



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

November 14, 2016

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

**Subject: Cowles “P” Landfarm Sampling Results
COGCC Remediation #9053**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm on the Cowles “P” 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 29th, 2016. The landfarm was previously sampled on October 18th, 2015 and May 25th, 2016.

GPS mapping showed that the landfarm covers about 0.10 acres and contains an estimated 250 yards of material. A total of 3 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), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, and conductivity 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 October 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 three samples and ranged from 1,557 mg/kg to 3,731 mg/kg. All pH, SAR, and conductivity results were below the standards.

Table 1 Cowles No. 1 Landfarm Sample Results – October 29, 2016

	Table 910-1 Standards	Cowles LF-1	Cowles LF-2	Cowles LF-3
TVPH – gasoline range	500 ¹	<0.1 UJ	<0.1 UJ	0.169 J
TEPH – diesel/motor oil range	500 ¹	1,557	3,731	2,580
benzene	0.17	0.000777 J	<0.0005 UJ	<0.0005 UJ
toluene	85	<0.005 UJ	<0.005 UJ	<0.005 UJ
ethylbenzene	100	<0.0005 UJ	<0.0005 UJ	<0.0005 UJ
xylenes	175	0.0016 J	0.00246 J	0.00363 J
SAR (ratio)	<12	2.52	2.87	3.39
pH (units)	6-9	8.85	8.76	8.79
sp. conductance (mmhos/cm)	<4.0	0.651	0.602	0.783

¹The standard is 500 for the combined total of TVPH and TEPH All units in mg/kg except where indicated

J = estimated concentration UJ = estimated detection limit

Values in bold type exceed standards

Table 2 provides the TPH results for the October 18th, 2015 and October 29th, 2016 samples and the percent difference between the two samples at each sample location. TPH ranged from 3,831 mg/kg to 43,600 mg/kg for the October 2015 samples and from 1,557 mg/kg to 3,731 mg/kg for the October 2016 samples. The TPH concentration was lower for the October 2016 samples at all three sample locations.

Table 2 Comparison of TPH Results, October 18, 2015 and October 29, 2016

Sample Location	TPH (mg/kg) October 18, 2015	TPH (mg/kg) October 29, 2016	%Difference
Cowles-LF-1	7,316	1,557	-78.7
Cowles-LF-2	3,831	3,731	-2.6
Cowles-LF-3	43,600	2,580	-94.1

Table 3 provides summary statistics for the two sampling events. The average TPH concentration for the three samples dropped from 18,249 mg/kg to 2,623 mg/kg between October 18th, 2015 and October 29th, 2016. The median concentration dropped from 7,316 mg/kg to 2,580 mg/kg. Using the results provided above in Table 2, the average %TPH reduction for the overall landfarm was -85.6%.

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

Sample Date	Minimum	Maximum	Average	Median	Average % Difference
Oct 18, 2015	3,831	43,600	18,249	7,316	
Oct 29, 2016	1,557	3,731	2,623	2,580	-85.6

Using the difference between the average TPH concentrations of 15,626 mg/kg, and the time period of 376 days, a biodegradation rate of 45.6 mg/kg-day is obtained. Using these data, approximately 47 days of treatment remain to reach the standard of 500 mg/kg.

Based on the analytical results, bioremediation of the TPH contained in the soils in the landfarm cells at the Cowles "P" lease is occurring. Tilling of the landfarm was performed on March 10th and August 14th during 2016. Additional treatment of the landfarm cells including tilling will be conducted prior to the next sampling event in May 2017.

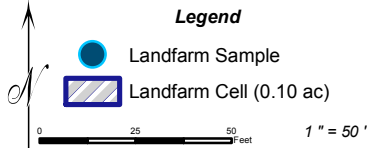
Nicholson GeoSolutions LLC

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

Cowles "P"
Landfarm
Sampling

Figure 1
November
2015

APPENDIX A
Laboratory Report

November 10, 2016

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L869690
Samples Received: 11/01/2016
Project Number:
Description: Cowles P

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.



