Nicholson GeoSolutions LLC
3433 East Lake Drive
Centennial, CO 80121

June 15, 2016

Mr. Terry Pape
HRM Resources, LLC
410 17th Street, Suite 1100
Denver, CO 80202

Subject: Herzberg No. 1 Landfarm Sampling Results
COGCC Remediation #9055

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm on the Herzberg No. 1 lease, Washington County, Colorado. Sampling of the landfarm was conducted at the required rate of approximately one sample per 100 yards of material on May 25th, 2016. The landfarm was previously sampled on October 18th, 2015.

GPS mapping showed that three landfarm cells cover a total of about 0.30 acres and contain an estimated 730 yards of material. A total of 10 discrete soil samples were collected at depths of approximately 12-16 inches. These samples were collected from approximately the same locations as those collected in October 2015. The extent of the landfarm cells and the locations of the samples are shown on Figure 1.

All samples were analyzed for Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel and motor oil range), and BTEX (benzene, toluene, ethylbenzene, and xylenes) to evaluate compliance with the COGCC Table 910-1 standards and further treatment needs.

Table 1 provides a summary of the analytical results for the samples. The laboratory report is contained in Appendix A. For the May 2016 sampling event, the sum of the concentrations of gasoline, diesel, and motor oil range petroleum hydrocarbons (total petroleum hydrocarbons [TPH]) exceeded the COGCC standard of 500 mg/kg for all 10 samples and ranged from 1,972 mg/kg to 11,000 mg/kg.

Table 1 Herzberg No. 1 Landfarm Sample Results – May 25, 2016

	Table 910-1 Standards	Herzberg LF-1	Herzberg LF-2	Herzberg LF-3	Herzberg LF-4	Herzberg LF-5
TVPH – gasoline range	500[1]	**1.63**	**1.65**	**0.633**	**<0.5**	**<0.5**
TEPH – diesel/motor oil range	500[1]	**4,410**	**3,330**	**4,480**	**4,850**	**1,972**
benzene	0.17	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
xylenes	175	0.0142	0.013	<0.0075	<0.0075	<0.0075

	Table 910-1 Standards	Herzberg LF-6	Herzberg LF-7	Herzberg LF-8	Herzberg LF-9	Herzberg LF-10
TVPH – gasoline range	500[1]	**<0.5**	**<0.5**	**0.755**	**<0.5**	**<0.5**
TEPH – diesel/motor oil range	500[1]	**2,970**	**2,165**	**5,890**	**2,260**	**11,000**
benzene	0.17	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
toluene	85	<0.025	<0.025	<0.025	<0.025	<0.025
ethylbenzene	100	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ	<0.0025 UJ
xylenes	175	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075

[1]The standard is 500 for the combined total of TVPH and TEPH All units in mg/kg
UJ = estimated detection limit
Values in bold type exceed standards

Table 2 provides the TPH results for the October 18th, 2015 and May 25th, 2016 samples and the percent difference between the two samples at each sample location. TPH ranged from 3,990 mg/kg to 27,716 mg/kg for the October 2015 samples and from 1,972 mg/kg to 11,000 mg/kg for the May 2016 samples. The TPH concentration was lower for the May 2016 samples at nine of the 10 sample locations and higher at the remaining location. The landfarm was thoroughly tilled on two occasions since the last sampling event.

Table 2 Comparison of TPH Results, October 18, 2015 and May 25, 2016

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) May 25, 2016	%Difference
Herzberg-LF-1	10,557	4,412	-58.2
Herzberg-LF-2	9,718	3,332	-65.7
Herzberg-LF-3	17,100	4,481	-73.8
Herzberg-LF-4	9,000	4,850	-46.1
Herzberg-LF-5	3,990	1,972	-50.6
Herzberg-LF-6	10,752	2,970	-72.4
Herzberg-LF-7	5,323	2,165	-59.3
Herzberg-LF-8	27,716	5,891	-78.7
Herzberg-LF-9	24,152	2,260	-90.6
Herzberg-LF-10	7,340	11,000	49.9

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the 10 samples dropped from 10,073 mg/kg to 3,809 mg/kg between October 18th, 2015 and May 25th, 2016. The median concentration dropped from 9,718 mg/kg to 4,412 mg/kg. Using the results provided above in Table 2, the average % TPH reduction for the overall landfarm was -62.2%.

