



*Colorado Operations
792 Buckhorn Dr.
Rifle, CO 81650*

McLin Access Road Trucking Accident Closure Summary Report

Colorado Operations

**Piceance Basin
Garfield County, CO**

April 2016



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HRL COMPLIANCE SOLUTIONS, INC.
Environmental Consultants

**Prepared by:
HRL Compliance Solutions, Inc.
2385 F ½ Road
Grand Junction, CO 81505**

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Introduction

Below is a description for the release that occurred in the early morning hours of December 26, 2015 & reported via Form 19 (Doc #400960713) and later issued a remediation number (#9449). Below is the information regarding the actions taken to remediate the impacted area within the drainage and recover the released produced water in the accident.

Initial Action Taken

Initial spill response measures consisted of absorbent booms and pads being placed down gradient of the accident of where the release occurred. A three (3) straw bale check dam was installed with absorbent booms in front of the culvet that directed the drainage flow to the north side of the road.

To prevent migration of production water downgradient during snow & ice melting, two (2) catchment basins were installed downgradient and lined with 6ml plastic to allow for liquids removal (See Figures 2 & 3). The catchment basins were also surrounded by straw bale check dams.

Source Removal

Personnel removed approximately 1-1.5 tons of snow & ice from within the drainage around the point of origin via hand equipment, equating to approximately 475-500 gallons (11-12 bbls). The snow and ice was placed inside steel 55 gallon drums and stored at the trucking contractor's yard on January 6, 2016 when it had thawed and was removed via truck, where it was disposed to the Wasatch Bench Facility.

Ongoing weekly monitoring of the drainage and catchment accumulation took place from January to March. Melting of the snow and ice from the surrounding hillsides, as well as up-gradient within the drainage began on February 24, 2016. At which time Catchment Basin #1 collected the run off, where it was removed via vac truck and hauled to the Ursa Wasatch Bench E&P Facility (See Figure 4). A total of 142 bbls was removed from Catchment Basin #1 between February 24, 2016 and March 9, 2016. Table 1 illustrates the volumes removed from Catchment Basin #1 during those time periods.

Table 1: Recovered Volumes

<u>Date</u>	<u>Location</u>	<u>Volume (BBLS)</u>
2/24/2016	Catch. Basin 1	10
2/25/2016	Catch. Basin 1	12
2/26/2016	Catch. Basin 1	10
2/27/2016	Catch. Basin 1	10
2/28/2016	Catch. Basin 1	11
2/29/2016	Catch. Basin 1	13
3/1/2016	Catch. Basin 1	12
3/2/2016	Catch. Basin 1	8
3/3/2016	Catch. Basin 1	10
3/4/2016	Catch. Basin 1	8
3/5/2016	Catch. Basin 1	8
3/6/2016	Catch. Basin 1	10
3/7/2016	Catch. Basin 1	10
3/8/2016	Catch. Basin 1	5
3/9/2016	Catch. Basin 1	5

Sampling & Analysis

Initial samples collected from the point of origin and downgradient (DG 1) were analyzed for hydrocarbon analysis to determine the furthest extent of impact. Samples were collected and tested for a limited analyte suite due to amount of snow present and knowing that full confirmation samples will be collected later when closure was to be desired.

Ongoing sampling was conducted throughout the entirety of the project. Initial sampling indicated hydrocarbon concentrations near the point of origin exceeded COGCC Table 910-1 for TPH and benzene. As the ice and snow melted and water was captured & removed from the catchment basin, samples were collected throughout the drainage, downgradient of the release. All samples collected downgradient of the point of origin indicated that soils satisfied constituents outlined in the COGCC Table 910-1.

E-mail correspondence with the COGCC on March 25, 2016 confirmed that a reduced analyte list was approved for diesel range organics (DRO), gasoline range organics (GRO), and poly-aromatic hydrocarbons (PAH) for downgradient samples 4 & 5 (DG 4 & DG 5); as no indication of metals exceedances have been detected in previous sampling events.

Analytical in Table 2 illustrate concentrations at each sample point. Samples are in order of date sampled to show a timeline of sampling events. Figure 1 provides visual representation of the sample point in relation to the drainage and where the accident occurred.

Table 3 provides background analytical data for typical inorganic constituents, as well as arsenic for the surrounding hillsides. The background samples used were from a previous sampling event on the Ursa Melin C well pad, which is located approximately 75-100ft to the north of where the accident occurred.

Exception to COGCC Table 910-1

Ursa is requesting an exception be granted for the arsenic and any inorganic exceedances as values are comparable to typical background concentrations observed in the surrounding soils in that area.

Reclamation

Upon approval, catchment basins #1 and #2 will have the liner removed and original soils used to backfilled the excavation. Contouring of the disturbed area will be returned to the pre disturbance conditions to allow for un-disrupted flow for future precipitation events. If re-seeding is needed, a seed mixture consistent with the surrounding vegetation will be applied via hand broadcasting.

Conclusion

Ursa is requesting closure of the release and remediation #9449 and a No Further Action (NFA) letter be provided as soils within the drainage satisfy COGCC Table 910-1 thresholds and no additional remediation is needed.

Spill Location: Mclin Access Road
 Spill Reporting Doc #: 400960713
 Remediation #: 9449

Name of Operator: Ursa Operating Company LLC
 Latitude: 39.523533 Longitude -107.607961
 Location (QtrQty, Sec, Twp, Rng, Meridian): NESE, Sec 13, T6S, R92W

COGCC Operator # 10447
 County: Garfield

Table 2: Analytical Sampling Results

Mclin Access Road	COGCC Table 910-1 Threshold	Sample Locations							
		Point of Origin 1	DG 1	DG 2	DG 3	Point of Origin 2	Point of Origin 3	DG 4	DG 5
		12/28/15		1/6/16	2/16/16	3/8/16	3/8/16	3/23/16	3/23/16
TEPH (DRO)	500	1890	4.19	69.8	42.5	37.8	62.5	ND	ND
TVPH (GRO)		625	ND	ND	ND	7.4	ND	ND	ND
BENZENE	0.17	2.66	ND	ND	ND	ND	ND	ND	ND
TOLUENE	85	2.45	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	100	5.5	ND	ND	ND	0.006	ND	ND	ND
XYLENE TOTAL	175	6.25	ND	ND	ND	0.159	0.0235	ND	ND
ACENAPHTHENE	1,000	0.088	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	1,000	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	0.22	0.013	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	0.022	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	0.22	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	2.2	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	22	0.0135	ND	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	0.022	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	1,000	0.0112	ND	ND	ND	ND	ND	ND	ND
FLUORENE	1,000	0.246	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	0.22	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	23	1.21	ND	ND	ND	ND	ND	ND	ND
PYRENE	1,000	0.026	ND	ND	ND	ND	ND	ND	ND
ARSENIC	0.39	-	-	4.95	ND	3.46	4.84	-	-
BARIUM	15,000	-	-	524	119	157	308	-	-
CADMIUM	70	-	-	ND	ND	ND	ND	-	-
CHROMIUM	-	-	-	17.1	3.87	8.03	9.47	-	-
CHROMIUM (III)	120,000	-	-	15.0	3.87	8.03	9.47	-	-
CHROMIUM (IV)	23	-	-	2.08	ND	ND	ND	-	-
COPPER	3,100	-	-	16.2	9.54	11.6	10.9	-	-
LEAD	400	-	-	12.3	9.79	11.6	13.8	-	-
MERCURY	23	-	-	ND	ND	ND	ND	-	-
NICKEL	1,600	-	-	17.8	7.23	11.6	12.6	-	-
SELENIUM	390	-	-	ND	ND	ND	ND	-	-
SILVER	390	-	-	ND	ND	ND	ND	-	-
ZINC	23,000	-	-	70.7	29.8	43.8	45.4	-	-
ELECTRICAL CONDUCTIVITY (EC) (mmho/cm)	<4 mmhos/cm or x2 bkgd	-	-	1740	982	406	263	-	-
pH	6 to 9	-	-	8.14	6.78	8.74	8.34	-	-
SODIUM ADSORPTION RATIO (SAR)	12	-	-	0.465	0.563	3.92	1.51	-	-

Note: Results are presented in mg/kg, unless otherwise noted.
 Exceedances are highlighted in yellow.

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 Latitude: 39.523533 Longitude -107.607961
 Location (QtrQty, Sec, Twp, Rng, Meridian): NESE, Sec 13, T6S, R92W

COGCC Operator # 10447
 County: Garfield

Table 3: Background Concentrations

Mclin Access Road	COGCC Table 910-1 Threshold	Sample Locations		
		BKGD 1	BKGD 2	BKGD 3
		8/14/13		
Arsenic	0.39	ND	1.7	ND
ELECTRICAL CONDUCTIVITY (EC) (mmho/cm)	<4 mmhos/cm or x2 bkgd	0.53	-	-
pH	6 to 9	7.7	-	-
SODIUM ADSORPTION RATIO (SAR)	12	0.14	-	-

Note: Results are presented in mg/kg, unless otherwise noted.

Figure 2: Catchment Basin #1



Picture of Catchment Basin #1 (pre-lined). Lining was completed same day

Figure 3: Catchment Basin #2



Picture of Catchment Basin #2 (pre-lined). Lining occurred on the same day

Figure 4: Catchment Basin #1 – Water Collection



Photograph shows the accumulation of water within Catchment Basin #1

Figure 5: Catchment Basin #2 – No Water



Photographs shows Catchment Basin #2 with no water, which never accumulated any

Figure 6: Drainage (Point of Origin)



Photograph shows the drainage where the accident occurred and vegetation regrowth.

ATTACHMENT A: INITIAL SAMPLING

- Point of origin
- DG 1

HRL Compliance Solutions- CO

Sample Delivery Group: L809221
Samples Received: 12/29/2015
Project Number: HRL 15-331
Description: K&K Trucking Roll-Over - Mclin Access Rd
Site: MCLIN ACCESS ROAD
Report To: Kris Rowe
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

Technical Service Representative

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



¹Cp: Cover Page	1
²Tc: Table of Contents	2
³Ss: Sample Summary	3
⁴Cn: Case Narrative	4
⁵Sr: Sample Results	5
POINT OF ORIGIN 2IN L809221-01	5
DG-1 2IN L809221-02	6
⁶Qc: Quality Control Summary	7
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POINT OF ORIGIN 2IN L809221-01 Solid

Collected by
Kris RoweCollected date/time
12/28/15 13:30Received date/time
12/29/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG838629	1	12/29/15 20:40	12/30/15 11:48	FMB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG838629	20	12/29/15 20:40	01/04/16 10:06	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG838825	10	12/29/15 16:24	12/30/15 16:08	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG838996	100	12/29/15 10:47	12/30/15 08:08	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG839115	100	12/30/15 06:52	12/30/15 14:23	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG839373	100	12/31/15 01:05	12/31/15 09:20	ACG

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

DG-1 2IN L809221-02 Solid

Collected by
Kris RoweCollected date/time
12/28/15 13:45Received date/time
12/29/15 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG838629	1	12/29/15 20:40	12/30/15 12:10	FMB
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG838825	1	12/29/15 16:24	12/30/15 11:06	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG838996	5	12/29/15 10:47	12/30/15 08:30	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG839115	5	12/30/15 06:52	12/30/15 14:46	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG839373	5	12/31/15 01:05	12/31/15 09:43	ACG

¹⁰Co¹¹B¹²Mg¹³Al¹⁴Si¹⁵P¹⁶S¹⁷Cl¹⁸Ar¹⁹K²⁰Ca²¹Sc²²Ti²³V²⁴Cr



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	625		10.0	100	12/30/2015 08:08	WG838996
(S) a,a,a-Trifluorotoluene(FID)	93.6		59.0-128		12/30/2015 08:08	WG838996

Volatile Organic Compounds (GC/MS) by Method 8260B

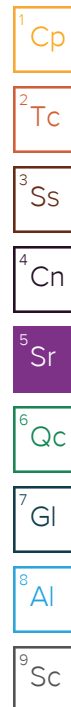
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	2.66		0.100	100	12/30/2015 14:23	WG839115
Toluene	2.45		0.500	100	12/31/2015 09:20	WG839373
Ethylbenzene	5.50		0.100	100	12/30/2015 14:23	WG839115
Total Xylenes	6.25		0.300	100	12/31/2015 09:20	WG839373
(S) Toluene-d8	110		88.7-115		12/30/2015 14:23	WG839115
(S) Dibromofluoromethane	102		76.3-123		12/30/2015 14:23	WG839115
(S) a,a,a-Trifluorotoluene	107		87.2-117		12/30/2015 14:23	WG839115
(S) 4-Bromofluorobenzene	131	J1	69.7-129		12/30/2015 14:23	WG839115

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1890		40.0	10	12/30/2015 16:08	WG838825
(S) o-Terphenyl	154	J1	50.0-150		12/30/2015 16:08	WG838825

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/30/2015 11:48	WG838629
Acenaphthene	0.0879		0.00600	1	12/30/2015 11:48	WG838629
Acenaphthylene	ND		0.00600	1	12/30/2015 11:48	WG838629
Benzo(a)anthracene	0.0134		0.00600	1	12/30/2015 11:48	WG838629
Benzo(a)pyrene	ND		0.00600	1	12/30/2015 11:48	WG838629
Benzo(b)fluoranthene	ND		0.00600	1	12/30/2015 11:48	WG838629
Benzo(g,h,i)perylene	ND		0.00600	1	12/30/2015 11:48	WG838629
Benzo(k)fluoranthene	ND		0.00600	1	12/30/2015 11:48	WG838629
Chrysene	0.0135		0.00600	1	12/30/2015 11:48	WG838629
Dibenz(a,h)anthracene	ND		0.00600	1	12/30/2015 11:48	WG838629
Fluoranthene	0.0112		0.00600	1	12/30/2015 11:48	WG838629
Fluorene	0.246		0.00600	1	12/30/2015 11:48	WG838629
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/30/2015 11:48	WG838629
Naphthalene	1.21		0.400	20	01/04/2016 10:06	WG838629
Phenanthrene	0.280		0.00600	1	12/30/2015 11:48	WG838629
Pyrene	0.0268		0.00600	1	12/30/2015 11:48	WG838629
1-Methylnaphthalene	1.94		0.400	20	01/04/2016 10:06	WG838629
2-Methylnaphthalene	4.28		0.400	20	01/04/2016 10:06	WG838629
2-Chloronaphthalene	ND		0.0200	1	12/30/2015 11:48	WG838629
(S) p-Terphenyl-d14	58.7		32.2-131		12/30/2015 11:48	WG838629
(S) Nitrobenzene-d5	203	J7	22.1-146		01/04/2016 10:06	WG838629
(S) 2-Fluorobiphenyl	59.1		40.6-122		12/30/2015 11:48	WG838629





Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.500	5	12/30/2015 08:30	WG838996
(S) a,a,a-Trifluorotoluene(FID)	96.0		59.0-128		12/30/2015 08:30	WG838996

Volatile Organic Compounds (GC/MS) by Method 8260B

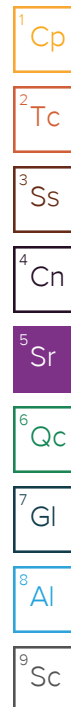
Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	12/30/2015 14:46	WG839115
Toluene	ND		0.0250	5	12/30/2015 14:46	WG839115
Ethylbenzene	ND		0.00500	5	12/30/2015 14:46	WG839115
Total Xylenes	ND		0.0150	5	12/31/2015 09:43	WG839373
(S) Toluene-d8	101		88.7-115		12/30/2015 14:46	WG839115
(S) Dibromofluoromethane	104		76.3-123		12/30/2015 14:46	WG839115
(S) a,a,a-Trifluorotoluene	105		87.2-117		12/30/2015 14:46	WG839115
(S) 4-Bromofluorobenzene	103		69.7-129		12/30/2015 14:46	WG839115

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	4.19		4.00	1	12/30/2015 11:06	WG838825
(S) o-Terphenyl	81.2		50.0-150		12/30/2015 11:06	WG838825

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/30/2015 12:10	WG838629
Acenaphthene	ND		0.00600	1	12/30/2015 12:10	WG838629
Acenaphthylene	ND		0.00600	1	12/30/2015 12:10	WG838629
Benzo(a)anthracene	ND		0.00600	1	12/30/2015 12:10	WG838629
Benzo(a)pyrene	ND		0.00600	1	12/30/2015 12:10	WG838629
Benzo(b)fluoranthene	ND		0.00600	1	12/30/2015 12:10	WG838629
Benzo(g,h,i)perylene	ND		0.00600	1	12/30/2015 12:10	WG838629
Benzo(k)fluoranthene	ND		0.00600	1	12/30/2015 12:10	WG838629
Chrysene	ND		0.00600	1	12/30/2015 12:10	WG838629
Dibenz(a,h)anthracene	ND		0.00600	1	12/30/2015 12:10	WG838629
Fluoranthene	ND		0.00600	1	12/30/2015 12:10	WG838629
Fluorene	ND		0.00600	1	12/30/2015 12:10	WG838629
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/30/2015 12:10	WG838629
Naphthalene	ND		0.0200	1	12/30/2015 12:10	WG838629
Phenanthrene	ND		0.00600	1	12/30/2015 12:10	WG838629
Pyrene	ND		0.00600	1	12/30/2015 12:10	WG838629
1-Methylnaphthalene	ND		0.0200	1	12/30/2015 12:10	WG838629
2-Methylnaphthalene	ND		0.0200	1	12/30/2015 12:10	WG838629
2-Chloronaphthalene	ND		0.0200	1	12/30/2015 12:10	WG838629
(S) p-Terphenyl-d14	46.4		32.2-131		12/30/2015 12:10	WG838629
(S) Nitrobenzene-d5	85.9		22.1-146		12/30/2015 12:10	WG838629
(S) 2-Fluorobiphenyl	73.3		40.6-122		12/30/2015 12:10	WG838629





