/16 11:24	RDS
Metals (ICP) by Method 6010B	WG903373	1	08/29/16 17:59	08/30/16 12:28	LTB
Metals (ICP) by Method 6010B	WG903373	5	08/29/16 17:59	08/30/16 16:58	ST
Metals (ICP) by Method 6010B	WG903842	1	08/31/16 16:50	08/31/16 19:55	ST
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG902371	1	08/30/16 02:30	08/31/16 05:11	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG902439	1	08/26/16 07:35	08/26/16 19:30	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG903464	1	08/30/16 09:10	08/30/16 23:37	JAH
Wet Chemistry by Method 3060A/7196A	WG901953	1	08/26/16 17:09	08/27/16 17:27	MHM
Wet Chemistry by Method 9045D	WG902378	1	08/30/16 14:50	08/30/16 14:50	MHM
Wet Chemistry by Method 9050AMod	WG902319	1	08/26/16 13:00	08/26/16 13:00	AMC

J15-P-2 L855711-02 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:20
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG902700	1	08/29/16 14:47	08/30/16 15:03	RDS
Mercury by Method 7471A	WG902397	1	08/25/16 18:10	08/26/16 11:37	RDS
Metals (ICP) by Method 6010B	WG903373	1	08/29/16 17:59	08/30/16 12:32	LTB
Metals (ICP) by Method 6010B	WG903373	10	08/29/16 17:59	08/30/16 17:00	ST
Metals (ICP) by Method 6010B	WG903842	1	08/31/16 16:50	08/31/16 19:42	ST
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG902371	1	08/30/16 02:30	08/31/16 08:04	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG902439	1	08/26/16 07:35	08/26/16 21:14	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG903464	1	08/30/16 09:10	08/30/16 23:59	JAH
Wet Chemistry by Method 3060A/7196A	WG901953	1	08/26/16 17:09	08/27/16 17:28	MHM
Wet Chemistry by Method 9045D	WG902378	1	08/30/16 14:50	08/30/16 14:50	MHM
Wet Chemistry by Method 9050AMod	WG902319	1	08/26/16 13:00	08/26/16 13:00	AMC

J15-P-3 L855711-03 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:30
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG902700	1	08/29/16 14:47	08/30/16 15:05	RDS
Mercury by Method 7471A	WG902397	1	08/25/16 18:10	08/26/16 11:39	RDS
Metals (ICP) by Method 6010B	WG903373	1	08/29/16 17:59	08/30/16 12:35	LTB
Metals (ICP) by Method 6010B	WG903373	10	08/29/16 17:59	08/30/16 17:03	ST
Metals (ICP) by Method 6010B	WG903842	1	08/31/16 16:50	08/31/16 19:58	ST
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG902371	1	08/30/16 02:30	08/31/16 07:21	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG902439	1	08/26/16 07:35	08/26/16 20:59	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG903464	1	08/30/16 09:10	08/31/16 00:21	JAH
Wet Chemistry by Method 3060A/7196A	WG901953	1	08/26/16 17:09	08/27/16 17:29	MHM
Wet Chemistry by Method 9045D	WG902378	1	08/30/16 14:50	08/30/16 14:50	MHM
Wet Chemistry by Method 9050AMod	WG902319	1	08/26/16 13:00	08/26/16 13:00	AMC

J15-P-4 L855711-04 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:40
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG902700	1	08/29/16 14:47	08/30/16 15:08	RDS
Mercury by Method 7471A	WG902397	1	08/25/16 18:10	08/26/16 11:42	RDS
Metals (ICP) by Method 6010B	WG903373	1	08/29/16 17:59	08/30/16 12:38	RDS
Metals (ICP) by Method 6010B	WG903373	10	08/29/16 17:59	08/30/16 17:06	ST

J15-P-4 L855711-04 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:40
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG904327	1	09/01/16 10:25	09/01/16 13:11	CCE
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG902371	1	08/30/16 02:30	08/31/16 07:42	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG902439	1	08/26/16 07:35	08/26/16 20:29	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG903464	1	08/30/16 09:10	08/31/16 00:43	JAH
Wet Chemistry by Method 3060A/7196A	WG901953	1	08/26/16 17:09	08/27/16 17:29	MHM
Wet Chemistry by Method 9045D	WG902378	1	08/30/16 14:50	08/30/16 14:50	MHM
Wet Chemistry by Method 9050AMod	WG902319	1	08/26/16 13:00	08/26/16 13:00	AMC

J15-P-5 L855711-05 Solid

Collected by: DK Nicholson
Collected date/time: 08/23/16 12:50
Received date/time: 08/25/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG902700	1	08/29/16 14:47	08/30/16 15:11	RDS
Mercury by Method 7471A	WG902397	1	08/25/16 18:10	08/26/16 11:44	RDS
Metals (ICP) by Method 6010B	WG903373	1	08/29/16 17:59	08/30/16 12:47	LTB
Metals (ICP) by Method 6010B	WG903373	10	08/29/16 17:59	08/30/16 17:08	ST
Metals (ICP) by Method 6010B	WG903842	1	08/31/16 16:50	08/31/16 20:06	ST
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG902371	1	08/30/16 02:30	08/31/16 05:32	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG902439	1	08/26/16 07:35	08/26/16 20:44	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG903464	1	08/30/16 09:10	08/31/16 01:06	JAH
Wet Chemistry by Method 3060A/7196A	WG901953	1	08/26/16 17:09	08/27/16 17:30	MHM
Wet Chemistry by Method 9045D	WG901335	1	08/26/16 11:44	08/26/16 11:44	JJL
Wet Chemistry by Method 9050AMod	WG902319	1	08/26/16 13:00	08/26/16 13:00	AMC

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.