Table 3 Summary Statistics for the October 2015 and May 2016 Samples

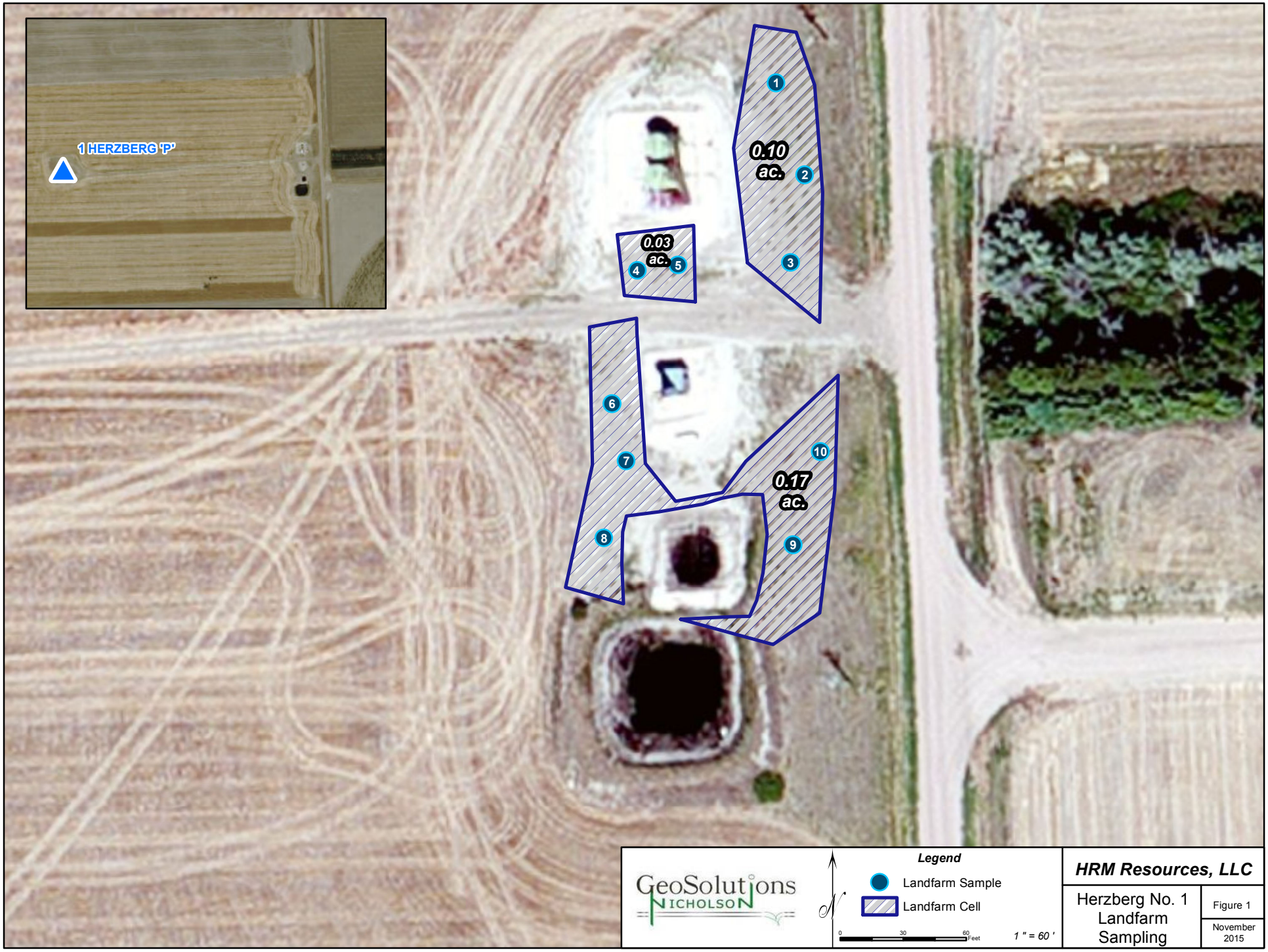
Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	3,990	27,716	10,073	9,718	
May 25, 2016	1,972	11,000	3,809	4,412	-62.2

Using the difference between the average TPH concentrations of 6,624 mg/kg, and the time period of 220 days, a biodegradation rate of 28.5 mg/kg-day is obtained. However, with only two data points, the calculated rate assumes that the rate of decline is linear when it is likely a first-order or second-order decay equation. Therefore, the calculated biodegradation rate may by higher than the actual rate. A more accurate rate may be determined following the collection of the October 2016 samples.