¹Cp: Cover Page	1	¹Cp
²Tc: Table of Contents	2	²Tc
³Ss: Sample Summary	3	³Ss
⁴Cn: Case Narrative	4	⁴Cn
⁵Sr: Sample Results	5	⁵Sr
COWLES-LF-1 L869690-01	5	
COWLES-LF-2 L869690-02	6	
COWLES-LF-3 L869690-03	7	
⁶Qc: Quality Control Summary	8	⁶Qc
Wet Chemistry by Method 9045D	8	
Wet Chemistry by Method 9050AMod	9	
Volatile Organic Compounds (GC) by Method 8015/8021	10	
Semi-Volatile Organic Compounds (GC) by Method 8015	12	
⁷Gl: Glossary of Terms	13	⁷Gl
⁸Al: Accreditations & Locations	14	⁸Al
⁹Sc: Chain of Custody	15	⁹Sc

SAMPLE SUMMARY



COWLES-LF-1 L869690-01 Solid

Collected by
Dave Nicholson Collected date/time
10/29/16 11:00 Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG923491	1	11/04/16 13:03	11/08/16 03:03	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG924278	100	11/06/16 16:21	11/08/16 04:30	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG923605	1	11/04/16 14:15	11/04/16 16:02	LRL
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

1
Cp

2
Tc

3
Ss

4
Cn

COWLES-LF-2 L869690-02 Solid

Collected by
Dave Nicholson Collected date/time
10/29/16 11:05 Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG923491	1	11/04/16 13:03	11/08/16 03:06	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG924278	100	11/06/16 16:21	11/08/16 04:43	ACM
Volatile Organic Compounds (GC) by Method 8015/8021	WG923605	1	11/04/16 14:15	11/04/16 16:25	LRL
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

5
Sr

6
Qc

7
Gl

8
Al

COWLES-LF-3 L869690-03 Solid

Collected by
Dave Nicholson Collected date/time
10/29/16 11:10 Received date/time
11/01/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG923491	1	11/04/16 13:03	11/08/16 03:09	LTB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG924278	100	11/06/16 16:21	11/09/16 04:02	DMG
Volatile Organic Compounds (GC) by Method 8015/8021	WG923605	1	11/04/16 14:15	11/04/16 16:47	LRL
Wet Chemistry by Method 9045D	WG922755	1	11/08/16 07:55	11/08/16 08:44	MHM
Wet Chemistry by Method 9050AMod	WG922908	1	11/02/16 19:59	11/02/16 19:59	MZ

9
Sc



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.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L869690-01	COWLES-LF-1	9045D
L869690-02	COWLES-LF-2	9045D
L869690-03	COWLES-LF-3	9045D

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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.52		1	11/08/2016 03:03	WG923491

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.85		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869690-01 WG922755: 8.85 at 20.4c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	651 umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000777		0.000500	1	11/04/2016 16:02	WG923605
Toluene	ND		0.00500	1	11/04/2016 16:02	WG923605
Ethylbenzene	ND		0.000500	1	11/04/2016 16:02	WG923605
Total Xylene	0.00160	<u>B</u>	0.00150	1	11/04/2016 16:02	WG923605
TPH (GC/FID) Low Fraction	ND		0.100	1	11/04/2016 16:02	WG923605
(S) a,a,a-Trifluorotoluene(FID)	71.1		59.0-128		11/04/2016 16:02	WG923605
(S) a,a,a-Trifluorotoluene(PID)	66.5		54.0-144		11/04/2016 16:02	WG923605

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1020		400	100	11/08/2016 04:30	WG924278
C28-C40 Oil Range	537		400	100	11/08/2016 04:30	WG924278
(S) o-Terphenyl	107	<u>J7</u>	50.0-150		11/08/2016 04:30	WG924278

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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.87		1	11/08/2016 03:06	WG923491