Mark W. Beasley
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L855711-01	J15-P-1	9045D
L855711-02	J15-P-2	9045D
L855711-03	J15-P-3	9045D
L855711-04	J15-P-4	9045D
L855711-05	J15-P-5	9045D

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	39.6		1	09/01/2016 09:35	WG902700

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	08/27/2016 17:27	WG901953

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.69		1	08/30/2016 14:50	WG902378

Sample Narrative:

9045D L855711-01 WG902378: 7.69 at 20.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	12800		1	08/26/2016 13:00	WG902319

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0293		0.0200	1	08/26/2016 11:24	WG902397

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	4.49		2.00	1	08/30/2016 12:28	WG903373
Barium	2620		2.50	5	08/30/2016 16:58	WG903373
Boron	17.4		10.0	1	08/30/2016 12:28	WG903373
Cadmium	ND		0.500	1	08/30/2016 12:28	WG903373
Chromium	30.6		1.00	1	08/30/2016 12:28	WG903373
Copper	17.2		2.00	1	08/30/2016 12:28	WG903373
Lead	13.2		0.500	1	08/30/2016 12:28	WG903373
Nickel	18.9		2.00	1	08/30/2016 12:28	WG903373
Selenium	ND		2.00	1	08/30/2016 12:28	WG903373
Silver	ND		1.00	1	08/31/2016 19:55	WG903842
Zinc	44.6		5.00	1	08/30/2016 12:28	WG903373

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00110		0.000500	1	08/30/2016 23:37	WG903464
Toluene	ND		0.00500	1	08/30/2016 23:37	WG903464
Ethylbenzene	ND		0.000500	1	08/30/2016 23:37	WG903464
Total Xylene	ND		0.00150	1	08/30/2016 23:37	WG903464
TPH (GC/FID) Low Fraction	ND		0.100	1	08/30/2016 23:37	WG903464
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*59.0-128*		*08/30/2016 23:37*	WG903464
(S) a,a,a-Trifluorotoluene(PID)	*104*		*54.0-144*		*08/30/2016 23:37*	WG903464

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	12.9		4.00	1	08/26/2016 19:30	WG902439
C28-C40 Oil Range	5.75		4.00	1	08/26/2016 19:30	WG902439
(S) o-Terphenyl	*55.9*		*50.0-150*		*08/26/2016 19:30*	WG902439

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	08/31/2016 05:11	WG902371
Acenaphthene	ND		0.00600	1	08/31/2016 05:11	WG902371
Acenaphthylene	ND		0.00600	1	08/31/2016 05:11	WG902371
Benzo(a)anthracene	ND		0.00600	1	08/31/2016 05:11	WG902371
Benzo(a)pyrene	ND		0.00600	1	08/31/2016 05:11	WG902371
Benzo(b)fluoranthene	ND		0.00600	1	08/31/2016 05:11	WG902371
Benzo(g,h,i)perylene	ND		0.00600	1	08/31/2016 05:11	WG902371
Benzo(k)fluoranthene	ND		0.00600	1	08/31/2016 05:11	WG902371
Chrysene	ND		0.00600	1	08/31/2016 05:11	WG902371
Dibenz(a,h)anthracene	ND		0.00600	1	08/31/2016 05:11	WG902371
Fluoranthene	ND		0.00600	1	08/31/2016 05:11	WG902371
Fluorene	ND		0.00600	1	08/31/2016 05:11	WG902371
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/31/2016 05:11	WG902371
Naphthalene	0.0265		0.0200	1	08/31/2016 05:11	WG902371
Phenanthrene	0.0193		0.00600	1	08/31/2016 05:11	WG902371
Pyrene	ND		0.00600	1	08/31/2016 05:11	WG902371
1-Methylnaphthalene	0.0341		0.0200	1	08/31/2016 05:11	WG902371
2-Methylnaphthalene	0.0615		0.0200	1	08/31/2016 05:11	WG902371
2-Chloronaphthalene	ND		0.0200	1	08/31/2016 05:11	WG902371
(S) p-Terphenyl-d14	*71.5*		*32.2-131*		*08/31/2016 05:11*	WG902371
(S) Nitrobenzene-d5	*60.6*		*22.1-146*		*08/31/2016 05:11*	WG902371
(S) 2-Fluorobiphenyl	*77.1*		*40.6-122*		*08/31/2016 05:11*	WG902371

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	18.2		1	08/30/2016 15:03	WG902700

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	08/27/2016 17:28	WG901953

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.88		1	08/30/2016 14:50	WG902378

Sample Narrative:

9045D L855711-02 WG902378: 7.88 at 21.0C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	6930		1	08/26/2016 13:00	WG902319

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	08/26/2016 11:37	WG902397

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.62		2.00	1	08/30/2016 12:32	WG903373
Barium	6100		5.00	10	08/30/2016 17:00	WG903373
Boron	11.8		10.0	1	08/30/2016 12:32	WG903373
Cadmium	ND		0.500	1	08/30/2016 12:32	WG903373
Chromium	31.7		1.00	1	08/30/2016 12:32	WG903373
Copper	17.2		2.00	1	08/30/2016 12:32	WG903373
Lead	15.3		0.500	1	08/30/2016 12:32	WG903373
Nickel	18.7		2.00	1	08/30/2016 12:32	WG903373
Selenium	ND		2.00	1	08/30/2016 12:32	WG903373
Silver	ND		1.00	1	08/31/2016 19:42	WG903842
Zinc	44.2		5.00	1	08/30/2016 12:32	WG903373

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00250		0.000500	1	08/30/2016 23:59	WG903464
Toluene	ND		0.00500	1	08/30/2016 23:59	WG903464
Ethylbenzene	0.00105		0.000500	1	08/30/2016 23:59	WG903464
Total Xylene	0.00234	B	0.00150	1	08/30/2016 23:59	WG903464
TPH (GC/FID) Low Fraction	0.123	B	0.100	1	08/30/2016 23:59	WG903464
(S) a,a,a-Trifluorotoluene(FID)	*98.0*		*59.0-128*		*08/30/2016 23:59*	WG903464
(S) a,a,a-Trifluorotoluene(PID)	*103*		*54.0-144*		*08/30/2016 23:59*	WG903464