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Herzberg No. 1 lease is occurring. Additional treatment of the landfarm cells including tilling will be conducted prior to the next sampling event in October 2016.

Nicholson GeoSolutions LLC

David K. Nicholson, P.G.
Principal Geologist


1 HERZBERG 'P'
1
0.10 ac.
2
3
0.03 ac.
4
5
6
7
8
9
10
0.17 ac.
GeoSolutions
NICHOLSON
Legend
Landfarm Sample
Landfarm Cell
0
30
60
Feet
1 " = 60 '
HRM Resources, LLC
Herzberg No. 1 Landfarm Sampling
Figure 1
November 2015

APPENDIX A
Laboratory Report

ANALYTICAL REPORT

June 07, 2016

HRM Resources, LLC - Denver, CO

Sample Delivery Group:	L838264
Samples Received:	05/27/2016
Project Number:	
Description:	HRM Landform Sampling

Report To: Dave Nicholson
410 17th St., Ste. 1600
Denver, CO 80202

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

HERZBERG-LF-1 L838264-01 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 12:10 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 18:44	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876836	5	06/03/16 18:56	06/05/16 01:04	BMB

HERZBERG-LF-2 L838264-02 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 12:15 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 18:58	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876836	5	06/03/16 18:56	06/05/16 01:27	BMB

HERZBERG-LF-3 L838264-03 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 12:20 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 19:12	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876836	5	06/03/16 18:56	06/05/16 01:49	BMB

HERZBERG-LF-4 L838264-04 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 12:25 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 19:26	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876836	5	06/03/16 18:56	06/05/16 02:11	BMB

HERZBERG-LF-5 L838264-05 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 12:28 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 19:40	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 17:23	DWR

HERZBERG-LF-6 L838264-06 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 13:00 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 19:54	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 19:31	DWR

HERZBERG-LF-7 L838264-07 Solid

Collected by: D. Nicholson | Collected date/time: 05/25/16 13:05 | Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 20:08	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 19:53	DWR

HERZBERG-LF-8 L838264-08 Solid

Collected by: D. Nicholson
Collected date/time: 05/25/16 13:08
Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 20:22	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 20:15	DWR

HERZBERG-LF-9 L838264-09 Solid

Collected by: D. Nicholson
Collected date/time: 05/25/16 13:10
Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	10	06/01/16 09:21	06/01/16 20:37	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 20:37	DWR

HERZBERG-LF-10 L838264-10 Solid

Collected by: D. Nicholson
Collected date/time: 05/25/16 13:15
Received date/time: 05/27/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 8015	WG876718	20	06/01/16 09:21	06/01/16 23:50	TRF
Volatile Organic Compounds (GC) by Method 8015/8021	WG876838	5	06/03/16 23:20	06/04/16 21:00	DWR

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. 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

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/05/2016 01:04	WG876836
Toluene	ND		0.0250	5	06/05/2016 01:04	WG876836
Ethylbenzene	ND		0.00250	5	06/05/2016 01:04	WG876836
Total Xylene	0.0142	B	0.00750	5	06/05/2016 01:04	WG876836
TPH (GC/FID) Low Fraction	1.63		0.500	5	06/05/2016 01:04	WG876836
(S) a,a,a-Trifluorotoluene(FID)	*89.5*		*59.0-128*		*06/05/2016 01:04*	WG876836
(S) a,a,a-Trifluorotoluene(PID)	*95.5*		*54.0-144*		*06/05/2016 01:04*	WG876836

