

APPROVED

By CHernandez at 10:26 am, Jul 25, 2018

Please be advised to replace the liner currently inside west part of containment as it was unclear in report if liner puncture was repaired during the gravel removal activity on March 8, 2018. Due to levels of chloride over RRAL's underneath liner at HA-5 (2-4ft) and at HA-2 (0-1 and 4-5 ft), please be advised to excavate to 4' (where deemed applicable) and line entire containment. Please provide sidewall confirmation samples from inside containment. Please be advised to replace gravel inside containment as chloride concentrations are exceedingly high. Confirmation bottom and sidewall samples are required for proposed excavations at HA-3, DP-2, DP-3, and DP-4. At least one of the sidewall/edge samples is to be at the border between the different depths of excavation at areas DP-1, DP-2, DP-3, DP-4. Please be advised to excavate to 4' at DP-1 and use impermeable liner. Sidewall confirmation samples are required. Provide dated photo documentation of the remedial activities, including the proper emplacement of the liners used. Provide scaled map with the confirmation sample locations in relation to the delineation sample points.

1RP-4932

DELINEATION REPORT

Arnott Ramsay D Station 5 Produced Water Spill

Lea County, New Mexico

Latitude: 32° 26' 0.69"

Longitude: 103° 16' 11.28"

LAI Project No. 18-0111-01

July 13, 2018

Prepared for:

XTO Energy, Inc.

6401 Holiday Hill Road, Building 5

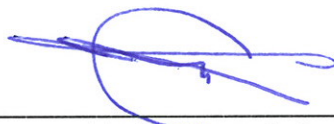
Midland, Texas 79707

Prepared by:

Larson & Associates, Inc.

507 North Marienfeld Street, Suite 205

Midland, Texas 79701



Mark J. Larson, P. G.

Certified Professional Geologist #10490

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1.0 INTRODUCTION

Larson & Associates, Inc., (LAI) has prepared this delineation report on behalf of XTO Energy, Inc. (XTO) for submittal to the New Mexico Oil Conservation Division (OCD) District 1 for a produced water spill at the Arnott Ramsay D Station #5 battery (Site) located in Unit J (NE/4, SW/4), Section 33, Township 21 South, Range 36 East in Lea County, New Mexico. The geodetic position is North 32° 26' 0.69" and West 103° 19' 16' 11.28". Figure 1 presents a topographic map.

1.1 Background

The spill occurred on January 3, 2018, due to failure of a swedge fitting on the transfer line connection at the produced water tank releasing approximately 126 barrels (bbl) of produced water and oil with no fluid recovered. The release breached the containment near the southeast corner and flowed south around piping and equipment before terminating in a low area south of the lease road. The spill area measures approximately 4,224 square feet. The surface and mineral owner is the State of New Mexico State Land Office (SLO). XTO submitted the initial C-141 to OCD District 1 on January 12, 2018, which assigned the release remediation permit number 1RP-4932, with conditions. A delineation plan was not submitted for the release. Appendix A presents the initial C-141.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 3,570 feet above mean sea level (MSL);
- The topography slopes to the southeast;
- There are no surface water features within 1,000 feet of the Site;
- The soils are designated as "Berino-Cacique loamy fine sands", consisting of approximately 6 inches of loamy fine sand and underlain sandy clay loam to approximately 60 inches below ground surface (bgs);
- The soil is sandy eolian deposits over calcareous sandy alluvium derived from sedimentary rock;
- The upper geological unit is the Tertiary-age Blackwater Draw and Ogallala formations, in descending order, comprised of very fine to medium-grained quartz sand and gravel, with minor amount of silt and clay with indistinct to massive cross beds;
- The Ogallala formation is underlain by clay, silty clay, shale and sandstone of the Chinle formation (Triassic) and is about 300 feet thick;
- According to records from the State of New Mexico Office of the State Engineer (OSE) the nearest fresh water well is located in Unit B (NW/4, NE/4), Section 33, Township 21 South, Range 33 East, with depth to water reported at approximately 600 feet bgs;
- According to records from the United State Geological Survey (USGS) the nearest fresh water well is located in Unit C (NE/4, NW/4), Section 28, Township 21 South, Range 33 East, with depth to water reported at approximately 178.85 feet bgs.

1.3 Remediation Action Levels

Remediation action levels (RRAL) were calculated for benzene, BTEX and TPH based on the following criteria established by the OCD in "Guidelines for Remediation of Leaks, Spills and Releases, pp. 6 – 7, August 13, 1993":

Criteria	Result	Score
Depth-to-Groundwater	>100 Feet	0

Wellhead Protection Area	No	0
Distance to Surface Water Body	>1,000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 20 0-9

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 5,000 mg/Kg

Depth to groundwater greater than 100 feet bgs requires vertical delineation of chloride to 600 milligrams per kilogram (mg/Kg) and maintained for a minimum of 3 to 4 feet farther in depth.

2.0 DELINEATION

On January 19 and 22, 2018, LAI personnel used a stainless steel hand auger (HA) and direct push rig (DP) to collect soil samples at ten (10) locations (HA-1 through HA-5 and DP-1 through DP-5) inside the spill. DP was used to collect soil samples from four (4) locations in each cardinal direction (DP-N, DP-S, DP-E and DP-W) for horizontal delineation. Hand auger samples were collected in 1 foot increments (i.e., 0 to 1, 1 to 2, 2 to 3 feet, etc.) to depths ranging from approximately 4 (HA-1, HA-4 and HA-5) and 8 (HA-2) feet bgs. Direct push samples were collected in 1 foot increments (i.e., 0 to 1, 1 to 2, 2 to 3 feet, etc.) to approximately 4 feet bgs and 2 foot increments (i.e., 4 to 6, 6 to 8, 8 to 10 feet, etc.) to depths ranging from approximately 2 (DP-5 and DP-N) and 12 (DP-1) feet bgs. A layer of gravel about 1 foot thick is present inside the containment. A polyethylene liner was observed below the gravel at location HA-5. The samples were delivered under preservation and chain of custody to Permian Basin Environmental Lab (PBEL) in Midland, Texas, which analyzed the upper samples for benzene, toluene, ethylbenzene and xylenes (BTEX) and total petroleum hydrocarbons (TPH), including gasoline range organics (C6-C12), diesel range organics (>C12-C28) and oil range organics (>C28-C35) by EPA SW-846 Methods 8021B and 8015M, respectively. All samples were analyzed for chloride by EPA Method 300.

BTEX was not reported in the upper samples at concentrations exceeding the analytical method reporting limits and RRAL of 10 mg/Kg and 50 mg/Kg, respectively. TPH was below the RRAL (5,000 mg/Kg) in the upper samples. Chloride exceeded the delineation limit (600 mg/Kg) in the following samples:

- | | |
|-----------------------------------|----------------------------------|
| • HA-2, 0 – 1 foot (1,820 mg/Kg) | • HA-3, 0 – 2 foot (1,010 mg/Kg) |
| • *HA-5, 0 – 1 foot (5,090 mg/Kg) | • HA-5, 2 – 3 feet (602 mg/Kg) |
| • HA-5, 3 – 4 feet (636 mg/Kg) | • DP-1, 0 – 1 foot (1,790 mg/Kg) |
| • DP-1, 1 - 2 feet (1,120 mg/Kg) | • DP-2, 0 – 1 foot (1,080 mg/Kg) |
| • DP-2, 1 – 2 feet (2,800 mg/Kg) | • DP-2, 2 – 3 feet (1,380 mg/Kg) |

*sample of gravel above liner

On March 8, 2018, personnel from SDR Enterprises, LLC (SDR), under supervision from LAI, removed gravel from inside the containment for the purpose of inspecting the poly liner. The gravel was piled on plastic east of the battery. A composite sample (5 spot) collected from the gravel pile, on March 27, 2018, reported chloride at 10,900 mg/Kg. The liner was found to have a small hole that may have resulted from shoveling gravel off the liner. The liner was present beneath the west half of the containment including the produced water tank and had a barrier separating the unlined area. A soil sample beneath the liner, north of HA-5, from 1 to 2 feet reported chloride at less than the analytical

method reporting limit of 1 mg/Kg. On April 20, 2018, LAI personnel collected soil samples from 2 to 3 and 3 to 4 feet which reported chloride at 602 mg/Kg and 636 mg/Kg, respectively.

Chloride was delineated to 600 mg/Kg at the remaining locations and maintained for 3 to 4 feet farther in depth. Table 1 presents the laboratory analytical data summary. Appendix B presents the laboratory reports. Appendix C presents photographs.

3.0 REDMEDIATION PLAN

XTO proposes the following remedial actions:

- Prepare delineation report for submittal to OCD requesting the following:
 - Collect confirmation soil sample from excavated area at southeast corner of containment (HA-2) from approximately 1 foot bgs and analyze for chloride to confirm chloride below 600 mg/kg;
 - Excavate soil to approximately 1 foot bgs in the vicinity of HA-3 (15' x 15');
 - Excavate soil between approximately 1 and 4 feet bgs in the vicinity of DP-1, DP-2 and DP-3;
 - Excavate soil to approximately 1 foot bgs in the vicinity of DP-4 (15' x 15');
 - Collect confirmation samples from bottom and sidewalls of excavations and analyze for chloride by EPA Method 300;
 - Excavate additional soil from bottom and sidewalls to reduce chloride below 600 mg/Kg based on initial confirmation soil samples;
 - Dispose of excavated soil and gravel at Sundance (Parabo) disposal;
 - Assuming no additional soil removal backfill excavations at HA-3 and DP-4 with caliche;
 - Backfill excavation at DP-1, DP-2 and DP-3 with clean soil and seed with BLM Mix 3;

XTO will submit a remediation report and final C-141 upon receipt of laboratory analysis and completion of the remediation. Figure 3 presents the proposed remediation areas and depths.

Tables

Table 1
1RP-4932
Delineatio Soil Sample Analytical Data Summary
XTO Energy, Inc., Arnot Ramsay D Station 5
Lea County, New Mexico

Page 1 of 3

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:									1,000	*600
HA-1	0 - 1	01/19/2018	In-Situ	<0.0208	<0.5834	<26.0	296	159	455	156
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	4.36
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	<1.05
	3 - 4	01/19/2018	In-Situ	--	--	--	--	--	--	<1.05
HA-2	0 - 1	01/22/2018	In-Situ	<0.0220	<0.616	<27.5	<27.5	<27.5	<27.5	1,820
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	261
	2 - 3	01/22/2018	In-Situ	--	--	--	--	--	--	294
	3 - 4	01/22/2018	In-Situ	--	--	--	--	--	--	247
	4 - 5	03/07/2018	In-Situ	--	--	--	--	--	--	*1,580
	5 - 6	03/07/2018	In-Situ	--	--	--	--	--	--	109
	6 - 7	03/07/2018	In-Situ	--	--	--	--	--	--	5.01
	7 - 8	03/07/2018	In-Situ	--	--	--	--	--	--	91.8
HA-3	0 - 1	01/22/2018	In-Situ	<0.0215	<0.6025	77.3	144	84.0	305	1,010
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	6.03
	2 - 3	01/22/2018	In-Situ	--	--	--	--	--	--	<1.11
	3 - 4	01/22/2018	In-Situ	--	--	--	--	--	--	1.70
	4 - 5	03/07/2018	In-Situ	--	--	--	--	--	--	27.4
	5 - 6	03/07/2018	In-Situ	--	--	--	--	--	--	<1.22
	6 - 7	03/07/2018	In-Situ	--	--	--	--	--	--	44.1
HA-4	0 - 1	01/22/2018	In-Situ	<0.0211	<0.5893	63.3	82.9	51.9	198	<1.05
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	<1.04
	2 - 3	01/22/2018	In-Situ	--	--	--	--	--	--	<1.06
	3 - 4	01/22/2018	In-Situ	--	--	--	--	--	--	<1.08
HA-5	0 - 1	01/22/2018	In-Situ	<0.0217	<0.6091	61.7	441	73.4	576	5,090

Table 1
1RP-4932
Delineatio Soil Sample Analytical Data Summary
XTO Energy, Inc., Arnot Ramsay D Station 5
Lea County, New Mexico

Page 2 of 3

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:									1,000	*600
DP-1	0 - 1	01/19/2018	In-Situ	<0.0213	<0.5959	<26.6	276	135	410	1,790
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	1,120
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	389
	3 - 4	01/19/2018	In-Situ	--	--	--	--	--	--	569
	4 - 6	01/19/2018	In-Situ	--	--	--	--	--	--	924
	6 - 8	01/19/2018	In-Situ	--	--	--	--	--	--	182
	8 - 10	01/19/2018	In-Situ	--	--	--	--	--	--	442
	10 -12	01/19/2018	In-Situ	--	--	--	--	--	--	<1.11
DP-2	0 - 1	01/19/2018	In-Situ	<0.0206	<0.5768	30.2	1,020	485	1,530	1,080
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	2,800
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	1,380
	3 - 4	01/19/2018	In-Situ	--	--	--	--	--	--	438
	4 - 6	01/19/2018	In-Situ	--	--	--	--	--	--	50.2
	6 - 8	01/19/2018	In-Situ	--	--	--	--	--	--	41.8
	8 - 10	01/19/2018	In-Situ	--	--	--	--	--	--	<1.06
DP-3	0 - 1	01/19/2018	In-Situ	<0.0202	<0.5656	62.1	258	127	447	1,750
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	176
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	117
	3 - 4	01/19/2018	In-Situ	--	--	--	--	--	--	78.0
	4 - 6	01/19/2018	In-Situ	--	--	--	--	--	--	292
	6 - 8	01/19/2018	In-Situ	--	--	--	--	--	--	92.0
	8 - 10	01/19/2018	In-Situ	--	--	--	--	--	--	15.8
DP-4	0 - 1	01/19/2018	In-Situ	<0.211	<0.5893	74.6	186	78.0	338	1,340
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	118
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	57.4
	3 - 4	01/19/2018	In-Situ	--	--	--	--	--	--	5.05

Table 1
1RP-4932
Delineatio Soil Sample Analytical Data Summary
XTO Energy, Inc., Arnot Ramsay D Station 5
Lea County, New Mexico

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:									1,000	*600
	4 - 6	01/19/2018	In-Situ	--	--	--	--	--	--	369
	6 - 8	01/19/2018	In-Situ	--	--	--	--	--	--	66.4
DP-5	0 - 1	01/19/2018	In-Situ	<0.0208	<0.5834	72.9	335	185	593	545
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	182
DP-S	0 - 1	01/19/2018	In-Situ	<0.0204	<0.5712	<25.5	<25.5	<25.5	<25.5	<1.02
	1 - 2	01/19/2018	In-Situ	--	--	--	--	--	--	<1.03
	2 - 3	01/19/2018	In-Situ	--	--	--	--	--	--	<1.41
DP-E	0 - 1	01/22/2018	In-Situ	<0.0204	<0.5712	<25.5	<25.5	<25.5	<25.5	<1.02
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	<1.03
	2 - 3	01/22/2018	In-Situ	--	--	--	--	--	--	<1.03
	3 - 4	01/22/2018	In-Situ	--	--	--	--	--	--	5.18
DP-W	0 - 1	01/22/2018	In-Situ	<0.0204	<0.5712	60.5	336	148	544	<1.02
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	<1.02
	2 - 3	01/22/2018	In-Situ	--	--	--	--	--	--	<1.05
DP-N	0 - 1	01/22/2018	In-Situ	<0.0206	<0.5768	<25.8	<25.8	<25.8	<25.8	<1.03
	1 - 2	01/22/2018	In-Situ	--	--	--	--	--	--	<1.10
Composite		3/27/2018		--	--	ND	ND	ND	ND	10900

Notes: Laboratory analysis performed by Permian Basin Environmental Lab, Midland, Texas by EPA SW-846 Method 8015M (TPH) and 300 (chloride)

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

*: OCD delineation level

Figures

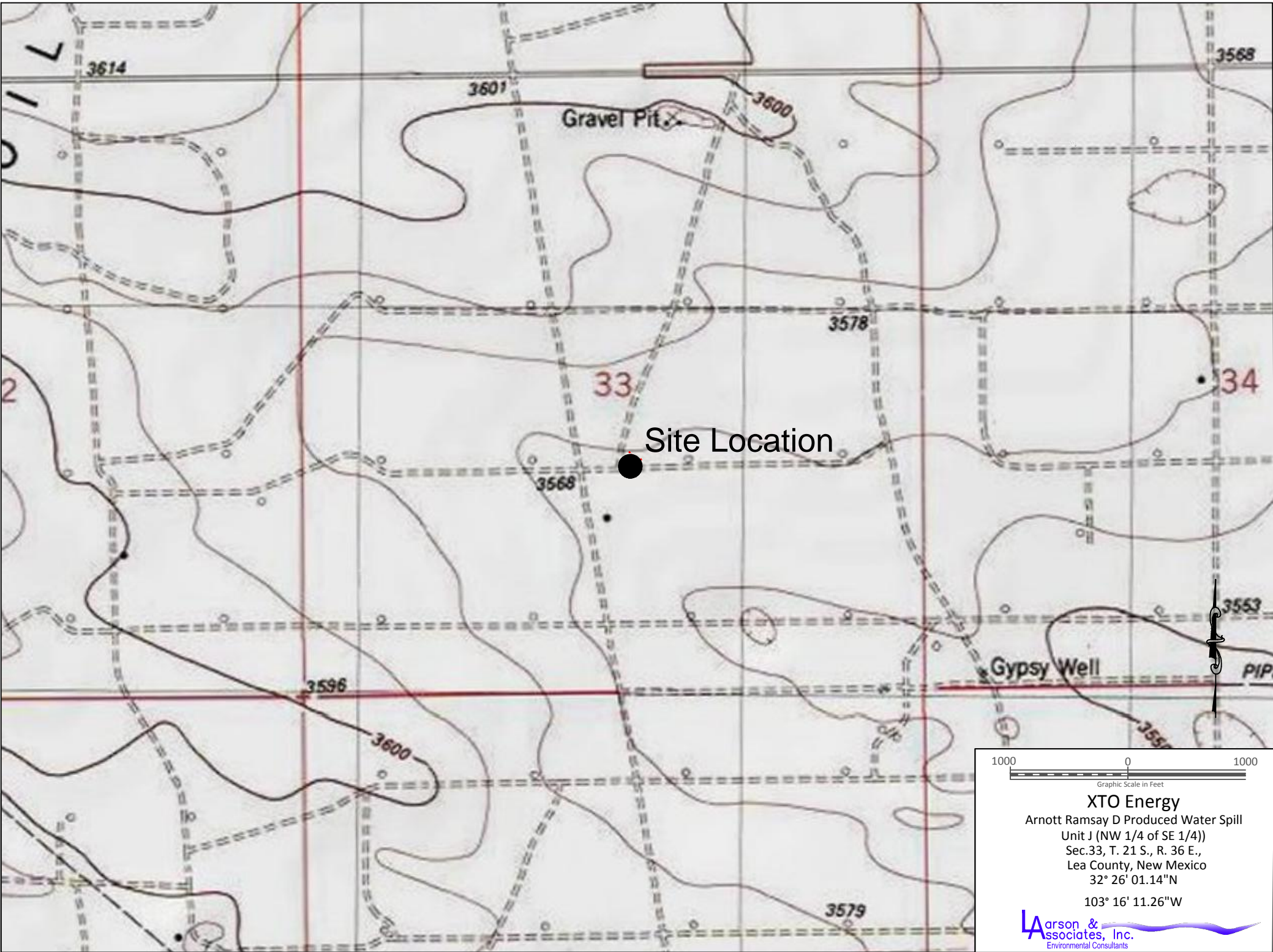


Figure 1 - Topographic Map

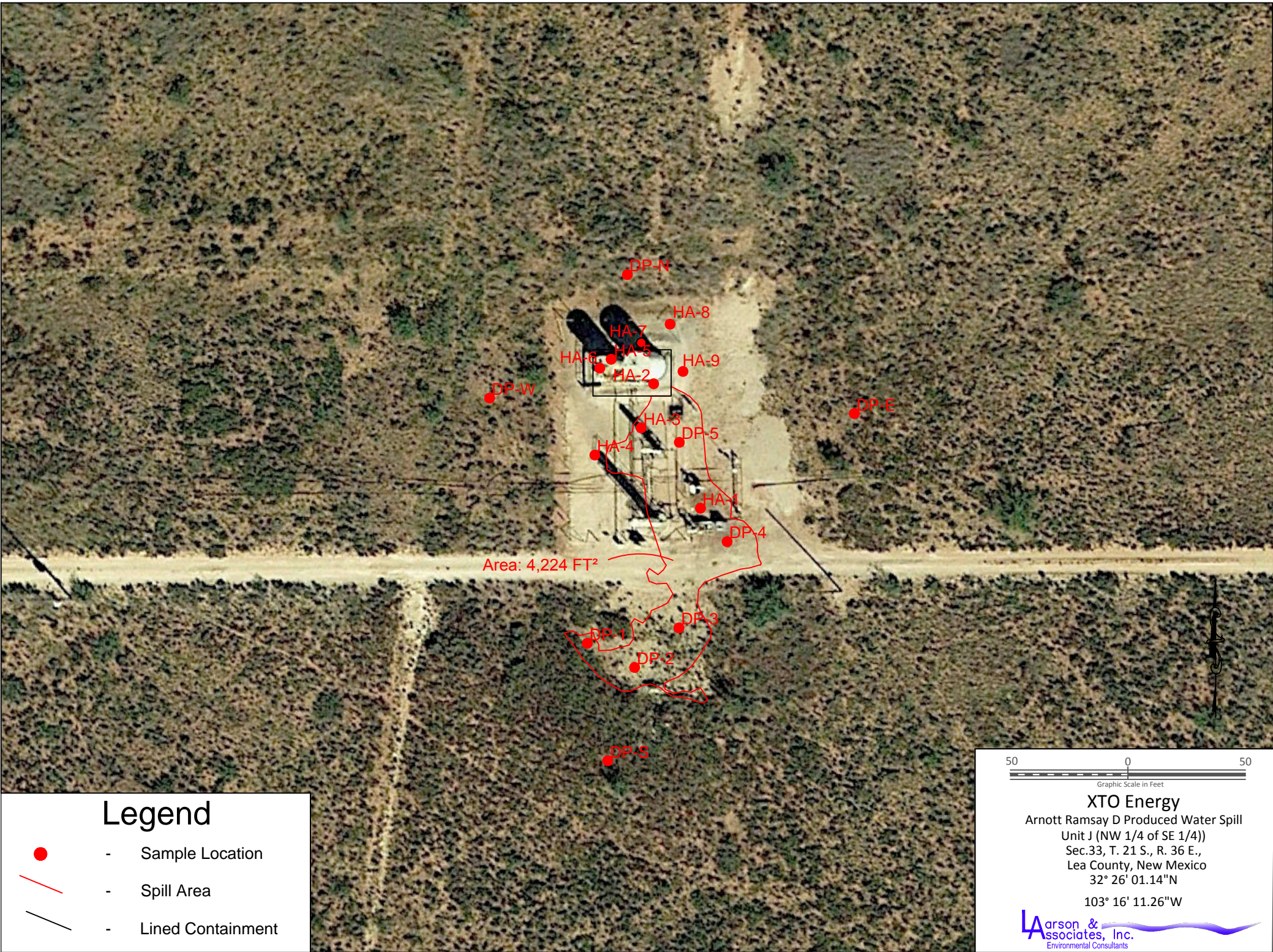


Figure 2 - Aerial Map with Sample Locations

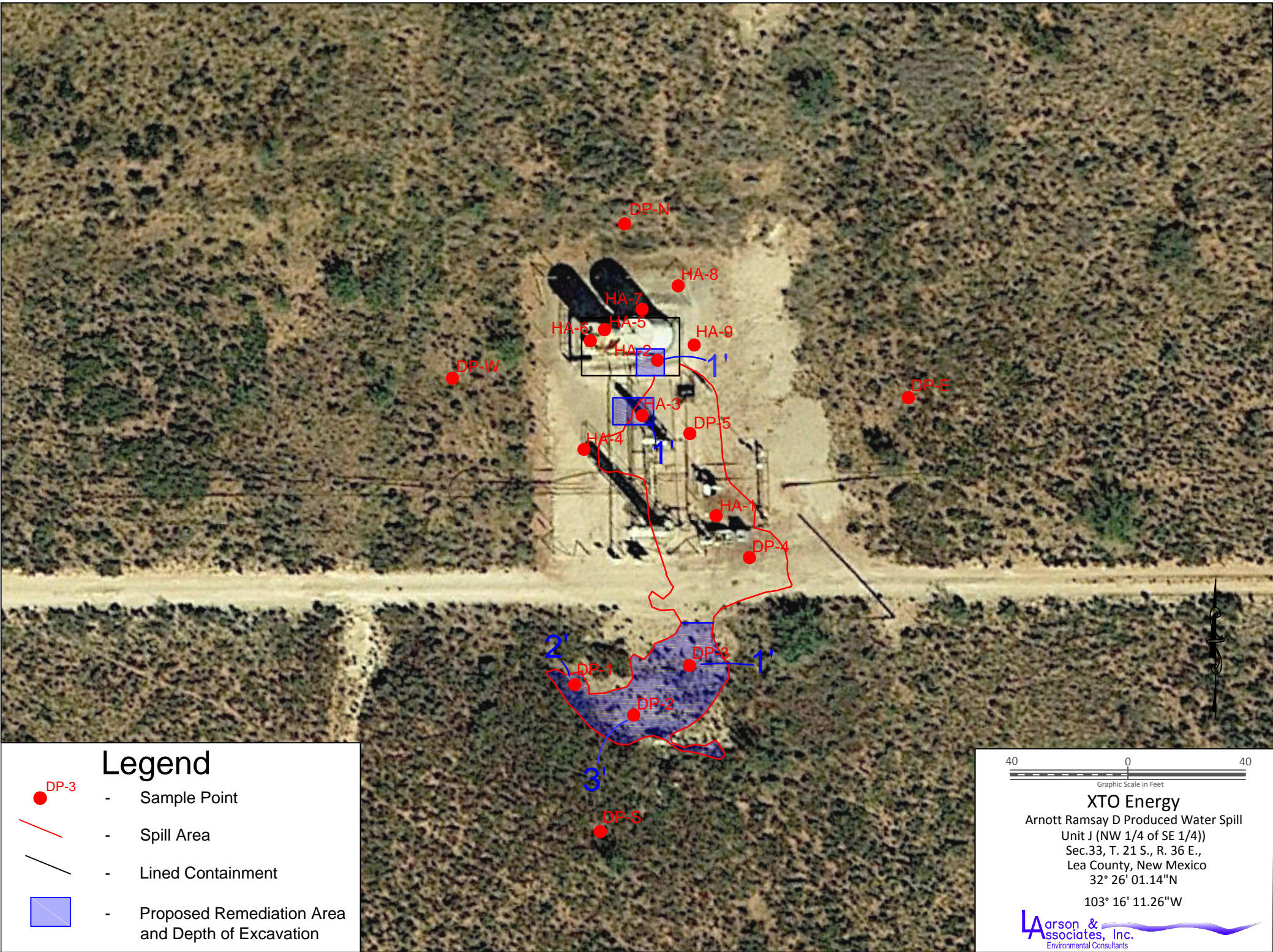


Figure 3 - Aerial Map Showing Remediation Areas and Depth of Excavations

Appendix A

Initial C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	XTO Energy	Contact	Scott Kaufman
Address	500 W. Illinois Suite 100 Midland, TX 79701	Telephone No.	432-234-3054
Facility Name	Arnott Ramsay D Station #5	Facility Type	Battery

Surface Owner	New Mexico State	Mineral Owner	State	API No.	30-025-04893
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	33	21S	36E					Lea

Latitude 32°26'0.69"N IN Longitude 103°16'11.28"W NAD83

NATURE OF RELEASE

Type of Release	Produced Water	Volume of Release	126 bbls	Volume Recovered	0
Source of Release:	Tank battery/ transfer line connection	Date and Hour of Occurrence	1/3/2018 Time unknown	Date and Hour of Discovery	1/3/2018 @ 3:00 pm MT
Was Immediate Notice Given?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Verbal to NM State Land & Voicemail and an E-mail to NMOCD			
By Whom?	Scott Kaufman	Date and Hour	1/4/2018 @ 4:00pm		
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.			

If a Watercourse was Impacted, Describe Fully.*

N?A

RECEIVED

By Olivia Yu at 2:26 pm, Jan 16, 2018

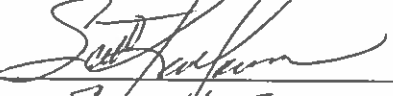

Describe Cause of Problem and Remedial Action Taken.*

Operator found swedge on tank had failed and caused tank to leak and release produced water on to battery location and state land. Produced water soaked into ground leaving nothing on surface to pick up.

Describe Area Affected and Cleanup Action Taken.*

Spill area is an estimated 30' x 50' area. Estimated 126 barrels released, None was recoverable. Once RP# is given final clean up measures will be taken by XTO Energy to complete remediation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Scott Kaufman	Approved by Environmental Specialist: 	
Title: Oil Center Production Foreman	Approval Date: 1/16/2018	Expiration Date:
E-mail Address: Scott.Kaufman@xtoenergy.com	Conditions of Approval: see attached directive	Attached <input checked="" type="checkbox"/>
Date: 1/12/2018	Phone: 432-234-3054	

* Attach/Additional Sheets If Necessary

1RP-4932

nOY1801653359

pOY1801654989

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 1/12/2018 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1RP-4932 has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC. [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District 1 office in Hobbs on or before 2/16/2018. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.
- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.
- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.
- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

- Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

- If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

- Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold

OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

Appendix B

Laboratory Reports

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Mark Larson
Larson & Associates, Inc.
P.O. Box 50685
Midland, TX 79710

Project: Arnott Ramsay
Project Number: 18-0111-01

Location:

Lab Order Number: 8A23002



NELAP/TCEQ # T104704516-17-8

Report Date: 01/25/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1 (0-1)	8A23002-01	Soil	01/19/18 11:30	01-23-2018 08:35
DP-1 (1-2)	8A23002-02	Soil	01/19/18 11:33	01-23-2018 08:35
DP-1 (2-3)	8A23002-03	Soil	01/19/18 11:34	01-23-2018 08:35
DP-1 (3-4)	8A23002-04	Soil	01/19/18 11:36	01-23-2018 08:35
DP-1 (4-6)	8A23002-05	Soil	01/19/18 11:38	01-23-2018 08:35
DP-1 (6-8)	8A23002-06	Soil	01/19/18 11:43	01-23-2018 08:35
DP-1 (8-10)	8A23002-07	Soil	01/19/18 11:49	01-23-2018 08:35
DP-1 (10-12)	8A23002-08	Soil	01/19/18 11:51	01-23-2018 08:35
HA-1 (0-1)	8A23002-09	Soil	01/19/18 11:58	01-23-2018 08:35
HA-1 (1-2)	8A23002-10	Soil	01/19/18 12:00	01-23-2018 08:35
HA-1 (2-3)	8A23002-11	Soil	01/19/18 12:19	01-23-2018 08:35
HA-1 (3-4)	8A23002-12	Soil	01/19/18 12:21	01-23-2018 08:35
DP-2 (0-1)	8A23002-13	Soil	01/19/18 12:29	01-23-2018 08:35
DP-2 (1-2)	8A23002-14	Soil	01/19/18 12:31	01-23-2018 08:35
DP-2 (2-3)	8A23002-15	Soil	01/19/18 12:32	01-23-2018 08:35
DP-2 (3-4)	8A23002-16	Soil	01/19/18 12:33	01-23-2018 08:35
DP-2 (4-6)	8A23002-17	Soil	01/19/18 12:35	01-23-2018 08:35
DP-2 (6-8)	8A23002-18	Soil	01/19/18 12:38	01-23-2018 08:35
DP-2 (8-10)	8A23002-19	Soil	01/19/18 12:39	01-23-2018 08:35
DP-3 (0-1)	8A23002-20	Soil	01/19/18 13:07	01-23-2018 08:35
DP-3 (1-2)	8A23002-21	Soil	01/19/18 13:09	01-23-2018 08:35
DP-3 (2-3)	8A23002-22	Soil	01/19/18 13:10	01-23-2018 08:35
DP-3 (3-4)	8A23002-23	Soil	01/19/18 13:11	01-23-2018 08:35
DP-3 (4-6)	8A23002-24	Soil	01/19/18 13:13	01-23-2018 08:35
DP-3 (6-8)	8A23002-25	Soil	01/19/18 13:15	01-23-2018 08:35
DP-3 (8-10)	8A23002-26	Soil	01/19/18 13:20	01-23-2018 08:35
DP-4 (0-1)	8A23002-27	Soil	01/19/18 13:46	01-23-2018 08:35
DP-4 (1-2)	8A23002-28	Soil	01/19/18 13:47	01-23-2018 08:35
DP-4 (2-3)	8A23002-29	Soil	01/19/18 13:49	01-23-2018 08:35
DP-4 (3-4)	8A23002-30	Soil	01/19/18 13:51	01-23-2018 08:35
DP-4 (4-6)	8A23002-31	Soil	01/19/18 13:52	01-23-2018 08:35
DP-4 (6-8)	8A23002-32	Soil	01/19/18 13:54	01-23-2018 08:35
DP-5 (0-1)	8A23002-33	Soil	01/19/18 14:20	01-23-2018 08:35
DP-5 (1-2)	8A23002-34	Soil	01/19/18 14:22	01-23-2018 08:35

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-S (0-1)	8A23002-35	Soil	01/22/18 12:07	01-23-2018 08:35
DP-S (1-2)	8A23002-36	Soil	01/22/18 12:10	01-23-2018 08:35
DP-S (2-3)	8A23002-37	Soil	01/22/18 12:12	01-23-2018 08:35
DP-E (0-1)	8A23002-38	Soil	01/22/18 12:14	01-23-2018 08:35
DP-E (1-2)	8A23002-39	Soil	01/22/18 12:15	01-23-2018 08:35
DP-E (2-3)	8A23002-40	Soil	01/22/18 12:16	01-23-2018 08:35
DP-E (3-4)	8A23002-41	Soil	01/22/18 12:18	01-23-2018 08:35
DP-W (0-1)	8A23002-42	Soil	01/22/18 12:21	01-23-2018 08:35
DP-W (1-2)	8A23002-43	Soil	01/22/18 12:23	01-23-2018 08:35
DP-W (2-3)	8A23002-44	Soil	01/22/18 12:25	01-23-2018 08:35
DP-N (0-1)	8A23002-45	Soil	01/22/18 12:28	01-23-2018 08:35
DP-N (1-2)	8A23002-46	Soil	01/22/18 12:30	01-23-2018 08:35
HA-2 (0-1)	8A23002-47	Soil	01/22/18 13:04	01-23-2018 08:35
HA-2 (1-2)	8A23002-48	Soil	01/22/18 13:05	01-23-2018 08:35
HA-2 (2-3)	8A23002-49	Soil	01/22/18 13:07	01-23-2018 08:35
HA-2 (3-4)	8A23002-50	Soil	01/22/18 13:08	01-23-2018 08:35
HA-3 (0-1)	8A23002-51	Soil	01/22/18 13:09	01-23-2018 08:35
HA-4 (0-1)	8A23002-52	Soil	01/22/18 13:11	01-23-2018 08:35
HA-4 (1-2)	8A23002-53	Soil	01/22/18 13:12	01-23-2018 08:35
HA-4 (2-3)	8A23002-54	Soil	01/22/18 13:13	01-23-2018 08:35
HA-4 (3-4)	8A23002-55	Soil	01/22/18 13:15	01-23-2018 08:35
HA-5 (0-1)	8A23002-56	Soil	01/22/18 13:20	01-23-2018 08:35

Larson & Associates, Inc.
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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-1 (0-1)
8A23002-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0213	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Toluene	ND	0.213	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Ethylbenzene	ND	0.106	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Xylene (p/m)	ND	0.426	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Xylene (o)	ND	0.213	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		103 %		75-125	P8A2308	01/23/18	01/24/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		77.1 %		75-125	P8A2308	01/23/18	01/24/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1790	5.32	mg/kg dry	5	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
>C12-C28	276	26.6	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
>C28-C35	135	26.6	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		130 %		70-130	P8A2309	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		135 %		70-130	P8A2309	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	410	26.6	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-1 (1-2)
8A23002-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1120	5.38	mg/kg dry	5	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project Manager: Mark Larson

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DP-1 (2-3)
8A23002-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	389	1.08	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-1 (3-4)
8A23002-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	569	1.12	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	11.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-1 (4-6)
8A23002-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	924	1.15	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-1 (6-8)
8A23002-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	182	1.11	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Larson & Associates, Inc.
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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-1 (8-10)
8A23002-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	442	1.09	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	8.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Larson & Associates, Inc.
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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-1 (10-12)
8A23002-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.11	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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P.O. Box 50685
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Project: Arnott Ramsay
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HA-1 (0-1)
8A23002-09 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0208	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Toluene	ND	0.208	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Ethylbenzene	ND	0.104	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Xylene (p/m)	ND	0.417	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Xylene (o)	ND	0.208	mg/kg dry	20	P8A2308	01/23/18	01/24/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		87.8 %	75-125		P8A2308	01/23/18	01/24/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		123 %	75-125		P8A2308	01/23/18	01/24/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	156	1.04	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	4.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
>C12-C28	296	26.0	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
>C28-C35	159	26.0	mg/kg dry	1	P8A2309	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		128 %	70-130		P8A2309	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		136 %	70-130		P8A2309	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	455	26.0	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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HA-1 (1-2)
8A23002-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	4.36	1.04	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	4.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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HA-1 (2-3)
8A23002-11 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.05	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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HA-1 (3-4)
8A23002-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.05	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-2 (0-1)
8A23002-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.103	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.412	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		100 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		76.7 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1080	5.15	mg/kg dry	5	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	3.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	30.2	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	1020	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	485	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		118 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		134 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	1530	25.8	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-2 (1-2)
8A23002-14 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	2800	10.5	mg/kg dry	10	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-2 (2-3)
8A23002-15 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1380	5.49	mg/kg dry	5	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-2 (3-4)
8A23002-16 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	438	1.18	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	15.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-2 (4-6)
8A23002-17 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	50.2	1.15	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0
% Moisture	13.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-2 (6-8)
8A23002-18 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	41.8	1.12	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-2 (8-10)
8A23002-19 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.06	mg/kg dry	1	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-3 (0-1)
8A23002-20 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0202	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.202	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.101	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.404	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.202	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		89.5 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1750	5.05	mg/kg dry	5	P8A2310	01/23/18	01/24/18	EPA 300.0	
% Moisture	1.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	62.1	25.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	258	25.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	127	25.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		118 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		138 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	447	25.3	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-3 (1-2)
8A23002-21 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	176	1.06	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-3 (2-3)
8A23002-22 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	117	1.10	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-3 (3-4)
8A23002-23 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	78.0	1.16	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0
% Moisture	14.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-3 (4-6)
8A23002-24 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	292	1.18	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0
% Moisture	15.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-3 (6-8)
8A23002-25 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	92.0	1.11	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-3 (8-10)
8A23002-26 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	15.8	1.08	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-4 (0-1)
8A23002-27 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.105	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.421	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		114 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		90.8 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1340	5.26	mg/kg dry	5	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	74.6	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	186	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	78.0	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		120 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		141 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	338	26.3	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-4 (1-2)
8A23002-28 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	118	1.08	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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DP-4 (2-3)
8A23002-29 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	57.4	1.11	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-4 (3-4)
8A23002-30 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	5.05	1.10	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-4 (4-6)
8A23002-31 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	369	1.10	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-4 (6-8)
8A23002-32 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	66.4	1.10	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-5 (0-1)
8A23002-33 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0208	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.208	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.104	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.417	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.208	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		81.8 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		110 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	545	1.04	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	4.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	72.9	26.0	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	335	26.0	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	185	26.0	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		117 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		135 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	593	26.0	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-5 (1-2)
8A23002-34 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	182	1.06	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-S (0-1)
8A23002-35 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.102	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.408	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		101 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		75.2 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.02	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	2.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		122 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		144 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.5	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-S (1-2)
8A23002-36 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.03	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0
% Moisture	3.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-S (2-3)
8A23002-37 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.41	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0
% Moisture	29.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-E (0-1)
8A23002-38 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.102	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.408	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		108 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.1 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.02	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	2.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	ND	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		90.6 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		108 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.5	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-E (1-2)
8A23002-39 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.02	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	2.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-E (2-3)
8A23002-40 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.03	mg/kg dry	1	P8A2311	01/23/18	01/24/18	EPA 300.0	
% Moisture	3.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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Project Manager: Mark Larson

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DP-E (3-4)
8A23002-41 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	5.18	1.05	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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Project Number: 18-0111-01
Project Manager: Mark Larson

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DP-W (0-1)
8A23002-42 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.102	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.408	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.204	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		100 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		87.2 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.02	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	2.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	60.5	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	336	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	148	25.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		96.2 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		108 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	544	25.5	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-W (1-2)
8A23002-43 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.02	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0
% Moisture	2.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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Project Manager: Mark Larson

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DP-W (2-3)
8A23002-44 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.05	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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DP-N (0-1)
8A23002-45 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.103	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.412	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.206	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		91.4 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		101 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.03	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	3.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		92.7 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		109 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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DP-N (1-2)
8A23002-46 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.10	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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HA-2 (0-1)
8A23002-47 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0220	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.220	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.110	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.440	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.220	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		118 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		93.6 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1820	5.49	mg/kg dry	5	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		94.9 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		111 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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HA-2 (1-2)
8A23002-48 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	261	1.06	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216

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HA-2 (2-3)
8A23002-49 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	294	1.08	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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HA-2 (3-4)
8A23002-50 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	247	1.11	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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HA-3 (0-1)
8A23002-51 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0215	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.215	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.108	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.430	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.215	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		112 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		81.3 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1010	1.08	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	77.3	26.9	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	144	26.9	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	84.0	26.9	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		92.4 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		107 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	305	26.9	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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HA-4 (0-1)
8A23002-52 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.105	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.421	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.211	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		127 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	S-GC
Surrogate: 1,4-Difluorobenzene		104 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.05	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	5.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	63.3	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	82.9	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	51.9	26.3	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		84.2 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		98.9 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	198	26.3	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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HA-4 (1-2)
8A23002-53 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.04	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	4.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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HA-4 (2-3)
8A23002-54 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.06	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (3-4)
8A23002-55 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.08	mg/kg dry	1	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

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HA-5 (0-1)
8A23002-56 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

Benzene	ND	0.0217	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Toluene	ND	0.217	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Ethylbenzene	ND	0.109	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (p/m)	ND	0.435	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Xylene (o)	ND	0.217	mg/kg dry	20	P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		117 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		89.2 %	75-125		P8A2313	01/23/18	01/25/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	5090	27.2	mg/kg dry	25	P8A2312	01/23/18	01/24/18	EPA 300.0	
% Moisture	8.0	0.1	%	1	P8A2407	01/24/18	01/24/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	61.7	27.2	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C12-C28	441	27.2	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
>C28-C35	73.4	27.2	mg/kg dry	1	P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		92.9 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Surrogate: o-Terphenyl		111 %	70-130		P8A2314	01/23/18	01/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	576	27.2	mg/kg dry	1	[CALC]	01/23/18	01/24/18	calc	

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2308 - General Preparation (GC)

Blank (P8A2308-BLK1)

Prepared & Analyzed: 01/23/18

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 1,4-Difluorobenzene	0.0510		"	0.0600		84.9	75-125			
Surrogate: 4-Bromofluorobenzene	0.0649		"	0.0600		108	75-125			

LCS (P8A2308-BS1)

Prepared & Analyzed: 01/23/18

Benzene	0.107	0.00100	mg/kg wet	0.100		107	70-130			
Toluene	0.115	0.0100	"	0.100		115	70-130			
Ethylbenzene	0.120	0.00500	"	0.100		120	70-130			
Xylene (p/m)	0.217	0.0200	"				70-130			
Xylene (o)	0.118	0.0100	"				70-130			
Surrogate: 4-Bromofluorobenzene	0.0753		"	0.0600		126	75-125			S-GC
Surrogate: 1,4-Difluorobenzene	0.0657		"	0.0600		110	75-125			

LCS Dup (P8A2308-BSD1)

Prepared & Analyzed: 01/23/18

Benzene	0.100	0.00100	mg/kg wet	0.100		100	70-130	6.08	20	
Toluene	0.105	0.0100	"	0.100		105	70-130	8.71	20	
Ethylbenzene	0.114	0.00500	"	0.100		114	70-130	4.94	20	
Xylene (p/m)	0.219	0.0200	"				70-130		20	
Xylene (o)	0.111	0.0100	"				70-130		20	
Surrogate: 1,4-Difluorobenzene	0.0659		"	0.0600		110	75-125			
Surrogate: 4-Bromofluorobenzene	0.0677		"	0.0600		113	75-125			

Calibration Blank (P8A2308-CCB1)

Prepared & Analyzed: 01/23/18

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.0689		"	0.0600		115	75-125			
Surrogate: 1,4-Difluorobenzene	0.0558		"	0.0600		92.9	75-125			

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2308 - General Preparation (GC)

Calibration Blank (P8A2308-CCB2)

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.0539		"	0.0600		89.8	75-125			
Surrogate: 4-Bromofluorobenzene	0.0550		"	0.0600		91.7	75-125			

Calibration Check (P8A2308-CCV1)

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	ND	0.00100	mg/kg wet	0.100			80-120			
Toluene	ND	0.0100	"	0.100			80-120			
Ethylbenzene	ND	0.00500	"	0.100			80-120			
Xylene (p/m)	ND	0.0200	"	0.200			80-120			
Xylene (o)	ND	0.0100	"	0.100			80-120			
Surrogate: 1,4-Difluorobenzene	0.00		"	0.0600			75-125			
Surrogate: 4-Bromofluorobenzene	0.00		"	0.0600			75-125			

Calibration Check (P8A2308-CCV2)

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	0.106	0.00100	mg/kg wet	0.100		106	80-120			
Toluene	0.117	0.0100	"	0.100		117	80-120			
Ethylbenzene	0.117	0.00500	"	0.100		117	80-120			
Xylene (p/m)	0.215	0.0200	"	0.200		107	80-120			
Xylene (o)	0.119	0.0100	"	0.100		119	80-120			
Surrogate: 4-Bromofluorobenzene	0.0876		"	0.0600		146	75-125			S-GC
Surrogate: 1,4-Difluorobenzene	0.0688		"	0.0600		115	75-125			

Calibration Check (P8A2308-CCV3)

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	ND	0.00100	mg/kg wet	0.100			80-120			
Toluene	ND	0.0100	"	0.100			80-120			
Ethylbenzene	ND	0.00500	"	0.100			80-120			
Xylene (p/m)	ND	0.0200	"	0.200			80-120			
Xylene (o)	ND	0.0100	"	0.100			80-120			
Surrogate: 1,4-Difluorobenzene	0.00		"	0.0600			75-125			
Surrogate: 4-Bromofluorobenzene	0.00		"	0.0600			75-125			

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2308 - General Preparation (GC)

Matrix Spike (P8A2308-MS1)

Source: 8A23006-12

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	0.0232	0.00104	mg/kg dry	0.104	ND	22.3	80-120			
Toluene	0.0272	0.0104	"	0.104	ND	26.1	80-120			
Ethylbenzene	0.0358	0.00521	"	0.104	ND	34.4	80-120			
Xylene (p/m)	0.0819	0.0208	"		ND		80-120			
Xylene (o)	ND	0.0104	"		ND		80-120			
Surrogate: 4-Bromofluorobenzene	0.0812		"	0.0625		130	75-125			
Surrogate: 1,4-Difluorobenzene	0.0588		"	0.0625		94.1	75-125			

Matrix Spike Dup (P8A2308-MSD1)

Source: 8A23006-12

Prepared: 01/23/18 Analyzed: 01/24/18

Benzene	0.0209	0.00104	mg/kg dry	0.104	ND	20.1	80-120	10.5	20	
Toluene	0.0265	0.0104	"	0.104	ND	25.4	80-120	2.64	20	
Ethylbenzene	0.0407	0.00521	"	0.104	ND	39.0	80-120	12.6	20	
Xylene (p/m)	0.0827	0.0208	"		ND		80-120		20	
Xylene (o)	ND	0.0104	"		ND		80-120		20	
Surrogate: 4-Bromofluorobenzene	0.0776		"	0.0625		124	75-125			
Surrogate: 1,4-Difluorobenzene	0.0614		"	0.0625		98.3	75-125			

Batch P8A2313 - General Preparation (GC)

Blank (P8A2313-BLK1)

Prepared: 01/23/18 Analyzed: 01/25/18

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 1,4-Difluorobenzene	0.0540		"	0.0600		90.1	75-125			
Surrogate: 4-Bromofluorobenzene	0.0694		"	0.0600		116	75-125			

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2313 - General Preparation (GC)

LCS (P8A2313-BS1)

Prepared: 01/23/18 Analyzed: 01/25/18

Benzene	0.0966	0.00100	mg/kg wet	0.100		96.6	70-130			
Toluene	0.0962	0.0100	"	0.100		96.2	70-130			
Ethylbenzene	0.118	0.00500	"	0.100		118	70-130			
Xylene (p/m)	0.197	0.0200	"				70-130			
Xylene (o)	ND	0.0100	"				70-130			
Surrogate: 1,4-Difluorobenzene	0.0617		"	0.0600		103	75-125			
Surrogate: 4-Bromofluorobenzene	0.0666		"	0.0600		111	75-125			

LCS Dup (P8A2313-BS1)

Prepared: 01/23/18 Analyzed: 01/25/18

Benzene	0.0904	0.00100	mg/kg wet	0.100		90.4	70-130	6.63	20	
Toluene	0.0975	0.0100	"	0.100		97.5	70-130	1.33	20	
Ethylbenzene	0.118	0.00500	"	0.100		118	70-130	0.280	20	
Xylene (p/m)	0.203	0.0200	"				70-130		20	
Xylene (o)	ND	0.0100	"				70-130		20	
Surrogate: 4-Bromofluorobenzene	0.0790		"	0.0600		132	75-125			S-GC
Surrogate: 1,4-Difluorobenzene	0.0681		"	0.0600		113	75-125			

Calibration Blank (P8A2313-CCB1)

Prepared: 01/23/18 Analyzed: 01/25/18

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.0577		"	0.0600		96.2	75-125			
Surrogate: 4-Bromofluorobenzene	0.0735		"	0.0600		123	75-125			

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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2310 - * DEFAULT PREP *****

Blank (P8A2310-BLK1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	ND	1.00	mg/kg wet							
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LCS (P8A2310-BS1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	409	1.00	mg/kg wet	400		102	80-120			
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LCS Dup (P8A2310-BSD1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	411	1.00	mg/kg wet	400		103	80-120	0.317	20	
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Duplicate (P8A2310-DUP1)

Source: 8A23002-01

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	1780	5.32	mg/kg dry		1790			0.286	20	
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Duplicate (P8A2310-DUP2)

Source: 8A23002-11

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	ND	1.05	mg/kg dry		ND				20	
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Matrix Spike (P8A2310-MS1)

Source: 8A23002-01

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	2900	5.32	mg/kg dry	1060	1790	105	80-120			
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Batch P8A2311 - * DEFAULT PREP *****

Blank (P8A2311-BLK1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	ND	1.00	mg/kg wet							
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LCS (P8A2311-BS1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	398	1.00	mg/kg wet	400		99.5	80-120			
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LCS Dup (P8A2311-BSD1)

Prepared: 01/23/18 Analyzed: 01/24/18

Chloride	395	1.00	mg/kg wet	400		98.8	80-120	0.749	20	
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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2311 - * DEFAULT PREP *****

Duplicate (P8A2311-DUP1)		Source: 8A23002-21		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	169	1.06	mg/kg dry		176			3.52	20	
Duplicate (P8A2311-DUP2)		Source: 8A23002-31		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	371	1.10	mg/kg dry		369			0.330	20	
Matrix Spike (P8A2311-MS1)		Source: 8A23002-21		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	1310	1.06	mg/kg dry	1060	176	107	80-120			

Batch P8A2312 - * DEFAULT PREP *****

Blank (P8A2312-BLK1)				Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8A2312-BS1)				Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	396	1.00	mg/kg wet	400		99.0	80-120			
LCS Dup (P8A2312-BSD1)				Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	401	1.00	mg/kg wet	400		100	80-120	1.35	20	
Duplicate (P8A2312-DUP1)		Source: 8A23002-41		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	6.46	1.05	mg/kg dry		5.18			22.1	20	
Duplicate (P8A2312-DUP2)		Source: 8A23002-51		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	1030	1.08	mg/kg dry		1010			2.13	20	
Matrix Spike (P8A2312-MS1)		Source: 8A23002-41		Prepared: 01/23/18 Analyzed: 01/24/18						
Chloride	1090	1.05	mg/kg dry	1050	5.18	103	80-120			

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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2407 - * DEFAULT PREP *****

Blank (P8A2407-BLK1)

Prepared & Analyzed: 01/24/18

% Moisture ND 0.1 %

Duplicate (P8A2407-DUP1)

Source: 8A22006-01

Prepared & Analyzed: 01/24/18

% Moisture 7.0 0.1 % 7.0 0.00 20

Duplicate (P8A2407-DUP2)

Source: 8A23001-24

Prepared & Analyzed: 01/24/18

% Moisture 14.0 0.1 % 16.0 13.3 20

Duplicate (P8A2407-DUP3)

Source: 8A23002-25

Prepared & Analyzed: 01/24/18

% Moisture 10.0 0.1 % 10.0 0.00 20

Duplicate (P8A2407-DUP4)

Source: 8A23002-52

Prepared & Analyzed: 01/24/18

% Moisture 6.0 0.1 % 5.0 18.2 20

Duplicate (P8A2407-DUP5)

Source: 8A23002-56

Prepared & Analyzed: 01/24/18

% Moisture 9.0 0.1 % 8.0 11.8 20

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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2309 - General Preparation (GC)

Blank (P8A2309-BLK1)

Prepared & Analyzed: 01/23/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	132		"	130		101	70-130			
Surrogate: o-Terphenyl	72.1		"	65.0		111	70-130			

LCS (P8A2309-BS1)

Prepared & Analyzed: 01/23/18

C6-C12	1070	25.0	mg/kg wet	1000		107	75-125			
>C12-C28	1170	25.0	"	1000		117	75-125			
Surrogate: 1-Chlorooctane	128		"	100		128	70-130			
Surrogate: o-Terphenyl	64.6		"	50.0		129	70-130			

LCS Dup (P8A2309-BSD1)

Prepared & Analyzed: 01/23/18

C6-C12	1070	25.0	mg/kg wet	1000		107	75-125	0.574	20	
>C12-C28	1170	25.0	"	1000		117	75-125	0.0955	20	
Surrogate: 1-Chlorooctane	126		"	100		126	70-130			
Surrogate: o-Terphenyl	64.5		"	50.0		129	70-130			

Calibration Blank (P8A2309-CCB1)

Prepared & Analyzed: 01/23/18

C6-C12	14.1		mg/kg wet							
>C12-C28	5.72		"							
Surrogate: 1-Chlorooctane	127		"	130		97.7	70-130			
Surrogate: o-Terphenyl	69.2		"	65.0		106	70-130			

Calibration Blank (P8A2309-CCB2)

Prepared & Analyzed: 01/23/18

C6-C12	15.6		mg/kg wet							
>C12-C28	11.8		"							
Surrogate: 1-Chlorooctane	137		"	130		106	70-130			
Surrogate: o-Terphenyl	72.4		"	65.0		111	70-130			

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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2309 - General Preparation (GC)

Calibration Check (P8A2309-CCV1)

Prepared & Analyzed: 01/23/18

C6-C12	531	25.0	mg/kg wet	500		106	85-115			
>C12-C28	566	25.0	"	500		113	85-115			
Surrogate: 1-Chlorooctane	129		"	100		129	70-130			
Surrogate: o-Terphenyl	64.0		"	50.0		128	70-130			

Calibration Check (P8A2309-CCV2)

Prepared & Analyzed: 01/23/18

C6-C12	574	25.0	mg/kg wet	500		115	85-115			
>C12-C28	572	25.0	"	500		114	85-115			
Surrogate: 1-Chlorooctane	125		"	100		125	70-130			
Surrogate: o-Terphenyl	63.8		"	50.0		128	70-130			

Calibration Check (P8A2309-CCV3)

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	529	25.0	mg/kg wet	500		106	85-115			
>C12-C28	570	25.0	"	500		114	85-115			
Surrogate: 1-Chlorooctane	115		"	100		115	70-130			
Surrogate: o-Terphenyl	62.6		"	50.0		125	70-130			

Matrix Spike (P8A2309-MS1)

Source: 8A23006-12

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	1150	26.0	mg/kg dry	1040	14.4	109	75-125			
>C12-C28	1210	26.0	"	1040	ND	116	75-125			
Surrogate: 1-Chlorooctane	133		"	104		128	70-130			
Surrogate: o-Terphenyl	71.8		"	52.1		138	70-130			S-GC

Matrix Spike Dup (P8A2309-MSD1)

Source: 8A23006-12

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	1160	26.0	mg/kg dry	1040	14.4	109	75-125	0.398	20	
>C12-C28	1210	26.0	"	1040	ND	116	75-125	0.631	20	
Surrogate: 1-Chlorooctane	130		"	104		125	70-130			
Surrogate: o-Terphenyl	72.4		"	52.1		139	70-130			S-GC

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2314 - General Preparation (GC)

Blank (P8A2314-BLK1)

Prepared & Analyzed: 01/23/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	123		"	100		123	70-130			
Surrogate: o-Terphenyl	75.3		"	50.0		151	70-130			S-GC

LCS (P8A2314-BS1)

Prepared & Analyzed: 01/23/18

C6-C12	956	25.0	mg/kg wet	1000		95.6	75-125			
>C12-C28	1160	25.0	"	1000		116	75-125			
Surrogate: 1-Chlorooctane	114		"	100		114	70-130			
Surrogate: o-Terphenyl	64.4		"	50.0		129	70-130			

LCS Dup (P8A2314-BSD1)

Prepared & Analyzed: 01/23/18

C6-C12	955	25.0	mg/kg wet	1000		95.5	75-125	0.127	20	
>C12-C28	1160	25.0	"	1000		116	75-125	0.0369	20	
Surrogate: 1-Chlorooctane	116		"	100		116	70-130			
Surrogate: o-Terphenyl	64.7		"	50.0		129	70-130			

Calibration Blank (P8A2314-CCB1)

Prepared & Analyzed: 01/23/18

C6-C12	24.0		mg/kg wet							
>C12-C28	4.78		"							
Surrogate: 1-Chlorooctane	121		"	100		121	70-130			
Surrogate: o-Terphenyl	72.8		"	50.0		146	70-130			S-GC

Calibration Blank (P8A2314-CCB2)

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	21.1		mg/kg wet							
>C12-C28	12.1		"							
Surrogate: 1-Chlorooctane	125		"	100		125	70-130			
Surrogate: o-Terphenyl	74.6		"	50.0		149	70-130			S-GC

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P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8A2314 - General Preparation (GC)

Calibration Check (P8A2314-CCV1)

Prepared & Analyzed: 01/23/18

C6-C12	537	25.0	mg/kg wet	500		107	85-115			
>C12-C28	564	25.0	"	500		113	85-115			
Surrogate: 1-Chlorooctane	120		"	100		120	70-130			
Surrogate: o-Terphenyl	63.0		"	50.0		126	70-130			

Calibration Check (P8A2314-CCV2)

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	542	25.0	mg/kg wet	500		108	85-115			
>C12-C28	530	25.0	"	500		106	85-115			
Surrogate: 1-Chlorooctane	124		"	100		124	70-130			
Surrogate: o-Terphenyl	64.4		"	50.0		129	70-130			

Calibration Check (P8A2314-CCV3)

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	540	25.0	mg/kg wet	500		108	85-115			
>C12-C28	532	25.0	"	500		106	85-115			
Surrogate: 1-Chlorooctane	129		"	100		129	70-130			
Surrogate: o-Terphenyl	64.7		"	50.0		129	70-130			

Matrix Spike (P8A2314-MS1)

Source: 8A23002-56

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	984	27.2	mg/kg dry	1090	61.7	84.9	75-125			
>C12-C28	1280	27.2	"	1090	441	77.1	75-125			
Surrogate: 1-Chlorooctane	140		"	109		128	70-130			
Surrogate: o-Terphenyl	61.2		"	54.3		113	70-130			

Matrix Spike Dup (P8A2314-MSD1)

Source: 8A23002-56

Prepared: 01/23/18 Analyzed: 01/24/18

C6-C12	1010	27.2	mg/kg dry	1090	61.7	86.8	75-125	2.25	20	
>C12-C28	1300	27.2	"	1090	441	79.1	75-125	2.60	20	
Surrogate: 1-Chlorooctane	129		"	109		119	70-130			
Surrogate: o-Terphenyl	63.5		"	54.3		117	70-130			

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

BULK Samples received in Bulk soil containers

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

LCS Laboratory Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By:



Date: 1/25/2018

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 4/23/18
PO #: _____
PROJECT LOCATION: _____
LAI PROJECT #: 14

PAGE 1 OF 1
LAB WORK ORDER #: SA735002
Arnott Ramsey
COLLECTOR: Ashton

Page 72 of 75

CHAIN-OF-CUSTODY

TRRP report?		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
TIME ZONE: Time zone/State:					
MST					
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers
DP-1 (0-1)	1	1-19-18	11:30	S	1
(1-2)	2		11:33		
(2-3)	3		11:34		
(3-4)	4		11:36		
(4-6)	5		11:38		
(6-8)	6		11:43		
(8-10)	7		11:49		
(10-12)	8		11:51		
HA-1 (0-1)	9		11:58		
(1-2)	10		12:00		
(2-3)	11		12:19		
(3-4)	12		12:21		
DP-2 (0-1)	13		12:29		
(1-2)	14		12:31		
(2-3)	15		12:32		
TOTAL					
RELINQUISHED BY: (Signature)					
DATE/TIME 1/23/18 8:35					
RECEIVED BY: (Signature)					
DATE/TIME 1/23/18 8:35					
RECEIVED BY: (Signature)					
DATE/TIME					
RECEIVED BY: (Signature)					
TURN AROUND TIME					
NORMAL <input type="checkbox"/>					
1 DAY <input type="checkbox"/>					
2 DAY <input checked="" type="checkbox"/>					
OTHER <input type="checkbox"/>					
LABORATORY USE ONLY					
RECEIVING TEMP: -10 ± 4					
THERM #					
CUSTODY SEALS - <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED					
CARRIER BILL #					
HAND DELIVERED					
ANALYSES					
BTX <input checked="" type="checkbox"/> MTBE <input type="checkbox"/>					
TPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/>					
GASOLINE MOD 8015 <input checked="" type="checkbox"/>					
DIESEL - MOD 8015 <input checked="" type="checkbox"/>					
VOC 8260 <input type="checkbox"/>					
SVOC 8270 <input type="checkbox"/>					
8081 PESTICIDES <input type="checkbox"/>					
8082 PCBs <input type="checkbox"/>					
TCLP - METALS (RCRA) <input type="checkbox"/>					
TCLP - PEST <input type="checkbox"/>					
TOTAL METALS (RCRA) <input type="checkbox"/>					
LEAD - TOTAL <input type="checkbox"/>					
RCL <input type="checkbox"/>					
TDS <input type="checkbox"/>					
TOX <input type="checkbox"/>					
TSS <input type="checkbox"/>					
% MOISTURE <input type="checkbox"/>					
FLASHPOINT <input type="checkbox"/>					
PH <input type="checkbox"/>					
HEXAVALENT CHROMIUM <input type="checkbox"/>					
PECHLORATE <input type="checkbox"/>					
EXPLOSIVES <input type="checkbox"/>					
CHLORIDE <input type="checkbox"/>					
ANIONS <input type="checkbox"/>					
ALKALINITY <input type="checkbox"/>					
FIELD NOTES					

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: V123168 PAGE 2 OF 2
PO #: _____ LAB WORK ORDER #: _____
PROJECT LOCATION OR NAME: Aircraft Ramsey
LAI PROJECT #: 18-011-01 COLLECTOR: Adrian

Page 73 of 75

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
TIME ZONE: Time zone/State: MST					
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers
DP-2 (3-4)	16	1/19/16	12:33	5	1
(4-6)	17		12:35		
(6-8)	18		12:38		
(8-10)	19		12:39		
DP-3 (0-1)	20		13:07		
(1-2)	21		13:09		
(2-3)	22		13:16		
(3-4)	23		13:11		
(4-6)	24		13:13		
(6-8)	25		13:15		
(8-10)	26		13:20		
DP-4 (0-1)	27		13:46		
(1-2)	28		13:47		
(2-3)	29		13:49		
(3-4)	30		13:51		
TOTAL					
RELINQUISHED BY: (Signature) <i>[Signature]</i>		DATE/TIME 1/23/18 8:35		RECEIVED BY: (Signature) <i>[Signature]</i>	
RELINQUISHED BY: (Signature)		DATE/TIME 1/23/18 8:35		RECEIVED BY: (Signature) <i>[Signature]</i>	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
TURN AROUND TIME NORMAL <input type="checkbox"/> 1 DAY <input type="checkbox"/> 2 DAY <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>					
LABORATORY USE ONLY: RECEIVING TEMP: -10 °C THERM #: CUSTODY SEALS - <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED <input checked="" type="checkbox"/> CARRIER BILL # <input checked="" type="checkbox"/> HAND DELIVERED					

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 1/23/18 PAGE 3 OF 3
PO #: _____ LAB WORK ORDER # _____
PROJECT LOCATION OR NAME: Arnott Ramsey
LAI PROJECT # 18-011-01 COLLECTOR: Ashton

Page 74 of 75

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
TIME ZONE: Time zone/State: MSE		Lab #		Date	
Field Sample I.D.		Time		Matrix	
DP-4 (4-6)		31		1/19/18 13:52	
(6-8)		33		13:54	
DE-5 (0-1)		33		14:20	
(1-2)		34		14:22	
DP-5 (0-1)		35		1/24/18 12:07	
(1-2)		36		12:10	
(2-3)		37		12:12	
DP-E (0-1)		38		12:14	
(1-2)		39		12:15	
(2-3)		40		12:16	
(3-4)		41		12:18	
DP-W (0-1)		42		12:21	
(1-2)		43		12:23	
(2-3)		44		12:25	
DP-N (0-1)		45		12:28	
TOTAL					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
TURN AROUND TIME		LABORATORY USE ONLY:		RECEIVING TEMP: 70°F THERM #:	
NORMAL <input type="checkbox"/>		RECEIVED BY: (Signature)		CUSTODY SEALS - <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED	
1 DAY <input type="checkbox"/>		RECEIVED BY: (Signature)		CARRIER BILL #	
2 DAY <input checked="" type="checkbox"/>		RECEIVED BY: (Signature)		HAND DELIVERED <input checked="" type="checkbox"/>	
OTHER <input type="checkbox"/>		RECEIVED BY: (Signature)			

507 N. Marientfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 1/23/18 PAGE 4 OF 1
PO #: _____ LAB WORK ORDER #: _____
PROJECT LOCATION OR NAME: Apnott RauSoy
LAI PROJECT #: 18-0111-01 COLLECTOR: Ashtyn

Page 75 of 75

TRRP report?		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
TIME ZONE:					
Time zone/State:					
MSE					
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers
DP-N (1-2)	46	1/22/18	12:30	S	1
HA-2 (0-1)	47		13:04		
(1-2)	48		13:05		
(2-3)	49		13:07		
(3-4)	50		13:08		
HA-3 (0-1)	51		13:09		
HA-4 (0-1)	52		13:11		
(1-2)	53		13:12		
(2-3)	54		13:13		
(3-4)	55		13:15		
HA-5 (0-1)	56		13:20		
TOTAL					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
TURN AROUND TIME		LABORATORY USE ONLY:		RECEIVING TEMP: -10°F	
NORMAL <input type="checkbox"/>		RECEIVING TEMP: -10°F		THERM #:	
1 DAY <input type="checkbox"/>		CUSTODY SEALS - <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED			
2 DAY <input checked="" type="checkbox"/>		CARRIER BILL #			
OTHER <input type="checkbox"/>		HAND DELIVERED			
ANALYSES					
BTEX <input checked="" type="checkbox"/> MTBE <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/>					
TRPH 418.1 <input type="checkbox"/> TPH 1005 <input checked="" type="checkbox"/> TPH 1006 <input checked="" type="checkbox"/>					
GASOLINE MOD 8015 <input checked="" type="checkbox"/> MOD 8015 <input checked="" type="checkbox"/>					
DIESEL - MOD 8015 <input checked="" type="checkbox"/> MOD 8015 <input checked="" type="checkbox"/>					
VOC 8260 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/>					
SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/>					
8081 PESTICIDES <input type="checkbox"/> 8151 HERBICIDES <input type="checkbox"/>					
8082 PCBs <input type="checkbox"/> TCIP - METALS (RCRA) <input type="checkbox"/> TCIP VOC <input type="checkbox"/>					
TCIP - PEST <input type="checkbox"/> HERB <input type="checkbox"/> Semi-VOC <input type="checkbox"/>					
TOTAL METALS (RCRA) <input type="checkbox"/> OTHER LIST <input type="checkbox"/>					
LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/> TCIP <input type="checkbox"/>					
RCI <input type="checkbox"/> TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/>					
TDS <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/> CYANIDE <input type="checkbox"/>					
PH <input type="checkbox"/> HEXAVALENT CHROMIUM <input type="checkbox"/>					
EXPLOSIVES <input type="checkbox"/> PCHLORATE <input type="checkbox"/>					
CHLORIDE <input type="checkbox"/> ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/>					
FIELD NOTES					

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Mark Larson
Larson & Associates, Inc.
P.O. Box 50685
Midland, TX 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Location: None Given
Lab Order Number: 8C08009



NELAP/TCEQ # T104704516-17-8

Report Date: 03/09/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA -2 (0-1')	8C08009-01	Soil	03/07/18 12:27	03-08-2018 14:38
HA -2 (1-2')	8C08009-02	Soil	03/08/18 12:34	03-08-2018 14:38
HA -2 (2-3')	8C08009-03	Soil	03/08/18 12:41	03-08-2018 14:38
HA -2 (3-4')	8C08009-04	Soil	03/07/18 12:53	03-08-2018 14:38
HA -2 (4-5')	8C08009-05	Soil	03/07/18 13:05	03-08-2018 14:38
HA -2 (5-6')	8C08009-06	Soil	03/07/18 13:20	03-08-2018 14:38
HA -2 (6-7')	8C08009-07	Soil	03/07/18 13:40	03-08-2018 14:38
HA -2 (7-8')	8C08009-08	Soil	03/07/18 14:00	03-08-2018 14:38
HA -3 (0-1')	8C08009-09	Soil	03/07/18 15:01	03-08-2018 14:38
HA -3 (1-2')	8C08009-10	Soil	03/07/18 15:07	03-08-2018 14:38
HA -3 (2-3')	8C08009-11	Soil	03/07/18 15:15	03-08-2018 14:38
HA -3 (3-4')	8C08009-12	Soil	03/07/18 15:22	03-08-2018 14:38
HA -3 (4-5')	8C08009-13	Soil	03/07/18 15:32	03-08-2018 14:38
HA -3 (5-6')	8C08009-14	Soil	03/07/18 15:42	03-08-2018 14:38
HA -3 (6-7')	8C08009-15	Soil	03/07/18 16:00	03-08-2018 14:38

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (0-1')
8C08009-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1940	5.43	mg/kg dry	5	P8C0809	03/08/18	03/09/18	EPA 300.0
% Moisture	8.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (1-2')
8C08009-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1160	1.06	mg/kg dry	1	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (2-3')
8C08009-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	610	1.11	mg/kg dry	1	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (3-4')
8C08009-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1130	1.15	mg/kg dry	1	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (4-5')
8C08009-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1580	5.88	mg/kg dry	5	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (5-6')
8C08009-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	109	1.18	mg/kg dry	1	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (6-7')
8C08009-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	5.01	1.22	mg/kg dry	1	P8C0809	03/08/18	03/09/18	EPA 300.0	
% Moisture	18.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -2 (7-8')
8C08009-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	91.8	1.09	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	8.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -3 (0-1')
8C08009-09 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	25.5	1.06	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -3 (1-2')
8C08009-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	6.03	1.10	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	9.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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HA -3 (2-3')
8C08009-11 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.11	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -3 (3-4')
8C08009-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	1.70	1.11	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	10.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -3 (4-5')
8C08009-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	27.4	1.20	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	17.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA -3 (5-6')
8C08009-14 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.22	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	18.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

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HA -3 (6-7')
8C08009-15 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	44.1	1.14	mg/kg dry	1	P8C0812	03/08/18	03/09/18	EPA 300.0	
% Moisture	12.0	0.1	%	1	P8C0811	03/08/18	03/09/18	ASTM D2216	

Larson & Associates, Inc.
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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8C0809 - * DEFAULT PREP *****

Blank (P8C0809-BLK1)

Prepared & Analyzed: 03/08/18

Chloride	ND	1.00	mg/kg wet							
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LCS (P8C0809-BS1)

Prepared & Analyzed: 03/08/18

Chloride	431	1.00	mg/kg wet	400		108	80-120			
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LCS Dup (P8C0809-BSD1)

Prepared & Analyzed: 03/08/18

Chloride	433	1.00	mg/kg wet	400		108	80-120	0.423	20	
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Duplicate (P8C0809-DUP1)

Source: 8C07008-01

Prepared & Analyzed: 03/08/18

Chloride	1280	10.3	mg/kg dry		1260			1.15	20	
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Duplicate (P8C0809-DUP2)

Source: 8C07005-04

Prepared & Analyzed: 03/08/18

Chloride	27800	63.3	mg/kg dry		27700			0.356	20	
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Matrix Spike (P8C0809-MS1)

Source: 8C07008-01

Prepared & Analyzed: 03/08/18

Chloride	2360	10.3	mg/kg dry	1030	1260	106	80-120			
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Batch P8C0811 - * DEFAULT PREP *****

Blank (P8C0811-BLK1)

Prepared: 03/08/18 Analyzed: 03/09/18

% Moisture	ND	0.1	%							
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Duplicate (P8C0811-DUP1)

Source: 8C08010-01

Prepared: 03/08/18 Analyzed: 03/09/18

% Moisture	ND	0.1	%		ND				20	
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Batch P8C0812 - * DEFAULT PREP *****

Blank (P8C0812-BLK1)

Prepared: 03/08/18 Analyzed: 03/09/18

Chloride	ND	1.00	mg/kg wet							
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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8C0812 - * DEFAULT PREP *****

LCS (P8C0812-BS1)

Prepared: 03/08/18 Analyzed: 03/09/18

Chloride	421	1.00	mg/kg wet	400	105	80-120
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LCS Dup (P8C0812-BSD1)

Prepared: 03/08/18 Analyzed: 03/09/18

Chloride	417	1.00	mg/kg wet	400	104	80-120	1.05	20
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Duplicate (P8C0812-DUP1)

Source: 8C08009-08

Prepared: 03/08/18 Analyzed: 03/09/18

Chloride	93.8	1.09	mg/kg dry	91.8	2.14	20
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Matrix Spike (P8C0812-MS1)

Source: 8C08009-08

Prepared: 03/08/18 Analyzed: 03/09/18

Chloride	1190	1.09	mg/kg dry	1090	91.8	101	80-120
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Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

BULK Samples received in Bulk soil containers
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference
LCS Laboratory Control Spike
MS Matrix Spike
Dup Duplicate

Report Approved By:



Date:

3/9/2018

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Mark Larson
Larson & Associates, Inc.
P.O. Box 50685
Midland, TX 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Location: None Given
Lab Order Number: 8C09015



NELAP/TCEQ # T104704516-17-8

Report Date: 03/12/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-2 (1-2)	8C09015-01	Soil	03/09/18 07:35	03-09-2018 14:51
DP-2 (2-3)	8C09015-02	Soil	03/09/18 07:38	03-09-2018 14:51
DP-2 (3-4)	8C09015-03	Soil	03/09/18 07:40	03-09-2018 14:51
HA-9 (0-1)	8C09015-04	Soil	03/09/18 07:47	03-09-2018 14:51
HA-9 (1-2)	8C09015-05	Soil	03/09/18 07:50	03-09-2018 14:51
HA-9 (2-3)	8C09015-06	Soil	03/09/18 07:53	03-09-2018 14:51
HA-9 (3-4)	8C09015-07	Soil	03/09/18 08:00	03-09-2018 14:51
HA-9 (4-5)	8C09015-08	Soil	03/09/18 08:07	03-09-2018 14:51
HA-9 (5-6)	8C09015-09	Soil	03/09/18 08:15	03-09-2018 14:51
HA-9 (6-7)	8C09015-10	Soil	03/09/18 08:21	03-09-2018 14:51
HA-8 (0-1)	8C09015-11	Soil	03/09/18 08:27	03-09-2018 14:51
HA-8 (1-2)	8C09015-12	Soil	03/09/18 08:29	03-09-2018 14:51
HA-8 (2-3)	8C09015-13	Soil	03/09/18 08:34	03-09-2018 14:51
HA-8 (3-4)	8C09015-14	Soil	03/09/18 08:55	03-09-2018 14:51
HA-6 (7-8)	8C09015-15	Soil	03/09/18 10:25	03-09-2018 14:51
HA-7 (0-1)	8C09015-16	Soil	03/09/18 09:00	03-09-2018 14:51
HA-7 (1-2)	8C09015-17	Soil	03/09/18 09:04	03-09-2018 14:51
HA-7 (2-3)	8C09015-18	Soil	03/09/18 09:06	03-09-2018 14:51
HA-7 (3-4)	8C09015-19	Soil	03/09/18 09:10	03-09-2018 14:51
HA-7 (4-5)	8C09015-20	Soil	03/09/18 09:15	03-09-2018 14:51
HA-7 (5-6)	8C09015-21	Soil	03/09/18 09:17	03-09-2018 14:51
HA-7 (6-7)	8C09015-22	Soil	03/09/18 09:21	03-09-2018 14:51
HA-7 (7-8)	8C09015-23	Soil	03/09/18 09:25	03-09-2018 14:51
HA-6 (0-1)	8C09015-24	Soil	03/09/18 09:56	03-09-2018 14:51
HA-6 (1-2)	8C09015-25	Soil	03/09/18 09:59	03-09-2018 14:51
HA-6 (2-3)	8C09015-26	Soil	03/09/18 10:02	03-09-2018 14:51
HA-6 (3-4)	8C09015-27	Soil	03/09/18 10:04	03-09-2018 14:51
HA-6 (4-5)	8C09015-28	Soil	03/09/18 10:06	03-09-2018 14:51
HA-6 (5-6)	8C09015-29	Soil	03/09/18 10:08	03-09-2018 14:51
HA-6 (6-7)	8C09015-30	Soil	03/09/18 10:18	03-09-2018 14:51

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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-2 (1-2)
8C09015-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	134	1.03	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0
% Moisture	3.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.8	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
>C12-C28	738	25.8	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
>C28-C35	319	25.8	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
Surrogate: 1-Chlorooctane		100 %	70-130		P8C0906	03/09/18	03/10/18	TPH 8015M
Surrogate: o-Terphenyl		103 %	70-130		P8C0906	03/09/18	03/10/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	1060	25.8	mg/kg dry	1	[CALC]	03/09/18	03/10/18	calc

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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-2 (2-3)
8C09015-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	52.2	1.08	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
>C12-C28	1700	26.9	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
>C28-C35	619	26.9	mg/kg dry	1	P8C0906	03/09/18	03/10/18	TPH 8015M
Surrogate: 1-Chlorooctane		102 %	70-130		P8C0906	03/09/18	03/10/18	TPH 8015M
Surrogate: o-Terphenyl		105 %	70-130		P8C0906	03/09/18	03/10/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	2310	26.9	mg/kg dry	1	[CALC]	03/09/18	03/10/18	calc

Larson & Associates, Inc.
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Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-2 (3-4)
8C09015-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	201	1.12	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-9 (0-1)
8C09015-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.16	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0
% Moisture	14.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-9 (1-2)
8C09015-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.25	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	20.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
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Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-9 (2-3)
8C09015-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.20	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	17.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-9 (3-4)
8C09015-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.39	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0
% Moisture	28.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216

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Project Number: 18-0111-01
Project Manager: Mark Larson

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HA-9 (4-5)
8C09015-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.23	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	19.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-9 (5-6)
8C09015-09 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.14	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-9 (6-7)
8C09015-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.35	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	26.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-8 (0-1)
8C09015-11 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.19	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	16.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-8 (1-2)
8C09015-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.15	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-8 (2-3)
8C09015-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.30	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	23.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-8 (3-4)
8C09015-14 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.23	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	19.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (7-8)
8C09015-15 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	119	1.12	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (0-1)
8C09015-16 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	24.9	1.12	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (1-2)
8C09015-17 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	2.22	1.15	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (2-3)
8C09015-18 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	16.4	1.18	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (3-4)
8C09015-19 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	175	1.19	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0	
% Moisture	16.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (4-5)
8C09015-20 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	102	1.19	mg/kg dry	1	P8C1202	03/12/18	03/12/18	EPA 300.0
% Moisture	16.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216

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HA-7 (5-6)
8C09015-21 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.27	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	21.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (6-7)
8C09015-22 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	14.2	1.14	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	12.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-7 (7-8)
8C09015-23 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	18.9	1.16	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	14.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (0-1)
8C09015-24 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	427	1.06	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (1-2)
8C09015-25 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	389	1.08	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (2-3)
8C09015-26 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	27.2	1.18	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (3-4)
8C09015-27 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	161	1.08	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (4-5)
8C09015-28 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	43.7	1.20	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	17.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (5-6)
8C09015-29 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	246	1.20	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	17.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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HA-6 (6-7)
8C09015-30 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	244	1.16	mg/kg dry	1	P8C1203	03/12/18	03/12/18	EPA 300.0	
% Moisture	14.0	0.1	%	1	P8C1210	03/12/18	03/12/18	ASTM D2216	

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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P8C1202 - *** DEFAULT PREP ***										
Blank (P8C1202-BLK1)				Prepared & Analyzed: 03/12/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8C1202-BS1)				Prepared & Analyzed: 03/12/18						
Chloride	426	1.00	mg/kg wet	400		107	80-120			
LCS Dup (P8C1202-BSD1)				Prepared & Analyzed: 03/12/18						
Chloride	422	1.00	mg/kg wet	400		105	80-120	1.05	20	
Batch P8C1210 - *** DEFAULT PREP ***										
Blank (P8C1210-BLK1)				Prepared & Analyzed: 03/12/18						
% Moisture	ND	0.1	%							
Duplicate (P8C1210-DUP1)				Prepared & Analyzed: 03/12/18						
% Moisture	11.0	0.1	%		11.0			0.00	20	
Duplicate (P8C1210-DUP2)				Prepared & Analyzed: 03/12/18						
% Moisture	15.0	0.1	%		14.0			6.90	20	

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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8C0906 - General Preparation (GC)

Blank (P8C0906-BLK1)

Prepared: 03/09/18 Analyzed: 03/10/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
<i>Surrogate: 1-Chlorooctane</i>	<i>108</i>		<i>"</i>	<i>100</i>		<i>108</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>56.2</i>		<i>"</i>	<i>50.0</i>		<i>112</i>	<i>70-130</i>			

LCS (P8C0906-BS1)

Prepared: 03/09/18 Analyzed: 03/10/18

C6-C12	1090	25.0	mg/kg wet	1000		109	75-125			
>C12-C28	1070	25.0	"	1000		107	75-125			
<i>Surrogate: 1-Chlorooctane</i>	<i>126</i>		<i>"</i>	<i>100</i>		<i>126</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>64.6</i>		<i>"</i>	<i>50.0</i>		<i>129</i>	<i>70-130</i>			

LCS Dup (P8C0906-BSD1)

Prepared: 03/09/18 Analyzed: 03/10/18

C6-C12	1150	25.0	mg/kg wet	1000		115	75-125	4.98	20	
>C12-C28	1130	25.0	"	1000		113	75-125	5.82	20	
<i>Surrogate: 1-Chlorooctane</i>	<i>128</i>		<i>"</i>	<i>100</i>		<i>128</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>67.9</i>		<i>"</i>	<i>50.0</i>		<i>136</i>	<i>70-130</i>			<i>S-GC</i>

Matrix Spike (P8C0906-MS1)

Source: 8C09014-03

Prepared: 03/09/18 Analyzed: 03/10/18

C6-C12	1220	25.5	mg/kg dry	1020	386	81.8	75-125			
>C12-C28	1780	25.5	"	1020	1450	32.5	75-125			QM-05
<i>Surrogate: 1-Chlorooctane</i>	<i>115</i>		<i>"</i>	<i>102</i>		<i>113</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>64.6</i>		<i>"</i>	<i>51.0</i>		<i>127</i>	<i>70-130</i>			

Matrix Spike Dup (P8C0906-MSD1)

Source: 8C09014-03

Prepared: 03/09/18 Analyzed: 03/10/18

C6-C12	1230	25.5	mg/kg dry	1020	386	82.9	75-125	1.34	20	
>C12-C28	1810	25.5	"	1020	1450	34.9	75-125	6.91	20	QM-05
<i>Surrogate: 1-Chlorooctane</i>	<i>109</i>		<i>"</i>	<i>102</i>		<i>107</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>65.4</i>		<i>"</i>	<i>51.0</i>		<i>128</i>	<i>70-130</i>			

Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By:



Date:

3/12/2018

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Mark Larson
Larson & Associates, Inc.
P.O. Box 50685
Midland, TX 79710

Project: Arnott Ramsay
Project Number: 18-0111-01

Location:

Lab Order Number: 8C27001



NELAP/TCEQ # T104704516-17-8

Report Date: 04/03/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Composite	8C27001-01	Soil	03/26/18 14:10	03-27-2018 08:50

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Composite
8C27001-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	10900	53.8	mg/kg dry	50	P8D0202	04/02/18	04/03/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8C2905	03/29/18	03/29/18	ASTM D2216

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P8C2802	03/28/18	03/28/18	TPH 8015M
>C12-C28	ND	26.9	mg/kg dry	1	P8C2802	03/28/18	03/28/18	TPH 8015M
>C28-C35	ND	26.9	mg/kg dry	1	P8C2802	03/28/18	03/28/18	TPH 8015M
Surrogate: 1-Chlorooctane		74.8 %	70-130		P8C2802	03/28/18	03/28/18	TPH 8015M
Surrogate: o-Terphenyl		80.4 %	70-130		P8C2802	03/28/18	03/28/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	03/28/18	03/28/18	calc

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P8C2905 - *** DEFAULT PREP ***										
Blank (P8C2905-BLK1)				Prepared & Analyzed: 03/29/18						
% Moisture	ND	0.1	%							
Duplicate (P8C2905-DUP1)				Source: 8C26001-26		Prepared & Analyzed: 03/29/18				
% Moisture	12.0	0.1	%		18.0			40.0	20	
Batch P8D0202 - *** DEFAULT PREP ***										
Blank (P8D0202-BLK1)				Prepared & Analyzed: 04/02/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8D0202-BS1)				Prepared & Analyzed: 04/02/18						
Chloride	388	1.00	mg/kg wet	400		97.1	80-120			
LCS Dup (P8D0202-BSD1)				Prepared & Analyzed: 04/02/18						
Chloride	389	1.00	mg/kg wet	400		97.2	80-120	0.129	20	
Duplicate (P8D0202-DUP1)				Source: 8C26001-27		Prepared: 04/02/18 Analyzed: 04/03/18				
Chloride	803	1.12	mg/kg dry		966			18.4	20	
Duplicate (P8D0202-DUP2)				Source: 8C27003-08		Prepared: 04/02/18 Analyzed: 04/03/18				
Chloride	8470	29.4	mg/kg dry		8470			0.0208	20	
Matrix Spike (P8D0202-MS1)				Source: 8C26001-27		Prepared: 04/02/18 Analyzed: 04/03/18				
Chloride	1900	1.12	mg/kg dry	1120	966	83.5	80-120			

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8C2802 - General Preparation (GC)

Blank (P8C2802-BLK1)

Prepared & Analyzed: 03/28/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
<i>Surrogate: 1-Chlorooctane</i>	<i>97.3</i>		<i>"</i>	<i>100</i>		<i>97.3</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>50.7</i>		<i>"</i>	<i>50.0</i>		<i>101</i>	<i>70-130</i>			

LCS (P8C2802-BS1)

Prepared & Analyzed: 03/28/18

C6-C12	1050	25.0	mg/kg wet	1000		105	75-125			
>C12-C28	962	25.0	"	1000		96.2	75-125			
<i>Surrogate: 1-Chlorooctane</i>	<i>114</i>		<i>"</i>	<i>100</i>		<i>114</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>58.9</i>		<i>"</i>	<i>50.0</i>		<i>118</i>	<i>70-130</i>			

LCS Dup (P8C2802-BSD1)

Prepared & Analyzed: 03/28/18

C6-C12	1040	25.0	mg/kg wet	1000		104	75-125	0.803	20	
>C12-C28	979	25.0	"	1000		97.9	75-125	1.82	20	
<i>Surrogate: 1-Chlorooctane</i>	<i>128</i>		<i>"</i>	<i>100</i>		<i>128</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>51.8</i>		<i>"</i>	<i>50.0</i>		<i>104</i>	<i>70-130</i>			

Matrix Spike (P8C2802-MS1)

Source: 8C28002-02

Prepared: 03/28/18 Analyzed: 03/29/18

C6-C12	952	25.3	mg/kg dry	1010	69.6	87.4	75-125			
>C12-C28	3000	25.3	"	1010	2700	29.8	75-125			
<i>Surrogate: 1-Chlorooctane</i>	<i>128</i>		<i>"</i>	<i>101</i>		<i>127</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>49.2</i>		<i>"</i>	<i>50.5</i>		<i>97.4</i>	<i>70-130</i>			

Matrix Spike Dup (P8C2802-MSD1)

Source: 8C28002-02

Prepared: 03/28/18 Analyzed: 03/29/18

C6-C12	931	25.3	mg/kg dry	1010	69.6	85.3	75-125	2.43	20	
>C12-C28	3040	25.3	"	1010	2700	34.1	75-125	13.5	20	
<i>Surrogate: 1-Chlorooctane</i>	<i>128</i>		<i>"</i>	<i>101</i>		<i>126</i>	<i>70-130</i>			
<i>Surrogate: o-Terphenyl</i>	<i>56.0</i>		<i>"</i>	<i>50.5</i>		<i>111</i>	<i>70-130</i>			

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

BULK Samples received in Bulk soil containers
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference
LCS Laboratory Control Spike
MS Matrix Spike
Dup Duplicate

Report Approved By:



Date:

4/3/2018

Brent Barron, Laboratory Director/Technical Director

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If you have received this material in error, please notify us immediately at 432-686-7235.

Data Reported to:

DATE: 3/27/2018 PAGE 1 OF 9
PO #: _____ LAB WORK ORDER #: 80270
PROJECT LOCATION OR NAME: X70 Annett Ramsey
LAI PROJECT #: 18-011-01 COLLECTOR: DS

CHAIN-OF-CUSTODY

TRRP report?
☐ Yes ☒ No

S=SOIL W=WATER P=PAINT
A=AIR SL=SLUDGE
OT=OTHER

TIME ZONE:
Time zone/State:

MST

Field
Sample I.D.

Lab #

Date

Time

Matrix

of Containers

HCl

HNO₃

H₂SO₄ ☐ NaOH ☐

ICE

UNPRESERVED

ANALYSES

BTEX ☐ MTBE ☐
TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐
GASOLINE MOD 8015 ☒ **2000**
DIESEL MOD 8015 ☒
VOC 8260 ☐
SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐
8081 PESTICIDES ☐ 8151 HERBICIDES ☐
8082 PQBS ☐
TCPP - METALS (RCRA) ☐ TCPP VOC ☐
TCPP - PEST ☐ TCPP semi-VOC ☐
TOTAL METALS (RCRA) ☐ OTHER LIST ☐
LEAD - TOTAL ☐ D.W.-200.8 ☐ TCPP ☐
ROCI ☐ TOX ☐ FLASHPOINT ☐
TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐
PH ☐ HEXAVALENT CHROMIUM ☐
EXPLOSIVES ☐ PETCHLORATE ☐
CHLORIDE ☒ ANIONS ☐ ALKALINITY ☐

FIELD NOTES

~~Annett Ramsey~~
Composite

3/26/18 14:10

S

1

X

XX

X

TOTAL

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

TURN AROUND TIME

LABORATORY USE ONLY:

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

RECEIVING TEMP: -2.1 + 0.4 THERM #: -2.5
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☐ HAND DELIVERED

RELINQUISHED BY: (Signature)

DATE/TIME

RECEIVED BY: (Signature)

3/27/18 8:50

PBEL

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Mark Larson
Larson & Associates, Inc.
P.O. Box 50685
Midland, TX 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Location: None Given
Lab Order Number: 8D20018



NELAP/TCEQ # T104704516-17-8

Report Date: 04/24/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-2 (1-2)	8D20018-01	Soil	04/20/18 09:36	04-20-2018 13:10
HA-2 (2-3)	8D20018-02	Soil	04/20/18 09:40	04-20-2018 13:10
HA-2 (3-4)	8D20018-03	Soil	04/20/18 09:44	04-20-2018 13:10
HA-2 (4-5)	8D20018-04	Soil	04/20/18 09:50	04-20-2018 13:10
HA-2 (5-6)	8D20018-05	Soil	04/20/18 09:55	04-20-2018 13:10
HA-5 (2-3)	8D20018-06	Soil	04/20/18 10:00	04-20-2018 13:10
HA-5 (3-4)	8D20018-07	Soil	04/20/18 10:04	04-20-2018 13:10

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (1-2)
8D20018-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	14.0	1.03	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0
% Moisture	3.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (2-3)
8D20018-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	155	1.06	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0	
% Moisture	6.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (3-4)
8D20018-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	63.3	1.12	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (4-5)
8D20018-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	7.80	1.18	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (5-6)
8D20018-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	48.6	1.14	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0
% Moisture	12.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (2-3)
8D20018-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	602	1.08	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (3-4)
8D20018-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	636	1.08	mg/kg dry	1	P8D2006	04/20/18	04/20/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8D2304	04/23/18	04/23/18	ASTM D2216	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P8D2006 - *** DEFAULT PREP ***										
Blank (P8D2006-BLK1)				Prepared & Analyzed: 04/20/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8D2006-BS1)				Prepared & Analyzed: 04/20/18						
Chloride	378	1.00	mg/kg wet	400		94.5	80-120			
LCS Dup (P8D2006-BSD1)				Prepared & Analyzed: 04/20/18						
Chloride	378	1.00	mg/kg wet	400		94.4	80-120	0.0979	20	
Duplicate (P8D2006-DUP1)				Source: 8D18002-06		Prepared & Analyzed: 04/20/18				
Chloride	1230	5.21	mg/kg dry		1230			0.597	20	
Duplicate (P8D2006-DUP2)				Source: 8D18003-09		Prepared & Analyzed: 04/20/18				
Chloride	43.4	1.01	mg/kg dry		42.1			2.88	20	
Matrix Spike (P8D2006-MS1)				Source: 8D18002-06		Prepared & Analyzed: 04/20/18				
Chloride	2260	5.21	mg/kg dry	1040	1230	99.1	80-120			
Batch P8D2304 - *** DEFAULT PREP ***										
Blank (P8D2304-BLK1)				Prepared & Analyzed: 04/23/18						
% Moisture	ND	0.1	%							
Duplicate (P8D2304-DUP1)				Source: 8D20004-01		Prepared & Analyzed: 04/23/18				
% Moisture	4.0	0.1	%		4.0			0.00	20	
Duplicate (P8D2304-DUP2)				Source: 8D20008-02		Prepared & Analyzed: 04/23/18				
% Moisture	3.0	0.1	%		4.0			28.6	20	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P8D2304 - * DEFAULT PREP *****

Duplicate (P8D2304-DUP3)

Source: 8D20011-02

Prepared & Analyzed: 04/23/18

% Moisture	10.0	0.1	%		10.0			0.00	20	
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Duplicate (P8D2304-DUP4)

Source: 8D20020-02

Prepared & Analyzed: 04/23/18

% Moisture	1.0	0.1	%		1.0			0.00	20	
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Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Arnott Ramsay
Project Number: 18-0111-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference
LCS Laboratory Control Spike
MS Matrix Spike
Dup Duplicate

Report Approved By:



Date: 4/24/2018

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

PBE L

CHAIN-OF-CUSTODY

Marson & Associates, Inc.
Environmental Consultants

507 N. Marientfield, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 4-20-18 PAGE 1 OF 1
PO #: 8220018
LAB WORK ORDER #: 8220018
PROJECT LOCATION OR NAME: Arnold Basin
LAI PROJECT #: 18-011-01 COLLECTOR: BSM

Page 13 of 13

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		PRESERVATION HCl HNO ₃ H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> ICE UNPRESERVED		ANALYSES BTEX <input type="checkbox"/> MTBE <input type="checkbox"/> TRPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/> GASOLINE MOD 8015 <input type="checkbox"/> DIESEL - MOD 8015 <input type="checkbox"/> VOC 8260 <input type="checkbox"/> SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/> 8081 PESTICIDES <input type="checkbox"/> 8151 HERBICIDES <input type="checkbox"/> TCCLP - METALS (RCRA) <input type="checkbox"/> Semi-VOC <input type="checkbox"/> TOTAL METALS (RCRA) <input type="checkbox"/> OTHER LIST <input type="checkbox"/> LEAD - TOTAL <input type="checkbox"/> DW 200.8 <input type="checkbox"/> TCLP <input type="checkbox"/> TDS <input type="checkbox"/> TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/> pH <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/> CYANIDE <input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> PECTHLORATE <input type="checkbox"/> CHLORIDE ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/> FIELD NOTES	
TIME ZONE: Time zone/State: <u>M 8k</u>	Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers			
	H-2 (1-2)	-01	4-20-18	9:30	S	1	X		
	(2-3)	-02		9:40					
	(3-4)	-03		9:44					
	(4-5)	-04		9:50					
	(5-6)	-05		9:55					
	H-5 (1-2)	-06		10:00					
	(6-3)	-07		10:04					
TOTAL									
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		TURN AROUND TIME		LABORATORY USE ONLY:	
<u>[Signature]</u>		4/20/18 1310		<u>[Signature]</u>		NORMAL <input type="checkbox"/> 1 DAY <input checked="" type="checkbox"/> 2 DAY <input type="checkbox"/> OTHER <input type="checkbox"/>		RECEIVING TEMP: <u>20/20.4</u> THERM #: <u>LI</u>	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input type="checkbox"/> NOT USED		CARRIER BILL #	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		HAND-DELIVERED			

Appendix C
Photographs



View of Site Facing North, March 7, 2018



View of Site Facing East, March 7, 2018



View of Site Facing South, March 7, 2018



View of Site Facing Northwest, March 7, 2018



View of Produced Water Tank (Foreground) Facing Northeast, March 7, 2018



View of Crude Oil Tank (Foreground) Facing Southwest, March 7, 2018



Soil Sample Location (HA-2) Southwest of Oil Tank, March 7, 2018



Produced Water Tank and Spill Origin Following Removal of Gravel March 9, 2018



Poly Liner beneath Produced Water Tank Following Removal of Gravel March 9, 2018



Crude Oil Tank Following Removal of Gravel Viewing Northeast, March 9, 2018

From: [Hernandez, Christina, EMNRD](#)
To: "Mark Larson"; Yu, Olivia, EMNRD; "rmann@slo.state.nm.us"
Cc: "Pennington, Shelby"
Subject: RE: 1RP-4932 - Arnott Ramsay Station 5 Produced Water Spill Delineation Report, July 13, 2018
Date: Wednesday, July 25, 2018 10:42:00 AM
Attachments: [Approved1RP-4932 Arnott Ramsay Produced Water Leak Delineation Report.pdf](#)

Dear Mr. Larson:

NMOCD approves of the delineation completed for 1RP-4932. The proposed remediation is also approved with these conditions:

- Please be advised to replace the liner currently inside west part of containment as it was unclear in report if liner puncture was repaired during the gravel removal activity on March 8, 2018.
- Due to levels of chloride over RRAL's underneath liner at HA-5 (2-4ft) and at HA-2 (0-1 and 4-5 ft), please be advised to excavate to 4' (where deemed applicable) and line entire containment. Please provide sidewall confirmation samples from inside containment.
- Please be advised to replace gravel inside containment as chloride concentrations are exceedingly high.
- Confirmation bottom and sidewall samples are required for proposed excavations at HA-3, DP-2, DP-3, and DP-4. At least one of the sidewall/edge samples is to be at the border between the different depths of excavation at areas DP-1, DP-2, DP-3, DP-4.
- Please be advised to excavate to 4' at DP-1 and use impermeable liner. Sidewall confirmation samples are required.
- Provide dated photo documentation of the remedial activities, including the proper emplacement of the liners used.
- Provide scaled map with the confirmation sample locations in relation to the delineation sample points.

Thanks,

Christina Hernandez
EMNRD-OCD
Environmental Specialist
1625 N. French Drive
Hobbs, NM 88240
575-393-6161 x111
Christina.Hernandez@state.nm.us

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

From: Mark Larson <Mark@laenvironmental.com>

Sent: Tuesday, July 17, 2018 3:49 PM

To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>; Hernandez, Christina, EMNRD <Christina.Hernandez@state.nm.us>; 'rmann@slo.state.nm.us' <rmann@slo.state.nm.us>

Cc: 'Pennington, Shelby' <Shelby_Pennington@xtoenergy.com>

Subject: Re: 1RP-4932 - Arnott Ramsay Station 5 Produced Water Spill Delineation Report, July 13, 2018

Dear Ms. Yu, Ms. Hernandez and Mr. Mann,

Larson & Associates, Inc. (LAI), on behalf of XTO Energy, Inc. (XTO), submits the attached delineation report for a spill from the produced water tank at the Arnott Ramsay Station 5 tank battery located in Lea County, New Mexico. The spill occurred after a swedge on the produced water tank failed causing the release of produced water. XTO proposes the following remedial actions in response to the spill:

- Collect confirmation soil sample from excavated area at southeast corner of containment (HA-2) from approximately 1 foot bgs and analyze for chloride to confirm chloride below 600 mg/kg;
- Excavate soil to approximately 1 foot bgs in the vicinity of HA-3 (15' x 15');
- Excavate soil between approximately 1 and 4 feet bgs in the vicinity of DP-1, DP-2 and DP-3;
- Excavate soil to approximately 1 foot bgs in the vicinity of DP-4 (15' x 15');
- Collect confirmation samples from bottom and sidewalls of excavations and analyze for chloride by EPA Method 300;
- Excavate additional soil from bottom and sidewalls to reduce chloride below 600 mg/Kg based on initial confirmation soil samples;
- Dispose of excavated soil and gravel at Sundance (Parabo) disposal;
- Assuming no additional soil removal backfill excavations at HA-3 and DP-4 with caliche;
- Backfill excavation at DP-1, DP-2 and DP-3 with clean soil and seed with BLM Mix 3;

XTO will submit a remediation report and final C-141 upon receipt of laboratory analysis and completion of the remediation. Your approval of the delineation report and proposed remediation plan are appreciated. Please contact Shelby Pennington with XTO at (432) 682-8873 or email Shelby_Pennington@xtoenergy.com or me if you have questions.

Respectfully,

Mark J. Larson, P.G.

President/Sr. Project Manager

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