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	77.6		4.00	1	08/26/2016 21:14	WG902439
C28-C40 Oil Range	31.8		4.00	1	08/26/2016 21:14	WG902439
(S) o-Terphenyl	*49.6*	J2	*50.0-150*		*08/26/2016 21:14*	WG902439

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	08/31/2016 08:04	WG902371
Acenaphthene	ND		0.00600	1	08/31/2016 08:04	WG902371
Acenaphthylene	ND		0.00600	1	08/31/2016 08:04	WG902371
Benzo(a)anthracene	ND		0.00600	1	08/31/2016 08:04	WG902371
Benzo(a)pyrene	ND		0.00600	1	08/31/2016 08:04	WG902371
Benzo(b)fluoranthene	ND		0.00600	1	08/31/2016 08:04	WG902371
Benzo(g,h,i)perylene	ND		0.00600	1	08/31/2016 08:04	WG902371
Benzo(k)fluoranthene	ND		0.00600	1	08/31/2016 08:04	WG902371
Chrysene	0.00832		0.00600	1	08/31/2016 08:04	WG902371
Dibenz(a,h)anthracene	ND		0.00600	1	08/31/2016 08:04	WG902371
Fluoranthene	ND		0.00600	1	08/31/2016 08:04	WG902371
Fluorene	0.00910		0.00600	1	08/31/2016 08:04	WG902371
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/31/2016 08:04	WG902371
Naphthalene	0.0665		0.0200	1	08/31/2016 08:04	WG902371
Phenanthrene	0.0303		0.00600	1	08/31/2016 08:04	WG902371
Pyrene	0.0107		0.00600	1	08/31/2016 08:04	WG902371
1-Methylnaphthalene	0.0658		0.0200	1	08/31/2016 08:04	WG902371
2-Methylnaphthalene	0.133		0.0200	1	08/31/2016 08:04	WG902371
2-Chloronaphthalene	ND		0.0200	1	08/31/2016 08:04	WG902371
(S) p-Terphenyl-d14	*74.4*		*32.2-131*		*08/31/2016 08:04*	WG902371
(S) Nitrobenzene-d5	*61.4*		*22.1-146*		*08/31/2016 08:04*	WG902371
(S) 2-Fluorobiphenyl	*73.7*		*40.6-122*		*08/31/2016 08:04*	WG902371

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	22.5		1	08/30/2016 15:05	WG902700

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	08/27/2016 17:29	WG901953

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.98		1	08/30/2016 14:50	WG902378

Sample Narrative:

9045D L855711-03 WG902378: 7.98 at 20.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	4030		1	08/26/2016 13:00	WG902319

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	08/26/2016 11:39	WG902397

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.05		2.00	1	08/30/2016 12:35	WG903373
Barium	5910		5.00	10	08/30/2016 17:03	WG903373
Boron	14.5		10.0	1	08/30/2016 12:35	WG903373
Cadmium	ND		0.500	1	08/30/2016 12:35	WG903373
Chromium	40.5		1.00	1	08/30/2016 12:35	WG903373
Copper	21.6		2.00	1	08/30/2016 12:35	WG903373
Lead	18.4		0.500	1	08/30/2016 12:35	WG903373
Nickel	23.7		2.00	1	08/30/2016 12:35	WG903373
Selenium	ND		2.00	1	08/30/2016 12:35	WG903373
Silver	ND		1.00	1	08/31/2016 19:58	WG903842
Zinc	50.1		5.00	1	08/30/2016 12:35	WG903373

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00216		0.000500	1	08/31/2016 00:21	WG903464
Toluene	ND		0.00500	1	08/31/2016 00:21	WG903464
Ethylbenzene	0.000789		0.000500	1	08/31/2016 00:21	WG903464
Total Xylene	0.00193	B	0.00150	1	08/31/2016 00:21	WG903464
TPH (GC/FID) Low Fraction	0.106	B	0.100	1	08/31/2016 00:21	WG903464
(S) a,a,a-Trifluorotoluene(FID)	*97.8*		*59.0-128*		*08/31/2016 00:21*	WG903464
(S) a,a,a-Trifluorotoluene(PID)	*104*		*54.0-144*		*08/31/2016 00:21*	WG903464

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	26.7		4.00	1	08/26/2016 20:59	WG902439
C28-C40 Oil Range	13.8		4.00	1	08/26/2016 20:59	WG902439
(S) o-Terphenyl	*51.9*		*50.0-150*		*08/26/2016 20:59*	WG902439

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	08/31/2016 07:21	WG902371
Acenaphthene	ND		0.00600	1	08/31/2016 07:21	WG902371
Acenaphthylene	ND		0.00600	1	08/31/2016 07:21	WG902371
Benzo(a)anthracene	ND		0.00600	1	08/31/2016 07:21	WG902371
Benzo(a)pyrene	ND		0.00600	1	08/31/2016 07:21	WG902371
Benzo(b)fluoranthene	ND		0.00600	1	08/31/2016 07:21	WG902371
Benzo(g,h,i)perylene	ND		0.00600	1	08/31/2016 07:21	WG902371
Benzo(k)fluoranthene	ND		0.00600	1	08/31/2016 07:21	WG902371
Chrysene	0.00641		0.00600	1	08/31/2016 07:21	WG902371
Dibenz(a,h)anthracene	ND		0.00600	1	08/31/2016 07:21	WG902371
Fluoranthene	ND		0.00600	1	08/31/2016 07:21	WG902371
Fluorene	0.00709		0.00600	1	08/31/2016 07:21	WG902371
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/31/2016 07:21	WG902371
Naphthalene	0.0506		0.0200	1	08/31/2016 07:21	WG902371
Phenanthrene	0.0286		0.00600	1	08/31/2016 07:21	WG902371
Pyrene	0.00656		0.00600	1	08/31/2016 07:21	WG902371
1-Methylnaphthalene	0.0664		0.0200	1	08/31/2016 07:21	WG902371
2-Methylnaphthalene	0.133		0.0200	1	08/31/2016 07:21	WG902371
2-Chloronaphthalene	ND		0.0200	1	08/31/2016 07:21	WG902371
(S) p-Terphenyl-d14	*77.6*		*32.2-131*		*08/31/2016 07:21*	WG902371
(S) Nitrobenzene-d5	*58.6*		*22.1-146*		*08/31/2016 07:21*	WG902371
(S) 2-Fluorobiphenyl	*81.2*		*40.6-122*		*08/31/2016 07:21*	WG902371

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	16.7		1	08/30/2016 15:08	WG902700

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	08/27/2016 17:29	WG901953

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.47		1	08/30/2016 14:50	WG902378

Sample Narrative:

9045D L855711-04 WG902378: 8.47 at 20.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1890		1	08/26/2016 13:00	WG902319

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	08/26/2016 11:42	WG902397

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.96		2.00	1	08/30/2016 12:38	WG903373
Barium	3260		5.00	10	08/30/2016 17:06	WG903373
Boron	11.5		10.0	1	08/30/2016 12:38	WG903373
Cadmium	ND		0.500	1	08/30/2016 12:38	WG903373
Chromium	31.3		1.00	1	08/30/2016 12:38	WG903373
Copper	15.2		2.00	1	08/30/2016 12:38	WG903373
Lead	12.6		0.500	1	08/30/2016 12:38	WG903373
Nickel	17.7		2.00	1	08/30/2016 12:38	WG903373
Selenium	ND		2.00	1	08/30/2016 12:38	WG903373
Silver	ND		1.00	1	09/01/2016 13:11	WG904327
Zinc	36.5		5.00	1	08/30/2016 12:38	WG903373

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00164		0.000500	1	08/31/2016 00:43	WG903464
Toluene	ND		0.00500	1	08/31/2016 00:43	WG903464
Ethylbenzene	0.000650		0.000500	1	08/31/2016 00:43	WG903464
Total Xylene	0.00185	B	0.00150	1	08/31/2016 00:43	WG903464
TPH (GC/FID) Low Fraction	ND		0.100	1	08/31/2016 00:43	WG903464
(S) a,a,a-Trifluorotoluene(FID)	*98.0*		*59.0-128*		*08/31/2016 00:43*	WG903464
(S) a,a,a-Trifluorotoluene(PID)	*104*		*54.0-144*		*08/31/2016 00:43*	WG903464

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	21.2		4.00	1	08/26/2016 20:29	WG902439
C28-C40 Oil Range	8.09		4.00	1	08/26/2016 20:29	WG902439
(S) o-Terphenyl	*62.7*		*50.0-150*		*08/26/2016 20:29*	WG902439

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	08/31/2016 07:42	WG902371
Acenaphthene	ND		0.00600	1	08/31/2016 07:42	WG902371
Acenaphthylene	ND		0.00600	1	08/31/2016 07:42	WG902371
Benzo(a)anthracene	ND		0.00600	1	08/31/2016 07:42	WG902371
Benzo(a)pyrene	ND		0.00600	1	08/31/2016 07:42	WG902371
Benzo(b)fluoranthene	ND		0.00600	1	08/31/2016 07:42	WG902371
Benzo(g,h,i)perylene	ND		0.00600	1	08/31/2016 07:42	WG902371
Benzo(k)fluoranthene	ND		0.00600	1	08/31/2016 07:42	WG902371
Chrysene	ND		0.00600	1	08/31/2016 07:42	WG902371
Dibenz(a,h)anthracene	ND		0.00600	1	08/31/2016 07:42	WG902371
Fluoranthene	ND		0.00600	1	08/31/2016 07:42	WG902371
Fluorene	0.00655		0.00600	1	08/31/2016 07:42	WG902371
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/31/2016 07:42	WG902371
Naphthalene	0.0345		0.0200	1	08/31/2016 07:42	WG902371
Phenanthrene	0.0203		0.00600	1	08/31/2016 07:42	WG902371
Pyrene	ND		0.00600	1	08/31/2016 07:42	WG902371
1-Methylnaphthalene	0.0476		0.0200	1	08/31/2016 07:42	WG902371
2-Methylnaphthalene	0.0839		0.0200	1	08/31/2016 07:42	WG902371
2-Chloronaphthalene	ND		0.0200	1	08/31/2016 07:42	WG902371
(S) p-Terphenyl-d14	*72.9*		*32.2-131*		*08/31/2016 07:42*	WG902371
(S) Nitrobenzene-d5	*54.1*		*22.1-146*		*08/31/2016 07:42*	WG902371
(S) 2-Fluorobiphenyl	*85.4*		*40.6-122*		*08/31/2016 07:42*	WG902371

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	20.7		1	08/30/2016 15:11	WG902700

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	08/27/2016 17:30	WG901953

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.67		1	08/26/2016 11:44	WG901335

Sample Narrative:

9045D L855711-05 WG901335: 8.67 at 22.5c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	6850		1	08/26/2016 13:00	WG902319

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0223		0.0200	1	08/26/2016 11:44	WG902397

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.74		2.00	1	08/30/2016 12:47	WG903373
Barium	4050		5.00	10	08/30/2016 17:08	WG903373
Boron	11.1		10.0	1	08/30/2016 12:47	WG903373
Cadmium	ND		0.500	1	08/30/2016 12:47	WG903373
Chromium	45.8		1.00	1	08/30/2016 12:47	WG903373
Copper	18.7		2.00	1	08/30/2016 12:47	WG903373
Lead	16.4		0.500	1	08/30/2016 12:47	WG903373
Nickel	25.3		2.00	1	08/30/2016 12:47	WG903373
Selenium	ND		2.00	1	08/30/2016 12:47	WG903373
Silver	ND		1.00	1	08/31/2016 20:06	WG903842
Zinc	46.5		5.00	1	08/30/2016 12:47	WG903373

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00153		0.000500	1	08/31/2016 01:06	WG903464
Toluene	ND		0.00500	1	08/31/2016 01:06	WG903464
Ethylbenzene	ND		0.000500	1	08/31/2016 01:06	WG903464
Total Xylene	ND		0.00150	1	08/31/2016 01:06	WG903464
TPH (GC/FID) Low Fraction	ND		0.100	1	08/31/2016 01:06	WG903464
(S) a,a,a-Trifluorotoluene(FID)	*97.9*		*59.0-128*		*08/31/2016 01:06*	WG903464
(S) a,a,a-Trifluorotoluene(PID)	*104*		*54.0-144*		*08/31/2016 01:06*	WG903464

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	21.5		4.00	1	08/26/2016 20:44	WG902439
C28-C40 Oil Range	11.1		4.00	1	08/26/2016 20:44	WG902439
(S) o-Terphenyl	*59.3*		*50.0-150*		*08/26/2016 20:44*	WG902439

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	08/31/2016 05:32	WG902371
Acenaphthene	ND		0.00600	1	08/31/2016 05:32	WG902371
Acenaphthylene	ND		0.00600	1	08/31/2016 05:32	WG902371
Benzo(a)anthracene	ND		0.00600	1	08/31/2016 05:32	WG902371
Benzo(a)pyrene	ND		0.00600	1	08/31/2016 05:32	WG902371
Benzo(b)fluoranthene	ND		0.00600	1	08/31/2016 05:32	WG902371
Benzo(g,h,i)perylene	ND		0.00600	1	08/31/2016 05:32	WG902371
Benzo(k)fluoranthene	ND		0.00600	1	08/31/2016 05:32	WG902371
Chrysene	ND		0.00600	1	08/31/2016 05:32	WG902371
Dibenz(a,h)anthracene	ND		0.00600	1	08/31/2016 05:32	WG902371
Fluoranthene	ND		0.00600	1	08/31/2016 05:32	WG902371
Fluorene	ND		0.00600	1	08/31/2016 05:32	WG902371
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	08/31/2016 05:32	WG902371
Naphthalene	0.0224		0.0200	1	08/31/2016 05:32	WG902371
Phenanthrene	0.0148		0.00600	1	08/31/2016 05:32	WG902371
Pyrene	ND		0.00600	1	08/31/2016 05:32	WG902371
1-Methylnaphthalene	0.0318		0.0200	1	08/31/2016 05:32	WG902371
2-Methylnaphthalene	0.0578		0.0200	1	08/31/2016 05:32	WG902371
2-Chloronaphthalene	ND		0.0200	1	08/31/2016 05:32	WG902371
(S) p-Terphenyl-d14	*69.8*		*32.2-131*		*08/31/2016 05:32*	WG902371
(S) Nitrobenzene-d5	*63.0*		*22.1-146*		*08/31/2016 05:32*	WG902371
(S) 2-Fluorobiphenyl	*80.6*		*40.6-122*		*08/31/2016 05:32*	WG902371

Method Blank (MB)

(MB) R3159786-1 08/27/16 17:12

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

L855707-03 Original Sample (OS) • Duplicate (DUP)

(OS) L855707-03 08/27/16 17:24 • (DUP) R3159786-4 08/27/16 17:25

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

L856031-03 Original Sample (OS) • Duplicate (DUP)

(OS) L856031-03 08/27/16 17:31 • (DUP) R3159786-5 08/27/16 17:32

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

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

(LCS) R3159786-2 08/27/16 17:13 • (LCSD) R3159786-3 08/27/16 17:14

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	48.6	50.2	85.0	88.0	80.0-120			3.00	20

L856031-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L856031-03 08/27/16 17:31 • (MS) R3159786-6 08/27/16 17:33 • (MSD) R3159786-7 08/27/16 17:33

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	U	15.8	17.5	79.0	88.0	1	75.0-125			10.0	20

L853915-03 Original Sample (OS) • Duplicate (DUP)

(OS) L853915-03 08/26/16 11:44 • (DUP) WG901335-3 08/26/16 11:44

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.83	7.79	1	0.512		1

L855711-05 Original Sample (OS) • Duplicate (DUP)

(OS) L855711-05 08/26/16 11:44 • (DUP) WG901335-4 08/26/16 11:44

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.67	8.60	1	0.811		1

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

(LCS) WG901335-1 08/26/16 11:44 • (LCSD) WG901335-2 08/26/16 11:44

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	su	su	su	%	%	%			%	%
pH	6.11	6.09	6.09	99.7	99.7	98.4-102			0.000	1

L855419-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855419-01 08/30/16 14:50 • (DUP) WG902378-3 08/30/16 14:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	11.5	11.5	1	0.0869		1

L856349-04 Original Sample (OS) • Duplicate (DUP)

(OS) L856349-04 08/30/16 14:50 • (DUP) WG902378-4 08/30/16 14:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.95	8.95	1	0.000		1

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

(LCS) WG902378-1 08/30/16 14:50 • (LCSD) WG902378-2 08/30/16 14:50

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.10	6.10	99.8	99.8	98.4-102			0.000	1

Method Blank (MB)

(MB) WG902319-5 08/26/16 13:00

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	1.60			

L855707-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855707-01 08/26/16 13:00 • (DUP) WG902319-1 08/26/16 13:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	149	149	1	0.405		20

L855711-05 Original Sample (OS) • Duplicate (DUP)