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.76		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869690-02 WG922755: 8.76 at 20.3c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	602 umhos/cm		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND	J6	0.000500 mg/kg	1	11/04/2016 16:25	WG923605
Toluene	ND	J6	0.00500	1	11/04/2016 16:25	WG923605
Ethylbenzene	ND	J6	0.000500	1	11/04/2016 16:25	WG923605
Total Xylene	0.00246	B J3 J6	0.00150	1	11/04/2016 16:25	WG923605
TPH (GC/FID) Low Fraction	ND	J6	0.100	1	11/04/2016 16:25	WG923605
(S) a,a,a-Trifluorotoluene(FID)	70.7		59.0-128		11/04/2016 16:25	WG923605
(S) a,a,a-Trifluorotoluene(PID)	66.4		54.0-144		11/04/2016 16:25	WG923605

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2790		400 mg/kg	100	11/08/2016 04:43	WG924278
C28-C40 Oil Range	941		400	100	11/08/2016 04:43	WG924278
(S) o-Terphenyl	266	J7	50.0-150		11/08/2016 04:43	WG924278

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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.39		1	11/08/2016 03:09	WG923491

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

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.79		1	11/08/2016 08:44	WG922755

Sample Narrative:

9045D L869690-03 WG922755: 8.79 at 20.2c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	783		1	11/02/2016 19:59	WG922908

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	11/04/2016 16:47	WG923605
Toluene	ND		0.00500	1	11/04/2016 16:47	WG923605
Ethylbenzene	ND		0.000500	1	11/04/2016 16:47	WG923605
Total Xylene	0.00363	<u>B</u>	0.00150	1	11/04/2016 16:47	WG923605
TPH (GC/FID) Low Fraction	0.169		0.100	1	11/04/2016 16:47	WG923605
(S) a,a,a-Trifluorotoluene(FID)	67.2		59.0-128		11/04/2016 16:47	WG923605
(S) a,a,a-Trifluorotoluene(PID)	62.8		54.0-144		11/04/2016 16:47	WG923605

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1690		400	100	11/09/2016 04:02	WG924278
C28-C40 Oil Range	890		400	100	11/09/2016 04:02	WG924278
(S) o-Terphenyl	0.000	<u>J7</u>	50.0-150		11/09/2016 04:02	WG924278



L869670-07 Original Sample (OS) • Duplicate (DUP)

(OS) L869670-07 11/08/16 08:44 • (DUP) WG922755-3 11/08/16 08:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.15	7.12	1	0.420		1

L869696-06 Original Sample (OS) • Duplicate (DUP)

(OS) L869696-06 11/08/16 08:44 • (DUP) WG922755-4 11/08/16 08:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.80	8.81	1	0.114		1

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

(LCS) WG922755-1 11/08/16 08:44 • (LCSD) WG922755-2 11/08/16 08:44

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	6.12	6.12	100	100	98.4-102			0.000	1

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) WG922908-1 11/02/16 19:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Specific Conductance	umhos/cm		umhos/cm	umhos/cm
	1.03			

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L869687-03 Original Sample (OS) • Duplicate (DUP)

(OS) L869687-03 11/02/16 19:59 • (DUP) WG922908-4 11/02/16 19:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	umhos/cm	umhos/cm		%		%
	706	706	1	0.000		20

L869696-10 Original Sample (OS) • Duplicate (DUP)

(OS) L869696-10 11/02/16 19:59 • (DUP) WG922908-5 11/02/16 19:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Specific Conductance	umhos/cm	umhos/cm		%		%
	868	868	1	0.000		20

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

(LCS) WG922908-2 11/02/16 19:59 • (LCSD) WG922908-3 11/02/16 19:59

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Specific Conductance	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
	542	548	548	101	101	90.0-110			0.000	20



Method Blank (MB)

(MB) R3176099-5 11/04/16 14:15

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000151	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)	98.7			59.0-128
(S) a,a,a-Trifluorotoluene(PID)	91.6			54.0-144

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

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

(LCS) R3176099-1 11/04/16 11:58 • (LCSD) R3176099-2 11/04/16 12:47

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	%	%	%			%	%
Benzene	0.0500	0.0543	0.0522	109	104	70.0-130			4.11	20
Toluene	0.0500	0.0535	0.0510	107	102	70.0-130			4.69	20
Ethylbenzene	0.0500	0.0547	0.0523	109	105	70.0-130			4.51	20
Total Xylene	0.150	0.166	0.160	110	106	70.0-130			3.72	20
(S) a,a,a-Trifluorotoluene(FID)				96.8	97.8	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				100	101	54.0-144				

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3176099-3 11/04/16 13:09 • (LCSD) R3176099-4 11/04/16 13:31

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	%	%	%			%	%
TPH (GC/FID) Low Fraction	5.50	5.25	5.85	95.4	106	63.5-137			10.9	20
(S) a,a,a-Trifluorotoluene(FID)				98.8	99.5	59.0-128				
(S) a,a,a-Trifluorotoluene(PID)				108	109	54.0-144				

L869690-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869690-02 11/04/16 16:25 • (MS) R3176099-6 11/04/16 20:29 • (MSD) R3176099-7 11/04/16 20:51

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	%	%		%			%	%
Benzene	0.0500	ND	0.0223	0.0265	43.8	52.1	1	49.7-127	J6		17.0	23.5
Toluene	0.0500	ND	0.0154	0.0178	29.8	34.7	1	49.8-132	J6	J6	14.7	23.5
Ethylbenzene	0.0500	ND	0.0103	0.0119	20.6	23.8	1	40.8-141	J6	J6	14.4	23.8
Total Xylene	0.150	0.00246	0.0338	0.0420	20.9	26.3	1	41.2-140	J6	J3 J6	21.5	23.7
(S) a,a,a-Trifluorotoluene(FID)					67.2	69.6		59.0-128				



L869690-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869690-02 11/04/16 16:25 • (MS) R3176099-6 11/04/16 20:29 • (MSD) R3176099-7 11/04/16 20:51

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) a,a,a-Trifluorotoluene(PID)					65.8	67.2		54.0-144				

L869690-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L869690-02 11/04/16 16:25 • (MS) R3176099-8 11/04/16 21:13 • (MSD) R3176099-9 11/04/16 21:36

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	1.34	1.21	23.8	21.4	1	28.5-138	J6	J6	10.1	23.6
(S) a,a,a-Trifluorotoluene(FID)					74.5	81.7		59.0-128				
(S) a,a,a-Trifluorotoluene(PID)					74.3	79.0		54.0-144				

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



Method Blank (MB)

(MB) R3176441-1 11/07/16 19:24

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
<i>(S) o-Terphenyl</i>	85.5			50.0-150

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

(LCS) R3176441-2 11/07/16 19:37 • (LCSD) R3176441-3 11/07/16 19:50

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	51.9	45.1	86.6	75.2	50.0-150			14.0	20
<i>(S) o-Terphenyl</i>				139	127	50.0-150				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



