



Nicholson GeoSolutions LLC

3433 East Lake Drive
Centennial, CO 80121

June 21, 2018

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

**Subject: Lipplemann “P” Landfarm Removal and Footprint Sampling Results
COGCC Remediation #9058**

Dear Terry:

Nicholson GeoSolutions LLC was retained by HRM Resources II LLC (HRM) to conduct soil sampling of the landfarm footprint on the Lipplemann “P” lease, Washington County, Colorado. The landfarm material was removed and sent to the Denver Arapahoe Disposal (DADS) Landfill in Aurora, Colorado during May and early June 2018 by Jayhawk Grading, Inc. A total of 1,581 yards of impacted material was sent to the landfill. Appendix A provides the landfill gatehouse summary.

Sampling of the landfarm footprint was initially conducted at four locations on May 22nd, 2018. The locations of the footprint samples are shown on Figure 1. All footprint 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.

Table 1 provides a summary of the analytical results for the samples. The laboratory report is contained in Appendix B. TPH exceeded the standard of 500 mg/kg for samples Lipplemann-1, Lipplemann-2, and Lipplemann-3.

In response to the initial round of sampling, additional soil was excavated from the portions of the landfarm that failed and three additional footprint samples were collected on June 8th, 2018 and June 13th, 2018. Tables 2 and 3 provide the results for the additional footprint samples. All results were below the COGCC standards and no further action is required at this site.

Nicholson GeoSolutions LLC



David K. Nicholson, P.G.
Principal Geologist

Table 1 Lipplemann "P" Landfarm Footprint Sample Results – May 22, 2018

	Table 910-1 Standards	Lipplemann-1	Lipplemann-2	Lipplemann-3	Lipplemann-4
TVPH – gasoline range	500 ¹	0.229	<0.1	1.91	<0.1
TEPH – diesel and motor oil range		3,870	964	3,280	131.3
benzene	0.17	0.000989	0.000547	0.0033	0.000638
toluene	85	<0.005	<0.005	<0.005	<0.005
ethylbenzene	100	<0.0005	<0.0005	<0.0005	<0.0005
xylenes	175	0.0044	<0.0015	0.0246	<0.0015
pH	6-9 units	8.84	8.68	9.09	8.66
Specific Conductivity	<4 mmhos/cm	0.532	0.401	0.474	0.37
SAR	<12	9.71	9.06	11.9	3.30

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

Table 2 Lipplemann "P" Additional Footprint Sample Results – June 8, 2018

	Table 910-1 Standards	Lipplemann-2	Lipplemann-3
TVPH – gasoline range	500 ¹	<0.1	<0.1
TEPH – diesel and motor oil range		17.32	<80.0
benzene	0.17	<0.0005	<0.0005
toluene	85	<0.005	<0.005
ethylbenzene	100	<0.0005	<0.0005
xylenes	175	<0.0015	<0.0015
pH	6-9 units	7.93	8.26
Specific Conductivity	<4 mmhos/cm	0.987	0.223
SAR	<12	4.0	4.98

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

Table 3 Lipplemann "P" Additional Footprint Sample Results – June 13, 2018

	Table 910-1 Standards	Lipplemann-1
TVPH – gasoline range	500 ¹	<0.1
TEPH – diesel and motor oil range		23.1
benzene	0.17	0.00147
toluene	85	<0.005
ethylbenzene	100	0.000733
xylenes	175	0.00169
pH	6-9 units	7.48
Specific Conductivity	<4 mmhos/cm	0.673
SAR	<12	3.14

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



APPENDIX A
Landfill Gatehouse Summaries

App A_Lipplemann
HRM Resources II LLC

Ticket Date	Ticket ID	Cust Code	MAS Unique ID	Manifest	Profile	Truck	Material	Material Description	Origin	Rate Unit	Rate Qty	Yards
5/16/2018	3119922	0015549	150419453005	469005	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119923	0015549	150419453005	469007	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119926	0015549	150419453005	469008	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119927	0015549	150419453005	469009	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119931	0015549	150419453005	469010	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119933	0015549	150419453005	469006	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119947	0015549	150419453005	469012	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3119950	0015549	150419453005	469011	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120062	0015549	150419453005	469015	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120064	0015549	150419453005	469013	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120068	0015549	150419453005	469014	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120246	0015549	150419453005	469016	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120328	0015549	150419453005	469021	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120329	0015549	150419453005	469018	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120331	0015549	150419453005	469020	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120335	0015549	150419453005	469017	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120336	0015549	150419453005	469019	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3120441	0015549	150419453005	469024	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121391	0015549	150419453005	469046	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121392	0015549	150419453005	469047	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121394	0015549	150419453005	469049	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121396	0015549	150419453005	469048	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121528	0015549	150419453005	469061	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121529	0015549	150419453005	469060	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121532	0015549	150419453005	469057	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121533	0015549	150419453005	469058	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121539	0015549	150419453005	469033	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121541	0015549	150419453005	469034	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121542	0015549	150419453005	469035	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121543	0015549	150419453005	469031	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121545	0015549	150419453005	469029	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121546	0015549	150419453005	469030	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121549	0015549	150419453005	469028	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121551	0015549	150419453005	469032	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121558	0015549	150419453005	469045	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121560	0015549	150419453005	469044	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121562	0015549	150419453005	469041	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17

App A_Lipplemann
HRM Resources II LLC

5/17/2018	3121564	0015549	150419453005	469040	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121565	0015549	150419453005	469036	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121568	0015549	150419453005	469043	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121569	0015549	150419453005	409039	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121573	0015549	150419453005	469042	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121575	0015549	150419453005	469038	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121577	0015549	150419453005	469037	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3121582	0015549	150419453005	469027	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3121584	0015549	150419453005	469022	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3121585	0015549	150419453005	469026	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/16/2018	3121586	0015549	150419453005	469025	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121655	0015549	150419453005	469050	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121657	0015549	150419453005	469051	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121658	0015549	150419453005	469052	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121659	0015549	150419453005	469053	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121661	0015549	150419453005	469054	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121662	0015549	150419453005	469055	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121665	0015549	150419453005	469059	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121666	0015549	150419453005	469062	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3121667	0015549	150419453005	469063	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/17/2018	3122138	0015549	150419453005	469056	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17
5/18/2018	3122338	0015549	150419453005	469023	120980CO	1	ContSoilPet-Cubic Yards	Cont. Soil - Petroleum	LIPPLEMANN P	CYD	17	17

Criteria: 05/20/2018 12:00 AM to 06/16/2018 11:59 PM
Business Unit Name: S04012 - Denver Arapahoe Disposal (USA)
User: SLA
Date: Jun 21 2018, 12:15:06 PM
Operation Type: All
Customer Name: HRMRESOURCESIILLC(HRM RESOURCES II LLC)
Ticket Type: All
Customer Type: All
PMT Category: All

Ticket Date	Ticket ID	Cust Code	MAS Uniq	Customer	Generator	Manifest	Profile	Truck	Material	Mat. Desc.	Origin	Rt. Qty	Yards
6/6/2018	3137003	15549	419453005	HRM RESOL	125-HRMR	448490	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137008	15549	419453005	HRM RESOL	125-HRMR	448541	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137012	15549	419453005	HRM RESOL	125-HRMR	448543	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137019	15549	419453005	HRM RESOL	125-HRMR	448542	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137022	15549	419453005	HRM RESOL	125-HRMR	446458	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137028	15549	419453005	HRM RESOL	125-HRMR	448523	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137032	15549	419453005	HRM RESOL	125-HRMR	448522	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137034	15549	419453005	HRM RESOL	125-HRMR	448524	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137076	15549	419453005	HRM RESOL	125-HRMR	446408	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137078	15549	419453005	HRM RESOL	125-HRMR	446409	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137081	15549	419453005	HRM RESOL	125-HRMR	446410	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137222	15549	419453005	HRM RESOL	125-HRMR	446424	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137228	15549	419453005	HRM RESOL	125-HRMR	446425	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137233	15549	419453005	HRM RESOL	125-HRMR	446426	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137236	15549	419453005	HRM RESOL	125-HRMR	446427	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137249	15549	419453005	HRM RESOL	125-HRMR	446423	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137250	15549	419453005	HRM RESOL	125-HRMR	446423	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137310	15549	419453005	HRM RESOL	125-HRMR	446428	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137313	15549	419453005	HRM RESOL	125-HRMR	446429	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137315	15549	419453005	HRM RESOL	125-HRMR	446430	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137357	15549	419453005	HRM RESOL	125-HRMR	446411	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137414	15549	419453005	HRM RESOL	125-HRMR	448544	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137418	15549	419453005	HRM RESOL	125-HRMR	446412	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137453	15549	419453005	HRM RESOL	125-HRMR	446434	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137455	15549	419453005	HRM RESOL	125-HRMR	446431	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137456	15549	419453005	HRM RESOL	125-HRMR	446435	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137457	15549	419453005	HRM RESOL	125-HRMR	446432	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/6/2018	3137500	15549	419453005	HRM RESOL	125-HRMR	446433	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3137823	15549	419453005	HRM RESOL	125-HRMR	4478560	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3137825	15549	419453005	HRM RESOL	125-HRMR	448561	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3137831	15549	419453005	HRM RESOL	125-HRMR	448558	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3137832	15549	419453005	HRM RESOL	125-HRMR	448559	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3137836	15549	419453005	HRM RESOL	125-HRMR	448562	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
6/7/2018	3138020	15549	419453005	HRM RESOL	125-HRMR	442445	120980CO	1	ContSoilPei	Cont. Soil	LIPPLEMANN	17	17.0
													578.0

APPENDIX B

Laboratory Reports

May 29, 2018

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L996490
Samples Received: 05/24/2018
Project Number:
Description: HRM Landfarm Sampling

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	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
LIPPLEMANN-1 L996490-01	5	
LIPPLEMANN-2 L996490-02	6	⁴ Cn
LIPPLEMANN-3 L996490-03	7	⁵ Sr
LIPPLEMANN-4 L996490-04	8	
Qc: Quality Control Summary	9	⁶ Qc
Wet Chemistry by Method 9045D	9	
Wet Chemistry by Method 9050AMod	10	⁷ Gl
Volatile Organic Compounds (GC) by Method 8015/8021	11	⁸ Al
Semi-Volatile Organic Compounds (GC) by Method 8015	13	
Gl: Glossary of Terms	14	⁹ Sc
Al: Accreditations & Locations	15	
Sc: Sample Chain of Custody	16	

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



LIPPLEMANN-1 L996490-01 Solid

Collected by
D. Nicholson

Collected date/time
05/22/18 12:05

Received date/time
05/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1115784	1	05/25/18 10:09	05/27/18 12:11	ST
Wet Chemistry by Method 9045D	WG1115800	1	05/24/18 16:05	05/24/18 17:00	MLW
Wet Chemistry by Method 9050AMod	WG1115793	1	05/24/18 15:37	05/24/18 16:16	MA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1115968	1	05/24/18 15:34	05/25/18 01:43	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1115978	50	05/25/18 16:18	05/26/18 00:43	DMW

¹ Cp

² Tc

³ Ss

⁴ Cn

LIPPLEMANN-2 L996490-02 Solid

Collected by
D. Nicholson

Collected date/time
05/22/18 12:10

Received date/time
05/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1115784	1	05/25/18 10:09	05/27/18 12:14	ST
Wet Chemistry by Method 9045D	WG1115800	1	05/24/18 16:05	05/24/18 17:00	MLW
Wet Chemistry by Method 9050AMod	WG1115793	1	05/24/18 15:37	05/24/18 16:16	MA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1115968	1	05/24/18 15:34	05/25/18 02:06	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1115978	50	05/25/18 16:18	05/26/18 00:56	DMW

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

LIPPLEMANN-3 L996490-03 Solid

Collected by
D. Nicholson

Collected date/time
05/22/18 12:15

Received date/time
05/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1115784	1	05/25/18 10:09	05/27/18 12:17	ST
Wet Chemistry by Method 9045D	WG1115800	1	05/24/18 16:05	05/24/18 17:00	MLW
Wet Chemistry by Method 9050AMod	WG1115793	1	05/24/18 15:37	05/24/18 16:16	MA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1115968	1	05/24/18 15:34	05/25/18 02:28	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1115978	50	05/25/18 16:20	05/26/18 01:09	DMW

⁹ Sc

LIPPLEMANN-4 L996490-04 Solid

Collected by
D. Nicholson

Collected date/time
05/22/18 12:20

Received date/time
05/24/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1115784	1	05/25/18 10:09	05/27/18 12:21	ST
Wet Chemistry by Method 9045D	WG1115800	1	05/24/18 16:05	05/24/18 17:00	MLW
Wet Chemistry by Method 9050AMod	WG1115793	1	05/24/18 15:37	05/24/18 16:16	MA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1115968	1	05/24/18 15:34	05/25/18 03:35	DWR
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1115978	10	05/25/18 16:18	05/25/18 23:27	DMW

ACCOUNT:

HRM Resources, LLC - Denver, CO

PROJECT:

SDG:

L996490

DATE/TIME:

05/29/18 13:03

PAGE:

3 of 17



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	9.71		1	05/27/2018 12:11	WG1115784

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.84	T8	1	05/24/2018 17:00	WG1115800

Sample Narrative:

L996490-01 WG1115800: 8.84 at 23.1C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	532		10.0	1	05/24/2018 16:16	WG1115793

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000989		0.000500	1	05/25/2018 01:43	WG1115968
Toluene	ND		0.00500	1	05/25/2018 01:43	WG1115968
Ethylbenzene	ND		0.000500	1	05/25/2018 01:43	WG1115968
Total Xylene	0.00440		0.00150	1	05/25/2018 01:43	WG1115968
TPH (GC/FID) Low Fraction	0.229		0.100	1	05/25/2018 01:43	WG1115968
(S) a,a,a-Trifluorotoluene(FID)	90.2		77.0-120		05/25/2018 01:43	WG1115968
(S) a,a,a-Trifluorotoluene(PID)	91.4		75.0-128		05/25/2018 01:43	WG1115968

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	2070		200	50	05/26/2018 00:43	WG1115978
C28-C40 Oil Range	1800		200	50	05/26/2018 00:43	WG1115978
(S) o-Terphenyl	0.000	J7	18.0-148		05/26/2018 00:43	WG1115978

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	9.06		1	05/27/2018 12:14	WG1115784

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.68	T8	1	05/24/2018 17:00	WG1115800

Sample Narrative:

L996490-02 WG1115800: 8.68 at 23.1C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	401		10.0	1	05/24/2018 16:16	WG1115793

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000547		0.000500	1	05/25/2018 02:06	WG1115968
Toluene	ND		0.00500	1	05/25/2018 02:06	WG1115968
Ethylbenzene	ND		0.000500	1	05/25/2018 02:06	WG1115968
Total Xylene	ND		0.00150	1	05/25/2018 02:06	WG1115968
TPH (GC/FID) Low Fraction	ND		0.100	1	05/25/2018 02:06	WG1115968
(S) a,a,a-Trifluorotoluene(FID)	91.4		77.0-120		05/25/2018 02:06	WG1115968
(S) a,a,a-Trifluorotoluene(PID)	92.7		75.0-128		05/25/2018 02:06	WG1115968

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	347		200	50	05/26/2018 00:56	WG1115978
C28-C40 Oil Range	617		200	50	05/26/2018 00:56	WG1115978
(S) o-Terphenyl	0.000	J7	18.0-148		05/26/2018 00:56	WG1115978

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	11.9		1	05/27/2018 12:17	WG1115784

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.09	T8	1	05/24/2018 17:00	WG1115800

Sample Narrative:

L996490-03 WG1115800: 9.09 at 23C

Wet Chemistry by Method 9050AMod

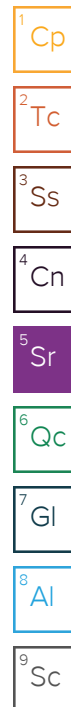
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	474		10.0	1	05/24/2018 16:16	WG1115793

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.00330		0.000500	1	05/25/2018 02:28	WG1115968
Toluene	ND		0.00500	1	05/25/2018 02:28	WG1115968
Ethylbenzene	ND		0.000500	1	05/25/2018 02:28	WG1115968
Total Xylene	0.0246		0.00150	1	05/25/2018 02:28	WG1115968
TPH (GC/FID) Low Fraction	1.91		0.100	1	05/25/2018 02:28	WG1115968
(S) a,a,a-Trifluorotoluene(FID)	81.0		77.0-120		05/25/2018 02:28	WG1115968
(S) a,a,a-Trifluorotoluene(PID)	93.7		75.0-128		05/25/2018 02:28	WG1115968

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1800		200	50	05/26/2018 01:09	WG1115978
C28-C40 Oil Range	1480		200	50	05/26/2018 01:09	WG1115978
(S) o-Terphenyl	0.000	J7	18.0-148		05/26/2018 01:09	WG1115978





Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.30		1	05/27/2018 12:21	WG1115784

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.66	T8	1	05/24/2018 17:00	WG1115800

Sample Narrative:

L996490-04 WG1115800: 8.66 at 23C

Wet Chemistry by Method 9050AMod

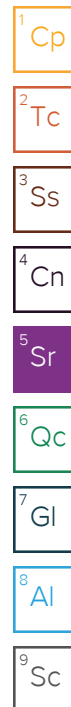
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	370		10.0	1	05/24/2018 16:16	WG1115793

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000638		0.000500	1	05/25/2018 03:35	WG1115968
Toluene	ND		0.00500	1	05/25/2018 03:35	WG1115968
Ethylbenzene	ND		0.000500	1	05/25/2018 03:35	WG1115968
Total Xylene	ND		0.00150	1	05/25/2018 03:35	WG1115968
TPH (GC/FID) Low Fraction	ND		0.100	1	05/25/2018 03:35	WG1115968
(S) a,a,a-Trifluorotoluene(FID)	95.4		77.0-120		05/25/2018 03:35	WG1115968
(S) a,a,a-Trifluorotoluene(PID)	96.0		75.0-128		05/25/2018 03:35	WG1115968

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	56.6		40.0	10	05/25/2018 23:27	WG1115978
C28-C40 Oil Range	74.7		40.0	10	05/25/2018 23:27	WG1115978
(S) o-Terphenyl	56.6		18.0-148		05/25/2018 23:27	WG1115978





L996490-01 Original Sample (OS) • Duplicate (DUP)

(OS) L996490-01 05/24/18 17:00 • (DUP) R3312916-3 05/24/18 17:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.84	8.82	1	0.227		1

Sample Narrative:

OS: 8.84 at 23.1C

DUP: 8.82 at 22.7C



L996532-04 Original Sample (OS) • Duplicate (DUP)

(OS) L996532-04 05/24/18 17:00 • (DUP) R3312916-4 05/24/18 17:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	9.08	9.07	1	0.110		1

Sample Narrative:

OS: 9.08 at 22.2C

DUP: 9.07 at 22.1C

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

(LCS) R3312916-1 05/24/18 17:00 • (LCSD) R3312916-2 05/24/18 17:00

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	su	su	su	%	%	%			%	%
pH	10.0	9.97	9.96	99.7	99.6	99.0-101			0.100	1

Sample Narrative:

LCS: 9.97 at 20.8C

LCSD: 9.96 at 20.5C

Method Blank (MB)

(MB) R3312896-1 05/24/18 16:16

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L996490-01 Original Sample (OS) • Duplicate (DUP)

(OS) L996490-01 05/24/18 16:16 • (DUP) R3312896-4 05/24/18 16:16

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	532	529	1	0.566		20

L996523-03 Original Sample (OS) • Duplicate (DUP)

(OS) L996523-03 05/24/18 16:16 • (DUP) R3312896-5 05/24/18 16:16

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	357	355	1	0.562		20

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

(LCS) R3312896-2 05/24/18 16:16 • (LCSD) R3312896-3 05/24/18 16:16

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	877	875	873	99.8	99.5	85.0-115			0.229	20

Method Blank (MB)

(MB) R3313347-5 05/25/18 01:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	U		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)	99.0			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	99.4			75.0-128

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3313347-3 05/25/18 00:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0500	0.0523	105	71.0-121	
Toluene	0.0500	0.0533	107	72.0-120	
Ethylbenzene	0.0500	0.0532	106	76.0-121	
Total Xylene	0.150	0.159	106	75.0-124	
(S) a,a,a-Trifluorotoluene(FID)			99.6	77.0-120	
(S) a,a,a-Trifluorotoluene(PID)			98.8	75.0-128	

Laboratory Control Sample (LCS)

(LCS) R3313347-4 05/25/18 00:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.85	106	70.0-136	
(S) a,a,a-Trifluorotoluene(FID)			104	77.0-120	
(S) a,a,a-Trifluorotoluene(PID)			109	75.0-128	



L996532-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L996532-04 05/25/18 08:48 • (MS) R3313347-8 05/25/18 10:18 • (MSD) R3313347-9 05/25/18 10:40

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	1.30	1.27	23.7	23.1	1	10.0-147			2.53	30
(S) a,a,a-Trifluorotoluene(FID)					94.8	94.2		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					97.4	98.2		75.0-128				

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc



Method Blank (MB)

(MB) R3313205-1 05/25/18 21:08

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	82.5			18.0-148

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

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

(LCS) R3313205-2 05/25/18 21:20 • (LCSD) R3313205-3 05/25/18 21:33

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	50.0	36.5	39.7	73.1	79.4	50.0-150			8.32	20
(S) o-Terphenyl				84.0	88.1	18.0-148				



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, the sample preparation volume or weight values differ from the standard, 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.

Qualifier Description

J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.

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.

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN2000002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater 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 II, LLC
410 17th Street, Suite 1600
Denver, CO 80202**

Report to:

Dave Nicholson

Email To:

dknicholson@q.comProject Description: **HRM Landfarm Sampling**City/State
Collected:Phone: **303-601-2023**

Client Project #

Lab Project #

Fax:

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

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

Date Results Needed

Email? ☐ No ☒ YesFAX? ☐ No ☒ YesNo.
of
CntrsPacked on ice N ☐ Y ☐

Sample ID

Comp/Grab

Matrix *

Depth

Date

Time

No.
of
Cntrs

Lipplemann - 1

SS

5/22

1205

4

Lipplemann - 2

SS

↓

1210

1

Lipplemann - 3

SS

↓

1215

1

Lipplemann - 4

SS

↓

1220

1

SS

SS

SS

SS

SS

SS

SS

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

Remarks:

Relinquished by: (Signature)

Date:

5/23/18

Time:

1200

Received by: (Signature)

FedEx

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

pH _____ Temp _____

Flow _____ Other _____

Hold #

Condition: (lab use only)

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

Temp: _____ °C Bottles Received:

3.73 161402d

COC Seal Intact: ☐ Y ☐ N ☒ NA

pH Checked:

NCF:

OK

Analysis / Container / Preservative

TEPH(8015)Diesel & Oil Range (1) 4oz Clear-No Pres

BTEX/TVPH (1) 4oz Clear - No Pres

SAR - 4oz Clear - No Pres

SPCON, pH - 4oz Clear - No Pres

Chain of Custody Page 1 of 1



YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859L# **L996490****C108**Acctnum: **HRMRESDCO**

Template:

Prelimin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant

Sample # (lab only)

-01

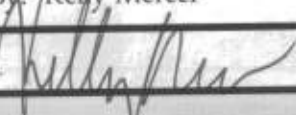
-02

-03

-04

Tracking #: 436169302112

ESC LAB SCIENCES Cooler Receipt Form

Client: <u>HRMBESDCO</u>	SDG#	<u>1996490</u>	
Cooler Received/Opened On: <u>5/24/18</u>	Temperature:	<u>3.7</u>	
Received By: <u>Kelly Mercer</u>			
Signature: 			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	<input checked="" type="checkbox"/>		
COC Signed / Accurate?		<input checked="" type="checkbox"/>	
Bottles arrive intact?		<input checked="" type="checkbox"/>	
Correct bottles used?		<input checked="" type="checkbox"/>	
Sufficient volume sent?		<input checked="" type="checkbox"/>	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

June 13, 2018

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L1000413
Samples Received: 06/09/2018
Project Number:
Description: HRM Landfarm Sampling

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.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



LIPPLEMANN P-2 L1000413-01 Solid

Collected by
D. Cox

Collected date/time
06/08/18 09:50

Received date/time
06/09/18 08:45

¹ Cp

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 09:53	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 01:46	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	1	06/11/18 13:57	06/11/18 23:51	MTJ

² Tc

³ Ss

⁴ Cn

LIPPLEMANN P-3 L1000413-02 Solid

Collected by
D. Cox

Collected date/time
06/08/18 10:00

Received date/time
06/09/18 08:45

⁵ Sr

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 09:56	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 02:08	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	10	06/11/18 13:57	06/11/18 21:49	MTJ

⁶ Qc

⁷ Gl

⁸ Al

HICKERT1A-2 L1000413-03 Solid

Collected by
D. Cox

Collected date/time
06/08/18 10:20

Received date/time
06/09/18 08:45

⁹ Sc

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:00	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 02:30	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	1	06/11/18 13:57	06/12/18 00:05	MTJ

HERZBERG1-1 L1000413-04 Solid

Collected by
D. Cox

Collected date/time
06/08/18 10:40

Received date/time
06/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:03	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 02:53	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	50	06/11/18 13:57	06/11/18 23:11	MTJ

SCHEETZ2-23-4 L1000413-05 Solid

Collected by
D. Cox

Collected date/time
06/08/18 11:00

Received date/time
06/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:06	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 03:15	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	10	06/11/18 13:57	06/11/18 22:57	MTJ

ACCOUNT:

HRM Resources, LLC - Denver, CO

PROJECT:

SDG:

L1000413

DATE/TIME:

06/13/18 14:59

PAGE:

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



PARRL-1 L1000413-06 Solid

Collected by
D. Cox

Collected date/time
06/08/18 11:15

Received date/time
06/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:10	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 03:38	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	10	06/11/18 13:57	06/11/18 22:03	MTJ

¹ Cp

² Tc

³ Ss

⁴ Cn

PARRL-2 L1000413-07 Solid

Collected by
D. Cox

Collected date/time
06/08/18 11:20

Received date/time
06/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:13	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 04:00	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	10	06/11/18 13:57	06/11/18 22:30	MTJ

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

PARRL-3 L1000413-08 Solid

Collected by
D. Cox

Collected date/time
06/08/18 11:30

Received date/time
06/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1122595	1	06/11/18 19:54	06/13/18 10:17	CCE
Wet Chemistry by Method 9045D	WG1122978	1	06/12/18 11:28	06/12/18 14:00	EEM
Wet Chemistry by Method 9050AMod	WG1122421	1	06/10/18 08:41	06/10/18 09:41	TH
Volatile Organic Compounds (GC) by Method 8015/8021	WG1122585	1	06/09/18 16:22	06/11/18 04:45	BMB
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1122541	10	06/11/18 13:57	06/11/18 22:43	MTJ