(OS) L855711-05 08/26/16 13:00 • (DUP) WG902319-2 08/26/16 13:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	6850	6860	1	0.0876		20

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

(LCS) WG902319-3 08/26/16 13:00 • (LCSD) WG902319-4 08/26/16 13:00

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	542	553	551	102	102	90.0-110			0.362	20

Method Blank (MB)

(MB) R3159491-6 08/26/16 11:16

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

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

(LCS) R3159491-7 08/26/16 11:19 • (LCSD) R3159491-8 08/26/16 11:21

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	0.274	0.275	91	92	80-120			0	20

L855711-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855711-01 08/26/16 11:24 • (MS) R3159491-9 08/26/16 11:26 • (MSD) R3159491-10 08/26/16 11:34

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	0.0293	0.277	0.295	83	89	1	75-125			6	20

Method Blank (MB)

(MB) R3160227-1 08/30/16 11:37

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
Boron	U		1.26	10.0
Cadmium	U		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
Zinc	1.51	J	0.59	5.00

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

(LCS) R3160227-2 08/30/16 11:39 • (LCSD) R3160227-3 08/30/16 11:42

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	105	103	105	103	80-120			2	20
Barium	100	106	104	106	104	80-120			1	20
Boron	100	101	99.7	101	100	80-120			1	20
Cadmium	100	103	102	103	102	80-120			1	20
Chromium	100	102	101	102	101	80-120			2	20
Copper	100	104	103	104	103	80-120			1	20
Lead	100	98.5	97.7	99	98	80-120			1	20
Nickel	100	102	100	102	100	80-120			1	20
Selenium	100	106	104	106	104	80-120			1	20
Zinc	100	100	99.2	100	99	80-120			1	20

L855746-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855746-01 08/30/16 11:44 • (MS) R3160227-6 08/30/16 11:52 • (MSD) R3160227-7 08/30/16 11:55

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	4.80	106	103	101	98	1	75-125			3	20
Barium	100	79.3	183	185	104	106	1	75-125			1	20
Boron	100	ND	100	97.2	96	93	1	75-125			3	20
Cadmium	100	ND	101	97.2	101	97	1	75-125			4	20
Chromium	100	12.6	112	108	99	95	1	75-125			4	20
Copper	100	12.6	116	112	103	99	1	75-125			4	20
Lead	100	9.11	109	105	100	96	1	75-125			3	20

L855746-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855746-01 08/30/16 11:44 • (MS) R3160227-6 08/30/16 11:52 • (MSD) R3160227-7 08/30/16 11:55

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 %
Nickel	100	14.0	117	116	103	102	1	75-125			1	20
Selenium	100	ND	103	98.6	103	99	1	75-125			5	20
Zinc	100	46.8	139	137	92	90	1	75-125			1	20

Method Blank (MB)

(MB) R3160713-1 08/31/16 19:34

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Silver	U		0.28	1.00

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

(LCS) R3160713-2 08/31/16 19:36 • (LCSD) R3160713-3 08/31/16 19:39

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 %
Silver	100	103	99.8	103	100	80-120			3	20

L855711-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855711-02 08/31/16 19:42 • (MS) R3160713-6 08/31/16 19:50 • (MSD) R3160713-7 08/31/16 19:52

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 %
Silver	100	ND	103	101	103	101	1	75-125			2	20

Method Blank (MB)

(MB) R3160861-1 09/01/16 12:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Silver	U		0.28	1.00

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

(LCS) R3160861-2 09/01/16 12:52 • (LCSD) R3160861-3 09/01/16 12:54

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 %
Silver	100	97.0	99.6	97	100	80-120			3	20

L857009-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L857009-01 09/01/16 12:57 • (MS) R3160861-6 09/01/16 13:05 • (MSD) R3160861-7 09/01/16 13:08

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 %
Silver	100	U	96.9	94.5	97	95	1	75-125			3	20

Method Blank (MB)

(MB) R3160670-5 08/30/16 12:03

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000279	J	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U	J	0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0380	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*98.6*			*59.0-128*
(S) a,a,a-Trifluorotoluene(PID)	*104*			*54.0-144*

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

(LCS) R3160670-1 08/30/16 10:11 • (LCSD) R3160670-2 08/30/16 10:34

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0452	0.0453	90.3	90.5	70.0-130			0.190	20
Toluene	0.0500	0.0461	0.0458	92.3	91.5	70.0-130			0.810	20
Ethylbenzene	0.0500	0.0479	0.0480	95.7	96.0	70.0-130			0.270	20
Total Xylene	0.150	0.143	0.144	95.5	95.7	70.0-130			0.200	20
(S) a,a,a-Trifluorotoluene(FID)				*97.7*	*98.3*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*103*	*103*	*54.0-144*				

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

(LCS) R3160670-3 08/30/16 10:56 • (LCSD) R3160670-4 08/30/16 11:18

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.88	5.87	107	107	63.5-137			0.110	20
(S) a,a,a-Trifluorotoluene(FID)				*105*	*105*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*112*	*112*	*54.0-144*				

L855707-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855707-01 08/30/16 15:28 • (MS) R3160670-6 08/30/16 15:50 • (MSD) R3160670-7 08/30/16 16:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	ND	0.0315	0.0258	62.0	50.7	1	49.7-127			19.6	23.5
Toluene	0.0500	ND	0.0317	0.0258	62.6	50.7	1	49.8-132			20.7	23.5
Ethylbenzene	0.0500	ND	0.0334	0.0266	66.4	52.9	1	40.8-141			22.5	23.8
Total Xylene	0.150	ND	0.0981	0.0769	65.4	51.3	1	41.2-140		J J3	24.2	23.7
(S) a,a,a-Trifluorotoluene(FID)					*97.9*	*97.9*		*59.0-128*				

L855707-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855707-01 08/30/16 15:28 • (MS) R3160670-6 08/30/16 15:50 • (MSD) R3160670-7 08/30/16 16:13

