Nicholson GeoSolutions LLC
3433 East Lake Drive
Centennial, CO 80121

November 23, 2015

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 18th, 2015. These samples provide the baseline concentrations for further progress sampling which will be conducted in May, 2016. The May 2016 progress samples will be collected from the same locations and used to establish the rate of biodegradation.

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. 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.

Table 1 provides a summary of the analytical results for the samples. The laboratory report is contained in Appendix A. The combined TPH exceeded the standard of 500 mg/kg for all three samples and ranged from 3,830.8 mg/kg to 43,600 mg/kg.

Based on these results, continued treatment of this landfarm is required.

Nicholson GeoSolutions LLC

David K. Nicholson, P.G.
Principal Geologist

Table 1 Cowles No. 1 Landfarm Sample Results – October 18, 2015

	Table 910-1 Standards	Cowles LF-1	Cowles LF-2	Cowles LF-3
TVPH – gasoline range	500[1]	**26.0**	**30.8 J**	**<0.5**
TEPH – diesel/motor oil range	500[1]	**7,290**	**3,800**	**43,600**
benzene	0.17	<0.0025 UJ	0.016 J	<0.0025 UJ
toluene	85	0.0368 J	0.0852 J	<0.025 UJ
ethylbenzene	100	0.0591 J	0.139 J	<0.0025 UJ
xylenes	175	0.323 J	0.848 J	<0.0075 UJ

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


2 COWLES
1 COWLES
3 COWLES
0.10 ac.
3
2
1
Legend
Landfarm Sample
Landfarm Cell (0.10 ac)
0
25
50
Feet
1 " = 50 '
GeoSolutions
NICHOLSON
HRM Resources, LLC
Cowles "P" Landfarm Sampling
Figure 1
November 2015

APPENDIX A
Laboratory Report

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th Street, Suite 1100
Denver, CO 80202

Report Summary

Tuesday October 27, 2015

Report Number: L795511
Samples Received: 10/20/15
Client Project:

Description: HRM Landfarm Sampling

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01,1461-02, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th Street, Suite 1100
Denver, CO 80202

October 27, 2015

ESC Sample # : L795511-01

Date Received : October 20, 2015
Description : HRM Landfarm Sampling

Site ID :

Sample ID : COWLES-LF-1

Project # :

Collected By : DK Nicholson
Collection Date : 10/18/15 11:05

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	10/25/15	5
Toluene	0.0368	0.0250	mg/kg	8021	10/25/15	5
Ethylbenzene	0.0591	0.00250	mg/kg	8021	10/25/15	5
Total Xylene	0.323	0.00750	mg/kg	8021	10/25/15	5
TPH (GC/FID) Low Fraction	26.0	0.500	mg/kg	8015	10/25/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.3		% Rec.	8015	10/25/15	1
a,a,a-Trifluorotoluene(PID)	96.8		% Rec.	8021	10/25/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	5030	200.	mg/kg	8015	10/27/15	50
C28-C40 Oil Range	2260	200.	mg/kg	8015	10/27/15	50
Surrogate Recovery						
o-Terphenyl	66.1		% Rec.	8015	10/27/15	50

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/27/15 17:04 Printed: 10/27/15 17:04

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REPORT OF ANALYSIS

Dave Nicholson
HRM Resources, LLC - Denver, CO
410 17th Street, Suite 1100
Denver, CO 80202

October 27, 2015

ESC Sample # : L795511-02

Date Received : October 20, 2015
Description : HRM Landfarm Sampling

Site ID :

Sample ID : COWLES-LF-2

Project # :

Collected By : DK Nicholson
Collection Date : 10/18/15 11:10

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.0160	0.00250	mg/kg	8021	10/25/15	5
Toluene	0.0852	0.0250	mg/kg	8021	10/25/15	5
Ethylbenzene	0.139	0.00250	mg/kg	8021	10/25/15	5
Total Xylene	0.848	0.00750	mg/kg	8021	10/25/15	5
TPH (GC/FID) Low Fraction	30.8	2.50	mg/kg	8015	10/27/15	25
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.8		% Rec.	8015	10/27/15	1
a,a,a-Trifluorotoluene(PID)	81.7		% Rec.	8021	10/25/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	2720	40.0	mg/kg	8015	10/26/15	10
C28-C40 Oil Range	1080	40.0	mg/kg	8015	10/26/15	10
Surrogate Recovery						
o-Terphenyl	123.		% Rec.	8015	10/26/15	10