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	2750		40.0	10	06/01/2016 18:44	WG876718
C28-C40 Oil Range	1660		40.0	10	06/01/2016 18:44	WG876718
(S) o-Terphenyl	*25.2*	J2	*50.0-150*		*06/01/2016 18:44*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/05/2016 01:27	WG876836
Toluene	ND		0.0250	5	06/05/2016 01:27	WG876836
Ethylbenzene	ND		0.00250	5	06/05/2016 01:27	WG876836
Total Xylene	0.0130	B	0.00750	5	06/05/2016 01:27	WG876836
TPH (GC/FID) Low Fraction	1.65		0.500	5	06/05/2016 01:27	WG876836
(S) a,a,a-Trifluorotoluene(FID)	*91.6*		*59.0-128*		*06/05/2016 01:27*	WG876836
(S) a,a,a-Trifluorotoluene(PID)	*97.3*		*54.0-144*		*06/05/2016 01:27*	WG876836

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	2030		40.0	10	06/01/2016 18:58	WG876718
C28-C40 Oil Range	1300		40.0	10	06/01/2016 18:58	WG876718
(S) o-Terphenyl	*12.5*	J2	*50.0-150*		*06/01/2016 18:58*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/05/2016 01:49	WG876836
Toluene	ND		0.0250	5	06/05/2016 01:49	WG876836
Ethylbenzene	ND		0.00250	5	06/05/2016 01:49	WG876836
Total Xylene	ND	B	0.00750	5	06/05/2016 01:49	WG876836
TPH (GC/FID) Low Fraction	0.633	B	0.500	5	06/05/2016 01:49	WG876836
(S) a,a,a-Trifluorotoluene(FID)	*90.3*		*59.0-128*		*06/05/2016 01:49*	WG876836
(S) a,a,a-Trifluorotoluene(PID)	*96.5*		*54.0-144*		*06/05/2016 01:49*	WG876836

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	2650		40.0	10	06/01/2016 19:12	WG876718
C28-C40 Oil Range	1830		40.0	10	06/01/2016 19:12	WG876718
(S) o-Terphenyl	*60.3*		*50.0-150*		*06/01/2016 19:12*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/05/2016 02:11	WG876836
Toluene	ND		0.0250	5	06/05/2016 02:11	WG876836
Ethylbenzene	ND		0.00250	5	06/05/2016 02:11	WG876836
Total Xylene	ND	B	0.00750	5	06/05/2016 02:11	WG876836
TPH (GC/FID) Low Fraction	ND		0.500	5	06/05/2016 02:11	WG876836
(S) a,a,a-Trifluorotoluene(FID)	*93.6*		*59.0-128*		*06/05/2016 02:11*	WG876836
(S) a,a,a-Trifluorotoluene(PID)	*99.2*		*54.0-144*		*06/05/2016 02:11*	WG876836

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	2880		40.0	10	06/01/2016 19:26	WG876718
C28-C40 Oil Range	1970		40.0	10	06/01/2016 19:26	WG876718
(S) o-Terphenyl	*88.4*		*50.0-150*		*06/01/2016 19:26*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 17:23	WG876838
Toluene	ND		0.0250	5	06/04/2016 17:23	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 17:23	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 17:23	WG876838
TPH (GC/FID) Low Fraction	ND		0.500	5	06/04/2016 17:23	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*96.7*		*59.0-128*		*06/04/2016 17:23*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*102*		*54.0-144*		*06/04/2016 17:23*	WG876838

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	1210		40.0	10	06/01/2016 19:40	WG876718
C28-C40 Oil Range	762		40.0	10	06/01/2016 19:40	WG876718
(S) o-Terphenyl	*69.5*		*50.0-150*		*06/01/2016 19:40*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 19:31	WG876838
Toluene	ND		0.0250	5	06/04/2016 19:31	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 19:31	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 19:31	WG876838
TPH (GC/FID) Low Fraction	ND		0.500	5	06/04/2016 19:31	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*95.3*		*59.0-128*		*06/04/2016 19:31*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*101*		*54.0-144*		*06/04/2016 19:31*	WG876838

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	1760		40.0	10	06/01/2016 19:54	WG876718
C28-C40 Oil Range	1210		40.0	10	06/01/2016 19:54	WG876718
(S) o-Terphenyl	*100*		*50.0-150*		*06/01/2016 19:54*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 19:53	WG876838
Toluene	ND		0.0250	5	06/04/2016 19:53	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 19:53	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 19:53	WG876838
TPH (GC/FID) Low Fraction	ND		0.500	5	06/04/2016 19:53	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*94.8*		*59.0-128*		*06/04/2016 19:53*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*100*		*54.0-144*		*06/04/2016 19:53*	WG876838

