

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

REM 9878
Facility ID 284692
Document 2527542

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☒ Site/Facility Closure ☐ Other (describe): Pit Closure

OGCC Operator Number: 96850

Name of Operator: Terra Energy Partners LLC

Address: 1058 County Road 215

City: Parachute State: CO Zip: 81635

Contact Name and Telephone:

Mike Gardner

No: 970-263-2760

Fax: 970-285-9573

API Number: 05-045-12460

County: Garfield

Facility Name: Chevron TR 23-30-597

Facility Number: 284692

Well Name: _____

Well Number: 23-30-597

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NESW, Sec 30, T5S, R97W Latitude: 39.582927 Longitude: -108.323653

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced Water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland, non-crop land

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Parachute-Irigul Complex, 5-30% Slope

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Wiess Creek lies approximately 1,850ft to the east

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

- ☒ Soils
☐ Vegetation
☐ Groundwater
☐ Surface Water

Extent of Impact:

See NOC Attached Report

How Determined:

Visual observations, laboratory data, and field screening instruments.

REMEDIAL WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

See Attached Notice of Completion Report (REM# 9878)

Describe how source is to be removed:

See Attached Notice of Completion Report (REM# 9878)

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

See Attached Notice of Completion Report (REM# 9878)



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

See Attached Notice of Completion (NOC) Report (REM # 9878)

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

See Attached Notice of Completion (NOC) Report (REM # 9878)

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

See Attached Notice of Completion (NOC) Report (REM # 9878)

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See Attached Notice of Completion (NOC) Report (REM # 9878)

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: September 20, 2016 Date Site Investigation Completed: November 10, 2016 Date Remediation Plan Submitted: September 21, 2016
Remediation Start Date: N/A Anticipated Completion Date: N/A Actual Completion Date: November 10, 2016

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Mike Gardner Signed: Michael J. Gardner
Title: Environmental Specialist Date: 12/29/16

OGCC Approved: _____ Title: EPS NW Date: 1/3/2017

TERRA ENERGY PARTNERS (TEP)
TRAIL RIDGE FIELD
NOTICE OF COMPLETION REPORT FOR
TR 23-30-597 PRODUCTION PIT
REMEDIATION #9878

Prepared For:



1058 County Road 215
P.O. Box 370
Parachute, Colorado 81635

Prepared By:



HRL COMPLIANCE SOLUTIONS, INC.
Environmental Consultants

2385 F ½ RD
Grand Junction, CO81505
Phone: 970-243-3271
Fax: 970-243-3280

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Introduction

The purpose of this Notice of Completion report – for the closure of the TR 23-30-597 Production Pit (COGCC Facility Name Chevron TR 23-30-597 & COGCC Facility ID number 284692; hereinafter referred to as TR 32-30-597 – is to provide detailed information and result analysis for the previously submitted and approved Colorado Oil and Gas Conservation Commission (COGCC) Site Investigation and Remediation Workplan, Form 27 (REM# 9878). This report will provide the documentation necessary to demonstrate a comprehensive and diligent investigation of the pit and adjacent environment which was obtained as described and in accordance with all appropriate county, state and federal rules and regulations.

The subject Form 27 was submitted electronically on September 21, 2016 requesting a remediation number for the closure of the production pit as outlined in COGCC Rule. Preliminary approval to proceed with closure of the subject pit was issued by the COGCC and obtained by Terra on September 30, 2016 via E-mail. Form 27 information was entered by the COGCC and the aforementioned remediation (REM# 9878) assigned on October 11, 2016.

Closure activities began on September 20, 2016 and were concluded on November 10, 2016. Information included in this report includes but is not limited to; field screening results, laboratory analytical, subliner soil investigation, soil treatment, and liner recycling.

Evacuation of Pit Contents

Produced water and free liquids were removed from the pit utilizing a vacuum truck and managed at Terra Centralized E&P waste treatment facilities. Once the liquids were removed from the pit, the residual pit contents remaining on the liner were removed using a pressure washer and vac truck and managed at the Terra centralized E&P waste treatment facilities accordingly.

Background Sampling

Three grab samples were collected from the upgradient, undisturbed soil surrounding the pad. All three samples were analyzed for arsenic, as well as an additional analysis at one location which included inorganic parameters listed in COGCC Table 910-1. Refer to Table 2 and Appendix 2 for background sampling results.

Pit Liner Investigation and Integrity Assessment

The pit liner consisted of a three layer system. These layers included: Two (2) 12mm poly synthetic material, a felt fabric.

Pit Liner Removal

Once the pit liner was cleaned of residual pit contents, the entire liner system was removed from the pit. A trackhoe was utilized to pull the liner off the ground surface and out of the pit. The liner material was stockpiled on site where it was compacted, bailed and processed for transport to a recycling center. During the removal process, no holes, rips, or tears were observed in any of the liner systems.

Evaluation of Pit Sub-Soils

After the liner was removed, the pit sub-soils were evaluated for evidence of staining and possibly impacts. The pit was divided into a five (5) quadrants in order to accurately characterize the pit as a whole by investigating individual quadrants. The five (5) quadrants were named by their geographical direction in relation to the pit as defined in Figure 1.

For each quadrant, soils were visually inspected for impacts and field screened utilizing a PetroFlag Hydrocarbon Detection Unit (PetroFlag) as well as a Photo-Ionizing Detection unit (PID). Dark staining was present on the surface of the soils from the underlying fabric felt liner. Dark staining was no longer visible below 1-2 inches and did not contain any hydrocarbon odor. Field screening instruments indicated that soils did not contain any hydrocarbon concentrations exceeding COGCC Table 910-1 thresholds and confirmation samples were collected.

Remediation Activities

Samples were collected from each of the side walls, and the lowest point of the pit bottom where the visual staining was observed. Samples were collected from six (6) inches to a foot below the surface. Samples were submitted to ESC Laboratory on August 16, 2016 for constituents outlined in COGCC Table 910-1. Results are outlined in Table 1, with raw data available in Appendix 1.

- Confirmation samples were collected in accordance with Rule 905.b.(4), from all four walls at a position that was centered vertically and horizontally. These samples were collected for confirmation of compliance of COGCC Rule 910 for hydrocarbon concentrations. One additional grab sample was collected from the base of the pit, which included the low point of the base to be analyzed for full COGCC Table 910-1, to demonstrate compliance in accordance with Rule 905.b.(1).
- A Trimble Geo XT 2011 was used to satisfy requirements as outlined in COGCC Rule 215 for collecting GPS locations of each confirmation sample location from the pit walls and pit bottom.
- Visual inspection of the pit bottoms, field screening techniques, and sampling procedures were followed in accordance with.

Confirmation samples indicated that all of the side walls, as well as the pit bottom satisfied COGCC Table 910-1 thresholds and no remediation was necessary on the subsoils.

Backfill Material

Material utilized to backfill the pit will be the original excavated soil from construction of the pit that was stockpiled on the southern end of the pad.

- The soil will be placed in five foot lifts and will not be compacted beyond the point of making an impenetrable layer but sufficient to suppose subsequent operations and prevent subsidence.
- The pit will be reclaimed in accordance with the COGCC 1000 Series Rule in addition to all SUA/COA's per the land owner.

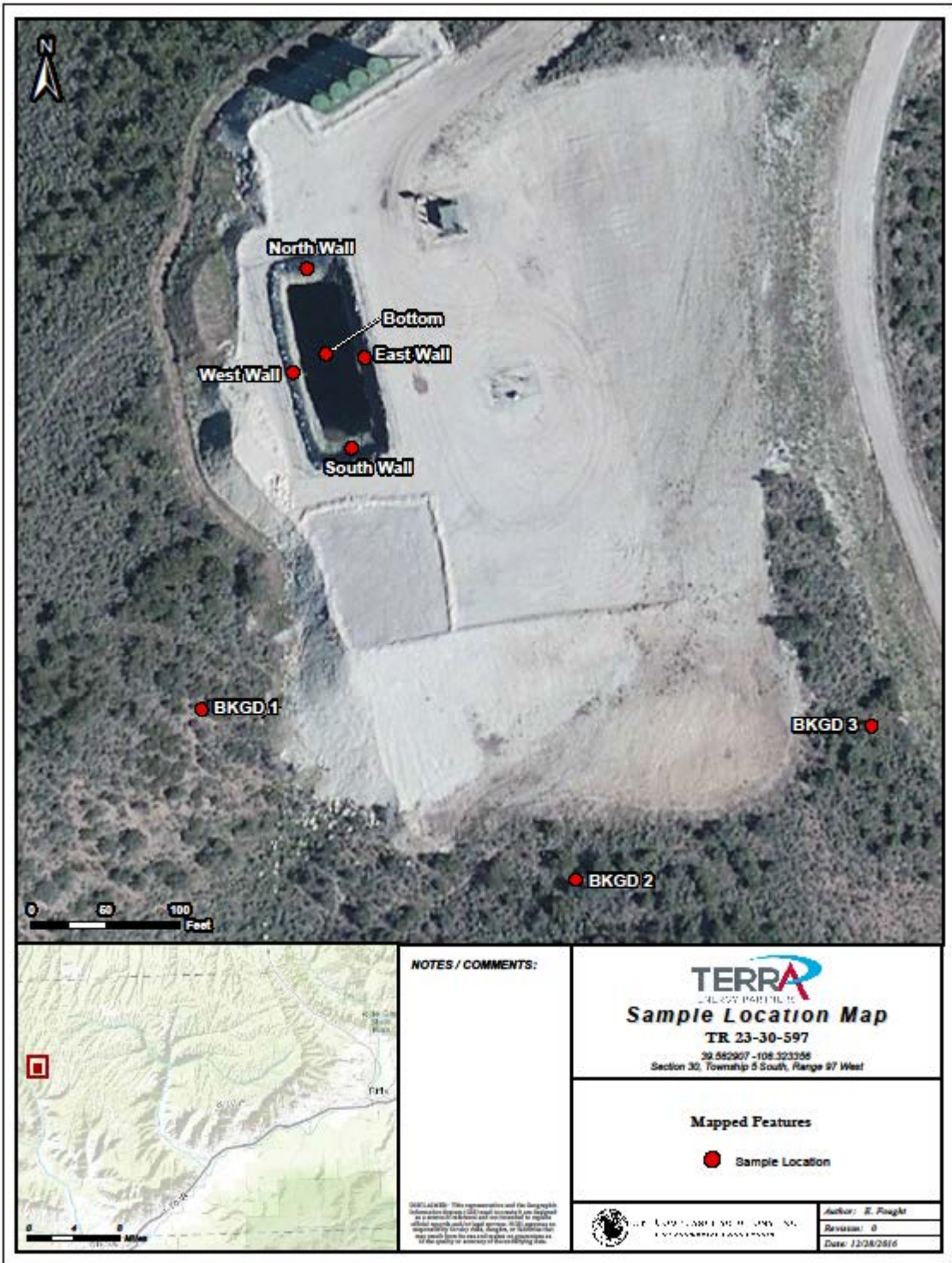
Facility Name: Chevron TR 23-30-597 Name of Operator: Terra Energy Partners COGCC Operator # 96850
Facility ID# 284692 Latitude: 39.582927 Longitude: -108.323653 County: Garfield
REM#: 9878 Location (QtrQtr, Sec, Twp, Rng, Meridian): NESW, Sec 30, T5S, R97W, 6th PM

Exceptions to COGCC Table 910-1

The only exceedances with regards to COGCC Table 910-1 were within the arsenic and inorganic analysis. Terra is requesting that an allowance for arsenic be considered as it is relative to background arsenic levels and well as any inorganic exceedances will be covered with 3ft of native material.

FIGURES

FIGURE 1: SAMPLE LOCATION MAP



TABLES

TABLE 1: PIT BOTTOM AND SIDE WALL ANALYTICAL RESULTS

TR 23-30-597 Pit Closure	COGCC Table 910-1 Threshold	Sample Locations				
		Initial Sampling 8/16/16				
		North Wall	East Wall	Exc Bottom	South Wall	West Wall
DRO	500	12.9	4.05	168	37.5	9.87
GRO		2.90	ND	0.430	ND	ND
BENZENE	0.17	ND	ND	ND	0.001	ND
TOLUENE	85	ND	ND	0.0065	ND	ND
ETHYLBENZENE	100	ND	ND	ND	ND	ND
XYLENE TOTAL	175	ND	ND	0.0123	ND	ND
ACENAPHTHENE	1,000	ND	ND	ND	ND	ND
ANTHRACENE	1,000	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	0.22	ND	ND	ND	ND	ND
BENZO(A)PYRENE	0.022	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	0.22	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	2.2	ND	ND	ND	ND	ND
CHRYSENE	22	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	0.022	ND	ND	ND	ND	ND
FLUORANTHENE	1,000	ND	ND	ND	ND	ND
FLUORENE	1,000	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	0.22	ND	ND	ND	ND	ND
NAPHTHALENE	23	ND	ND	ND	ND	ND
PYRENE	1,000	ND	ND	ND	ND	ND
ARSENIC	0.39	6.79	12.8	3.73	7.98	6.80
BARIUM	15,000	821	577	645	518	380
CADMIUM	70	ND	ND	ND	ND	ND
CHROMIUM	-	29.4	31.8	27.1	28	22.9
CHROMIUM (III)	120,000	29.4	31.8	27.1	28	22.9
CHROMIUM (IV)	23	ND	ND	ND	ND	ND
COPPER	3,100	16.3	21.2	20.1	19.1	16.6
LEAD	400	12.9	17.2	12.8	14.9	11.8
MERCURY	23	ND	0.0215	ND	0.0221	ND
NICKEL	1,600	20.9	18.6	20.3	20.4	16.4
SELENIUM	390	ND	ND	ND	ND	ND
SILVER	390	ND	ND	ND	ND	ND
ZINC	23,000	39.2	39.8	38.1	43.6	36.5
ELECTRICAL CONDUCTIVITY (EC) (mmho/cm)	<4 mmhos/cm or x2 bkgd	2900	2760	799	401	1790
pH	6 to 9	7.79	8.23	7.32	8.15	7.02
SODIUM ADSORPTION RATIO (SAR)	12	68	28.9	42	3.55	12.6

Readings above state limits are highlighted in yellow

Note: all results are in, mg/kg = milligram per kilogram, unless noted otherwise

ND = Non Detect

TABLE 2: BACKGROUND DATA

Sample ID	Arsenic (mg/kg)	Conductivity(mmho/cm)	pH (s.u.)	Sodium Adsorbtion Ratio
BKGD 1	6.87	115	7.79	0.560
BKGD 2	7.78	-	-	-
BKGD 3	7.82	-	-	-

Results above state limits are highlighted in yellow

APPENDIX 1: PIT SIDE WALL AND BOTTOM CONFIRMATION RAW DATA

Terra Energy Partners

Sample Delivery Group: L854216
Samples Received: 08/18/2016
Project Number: TR 23-30-597-PIT
Description: Terra Energy-TR-23-30-597-Pit Closure
Site: TERRA TR 23-30-597
Report To: Mike Gardner
1058 County Road 215
Parachute, CO 81635

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	5
⁵Sr: Sample Results	6
NORTH WALL 0-6 IN L854216-01	6
EAST WALL 0-6 IN L854216-02	8
WEST WALL 0-6 IN L854216-03	10
SOUTH WALL 0-6 IN L854216-04	12
PIT BOTTOM 0-6 IN L854216-05	14
BKGD 1 0-6 IN L854216-06	16
BKGD 2 0-6 IN L854216-07	17
BKGD 3 0-6 IN L854216-08	18
⁶Qc: Quality Control Summary	19
Wet Chemistry by Method 3060A/7196A	19
Wet Chemistry by Method 9045D	20
Wet Chemistry by Method 9050AMod	21
Mercury by Method 7471A	22
Metals (ICP) by Method 6010B	23
Volatile Organic Compounds (GC) by Method 8015D/GRO	25
Volatile Organic Compounds (GC/MS) by Method 8260B	26
Semi-Volatile Organic Compounds (GC) by Method 8015	27
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	28
⁷Gl: Glossary of Terms	30
⁸Al: Accreditations & Locations	31
⁹Sc: Chain of Custody	32



SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



NORTH WALL 0-6 IN L854216-01 Solid

Collected by
Kris Rowe

Collected date/time
08/16/16 13:15

Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 04:58	LTB
Calculated Results	WG900031	1	08/18/16 14:04	08/19/16 12:22	MHM
Mercury by Method 7471A	WG900022	1	08/18/16 14:27	08/19/16 10:07	TRB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:18	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG900153	1	08/19/16 01:27	08/19/16 10:08	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG900383	1	08/19/16 09:48	08/19/16 13:07	ACM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG900284	1	08/19/16 05:00	08/19/16 07:47	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG900301	1	08/19/16 04:00	08/19/16 10:01	DWR
Wet Chemistry by Method 3060A/7196A	WG900082	1	08/18/16 15:47	08/19/16 12:22	MHM
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

EAST WALL 0-6 IN L854216-02 Solid

Collected by
Kris Rowe

Collected date/time
08/16/16 13:25

Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 05:01	LTB
Calculated Results	WG900031	1	08/18/16 14:04	08/19/16 12:26	MHM
Mercury by Method 7471A	WG900022	1	08/18/16 14:27	08/19/16 10:34	TRB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:21	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG900153	1	08/19/16 01:27	08/19/16 10:50	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG900383	1	08/19/16 09:48	08/19/16 13:52	ACM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG900284	1	08/19/16 05:00	08/19/16 08:08	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG900301	1	08/19/16 04:00	08/19/16 10:22	DWR
Wet Chemistry by Method 3060A/7196A	WG900082	1	08/18/16 15:47	08/19/16 12:26	MHM
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

WEST WALL 0-6 IN L854216-03 Solid

Collected by
Kris Rowe

Collected date/time
08/16/16 13:35

Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 05:04	LTB
Calculated Results	WG900031	1	08/18/16 14:04	08/19/16 12:26	MHM
Mercury by Method 7471A	WG900022	1	08/18/16 14:27	08/19/16 10:37	TRB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:23	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG900153	1	08/19/16 01:27	08/19/16 11:53	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG900383	1	08/19/16 09:48	08/19/16 14:24	ACM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG900284	1	08/19/16 05:00	08/19/16 08:29	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG900301	1	08/19/16 04:00	08/19/16 10:43	DWR
Wet Chemistry by Method 3060A/7196A	WG900082	1	08/18/16 15:47	08/19/16 12:26	MHM
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

SOUTH WALL 0-6 IN L854216-04 Solid

Collected by
Kris Rowe

Collected date/time
08/16/16 13:00

Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 05:07	LTB
Calculated Results	WG900031	1	08/18/16 14:04	08/19/16 12:27	MHM
Mercury by Method 7471A	WG900022	1	08/18/16 14:27	08/19/16 10:40	TRB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:26	LTB



SOUTH WALL 0-6 IN L854216-04 Solid

Collected by
Kris RoweCollected date/time
08/16/16 13:00Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG900153	1	08/19/16 01:27	08/19/16 12:14	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG900383	1	08/19/16 09:48	08/19/16 14:35	ACM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG900284	1	08/19/16 05:00	08/19/16 08:50	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG900301	1	08/19/16 04:00	08/19/16 11:04	DWR
Wet Chemistry by Method 3060A/7196A	WG900082	1	08/18/16 15:47	08/19/16 12:27	MHM
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

PIT BOTTOM 0-6 IN L854216-05 Solid

Collected by
Kris RoweCollected date/time
08/16/16 13:45Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 05:15	LTB
Calculated Results	WG900031	1	08/18/16 14:04	08/19/16 12:27	MHM
Mercury by Method 7471A	WG900022	1	08/18/16 14:27	08/19/16 10:42	TRB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:29	LTB
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG900153	1	08/19/16 01:27	08/19/16 12:36	KMP
Semi-Volatile Organic Compounds (GC) by Method 8015	WG900383	1	08/19/16 09:48	08/19/16 16:06	ACM
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG900284	1	08/19/16 05:00	08/19/16 09:11	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG900301	1	08/19/16 04:00	08/19/16 11:25	DWR
Wet Chemistry by Method 3060A/7196A	WG900082	1	08/18/16 15:47	08/19/16 12:27	MHM
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

BKGD 1 0-6 IN L854216-06 Solid

Collected by
Kris RoweCollected date/time
08/16/16 14:20Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Calculated Results	WG899943	1	08/18/16 13:11	08/19/16 05:18	LTB
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 01:45	LTB
Wet Chemistry by Method 9045D	WG899712	1	08/19/16 10:18	08/19/16 10:18	KK
Wet Chemistry by Method 9050AMod	WG900163	1	08/18/16 15:04	08/18/16 15:04	MAJ

BKGD 2 0-6 IN L854216-07 Solid

Collected by
Kris RoweCollected date/time
08/16/16 14:30Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:32	LTB

BKGD 3 0-6 IN L854216-08 Solid

Collected by
Kris RoweCollected date/time
08/16/16 14:35Received date/time
08/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG900031	1	08/18/16 14:04	08/19/16 02:34	LTB



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
L854216-01	NORTH WALL 0-6 IN	9045D
L854216-02	EAST WALL 0-6 IN	9045D
L854216-03	WEST WALL 0-6 IN	9045D
L854216-04	SOUTH WALL 0-6 IN	9045D
L854216-05	PIT BOTTOM 0-6 IN	9045D
L854216-06	BKGD 1 0-6 IN	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	68.0		1	08/19/2016 04:58	WG899943

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	29.4		2.00	1	08/19/2016 12:22	WG900031

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND	J6 O1	2.00	1	08/19/2016 12:22	WG900082

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.79		1	08/19/2016 10:18	WG899712

Sample Narrative:

9045D L854216-01 WG899712: 7.79 at 20.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2900		1	08/18/2016 15:04	WG900163

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND	J6 O1	0.0200	1	08/19/2016 10:07	WG900022

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.79		2.00	1	08/19/2016 02:18	WG900031
Barium	821		0.500	1	08/19/2016 02:18	WG900031
Cadmium	ND		0.500	1	08/19/2016 02:18	WG900031
Chromium	29.4		1.00	1	08/19/2016 02:18	WG900031
Copper	16.3		2.00	1	08/19/2016 02:18	WG900031
Lead	12.9		0.500	1	08/19/2016 02:18	WG900031
Nickel	20.9		2.00	1	08/19/2016 02:18	WG900031
Selenium	ND		2.00	1	08/19/2016 02:18	WG900031
Silver	ND		1.00	1	08/19/2016 02:18	WG900031
Zinc	39.2		5.00	1	08/19/2016 02:18	WG900031

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	2.89		0.100	1	08/19/2016 07:47	WG900284
(S) a,a,a-Trifluorotoluene(FID)	99.8		59.0-128		08/19/2016 07:47	WG900284

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		0.00100	1	08/19/2016 10:01	WG900301
Toluene	ND		0.00500	1	08/19/2016 10:01	WG900301
Ethylbenzene	ND		0.00100	1	08/19/2016 10:01	WG900301
Total Xylenes	ND		0.00300	1	08/19/2016 10:01	WG900301
(S) Toluene-d8	109		88.7-115		08/19/2016 10:01	WG900301
(S) Dibromofluoromethane	123		76.3-123		08/19/2016 10:01	WG900301
(S) a,a,a-Trifluorotoluene	106		87.2-117		08/19/2016 10:01	WG900301
(S) 4-Bromofluorobenzene	113		69.7-129		08/19/2016 10:01	WG900301

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	12.9		4.00	1	08/19/2016 13:07	WG900383
(S) o-Terphenyl	55.5		50.0-150		08/19/2016 13:07	WG900383

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	08/19/2016 10:08	WG900153
Acenaphthene	ND		0.00600	1	08/19/2016 10:08	WG900153
Acenaphthylene	ND		0.00600	1	08/19/2016 10:08	WG900153
Benzo(a)anthracene	ND		0.00600	1	08/19/2016 10:08	WG900153
Benzo(a)pyrene	ND		0.00600	1	08/19/2016 10:08	WG900153
Benzo(b)fluoranthene	ND		0.00600	1	08/19/2016 10:08	WG900153
Benzo(g,h,i)perylene	ND	J3	0.00600	1	08/19/2016 10:08	WG900153
Benzo(k)fluoranthene	ND		0.00600	1	08/19/2016 10:08	WG900153
Chrysene	ND		0.00600	1	08/19/2016 10:08	WG900153
Dibenz(a,h)anthracene	ND	J3	0.00600	1	08/19/2016 10:08	WG900153
Fluoranthene	ND		0.00600	1	08/19/2016 10:08	WG900153
Fluorene	ND		0.00600	1	08/19/2016 10:08	WG900153
Indeno(1,2,3-cd)pyrene	ND	J3	0.00600	1	08/19/2016 10:08	WG900153
Naphthalene	ND		0.0200	1	08/19/2016 10:08	WG900153
Phenanthrene	ND		0.00600	1	08/19/2016 10:08	WG900153
Pyrene	ND		0.00600	1	08/19/2016 10:08	WG900153
1-Methylnaphthalene	ND		0.0200	1	08/19/2016 10:08	WG900153
2-Methylnaphthalene	ND		0.0200	1	08/19/2016 10:08	WG900153
2-Chloronaphthalene	ND		0.0200	1	08/19/2016 10:08	WG900153
(S) p-Terphenyl-d14	81.9		32.2-131		08/19/2016 10:08	WG900153
(S) Nitrobenzene-d5	98.8		22.1-146		08/19/2016 10:08	WG900153
(S) 2-Fluorobiphenyl	84.8		40.6-122		08/19/2016 10:08	WG900153

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	28.9		1	08/19/2016 05:01	WG899943

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Trivalent	31.8		2.00	1	08/19/2016 12:26	WG900031

Wet Chemistry by Method 3060A/7196A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Chromium, Hexavalent	ND		2.00	1	08/19/2016 12:26	WG900082

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.23		1	08/19/2016 10:18	WG899712

Sample Narrative:

9045D L854216-02 WG899712: 8.23 at 19.9c

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	2760		1	08/18/2016 15:04	WG900163

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	0.0215		0.0200	1	08/19/2016 10:34	WG900022

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	12.8		2.00	1	08/19/2016 02:21	WG900031
Barium	577		0.500	1	08/19/2016 02:21	WG900031
Cadmium	ND		0.500	1	08/19/2016 02:21	WG900031
Chromium	31.8		1.00	1	08/19/2016 02:21	WG900031
Copper	21.2		2.00	1	08/19/2016 02:21	WG900031
Lead	17.2		0.500	1	08/19/2016 02:21	WG900031
Nickel	18.6		2.00	1	08/19/2016 02:21	WG900031
Selenium	ND		2.00	1	08/19/2016 02:21	WG900031
Silver	ND		1.00	1	08/19/2016 02:21	WG900031
Zinc	39.8		5.00	1	08/19/2016 02:21	WG900031

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	08/19/2016 08:08	WG900284
(S) a,a,a-Trifluorotoluene(FID)	101		59.0-128		08/19/2016 08:08	WG900284

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 08/16/16 13:25

L854216

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/19/2016 10:22	WG900301
Toluene	ND		0.00500	1	08/19/2016 10:22	WG900301
Ethylbenzene	ND		0.00100	1	08/19/2016 10:22	WG900301
Total Xylenes	ND		0.00300	1	08/19/2016 10:22	WG900301
(S) Toluene-d8	105		88.7-115		08/19/2016 10:22	WG900301
(S) Dibromofluoromethane	119		76.3-123		08/19/2016 10:22	WG900301
(S) a,a,a-Trifluorotoluene	101		87.2-117		08/19/2016 10:22	WG900301
(S) 4-Bromofluorobenzene	102		69.7-129		08/19/2016 10:22	WG900301

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	4.05		4.00	1	08/19/2016 13:52	WG900383
(S) o-Terphenyl	71.3		50.0-150		08/19/2016 13:52	WG900383

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	08/19/2016 10:50	WG900153
Acenaphthene	ND		0.00600	1	08/19/2016 10:50	WG900153
Acenaphthylene	ND		0.00600	1	08/19/2016 10:50	WG900153
Benzo(a)anthracene	ND		0.00600	1	08/19/2016 10:50	WG900153
Benzo(a)pyrene	ND		0.00600	1	08/19/2016 10:50	WG900153
Benzo(b)fluoranthene	ND		0.00600	1	08/19/2016 10:50	WG900153
Benzo(g,h,i)perylene	ND	J3	0.00600	1	08/19/2016 10:50	WG900153
Benzo(k)fluoranthene	ND		0.00600	1	08/19/2016 10:50	WG900153
Chrysene	ND		0.00600	1	08/19/2016 10:50	WG900153
Dibenz(a,h)anthracene	ND	J3	0.00600	1	08/19/2016 10:50	WG900153
Fluoranthene	ND		0.00600	1	08/19/2016 10:50	WG900153
Fluorene	ND		0.00600	1	08/19/2016 10:50	WG900153
Indeno(1,2,3-cd)pyrene	ND	J3	0.00600	1	08/19/2016 10:50	WG900153
Naphthalene	ND		0.0200	1	08/19/2016 10:50	WG900153
Phenanthrene	ND		0.00600	1	08/19/2016 10:50	WG900153
Pyrene	ND		0.00600	1	08/19/2016 10:50	WG900153
1-Methylnaphthalene	ND		0.0200	1	08/19/2016 10:50	WG900153
2-Methylnaphthalene	ND		0.0200	1	08/19/2016 10:50	WG900153
2-Chloronaphthalene	ND		0.0200	1	08/19/2016 10:50	WG900153
(S) p-Terphenyl-d14	77.3		32.2-131		08/19/2016 10:50	WG900153
(S) Nitrobenzene-d5	102		22.1-146		08/19/2016 10:50	WG900153
(S) 2-Fluorobiphenyl	86.1		40.6-122		08/19/2016 10:50	WG900153

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	12.6		1	08/19/2016 05:04	WG899943

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	22.9		2.00	1	08/19/2016 12:26	WG900031

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	08/19/2016 12:26	WG900082

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.02		1	08/19/2016 10:18	WG899712

Sample Narrative:

9045D L854216-03 WG899712: 7.02 at 20.4c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	1790		1	08/18/2016 15:04	WG900163

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	08/19/2016 10:37	WG900022

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	6.80		2.00	1	08/19/2016 02:23	WG900031
Barium	380		0.500	1	08/19/2016 02:23	WG900031
Cadmium	ND		0.500	1	08/19/2016 02:23	WG900031
Chromium	22.9		1.00	1	08/19/2016 02:23	WG900031
Copper	16.6		2.00	1	08/19/2016 02:23	WG900031
Lead	11.8		0.500	1	08/19/2016 02:23	WG900031
Nickel	16.4		2.00	1	08/19/2016 02:23	WG900031
Selenium	ND		2.00	1	08/19/2016 02:23	WG900031
Silver	ND		1.00	1	08/19/2016 02:23	WG900031
Zinc	36.5		5.00	1	08/19/2016 02:23	WG900031

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		0.100	1	08/19/2016 08:29	WG900284
(S) a,a,a-Trifluorotoluene(FID)	100		59.0-128		08/19/2016 08:29	WG900284



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/19/2016 10:43	WG900301
Toluene	ND		0.00500	1	08/19/2016 10:43	WG900301
Ethylbenzene	ND		0.00100	1	08/19/2016 10:43	WG900301
Total Xylenes	ND		0.00300	1	08/19/2016 10:43	WG900301
(S) Toluene-d8	104		88.7-115		08/19/2016 10:43	WG900301
(S) Dibromofluoromethane	124	<u>J1</u>	76.3-123		08/19/2016 10:43	WG900301
(S) a,a,a-Trifluorotoluene	102		87.2-117		08/19/2016 10:43	WG900301
(S) 4-Bromofluorobenzene	113		69.7-129		08/19/2016 10:43	WG900301

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	9.87		4.00	1	08/19/2016 14:24	WG900383
(S) o-Terphenyl	66.2		50.0-150		08/19/2016 14:24	WG900383

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	08/19/2016 11:53	WG900153
Acenaphthene	ND		0.00600	1	08/19/2016 11:53	WG900153
Acenaphthylene	ND		0.00600	1	08/19/2016 11:53	WG900153
Benzo(a)anthracene	ND		0.00600	1	08/19/2016 11:53	WG900153
Benzo(a)pyrene	ND		0.00600	1	08/19/2016 11:53	WG900153
Benzo(b)fluoranthene	ND		0.00600	1	08/19/2016 11:53	WG900153
Benzo(g,h,i)perylene	ND	<u>J3</u>	0.00600	1	08/19/2016 11:53	WG900153
Benzo(k)fluoranthene	ND		0.00600	1	08/19/2016 11:53	WG900153
Chrysene	ND		0.00600	1	08/19/2016 11:53	WG900153
Dibenz(a,h)anthracene	ND	<u>J3</u>	0.00600	1	08/19/2016 11:53	WG900153
Fluoranthene	ND		0.00600	1	08/19/2016 11:53	WG900153
Fluorene	ND		0.00600	1	08/19/2016 11:53	WG900153
Indeno(1,2,3-cd)pyrene	ND	<u>J3</u>	0.00600	1	08/19/2016 11:53	WG900153
Naphthalene	ND		0.0200	1	08/19/2016 11:53	WG900153
Phenanthrene	ND		0.00600	1	08/19/2016 11:53	WG900153
Pyrene	ND		0.00600	1	08/19/2016 11:53	WG900153
1-Methylnaphthalene	ND		0.0200	1	08/19/2016 11:53	WG900153
2-Methylnaphthalene	ND		0.0200	1	08/19/2016 11:53	WG900153
2-Chloronaphthalene	ND		0.0200	1	08/19/2016 11:53	WG900153
(S) p-Terphenyl-d14	82.4		32.2-131		08/19/2016 11:53	WG900153
(S) Nitrobenzene-d5	101		22.1-146		08/19/2016 11:53	WG900153
(S) 2-Fluorobiphenyl	87.8		40.6-122		08/19/2016 11:53	WG900153



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.55		1	08/19/2016 05:07	WG899943

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	28.0		2.00	1	08/19/2016 12:27	WG900031

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	08/19/2016 12:27	WG900082

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	8.15		1	08/19/2016 10:18	WG899712

Sample Narrative:

9045D L854216-04 WG899712: 8.15 at 20.0c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	401		1	08/18/2016 15:04	WG900163

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0221		0.0200	1	08/19/2016 10:40	WG900022

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.98		2.00	1	08/19/2016 02:26	WG900031
Barium	518		0.500	1	08/19/2016 02:26	WG900031
Cadmium	ND		0.500	1	08/19/2016 02:26	WG900031
Chromium	28.0		1.00	1	08/19/2016 02:26	WG900031
Copper	19.1		2.00	1	08/19/2016 02:26	WG900031
Lead	14.9		0.500	1	08/19/2016 02:26	WG900031
Nickel	20.4		2.00	1	08/19/2016 02:26	WG900031
Selenium	ND		2.00	1	08/19/2016 02:26	WG900031
Silver	ND		1.00	1	08/19/2016 02:26	WG900031
Zinc	43.6		5.00	1	08/19/2016 02:26	WG900031

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		0.100	1	08/19/2016 08:50	WG900284
(S) a,a,a-Trifluorotoluene(FID)	99.5		59.0-128		08/19/2016 08:50	WG900284



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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00102		0.00100	1	08/19/2016 11:04	WG900301
Toluene	ND		0.00500	1	08/19/2016 11:04	WG900301
Ethylbenzene	ND		0.00100	1	08/19/2016 11:04	WG900301
Total Xylenes	ND		0.00300	1	08/19/2016 11:04	WG900301
(S) Toluene-d8	106		88.7-115		08/19/2016 11:04	WG900301
(S) Dibromofluoromethane	126	<u>J1</u>	76.3-123		08/19/2016 11:04	WG900301
(S) a,a,a-Trifluorotoluene	100		87.2-117		08/19/2016 11:04	WG900301
(S) 4-Bromofluorobenzene	92.7		69.7-129		08/19/2016 11:04	WG900301

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	37.5		4.00	1	08/19/2016 14:35	WG900383
(S) o-Terphenyl	86.9		50.0-150		08/19/2016 14:35	WG900383

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	08/19/2016 12:14	WG900153
Acenaphthene	ND		0.00600	1	08/19/2016 12:14	WG900153
Acenaphthylene	ND		0.00600	1	08/19/2016 12:14	WG900153
Benzo(a)anthracene	ND		0.00600	1	08/19/2016 12:14	WG900153
Benzo(a)pyrene	ND		0.00600	1	08/19/2016 12:14	WG900153
Benzo(b)fluoranthene	ND		0.00600	1	08/19/2016 12:14	WG900153
Benzo(g,h,i)perylene	ND	<u>J3</u>	0.00600	1	08/19/2016 12:14	WG900153
Benzo(k)fluoranthene	ND		0.00600	1	08/19/2016 12:14	WG900153
Chrysene	ND		0.00600	1	08/19/2016 12:14	WG900153
Dibenz(a,h)anthracene	ND	<u>J3</u>	0.00600	1	08/19/2016 12:14	WG900153
Fluoranthene	ND		0.00600	1	08/19/2016 12:14	WG900153
Fluorene	ND		0.00600	1	08/19/2016 12:14	WG900153
Indeno(1,2,3-cd)pyrene	ND	<u>J3</u>	0.00600	1	08/19/2016 12:14	WG900153
Naphthalene	ND		0.0200	1	08/19/2016 12:14	WG900153
Phenanthrene	ND		0.00600	1	08/19/2016 12:14	WG900153
Pyrene	ND		0.00600	1	08/19/2016 12:14	WG900153
1-Methylnaphthalene	ND		0.0200	1	08/19/2016 12:14	WG900153
2-Methylnaphthalene	ND		0.0200	1	08/19/2016 12:14	WG900153
2-Chloronaphthalene	ND		0.0200	1	08/19/2016 12:14	WG900153
(S) p-Terphenyl-d14	67.6		32.2-131		08/19/2016 12:14	WG900153
(S) Nitrobenzene-d5	92.0		22.1-146		08/19/2016 12:14	WG900153
(S) 2-Fluorobiphenyl	81.2		40.6-122		08/19/2016 12:14	WG900153

8 Al

9 Sc



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	42.0		1	08/19/2016 05:15	WG899943

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium, Trivalent	27.1		2.00	1	08/19/2016 12:27	WG900031

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	08/19/2016 12:27	WG900082

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.32		1	08/19/2016 10:18	WG899712

Sample Narrative:

9045D L854216-05 WG899712: 7.32 at 19.9c

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	799		1	08/18/2016 15:04	WG900163

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	08/19/2016 10:42	WG900022

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.73		2.00	1	08/19/2016 02:29	WG900031
Barium	645		0.500	1	08/19/2016 02:29	WG900031
Cadmium	ND		0.500	1	08/19/2016 02:29	WG900031
Chromium	27.1		1.00	1	08/19/2016 02:29	WG900031
Copper	20.1		2.00	1	08/19/2016 02:29	WG900031
Lead	12.8		0.500	1	08/19/2016 02:29	WG900031
Nickel	20.3		2.00	1	08/19/2016 02:29	WG900031
Selenium	ND		2.00	1	08/19/2016 02:29	WG900031
Silver	ND		1.00	1	08/19/2016 02:29	WG900031
Zinc	38.1		5.00	1	08/19/2016 02:29	WG900031

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	0.430		0.100	1	08/19/2016 09:11	WG900284
(S) a,a,a-Trifluorotoluene(FID)	98.8		59.0-128		08/19/2016 09:11	WG900284



Collected date/time: 08/16/16 13:45

L854216

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/19/2016 11:25	WG900301
Toluene	0.00659		0.00500	1	08/19/2016 11:25	WG900301
Ethylbenzene	ND		0.00100	1	08/19/2016 11:25	WG900301
Total Xylenes	0.0123		0.00300	1	08/19/2016 11:25	WG900301
(S) Toluene-d8	103		88.7-115		08/19/2016 11:25	WG900301
(S) Dibromofluoromethane	117		76.3-123		08/19/2016 11:25	WG900301
(S) a,a,a-Trifluorotoluene	91.2		87.2-117		08/19/2016 11:25	WG900301
(S) 4-Bromofluorobenzene	120		69.7-129		08/19/2016 11:25	WG900301

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	168		4.00	1	08/19/2016 16:06	WG900383
(S) o-Terphenyl	77.7		50.0-150		08/19/2016 16:06	WG900383

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	08/19/2016 12:36	WG900153
Acenaphthene	ND		0.00600	1	08/19/2016 12:36	WG900153
Acenaphthylene	ND		0.00600	1	08/19/2016 12:36	WG900153
Benzo(a)anthracene	ND		0.00600	1	08/19/2016 12:36	WG900153
Benzo(a)pyrene	ND		0.00600	1	08/19/2016 12:36	WG900153
Benzo(b)fluoranthene	ND		0.00600	1	08/19/2016 12:36	WG900153
Benzo(g,h,i)perylene	ND	J3	0.00600	1	08/19/2016 12:36	WG900153
Benzo(k)fluoranthene	ND		0.00600	1	08/19/2016 12:36	WG900153
Chrysene	ND		0.00600	1	08/19/2016 12:36	WG900153
Dibenz(a,h)anthracene	ND	J3	0.00600	1	08/19/2016 12:36	WG900153
Fluoranthene	ND		0.00600	1	08/19/2016 12:36	WG900153
Fluorene	ND		0.00600	1	08/19/2016 12:36	WG900153
Indeno(1,2,3-cd)pyrene	ND	J3	0.00600	1	08/19/2016 12:36	WG900153
Naphthalene	ND		0.0200	1	08/19/2016 12:36	WG900153
Phenanthrene	ND		0.00600	1	08/19/2016 12:36	WG900153
Pyrene	ND		0.00600	1	08/19/2016 12:36	WG900153
1-Methylnaphthalene	ND		0.0200	1	08/19/2016 12:36	WG900153
2-Methylnaphthalene	ND		0.0200	1	08/19/2016 12:36	WG900153
2-Chloronaphthalene	ND		0.0200	1	08/19/2016 12:36	WG900153
(S) p-Terphenyl-d14	79.5		32.2-131		08/19/2016 12:36	WG900153
(S) Nitrobenzene-d5	102		22.1-146		08/19/2016 12:36	WG900153
(S) 2-Fluorobiphenyl	86.5		40.6-122		08/19/2016 12:36	WG900153



Method Blank (MB)

(MB) R3157952-1 08/19/16 12:17

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

L854216-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854216-01 08/19/16 12:22 • (DUP) R3157952-4 08/19/16 12:22

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

L854257-04 Original Sample (OS) • Duplicate (DUP)

(OS) L854257-04 08/19/16 12:37 • (DUP) R3157952-8 08/19/16 12:37

Analyte	Original Result (dry) mg/kg	DUP Result (dry) 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) R3157952-2 08/19/16 12:19 • (LCSD) R3157952-3 08/19/16 12:20

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	56.9	48.2	48.4	85.0	85.0	80.0-120			0.000	20

L854216-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854216-01 08/19/16 12:22 • (MS) R3157952-5 08/19/16 12:22 • (MSD) R3157952-6 08/19/16 12:23

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 %
Chromium,Hexavalent	20.0	ND	4.96	5.88	21.0	26.0	1	75.0-125	J6	J6	17.0	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



L853661-02 Original Sample (OS) • Duplicate (DUP)

(OS) L853661-02 08/19/16 10:18 • (DUP) WG899712-3 08/19/16 10:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.70	8.69	1	0.115		1

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

L854291-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854291-01 08/19/16 10:18 • (DUP) WG899712-4 08/19/16 10:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	11.8	11.8	1	0.254		1

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

(LCS) WG899712-1 08/19/16 10:18 • (LCSD) WG899712-2 08/19/16 10:18

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.10	6.10	99.8	99.8	98.4-102			0.000	1

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) WG900163-1 08/18/16 15:04

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	1.08			

L854216-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854216-01 08/18/16 15:04 • (DUP) WG900163-6 08/18/16 15:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2900	2890	1	0.242		20

L854230-02 Original Sample (OS) • Duplicate (DUP)

(OS) L854230-02 08/18/16 15:04 • (DUP) WG900163-7 08/18/16 15:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	181	181	1	0.221		20

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

(LCS) WG900163-2 08/18/16 15:04 • (LCSD) WG900163-3 08/18/16 15:04

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	653	660	659	101	101	90.0-110			0.152	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3157991-1 08/19/16 09:59

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

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

(LCS) R3157991-2 08/19/16 10:02 • (LCSD) R3157991-3 08/19/16 10:04

	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	%	%	%			%	%
Mercury	0.300	0.278	0.291	93	97	80-120			4	20

L854216-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854216-01 08/19/16 10:07 • (MS) R3157991-4 08/19/16 10:09 • (MSD) R3157991-5 08/19/16 10:12

	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	%	%		%			%	%
Mercury	0.300	ND	0.233	0.286	73	90	1	75-125	J6		20	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3157838-1 08/19/16 01:37

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	U		0.59	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) R3157838-2 08/19/16 01:39 • (LCSD) R3157838-3 08/19/16 01:42

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 %
Arsenic	100	99.5	94.3	100	94	80-120			5	20
Barium	100	103	97.2	103	97	80-120			6	20
Cadmium	100	102	96.2	102	96	80-120			6	20
Chromium	100	99.4	94.4	99	94	80-120			5	20
Copper	100	99.3	94.5	99	94	80-120			5	20
Lead	100	103	97.4	103	97	80-120			6	20
Nickel	100	100	95.0	100	95	80-120			6	20
Selenium	100	104	97.9	104	98	80-120			6	20
Silver	100	98.3	93.7	98	94	80-120			5	20
Zinc	100	99.2	93.7	99	94	80-120			6	20

L854216-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854216-06 08/19/16 01:45 • (MS) R3157838-6 08/19/16 01:53 • (MSD) R3157838-7 08/19/16 01:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	6.87	106	104	100	97	1	75-125			2	20
Barium	100	454	533	528	79	74	1	75-125		V	1	20
Cadmium	100	ND	101	99.6	101	99	1	75-125			2	20
Chromium	100	24.2	118	114	93	90	1	75-125			3	20
Copper	100	19.9	122	120	102	100	1	75-125			2	20
Lead	100	18.0	124	120	105	102	1	75-125			3	20
Nickel	100	20.9	124	121	103	100	1	75-125			2	20



L854216-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854216-06 08/19/16 01:45 • (MS) R3157838-6 08/19/16 01:53 • (MSD) R3157838-7 08/19/16 01:57

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Selenium	100	ND	104	101	104	101	1	75-125	E	E	3	20
Silver	100	ND	102	101	102	101	1	75-125			1	20
Zinc	100	47.1	135	134	88	87	1	75-125			1	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Method Blank (MB)

(MB) R3157949-5 08/19/16 03:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	103			59.0-128

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

(LCS) R3157949-3 08/19/16 02:29 • (LCSD) R3157949-4 08/19/16 02:50

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
TPH (GC/FID) Low Fraction	5.50	6.04	5.98	110	109	63.5-137			0.970	20
(S) a,a,a-Trifluorotoluene(FID)				106	106	59.0-128				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3158038-2 08/19/16 06:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000270	0.00100
Ethylbenzene	U		0.000297	0.00100
Toluene	U		0.000434	0.00500
Xylenes, Total	U		0.000698	0.00300
(S) Toluene-d8	104			88.7-115
(S) Dibromofluoromethane	112			76.3-123
(S) a,a,a-Trifluorotoluene	103			87.2-117
(S) 4-Bromofluorobenzene	96.5			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) R3158038-1 08/19/16 05:12 • (LCSD) R3158038-3 08/19/16 07:44

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 %
Benzene	0.0250	0.0268	0.0247	107	98.8	72.6-120			8.15	20
Ethylbenzene	0.0250	0.0271	0.0262	109	105	78.6-124			3.70	20
Toluene	0.0250	0.0261	0.0245	104	97.9	76.7-116			6.43	20
Xylenes, Total	0.0750	0.0815	0.0813	109	108	78.1-123			0.290	20
(S) Toluene-d8				105	107	88.7-115				
(S) Dibromofluoromethane				104	102	76.3-123				
(S) a,a,a-Trifluorotoluene				99.3	103	87.2-117				
(S) 4-Bromofluorobenzene				100	126	69.7-129				

L853451-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L853451-01 08/19/16 13:50 • (MS) R3158038-4 08/19/16 08:38 • (MSD) R3158038-5 08/19/16 08:59

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0275	U	0.0216	0.0200	78.5	72.8	1	47.8-131			7.60	22.8
Ethylbenzene	0.0275	U	0.0200	0.0177	72.6	64.3	1	44.8-135			12.1	26.9
Toluene	0.0275	U	0.0210	0.0187	76.4	67.8	1	47.8-127			11.9	24.3
Xylenes, Total	0.0826	U	0.0604	0.0529	73.2	64.1	1	42.7-135			13.3	26.6
(S) Toluene-d8					105	105		88.7-115				
(S) Dibromofluoromethane					111	112		76.3-123				
(S) a,a,a-Trifluorotoluene					96.4	98.1		87.2-117				
(S) 4-Bromofluorobenzene					96.1	98.7		69.7-129				



Method Blank (MB)

(MB) R3158053-1 08/19/16 12:33

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	81.1			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) R3158053-2 08/19/16 12:45 • (LCSD) R3158053-3 08/19/16 12:56

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	50.5	45.9	84.2	76.5	50.0-150			9.61	20
(S) o-Terphenyl				89.6	81.8	50.0-150				

L854216-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854216-01 08/19/16 13:07 • (MS) R3158053-4 08/19/16 13:18 • (MSD) R3158053-5 08/19/16 13:30

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	12.9	62.6	58.4	82.8	75.9	1	50.0-150			6.92	20
(S) o-Terphenyl					80.8	73.2		50.0-150				

Method Blank (MB)

(MB) R3157933-3 08/19/16 10:29

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	77.1			32.2-131
(S) Nitrobenzene-d5	89.6			22.1-146
(S) 2-Fluorobiphenyl	79.8			40.6-122

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

(LCS) R3157933-1 08/19/16 08:43 • (LCSD) R3157933-2 08/19/16 09:05

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 %
Anthracene	0.0800	0.0791	0.0722	98.9	90.3	50.3-130			9.15	20
Acenaphthene	0.0800	0.0754	0.0696	94.2	87.0	52.4-120			8.00	20
Acenaphthylene	0.0800	0.0743	0.0693	92.9	86.6	49.6-120			7.02	20
Benzo(a)anthracene	0.0800	0.0743	0.0684	92.9	85.5	46.7-125			8.28	20
Benzo(a)pyrene	0.0800	0.0733	0.0609	91.6	76.1	42.3-119			18.4	20
Benzo(b)fluoranthene	0.0800	0.0740	0.0722	92.6	90.3	43.6-124			2.46	20
Benzo(g,h,i)perylene	0.0800	0.0877	0.0677	110	84.6	45.1-132		J3	25.7	20
Benzo(k)fluoranthene	0.0800	0.0782	0.0682	97.8	85.3	46.1-131			13.6	20
Chrysene	0.0800	0.0762	0.0707	95.2	88.3	49.5-131			7.50	20
Dibenz(a,h)anthracene	0.0800	0.0909	0.0700	114	87.5	44.8-133		J3	26.0	20
Fluoranthene	0.0800	0.0789	0.0853	98.7	107	49.3-128			7.71	20

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

(LCS) R3157933-1 08/19/16 08:43 • (LCSD) R3157933-2 08/19/16 09:05

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 %
Fluorene	0.0800	0.0734	0.0680	91.7	85.0	50.6-121			7.59	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0909	0.0702	114	87.7	46.1-135		J3	25.7	20
Naphthalene	0.0800	0.0729	0.0681	91.1	85.1	49.6-115			6.77	20
Phenanthrene	0.0800	0.0748	0.0690	93.5	86.3	48.8-121			8.03	20
Pyrene	0.0800	0.0862	0.0798	108	99.7	44.7-130			7.77	20
1-Methylnaphthalene	0.0800	0.0753	0.0706	94.2	88.3	50.6-122			6.49	20
2-Methylnaphthalene	0.0800	0.0738	0.0686	92.2	85.8	50.4-120			7.19	20
2-Chloronaphthalene	0.0800	0.0749	0.0699	93.7	87.4	53.9-121			6.94	20
(S) p-Terphenyl-d14				84.0	87.2	32.2-131				
(S) Nitrobenzene-d5				99.3	99.8	22.1-146				
(S) 2-Fluorobiphenyl				75.8	90.6	40.6-122				

L854270-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854270-01 08/19/16 08:55 • (MS) R3157990-1 08/19/16 09:17 • (MSD) R3157990-2 08/19/16 09:39

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.104	0.0410	0.0914	0.161	48.4	115	1	26.5-141		J3	55.2	21.2
Acenaphthene	0.104	0.00746	0.0516	0.105	42.3	93.9	1	31.9-130		J3	68.5	20
Acenaphthylene	0.104	0.0258	0.0691	0.136	41.6	106	1	33.7-129		J3	65.2	20
Benzo(a)anthracene	0.104	0.164	0.221	0.325	54.6	155	1	18.3-136		J3 J5	38.1	24.6
Benzo(a)pyrene	0.104	0.191	0.248	0.348	54.5	150	1	16.9-135		J3 J5	33.6	25.2
Benzo(b)fluoranthene	0.104	0.216	0.292	0.363	73.0	142	1	10.0-134		J5	21.9	30.9
Benzo(g,h,i)perylene	0.104	0.240	0.331	0.407	86.9	160	1	14.1-140		J5	20.7	25.5
Benzo(k)fluoranthene	0.104	0.0718	0.114	0.178	40.1	102	1	18.2-138		J3	44.3	25.6
Chrysene	0.104	0.164	0.219	0.330	52.7	159	1	17.1-145		J3 J5	40.4	24.2
Dibenz(a,h)anthracene	0.104	0.0594	0.113	0.179	51.9	115	1	18.5-138		J3	45.0	24.3
Fluoranthene	0.104	0.277	0.329	0.486	50.1	201	1	15.4-144		J3 J5	38.5	27.1
Fluorene	0.104	0.0139	0.0596	0.119	43.8	101	1	23.5-136		J3	66.4	20
Indeno(1,2,3-cd)pyrene	0.104	0.176	0.255	0.317	76.2	136	1	14.5-142			21.9	25.8
Naphthalene	0.104	0.110	0.134	0.229	22.4	114	1	29.2-128	J6	J3	52.7	20
Phenanthrene	0.104	0.166	0.217	0.327	49.0	154	1	20.1-134		J3 J5	40.3	23.6
Pyrene	0.104	0.286	0.349	0.512	60.6	217	1	11.0-148		J3 J5	37.9	26.1
1-Methylnaphthalene	0.104	0.129	0.161	0.280	30.5	145	1	28.4-137		J3 J5	54.0	20
2-Methylnaphthalene	0.104	0.170	0.189	0.338	18.8	162	1	26.6-137	J6	J3 J5	56.4	20
2-Chloronaphthalene	0.104	U	0.0444	0.0947	42.7	90.9	1	38.6-126		J3	72.2	20
(S) p-Terphenyl-d14					77.9	73.2		32.2-131				
(S) Nitrobenzene-d5					80.3	85.8		22.1-146				
(S) 2-Fluorobiphenyl					88.3	90.1		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	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(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.

Qualifier Description

E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
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.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



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

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

State Accreditations

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

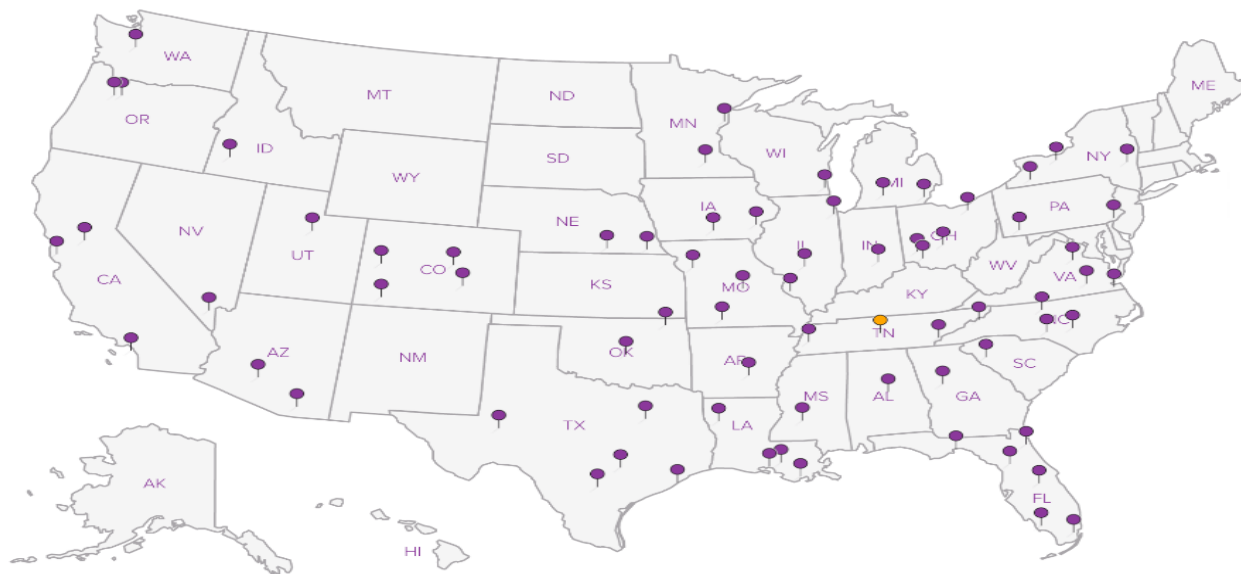
Third Party & Federal Accreditations



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

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

Our Locations

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



Company Name/Address: HRL Compliance Solutions 2385 F 1/2 Road Grand Junction, CO 81505				Billing Information: Terra Energy 1058 Country Road 215 Parachute CO 81635 Quote # WILP-CO-072016S.				Analysis / Container / Preservative										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 							
Report to: Kris Rowe & Mike Gardner				Email To: krowe@hrlcomp.com																					
Project Description: Terra Energy - TR 23-30-597 - Pit Closure				City/State Collected: Colorado																					
Phone: 970-243-3271 Fax:				Client Project # TR 23-30-597 - Pit				Lab Project # WILPCO072016S																	
Collected by (print): Kris Rowe				Site/Facility ID # Terra TR 23-30-597				P.O. #																	
Collected by (signature): <div style="border: 1px solid black; padding: 2px;"> Rush? (Lab MUST Be Notified) <input checked="" type="checkbox"/> Same Day200% <input checked="" type="checkbox"/> Next Day100% <input type="checkbox"/> Two Day50% <input type="checkbox"/> Three Day25% </div>				Date Results Needed 24hr Rush - 8/19/16				Email? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes FAX? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes				No. of Cntrs													
Immediately Packed on Ice N <input type="checkbox"/> Y <input checked="" type="checkbox"/>																									

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	V8260BTEX	GRO / DRO	SV8270PAHSIM	MRCRA8 + Cu, Ni, Zn	CR6SS (includes pH) / CR3	SPCON / SAR /pH	Arsenic						
North Wall	Grab	SS	0-6"	8/16/16	1315	3	X	X	X	X	X	X							
East Wall	Grab	SS	0-6"	8/16/16	1325	3	X	X	X	X	X	X							
West Wall	Grab	SS	0-6"	8/16/16	1335	3	X	X	X	X	X	X							
South Wall	Grab	SS	0-6"	8/16/16	1300	3	X	X	X	X	X	X							
Pit Bottom	Grab	SS	0-6"	8/16/16	1345	3	X	X	X	X	X	X							
BKGD 1	↓	↓	↓		1420	1						X	X						
BKGD 2	↓	↓	↓		1430	1							X						
BKGD 3	↓	↓	↓		1435	1							X						
							CS	8/18/16											

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

pH _____ Temp _____

Flow _____ Other _____

Remarks:

Relinquished by: (Signature)	Date: 8/16/16	Time: 1645	Received by: (Signature)	Samples returned via: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____
Relinquished by: (Signature)	Date: 8/17/16	Time: 1800	Received by: (Signature)	Temp: 7.1 °C Bottles Received: 13
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 8/19/16 Time: 0200

Hold # 6827 1102 9734

Condition: (lab use only)

COC Seal Intact: ☐ Y ☐ N ☐ NA

pH Checked: NCF:

APPENDIX 2: BACKGROUND SAMPLING RAW DATA



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.560		1	08/19/2016 05:18	WG899943

¹ Cp² Tc

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.79		1	08/19/2016 10:18	WG899712

³ Ss⁴ Cn

Sample Narrative:

9045D L854216-06 WG899712: 7.79 at 20.0c

⁵ Sr

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Specific Conductance	115		1	08/18/2016 15:04	WG900163

⁶ Qc⁷ Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	6.87		2.00	1	08/19/2016 01:45	WG900031

⁸ Al⁹ Sc



Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.78		2.00	1	08/19/2016 02:32	WG900031

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	7.82		2.00	1	08/19/2016 02:34	WG900031

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc