



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

November 6, 2017

Mr. Terry Pape
HRM Resources II, LLC
410 17th Street, Suite 1600
Denver, CO 80202

**Subject: Landfarm Sampling Results for the Anderson No. 1 Lease,
COGCC Remediation #9050**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm on the Anderson 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 October 24th, 2017. The landfarm was previously sampled on October 18th, 2015, May 25th, 2016, October 29th, 2016, and May 31st, 2017.

GPS mapping showed that the landfarm covers about 0.09 acres and contains an estimated 500 yards of material. A total of 5 discrete soil samples were collected at depths of approximately 12-16 inches. These samples were collected from approximately the same locations as those previously collected. The extent of the landfarm cell 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. SAR, pH, and conductivity were previously analyzed in October 2016 for the landfarm samples from this site.

Table 1 provides a summary of the analytical results for the samples. The laboratory report is contained in Appendix A. For the October 2017 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 five samples and ranged from 851.2 mg/kg to 2,878 mg/kg.

Table 1 Anderson No. 1 Landfarm Sample Results – October 24, 2017

	Table 910-1 Standards	Anderson LF-1	Anderson LF-2	Anderson LF-3	Anderson LF-4	Anderson LF-5
TVPH – gasoline range	500 ¹	<0.1	<0.1	<0.1	73.2	<0.1
TEPH – diesel/motor oil range		2,635	2,151	1,236	778	2,878
benzene	0.17	<0.0005	0.000714	0.000735	<0.0125	0.000718
toluene	85	<0.005	<0.005	<0.005	<0.125	<0.005
ethylbenzene	100	<0.0005	<0.0005	<0.0005	<0.0125	<0.0005
xylenes	175	<0.0015	<0.0015	<0.0015	0.427	<0.0015

¹The standard is 500 for the combined total of TVPH and TEPH All units in mg/kg
Values in bold type exceed standards

Table 2 provides the TPH results for the October 18th, 2015 and October 24th, 2017 samples and the percent difference between the two samples at each sample location. TPH ranged from 368 mg/kg to 9,010 mg/kg for the October 2015 samples and from 851.2 mg/kg to 2,878 mg/kg for the October 2017 samples. The TPH concentration was lower for the October 2017 samples at four of the five sample locations.

Table 2 Comparison of TPH Results, October 18, 2015 and October 24, 2017

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) Oct 24, 2017	%Difference
Anderson-LF-1	7,525	2,635	-65.0
Anderson-LF-2	368	2,151	484.5
Anderson-LF-3	1,652	1,236	-25.2
Anderson-LF-4	1,925	851.2	-55.8
Anderson-LF-5	9,010	2,878	-68.1

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the five samples decreased from 4,096 mg/kg to 1,950 mg/kg between October 18th, 2015 and October 24th, 2017. The median concentration increased from 1,925 mg/kg to 2,151 mg/kg. Using the results provided above in Table 2, the average TPH decrease for the overall landfarm was -52.4%.

Table 3 Summary Statistics for the October 2015 and October 2017 Samples

Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	368	9,010	4,096	1,925	
Oct 24, 2017	851	2,878	1,950	2,151	-52.4

Using the difference between the average TPH concentrations of 2.146 mg/kg, and the time period of 737 days, a biodegradation rate of 2.91 mg/kg-day is obtained. Using these data, and assuming a linear rate of decay, about 498 days of treatment remain to reach the standard of 500 mg/kg. The actual time required to reach the standard may be more than estimated if the decay is not linear.

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Anderson No. 1 lease is occurring. Tilling of the landfarm was performed on March 14th, April 25th, and September 30th during 2017. In addition, a nitrogen fertilizer was added during the April 2017 tilling. Additional treatment of the landfarm cells including tilling and the addition of water during dry periods should be conducted prior to the next sampling event in May 2018.

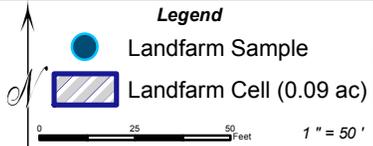
Nicholson GeoSolutions LLC

A handwritten signature in blue ink that reads "DK Nicholson". The signature is written in a cursive, flowing style.