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

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HRM Resources, LLC - Denver, CO
410 17th Street, Suite 1100
Denver, CO 80202

October 27, 2015

ESC Sample # : L795511-03

Date Received : October 20, 2015
Description : HRM Landfarm Sampling

Site ID :

Sample ID : COWLES-LF-3

Project # :

Collected By : DK Nicholson
Collection Date : 10/18/15 11:15

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00250	mg/kg	8021	10/25/15	5
Toluene	BDL	0.0250	mg/kg	8021	10/25/15	5
Ethylbenzene	BDL	0.00250	mg/kg	8021	10/25/15	5
Total Xylene	BDL	0.00750	mg/kg	8021	10/25/15	5
TPH (GC/FID) Low Fraction	BDL	0.500	mg/kg	8015	10/25/15	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.8		% Rec.	8015	10/25/15	1
a,a,a-Trifluorotoluene(PID)	97.7		% Rec.	8021	10/25/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	33200	400.	mg/kg	8015	10/27/15	100
C28-C40 Oil Range	10400	200.	mg/kg	8015	10/27/15	50
Surrogate Recovery						
o-Terphenyl	0.00		% Rec.	8015	10/27/15	50

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/27/15 17:04 Printed: 10/27/15 17:04

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L795511-03	WG823613	SAMP	Benzene	R3088204	J6J3
	WG823613	SAMP	Toluene	R3088204	J6J3
	WG823613	SAMP	Ethylbenzene	R3088204	J6J3
	WG823613	SAMP	Total Xylene	R3088204	J3J6
	WG823613	SAMP	TPH (GC/FID) Low Fraction	R3088204	J6J3
	WG824319	SAMP	o-Terphenyl	R3088118	J7

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
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.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

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Quality Assurance Report
Level II

L795511

October 27, 2015

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/kg			WG823613	10/25/15 13:30
Ethylbenzene	< .0005	mg/kg			WG823613	10/25/15 13:30
Toluene	< .005	mg/kg			WG823613	10/25/15 13:30
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG823613	10/25/15 13:30
Total Xylene	< .0015	mg/kg			WG823613	10/25/15 13:30
a,a,a-Trifluorotoluene(FID)		% Rec.	97.80	59-128	WG823613	10/25/15 13:30
a,a,a-Trifluorotoluene(PID)		% Rec.	100.0	54-144	WG823613	10/25/15 13:30
C10-C28 Diesel Range	< 4	mg/kg			WG824319	10/26/15 18:40
C28-C40 Oil Range	< 4	mg/kg			WG824319	10/26/15 18:40
o-Terphenyl		% Rec.	89.40	50-150	WG824319	10/26/15 18:40
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG824664	10/27/15 07:30
a,a,a-Trifluorotoluene(FID)		% Rec.	98.50	59-128	WG824664	10/27/15 07:30
a,a,a-Trifluorotoluene(PID)		% Rec.	100.0	54-144	WG824664	10/27/15 07:30

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/kg	.05	0.0444	88.8	70-130	WG823613
Ethylbenzene	mg/kg	.05	0.0479	95.8	70-130	WG823613
Toluene	mg/kg	.05	0.0473	94.6	70-130	WG823613
Total Xylene	mg/kg	.15	0.150	99.9	70-130	WG823613
a,a,a-Trifluorotoluene(FID)				97.90	59-128	WG823613
a,a,a-Trifluorotoluene(PID)				102.0	54-144	WG823613
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.29	114.	63.5-137	WG823613
a,a,a-Trifluorotoluene(FID)				102.0	59-128	WG823613
a,a,a-Trifluorotoluene(PID)				105.0	54-144	WG823613
C10-C28 Diesel Range	mg/kg	60	43.0	71.6	50-100	WG824319
o-Terphenyl				89.70	50-150	WG824319
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.05	110.	63.5-137	WG824664
a,a,a-Trifluorotoluene(FID)				99.00	59-128	WG824664
a,a,a-Trifluorotoluene(PID)				104.0	54-144	WG824664