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		

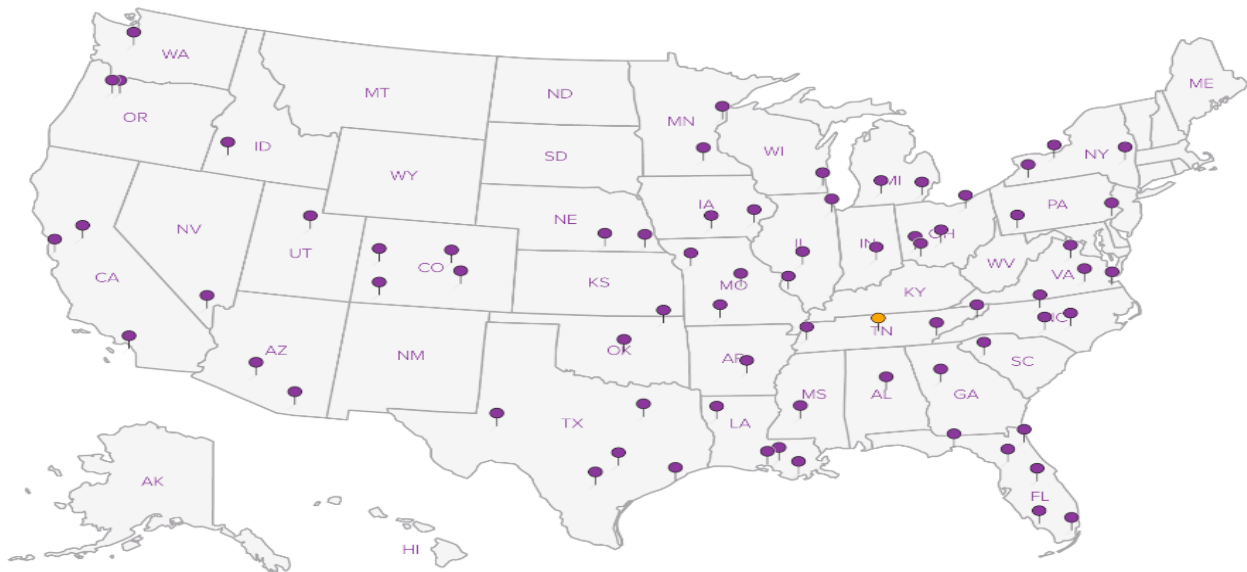
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	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
 410 17th St. Suite 1600
 Denver, CO 80202

Report to:
Dave Nicholson

Email To:
dknicholson@q.com

Project Description:
Cowles P

City/State Collected:

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

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):
DK Nicholson

Rush? (Lab MUST Be Notified)
 ___ Same Day200%
 ___ Next Day100%
 ___ Two Day50%
 ___ Three Day25%

Date Results Needed
 Email? ___ No Yes
 FAX? No ___ Yes

Immediately Packed on Ice N

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative			
							TVPH/BTEX - 4oz Soil Jar	TEPH - 4oz Soil Jar (diesel + motor oil)	SAR - 4oz Soil Jar	pH/SPCON - 4oz Soil Jar
Cowles-LF-1	Grab	SS		10/29	1100	4	X	X	X	X
Cowles-LF-2	Grab	SS		↓	1105	4	X	X	X	X
Cowles-LF-3	Grab	SS		↓	1110	4	X	X	X	X
	Grab	SS				4				
	Grab	SS				4				
	Grab	SS				4				
	Grab	SS				4				
	Grab	SS				4				
	Grab	SS				4				
	Grab	SS				4				

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# **1869690**
G038

Acctnum: **NICGEOCCO**

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant	Sample # (lab only)
	01
	02
	03

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

pH _____ Temp _____
 Flow _____ Other _____

Remarks:

Relinquished by: (Signature)
DK Nicholson

Relinquished by: (Signature)

Relinquished by: (Signature)

Date: **10/31/16** Time: **1200**

Date: Time:

Date: Time:

Received by: (Signature)
Fedex

Received by: (Signature)

Received for lab by: (Signature)
Windy

Samples returned via: UPS
 FedEx Courier _____

Temp: **2.6** °C Bottles Received: **12=403**

Date: **11-16** Time: **9:00**

Hold #

Condition: (lab use only)
or SWP

COC Seal Intact: ___ Y ___ N NA

pH Checked: NCF:



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

YOUR LAB OF CHOICE

Cooler Receipt Form

Client: *MILLER HRMR5000* SDG# *1869690*

Cooler Received/Opened On: *11/1* /16 Temperature Upon Receipt: *26* °c

Received By: **Rickey Mosley**

Signature: *Rickey Mosley*

Receipt Check List			
	Yes	No	N/A
Were custody seals on outside of cooler and intact?			✓
Were custody papers properly filled out?	✓		
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 all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)			✓
If applicable, was an observable VOA headspace present?			✓
Non Conformance Generated. (If yes see attached NCF)			