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 %
(S) a,a,a-Trifluorotoluene(PID)					*103*	*103*		*54.0-144*				

L855707-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855707-01 08/30/16 15:28 • (MS) R3160670-8 08/30/16 16:35 • (MSD) R3160670-9 08/30/16 16:57

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 %
TPH (GC/FID) Low Fraction	5.50	ND	4.74	4.25	85.6	76.7	1	28.5-138			10.9	23.6
(S) a,a,a-Trifluorotoluene(FID)					*104*	*103*		*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)					*111*	*110*		*54.0-144*				

Method Blank (MB)

(MB) R3159566-1 08/26/16 11:12

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*83.7*			*50.0-150*

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

(LCS) R3159566-2 08/26/16 11:27 • (LCSD) R3159566-3 08/26/16 11:42

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
C10-C28 Diesel Range	60.0	39.5	41.9	65.9	69.8	50.0-150			5.70	20
(S) o-Terphenyl				*85.0*	*86.4*	*50.0-150*				

L855707-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855707-01 08/26/16 16:45 • (MS) R3159566-4 08/26/16 17:00 • (MSD) R3159566-5 08/26/16 17:15

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	%	%		%			%	%
C10-C28 Diesel Range	60.0	ND	40.2	44.5	67.0	74.1	1	50.0-150			10.1	20
(S) o-Terphenyl					*79.4*	*88.9*		*50.0-150*				

Method Blank (MB)

(MB) R3160455-3 08/31/16 00:47

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) p-Terphenyl-d14	*83.9*			*32.2-131*
(S) Nitrobenzene-d5	*71.1*			*22.1-146*
(S) 2-Fluorobiphenyl	*93.7*			*40.6-122*

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

(LCS) R3160455-1 08/31/16 00:03 • (LCSD) R3160455-2 08/31/16 00:25

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	0.0689	0.0643	86.1	80.4	50.3-130			6.87	20
Acenaphthene	0.0800	0.0655	0.0624	81.9	78.0	52.4-120			4.94	20
Acenaphthylene	0.0800	0.0659	0.0637	82.4	79.7	49.6-120			3.31	20
Benzo(a)anthracene	0.0800	0.0694	0.0669	86.8	83.6	46.7-125			3.75	20
Benzo(a)pyrene	0.0800	0.0629	0.0602	78.6	75.3	42.3-119			4.34	20
Benzo(b)fluoranthene	0.0800	0.0642	0.0639	80.3	79.9	43.6-124			0.450	20
Benzo(g,h,i)perylene	0.0800	0.0723	0.0659	90.4	82.4	45.1-132			9.21	20
Benzo(k)fluoranthene	0.0800	0.0670	0.0627	83.8	78.4	46.1-131			6.59	20
Chrysene	0.0800	0.0693	0.0677	86.6	84.7	49.5-131			2.29	20
Dibenz(a,h)anthracene	0.0800	0.0735	0.0685	91.8	85.7	44.8-133			6.95	20
Fluoranthene	0.0800	0.0773	0.0722	96.6	90.3	49.3-128			6.75	20

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

(LCS) R3160455-1 08/31/16 00:03 • (LCSD) R3160455-2 08/31/16 00:25

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	0.0665	0.0654	83.2	81.8	50.6-121			1.63	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0739	0.0691	92.4	86.4	46.1-135			6.73	20
Naphthalene	0.0800	0.0634	0.0618	79.2	77.2	49.6-115			2.59	20
Phenanthrene	0.0800	0.0671	0.0642	83.9	80.3	48.8-121			4.39	20
Pyrene	0.0800	0.0724	0.0690	90.5	86.2	44.7-130			4.82	20
1-Methylnaphthalene	0.0800	0.0735	0.0668	91.9	83.5	50.6-122			9.56	20
2-Methylnaphthalene	0.0800	0.0716	0.0674	89.5	84.3	50.4-120			5.99	20
2-Chloronaphthalene	0.0800	0.0628	0.0607	78.4	75.8	53.9-121			3.41	20
(S) p-Terphenyl-d14				*78.2*	*78.6*	*32.2-131*				
(S) Nitrobenzene-d5				*72.1*	*69.9*	*22.1-146*				
(S) 2-Fluorobiphenyl				*87.6*	*87.5*	*40.6-122*				

L855707-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855707-02 08/31/16 02:39 • (MS) R3160455-4 08/31/16 03:01 • (MSD) R3160455-5 08/31/16 03:22

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	0.0589	0.0620	73.6	77.5	1	26.5-141			5.17	21.2
Acenaphthene	0.0800	ND	0.0591	0.0609	73.9	76.1	1	31.9-130			2.95	20
Acenaphthylene	0.0800	ND	0.0648	0.0656	80.9	82.0	1	33.7-129			1.30	20
Benzo(a)anthracene	0.0800	ND	0.0494	0.0536	61.7	67.0	1	18.3-136			8.29	24.6
Benzo(a)pyrene	0.0800	ND	0.0508	0.0544	63.6	68.0	1	16.9-135			6.75	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0388	0.0448	48.5	56.0	1	10.0-134			14.5	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0369	0.0484	46.2	60.5	1	14.1-140		J3	26.9	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0498	0.0504	62.2	63.0	1	18.2-138			1.21	25.6
Chrysene	0.0800	ND	0.0543	0.0560	67.9	70.1	1	17.1-145			3.20	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0440	0.0569	54.9	71.1	1	18.5-138		J3	25.7	24.3
Fluoranthene	0.0800	ND	0.0542	0.0554	67.8	69.2	1	15.4-144			2.14	27.1
Fluorene	0.0800	ND	0.0590	0.0613	73.7	76.6	1	23.5-136			3.76	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0403	0.0518	50.4	64.8	1	14.5-142			25.0	25.8
Naphthalene	0.0800	ND	0.0646	0.0637	77.3	76.3	1	29.2-128			1.35	20
Phenanthrene	0.0800	ND	0.0550	0.0582	67.5	71.5	1	20.1-134			5.75	23.6
Pyrene	0.0800	ND	0.0554	0.0555	69.3	69.3	1	11.0-148			0.0300	26.1
1-Methylnaphthalene	0.0800	ND	0.0677	0.0692	82.0	83.9	1	28.4-137			2.21	20
2-Methylnaphthalene	0.0800	ND	0.0708	0.0736	80.6	84.1	1	26.6-137			3.90	20
2-Chloronaphthalene	0.0800	ND	0.0600	0.0599	75.0	74.9	1	38.6-126			0.0700	20
(S) p-Terphenyl-d14					*85.5*	*80.0*		*32.2-131*				
(S) Nitrobenzene-d5					*67.8*	*70.7*		*22.1-146*				
(S) 2-Fluorobiphenyl					*92.6*	*91.9*		*40.6-122*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
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.
(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.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
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.

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
Conneticut	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		

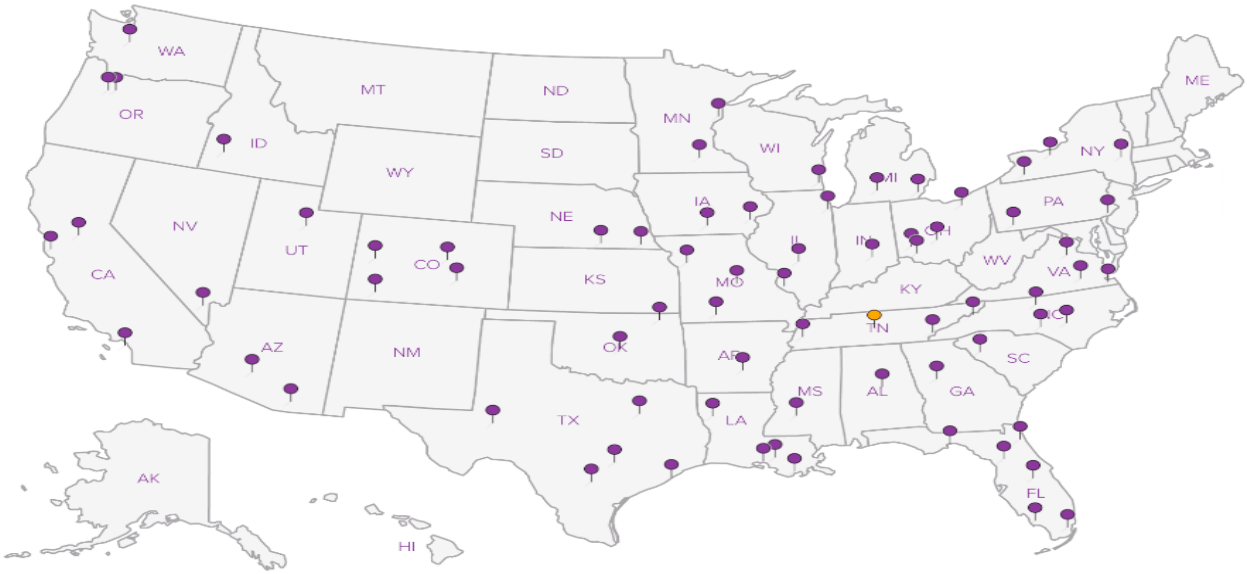
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	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.**



1 of 2

Company Name/Address:
~~Berry Petroleum Co.~~
~~1999 Broadway Suite 3700~~
~~Denver, CO 80202~~
Nicholson GeoSolutions

Billing Information:
Tom Hogelin
Linn Energy LLC
235 Callahan Ave
Parachute, CO 81635

Report to: Dave Nicholson

Email To: dknicholson@q.com

Project Description: ~~HRM Landfarm Sampling~~ Pit Reclamation

City/State Collected:

Phone: 303-601-2023
Fax:

Client Project #

Lab Project # BERPETDCO030615S

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature): DKNicholson
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X Yes
FAX? X No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 855711
B161

Acctnum: BERPETDCO
Template:
Prelogin:
TSR:
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TEPH(8015)Diesel & Oil Range (1) 4oz Clear-No Pres	BTEX/TVPH (1) 4oz Clear - No Pres	SAR, metals, Cr VI	SPCON, pH	PAHs 8270 SIM						Rem./Contaminant	Sample # (lab only)
J15-P-1		SS		8/23	1210	52	X	X	X	X	X							01
J15-P-2		SS			1220	2	X	X	X	X	X							02
J15-P-3		SS			1230	2	X	X	X	X	X							03
J15-P-4		SS			1240	2	X	X	X	X	X							04
J15-P-5		SS			1250	2	X	X	X	X	X							05
		SS				2												
		SS				2												
		SS				2												
		SS				2												
		SS				22												

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: As, Ba, B, Cd, Cr, Co, Pb, Hg, Ni, Se, Ag, Zn + Cr VI

pH ___ Temp ___
Flow ___ Other ___
Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

608271044105

Hold #

Condition: DBG (lab use only) a

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
DKNicholson	8/24/16	1400	FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/24	1730	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Temp: 1.9 °C Bottles Received: 25-40z
Date: 8.25.16 Time: 0900

ESC LAB SCIENCES

YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: BERPETDCO SDG# 85571(

Cooler Received/Opened On: 8/25/2016 By : Nikki Farmer

Temperature Upon Receipt: 1.9 °c

(Signature)

Cooler Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?			✓
Were custody papers properly filled out (ink, signed, etc.)?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were correct preservatives used?			✓
Were all applicable sample containers checked for preservation?			✓
(Any samples not in accepted pH range noted on COC .)			
If applicable, was an observable VOA headspace present?			✓
Non Conformance Generated? (If yes see attached NCF)		✓	