Method Blank (MB)

(MB) 12/29/15 21:11

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) Low Fraction	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	95.7		59.0-128

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) 12/29/15 20:05 • (LCSD) 12/29/15 20:27

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	5.34	5.48	97.0	99.6	63.5-137			2.60	20
(S) a,a,a-Trifluorotoluene(FID)				99.8	102	59.0-128				

L808166-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/30/15 00:51 • (MS) 12/29/15 22:40 • (MSD) 12/29/15 23:02

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	0.0777	20.0	21.1	72.4	76.3	5	28.5-138			5.26	23.6
(S) a,a,a-Trifluorotoluene(FID)					98.7	101		59.0-128				



Method Blank (MB)

(MB) 12/30/15 06:18

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Benzene	ND		0.00100
Ethylbenzene	ND		0.00100
Toluene	ND		0.00500
(S) Toluene-d8	100		88.7-115
(S) Dibromofluoromethane	99.6		76.3-123
(S) a,a,a-Trifluorotoluene	107		87.2-117
(S) 4-Bromofluorobenzene	105		69.7-129

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

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

(LCS) 12/30/15 04:45 • (LCSD) 12/30/15 05:08

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	0.0250	0.0241	0.0239	96.2	95.8	72.6-120			0.450	20
Ethylbenzene	0.0250	0.0257	0.0249	103	99.4	78.6-124			3.16	20
Toluene	0.0250	0.0235	0.0233	94.0	93.3	76.7-116			0.760	20
(S) Toluene-d8				102	102	88.7-115				
(S) Dibromofluoromethane				102	103	76.3-123				
(S) a,a,a-Trifluorotoluene				108	107	87.2-117				
(S) 4-Bromofluorobenzene				102	100	69.7-129				

L809238-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/30/15 08:13 • (MS) 12/30/15 07:04 • (MSD) 12/30/15 07:27

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	0.0250	ND	0.0867	0.0441	69.3	35.3	5	47.8-131		J3 J6	65.2	22.8
Ethylbenzene	0.0250	0.00280	0.0881	0.0447	68.2	33.6	5	44.8-135		J3 J6	65.2	26.9
Toluene	0.0250	0.000373	0.0838	0.0412	66.8	32.7	5	47.8-127		J3 J6	68.2	24.3
(S) Toluene-d8					103	102		88.7-115				
(S) Dibromofluoromethane					103	103		76.3-123				
(S) a,a,a-Trifluorotoluene					108	108		87.2-117				
(S) 4-Bromofluorobenzene					101	102		69.7-129				

Method Blank (MB)

(MB) 12/31/15 03:43

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Toluene	ND		0.00500
Xylenes, Total	ND		0.00300

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

(LCS) 12/31/15 02:13 • (LCSD) 12/31/15 02:35

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 %
Toluene	0.0250	0.0252	0.0250	101	100	76.7-116			0.570	20
Xylenes, Total	0.0750	0.0780	0.0780	104	104	78.1-123			0.0600	20

L808561-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/31/15 05:35 • (MS) 12/31/15 04:28 • (MSD) 12/31/15 04:50

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 %
Toluene	0.0250	0.000546	0.111	0.0750	88.1	59.6	5	47.8-127		J3	38.4	24.3
Xylenes, Total	0.0750	0.000432	0.350	0.223	93.3	59.3	5	42.7-135		J3	44.5	26.6

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) 12/30/15 00:52

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) High Fraction	ND		4.00
(S) o-Terphenyl	88.7		50.0-150

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) 12/30/15 01:03 • (LCSD) 12/30/15 01:14

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) High Fraction	60.0	48.9	48.3	81.5	80.5	50.0-150			1.13	20
(S) o-Terphenyl				90.3	87.8	50.0-150				

L808821-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/30/15 02:44 • (MS) 12/30/15 02:55 • (MSD) 12/30/15 03:07

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) High Fraction	60.0	43.8	94.8	85.8	85.1	70.1	1	50.0-150			9.96	20
(S) o-Terphenyl					92.3	94.2		50.0-150				

Method Blank (MB)

(MB) 12/30/15 10:03

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.00600
Acenaphthene	ND		0.00600
Acenaphthylene	ND		0.00600
Benzo(a)anthracene	ND		0.00600
Benzo(a)pyrene	ND		0.00600
Benzo(b)fluoranthene	ND		0.00600
Benzo(g,h,i)perylene	ND		0.00600
Benzo(k)fluoranthene	ND		0.00600
Chrysene	ND		0.00600
Dibenz(a,h)anthracene	ND		0.00600
Fluoranthene	ND		0.00600
Fluorene	ND		0.00600
Indeno(1,2,3-cd)pyrene	ND		0.00600
Naphthalene	ND		0.0200
Phenanthrene	ND		0.00600
Pyrene	ND		0.00600
1-Methylnaphthalene	ND		0.0200
2-Methylnaphthalene	ND		0.0200
2-Chloronaphthalene	ND		0.0200
(S) p-Terphenyl-d14	84.7		32.2-131
(S) Nitrobenzene-d5	97.9		22.1-146
(S) 2-Fluorobiphenyl	92.9		40.6-122

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) 12/30/15 08:56 • (LCSD) 12/30/15 09:42

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 %
Anthracene	0.0800	0.0596	0.0606	74.5	75.8	50.3-130			1.69	20
Acenaphthene	0.0800	0.0584	0.0572	72.9	71.5	52.4-120			2.03	20
Acenaphthylene	0.0800	0.0599	0.0568	74.9	71.1	49.6-120			5.25	20
Benzo(a)anthracene	0.0800	0.0610	0.0628	76.3	78.5	46.7-125			2.85	20
Benzo(a)pyrene	0.0800	0.0565	0.0555	70.6	69.4	42.3-119			1.67	20
Benzo(b)fluoranthene	0.0800	0.0586	0.0601	73.3	75.1	43.6-124			2.42	20
Benzo(g,h,i)perylene	0.0800	0.0673	0.0676	84.1	84.6	45.1-132			0.490	20
Benzo(k)fluoranthene	0.0800	0.0624	0.0646	78.0	80.7	46.1-131			3.41	20

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

(LCS) 12/30/15 08:56 • (LCSD) 12/30/15 09:42

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 %
Chrysene	0.0800	0.0635	0.0659	79.4	82.4	49.5-131			3.74	20
Dibenz(a,h)anthracene	0.0800	0.0648	0.0682	81.0	85.3	44.8-133			5.15	20
Fluoranthene	0.0800	0.0607	0.0637	75.9	79.6	49.3-128			4.79	20
Fluorene	0.0800	0.0638	0.0610	79.8	76.2	50.6-121			4.63	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0653	0.0697	81.6	87.2	46.1-135			6.56	20
Naphthalene	0.0800	0.0621	0.0638	77.6	79.7	49.6-115			2.75	20
Phenanthrene	0.0800	0.0587	0.0592	73.3	74.0	48.8-121			0.920	20
Pyrene	0.0800	0.0620	0.0695	77.5	86.9	44.7-130			11.4	20
1-Methylnaphthalene	0.0800	0.0657	0.0677	82.1	84.6	50.6-122			3.03	20
2-Methylnaphthalene	0.0800	0.0671	0.0672	83.9	84.0	50.4-120			0.0600	20
2-Chloronaphthalene	0.0800	0.0539	0.0621	67.4	77.6	53.9-121			14.0	20
(S) p-Terphenyl-d14				71.3	74.5	32.2-131				
(S) Nitrobenzene-d5				85.8	83.6	22.1-146				
(S) 2-Fluorobiphenyl				69.9	75.2	40.6-122				

L808593-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/30/15 17:05 • (MS) 12/30/15 17:26 • (MSD) 12/30/15 17:47

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 %
Anthracene	0.0800	ND	0.0482	0.0477	60.3	59.7	1	26.5-141			1.09	21.2
Acenaphthene	0.0800	ND	0.0498	0.0499	62.3	62.4	1	31.9-130			0.200	20
Acenaphthylene	0.0800	ND	0.0533	0.0547	66.7	68.4	1	33.7-129			2.52	20
Benzo(a)anthracene	0.0800	0.000613	0.0484	0.0468	59.7	57.8	1	18.3-136			3.29	24.6
Benzo(a)pyrene	0.0800	ND	0.0467	0.0453	58.4	56.7	1	16.9-135			2.94	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0428	0.0412	53.5	51.6	1	10.0-134			3.70	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0473	0.0451	59.2	56.4	1	14.1-140			4.76	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0489	0.0486	61.1	60.7	1	18.2-138			0.690	25.6
Chrysene	0.0800	ND	0.0511	0.0502	63.9	62.8	1	17.1-145			1.79	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0520	0.0501	65.0	62.7	1	18.5-138			3.69	24.3
Fluoranthene	0.0800	ND	0.0454	0.0470	56.8	58.7	1	15.4-144			3.35	27.1
Fluorene	0.0800	ND	0.0512	0.0527	64.0	65.9	1	23.5-136			2.84	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0495	0.0477	61.9	59.6	1	14.5-142			3.80	25.8
Naphthalene	0.0800	0.000723	0.0598	0.0622	73.9	76.9	1	29.2-128			3.90	20
Phenanthrene	0.0800	ND	0.0461	0.0458	57.6	57.2	1	20.1-134			0.670	23.6
Pyrene	0.0800	ND	0.0523	0.0487	65.4	60.9	1	11.0-148			7.17	26.1

L808593-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 12/30/15 17:05 • (MS) 12/30/15 17:26 • (MSD) 12/30/15 17:47

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	ND	0.0584	0.0612	73.0	76.5	1	28.4-137			4.77	20
2-Methylnaphthalene	0.0800	ND	0.0584	0.0607	72.9	75.8	1	26.6-137			3.88	20
2-Chloronaphthalene	0.0800	ND	0.0536	0.0526	67.0	65.8	1	38.6-126			1.78	20
(S) p-Terphenyl-d14					70.7	85.5		32.2-131				
(S) Nitrobenzene-d5					87.6	111		22.1-146				
(S) 2-Fluorobiphenyl					76.3	94.0		40.6-122				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

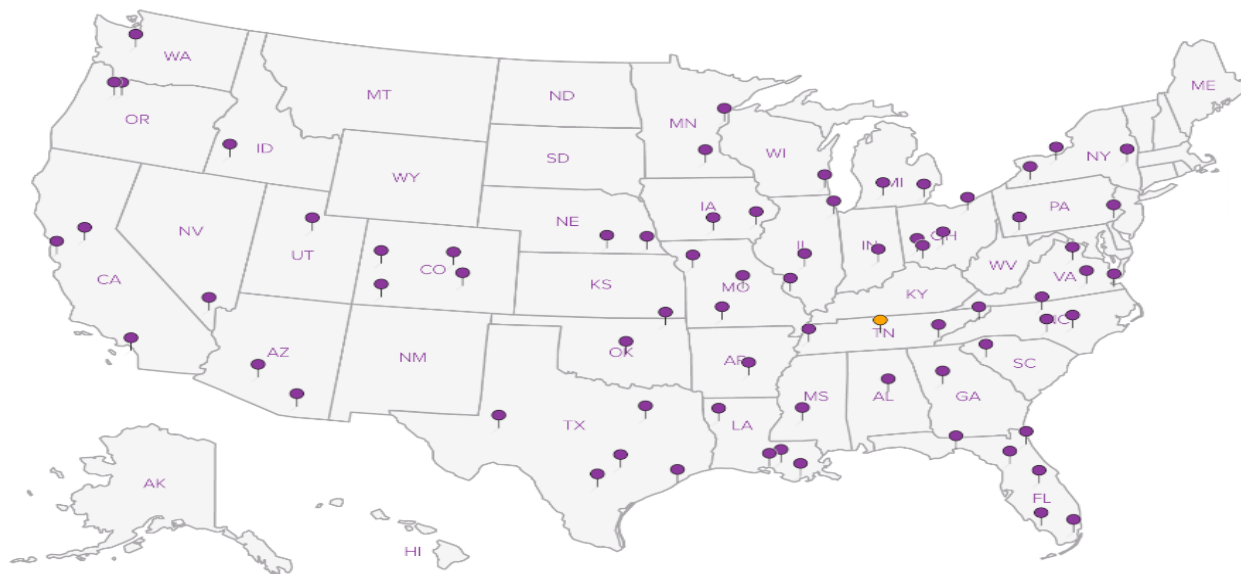
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



ATTACHMENT B: SUBSEQUENT SAMPLING

- DG 2

HRL Compliance Solutions- CO

Sample Delivery Group: L810435
Samples Received: 01/06/2016
Project Number: HRL 15-331
Description:
Site: MCLIN ACCESS ROAD
Report To: Kris Rowe
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

Technical Service Representative

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



¹Cp: Cover Page	1
²Tc: Table of Contents	2
³Ss: Sample Summary	3
⁴Cn: Case Narrative	4
⁵Sr: Sample Results	5
DG-2 CATCHMENT BASIN #2 L810435-02	5
⁶Qc: Quality Control Summary	7
Wet Chemistry by Method 2580 B-2011	7
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Wet Chemistry by Method 9045D	9
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Metals (ICP) by Method 6010B	12
Volatile Organic Compounds (GC) by Method 8015D/GRO	14
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Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	16
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⁷Gl: Glossary of Terms	20
⁸Al: Accreditations & Locations	21
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DG-2 CATCHMENT BASIN #2 L810435-02 Solid

Collected by
Kris RoweCollected date/time
01/05/16 13:00Received date/time
01/06/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	¹ Cp
Calculated Results	WG840888	1	01/07/16 18:10	01/11/16 11:16	LTB	² Tc
Calculated Results	WG841140	1	01/09/16 12:24	01/11/16 17:20	LTB	³ Ss
Mercury by Method 7471A	WG840811	1	01/07/16 16:17	01/08/16 08:04	BRJ	⁴ Cn
Metals (ICP) by Method 6010B	WG840888	1	01/07/16 18:10	01/08/16 11:28	LTB	⁵ Sr
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG840536	1	01/07/16 09:14	01/08/16 06:47	KMP	⁶ Qc
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG840663	1	01/07/16 13:43	01/07/16 18:57	DMG	⁷ Gl
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG841372	5	01/11/16 08:56	01/11/16 10:37	DWR	⁸ Al
Volatile Organic Compounds (GC) by Method 8021B	WG841187	5	01/09/16 16:01	01/09/16 16:42	ACG	⁹ Sc
Wet Chemistry by Method 2580 B-2011	WG840791	1	01/07/16 16:16	01/07/16 16:17	KBC	
Wet Chemistry by Method 3060A/7196A	WG841148	1	01/09/16 08:13	01/11/16 11:16	MAJ	
Wet Chemistry by Method 9045D	WG840492	1	01/07/16 10:13	01/07/16 10:13	MAJ	
Wet Chemistry by Method 9050AMod	WG841254	1	01/11/16 09:44	01/11/16 09:44	JER	



All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
L810435-02	DG-2 CATCHMENT BASIN #2	9045D

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Collected date/time: 01/05/16 13:00

L810435

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.465		1	01/11/2016 17:20	WG841140

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	15.0		2.00	1	01/11/2016 11:16	WG840888

Wet Chemistry by Method 2580 B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
ORP	122		1	01/07/2016 16:17	WG840791

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	2.08	J6	2.00	1	01/11/2016 11:16	WG841148

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.14		1	01/07/2016 10:13	WG840492

Sample Narrative:

9045D L810435-02 WG840492: 8.14 at 21.9c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1740		1	01/11/2016 09:44	WG841254

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	01/08/2016 08:04	WG840811

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	4.95		2.00	1	01/08/2016 11:28	WG840888
Barium	524		0.500	1	01/08/2016 11:28	WG840888
Cadmium	ND		0.500	1	01/08/2016 11:28	WG840888
Chromium	17.1		1.00	1	01/08/2016 11:28	WG840888
Copper	16.2		2.00	1	01/08/2016 11:28	WG840888
Lead	12.3		0.500	1	01/08/2016 11:28	WG840888
Nickel	17.8		2.00	1	01/08/2016 11:28	WG840888
Selenium	ND		2.00	1	01/08/2016 11:28	WG840888
Silver	ND		1.00	1	01/08/2016 11:28	WG840888
Zinc	70.7		5.00	1	01/08/2016 11:28	WG840888



Collected date/time: 01/05/16 13:00

L810435

Volatile Organic Compounds (GC) by Method 8015D/8021B/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00250	5	01/09/2016 16:42	WG841187
TPH (GC/FID) Low Fraction	ND		0.500	5	01/11/2016 10:37	WG841372
Toluene	ND		0.0250	5	01/09/2016 16:42	WG841187
Ethylbenzene	ND		0.00250	5	01/09/2016 16:42	WG841187
Total Xylene	ND		0.00750	5	01/09/2016 16:42	WG841187
(S) a,a,a-Trifluorotoluene(FID)	103		59.0-128		01/11/2016 10:37	WG841372
(S) a,a,a-Trifluorotoluene(PID)	99.2		54.0-144		01/09/2016 16:42	WG841187

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	69.8		4.00	1	01/07/2016 18:57	WG840663
(S) o-Terphenyl	54.5		50.0-150		01/07/2016 18:57	WG840663