David K. Nicholson, P.G.
Principal Geologist



GeoSolutions
NICHOLSON



HRM Resources, LLC

Anderson No. 1
Landfarm
Sampling

Figure 1
November
2015

APPENDIX A
Laboratory Report

November 10, 2017

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L946612
Samples Received: 10/26/2017
Project Number:
Description: Anderson

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

Entire Report Reviewed By:



Mark W. Beasley
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



Cp: Cover Page	1	
Tc: Table of Contents	2	
Ss: Sample Summary	3	
Cn: Case Narrative	4	
Sr: Sample Results	5	
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Qc: Quality Control Summary	10	
Volatile Organic Compounds (GC) by Method 8015/8021	10	
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Gl: Glossary of Terms	13	
Al: Accreditations & Locations	14	
Sc: Sample Chain of Custody	15	

SAMPLE SUMMARY



ANDERSON-LF-1 L946612-01 Solid

Collected by
DK Nicholson
Collected date/time
10/24/17 10:30
Received date/time
10/26/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015/8021	WG1036708	1	10/27/17 16:41	10/29/17 23:31	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	10	11/04/17 12:14	11/04/17 20:46	ACM

1
Cp

2
Tc

3
Ss

4
Cn

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Sr

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Qc

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Gl

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Al

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Sc

ANDERSON-LF-2 L946612-02 Solid

Collected by
DK Nicholson
Collected date/time
10/24/17 10:35
Received date/time
10/26/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015/8021	WG1036708	1	10/27/17 16:41	11/02/17 19:25	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	10	11/04/17 12:14	11/04/17 21:00	ACM

ANDERSON-LF-3 L946612-03 Solid

Collected by
DK Nicholson
Collected date/time
10/24/17 10:40
Received date/time
10/26/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015/8021	WG1036708	1	10/27/17 16:41	10/30/17 00:20	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	10	11/04/17 12:14	11/04/17 21:15	ACM

ANDERSON-LF-4 L946612-04 Solid

Collected by
DK Nicholson
Collected date/time
10/24/17 10:45
Received date/time
10/26/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015/8021	WG1036708	25	10/27/17 16:41	10/30/17 01:08	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	1	11/04/17 12:14	11/04/17 21:30	ACM
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	10	11/04/17 12:14	11/06/17 17:01	ACM

ANDERSON-LF-5 L946612-05 Solid

Collected by
DK Nicholson
Collected date/time
10/24/17 10:50
Received date/time
10/26/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8015/8021	WG1036708	1	10/27/17 16:41	10/30/17 00:44	LRL
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1039126	10	11/04/17 12:14	11/04/17 21:45	ACM



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 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.

Mark W. Beasley
Technical Service Representative

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



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	10/29/2017 23:31	WG1036708
Toluene	ND		0.00500	1	10/29/2017 23:31	WG1036708
Ethylbenzene	ND		0.000500	1	10/29/2017 23:31	WG1036708
Total Xylene	ND		0.00150	1	10/29/2017 23:31	WG1036708
TPH (GC/FID) Low Fraction	ND		0.100	1	10/29/2017 23:31	WG1036708
<i>(S) a,a,a-Trifluorotoluene(FID)</i>	79.8		77.0-120		10/29/2017 23:31	WG1036708
<i>(S) a,a,a-Trifluorotoluene(PID)</i>	83.0		75.0-128		10/29/2017 23:31	WG1036708

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1890		40.0	10	11/04/2017 20:46	WG1039126
C28-C40 Oil Range	745		40.0	10	11/04/2017 20:46	WG1039126
<i>(S) o-Terphenyl</i>	110		18.0-148		11/04/2017 20:46	WG1039126

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	0.000714		0.000500	1	11/02/2017 19:25	WG1036708
Toluene	ND		0.00500	1	11/02/2017 19:25	WG1036708
Ethylbenzene	ND		0.000500	1	11/02/2017 19:25	WG1036708
Total Xylene	ND		0.00150	1	11/02/2017 19:25	WG1036708
TPH (GC/FID) Low Fraction	ND		0.100	1	11/02/2017 19:25	WG1036708
<i>(S) a,a,a-Trifluorotoluene(FID)</i>	81.6		77.0-120		11/02/2017 19:25	WG1036708
<i>(S) a,a,a-Trifluorotoluene(PID)</i>	82.0		75.0-128		11/02/2017 19:25	WG1036708