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	1260		40.0	10	06/01/2016 20:08	WG876718
C28-C40 Oil Range	905		40.0	10	06/01/2016 20:08	WG876718
(S) o-Terphenyl	*52.3*		*50.0-150*		*06/01/2016 20:08*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 20:15	WG876838
Toluene	ND		0.0250	5	06/04/2016 20:15	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 20:15	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 20:15	WG876838
TPH (GC/FID) Low Fraction	0.755		0.500	5	06/04/2016 20:15	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*93.1*		*59.0-128*		*06/04/2016 20:15*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*98.8*		*54.0-144*		*06/04/2016 20:15*	WG876838

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	3690		40.0	10	06/01/2016 20:22	WG876718
C28-C40 Oil Range	2200		40.0	10	06/01/2016 20:22	WG876718
(S) o-Terphenyl	*23.0*	J2	*50.0-150*		*06/01/2016 20:22*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 20:37	WG876838
Toluene	ND		0.0250	5	06/04/2016 20:37	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 20:37	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 20:37	WG876838
TPH (GC/FID) Low Fraction	ND		0.500	5	06/04/2016 20:37	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*96.7*		*59.0-128*		*06/04/2016 20:37*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*103*		*54.0-144*		*06/04/2016 20:37*	WG876838

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	1190		40.0	10	06/01/2016 20:37	WG876718
C28-C40 Oil Range	1070		40.0	10	06/01/2016 20:37	WG876718
(S) o-Terphenyl	*68.4*		*50.0-150*		*06/01/2016 20:37*	WG876718

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	06/04/2016 21:00	WG876838
Toluene	ND		0.0250	5	06/04/2016 21:00	WG876838
Ethylbenzene	ND		0.00250	5	06/04/2016 21:00	WG876838
Total Xylene	ND	B	0.00750	5	06/04/2016 21:00	WG876838
TPH (GC/FID) Low Fraction	ND		0.500	5	06/04/2016 21:00	WG876838
(S) a,a,a-Trifluorotoluene(FID)	*96.5*		*59.0-128*		*06/04/2016 21:00*	WG876838
(S) a,a,a-Trifluorotoluene(PID)	*102*		*54.0-144*		*06/04/2016 21:00*	WG876838

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	7260		80.0	20	06/01/2016 23:50	WG876718
C28-C40 Oil Range	3740		80.0	20	06/01/2016 23:50	WG876718
(S) o-Terphenyl	*0.000*	J7	*50.0-150*		*06/01/2016 23:50*	WG876718

Method Blank (MB)

(MB) R3141910-5 06/04/16 15:49

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000545	J	0.000150	0.00500
Ethylbenzene	0.000176	J	0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	0.0243	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*92.6*			*59.0-128*
(S) a,a,a-Trifluorotoluene(PID)	*99.6*			*54.0-144*

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

(LCS) R3141910-1 06/04/16 13:58 • (LCSD) R3141910-2 06/04/16 14:20

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	0.0464	0.0467	92.8	93.4	70.0-130			0.580	20
Toluene	0.0500	0.0457	0.0453	91.4	90.5	70.0-130			0.980	20
Ethylbenzene	0.0500	0.0464	0.0466	92.7	93.2	70.0-130			0.560	20
Total Xylene	0.150	0.140	0.140	93.5	93.4	70.0-130			0.150	20
(S) a,a,a-Trifluorotoluene(FID)				*91.5*	*92.2*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*97.1*	*98.3*	*54.0-144*				

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

(LCS) R3141910-3 06/04/16 14:42 • (LCSD) R3141910-4 06/04/16 15:05

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	5.54	6.55	101	119	63.5-137			16.6	20
(S) a,a,a-Trifluorotoluene(FID)				*102*	*105*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*110*	*112*	*54.0-144*				