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	01/08/2016 06:47	WG840536
Acenaphthene	ND		0.00600	1	01/08/2016 06:47	WG840536
Acenaphthylene	ND		0.00600	1	01/08/2016 06:47	WG840536
Benzo(a)anthracene	ND		0.00600	1	01/08/2016 06:47	WG840536
Benzo(a)pyrene	ND		0.00600	1	01/08/2016 06:47	WG840536
Benzo(b)fluoranthene	ND		0.00600	1	01/08/2016 06:47	WG840536
Benzo(g,h,i)perylene	ND		0.00600	1	01/08/2016 06:47	WG840536
Benzo(k)fluoranthene	ND		0.00600	1	01/08/2016 06:47	WG840536
Chrysene	ND		0.00600	1	01/08/2016 06:47	WG840536
Dibenz(a,h)anthracene	ND		0.00600	1	01/08/2016 06:47	WG840536
Fluoranthene	ND		0.00600	1	01/08/2016 06:47	WG840536
Fluorene	ND		0.00600	1	01/08/2016 06:47	WG840536
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	01/08/2016 06:47	WG840536
Naphthalene	ND		0.0200	1	01/08/2016 06:47	WG840536
Phenanthrene	ND		0.00600	1	01/08/2016 06:47	WG840536
Pyrene	ND		0.00600	1	01/08/2016 06:47	WG840536
1-Methylnaphthalene	ND		0.0200	1	01/08/2016 06:47	WG840536
2-Methylnaphthalene	ND		0.0200	1	01/08/2016 06:47	WG840536
2-Chloronaphthalene	ND		0.0200	1	01/08/2016 06:47	WG840536
(S) p-Terphenyl-d14	45.0		32.2-131		01/08/2016 06:47	WG840536
(S) Nitrobenzene-d5	55.6		22.1-146		01/08/2016 06:47	WG840536
(S) 2-Fluorobiphenyl	56.8		40.6-122		01/08/2016 06:47	WG840536



Original Sample (OS) • Duplicate (DUP)

(OS) L810435-02 01/07/16 16:17 • (DUP) WG840791-1 01/07/16 16:17

Analyte	Original Result mV	DUP Result mV	Dilution	DUP RPD %	<u>DUP Qualifier</u>	DUP RPD Limits %
ORP	122	123	1	0.816		20

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

(LCS) WG840791-2 01/07/16 16:17 • (LCSD) WG840791-3 01/07/16 16:17

Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
ORP	100	108	108	108	108	90.0-110			0.000	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3105604-1 01/11/16 11:01

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Chromium,Hexavalent	U		0.640	2.00

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Original Sample (OS) • Duplicate (DUP)

(OS) L810435-02 01/11/16 11:16 • (DUP) R3105604-6 01/11/16 11:16

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	2.08	2.00	1	3.92		20

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

(LCS) R3105604-2 01/11/16 11:07 • (LCSD) R3105604-3 01/11/16 11:08

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Chromium,Hexavalent	97.4	78.8	78.6	80.9	80.7	80.0-120			0.254	20

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810435-02 01/11/16 11:16 • (MS) R3105604-4 01/11/16 11:18 • (MSD) R3105604-5 01/11/16 11:20

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	2.08	10.6	10.6	42.4	42.4	1	75.0-125	J6	J6	0.000	20



Original Sample (OS) • Duplicate (DUP)

(OS) L809786-02 01/07/16 10:13 • (DUP) WG840492-1 01/07/16 10:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.34	7.34	1	0.000		1

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

(LCS) WG840492-2 01/07/16 10:13 • (LCSD) WG840492-3 01/07/16 10:13

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.72	6.71	6.75	99.9	100	98.5-102			0.594	1

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) WG841254-4 01/11/16 09:44

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	1.46			

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Original Sample (OS) • Duplicate (DUP)

(OS) L810435-02 01/11/16 09:44 • (DUP) WG841254-1 01/11/16 09:44

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1740	1780	1	2.27		20

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

(LCS) WG841254-2 01/11/16 09:44 • (LCSD) WG841254-3 01/11/16 09:44

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	915	935	936	102	102	90.0-110			0.107	20



Method Blank (MB)

(MB) R3105196-2 01/08/16 07:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0028	0.0200

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) R3105196-4 01/08/16 07:38 • (LCSD) R3105196-3 01/08/16 07:33

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 %
Mercury	0.300	0.245	0.287	82	96	80-120			16	20

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810407-01 01/08/16 07:41 • (MS) R3105196-5 01/08/16 07:44 • (MSD) R3105196-6 01/08/16 07:47

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 %
Mercury	0.300	0.00189	0.274	0.284	91	94	1	75-125			4	20



Method Blank (MB)

(MB) R3105248-1 01/08/16 10:53

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Cadmium	U		0.07	0.500
Chromium	U		0.14	1.00
Copper	U		0.53	2.00
Lead	U		0.19	0.500
Nickel	U		0.49	2.00
Selenium	U		0.74	2.00
Silver	U		0.28	1.00
Zinc	1.14		0.59	5.00

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3105248-2 01/08/16 10:56 • (LCSD) R3105248-3 01/08/16 10:58

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 %
Arsenic	100	102	103	102	103	80-120			1	20
Barium	100	105	105	105	105	80-120			1	20
Cadmium	100	104	105	104	105	80-120			1	20
Chromium	100	102	102	102	102	80-120			0	20
Copper	100	105	105	105	105	80-120			0	20
Lead	100	104	105	104	105	80-120			1	20
Nickel	100	103	104	103	104	80-120			1	20
Selenium	100	104	105	104	105	80-120			1	20
Silver	100	85.2	92.2	85	92	80-120			8	20
Zinc	100	104	104	104	104	80-120			0	20

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810610-02 01/08/16 11:02 • (MS) R3105248-6 01/08/16 11:10 • (MSD) R3105248-7 01/08/16 11:13

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 %
Arsenic	100	7.71	101	96.4	93	89	1	75-125			5	20
Barium	100	93.6	191	192	98	98	1	75-125			0	20
Cadmium	100	0.176	98.2	93.2	98	93	1	75-125			5	20



Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810610-02 01/08/16 11:02 • (MS) R3105248-6 01/08/16 11:10 • (MSD) R3105248-7 01/08/16 11:13

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 %
Chromium	100	17.4	109	105	92	88	1	75-125			3	20
Copper	100	12.5	109	105	96	92	1	75-125			4	20
Lead	100	10.8	114	110	103	99	1	75-125			3	20
Nickel	100	23.7	125	121	101	97	1	75-125			3	20
Selenium	100	0.441	95.8	90.7	95	90	1	75-125			6	20
Silver	100	ND	57.6	33.0	58	33	1	75-125	J6	J3 J6	54	20
Zinc	100	48.5	144	141	95	92	1	75-125			2	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3105607-3 01/11/16 07:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	104			59.0-128

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) R3105607-1 01/11/16 06:47 • (LCSD) R3105607-2 01/11/16 07:10

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	6.54	6.14	119	112	63.5-137			6.30	20
(S) a,a,a-Trifluorotoluene(FID)				103	103	59.0-128				

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L811025-04 01/11/16 11:00 • (MS) R3105607-4 01/11/16 09:27 • (MSD) R3105607-5 01/11/16 09:50

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	0.384	279	266	115	110	44	28.5-138			4.53	23.6
(S) a,a,a-Trifluorotoluene(FID)					103	105		59.0-128				



Method Blank (MB)

(MB) R3105632-5 01/09/16 14:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000120	0.000500
Toluene	0.000297		0.000150	0.00500
Ethylbenzene	U		0.000110	0.000500
Total Xylene	U		0.000460	0.00150
(S) a,a,a-Trifluorotoluene(PID)	102			54.0-144

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) R3105632-1 01/09/16 12:20 • (LCSD) R3105632-2 01/09/16 12:42

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	0.0487	0.0485	97.3	97.1	70.0-130			0.220	20
Toluene	0.0500	0.0491	0.0481	98.1	96.2	70.0-130			2.03	20
Ethylbenzene	0.0500	0.0500	0.0502	100	100	70.0-130			0.280	20
Total Xylene	0.150	0.149	0.150	99.6	100	70.0-130			0.590	20
(S) a,a,a-Trifluorotoluene(PID)				100	99.9	54.0-144				

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810435-02 01/09/16 16:42 • (MS) R3105632-6 01/09/16 20:03 • (MSD) R3105632-7 01/09/16 20:25

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	0.000327	0.189	0.203	75.5	81.0	5	49.7-127			6.94	23.5
Toluene	0.0500	0.00130	0.173	0.189	68.8	75.0	5	49.8-132			8.56	23.5
Ethylbenzene	0.0500	0.000458	0.156	0.177	62.2	70.6	5	40.8-141			12.7	23.8
Total Xylene	0.150	0.00228	0.451	0.509	59.8	67.6	5	41.2-140			12.1	23.7
(S) a,a,a-Trifluorotoluene(PID)					98.8	98.7		54.0-144				



Method Blank (MB)

(MB) R3105208-1 01/07/16 17:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
(S) o-Terphenyl	88.1			50.0-150

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

(LCS) R3105208-2 01/07/16 17:27 • (LCSD) R3105208-3 01/07/16 17:38

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) High Fraction	60.0	54.1	53.6	90.2	89.4	50.0-150			0.940	20
(S) o-Terphenyl				95.8	93.8	50.0-150				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3105183-3 01/08/16 01:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00600
Acenaphthene	U		0.000600	0.00600
Acenaphthylene	U		0.000600	0.00600
Benzo(a)anthracene	U		0.000600	0.00600
Benzo(a)pyrene	U		0.000600	0.00600
Benzo(b)fluoranthene	U		0.000600	0.00600
Benzo(g,h,i)perylene	U		0.000600	0.00600
Benzo(k)fluoranthene	U		0.000600	0.00600
Chrysene	U		0.000600	0.00600
Dibenz(a,h)anthracene	U		0.000600	0.00600
Fluoranthene	U		0.000600	0.00600
Fluorene	U		0.000600	0.00600
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00600
Naphthalene	U		0.00200	0.0200
Phenanthrene	U		0.000600	0.00600
Pyrene	U		0.000600	0.00600
1-Methylnaphthalene	U		0.00200	0.0200
2-Methylnaphthalene	U		0.00200	0.0200
2-Chloronaphthalene	U		0.00200	0.0200
(S) p-Terphenyl-d14	52.5			32.2-131
(S) Nitrobenzene-d5	66.5			22.1-146
(S) 2-Fluorobiphenyl	64.9			40.6-122

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3105183-1 01/08/16 00:52 • (LCSD) R3105183-2 01/08/16 01:14

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 %
Anthracene	0.0800	0.0421	0.0451	52.6	56.4	50.3-130			6.89	20
Acenaphthene	0.0800	0.0467	0.0480	58.4	60.0	52.4-120			2.73	20
Acenaphthylene	0.0800	0.0459	0.0470	57.4	58.8	49.6-120			2.37	20
Benzo(a)anthracene	0.0800	0.0423	0.0438	52.9	54.7	46.7-125			3.49	20
Benzo(a)pyrene	0.0800	0.0379	0.0385	47.3	48.1	42.3-119			1.71	20
Benzo(b)fluoranthene	0.0800	0.0402	0.0445	50.3	55.6	43.6-124			9.98	20
Benzo(g,h,i)perylene	0.0800	0.0438	0.0459	54.7	57.4	45.1-132			4.85	20
Benzo(k)fluoranthene	0.0800	0.0482	0.0447	60.2	55.8	46.1-131			7.61	20

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

(LCS) R3105183-1 01/08/16 00:52 • (LCSD) R3105183-2 01/08/16 01:14

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 %
Chrysene	0.0800	0.0462	0.0472	57.7	59.0	49.5-131			2.13	20
Dibenz(a,h)anthracene	0.0800	0.0438	0.0466	54.7	58.3	44.8-133			6.31	20
Fluoranthene	0.0800	0.0446	0.0460	55.7	57.4	49.3-128			3.00	20
Fluorene	0.0800	0.0434	0.0452	54.2	56.4	50.6-121			3.99	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0440	0.0462	55.0	57.8	46.1-135			4.98	20
Naphthalene	0.0800	0.0488	0.0498	61.0	62.3	49.6-115			2.09	20
Phenanthrene	0.0800	0.0421	0.0434	52.6	54.3	48.8-121			3.19	20
Pyrene	0.0800	0.0408	0.0445	51.0	55.6	44.7-130			8.61	20
1-Methylnaphthalene	0.0800	0.0475	0.0481	59.3	60.1	50.6-122			1.28	20
2-Methylnaphthalene	0.0800	0.0475	0.0475	59.3	59.4	50.4-120			0.120	20
2-Chloronaphthalene	0.0800	0.0455	0.0466	56.8	58.3	53.9-121			2.53	20
(S) p-Terphenyl-d14				48.8	52.3	32.2-131				
(S) Nitrobenzene-d5				63.5	65.2	22.1-146				
(S) 2-Fluorobiphenyl				62.8	63.9	40.6-122				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810342-05 01/08/16 05:42 • (MS) R3105183-4 01/08/16 06:04 • (MSD) R3105183-5 01/08/16 06:25

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 %
Anthracene	0.0800	ND	0.0413	0.0434	51.6	54.2	1	26.5-141			4.89	21.2
Acenaphthene	0.0800	ND	0.0446	0.0454	55.7	56.7	1	31.9-130			1.86	20
Acenaphthylene	0.0800	ND	0.0440	0.0442	55.1	55.2	1	33.7-129			0.340	20
Benzo(a)anthracene	0.0800	0.000626	0.0385	0.0410	47.4	50.4	1	18.3-136			6.16	24.6
Benzo(a)pyrene	0.0800	ND	0.0386	0.0402	48.3	50.3	1	16.9-135			4.14	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0335	0.0361	41.9	45.2	1	10.0-134			7.49	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0355	0.0376	44.4	47.0	1	14.1-140			5.82	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0401	0.0402	50.1	50.2	1	18.2-138			0.260	25.6
Chrysene	0.0800	0.000665	0.0428	0.0439	52.7	54.1	1	17.1-145			2.61	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0382	0.0388	47.7	48.5	1	18.5-138			1.66	24.3
Fluoranthene	0.0800	ND	0.0406	0.0426	50.8	53.3	1	15.4-144			4.79	27.1
Fluorene	0.0800	ND	0.0418	0.0426	52.3	53.2	1	23.5-136			1.77	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0363	0.0384	45.4	48.0	1	14.5-142			5.44	25.8
Naphthalene	0.0800	0.00160	0.0499	0.0499	60.4	60.4	1	29.2-128			0.0200	20
Phenanthrene	0.0800	0.00183	0.0408	0.0418	48.7	49.9	1	20.1-134			2.40	23.6
Pyrene	0.0800	0.000784	0.0410	0.0430	50.2	52.8	1	11.0-148			4.94	26.1

Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L810342-05 01/08/16 05:42 • (MS) R3105183-4 01/08/16 06:04 • (MSD) R3105183-5 01/08/16 06:25

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	0.00143	0.0468	0.0472	56.7	57.2	1	28.4-137			0.800	20
2-Methylnaphthalene	0.0800	0.00212	0.0476	0.0487	56.9	58.2	1	26.6-137			2.21	20
2-Chloronaphthalene	0.0800	ND	0.0429	0.0444	53.6	55.5	1	38.6-126			3.49	20
(S) p-Terphenyl-d14					41.0	42.0		32.2-131				
(S) Nitrobenzene-d5					61.9	61.8		22.1-146				
(S) 2-Fluorobiphenyl					55.3	56.4		40.6-122				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
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.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

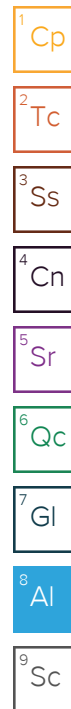
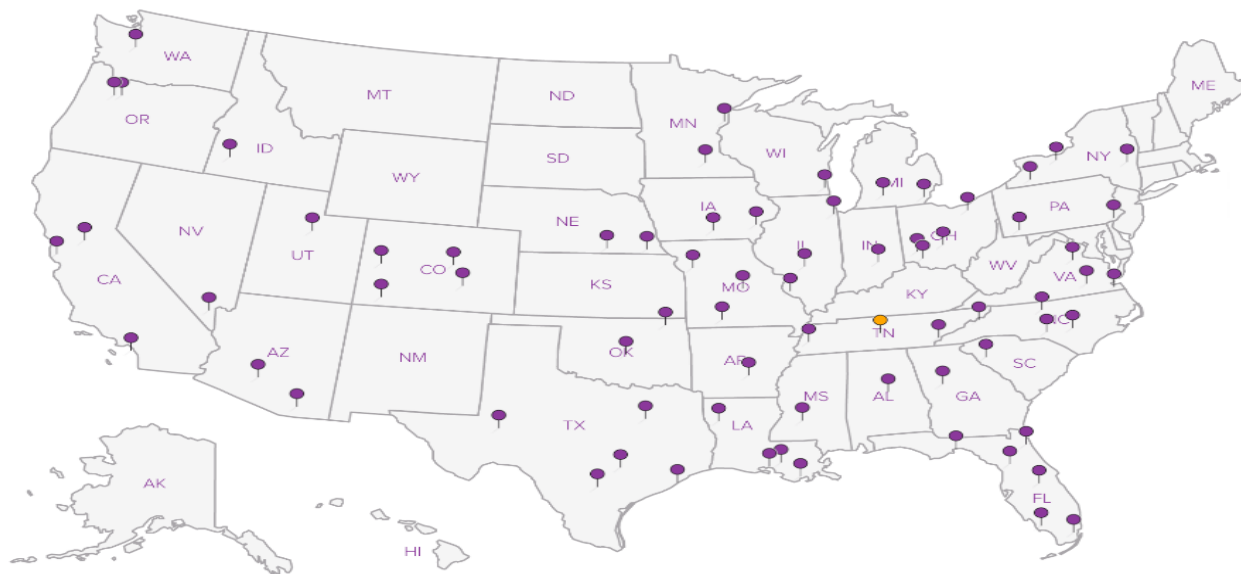
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



[illegible]

ATTACHMENT C: SUBSEQUENT SAMPLING

- DG 3

HRL Compliance Solutions- CO

Sample Delivery Group: L818528
Samples Received: 02/17/2016
Project Number: 15-331
Description: H&K - Mclin Access Rd - Spill - DG 3
Site: MCLIN ACCESS ROAD
Report To: Kris Rowe
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

Technical Service Representative

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



¹Cp: Cover Page	1
²Tc: Table of Contents	2
³Ss: Sample Summary	3
⁴Cn: Case Narrative	4
⁵Sr: Sample Results	5
DG 3 SAMPLE PT - CULVERT OUTLET 6IN L818528-01	5
⁶Qc: Quality Control Summary	7
Wet Chemistry by Method 2580 B-2011	7
Wet Chemistry by Method 3060A/7196A	8
Wet Chemistry by Method 9045D	9
Wet Chemistry by Method 9050AMod	10
Mercury by Method 7471A	11
Metals (ICP) by Method 6010B	12
Volatile Organic Compounds (GC) by Method 8015D/GRO	14
Volatile Organic Compounds (GC/MS) by Method 8260B	15
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	16
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⁷Gl: Glossary of Terms	20
⁸Al: Accreditations & Locations	21
⁹Sc: Chain of Custody	22



SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



DG 3 SAMPLE PT - CULVERT OUTLET 6IN L818528-01 Solid

Collected by
Kris Rowe

Collected date/time
02/16/16 14:00

Received date/time
02/17/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG850515	1	02/19/16 09:21	02/20/16 08:59	WBD
Calculated Results	WG850773	1	02/21/16 22:36	02/23/16 07:34	LTB
Mercury by Method 7471A	WG850523	1	02/19/16 15:07	02/23/16 12:17	BRJ
Metals (ICP) by Method 6010B	WG850515	1	02/19/16 09:21	02/19/16 18:40	WBD
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG850546	1	02/19/16 22:24	02/21/16 09:06	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG851626	1	02/23/16 12:13	02/23/16 22:03	KLM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG850821	5	02/20/16 15:27	02/20/16 19:13	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850573	5	02/24/16 05:18	02/24/16 22:26	JAH
Wet Chemistry by Method 2580 B-2011	WG850835	1	02/20/16 11:29	02/20/16 11:30	SAM
Wet Chemistry by Method 3060A/7196A	WG850503	1	02/19/16 12:15	02/20/16 08:59	AMC
Wet Chemistry by Method 9045D	WG850505	1	02/19/16 11:24	02/19/16 11:24	SJM
Wet Chemistry by Method 9050AMod	WG850841	1	02/20/16 10:18	02/20/16 10:18	JSS

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

ACCOUNT:

HRL Compliance Solutions- CO

PROJECT:

15-331

SDG:

L818528

DATE/TIME:

02/25/16 13:41

PAGE:

3 of 22



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Collected date/time: 02/16/16 14:00

L818528

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.563		1	02/23/2016 07:34	WG850773

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	3.87		2.00	1	02/20/2016 08:59	WG850515

Wet Chemistry by Method 2580 B-2011

Analyte	Result mV	Qualifier	Dilution	Analysis date / time	Batch
ORP	522		1	02/20/2016 11:30	WG850835

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	02/20/2016 08:59	WG850503

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	6.78		1	02/19/2016 11:24	WG850505

Sample Narrative:

9045D L818528-01 WG850505: 6.78 at 21.5c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	982		1	02/20/2016 10:18	WG850841

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	02/23/2016 12:17	WG850523

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	ND		2.00	1	02/19/2016 18:40	WG850515
Barium	119		0.500	1	02/19/2016 18:40	WG850515
Cadmium	ND		0.500	1	02/19/2016 18:40	WG850515
Chromium	3.87		1.00	1	02/19/2016 18:40	WG850515
Copper	9.54		2.00	1	02/19/2016 18:40	WG850515
Lead	9.79		0.500	1	02/19/2016 18:40	WG850515
Nickel	7.23		2.00	1	02/19/2016 18:40	WG850515
Selenium	ND		2.00	1	02/19/2016 18:40	WG850515
Silver	ND		1.00	1	02/19/2016 18:40	WG850515
Zinc	29.8		5.00	1	02/19/2016 18:40	WG850515



Collected date/time: 02/16/16 14:00

L818528

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND	<u>J3</u>	0.500	5	02/20/2016 19:13	WG850821
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	99.1		59.0-128		02/20/2016 19:13	WG850821

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	02/24/2016 22:26	WG850573
Toluene	ND		0.0250	5	02/24/2016 22:26	WG850573
Ethylbenzene	ND		0.00500	5	02/24/2016 22:26	WG850573
Total Xylenes	ND		0.0150	5	02/24/2016 22:26	WG850573
(S) <i>Toluene-d8</i>	102		88.7-115		02/24/2016 22:26	WG850573
(S) <i>Dibromofluoromethane</i>	96.8		76.3-123		02/24/2016 22:26	WG850573
(S) <i>a,a,a</i> -Trifluorotoluene	101		87.2-117		02/24/2016 22:26	WG850573
(S) <i>4</i> -Bromofluorobenzene	99.9		69.7-129		02/24/2016 22:26	WG850573

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	42.5		4.00	1	02/23/2016 22:03	WG851626
(S) <i>o</i> -Terphenyl	54.9		50.0-150		02/23/2016 22:03	WG851626

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	02/21/2016 09:06	WG850546
Acenaphthene	ND		0.00600	1	02/21/2016 09:06	WG850546
Acenaphthylene	ND		0.00600	1	02/21/2016 09:06	WG850546
Benzo(a)anthracene	ND		0.00600	1	02/21/2016 09:06	WG850546
Benzo(a)pyrene	ND		0.00600	1	02/21/2016 09:06	WG850546
Benzo(b)fluoranthene	ND		0.00600	1	02/21/2016 09:06	WG850546
Benzo(g,h,i)perylene	ND		0.00600	1	02/21/2016 09:06	WG850546
Benzo(k)fluoranthene	ND		0.00600	1	02/21/2016 09:06	WG850546
Chrysene	ND		0.00600	1	02/21/2016 09:06	WG850546
Dibenz(a,h)anthracene	ND		0.00600	1	02/21/2016 09:06	WG850546
Fluoranthene	ND		0.00600	1	02/21/2016 09:06	WG850546
Fluorene	ND		0.00600	1	02/21/2016 09:06	WG850546
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	02/21/2016 09:06	WG850546
Naphthalene	ND		0.0200	1	02/21/2016 09:06	WG850546
Phenanthrene	ND		0.00600	1	02/21/2016 09:06	WG850546
Pyrene	ND		0.00600	1	02/21/2016 09:06	WG850546
1-Methylnaphthalene	ND		0.0200	1	02/21/2016 09:06	WG850546
2-Methylnaphthalene	ND		0.0200	1	02/21/2016 09:06	WG850546
2-Chloronaphthalene	ND		0.0200	1	02/21/2016 09:06	WG850546
(S) <i>p</i> -Terphenyl-d14	64.0		32.2-131		02/21/2016 09:06	WG850546
(S) <i>Nitrobenzene-d5</i>	80.7		22.1-146		02/21/2016 09:06	WG850546
(S) <i>2</i> -Fluorobiphenyl	80.5		40.6-122		02/21/2016 09:06	WG850546



[L818528-01](#)

L818510-02 Original Sample (OS) • Duplicate (DUP)

(OS) 02/20/16 11:30 • (DUP) 02/20/16 11:30

Analyte	Original Result mV	DUP Result mV	Dilution	DUP RPD %	<u>DUP Qualifier</u>	DUP RPD Limits %
ORP	616	626	1	1.61		20

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

(LCS) 02/20/16 11:30 • (LCSD) 02/20/16 11:30

Analyte	Spike Amount mV	LCS Result mV	LCSD Result mV	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
ORP	100	109	106	109	106	90.0-110			2.79	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) 02/20/16 08:42

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Chromium,Hexavalent	ND		2.00

L818528-01 Original Sample (OS) • Duplicate (DUP)

(OS) 02/20/16 08:59 • (DUP) 02/20/16 08:59

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	ND	1	0.000		20

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

(LCS) 02/20/16 08:44 • (LCSD) 02/20/16 08:44

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 %
Chromium,Hexavalent	97.4	109	109	112	112	80.0-120			0.000	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L818469-01 Original Sample (OS) • Duplicate (DUP)

(OS) 02/19/16 11:24 • (DUP) 02/19/16 11:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	5.86	5.86	1	0.000	1	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

L818606-04 Original Sample (OS) • Duplicate (DUP)

(OS) 02/19/16 11:24 • (DUP) 02/19/16 11:24

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.22	6.22	1	0.000	1	

7 Gl

8 Al

9 Sc

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

(LCS) 02/19/16 11:24 • (LCSD) 02/19/16 11:24

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.72	6.73	6.74	100	100	98.5-102			0.148	1



Method Blank (MB)

(MB) 02/20/16 10:18

Analyte	MB Result umhos/cm	MB Qualifier	MB RDL umhos/cm
Specific Conductance	1.45		

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L818528-01 Original Sample (OS) • Duplicate (DUP)

(OS) 02/20/16 10:18 • (DUP) 02/20/16 10:18

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	982	1050	1	6.69		20

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

(LCS) 02/20/16 10:18 • (LCSD) 02/20/16 10:18

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	768	784	789	102	103	90.0-110			0.636	20



Method Blank (MB)

(MB) 02/23/16 08:36

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Mercury	ND		0.0200

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

(LCS) 02/23/16 08:38 • (LCSD) 02/23/16 08:41

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 %
Mercury	0.300	0.288	0.285	96	95	80-120			1	20

L818177-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/23/16 08:43 • (MS) 02/23/16 08:46 • (MSD) 02/23/16 08:49

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 %
Mercury	0.300	0.214	0.664	0.413	150	66	1	75-125	J5	J3 J6	47	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) 02/19/16 17:32

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Arsenic	ND		2.00
Barium	ND		0.500
Cadmium	ND		0.500
Chromium	ND		1.00
Copper	ND		2.00
Lead	ND		0.500
Nickel	ND		2.00
Selenium	ND		2.00
Silver	ND		1.00
Zinc	ND		5.00

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) 02/19/16 17:34 • (LCSD) 02/19/16 17:37

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 %
Arsenic	100	99.0	94.2	99	94	80-120			5	20
Barium	100	101	95.8	101	96	80-120			5	20
Cadmium	100	104	98.6	104	99	80-120			5	20
Chromium	100	97.5	93.5	98	94	80-120			4	20
Copper	100	101	95.7	101	96	80-120			6	20
Lead	100	104	98.9	104	99	80-120			5	20
Nickel	100	101	95.7	101	96	80-120			5	20
Selenium	100	104	98.3	104	98	80-120			5	20
Silver	100	95.4	90.9	95	91	80-120			5	20
Zinc	100	99.8	95.1	100	95	80-120			5	20

L818455-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/19/16 17:40 • (MS) 02/19/16 17:50 • (MSD) 02/19/16 17:53

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 %
Arsenic	100	1.41	102	108	100	107	1	75-125			6	20
Barium	100	28.0	116	122	88	94	1	75-125			6	20
Cadmium	100	0.210	104	111	104	110	1	75-125			6	20

L818455-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/19/16 17:40 • (MS) 02/19/16 17:50 • (MSD) 02/19/16 17:53

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 %
Chromium	100	3.88	93.6	100	90	96	1	75-125			7	20
Copper	100	6.19	111	112	104	106	1	75-125			2	20
Lead	100	20.5	119	133	99	112	1	75-125			11	20
Nickel	100	3.80	101	109	98	105	1	75-125			7	20
Selenium	100	0.486	102	108	101	107	1	75-125			6	20
Silver	100	ND	100	105	100	105	1	75-125			5	20
Zinc	100	90.6	187	186	96	96	1	75-125			0	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) 02/20/16 13:17

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) Low Fraction	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	100		59.0-128

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 02/20/16 12:14 • (LCSD) 02/20/16 12:35

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	4.29	4.19	78.0	76.2	63.5-137			2.24	20
(S) a,a,a-Trifluorotoluene(FID)				100	101	59.0-128				

L818528-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/20/16 19:13 • (MS) 02/20/16 22:22 • (MSD) 02/20/16 22:43

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	19.1	30.5	69.6	111	5	28.5-138		J3	45.9	23.6
(S) a,a,a-Trifluorotoluene(FID)					96.5	95.3		59.0-128				



Method Blank (MB)

(MB) 02/24/16 08:42

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Benzene	ND		0.00100
Ethylbenzene	ND		0.00100
Toluene	ND		0.00500
Xylenes, Total	ND		0.00300
(S) Toluene-d8	104		88.7-115
(S) Dibromofluoromethane	96.7		76.3-123
(S) a,a,a-Trifluorotoluene	105		87.2-117
(S) 4-Bromofluorobenzene	103		69.7-129

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) 02/24/16 06:41 • (LCSD) 02/24/16 07:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0223	0.0230	89.0	92.2	72.6-120			3.51	20
Ethylbenzene	0.0250	0.0255	0.0263	102	105	78.6-124			3.05	20
Toluene	0.0250	0.0237	0.0243	94.7	97.4	76.7-116			2.79	20
Xylenes, Total	0.0750	0.0758	0.0778	101	104	78.1-123			2.64	20
(S) Toluene-d8				102	103	88.7-115				
(S) Dibromofluoromethane				94.6	97.5	76.3-123				
(S) a,a,a-Trifluorotoluene				102	103	87.2-117				
(S) 4-Bromofluorobenzene				105	106	69.7-129				

L818242-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/24/16 15:18 • (MS) 02/24/16 17:19 • (MSD) 02/24/16 17:43

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	0.0250	0.000159	0.108	0.104	86.2	83.4	5	47.8-131			3.32	22.8
Ethylbenzene	0.0250	ND	0.122	0.122	97.4	97.9	5	44.8-135			0.470	26.9
Toluene	0.0250	0.000205	0.112	0.109	89.7	87.1	5	47.8-127			2.93	24.3
Xylenes, Total	0.0750	0.0602	0.357	0.357	79.1	79.1	5	42.7-135			0.000	26.6
(S) Toluene-d8					102	102		88.7-115				
(S) Dibromofluoromethane					94.4	94.9		76.3-123				
(S) a,a,a-Trifluorotoluene					102	103		87.2-117				
(S) 4-Bromofluorobenzene					103	107		69.7-129				



Method Blank (MB)

(MB) 02/23/16 21:29

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) High Fraction	ND		4.00
(S) o-Terphenyl	93.1		50.0-150

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) 02/23/16 21:40 • (LCSD) 02/23/16 21:52

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) High Fraction	60.0	58.3	56.1	97.2	93.5	50.0-150			3.87	20
(S) o-Terphenyl				107	104	50.0-150				

Method Blank (MB)

(MB) 02/21/16 03:22

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.00600
Acenaphthene	ND		0.00600
Acenaphthylene	ND		0.00600
Benzo(a)anthracene	ND		0.00600
Benzo(a)pyrene	ND		0.00600
Benzo(b)fluoranthene	ND		0.00600
Benzo(g,h,i)perylene	ND		0.00600
Benzo(k)fluoranthene	ND		0.00600
Chrysene	ND		0.00600
Dibenz(a,h)anthracene	ND		0.00600
Fluoranthene	ND		0.00600
Fluorene	ND		0.00600
Indeno(1,2,3-cd)pyrene	ND		0.00600
Naphthalene	ND		0.0200
Phenanthrene	ND		0.00600
Pyrene	ND		0.00600
1-Methylnaphthalene	ND		0.0200
2-Methylnaphthalene	ND		0.0200
2-Chloronaphthalene	ND		0.0200
(S) p-Terphenyl-d14	89.2		32.2-131
(S) Nitrobenzene-d5	92.2		22.1-146
(S) 2-Fluorobiphenyl	99.4		40.6-122

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 02/21/16 02:39 • (LCSD) 02/21/16 03:00

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 %
Anthracene	0.0800	0.0734	0.0709	91.8	88.6	50.3-130			3.50	20
Acenaphthene	0.0800	0.0748	0.0708	93.5	88.5	52.4-120			5.42	20
Acenaphthylene	0.0800	0.0745	0.0712	93.1	89.0	49.6-120			4.46	20
Benzo(a)anthracene	0.0800	0.0786	0.0770	98.2	96.2	46.7-125			2.02	20
Benzo(a)pyrene	0.0800	0.0667	0.0627	83.4	78.4	42.3-119			6.18	20
Benzo(b)fluoranthene	0.0800	0.0782	0.0754	97.8	94.2	43.6-124			3.71	20
Benzo(g,h,i)perylene	0.0800	0.0881	0.0838	110	105	45.1-132			4.93	20
Benzo(k)fluoranthene	0.0800	0.0705	0.0678	88.1	84.8	46.1-131			3.84	20

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

(LCS) 02/21/16 02:39 • (LCSD) 02/21/16 03:00

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 %
Chrysene	0.0800	0.0733	0.0712	91.6	89.0	49.5-131			2.90	20
Dibenz(a,h)anthracene	0.0800	0.0913	0.0868	114	109	44.8-133			5.02	20
Fluoranthene	0.0800	0.0842	0.0821	105	103	49.3-128			2.50	20
Fluorene	0.0800	0.0795	0.0762	99.4	95.2	50.6-121			4.31	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0880	0.0842	110	105	46.1-135			4.41	20
Naphthalene	0.0800	0.0733	0.0708	91.7	88.5	49.6-115			3.49	20
Phenanthrene	0.0800	0.0825	0.0789	103	98.6	48.8-121			4.44	20
Pyrene	0.0800	0.0850	0.0801	106	100	44.7-130			5.95	20
1-Methylnaphthalene	0.0800	0.0809	0.0801	101	100	50.6-122			1.04	20
2-Methylnaphthalene	0.0800	0.0805	0.0788	101	98.5	50.4-120			2.22	20
2-Chloronaphthalene	0.0800	0.0772	0.0735	96.5	91.9	53.9-121			4.92	20
(S) p-Terphenyl-d14				98.5	93.5	32.2-131				
(S) Nitrobenzene-d5				98.5	91.2	22.1-146				
(S) 2-Fluorobiphenyl				102	97.0	40.6-122				