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	1440		40.0	10	11/04/2017 21:00	WG1039126
C28-C40 Oil Range	711		40.0	10	11/04/2017 21:00	WG1039126
<i>(S) o-Terphenyl</i>	79.5		18.0-148		11/04/2017 21:00	WG1039126

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	0.000735		0.000500	1	10/30/2017 00:20	WG1036708
Toluene	ND		0.00500	1	10/30/2017 00:20	WG1036708
Ethylbenzene	ND		0.000500	1	10/30/2017 00:20	WG1036708
Total Xylene	ND		0.00150	1	10/30/2017 00:20	WG1036708
TPH (GC/FID) Low Fraction	ND		0.100	1	10/30/2017 00:20	WG1036708
<i>(S) a,a,a-Trifluorotoluene(FID)</i>	89.0		77.0-120		10/30/2017 00:20	WG1036708
<i>(S) a,a,a-Trifluorotoluene(PID)</i>	91.7		75.0-128		10/30/2017 00:20	WG1036708

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

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	772		40.0	10	11/04/2017 21:15	WG1039126
C28-C40 Oil Range	514		40.0	10	11/04/2017 21:15	WG1039126
<i>(S) o-Terphenyl</i>	93.3		18.0-148		11/04/2017 21:15	WG1039126



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	ND		0.0125	25	10/30/2017 01:08	WG1036708
Toluene	ND		0.125	25	10/30/2017 01:08	WG1036708
Ethylbenzene	ND		0.0125	25	10/30/2017 01:08	WG1036708
Total Xylene	0.427	<u>B J6</u>	0.0375	25	10/30/2017 01:08	WG1036708
TPH (GC/FID) Low Fraction	73.2		2.50	25	10/30/2017 01:08	WG1036708
<i>(S) a,a,a-Trifluorotoluene(FID)</i>	98.6		77.0-120		10/30/2017 01:08	WG1036708
<i>(S) a,a,a-Trifluorotoluene(PID)</i>	100		75.0-128		10/30/2017 01:08	WG1036708

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

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	628		40.0	10	11/06/2017 17:01	WG1039126
C28-C40 Oil Range	150		4.00	1	11/04/2017 21:30	WG1039126
<i>(S) o-Terphenyl</i>	227	<u>J1</u>	18.0-148		11/06/2017 17:01	WG1039126
<i>(S) o-Terphenyl</i>	220	<u>J1</u>	18.0-148		11/04/2017 21:30	WG1039126



Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Benzene	0.000718		0.000500	1	10/30/2017 00:44	WG1036708
Toluene	ND		0.00500	1	10/30/2017 00:44	WG1036708
Ethylbenzene	ND		0.000500	1	10/30/2017 00:44	WG1036708
Total Xylene	ND		0.00150	1	10/30/2017 00:44	WG1036708
TPH (GC/FID) Low Fraction	ND		0.100	1	10/30/2017 00:44	WG1036708
<i>(S) a,a,a-Trifluorotoluene(FID)</i>	80.6		77.0-120		10/30/2017 00:44	WG1036708
<i>(S) a,a,a-Trifluorotoluene(PID)</i>	83.1		75.0-128		10/30/2017 00:44	WG1036708

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
C10-C28 Diesel Range	1990		40.0	10	11/04/2017 21:45	WG1039126
C28-C40 Oil Range	888		40.0	10	11/04/2017 21:45	WG1039126
<i>(S) o-Terphenyl</i>	122		18.0-148		11/04/2017 21:45	WG1039126

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3262517-5 10/29/17 18:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000574	↓	0.000150	0.00500
Ethylbenzene	0.000249	↓	0.000110	0.000500
Total Xylene	0.000511		0.000460	0.00150
TPH (GC/FID) Low Fraction	U		0.0217	0.100
^(S) a,a,a-Trifluorotoluene(FID)	98.6			77.0-120
^(S) a,a,a-Trifluorotoluene(PID)	102			75.0-128