⁹ Sc

ACCOUNT:

HRM Resources, LLC - Denver, CO

PROJECT:

SDG:

L1000413

DATE/TIME:

06/13/18 14:59

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.00		1	06/13/2018 09:53	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.93	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-01 WG1122978: 7.93 at 25.4C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	987		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	06/11/2018 01:46	WG1122585
Toluene	ND		0.00500	1	06/11/2018 01:46	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 01:46	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 01:46	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 01:46	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	93.8		77.0-120		06/11/2018 01:46	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	96.3		75.0-128		06/11/2018 01:46	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	8.74		4.00	1	06/11/2018 23:51	WG1122541
C28-C40 Oil Range	8.58		4.00	1	06/11/2018 23:51	WG1122541
(S) o-Terphenyl	49.7		18.0-148		06/11/2018 23:51	WG1122541

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	4.98		1	06/13/2018 09:56	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.26	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-02 WG1122978: 8.26 at 25C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	223		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	06/11/2018 02:08	WG1122585
Toluene	ND		0.00500	1	06/11/2018 02:08	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 02:08	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 02:08	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 02:08	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	92.1		77.0-120		06/11/2018 02:08	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	95.9		75.0-128		06/11/2018 02:08	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		40.0	10	06/11/2018 21:49	WG1122541
C28-C40 Oil Range	ND		40.0	10	06/11/2018 21:49	WG1122541
(S) o-Terphenyl	65.7		18.0-148		06/11/2018 21:49	WG1122541

Sample Narrative:

L1000413-02 WG1122541: Dilution due to matrix

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	4.77		1	06/13/2018 10:00	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.91	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-03 WG1122978: 7.91 at 25.1C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	1040		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	06/11/2018 02:30	WG1122585
Toluene	ND		0.00500	1	06/11/2018 02:30	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 02:30	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 02:30	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 02:30	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	93.2		77.0-120		06/11/2018 02:30	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	96.6		75.0-128		06/11/2018 02:30	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	6.82		4.00	1	06/12/2018 00:05	WG1122541
C28-C40 Oil Range	9.40		4.00	1	06/12/2018 00:05	WG1122541
(S) o-Terphenyl	73.3		18.0-148		06/12/2018 00:05	WG1122541

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	4.22		1	06/13/2018 10:03	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.01	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-04 WG1122978: 8.01 at 25C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	152		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND		0.000500	1	06/11/2018 02:53	WG1122585
Toluene	ND		0.00500	1	06/11/2018 02:53	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 02:53	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 02:53	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 02:53	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	92.5		77.0-120		06/11/2018 02:53	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	95.7		75.0-128		06/11/2018 02:53	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1300		200	50	06/11/2018 23:11	WG1122541
C28-C40 Oil Range	1790		200	50	06/11/2018 23:11	WG1122541
(S) o-Terphenyl	105	J7	18.0-148		06/11/2018 23:11	WG1122541

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	6.75		1	06/13/2018 10:06	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.47	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-05 WG1122978: 8.47 at 25.2C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	108		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000696	B	0.000500	1	06/11/2018 03:15	WG1122585
Toluene	ND		0.00500	1	06/11/2018 03:15	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 03:15	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 03:15	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 03:15	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	91.4		77.0-120		06/11/2018 03:15	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	94.2		75.0-128		06/11/2018 03:15	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	48.6		40.0	10	06/11/2018 22:57	WG1122541
C28-C40 Oil Range	ND		40.0	10	06/11/2018 22:57	WG1122541
(S) o-Terphenyl	96.4		18.0-148		06/11/2018 22:57	WG1122541

Sample Narrative:

L1000413-05 WG1122541: Dilution due to matrix impact during extract concentration procedure

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	8.38		1	06/13/2018 10:10	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.03	<u>T8</u>	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-06 WG1122978: 9.03 at 24.9C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
Specific Conductance	366		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000622	<u>B</u>	0.000500	1	06/11/2018 03:38	WG1122585
Toluene	ND		0.00500	1	06/11/2018 03:38	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 03:38	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 03:38	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 03:38	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	85.5		77.0-120		06/11/2018 03:38	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	88.5		75.0-128		06/11/2018 03:38	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	73.0		40.0	10	06/11/2018 22:03	WG1122541
C28-C40 Oil Range	47.8		40.0	10	06/11/2018 22:03	WG1122541
(S) o-Terphenyl	61.6		18.0-148		06/11/2018 22:03	WG1122541

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	6.18		1	06/13/2018 10:13	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.82	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-07 WG1122978: 8.82 at 24.9C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	273		umhos/cm	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.000668	B	mg/kg	1	06/11/2018 04:00	WG1122585
Toluene	ND		0.00500	1	06/11/2018 04:00	WG1122585
Ethylbenzene	ND		0.000500	1	06/11/2018 04:00	WG1122585
Total Xylene	ND		0.00150	1	06/11/2018 04:00	WG1122585
TPH (GC/FID) Low Fraction	ND		0.100	1	06/11/2018 04:00	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	90.2		77.0-120		06/11/2018 04:00	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	93.2		75.0-128		06/11/2018 04:00	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	56.6		mg/kg	10	06/11/2018 22:30	WG1122541
C28-C40 Oil Range	ND		40.0	10	06/11/2018 22:30	WG1122541
(S) o-Terphenyl	69.2		18.0-148		06/11/2018 22:30	WG1122541

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	4.84		1	06/13/2018 10:17	WG1122595

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.83	T8	1	06/12/2018 14:00	WG1122978

Sample Narrative:

L1000413-08 WG1122978: 7.83 at 24.6C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	628		10.0	1	06/10/2018 09:41	WG1122421

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	ND	J6	0.000500	1	06/11/2018 04:45	WG1122585
Toluene	ND	J6	0.00500	1	06/11/2018 04:45	WG1122585
Ethylbenzene	ND	J6	0.000500	1	06/11/2018 04:45	WG1122585
Total Xylene	ND	J6	0.00150	1	06/11/2018 04:45	WG1122585
TPH (GC/FID) Low Fraction	ND	J3 J6	0.100	1	06/11/2018 04:45	WG1122585
(S) a,a,a-Trifluorotoluene(FID)	92.6		77.0-120		06/11/2018 04:45	WG1122585
(S) a,a,a-Trifluorotoluene(PID)	96.7		75.0-128		06/11/2018 04:45	WG1122585

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	ND		40.0	10	06/11/2018 22:43	WG1122541
C28-C40 Oil Range	ND		40.0	10	06/11/2018 22:43	WG1122541
(S) o-Terphenyl	80.0		18.0-148		06/11/2018 22:43	WG1122541

Sample Narrative:

L1000413-08 WG1122541: Dilution due to matrix

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



L1000283-50 Original Sample (OS) • Duplicate (DUP)

(OS) L1000283-50 06/12/18 14:00 • (DUP) R3317258-3 06/12/18 14:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	6.89	6.94	1	0.723		1

Sample Narrative:

OS: 6.89 at 25.8C
DUP: 6.94 at 25.7C

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

(LCS) R3317258-1 06/12/18 14:00 • (LCSD) R3317258-2 06/12/18 14:00

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	su	su	su	%	%	%			%	%
pH	10.0	9.97	9.97	99.7	99.7	99.0-101			0.000	1

Sample Narrative:

LCS: 9.97 at 24C
LCSD: 9.97 at 24C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3316716-1 06/10/18 09:41

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1000413-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1000413-01 06/10/18 09:41 • (DUP) R3316716-4 06/10/18 09:41

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	umhos/cm	umhos/cm		%		%
Specific Conductance	987	985	1	0.203		20

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

(LCS) R3316716-2 06/10/18 09:41 • (LCSD) R3316716-3 06/10/18 09:41

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	877	858	858	97.8	97.8	85.0-115			0.000	20



Method Blank (MB)

(MB) R3317336-5 06/10/18 21:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	0.000209	U	0.000120	0.000500
Toluene	0.000184	U	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)	96.1			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	99.2			75.0-128

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

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

(LCS) R3317336-1 06/10/18 19:25 • (LCSD) R3317336-2 06/10/18 19:47

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	0.0517	0.0481	103	96.2	71.0-121			7.30	20
Toluene	0.0500	0.0537	0.0496	107	99.2	72.0-120			7.92	20
Ethylbenzene	0.0500	0.0529	0.0492	106	98.4	76.0-121			7.23	20
Total Xylene	0.150	0.157	0.147	105	97.7	75.0-124			7.11	20
(S) a,a,a-Trifluorotoluene(FID)				96.0	95.5	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				97.7	97.6	75.0-128				

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

(LCS) R3317336-3 06/10/18 20:10 • (LCSD) R3317336-4 06/10/18 20:32

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	5.41	5.48	98.3	99.6	70.0-136			1.30	20
(S) a,a,a-Trifluorotoluene(FID)				108	109	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				111	111	75.0-128				



L1000413-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1000413-08 06/11/18 04:45 • (MS) R3317336-6 06/11/18 05:07 • (MSD) R3317336-7 06/11/18 05:29

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	0.00519	0.00481	9.72	8.97	1	10.0-146	J6	J6	7.53	29
Toluene	0.0500	ND	0.00325	0.00320	5.63	5.53	1	10.0-143	J6	J6	1.58	30
Ethylbenzene	0.0500	ND	0.00242	0.00231	4.54	4.33	1	10.0-147	J6	J6	4.50	31
Total Xylene	0.150	ND	0.00622	0.00587	3.79	3.56	1	10.0-149	J6	J6	5.79	30
(S) a,a,a-Trifluorotoluene(FID)					91.3	91.9		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					94.0	95.3		75.0-128				

L1000413-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1000413-08 06/11/18 04:45 • (MS) R3317336-8 06/11/18 05:52 • (MSD) R3317336-9 06/11/18 06:14

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	0.168	0.117	2.45	1.53	1	10.0-147	J6	J3 J6	35.7	30
(S) a,a,a-Trifluorotoluene(FID)					91.9	92.0		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					93.0	93.2		75.0-128				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3317073-1 06/11/18 20:14

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	65.9			18.0-148

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

(LCS) R3317073-2 06/11/18 20:28 • (LCSD) R3317073-3 06/11/18 20:41

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	50.0	28.7	32.2	57.4	64.4	50.0-150			11.4	20
(S) o-Terphenyl				67.1	76.7	18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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, the sample preparation volume or weight values differ from the standard, 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.

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.
T8	Sample(s) received past/too close to holding time expiration.

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.

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN2000002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater 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.



ESC LAB SCIENCES Cooler Receipt Form

Client: <u>HRMR ESDCO</u>	SDG#	<u>1000413</u>	
Cooler Received/Opened On: <u>6/9</u> /18	Temperature:	<u>2.1</u>	
Received By: Kathryn Cason			
Signature: <u>Kathryn Cason</u>			
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?			

June 15, 2018

HRM Resources, LLC - Denver, CO

Sample Delivery Group: L1001547
Samples Received: 06/14/2018
Project Number:
Description: HRM Landfarm Sampling

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.



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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



MARICK- S-23 L1001547-01 Solid

Collected by
D. Cox

Collected date/time
06/13/18 13:40

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:33	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 15:22	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	5	06/14/18 16:07	06/14/18 22:13	DMW

¹ Cp

² Tc

³ Ss

⁴ Cn

MARICK-LFF-3 L1001547-02 Solid

Collected by
D. Cox

Collected date/time
06/13/18 13:50

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:36	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 15:43	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 23:48	DMW

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

MARICK-LFF-4 L1001547-03 Solid

Collected by
D. Cox

Collected date/time
06/13/18 13:55

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:39	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 16:04	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/15/18 00:02	DMW

⁹ Sc

MARICK-LFF-5 L1001547-04 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:00

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:41	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 16:25	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/15/18 00:15	DMW

MARICK-LFF-6 L1001547-05 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:10

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:44	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 16:46	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 23:35	DMW

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



MARICK-LFF-7 L1001547-06 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:15

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:46	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 17:08	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 23:35	DMW
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	5	06/14/18 16:07	06/14/18 22:27	DMW

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

MARICK-LFF-8 L1001547-07 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:25

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA

MARICK-LFF-9 L1001547-08 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:30

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA

MARICK-LFF-10 L1001547-09 Solid

Collected by
D. Cox

Collected date/time
06/13/18 14:40

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:49	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA

LIPPLEMAN-LFF-1 L1001547-10 Solid

Collected by
D. Cox

Collected date/time
06/13/18 15:05

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:52	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 17:29	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	1	06/14/18 16:07	06/14/18 22:00	DMW

HERZBERG-LFF-1 L1001547-11 Solid

Collected by
D. Cox

Collected date/time
06/13/18 15:25

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 12:54	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 17:50	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 22:41	DMW

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SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



ANDERSON-LFF-1 L1001547-12 Solid

Collected by
D. Cox

Collected date/time
06/13/18 15:45

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 13:02	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 18:11	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 23:21	DMW

¹ Cp

² Tc

³ Ss

⁴ Cn

ANDERSON-LFF-3 L1001547-13 Solid

Collected by
D. Cox

Collected date/time
06/13/18 15:50

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 13:05	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 18:32	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 22:54	DMW