L838260-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838260-01 06/04/16 18:26 • (MS) R3141910-6 06/04/16 16:35 • (MSD) R3141910-7 06/04/16 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 %
Benzene	0.0500	ND	0.184	0.208	73.7	83.2	5	49.7-127			12.1	23.5
Toluene	0.0500	ND	0.157	0.185	62.0	73.1	5	49.8-132			16.2	23.5
Ethylbenzene	0.0500	ND	0.136	0.174	54.3	69.6	5	40.8-141		J3	24.6	23.8
Total Xylene	0.150	0.00832	0.419	0.527	54.7	69.2	5	41.2-140			23.0	23.7
(S) a,a,a-Trifluorotoluene(FID)					*90.8*	*92.7*		*59.0-128*				

L838260-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838260-01 06/04/16 18:26 • (MS) R3141910-6 06/04/16 16:35 • (MSD) R3141910-7 06/04/16 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 %
(S) a,a,a-Trifluorotoluene(PID)					*97.1*	*98.0*		*54.0-144*				

L838260-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838260-01 06/04/16 18:26 • (MS) R3141910-8 06/04/16 17:20 • (MSD) R3141910-9 06/04/16 17:42

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	1.24	15.5	12.4	52.0	40.7	5	28.5-138			22.2	23.6
(S) a,a,a-Trifluorotoluene(FID)					*95.9*	*95.2*		*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)					*102*	*101*		*54.0-144*				

Method Blank (MB)

(MB) R3141908-5 06/04/16 14:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000302	J	0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*97.0*			*59.0-128*
(S) a,a,a-Trifluorotoluene(PID)	*103*			*54.0-144*

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

(LCS) R3141908-1 06/04/16 12:26 • (LCSD) R3141908-2 06/04/16 12:48

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	0.0434	0.0436	86.8	87.2	70.0-130			0.460	20
Toluene	0.0500	0.0441	0.0439	88.1	87.8	70.0-130			0.410	20
Ethylbenzene	0.0500	0.0455	0.0460	91.0	92.1	70.0-130			1.15	20
Total Xylene	0.150	0.135	0.137	90.3	91.6	70.0-130			1.40	20
(S) a,a,a-Trifluorotoluene(FID)				*96.3*	*96.7*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*102*	*102*	*54.0-144*				

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

(LCS) R3141908-3 06/04/16 13:10 • (LCSD) R3141908-4 06/04/16 13:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.83	5.79	106	105	63.5-137			0.720	20
(S) a,a,a-Trifluorotoluene(FID)				*104*	*103*	*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*111*	*111*	*54.0-144*				

L838264-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838264-05 06/04/16 17:23 • (MS) R3141908-6 06/04/16 15:32 • (MSD) R3141908-7 06/04/16 15:54

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	0.165	0.185	65.9	73.9	5	49.7-127			11.4	23.5
Toluene	0.0500	ND	0.158	0.177	62.8	70.3	5	49.8-132			11.3	23.5
Ethylbenzene	0.0500	ND	0.146	0.165	58.3	66.0	5	40.8-141			12.5	23.8
Total Xylene	0.150	ND	0.428	0.489	57.1	65.2	5	41.2-140			13.3	23.7
(S) a,a,a-Trifluorotoluene(FID)					*96.0*	*96.6*		*59.0-128*				

L838264-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838264-05 06/04/16 17:23 • (MS) R3141908-6 06/04/16 15:32 • (MSD) R3141908-7 06/04/16 15:54

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)					*101*	*102*		*54.0-144*				

L838264-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L838264-05 06/04/16 17:23 • (MS) R3141908-8 06/04/16 16:16 • (MSD) R3141908-9 06/04/16 16:39

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	ND	15.0	14.6	54.6	53.3	5	28.5-138			2.51	23.6
(S) a,a,a-Trifluorotoluene(FID)					*102*	*102*		*59.0-128*				
(S) a,a,a-Trifluorotoluene(PID)					*109*	*109*		*54.0-144*				

Method Blank (MB)

(MB) R3141062-1 06/01/16 17:05

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-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*89.1*			*50.0-150*

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

(LCS) R3141062-2 06/01/16 17:19 • (LCSD) R3141062-3 06/01/16 17:33

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 %
C10-C28 Diesel Range	60.0	55.1	65.0	91.9	108	50.0-150			16.5	20
(S) o-Terphenyl				*88.3*	*101*	*50.0-150*				

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.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