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3262517-1 10/29/17 15:27 • (LCSD) R3262517-2 10/29/17 15:51

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	0.0511	0.0511	102	102	71.0-121			0.0200	20
Toluene	0.0500	0.0517	0.0519	103	104	72.0-120			0.460	20
Ethylbenzene	0.0500	0.0517	0.0519	103	104	76.0-121			0.260	20
Total Xylene	0.150	0.159	0.159	106	106	75.0-124			0.190	20
^(S) a,a,a-Trifluorotoluene(FID)				98.3	98.5	77.0-120				
^(S) a,a,a-Trifluorotoluene(PID)				100	100	75.0-128				

7 Gl

8 Al

9 Sc

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

(LCS) R3262517-3 10/29/17 17:05 • (LCSD) R3262517-4 10/29/17 17:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.87	5.63	107	102	70.0-136			4.21	20
^(S) a,a,a-Trifluorotoluene(FID)				105	104	77.0-120				
^(S) a,a,a-Trifluorotoluene(PID)				119	117	75.0-128				



L946612-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L946612-04 10/30/17 01:08 • (MS) R3262517-6 10/30/17 01:32 • (MSD) R3262517-7 10/30/17 01:57

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	0.895	0.859	71.6	68.7	25	10.0-146			4.09	29
Toluene	0.0500	ND	0.988	0.959	79.1	76.7	25	10.0-143			3.02	30
Ethylbenzene	0.0500	ND	1.01	0.985	81.1	78.8	25	10.0-147			2.88	31
Total Xylene	0.150	0.427	3.51	3.43	82.2	80.1	25	10.0-149		J6	2.31	30
(S) a,a,a-Trifluorotoluene(FID)					97.4	97.0		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					98.6	98.5		75.0-128				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L946612-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L946612-04 10/30/17 01:08 • (MS) R3262517-8 10/30/17 02:21 • (MSD) R3262517-9 10/30/17 02:45

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	73.2	110	105	26.7	23.1	25	10.0-147			4.61	30
(S) a,a,a-Trifluorotoluene(FID)					93.5	93.7		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					101	101		75.0-128				

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3263290-1 11/04/17 18:18

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	76.6			18.0-148

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

(LCS) R3263290-2 11/04/17 18:33 • (LCSD) R3263290-3 11/04/17 18:47

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	49.6	45.8	82.6	76.4	50.0-150			7.86	20
(S) o-Terphenyl				78.7	74.5	18.0-148				

L946610-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L946610-01 11/04/17 19:17 • (MS) R3263290-4 11/04/17 19:32 • (MSD) R3263290-5 11/04/17 19:47

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	1830	1560	2310	0.000	802	10	50.0-150	V	J3 V	38.8	20
(S) o-Terphenyl					119	136		18.0-148				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



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.

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

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.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
V	The sample concentration is too high to evaluate accurate spike recoveries.



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 ¹⁴	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		

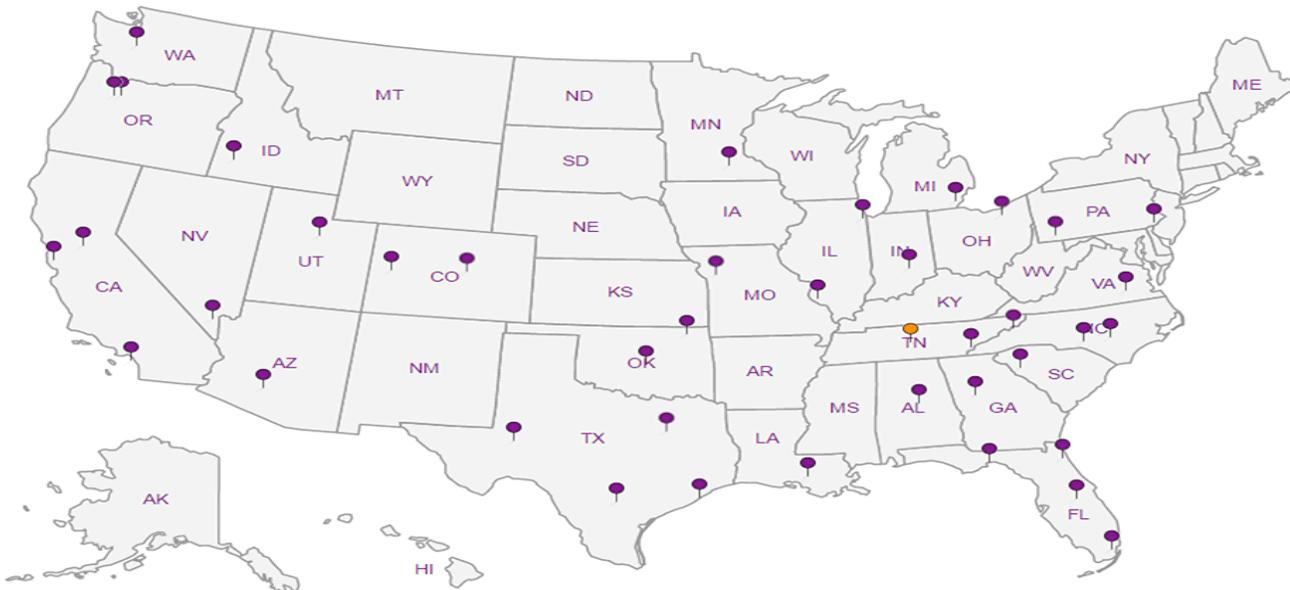
Third Party & Federal Accreditations

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.**



Company Name/Address:
Nicholson GeoSolutions. LLC.
 3433 E. Lake Dr.
 Centennial, CO 80121

Billing Information:
 Terry Pape
 HRM Resources
 1600 17th St. Ste 1600
 Denver, CO 80202

Report to:
Dave Nicholson

Email To:
dknicholson@q.com

Project Description:
HRM Landfarm Sampling Anderson

City/State Collected:

Phone: **303-601-2023**
 Fax:

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):
DW Nicholson
 Immediately Packed on Ice N

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

No. of Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TEPH(8015)Diesel & Oil Range (1) 4oz Clear-No Pres	BTEX/TPH (1) 4oz Clear - No Pres	Analysis / Container / Preservative
Anderson-LF-1		SS		10/24	1030	2	X	X	
Anderson-LF-2		SS		↓	1035	2	X	X	
Anderson-LF-3		SS		↓	1040	2	X	X	
Anderson-LF-4		SS		↓	1045	2	X	X	
Anderson-LF-5		SS		↓	105-	2	X	X	
		SS				2			
		SS				2			
		SS				2			
		SS				2			
		SS				2			

Chain of Custody Page 1 of 1



L.A.B. S.C.I.E.N.C.E.S

YOUR LAB OF CHOICE

12065 Lebanon Rd
 Mount Juliet, TN 37122
 Phone: 615-758-5858
 Phone: 800-767-5859
 Fax: 615-758-5859



L# **L946612**

Tab **E136**

Acctnum **HRMRESDCO**

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant	Sample # (lab only)
------------------	---------------------

-01
 02
 03
 04
 05

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

pH _____ Temp _____
 Flow _____ Other _____

Remarks:
 Relinquished by: (Signature) *DW Nicholson*
 Relinquished by: (Signature)
 Relinquished by: (Signature)

4094 8367 7194

Date: 10/25/17	Time: 1200	Received by: (Signature) <i>Fedex</i>
Date:	Time:	Received by: (Signature)
Date:	Time:	Received for lab by: (Signature) <i>WMP 1860</i>

Samples returned via: UPS
 FedEx Courier _____

Temp: 0.8 °C
 35

Bottles Received: 10

Date: 10/26/17 Time: 8:45

Hold # _____

Condition: (lab use only) **OK**

COC - Seal Intact: ___ Y ___ N ___ NA

pH Checked: _____ NCF: _____

ESC LAB SCIENCES Cooler Receipt Form

Client:	H R M P E S D C O	SDG#	L946612	
Cooler Received/Opened On:	10/26 /17	Temperature:	0.8	
Received by : Christian Kacar				
Signature: 				
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?				