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

ANDERSON-LFF-4 L1001547-14 Solid

Collected by
D. Cox

Collected date/time
06/13/18 16:00

Received date/time
06/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG1124553	1	06/14/18 11:46	06/15/18 13:07	WBD
Wet Chemistry by Method 9045D	WG1124591	1	06/14/18 16:00	06/15/18 09:00	AJG
Wet Chemistry by Method 9050AMod	WG1124605	1	06/14/18 15:33	06/14/18 16:11	MJA
Volatile Organic Compounds (GC) by Method 8015/8021	WG1124518	1	06/14/18 13:24	06/14/18 18:53	RAS
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1124902	10	06/14/18 16:07	06/14/18 23:08	DMW

⁹ Sc

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.14		1	06/15/2018 12:52	WG1124553

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.48	<u>T8</u>	1	06/15/2018 09:00	WG1124591

Sample Narrative:

L1001547-10 WG1124591: 7.48 at 22.5C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	umhos/cm		umhos/cm			
	673		10.0	1	06/14/2018 16:11	WG1124605

Volatile Organic Compounds (GC) by Method 8015/8021

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Benzene	0.00147		0.000500	1	06/14/2018 17:29	WG1124518
Toluene	ND		0.00500	1	06/14/2018 17:29	WG1124518
Ethylbenzene	0.000733	<u>B</u>	0.000500	1	06/14/2018 17:29	WG1124518
Total Xylene	0.00169	<u>B</u>	0.00150	1	06/14/2018 17:29	WG1124518
TPH (GC/FID) Low Fraction	ND		0.100	1	06/14/2018 17:29	WG1124518
(S) a,a,a-Trifluorotoluene(FID)	99.5		77.0-120		06/14/2018 17:29	WG1124518
(S) a,a,a-Trifluorotoluene(PID)	104		75.0-128		06/14/2018 17:29	WG1124518

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	11.2		4.00	1	06/14/2018 22:00	WG1124902
C28-C40 Oil Range	11.9		4.00	1	06/14/2018 22:00	WG1124902
(S) o-Terphenyl	47.3		18.0-148		06/14/2018 22:00	WG1124902

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



L1001547-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1001547-14 06/15/18 09:00 • (DUP) R3318185-4 06/15/18 09:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.74	7.70	1	0.518		1

Sample Narrative:

OS: 7.74 at 22.3C

DUP: 7.7 at 22.2C

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

(LCS) R3318185-1 06/15/18 09:00 • (LCSD) R3318185-2 06/15/18 09:00

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD	RPD Limits
Analyte	su	su	su	%	%	%			%	%
pH	10.0	9.99	9.98	99.9	99.8	99.0-101			0.100	1

Sample Narrative:

LCS: 9.99 at 20.2C

LCSD: 9.98 at 20.3C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3318001-1 06/14/18 16:11

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L1001547-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1001547-01 06/14/18 16:11 • (DUP) R3318001-4 06/14/18 16:11

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1010	1010	1	0.000		20

L1001547-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1001547-11 06/14/18 16:11 • (DUP) R3318001-5 06/14/18 16:11

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	593	591	1	0.338		20

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

(LCS) R3318001-2 06/14/18 16:11 • (LCSD) R3318001-3 06/14/18 16:11

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	559	557	555	99.6	99.3	85.0-115			0.360	20

[L1001547-01,02,03,04,05,06,10,11,12,13,14](#)

Method Blank (MB)

(MB) R3318054-5 06/14/18 12:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000376	U	0.000150	0.00500
Ethylbenzene	0.000114	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)	101			77.0-120
(S) a,a,a-Trifluorotoluene(PID)	104			75.0-128

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

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

(LCS) R3318054-1 06/14/18 10:32 • (LCSD) R3318054-2 06/14/18 10:53

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	0.0475	0.0478	94.9	95.6	71.0-121			0.642	20
Toluene	0.0500	0.0478	0.0479	95.7	95.8	72.0-120			0.107	20
Ethylbenzene	0.0500	0.0527	0.0531	105	106	76.0-121			0.640	20
Total Xylene	0.150	0.161	0.161	107	107	75.0-124			0.0622	20
(S) a,a,a-Trifluorotoluene(FID)				99.9	100	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				103	104	75.0-128				

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

(LCS) R3318054-3 06/14/18 11:14 • (LCSD) R3318054-4 06/14/18 11:35

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	5.66	5.54	103	101	70.0-136			1.98	20
(S) a,a,a-Trifluorotoluene(FID)				93.4	94.5	77.0-120				
(S) a,a,a-Trifluorotoluene(PID)				113	113	75.0-128				



L1001268-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1001268-01 06/14/18 13:12 • (MS) R3318054-6 06/14/18 19:14 • (MSD) R3318054-7 06/14/18 19:36

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0662	0.0221	1.06	1.14	62.6	67.4	25	10.0-146			7.22	29
Toluene	0.0662	0.0151	1.06	1.14	62.9	67.8	25	10.0-143			7.38	30
Ethylbenzene	0.0662	0.0225	1.22	1.32	72.5	78.4	25	10.0-147			7.64	31
Total Xylene	0.199	0.144	3.81	4.12	73.7	80.0	25	10.0-149			7.89	30
(S) a,a,a-Trifluorotoluene(FID)					102	101		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					105	105		75.0-128				

L1001268-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1001268-01 06/14/18 13:12 • (MS) R3318054-8 06/14/18 19:57 • (MSD) R3318054-9 06/14/18 20:18

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	7.28	2.64	79.9	79.0	42.4	42.0	25	10.0-147			1.10	30
(S) a,a,a-Trifluorotoluene(FID)					99.4	99.0		77.0-120				
(S) a,a,a-Trifluorotoluene(PID)					108	108		75.0-128				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3318073-1 06/14/18 21:19

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	64.1			18.0-148

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

(LCS) R3318073-2 06/14/18 21:33 • (LCSD) R3318073-3 06/14/18 21:46

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	50.0	36.0	38.4	72.0	76.9	50.0-150			6.59	20
(S) o-Terphenyl				68.9	74.9	18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



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

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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, the sample preparation volume or weight values differ from the standard, 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.

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.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

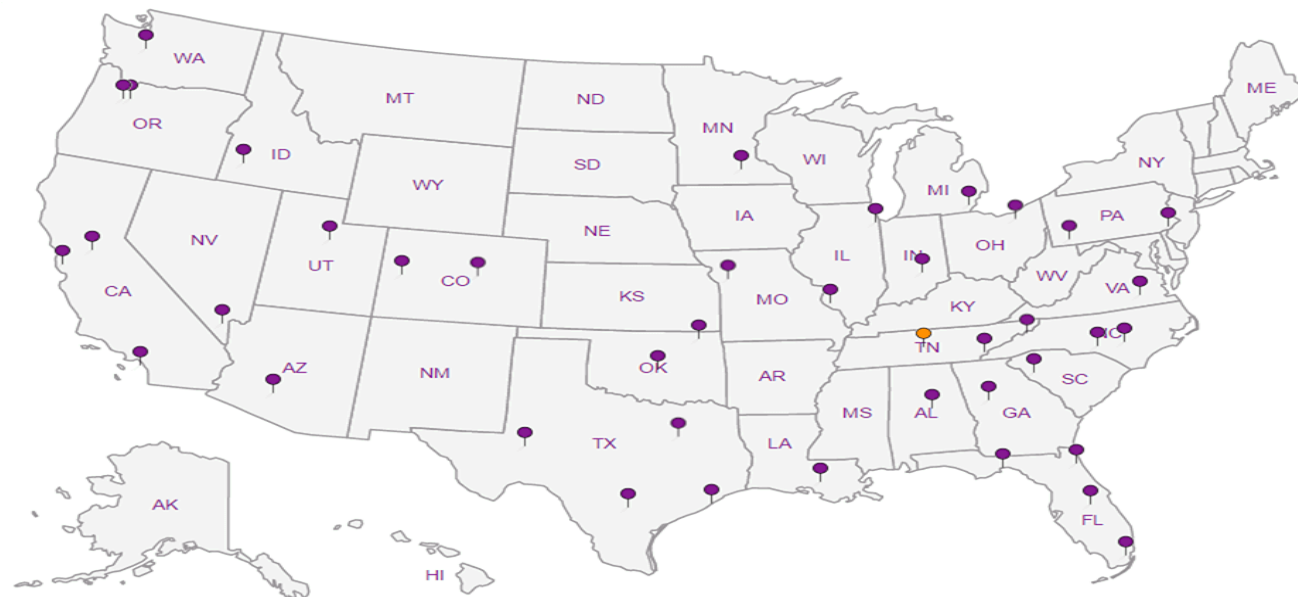
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Alabama	40660	Nebraska	NE-05-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

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 II, LLC 410 17th Street, Suite 1600 Denver, CO 80202			Analysis / Container / Preservative				Chain of Custody Page 1 of 2 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 														
Report to: Dave Nicholson & Dave Cox			Email To: palisades@techemail.com dknicholson@gmail.com			TEPH(8015) Diesel & Oil Range (1) 4oz Clear - No Pres BTX(TVPH) (1) 4oz Clear - No Pres SAR (1) 4oz Clear - No Pres SPCON, pH (1) 4oz Clear - No Pres						L# U001547												
Project Description: HRM Landfarm Sampling			City/State Collected:									Ta A138												
Phone: 303-601-2023 Fax:			Client Project #									Acctnum: HRMRSDCO												
Collected by (print): D. Cox			Site/Facility ID #									Template:												
Collected by (signature): 			P.O. #									Prelogin:												
Immediately Packed on Ice N <input checked="" type="checkbox"/> Y <input type="checkbox"/>			Date Results Needed 6-15-18 COB							TSR:														
			Email? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes FAX? <input type="checkbox"/> No <input type="checkbox"/> Yes							Cooler:														
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs																		
Marick S-23	G	SS		6-13-18	1340	4	X	X	X	X														
Marick-LFF-3	/	SS			1350	4	X	X	X	X														-01
Marick-LFF-4	/	SS			1355	4	X	X	X	X														-02
Marick-LFF-5	/	SS			1400	4	X	X	X	X														-03
Marick-LFF-6	/	SS			1410	4	X	X	X	X														-04
Marick-LFF-7	/	SS			1415	4	X	X	X	X														-05
Marick-LFF-8	/	SS			1425	1				X														-06
Marick-LFF-9	/	SS			1430	1				X														-07
Marick-LFF-10	/	SS			1440	2				X	X													-08
Lypleman-LFF-1	V	SS		V	1505	4				X	X													-09
																								-10

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

Remarks: **43616933 6577**

Relinquished by: (Signature) 		Date: 6-13-18		Time: 1830		Received by: (Signature)		Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/>		Hold #	
Relinquished by: (Signature)		Date:		Time:		Received by: (Signature)		Temp: °C Bottles Received: 23.40 48		Condition: (lab use only) OK	
Relinquished by: (Signature)		Date:		Time:		Received for lab by: (Signature) 		Date: 6/14/18		Time: 845	
										COC Seal Intact: <input type="checkbox"/> Y <input checked="" type="checkbox"/> NA	
										pH Checked: <input type="checkbox"/> NCF: <input type="checkbox"/>	

Company Name/Address:

Nicholson GeoSolutions. LLC.3433 E. Lake Dr.
Centennial, CO 80121

Billing Information:

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

Report to:

Dave Nicholson + Dave Cox

Email To:

palizades@tech@gmail.com
dknicholson@q.com

Project

Description: HRM Landfarm Sampling

Phone: 303-601-2023

Fax:

Client Project #

City/State

Collected:

Lab Project #

Collected by (print):

D. Cox

Site/Facility ID #

P.O. #

Collected by (signature):

D. Cox

Rush? (Lab MUST Be Notified)

Same Day 200%

☒ Next Day 100%

Two Day 50%

Three Day 25%

Date Results Needed

6-15-18

Email? ☐ No ☒ YesFAX? ☐ No ☐ YesNo.
of
Cntrs

Sample ID

Comp/Grab

Matrix *

Depth

Date

Time

Cntr

Hertzberg-LFF-1

G

SS

6-13-18

1525

4

Anderson-LFF-1

SS

↓

1545

42

Anderson-LFF-3

SS

↓

1550

42

Anderson-LFF-4

SS

↓

1600

42

2

2

2

2

2

2

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

Remarks:

Relinquished by: (Signature)

D. Cox

Date:

6-13-18

Time:

1830

Received by: (Signature)

4361 6933 6577

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)

pH _____ Temp _____

Flow _____ Other _____

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

Temp: _____ °C Bottles Received:

2.34 4/8

Date: 6/14/18 Time: 8:15

Hold #

Condition: (lab use only)

COC Seal Intact: ☐ Y ☒ N ☐ NA

pH Checked:

NCF:

Analysis / Container / Preservative

Chain of Custody

Page 2 of 2


ESC
 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.#

L1001547

Table #

Acctnum: HRMRESDCO

Template:

Prelogin:

TSR:

Cooler:

Shipped Via:

Rem./Contaminant

Sample # (lab only)

-11

-12

-13

-14

ESC LAB SCIENCES Cooler Receipt Form

Client: <u>HRM RESDCO</u>		SDG#	<u>4001547</u>	
Cooler Received/Opened On: <u>6/14/18</u>		Temperature:	<u>2.3</u>	
Received By: <u>Kelsey Stephenson</u>				
Signature: <u>[Signature]</u>				
Receipt Check List				
COC Seal Present / Intact?	NP	Yes	No	
COC Signed / Accurate?	-			
Bottles arrive intact?		-		
Correct bottles used?		-		
Sufficient volume sent?		-		
If Applicable		-		
VOA Zero headspace?				
Preservation Correct / Checked?				