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/kg	0.0455	0.0444	91.0	70-130	2.53	20	WG823613
Ethylbenzene	mg/kg	0.0489	0.0479	98.0	70-130	2.15	20	WG823613
Toluene	mg/kg	0.0484	0.0473	97.0	70-130	2.24	20	WG823613
Total Xylene	mg/kg	0.153	0.150	102.	70-130	1.74	20	WG823613
a,a,a-Trifluorotoluene(FID)				97.80	59-128			WG823613
a,a,a-Trifluorotoluene(PID)				101.0	54-144			WG823613
TPH (GC/FID) Low Fraction	mg/kg	6.48	6.29	118.	63.5-137	2.95	20	WG823613
a,a,a-Trifluorotoluene(FID)				101.0	59-128			WG823613
a,a,a-Trifluorotoluene(PID)				104.0	54-144			WG823613
C10-C28 Diesel Range	mg/kg	46.9	43.0	78.0	50-100	8.61	20	WG824319
o-Terphenyl				88.00	50-150			WG824319
TPH (GC/FID) Low Fraction	mg/kg	6.07	6.05	110.	63.5-137	0.260	20	WG824664

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L795511

October 27, 2015

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
a,a,a-Trifluorotoluene(FID)				100.0		59-128		
a,a,a-Trifluorotoluene(PID)				104.0		54-144		

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/kg	0.121	0.00102	.05	48.1*	49.7-127	L795511-03	WG823613
Ethylbenzene	mg/kg	0.0532	0.00	.05	21.3*	40.8-141	L795511-03	WG823613
Toluene	mg/kg	0.0871	0.000336	.05	34.7*	49.8-132	L795511-03	WG823613
Total Xylene	mg/kg	0.164	0.00224	.15	21.5*	41.2-140	L795511-03	WG823613
a,a,a-Trifluorotoluene(FID)					94.00	59-128		WG823613
a,a,a-Trifluorotoluene(PID)					97.10	54-144		WG823613
TPH (GC/FID) Low Fraction	mg/kg	4.09	0.00	5.5	14.9*	28.5-138	L795511-03	WG823613
a,a,a-Trifluorotoluene(FID)					94.80	59-128		WG823613
a,a,a-Trifluorotoluene(PID)					99.20	54-144		WG823613
TPH (GC/FID) Low Fraction	mg/kg	14.8	1.65	5.5	47.8	28.5-138	L795464-01	WG824664
a,a,a-Trifluorotoluene(FID)					90.10	59-128		WG824664
a,a,a-Trifluorotoluene(PID)					97.30	54-144		WG824664

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/kg	0.0880	0.121	34.8*	49.7-127	31.9*	23.5	L795511-03	WG823613
Ethylbenzene	mg/kg	0.0303	0.0532	12.1*	40.8-141	55.0*	23.8	L795511-03	WG823613
Toluene	mg/kg	0.0527	0.0871	21.0*	49.8-132	49.1*	23.5	L795511-03	WG823613
Total Xylene	mg/kg	0.0798	0.164	10.3*	41.2-140	68.9*	23.7	L795511-03	WG823613
a,a,a-Trifluorotoluene(FID)				94.40	59-128				WG823613
a,a,a-Trifluorotoluene(PID)				98.20	54-144				WG823613
TPH (GC/FID) Low Fraction	mg/kg	5.63	4.09	20.4*	28.5-138	31.7*	23.6	L795511-03	WG823613
a,a,a-Trifluorotoluene(FID)				95.30	59-128				WG823613
a,a,a-Trifluorotoluene(PID)				101.0	54-144				WG823613
TPH (GC/FID) Low Fraction	mg/kg	17.4	14.8	57.2	28.5-138	16.1	23.6	L795464-01	WG824664
a,a,a-Trifluorotoluene(FID)				85.50	59-128				WG824664
a,a,a-Trifluorotoluene(PID)				90.60	54-144				WG824664

Batch number /Run number / Sample number cross reference

WG824319: R3088118: L795511-01 02 03
WG823613: R3088204: L795511-01 02 03
WG824664: R3088255: L795511-02

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L795511

October 27, 2015

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.