L818358-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/21/16 06:57 • (MS) 02/21/16 07:19 • (MSD) 02/21/16 07:40

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 %
Anthracene	0.0800	ND	0.0579	0.0605	72.4	75.6	1	26.5-141			4.35	21.2
Acenaphthene	0.0800	ND	0.0630	0.0630	78.8	78.7	1	31.9-130			0.0700	20
Acenaphthylene	0.0800	ND	0.0644	0.0637	80.5	79.6	1	33.7-129			1.12	20
Benzo(a)anthracene	0.0800	ND	0.0576	0.0569	72.0	71.1	1	18.3-136			1.33	24.6
Benzo(a)pyrene	0.0800	ND	0.0563	0.0545	70.4	68.2	1	16.9-135			3.18	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0532	0.0498	66.5	62.2	1	10.0-134			6.62	30.9
Benzo(g,h,i)perylene	0.0800	0.000875	0.0592	0.0570	72.9	70.1	1	14.1-140			3.76	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0509	0.0514	63.6	64.2	1	18.2-138			0.980	25.6
Chrysene	0.0800	ND	0.0559	0.0546	69.9	68.2	1	17.1-145			2.35	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0639	0.0619	79.9	77.4	1	18.5-138			3.22	24.3
Fluoranthene	0.0800	ND	0.0652	0.0650	81.5	81.2	1	15.4-144			0.360	27.1
Fluorene	0.0800	ND	0.0651	0.0646	81.4	80.8	1	23.5-136			0.770	20
Indeno(1,2,3-cd)pyrene	0.0800	0.000603	0.0599	0.0579	74.1	71.7	1	14.5-142			3.29	25.8
Naphthalene	0.0800	0.00100	0.0693	0.0688	85.4	84.8	1	29.2-128			0.720	20
Phenanthrene	0.0800	0.00120	0.0681	0.0670	83.6	82.2	1	20.1-134			1.60	23.6
Pyrene	0.0800	0.000923	0.0603	0.0593	74.3	73.0	1	11.0-148			1.71	26.1

L818358-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/21/16 06:57 • (MS) 02/21/16 07:19 • (MSD) 02/21/16 07:40

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	0.00142	0.0754	0.0748	92.5	91.8	1	28.4-137			0.760	20
2-Methylnaphthalene	0.0800	0.00196	0.0754	0.0748	91.8	91.1	1	26.6-137			0.730	20
2-Chloronaphthalene	0.0800	ND	0.0672	0.0665	84.0	83.1	1	38.6-126			1.04	20
(S) p-Terphenyl-d14					70.8	64.5		32.2-131				
(S) Nitrobenzene-d5					89.5	87.0		22.1-146				
(S) 2-Fluorobiphenyl					80.7	80.1		40.6-122				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



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* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

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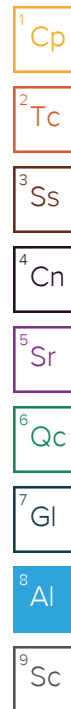
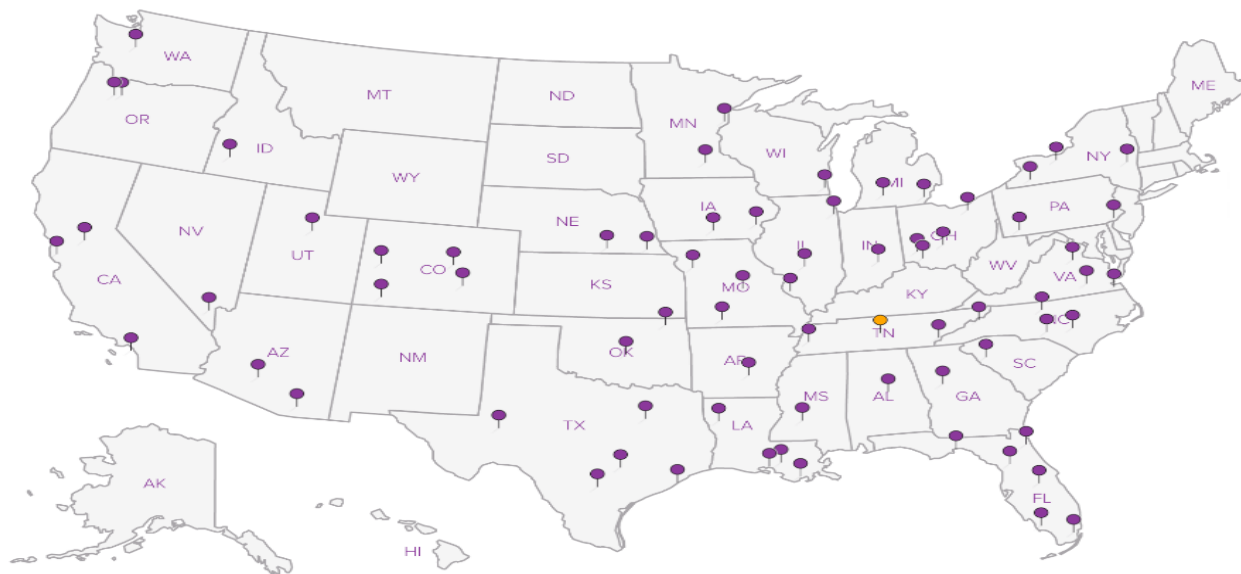
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Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:

HRL Compliance Solutions2385 F 1/2 Road
Grand Junction, CO 81505

Billing Information:

HRL Compliance Solutions
2385 F 1/2 Road
Grand Junction, CO 81505

Quote #: HRLCSCO- 042015S

Report to:

Kris Rowe

Email To:

krowe@hrlcomp.com

Project

Description: H&K - Mclin Access Rd - Spill - DG 3

City/State

Collected: Colorado

Phone: 970-243-3271

Client Project #

15-331

Lab Project #

Fax:

Collected by (print):

Kris Rowe

Site/Facility ID #

Mclin Access Road

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)

____ Same Day200%

____ Next Day100%

____ Two Day50%

____ Three Day25%

Date Results Needed

Standard 5 Day

Email? ____ No ☒ YesFAX? ☒ No ____ YesNo.
of
Cnts

Sample ID

Comp/Grab

Matrix *

Depth

Date

Time

DG 3 Sample Pt - Culvert

Grab

SS

6"

2/16/16

14:00

2

Outlet

Analysis / Container / Preservative

V8260BTEX

GRO / DRO

SV8270PAHSIM

MRCRA8 + Cu, Ni, Zn

CR6SS (includes pH) / CR3

SPCON / SAR

BTEX

GRO / DRO

PAH

910-1 Metals

910-1 Metals Cont

EC / SAR

Chain of Custody

Page ____ of ____



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 # 1818528

Table #

Acctnum: HRLCSCO

Template: T97067

Prelogin:

TSR: Shane Gambil

Cooler:

Shipped Via:

Rem./Contaminant

Sample # (lab only)

-0!

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

Remarks: Downgradient Sample Point (DG 3) - Outleft of culvert on north side of road

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

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: 22.0 °C Bottles Received: 2802

Date: 2-17-16 Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ____ Y ____ N ☒ NA

pH Checked:

NCF:

ATTACHMENT D: SUBSEQUENT SAMPLING

- Point of Origin 2
- Point of Origin 3

HRL Compliance Solutions- CO

Sample Delivery Group: L822222
Samples Received: 03/09/2016
Project Number: HRL 15-331
Description: H&K Trucking - Mclin Access Rd
Site: MCLIN ACCESS ROAD
Report To: Kris Rowe
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

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.



POINT OF ORIGIN #2 6IN L822222-01 Solid

Collected by
Kris Rowe

Collected date/time
03/08/16 00:00

Received date/time
03/09/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG855169	1	03/10/16 10:33	03/14/16 09:25	LTB
Calculated Results	WG855583	1	03/11/16 11:53	03/13/16 19:13	CCE
Mercury by Method 7471A	WG855104	1	03/10/16 15:23	03/11/16 08:44	TRB
Metals (ICP) by Method 6010B	WG855169	1	03/10/16 10:33	03/11/16 04:12	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG856286	1	03/16/16 09:55	03/16/16 18:15	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG855792	1	03/12/16 00:44	03/12/16 12:40	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG855912	5	03/12/16 14:27	03/12/16 16:45	JAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG855377	5	03/10/16 16:04	03/10/16 22:01	JAH
Wet Chemistry by Method 3060A/7196A	WG855570	1	03/11/16 12:26	03/14/16 09:25	AMC
Wet Chemistry by Method 9045D	WG855049	1	03/10/16 10:41	03/10/16 10:41	MAJ
Wet Chemistry by Method 9050AMod	WG855959	1	03/16/16 08:27	03/16/16 08:27	SJM

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

POINT OF ORIGIN #3 6IN L822222-02 Solid

Collected by
Kris Rowe

Collected date/time
03/08/16 00:00

Received date/time
03/09/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG855169	1	03/10/16 10:33	03/14/16 09:25	LTB
Calculated Results	WG855583	1	03/11/16 11:53	03/13/16 19:16	CCE
Mercury by Method 7471A	WG855104	1	03/10/16 15:23	03/11/16 08:47	TRB
Metals (ICP) by Method 6010B	WG855169	1	03/10/16 10:33	03/11/16 04:15	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG856286	1	03/16/16 09:55	03/16/16 18:37	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG855792	1	03/12/16 00:44	03/12/16 12:51	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG855919	5	03/13/16 23:34	03/14/16 01:52	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG855377	5	03/10/16 16:04	03/10/16 21:44	JAH
Wet Chemistry by Method 3060A/7196A	WG855570	1	03/11/16 12:26	03/14/16 09:25	AMC
Wet Chemistry by Method 9045D	WG855049	1	03/10/16 10:41	03/10/16 10:41	MAJ
Wet Chemistry by Method 9050AMod	WG855959	1	03/16/16 08:27	03/16/16 08:27	SJM



All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L822222-01	POINT OF ORIGIN #2 6IN	9045D
L822222-02	POINT OF ORIGIN #3 6IN	9045D

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.92		1	03/13/2016 19:13	WG855583

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	8.03		2.00	1	03/14/2016 09:25	WG855169

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	03/14/2016 09:25	WG855570

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.74		1	03/10/2016 10:41	WG855049

Sample Narrative:

9045D L822222-01 WG855049: 8.74 at 24.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	406		1	03/16/2016 08:27	WG855959

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	03/11/2016 08:44	WG855104

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.46		2.00	1	03/11/2016 04:12	WG855169
Barium	157		0.500	1	03/11/2016 04:12	WG855169
Cadmium	ND		0.500	1	03/11/2016 04:12	WG855169
Chromium	8.03		1.00	1	03/11/2016 04:12	WG855169
Copper	11.6		2.00	1	03/11/2016 04:12	WG855169
Lead	11.6		0.500	1	03/11/2016 04:12	WG855169
Nickel	11.6		2.00	1	03/11/2016 04:12	WG855169
Selenium	ND		2.00	1	03/11/2016 04:12	WG855169
Silver	ND		1.00	1	03/11/2016 04:12	WG855169
Zinc	43.8		5.00	1	03/11/2016 04:12	WG855169

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	7.40		0.500	5	03/12/2016 16:45	WG855912
(S) a,a,a-Trifluorotoluene(FID)	88.5		59.0-128		03/12/2016 16:45	WG855912

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



Collected date/time: 03/08/16 00:00

L822222

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	03/10/2016 22:01	WG855377
Toluene	ND		0.0250	5	03/10/2016 22:01	WG855377
Ethylbenzene	0.00684		0.00500	5	03/10/2016 22:01	WG855377
Total Xylenes	0.159		0.0150	5	03/10/2016 22:01	WG855377
(S) Toluene-d8	102		88.7-115		03/10/2016 22:01	WG855377
(S) Dibromofluoromethane	95.5		76.3-123		03/10/2016 22:01	WG855377
(S) a,a,a-Trifluorotoluene	107		87.2-117		03/10/2016 22:01	WG855377
(S) 4-Bromofluorobenzene	106		69.7-129		03/10/2016 22:01	WG855377

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	37.8		4.00	1	03/12/2016 12:40	WG855792
(S) o-Terphenyl	60.4		50.0-150		03/12/2016 12:40	WG855792

6 Qc

7 Gl

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	03/16/2016 18:15	WG856286
Acenaphthene	ND		0.00600	1	03/16/2016 18:15	WG856286
Acenaphthylene	ND		0.00600	1	03/16/2016 18:15	WG856286
Benzo(a)anthracene	ND		0.00600	1	03/16/2016 18:15	WG856286
Benzo(a)pyrene	ND		0.00600	1	03/16/2016 18:15	WG856286
Benzo(b)fluoranthene	ND		0.00600	1	03/16/2016 18:15	WG856286
Benzo(g,h,i)perylene	ND		0.00600	1	03/16/2016 18:15	WG856286
Benzo(k)fluoranthene	ND		0.00600	1	03/16/2016 18:15	WG856286
Chrysene	ND		0.00600	1	03/16/2016 18:15	WG856286
Dibenz(a,h)anthracene	ND		0.00600	1	03/16/2016 18:15	WG856286
Fluoranthene	ND		0.00600	1	03/16/2016 18:15	WG856286
Fluorene	ND		0.00600	1	03/16/2016 18:15	WG856286
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	03/16/2016 18:15	WG856286
Naphthalene	ND		0.0200	1	03/16/2016 18:15	WG856286
Phenanthrene	ND		0.00600	1	03/16/2016 18:15	WG856286
Pyrene	ND		0.00600	1	03/16/2016 18:15	WG856286
1-Methylnaphthalene	ND		0.0200	1	03/16/2016 18:15	WG856286
2-Methylnaphthalene	0.0218		0.0200	1	03/16/2016 18:15	WG856286
2-Chloronaphthalene	ND		0.0200	1	03/16/2016 18:15	WG856286
(S) p-Terphenyl-d14	56.8		32.2-131		03/16/2016 18:15	WG856286
(S) Nitrobenzene-d5	87.8		22.1-146		03/16/2016 18:15	WG856286
(S) 2-Fluorobiphenyl	74.6		40.6-122		03/16/2016 18:15	WG856286

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.51		1	03/13/2016 19:16	WG855583

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	9.47		2.00	1	03/14/2016 09:25	WG855169

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	03/14/2016 09:25	WG855570

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.34		1	03/10/2016 10:41	WG855049

Sample Narrative:

9045D L822222-02 WG855049: 8.34 at 24.1c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	263		1	03/16/2016 08:27	WG855959

Mercury by Method 7471A

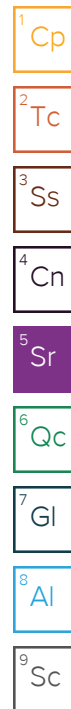
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	03/11/2016 08:47	WG855104

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	4.84		2.00	1	03/11/2016 04:15	WG855169
Barium	308		0.500	1	03/11/2016 04:15	WG855169
Cadmium	ND		0.500	1	03/11/2016 04:15	WG855169
Chromium	9.47		1.00	1	03/11/2016 04:15	WG855169
Copper	10.9		2.00	1	03/11/2016 04:15	WG855169
Lead	13.8		0.500	1	03/11/2016 04:15	WG855169
Nickel	12.6		2.00	1	03/11/2016 04:15	WG855169
Selenium	ND		2.00	1	03/11/2016 04:15	WG855169
Silver	ND		1.00	1	03/11/2016 04:15	WG855169
Zinc	45.4		5.00	1	03/11/2016 04:15	WG855169

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.500	5	03/14/2016 01:52	WG855919
(S) a,a,a-Trifluorotoluene(FID)	92.2		59.0-128		03/14/2016 01:52	WG855919





Collected date/time: 03/08/16 00:00

L822222

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	03/10/2016 21:44	WG855377
Toluene	ND		0.0250	5	03/10/2016 21:44	WG855377
Ethylbenzene	ND		0.00500	5	03/10/2016 21:44	WG855377
Total Xylenes	0.0235		0.0150	5	03/10/2016 21:44	WG855377
(S) Toluene-d8	99.8		88.7-115		03/10/2016 21:44	WG855377
(S) Dibromofluoromethane	96.2		76.3-123		03/10/2016 21:44	WG855377
(S) a,a,a-Trifluorotoluene	105		87.2-117		03/10/2016 21:44	WG855377
(S) 4-Bromofluorobenzene	103		69.7-129		03/10/2016 21:44	WG855377

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	62.5		4.00	1	03/12/2016 12:51	WG855792
(S) o-Terphenyl	66.0		50.0-150		03/12/2016 12:51	WG855792

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	03/16/2016 18:37	WG856286
Acenaphthene	ND		0.00600	1	03/16/2016 18:37	WG856286
Acenaphthylene	ND		0.00600	1	03/16/2016 18:37	WG856286
Benzo(a)anthracene	ND		0.00600	1	03/16/2016 18:37	WG856286
Benzo(a)pyrene	ND		0.00600	1	03/16/2016 18:37	WG856286
Benzo(b)fluoranthene	ND		0.00600	1	03/16/2016 18:37	WG856286
Benzo(g,h,i)perylene	ND		0.00600	1	03/16/2016 18:37	WG856286
Benzo(k)fluoranthene	ND		0.00600	1	03/16/2016 18:37	WG856286
Chrysene	ND		0.00600	1	03/16/2016 18:37	WG856286
Dibenz(a,h)anthracene	ND		0.00600	1	03/16/2016 18:37	WG856286
Fluoranthene	ND		0.00600	1	03/16/2016 18:37	WG856286
Fluorene	ND		0.00600	1	03/16/2016 18:37	WG856286
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	03/16/2016 18:37	WG856286
Naphthalene	ND		0.0200	1	03/16/2016 18:37	WG856286
Phenanthrene	ND		0.00600	1	03/16/2016 18:37	WG856286
Pyrene	ND		0.00600	1	03/16/2016 18:37	WG856286
1-Methylnaphthalene	ND		0.0200	1	03/16/2016 18:37	WG856286
2-Methylnaphthalene	ND		0.0200	1	03/16/2016 18:37	WG856286
2-Chloronaphthalene	ND		0.0200	1	03/16/2016 18:37	WG856286
(S) p-Terphenyl-d14	60.9		32.2-131		03/16/2016 18:37	WG856286
(S) Nitrobenzene-d5	92.9		22.1-146		03/16/2016 18:37	WG856286
(S) 2-Fluorobiphenyl	82.9		40.6-122		03/16/2016 18:37	WG856286

Method Blank (MB)

(MB) 03/14/16 09:21

	MB Result	MB Qualifier	MB RDL
Analyte	mg/kg		mg/kg
Chromium,Hexavalent	ND		2.00

L822222-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/14/16 09:25 • (DUP) 03/14/16 09:25

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	ND	1	0.000		20

L823038-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/14/16 09:31 • (DUP) 03/14/16 09:31

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Chromium,Hexavalent	ND	ND	1	2.00		20

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

(LCS) 03/14/16 09:22 • (LCSD) 03/14/16 09:22

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Chromium,Hexavalent	56.9	54.4	54.4	96.0	96.0	80.0-120			0.000	20

L822222-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/14/16 09:25 • (MS) 03/14/16 09:25 • (MSD) 03/14/16 09:25

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chromium,Hexavalent	20.0	ND	19.9	19.8	99.0	99.0	1	75.0-125			0.000	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc



L822204-02 Original Sample (OS) • Duplicate (DUP)

(OS) 03/10/16 10:41 • (DUP) 03/10/16 10:41

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	11.8	11.9	1	0.423	1	

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

L822279-07 Original Sample (OS) • Duplicate (DUP)

(OS) 03/10/16 10:41 • (DUP) 03/10/16 10:41

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.25	7.26	1	0.138	1	

7
Gl

8
Al

9
Sc

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

(LCS) 03/10/16 10:41 • (LCSD) 03/10/16 10:41

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.31	6.29	6.30	99.7	99.8	98.5-102			0.159	1



Method Blank (MB)

(MB) 03/16/16 08:27

Analyte	MB Result umhos/cm	MB Qualifier	MB RDL umhos/cm
Specific Conductance	1.90		

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L822222-01 Original Sample (OS) • Duplicate (DUP)

(OS) 03/16/16 08:27 • (DUP) 03/16/16 08:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	406	406	1	0.000		20

L823003-05 Original Sample (OS) • Duplicate (DUP)

(OS) 03/16/16 08:27 • (DUP) 03/16/16 08:27

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	88.3	88.1	1	0.227		20

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

(LCS) 03/16/16 08:27 • (LCSD) 03/16/16 08:27

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	915	944	939	103	103	90.0-110			0.531	20

Method Blank (MB)

(MB) 03/11/16 08:09

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Mercury	ND		0.0200

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

(LCS) 03/11/16 08:12 • (LCSD) 03/11/16 08:15

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 %
Mercury	0.300	0.282	0.279	94	93	80-120			1	20

L822188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/11/16 08:18 • (MS) 03/11/16 08:20 • (MSD) 03/11/16 08:23

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 %
Mercury	0.300	0.0232	0.305	0.364	94	114	1	75-125			18	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) 03/11/16 03:40

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Arsenic	ND		2.00
Barium	ND		0.500
Cadmium	ND		0.500
Chromium	ND		1.00
Copper	ND		2.00
Lead	ND		0.500
Nickel	ND		2.00
Selenium	ND		2.00
Silver	ND		1.00
Zinc	ND		5.00

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) 03/11/16 03:43 • (LCSD) 03/11/16 03:45

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 %
Arsenic	100	96.8	98.9	97	99	80-120			2	20
Barium	100	99.8	102	100	102	80-120			2	20
Cadmium	100	100	103	100	103	80-120			2	20
Chromium	100	95.3	97.6	95	98	80-120			2	20
Copper	100	98.2	101	98	101	80-120			2	20
Lead	100	101	103	101	103	80-120			3	20
Nickel	100	97.4	100	97	100	80-120			3	20
Selenium	100	100	102	100	102	80-120			2	20
Silver	100	93.3	95.8	93	96	80-120			3	20
Zinc	100	98.0	100	98	100	80-120			2	20

L822313-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/11/16 03:48 • (MS) 03/11/16 03:57 • (MSD) 03/11/16 04:00

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 %
Arsenic	100	4.92	97.9	97.1	93	92	1	75-125			1	20
Barium	100	118	210	210	92	92	1	75-125			0	20
Cadmium	100	0.186	99.5	98.1	99	98	1	75-125			1	20



[L822222-01.02](#)

L822313-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/11/16 03:48 • (MS) 03/11/16 03:57 • (MSD) 03/11/16 04:00

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Chromium	100	14.3	105	104	90	90	1	75-125			1	20
Copper	100	18.8	118	115	99	97	1	75-125			2	20
Lead	100	14.4	117	117	103	102	1	75-125			1	20
Nickel	100	15.6	117	116	101	100	1	75-125			1	20
Selenium	100	0.644	97.1	95.8	96	95	1	75-125			1	20
Silver	100	ND	93.3	92.0	93	92	1	75-125			1	20
Zinc	100	81.8	173	173	91	91	1	75-125			0	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) 03/12/16 13:32

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) Low Fraction	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	95.6		59.0-128

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 03/12/16 12:18 • (LCSD) 03/12/16 12:43

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	6.97	6.83	127	124	63.5-137			2.01	20
(S) a,a,a-Trifluorotoluene(FID)				106	107	59.0-128				

L822222-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/12/16 16:45 • (MS) 03/12/16 17:10 • (MSD) 03/12/16 17:34

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	7.40	30.9	32.7	85.3	92.1	5	28.5-138			5.89	23.6
(S) a,a,a-Trifluorotoluene(FID)					97.9	96.9		59.0-128				



Method Blank (MB)

(MB) 03/13/16 23:39

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) Low Fraction	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	93.7		59.0-128

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 03/13/16 22:32 • (LCSD) 03/13/16 22:55

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	5.38	5.41	97.9	98.4	63.5-137			0.560	20
(S) a,a,a-Trifluorotoluene(FID)				102	103	59.0-128				

L822265-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/14/16 02:14 • (MS) 03/14/16 00:45 • (MSD) 03/14/16 01:08

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	0.159	13.9	12.8	50.0	46.1	5	28.5-138			7.97	23.6
(S) a,a,a-Trifluorotoluene(FID)					94.4	93.8		59.0-128				



Method Blank (MB)

(MB) 03/10/16 16:17

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Benzene	ND		0.00100
Ethylbenzene	ND		0.00100
Toluene	ND		0.00500
Xylenes, Total	ND		0.00300
(S) Toluene-d8	97.9		88.7-115
(S) Dibromofluoromethane	95.7		76.3-123
(S) a,a,a-Trifluorotoluene	102		87.2-117
(S) 4-Bromofluorobenzene	102		69.7-129

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) 03/10/16 14:47 • (LCSD) 03/10/16 15:04

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	0.0250	0.0230	0.0217	92.0	87.0	72.6-120			5.67	20
Ethylbenzene	0.0250	0.0265	0.0255	106	102	78.6-124			3.97	20
Toluene	0.0250	0.0260	0.0246	104	98.5	76.7-116			5.55	20
Xylenes, Total	0.0750	0.0796	0.0778	106	104	78.1-123			2.39	20
(S) Toluene-d8				98.0	96.1	88.7-115				
(S) Dibromofluoromethane				95.5	95.1	76.3-123				
(S) a,a,a-Trifluorotoluene				102	101	87.2-117				
(S) 4-Bromofluorobenzene				96.9	97.7	69.7-129				

L822222-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/10/16 21:44 • (MS) 03/10/16 20:53 • (MSD) 03/10/16 21:10

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	0.0250	0.00135	0.102	0.109	80.8	86.5	5	47.8-131			6.64	22.8
Ethylbenzene	0.0250	0.00130	0.114	0.118	90.3	93.2	5	44.8-135			3.12	26.9
Toluene	0.0250	0.0104	0.138	0.158	102	118	5	47.8-127			13.2	24.3
Xylenes, Total	0.0750	0.0235	0.376	0.401	94.1	101	5	42.7-135			6.25	26.6
(S) Toluene-d8					99.1	98.8		88.7-115				
(S) Dibromofluoromethane					96.4	97.2		76.3-123				
(S) a,a,a-Trifluorotoluene					104	102		87.2-117				
(S) 4-Bromofluorobenzene					100	99.7		69.7-129				



Method Blank (MB)

(MB) 03/12/16 09:10

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) High Fraction	ND		4.00
(S) o-Terphenyl	78.7		50.0-150

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

(LCS) 03/12/16 09:22 • (LCSD) 03/12/16 09:33

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 %
TPH (GC/FID) High Fraction	60.0	48.3	46.3	80.5	77.1	50.0-150			4.31	20
(S) o-Terphenyl				82.7	77.9	50.0-150				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) 03/16/16 13:32

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.00600
Acenaphthene	ND		0.00600
Acenaphthylene	ND		0.00600
Benzo(a)anthracene	ND		0.00600
Benzo(a)pyrene	ND		0.00600
Benzo(b)fluoranthene	ND		0.00600
Benzo(g,h,i)perylene	ND		0.00600
Benzo(k)fluoranthene	ND		0.00600
Chrysene	ND		0.00600
Dibenz(a,h)anthracene	ND		0.00600
Fluoranthene	ND		0.00600
Fluorene	ND		0.00600
Indeno(1,2,3-cd)pyrene	ND		0.00600
Naphthalene	ND		0.0200
Phenanthrene	ND		0.00600
Pyrene	ND		0.00600
1-Methylnaphthalene	ND		0.0200
2-Methylnaphthalene	ND		0.0200
2-Chloronaphthalene	ND		0.0200
(S) p-Terphenyl-d14	77.3		32.2-131
(S) Nitrobenzene-d5	79.3		22.1-146
(S) 2-Fluorobiphenyl	90.5		40.6-122

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 03/16/16 12:49 • (LCSD) 03/16/16 13:11

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 %
Anthracene	0.0800	0.0629	0.0637	78.6	79.6	50.3-130			1.26	20
Acenaphthene	0.0800	0.0633	0.0634	79.2	79.2	52.4-120			0.0800	20
Acenaphthylene	0.0800	0.0646	0.0646	80.8	80.8	49.6-120			0.0500	20
Benzo(a)anthracene	0.0800	0.0613	0.0614	76.6	76.7	46.7-125			0.190	20
Benzo(a)pyrene	0.0800	0.0577	0.0591	72.2	73.9	42.3-119			2.38	20
Benzo(b)fluoranthene	0.0800	0.0541	0.0555	67.6	69.3	43.6-124			2.50	20
Benzo(g,h,i)perylene	0.0800	0.0561	0.0562	70.1	70.2	45.1-132			0.0600	20
Benzo(k)fluoranthene	0.0800	0.0694	0.0694	86.7	86.8	46.1-131			0.0800	20

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

(LCS) 03/16/16 12:49 • (LCSD) 03/16/16 13:11

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 %
Chrysene	0.0800	0.0650	0.0626	81.3	78.3	49.5-131			3.73	20
Dibenz(a,h)anthracene	0.0800	0.0628	0.0638	78.5	79.7	44.8-133			1.49	20
Fluoranthene	0.0800	0.0620	0.0645	77.5	80.6	49.3-128			3.95	20
Fluorene	0.0800	0.0559	0.0542	69.9	67.7	50.6-121			3.09	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0630	0.0632	78.8	79.0	46.1-135			0.320	20
Naphthalene	0.0800	0.0609	0.0596	76.1	74.5	49.6-115			2.18	20
Phenanthrene	0.0800	0.0568	0.0585	71.0	73.2	48.8-121			3.07	20
Pyrene	0.0800	0.0679	0.0680	84.9	85.0	44.7-130			0.0900	20
1-Methylnaphthalene	0.0800	0.0609	0.0606	76.1	75.8	50.6-122			0.360	20
2-Methylnaphthalene	0.0800	0.0621	0.0608	77.6	76.0	50.4-120			2.02	20
2-Chloronaphthalene	0.0800	0.0661	0.0657	82.7	82.1	53.9-121			0.700	20
(S) p-Terphenyl-d14				77.9	74.5	32.2-131				
(S) Nitrobenzene-d5				86.4	84.1	22.1-146				
(S) 2-Fluorobiphenyl				91.7	89.9	40.6-122				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L822298-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/16/16 14:38 • (MS) 03/16/16 14:59 • (MSD) 03/16/16 15:21

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 %
Anthracene	0.0800	ND	0.0605	0.0594	75.6	74.3	1	26.5-141			1.81	21.2
Acenaphthene	0.0800	ND	0.0600	0.0594	75.0	74.3	1	31.9-130			1.06	20
Acenaphthylene	0.0800	ND	0.0618	0.0617	77.2	77.2	1	33.7-129			0.0300	20
Benzo(a)anthracene	0.0800	ND	0.0549	0.0540	68.7	67.5	1	18.3-136			1.71	24.6
Benzo(a)pyrene	0.0800	ND	0.0624	0.0616	78.1	76.9	1	16.9-135			1.44	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0531	0.0534	66.3	66.7	1	10.0-134			0.540	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0491	0.0481	61.4	60.2	1	14.1-140			2.04	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0584	0.0552	72.9	68.9	1	18.2-138			5.63	25.6
Chrysene	0.0800	ND	0.0576	0.0568	72.0	71.0	1	17.1-145			1.48	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0572	0.0566	71.5	70.7	1	18.5-138			1.09	24.3
Fluoranthene	0.0800	ND	0.0577	0.0571	72.1	71.4	1	15.4-144			1.04	27.1
Fluorene	0.0800	ND	0.0510	0.0505	63.7	63.1	1	23.5-136			1.03	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0557	0.0544	69.6	68.0	1	14.5-142			2.37	25.8
Naphthalene	0.0800	ND	0.0579	0.0584	72.3	73.0	1	29.2-128			0.850	20
Phenanthrene	0.0800	ND	0.0524	0.0521	65.4	65.1	1	20.1-134			0.550	23.6
Pyrene	0.0800	ND	0.0616	0.0600	77.1	75.0	1	11.0-148			2.71	26.1

L822298-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/16/16 14:38 • (MS) 03/16/16 14:59 • (MSD) 03/16/16 15:21

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	ND	0.0588	0.0594	73.5	74.2	1	28.4-137			0.920	20
2-Methylnaphthalene	0.0800	ND	0.0593	0.0588	74.1	73.5	1	26.6-137			0.730	20
2-Chloronaphthalene	0.0800	ND	0.0626	0.0625	78.2	78.1	1	38.6-126			0.150	20
(S) p-Terphenyl-d14					70.3	69.5		32.2-131				
(S) Nitrobenzene-d5					84.1	84.5		22.1-146				
(S) 2-Fluorobiphenyl					87.4	88.2		40.6-122				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
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The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

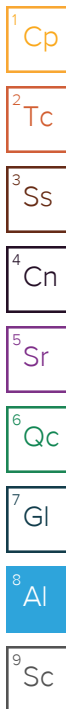
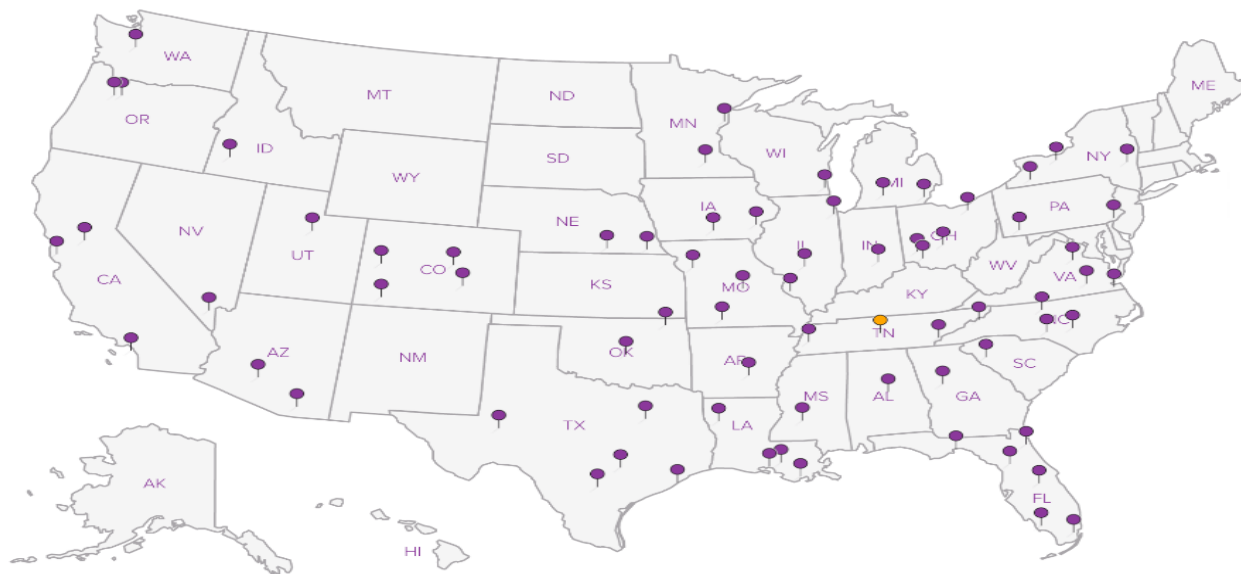
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



822222

Analyze the following parameters first;

- DRO
- GRO
- BTEX

If DRO, GRO, and BTEX are below COGCC Table 910-1 (see attached table), then complete the remaining analysis;

- 910-1 Metals
- PAH
- SAR/EC/pH

If DRO, GRO, & BTEX exceed threshold outlined in the attached table, do NOT complete the additional analysis.

Any questions, please call Kris Rowe @ 970-261-2016.

Thank you,

Kris

Table 910-1
CONCENTRATION LEVELS¹

Contaminant of Concern	Concentrations
Organic Compounds in Soil	
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg (ORO + GRO)
Benzene	0.17 mg/kg ²
Toluene	85 mg/kg ²
Ethylbenzene	100 mg/kg ²
Xylenes (total)	175 mg/kg ²
Acenaphthene	1,000 mg/kg ²
Anthracene	1,000 mg/kg ²
Benz(a)anthracene	0.22 mg/kg ²
Benzo(b)fluoranthene	0.22 mg/kg ²
Benzo(k)fluoranthene	2.2 mg/kg ²
Benzo(a)pyrene	0.022 mg/kg ²
Chrysene	22 mg/kg ²
Dibenzo(a,h)anthracene	0.022 mg/kg ²
Fluoranthene	1,000 mg/kg ²
Fluorene	1,000 mg/kg ²
Indeno(1,2,3,c,d)pyrene	0.22 mg/kg ²
Naphthalene	23 mg/kg ²
Pyrene	1,000 mg/kg ²

Organic Compounds in Ground Water	
Benzene	5 µg/l ³
Toluene	560 to 1,000 µg/l ³
Ethylbenzene	700 µg/l ³
Xylenes (Total)	1,400 to 10,000 µg/l ^{3,4}
Inorganics in Soils	
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background
Sodium Adsorption Ratio (SAR)	<12 ⁵
pH	6-9
Inorganics in Ground Water	
Total Dissolved Solids (TDS)	<1.25 x background ³
Chlorides	<1.25 x background ³
Sulfates	<1.25 x background ³
Metals in Soils	
Arsenic	0.39 mg/kg ²
Barium (LDNR True Total Barium)	15,000 mg/kg ²
Boron (Hot Water Soluble)	2 mg/l ³
Cadmium	70 mg/kg ^{3,5}
Chromium (III)	120,000 mg/kg ²
Chromium (VI)	23 mg/kg ^{2,6}
Copper	3,100 mg/kg ²
Lead (inorganic)	400 mg/kg ²
Mercury	23 mg/kg ²
Nickel (soluble salts)	1,600 mg/kg ^{2,5}
Selenium	390 mg/kg ^{2,6}
Silver	390 mg/kg ²
Zinc	23,000 mg/kg ^{2,5}
Liquid Hydrocarbons in Soils and Ground Water	
Liquid hydrocarbons including condensate and oil	Below detection level

ATTACHMENT E: SUBSEQUENT SAMPLING

- DG 4
- DG 5

HRL Compliance Solutions- CO

Sample Delivery Group: L825210
Samples Received: 03/24/2016
Project Number: H&K-HRL-15-331
Description: H&K-Mclin Access Rd-Spill Drainage
Site: DG 4 & DG 5
Report To: Kris Rowe
2385 F ½ Road
Grand Junction, CO 81505

Entire Report Reviewed By:



Shane Gambill

Technical Service Representative

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



¹Cp: Cover Page	1
²Tc: Table of Contents	2
³Ss: Sample Summary	3
⁴Cn: Case Narrative	4
⁵Sr: Sample Results	5
DG 4 6 IN L825210-01	5
DG 5 4 IN L825210-02	6
⁶Qc: Quality Control Summary	7
Volatile Organic Compounds (GC) by Method 8015D/GRO	7
Volatile Organic Compounds (GC/MS) by Method 8260B	8
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	9
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	10
⁷Gl: Glossary of Terms	13
⁸Al: Accreditations & Locations	14
⁹Sc: Chain of Custody	15



SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



DG 4 6 IN L825210-01 Solid

Collected by
Kris Rowe

Collected date/time
03/23/16 10:15

Received date/time
03/24/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG859133	1	03/25/16 13:29	03/28/16 09:02	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG859451	1	03/25/16 23:07	03/26/16 17:57	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG859652	5	03/27/16 18:31	03/28/16 05:54	ACG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG859238	5	03/26/16 22:05	03/27/16 23:38	DWR

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

DG 5 4 IN L825210-02 Solid

Collected by
Kris Rowe

Collected date/time
03/23/16 10:25

Received date/time
03/24/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG859133	1	03/25/16 13:29	03/28/16 10:06	KMP
Semi-Volatile Organic Compounds (GC) by Method 3546/DRO	WG859451	1	03/25/16 23:07	03/26/16 18:09	DMG
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG859652	5	03/27/16 18:31	03/28/16 06:18	ACG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG859238	5	03/26/16 22:05	03/27/16 23:56	DWR

¹⁰ Mn

¹¹ Fe

¹² Ni

¹³ Cu

¹⁴ Zn

¹⁵ Pb

¹⁶ Cd

¹⁷ Hg

¹⁸ As

¹⁹ Se

²⁰ Cr

²¹ Co

²² Mo

²³ U

²⁴ V

²⁵ Ti



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Shane Gambill
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.500	5	03/28/2016 05:54	WG859652
(S) a,a,a-Trifluorotoluene(FID)	109		59.0-128		03/28/2016 05:54	WG859652

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	03/27/2016 23:38	WG859238
Toluene	ND		0.0250	5	03/27/2016 23:38	WG859238
Ethylbenzene	ND		0.00500	5	03/27/2016 23:38	WG859238
Total Xylenes	ND		0.0150	5	03/27/2016 23:38	WG859238
(S) Toluene-d8	105		88.7-115		03/27/2016 23:38	WG859238
(S) Dibromofluoromethane	99.9		76.3-123		03/27/2016 23:38	WG859238
(S) a,a,a-Trifluorotoluene	118	<u>J1</u>	87.2-117		03/27/2016 23:38	WG859238
(S) 4-Bromofluorobenzene	107		69.7-129		03/27/2016 23:38	WG859238

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/26/2016 17:57	WG859451
(S) o-Terphenyl	81.2		50.0-150		03/26/2016 17:57	WG859451

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	03/28/2016 09:02	WG859133
Acenaphthene	ND		0.00600	1	03/28/2016 09:02	WG859133
Acenaphthylene	ND		0.00600	1	03/28/2016 09:02	WG859133
Benzo(a)anthracene	ND		0.00600	1	03/28/2016 09:02	WG859133
Benzo(a)pyrene	ND		0.00600	1	03/28/2016 09:02	WG859133
Benzo(b)fluoranthene	ND		0.00600	1	03/28/2016 09:02	WG859133
Benzo(g,h,i)perylene	ND		0.00600	1	03/28/2016 09:02	WG859133
Benzo(k)fluoranthene	ND		0.00600	1	03/28/2016 09:02	WG859133
Chrysene	ND		0.00600	1	03/28/2016 09:02	WG859133
Dibenz(a,h)anthracene	ND		0.00600	1	03/28/2016 09:02	WG859133
Fluoranthene	ND		0.00600	1	03/28/2016 09:02	WG859133
Fluorene	ND		0.00600	1	03/28/2016 09:02	WG859133
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	03/28/2016 09:02	WG859133
Naphthalene	ND		0.0200	1	03/28/2016 09:02	WG859133
Phenanthrene	ND		0.00600	1	03/28/2016 09:02	WG859133
Pyrene	ND		0.00600	1	03/28/2016 09:02	WG859133
1-Methylnaphthalene	ND		0.0200	1	03/28/2016 09:02	WG859133
2-Methylnaphthalene	ND		0.0200	1	03/28/2016 09:02	WG859133
2-Chloronaphthalene	ND		0.0200	1	03/28/2016 09:02	WG859133
(S) p-Terphenyl-d14	62.0		32.2-131		03/28/2016 09:02	WG859133
(S) Nitrobenzene-d5	75.3		22.1-146		03/28/2016 09:02	WG859133
(S) 2-Fluorobiphenyl	78.9		40.6-122		03/28/2016 09:02	WG859133

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.500	5	03/28/2016 06:18	WG859652
(S) a,a,a-Trifluorotoluene(FID)	108		59.0-128		03/28/2016 06:18	WG859652

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00500	5	03/27/2016 23:56	WG859238
Toluene	ND		0.0250	5	03/27/2016 23:56	WG859238
Ethylbenzene	ND		0.00500	5	03/27/2016 23:56	WG859238
Total Xylenes	ND		0.0150	5	03/27/2016 23:56	WG859238
(S) Toluene-d8	103		88.7-115		03/27/2016 23:56	WG859238
(S) Dibromofluoromethane	98.0		76.3-123		03/27/2016 23:56	WG859238
(S) a,a,a-Trifluorotoluene	112		87.2-117		03/27/2016 23:56	WG859238
(S) 4-Bromofluorobenzene	111		69.7-129		03/27/2016 23:56	WG859238

Semi-Volatile Organic Compounds (GC) by Method 3546/DRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.00	1	03/26/2016 18:09	WG859451
(S) o-Terphenyl	79.5		50.0-150		03/26/2016 18:09	WG859451

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	03/28/2016 10:06	WG859133
Acenaphthene	ND		0.00600	1	03/28/2016 10:06	WG859133
Acenaphthylene	ND		0.00600	1	03/28/2016 10:06	WG859133
Benzo(a)anthracene	ND		0.00600	1	03/28/2016 10:06	WG859133
Benzo(a)pyrene	ND		0.00600	1	03/28/2016 10:06	WG859133
Benzo(b)fluoranthene	ND	J3	0.00600	1	03/28/2016 10:06	WG859133
Benzo(g,h,i)perylene	ND	J3	0.00600	1	03/28/2016 10:06	WG859133
Benzo(k)fluoranthene	ND		0.00600	1	03/28/2016 10:06	WG859133
Chrysene	ND		0.00600	1	03/28/2016 10:06	WG859133
Dibenz(a,h)anthracene	ND	J3	0.00600	1	03/28/2016 10:06	WG859133
Fluoranthene	ND		0.00600	1	03/28/2016 10:06	WG859133
Fluorene	ND		0.00600	1	03/28/2016 10:06	WG859133
Indeno(1,2,3-cd)pyrene	ND	J3	0.00600	1	03/28/2016 10:06	WG859133
Naphthalene	ND		0.0200	1	03/28/2016 10:06	WG859133
Phenanthrene	ND		0.00600	1	03/28/2016 10:06	WG859133
Pyrene	ND		0.00600	1	03/28/2016 10:06	WG859133
1-Methylnaphthalene	ND		0.0200	1	03/28/2016 10:06	WG859133
2-Methylnaphthalene	ND		0.0200	1	03/28/2016 10:06	WG859133
2-Chloronaphthalene	ND		0.0200	1	03/28/2016 10:06	WG859133
(S) p-Terphenyl-d14	49.8		32.2-131		03/28/2016 10:06	WG859133
(S) Nitrobenzene-d5	72.7		22.1-146		03/28/2016 10:06	WG859133
(S) 2-Fluorobiphenyl	75.2		40.6-122		03/28/2016 10:06	WG859133

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) 03/27/16 21:08

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) Low Fraction	ND		0.100
(S) a,a,a-Trifluorotoluene(FID)	109		59.0-128

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 03/27/16 19:57 • (LCSD) 03/27/16 20:21

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	4.59	4.68	83.5	85.1	63.5-137			1.93	20
(S) a,a,a-Trifluorotoluene(FID)				106	106	59.0-128				

L824855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/28/16 00:21 • (MS) 03/27/16 21:56 • (MSD) 03/27/16 22:20

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	0.434	41.5	40.0	51.5	49.6	14.5	28.5-138			3.71	23.6
(S) a,a,a-Trifluorotoluene(FID)					108	108		59.0-128				



Method Blank (MB)

(MB) 03/27/16 22:11

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Benzene	ND		0.00100
Ethylbenzene	ND		0.00100
Toluene	ND		0.00500
Xylenes, Total	ND		0.00300
(S) Toluene-d8	101		88.7-115
(S) Dibromofluoromethane	101		76.3-123
(S) a,a,a-Trifluorotoluene	109		87.2-117
(S) 4-Bromofluorobenzene	106		69.7-129

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) 03/27/16 21:01 • (LCSD) 03/27/16 21:19

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	0.0250	0.0229	0.0233	91.6	93.2	72.6-120			1.76	20
Ethylbenzene	0.0250	0.0277	0.0282	111	113	78.6-124			1.90	20
Toluene	0.0250	0.0238	0.0244	95.0	97.5	76.7-116			2.56	20
Xylenes, Total	0.0750	0.0820	0.0825	109	110	78.1-123			0.670	20
(S) Toluene-d8				99.4	102	88.7-115				
(S) Dibromofluoromethane				98.0	101	76.3-123				
(S) a,a,a-Trifluorotoluene				111	113	87.2-117				
(S) 4-Bromofluorobenzene				99.3	101	69.7-129				

L824387-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/28/16 01:24 • (MS) 03/27/16 22:46 • (MSD) 03/27/16 23:03

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	0.0250	ND	0.112	0.106	89.6	84.8	5	47.8-131			5.46	22.8
Ethylbenzene	0.0250	0.00135	0.129	0.109	102	86.4	5	44.8-135			16.1	26.9
Toluene	0.0250	0.00161	0.118	0.107	93.2	84.6	5	47.8-127			9.49	24.3
Xylenes, Total	0.0750	0.0123	0.352	0.291	90.6	74.2	5	42.7-135			19.1	26.6
(S) Toluene-d8					109	105		88.7-115				
(S) Dibromofluoromethane					99.6	97.9		76.3-123				
(S) a,a,a-Trifluorotoluene					121	114		87.2-117	J1			
(S) 4-Bromofluorobenzene					106	101		69.7-129				



Method Blank (MB)

(MB) 03/26/16 10:53

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
TPH (GC/FID) High Fraction	ND		4.00
(S) o-Terphenyl	86.8		50.0-150

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) 03/26/16 11:04 • (LCSD) 03/26/16 11:15

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) High Fraction	60.0	53.8	54.0	89.7	90.0	50.0-150			0.380	20
(S) o-Terphenyl				91.1	83.2	50.0-150				

L824558-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/26/16 14:35 • (MS) 03/26/16 14:46 • (MSD) 03/26/16 14:58

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) High Fraction	60.0	1.47	58.0	55.0	94.2	89.2	1	50.0-150			5.36	20
(S) o-Terphenyl					89.4	86.1		50.0-150				



Method Blank (MB)

(MB) 03/28/16 04:19

Analyte	MB Result mg/kg	MB Qualifier	MB RDL mg/kg
Anthracene	ND		0.00600
Acenaphthene	ND		0.00600
Acenaphthylene	ND		0.00600
Benzo(a)anthracene	ND		0.00600
Benzo(a)pyrene	ND		0.00600
Benzo(b)fluoranthene	ND		0.00600
Benzo(g,h,i)perylene	ND		0.00600
Benzo(k)fluoranthene	ND		0.00600
Chrysene	ND		0.00600
Dibenz(a,h)anthracene	ND		0.00600
Fluoranthene	ND		0.00600
Fluorene	ND		0.00600
Indeno(1,2,3-cd)pyrene	ND		0.00600
Naphthalene	ND		0.0200
Phenanthrene	ND		0.00600
Pyrene	ND		0.00600
1-Methylnaphthalene	ND		0.0200
2-Methylnaphthalene	ND		0.0200
2-Chloronaphthalene	ND		0.0200
(S) p-Terphenyl-d14	57.2		32.2-131
(S) Nitrobenzene-d5	59.0		22.1-146
(S) 2-Fluorobiphenyl	65.3		40.6-122

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) 03/28/16 03:36 • (LCSD) 03/28/16 03:58

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 %
Anthracene	0.0800	0.0601	0.0622	75.1	77.7	50.3-130			3.41	20
Acenaphthene	0.0800	0.0596	0.0587	74.5	73.4	52.4-120			1.41	20
Acenaphthylene	0.0800	0.0631	0.0585	78.8	73.1	49.6-120			7.52	20
Benzo(a)anthracene	0.0800	0.0506	0.0496	63.3	62.0	46.7-125			2.07	20
Benzo(a)pyrene	0.0800	0.0498	0.0518	62.2	64.7	42.3-119			3.95	20
Benzo(b)fluoranthene	0.0800	0.0644	0.0438	80.5	54.8	43.6-124		J3	38.0	20
Benzo(g,h,i)perylene	0.0800	0.0681	0.0477	85.1	59.6	45.1-132		J3	35.2	20
Benzo(k)fluoranthene	0.0800	0.0739	0.0614	92.3	76.7	46.1-131			18.5	20

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

(LCS) 03/28/16 03:36 • (LCSD) 03/28/16 03:58

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 %
Chrysene	0.0800	0.0636	0.0630	79.5	78.7	49.5-131			0.980	20
Dibenz(a,h)anthracene	0.0800	0.0699	0.0549	87.4	68.7	44.8-133		J3	24.0	20
Fluoranthene	0.0800	0.0627	0.0604	78.4	75.5	49.3-128			3.76	20
Fluorene	0.0800	0.0512	0.0502	64.0	62.8	50.6-121			1.97	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0715	0.0571	89.4	71.3	46.1-135		J3	22.4	20
Naphthalene	0.0800	0.0563	0.0575	70.4	71.8	49.6-115			2.00	20
Phenanthrene	0.0800	0.0511	0.0516	63.9	64.5	48.8-121			0.860	20
Pyrene	0.0800	0.0619	0.0640	77.4	80.0	44.7-130			3.27	20
1-Methylnaphthalene	0.0800	0.0564	0.0540	70.6	67.6	50.6-122			4.35	20
2-Methylnaphthalene	0.0800	0.0563	0.0535	70.4	66.9	50.4-120			5.06	20
2-Chloronaphthalene	0.0800	0.0628	0.0567	78.5	70.9	53.9-121			10.3	20
(S) p-Terphenyl-d14				59.1	59.6	32.2-131				
(S) Nitrobenzene-d5				76.6	65.5	22.1-146				
(S) 2-Fluorobiphenyl				86.6	75.5	40.6-122				

L825210-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/28/16 09:02 • (MS) 03/28/16 09:23 • (MSD) 03/28/16 09:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0800	ND	0.0465	0.0501	58.1	62.7	1	26.5-141			7.51	21.2
Acenaphthene	0.0800	ND	0.0492	0.0509	61.5	63.7	1	31.9-130			3.40	20
Acenaphthylene	0.0800	ND	0.0523	0.0529	65.4	66.1	1	33.7-129			1.04	20
Benzo(a)anthracene	0.0800	ND	0.0330	0.0357	41.3	44.6	1	18.3-136			7.69	24.6
Benzo(a)pyrene	0.0800	ND	0.0387	0.0411	48.3	51.3	1	16.9-135			6.04	25.2
Benzo(b)fluoranthene	0.0800	ND	0.0272	0.0302	34.0	37.7	1	10.0-134			10.2	30.9
Benzo(g,h,i)perylene	0.0800	ND	0.0331	0.0357	41.4	44.6	1	14.1-140			7.58	25.5
Benzo(k)fluoranthene	0.0800	ND	0.0446	0.0465	55.7	58.2	1	18.2-138			4.30	25.6
Chrysene	0.0800	ND	0.0444	0.0469	55.5	58.6	1	17.1-145			5.48	24.2
Dibenz(a,h)anthracene	0.0800	ND	0.0360	0.0374	45.0	46.8	1	18.5-138			3.82	24.3
Fluoranthene	0.0800	ND	0.0389	0.0433	48.6	54.2	1	15.4-144			10.9	27.1
Fluorene	0.0800	ND	0.0389	0.0403	48.7	50.4	1	23.5-136			3.56	20
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0353	0.0375	44.1	46.9	1	14.5-142			6.21	25.8
Naphthalene	0.0800	0.00302	0.0538	0.0535	63.4	63.1	1	29.2-128			0.550	20
Phenanthrene	0.0800	ND	0.0372	0.0397	46.5	49.7	1	20.1-134			6.47	23.6
Pyrene	0.0800	ND	0.0426	0.0468	53.2	58.5	1	11.0-148			9.45	26.1

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L825210-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/28/16 09:02 • (MS) 03/28/16 09:23 • (MSD) 03/28/16 09:45

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
1-Methylnaphthalene	0.0800	ND	0.0477	0.0482	59.6	60.2	1	28.4-137			0.930	20
2-Methylnaphthalene	0.0800	ND	0.0468	0.0471	58.4	58.8	1	26.6-137			0.650	20
2-Chloronaphthalene	0.0800	ND	0.0501	0.0508	62.6	63.5	1	38.6-126			1.45	20
(S) p-Terphenyl-d14					57.2	56.3		32.2-131				
(S) Nitrobenzene-d5					69.6	70.1		22.1-146				
(S) 2-Fluorobiphenyl					74.1	73.8		40.6-122				

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

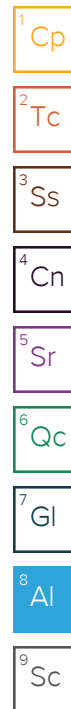
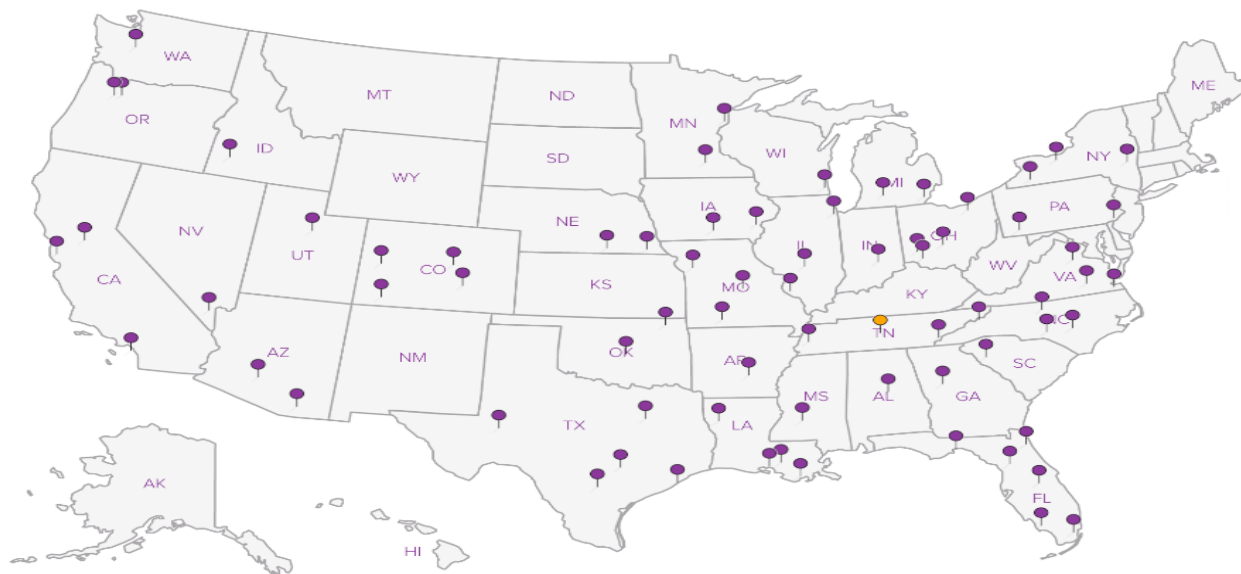
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

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

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



[illegible]

ATTACHMENT F: BACKGROUND DATA

- BKGD 1
- BKGD 2
- BKGD 3



14-Aug-2013

Mark Mumby
HRL Compliance Solutions
2385 F 1/2 Road
Grand Junction, CO 81505

Re: **Ursa Mclin C Well Pad 8/6/13**

Work Order: **1308253**

Dear Mark,

ALS Environmental received 3 samples on 07-Aug-2013 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston
Project Manager



Certificate No: MN 532786

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: HRL Compliance Solutions
Project: Ursa Mclin C Well Pad 8/6/13
Work Order: 1308253

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1308253-01	BKGD 1	Soil		8/6/2013 10:45	8/7/2013 09:30	<input type="checkbox"/>
1308253-02	BKGD 2	Soil		8/6/2013 10:50	8/7/2013 09:30	<input type="checkbox"/>
1308253-03	BKGD 3	Soil		8/6/2013 11:00	8/7/2013 09:30	<input type="checkbox"/>

Client: HRL Compliance Solutions
Project: Ursa Mclin C Well Pad 8/6/13
WorkOrder: 1308253

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	
s.u.	Standard Units

ALS Group USA, Corp

Date: 14-Aug-13

Client: HRL Compliance Solutions
Project: Ursa Mclin C Well Pad 8/6/13
Sample ID: BKGD 1
Collection Date: 8/6/2013 10:45 AM

Work Order: 1308253
Lab ID: 1308253-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS						
Arsenic	ND		SW6020A 2.0	mg/Kg-dry	Prep Date: 8/8/2013 5	Analyst: ML 8/9/2013 02:00 AM
SOLUBLE CATIONS FOR SAR						
Calcium	63		SW6020A 10	mg/L	Prep Date: 8/9/2013 20	Analyst: RH 8/9/2013 03:28 PM
Magnesium	18		4.0	mg/L	20	8/9/2013 03:28 PM
Sodium	4.9		4.0	mg/L	20	8/9/2013 03:28 PM
SODIUM ADSORPTION RATIO						
Sodium Adsorption Ratio	0.14		USDA H60 METHO 0.010	none	Prep Date: 8/9/2013 1	Analyst: RH 8/9/2013
ELECTRICAL CONDUCTIVITY (SAR)						
Electrical Conductivity @ Saturation	0.53		USDA H60 METHO 0.025	mmhos/cm @25	Prep Date: 8/9/2013 5	Analyst: JB 8/9/2013 03:15 PM
MOISTURE						
Moisture	3.4		A2540 G 0.050	% of sample	1	Analyst: BD 8/7/2013 03:25 PM
PH						
pH	7.7		SW9045D	s.u.	Prep Date: 8/7/2013 1	Analyst: CH 8/7/2013 03:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 14-Aug-13

Client: HRL Compliance Solutions
Project: Ursa Mclin C Well Pad 8/6/13
Sample ID: BKGD 2
Collection Date: 8/6/2013 10:50 AM

Work Order: 1308253
Lab ID: 1308253-02
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			SW6020A		Prep Date: 8/8/2013	Analyst: ML
Arsenic	1.7		1.7	mg/Kg-dry	5	8/9/2013 02:07 AM
MOISTURE			A2540 G			Analyst: BD
Moisture	5.0		0.050	% of sample	1	8/7/2013 03:25 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 14-Aug-13

Client: HRL Compliance Solutions
Project: Ursa Mclin C Well Pad 8/6/13
Sample ID: BKGD 3
Collection Date: 8/6/2013 11:00 AM

Work Order: 1308253
Lab ID: 1308253-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			SW6020A		Prep Date: 8/8/2013	Analyst: ML
Arsenic	ND		2.0	mg/Kg-dry	5	8/9/2013 02:32 AM
MOISTURE			A2540 G			Analyst: BD
Moisture	3.9		0.050	% of sample	1	8/7/2013 03:25 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 14-Aug-13

Client: HRL Compliance Solutions

Work Order: 1308253

Project: Ursa Mclin C Well Pad 8/6/13

QC BATCH REPORT

Batch ID: **50372** Instrument ID **ICPMS2** Method: **SW6020A** **(Dissolve)**

DUP		Sample ID: 1308253-01BDUP				Units: mg/L		Analysis Date: 8/9/2013 03:34 PM		
Client ID: BKGD 1		Run ID: ICPMS2_130809A				SeqNo: 2409927		Prep Date: 8/9/2013		DF: 20
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	67.1	10	0	0	0	0-0	62.96	6.37		
Magnesium	18.17	4.0	0	0	0	0-0	17.54	3.54		
Sodium	5.038	4.0	0	0	0	0-0	4.89	2.98		

The following samples were analyzed in this batch:

1308253-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions
Work Order: 1308253
Project: Ursa Mclin C Well Pad 8/6/13

QC BATCH REPORT

Batch ID: **50391** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK		Sample ID: MBLK-50391-50391				Units: mg/Kg		Analysis Date: 8/9/2013 01:48 AM		
Client ID:		Run ID: ICPMS1_130808A				SeqNo: 2408789		Prep Date: 8/8/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic ND 0.25

LCS		Sample ID: LCS-50391-50391				Units: mg/Kg		Analysis Date: 8/9/2013 01:54 AM		
Client ID:		Run ID: ICPMS1_130808A				SeqNo: 2408791		Prep Date: 8/8/2013		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 4.463 0.25 5 0 89.3 80-120 0

MS		Sample ID: 1308278-07AMS				Units: mg/Kg		Analysis Date: 8/9/2013 05:02 AM		
Client ID:		Run ID: ICPMS1_130808A				SeqNo: 2408836		Prep Date: 8/8/2013		DF: 4
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 9.149 1.4 7.163 2.526 92.5 75-125 0

MSD		Sample ID: 1308278-07AMSD				Units: mg/Kg		Analysis Date: 8/9/2013 05:08 AM		
Client ID:		Run ID: ICPMS1_130808A				SeqNo: 2408837		Prep Date: 8/8/2013		DF: 4
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 9.799 1.5 7.386 2.526 98.5 75-125 9.149 6.86 25

The following samples were analyzed in this batch:

1308253-01A	1308253-02A	1308253-03A
-------------	-------------	-------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions
Work Order: 1308253
Project: Ursa Mclin C Well Pad 8/6/13

QC BATCH REPORT

Batch ID: **50357** Instrument ID **WETCHEM** Method: **SW9045D**

LCS					Sample ID: LCS-50357-50357					Units: s.u.			Analysis Date: 8/7/2013 03:30 PM			
Client ID:					Run ID: WETCHEM_130807J					SeqNo: 2406192			Prep Date: 8/7/2013		DF: 1	
Analyte					Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH					4.34		0	4.4	0	98.6	90-110	0				

DUP					Sample ID: 1308246-05B DUP					Units: s.u.			Analysis Date: 8/7/2013 03:30 PM		
Client ID:					Run ID: WETCHEM_130807J					SeqNo: 2406197		Prep Date: 8/7/2013		DF: 1	
Analyte					Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH					8.52	0	0	0	0	0-0	8.48	0.471	20		

The following samples were analyzed in this batch:

1308253-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions
Work Order: 1308253
Project: Ursa Mclin C Well Pad 8/6/13

QC BATCH REPORT

Batch ID: **50372** Instrument ID **WETCHEM** Method: **USDA H60 Method**

DUP		Sample ID: 1308253-01B DUP				Units: mmhos/cm @25°C		Analysis Date: 8/9/2013 03:15 PM		
Client ID: BKGD 1		Run ID: WETCHEM_130809J				SeqNo: 2409688		Prep Date: 8/9/2013		DF: 5
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	0.5615	0.025	0	0	0		0.5285	6.06	50	

The following samples were analyzed in this batch:

1308253-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: HRL Compliance Solutions
Work Order: 1308253
Project: Ursa Mclin C Well Pad 8/6/13

QC BATCH REPORT

Batch ID: **R124830** Instrument ID **MOIST** Method: **A2540 G**

MBLK		Sample ID: WBLKS-R124830				Units: % of sample			Analysis Date: 8/7/2013 03:25 PM		
Client ID:		Run ID: MOIST_130807C				SeqNo: 2407362			Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

Moisture 0.03 0.050 J

LCS		Sample ID: LCS-R124830				Units: % of sample			Analysis Date: 8/7/2013 03:25 PM		
Client ID:		Run ID: MOIST_130807C				SeqNo: 2407361			Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

Moisture 100 0.050 100 0 100 99.5-100.5 0

DUP		Sample ID: 1308227-05B DUP				Units: % of sample			Analysis Date: 8/7/2013 03:25 PM		
Client ID:		Run ID: MOIST_130807C				SeqNo: 2407329			Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

Moisture 3.05 0.050 0 0 0 0-0 3.13 2.59 20

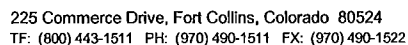
DUP		Sample ID: 1308227-17B DUP				Units: % of sample			Analysis Date: 8/7/2013 03:25 PM		
Client ID:		Run ID: MOIST_130807C				SeqNo: 2407348			Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

Moisture 9.63 0.050 0 0 0 0-0 9.99 3.67 20

The following samples were analyzed in this batch:

1308253-01A 1308253-02A 1308253-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



WORKORDER
#

1308253

Form 202r8

PAGE


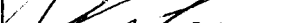
1 of 1

DISPOSAL

By Lab or Return to Client

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Kris Rowe	8/6/2013	17:00
RECEIVED BY		Diane F Shafer	8/7/13	0930
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HRL**

Date/Time Received: **07-Aug-13 09:30**

Work Order: **1308253**

Received by: **DS**

Checklist completed by *Diane Shaw* 07-Aug-13
eSignature Date

Reviewed by: *Ann Preston* 08-Aug-13
eSignature Date

Matrices: **Soil**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>5.2 c</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	<u>8/7/2013 11:05:44 AM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:			
Login Notes:			

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

fedex.com 1800.GoFedEx 1800.463.3339

FedEx **NEW Package**
Express US Airbill

FedEx
Tracking
Number

8022 0273 1630

1 From

Date

8/5/13

Sender's
Name

Kris Row

Phone

970 261 2015

Company

HRL Compliance Solutions Inc.

Address

2385 F 1/2 Rd

Dept./Floor/Suite/Room

City

Grand Junction

State

CO

ZIP

81505

2 Your Internal Billing Reference

3 To

Recipient's
Name

Samir P. P. P.

Phone

616 398 6170

Company

ALS CH. Laboratory

Address

3350

We cannot deliver to P.O. boxes or ZIP codes

Address

Use this line for the HOLD location

City

Holt



8022 0273 1630

Firm
No.

0200

4 Express Package Service

* To most locations.

NOTE: Service order has changed. Please select carefully.

Next Business Day

☐ FedEx First Overnight

Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

☒ FedEx Priority Overnight

Next business morning. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

☐ FedEx Standard Overnight

Next business afternoon. Saturday Delivery NOT available.

2 or 3 Business Days

☐ FedEx 2Day A.M.

Second business morning. Saturday Delivery NOT available.

☐ FedEx 2Day

Second business afternoon. Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

☐ FedEx Express Saver

Third business day. Saturday Delivery NOT available.

5 Packaging

* Declared value limit \$500.

☐ FedEx Envelope*

☐ FedEx Pak*

☐ FedEx Box

☐ FedEx Tube

☐ Other

6 Special Handling and Delivery Signature Options

☐ SATURDAY Delivery

NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required

Not available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ Direct Signature

Signature of recipient or authorized agent at delivery. Fee applies.

☐ Indirect Signature

Signature of someone at recipient's address, someone at a neighboring address, or sign for delivery. Fee applies.

Do you ship hazardous materials?

9601 San Leandro St. Oakland, CA 94603-8426

CUSTODY SEAL

Total Packages

Total Weight

(This label is removed. US\$100. Less you charge a higher value. US\$100. Less you charge a higher value. US\$100. Less you charge a higher value.)

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