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		

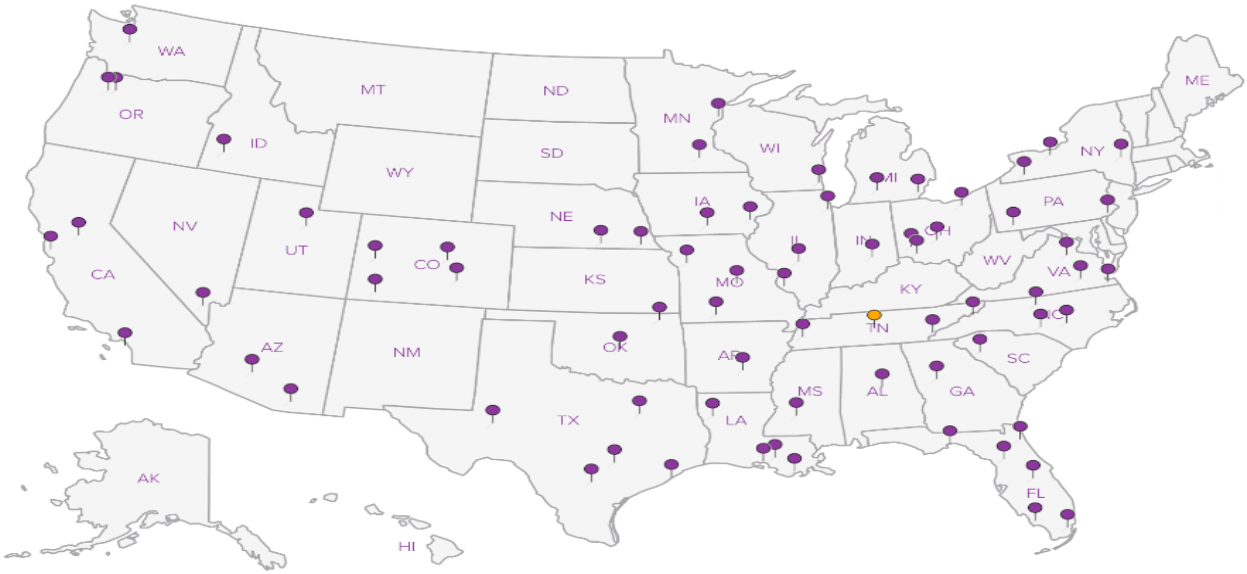
Third Party & Federal Accreditations

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.**



Chain of Custody Page 1 of 1

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

L# L8 38204

C143

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

Billing Information:
~~Tom Hogelin~~ Terry Pope
~~Linn Energy LLC~~ HRM Resources
~~235 Callahan Ave~~ 410 17th St
~~Parachute, CO 81635~~ Suite 1600
Denver, CO 80202

Report to: Dave Nicholson

Email To: dknicholson@q.com

Project Description: HRM Landfarm Sampling

City/State Collected:

Phone: 303-601-2023
Fax:

Client Project #

Lab Project #
~~BERPETDCO0306105~~

Collected by (print):

Site/Facility ID #

P.O. #

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

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

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

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	Rem./Contaminant	Sample # (lab only)
Herzberg-LF-1		SS		5/25	1210	2	X	X		-01
Herzberg-LF-2		SS			1215	2	X	X		-02
Herzberg-LF-3		SS			1220	2	X	X		-03
Herzberg-LF-4		SS			1225	2	X	X		-04
Herzberg-LF-5		SS			1228	2	X	X		-05
Herzberg-LF-6		SS			1300	2	X	X		-06
Herzberg-LF-7		SS			1305	2	X	X		-07
Herzberg-LF-8		SS			1308	2	X	X		-08
Herzberg-LF-9		SS			1310	2	X	X		-09
Herzberg-LF-10		SS		↓	1315	~~2~~ 3	X	X		-10

MW

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

Remarks:

pH _____ Temp _____
Flow _____ Other _____

6711 0334 0231

Hold #

Condition: (lab use only) GOW

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
DKNicholson	5/26/16	1900	Fedex
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 4.3 °C Bottles Received: 20-40?

Date: 5-27-16 Time: 900

COC Seal Intact: ___Y ___N ✓NA

pH Checked: NCF: