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 Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Legacy Reserves, L.P.	OGRID 240974
Contact Name Brian Cunningham	Contact Telephone 432-234-9450
Contact email bcunningham@legacylp.com	Incident # *(assigned by OCD)* 1RP-5321
Contact mailing address 303 West Wall Street, Suite 1300	

Location of Release Source

Latitude 32.57488° N Longitude -103.51560° W
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Lea Unit #10	Site Type Well Pad
Date Release Discovered 12/28/2018	API# *(if applicable)* 30-025-20506

Unit Letter	Section	Township	Range	County
F	13	20S	34E	Lea

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name:* Kenneth Smith, Inc.)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 60 bbls	Volume Recovered (bbls) 0 bbls
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	☐ Yes ☒ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A leak formed in a water line on the well pad.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? [X] Yes [ ] No	If YES, for what reason(s) does the responsible party consider this a major release? The release was greater than 25 bbls of liquid.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Larson and Associates personnel called Christina Hernandez on 12/31/2018 and left a voice mail.	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

[X] The source of the release has been stopped.

[X] The impacted area has been secured to protect human health and the environment.

[X] Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

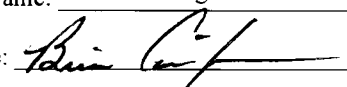
[X] All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Brian Cunningham Title: Production Foreman

Signature:  Date: 10/16/2019

email: bcunningham@legacylp.com Telephone: 432-234-9450

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	64 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Brian Cunningham Title: Production Foreman

Signature: Date: 10/16/2019

email: bcunningham@legacylp.com Telephone: 432-234-9450

OCD Only

Received by: Date:

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*

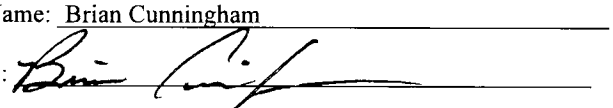
- [x] Detailed description of proposed remediation technique
- [x] Scaled sitemap with GPS coordinates showing delineation points
- [x] Estimated volume of material to be remediated
- [x] Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- [x] Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- [ ] Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- [ ] Extents of contamination must be fully delineated.
- [ ] Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Brian Cunningham Title: Production Foreman

Signature:  Date: 10/16/2019

email: bcunningham@legacylp.com Telephone: 432-234-9450

OCD Only

Received by: _____ Date: _____

- [ ] Approved
- [ ] Approved with Attached Conditions of Approval
- [ ] Denied
- [ ] Deferral Approved

Signature: _____ Date: _____

1RP-5321
Delineation Report and Remediation Plan
Lea Unit # 10
Produced Water Release
Lea County, New Mexico

Latitude: N 32.57488°
Longitude: W -103.51560°

LAI Project No. 18-0138-10

October 16, 2019

Prepared for:
Legacy Reserves Operating, LP
303 West Wall Street, Suite 1300
Midland, Texas 79701

Prepared by:
Larson & Associates, Inc.
507 North Marienfeld Street, Suite 205
Midland, Texas 79701

Mark J. Larson, P.G.
Certified Professional Geologist #10490

Rachel E. Owen
Sr. Geoscientist

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1.0 INTRODUCTION

Larson & Associates, Inc. (LAI), has prepared this delineation report and remediation plan on behalf of Legacy Reserves Operating, LP (Legacy) for submittal to the New Mexico Oil Conservation Division (OCD) District 1 for a produced water release at the Lea Unit #10 (Site) located in Unit F (SE/4, NW/4), Section 13, Township 20 South, Range 34 East in Lea County New Mexico. The geodetic position is North 32.57488° and West -103.51560°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

1.1 Background

The release was discovered on December 28, 2018. The spill occurred from a ruptured flowline on the well pad east of the well. Approximately 15 barrels (bbls) of produced water were released with no fluids recovered. The affected area measures approximately 1,923 square feet. LAI calculated the spill volume at approximately 60 bbls based on the depth of impacted soil between approximately 1 to 5 feet bgs and an average moisture content of 9% from laboratory analysis. The spill is considered a major release since the volume exceeded 25 bbl. The initial C-141 was submitted to OCD District 1 on December 31, 2018 and assigned remediation permit number 1RP-5321. Appendix A presents the initial C-141. Appendix B presents OCD communications.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 3,658 feet above mean sea level (msl);
- The topography slopes gently towards the southeast;
- There are no surface water features within 1,000 feet of the Site;
- The soils are designated as “Kermit soils and dune land, 0 to 12 percent slopes”, consisting of 0 to 60 inches of fine sand.
- The surface geology is the Ogallala Formation (lower Pliocene to middle Miocene)- Alluvial and eolian deposits, and petrocalcic soils of the southern High Plains;
- Groundwater occurs in the Ogallala formation at approximately 64.0 feet below ground surface (bgs) based on New Mexico State Engineer records;
- The nearest fresh water well is located in Unit P (SE/4, SE/4), Section 12, Township 20 South, Range 34 East, approximately 0.7 miles or about 3,698 feet southeast of the Site.

1.3 Remediation Action Levels

The following remediation standards are based on closure criteria for soils impacted by a release as presented in Table 1 of 19.15.29 NMAC:

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 2,500 mg/Kg
- Chloride 10,000 mg/Kg

Further, 19.15.29.13 NMAC (Restoration, Reclamation and Re-Vegetation) requires the operator to restore the impacted surface area that existed prior to the release or their final land use.

2.0 DELINEATION

On January 28 2019, LAI personnel used a stainless steel hand auger to collect soil samples from eleven (11) locations inside of the spill area (HA-1 through HA-7) and in each cardinal direction of the spill (HA-8 through HA-11) to vertically and horizontally delineate the release. The samples were collected to refusal at about 0.5 feet below ground surface (bgs). The soil samples were delivered under chain of custody and preservation to Permian Basin Environmental Laboratory (PBEL) in Midland, Texas. The upper samples were analyzed 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. Benzene and BTEX were reported below the remediation action levels of 10 milligrams per kilogram (mg/Kg) and 50 mg/Kg in all samples. TPH was reported above the remediation action level of 2,500 mg/Kg in samples HA-2 (10,505 mg/Kg), HA-3 (14,240 mg/Kg), HA-4 (4,377 mg/Kg), HA-6 (14,420 mg/Kg), HA-9 (13,730 mg/Kg), and HA-10 (15,340 mg/Kg). Chloride exceeded the OCD delineation limit of 600 mg/Kg in samples HA-2 (16,100 mg/Kg), HA-3 (14,100 mg/Kg), HA-4 (4,377 mg/Kg), HA-6 (14,420 mg/Kg), HA-9 (13,730 mg/Kg), and HA-10 (15,340 mg/Kg). Figure 2 presents the soil sample locations.

On March 28 and 28, 2019, LAI personnel used direct push technology (DPT) to further delineate the release. Soil samples were collected at 1 foot intervals between 2 and 4 feet bgs depending on subsurface conditions. PBEL analyzed the samples for TPH and chloride by EPA SW-846 Method 8015M and Method 300, respectively. All sample locations were delineated below the OCD remediation levels of 2,500 mg/Kg for TPH. Chloride reported above the OCD delineation limit (600 mg/Kg) in deepest samples from HA-3, 3 to 4 feet bgs (5,190 mg/Kg) and HA-9, 2 to 3 feet bgs (8,770 mg/Kg).

On October 1, 2019, Scarborough Drilling, Inc. (SDI), under LAI personnel supervision, used an air rotary rig and jam tube sampler to collect an additional samples at HA-3 and HA-9. Chloride reported below the OCD delineation limits in HA-3, 10 feet bgs (85.8 mg/Kg) and HA-9, 5 feet bgs (11.4 mg/Kg). Table 1 presents the soil sample analytical data summary. Appendix C presents the laboratory reports.

3.0 REMEDIATION PLAN

Legacy proposes the following remedial actions:

- Excavate 15’ X 30’ encompassing HA-2, HA-3, and HA-6 to 4 feet bgs;
- Excavate 10’ X 10’ encompassing HA-4 to 3 feet bgs;
- Excavate 10’ X 15’ encompassing HA-9 to 4 feet bgs;
- Excavate 10’ X15’ encompassing HA-10 to 3 feet bgs;
- Collect bottom and sidewall confirmation soil samples and analyze for BTEX, TPH and chloride by OCD approved methods;
- Backfill excavations with clean topsoil in pasture assuming achievement of OCD remediation levels;
- Backfill excavations with clean caliche on the well pad assuming achievement of OCD remediation levels;
- Seed the pasture area with BLM Mix No. 3

Figure 3 presents the proposed excavation areas.

Tables

Table 1
1RP-5321
Soil Sample Analytical Data Summary
Legacy Reserves, Lea Unit #10
Lea County, New Mexico
18-0138-10

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				**10**	**50**				**2,500**	**10,000**
Delineation										
HA-1	0 - 0.5	1/29/2019	In-situ	<0.00114	<0.00683	<28.4	<28.4	<28.4	<28.4	19.5
HA-2	0 - 0.5	1/29/2019	In-situ	0.793	32.443	2,160	7,390	955	10,505	16,100
	0 - 1	3/29/2019	In-situ	<0.00199	<0.00199	<15.0	<15.0	<15.0	<15.0	3,790
	1 -2	3/29/2019	In-situ	--	--	--	--	--	--	43.5
	2 - 3	3/29/2019	In-situ	--	--	--	--	--	--	35.1
HA-3	0 - 0.5	1/29/2019	In-situ	0.0371	22.8171	2,610	10,100	1,530	14,240	14,100
	0 - 1	3/28/2019	In-situ	0.0773	1.65	44	248	35	327	3,460
	1-2	3/28/2019	In-situ	--	--	--	--	--	--	1,480
	2-3	3/28/2019	In-situ	--	--	--	--	--	--	2,960
	3-4	3/28/2019	In-situ	--	--	--	--	--	--	5,190
	5	10/1/2019	In-situ	--	--	--	--	--	--	4,150
	10	10/1/2019	In-situ	--	--	--	--	--	--	85.8
	15	10/1/2019	In-situ	--	--	--	--	--	--	150
	20	10/1/2019	In-situ	--	--	--	--	--	--	114
HA-4	0 - 0.5	1/29/2019	In-situ	<0.0233	5.623	341	3,410	626	4,377	7,250
	0 - 1	3/28/2019	In-situ	<0.00200	<0.00200	<15.0	<15.0	<15.0	<15.0	7,660
	1 - 2	3/28/2019	In-situ	--	--	--	--	--	--	994
	2 - 3	3/28/2019	In-situ	--	--	--	--	--	--	352
	3 - 4	3/28/2019	In-situ	--	--	--	--	--	--	67.4
HA-5	0 - 0.5	1/29/2019	In-situ	<0.00105	<0.00631	<26.3	65	<26.3	65	55.1
HA-6	0 - 0.5	1/29/2019	In-situ	0.225	30.125	2,540	10,600	1,280	14,420	15,500
	0 - 1	3/28/2019	In-situ	0.0864	3.95	411	3,390	393	4,190	11,800
	1 - 2	3/28/2019	In-situ	--	--	<15.0	93.20	18.50	112	1,120
	2 - 3	3/28/2019	In-situ	--	--	--	--	--	--	115
HA-7	0 - 0.5	1/29/2019	In-situ	<0.00111	0.03847	<27.8	184	54.1	238	542

Table 1
1RP-5321
Soil Sample Analytical Data Summary
Legacy Reserves, Lea Unit #10
Lea County, New Mexico
18-0138-10

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				**10**	**50**				**2,500**	**10,000**
HA-8	0 -1	1/29/2019	In-situ	<0.0206	<0.1236	<25.8	73.0	<25.8	73.0	2,370
	0 -1	3/29/2019	In-situ	<0.00200	<0.00200	<14.9	158.0	27	185.0	5,000
	1 -2	3/29/2019	In-situ	--	--	--	--	--	--	27.0
HA-9	0 - 0.5	1/29/2019	In-Situ	0.829	96.129	3,920	8,700	1,110	13,730	15,900
	0 - 1	3/29/2019	In-Situ	<0.00200	0.00491	<15.0	<15.0	<15.0	<15.0	13,900
	1 - 2	3/29/2019	In-Situ	--	--	--	--	--	--	1,860
	2 - 3	3/29/2019	In-Situ	--	--	--	--	--	--	8,770
	5	10/1/2019	In-Situ	--	--	--	--	--	--	11.4
	10	10/1/2019	In-Situ	--	--	--	--	--	--	189
	15	10/1/2019	In-Situ	--	--	--	--	--	--	173
	20	10/1/2019	In-Situ	--	--	--	--	--	--	145
HA-10	0 - 0.5	1/29/2019	In-Situ	0.0807	35.1207	3,020	10,900	1,420	15,340	14,800
	0 - 1	3/29/2019	In-Situ	<0.00199	5.40	281	1,730	209	2,220	10,400
	1 - 2	3/29/2019	In-Situ	--	--	--	--	--	--	1,800
	2 - 3	3/29/2019	In-Situ	--	--	--	--	--	--	1,390
	3 - 4	3/29/2019	In-Situ	--	--	--	--	--	--	338
HA-11	0 - 1	1/29/2019	In-Situ	<0.00102	<0.00612	<25.5	125	38.8	163.8	37.5

Notes: Laboratory analysis performed by Permian Basin Environmental Lab, Midland, Texas by EPA 8021B (BTEX) Method 8015M (TPH) and 300 (chloride)
Depth in feet below ground surface (bgs)
mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)
Bold and highlited denote concentration above OCD surface restoration limit

Figures

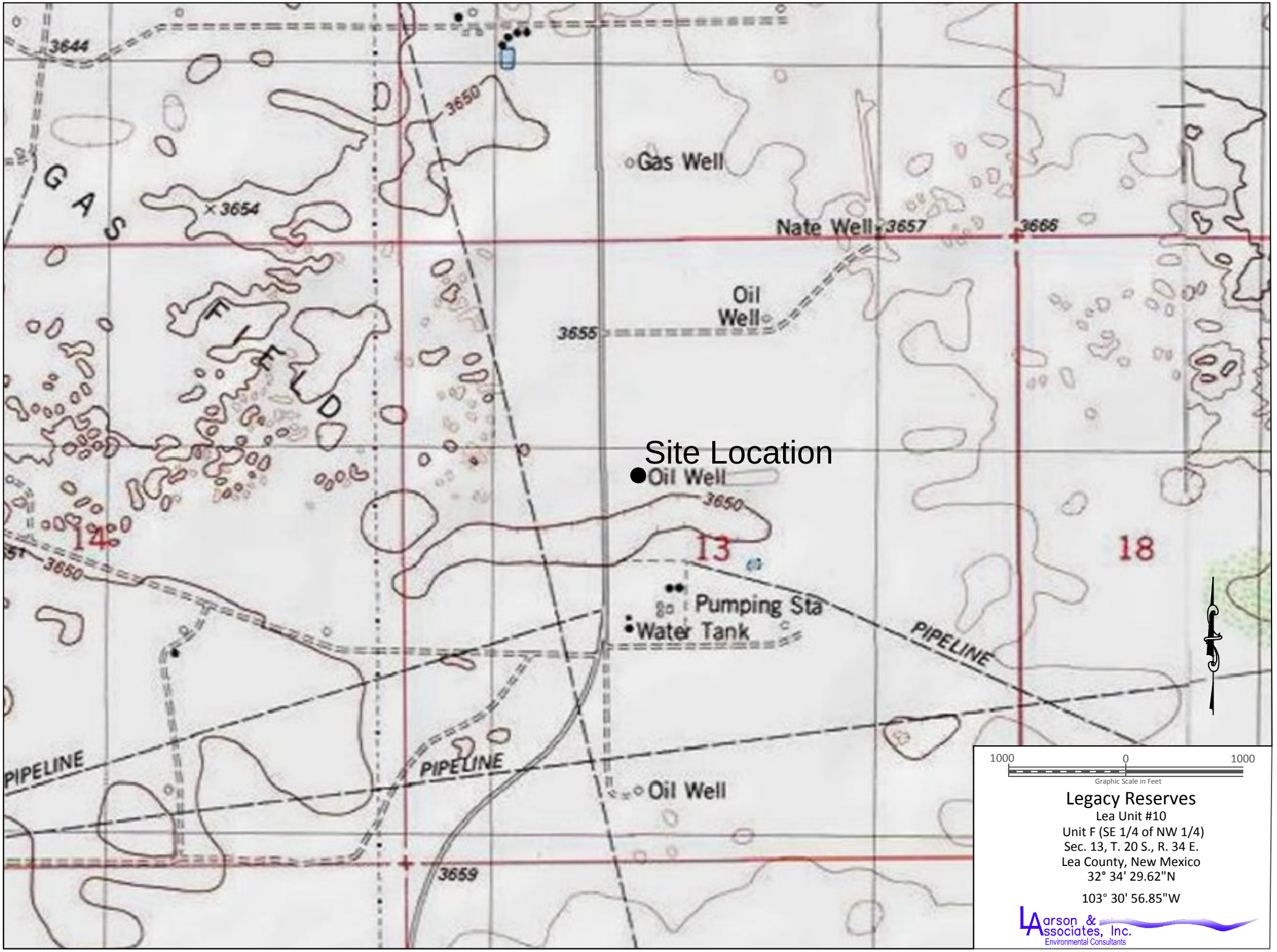

Figure 1 - Topographic Map

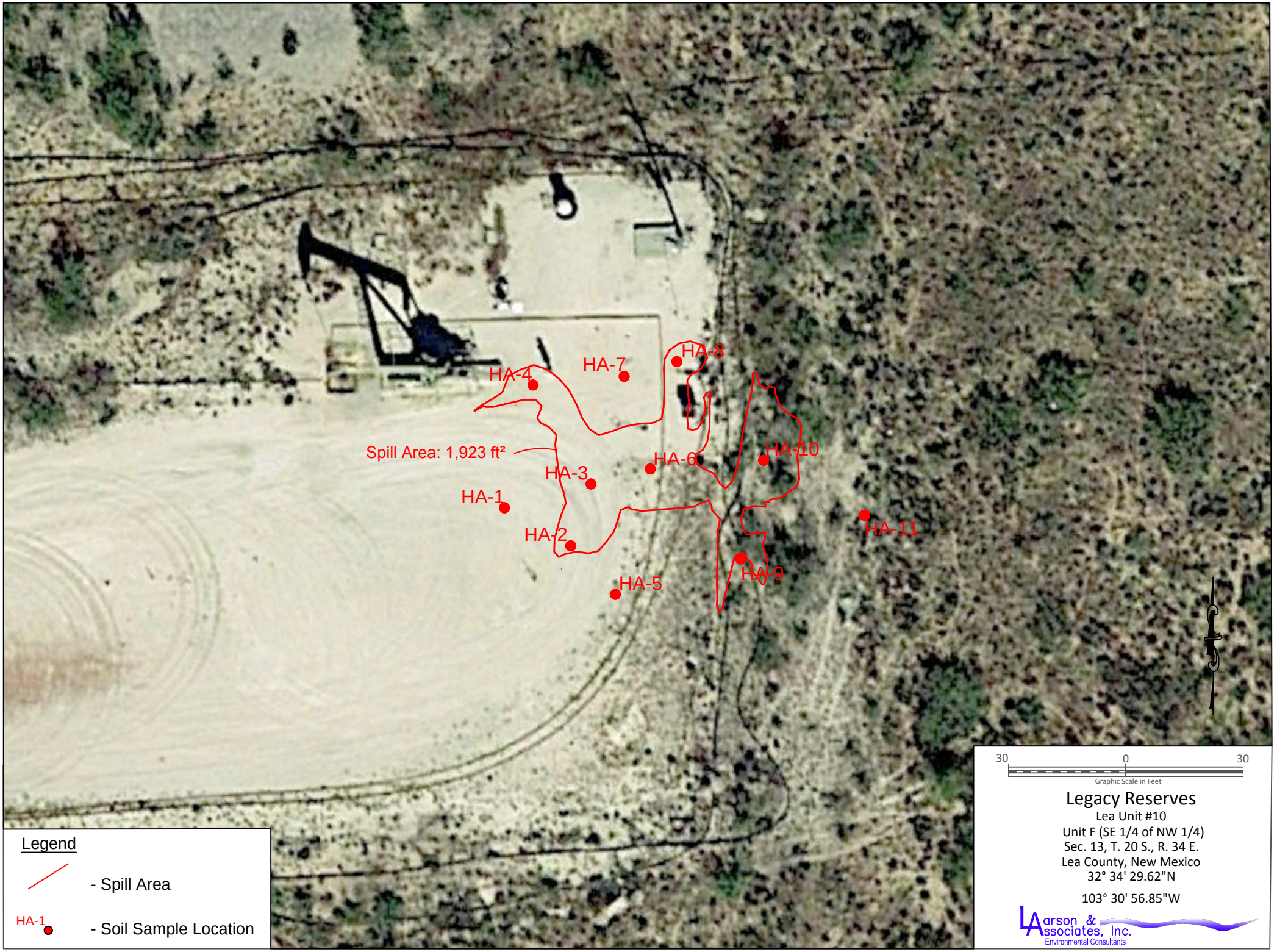

Figure 2 - Aerial Map Showing Soil Sample Locations

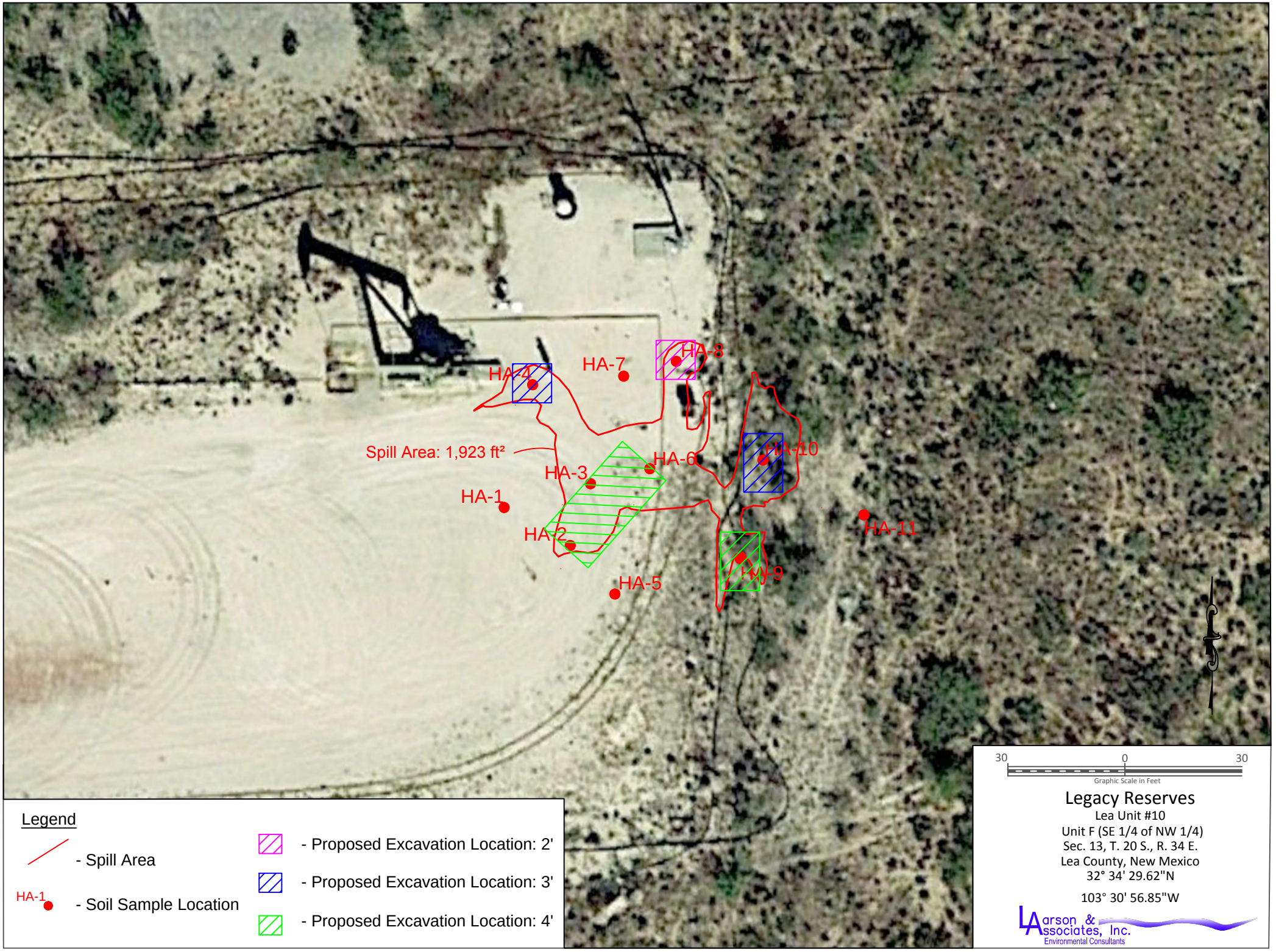

Figure 3 - Aerial Map Showing Soil Sample Locations and Proposed Excavation Locations

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 Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NCH1903536308
District RP	1RP-5321
Facility ID	
Application ID	pCH1903536527

Release Notification

Responsible Party

Responsible Party Legacy Reserves, L.P.	OGRID 240974
Contact Name Brian Cunningham	Contact Telephone 432-234-9450
Contact email bcunningham@legacylp.com	Incident # NCH1903536308 LEA UNIT #10 @ 30-025-20506
Contact mailing address 303 West Wall Street, Suite 1300	

Location of Release Source

Latitude 32.57488° N Longitude -103.51560° W
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Lea Unit #10	Site Type Well Pad
Date Release Discovered 12/28/18	API# *(if applicable)* 30-025-20506

Unit Letter	Section	Township	Range	County
F	13	20S	34E	Lea

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name:* Kenneth Smith, Inc.)

Federal Minerals

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 15 bbls	Volume Recovered (bbls) 0 bbls
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A leak formed in a water line on the well pad.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release? The release was less than 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

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☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Brian Cunningham Title: Production Foreman

Signature: Brian Cunningham Date: 12/31/2018

email: bcunningham@legacylp.com Telephone: 432-234-9450

OCD Only

Received by:

RECEIVED
By CHernandez at 10:07 am, Feb 04, 2019

Appendix B

OCD Communications

Rachel Owen

From: Hernandez, Christina, EMNRD <Christina.Hernandez@state.nm.us>
Sent: Monday, February 4, 2019 11:17 AM
To: Rachel Owen; Griswold, Jim, EMNRD
Cc: Mark Larson; bcunningham@legacylp.com
Subject: RE: C-141, Legacy Reserves, Lea Unit #10
Attachments: 1RP-5321.pdf

Ms. Owen:

Please be advised that

1. The initial portion of the C-141 form does not include the calculations to determine the release volume. Visual estimation is not sufficient nor adequate. Please submit measurements in volume estimation; including dimensions, soil parameters (porosity, texture, bulk density, etc).
2. Provide dated, geo-referenced photo documentation for verification that the initial response activities have been employed to contain the release.
3. NMOCD database indicate Federal mineral ownership; BLM can verify. Per 19.15.29.13 NMAC, regulations of corresponding agencies supersede NMOCD's.

The 1RP for this incident is

5321	2/4/2019	A	Legacy	Lea Unit #10	30-025-20506	20S-34E-13F	12/28

Please remember to include this 1RP identifier to all communications. Revised NMAC 19.15.29 was effective on August 14, 2018. Delineate and remediate per regulation. Mind the timelines for submittal of requisite information.

Please be advised that NMOCD recommends a completed site characterization/delineation report be reviewed or approved by NMOCD BEFORE any significant remediation work towards closure.

Thanks,

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

From: Rachel Owen <rowen@laenvironmental.com>
Sent: Thursday, January 3, 2019 7:23 AM
To: Hernandez, Christina, EMNRD <Christina.Hernandez@state.nm.us>; Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>

Cc: Mark Larson <Mark@laenvironmental.com>; bcunningham@legacylp.com
Subject: [EXT] C-141, Legacy Reserves, Lea Unit #10

Dear All,

Larson & Associates, Inc. (LAI), on behalf of Legacy Reserves, LP (Legacy), submits the attached C-141 for a produced water spill at the Lea Unit #10 located in Lea County, New Mexico. Your approval of the C-141 is requested. Please feel free to contact Mr. Brian Cunningham with Legacy bcunningham@legacylp.com, myself, or Mark Larson if you have any questions.

Respectfully,

Rachel Owen
Staff Geologist
Larson & Associates
Phone: 432.664.5357
Email: rowen@laenvironmental.com

Appendix C

Laboratory Reports

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

PBELAB

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Legaqcy Lea Unit #10

Project Number: 18-0138-10

Location:

Lab Order Number: 9A30002

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704516-18-9

Report Date: 09/04/19

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-1 (0-0.5')	9A30002-01	Soil	01/29/19 11:32	01-30-2019 09:30
HA-2 (0-0.5')	9A30002-02	Soil	01/29/19 11:40	01-30-2019 09:30
HA-3 (0-0.5')	9A30002-03	Soil	01/29/19 11:47	01-30-2019 09:30
HA-4 (0-0.5')	9A30002-04	Soil	01/29/19 11:54	01-30-2019 09:30
HA-5 (0-0.5')	9A30002-05	Soil	01/29/19 12:10	01-30-2019 09:30
HA-6 (0-0.5')	9A30002-06	Soil	01/29/19 12:16	01-30-2019 09:30
HA-7 (0-0.5')	9A30002-07	Soil	01/29/19 12:25	01-30-2019 09:30
HA-8 (0-1')	9A30002-08	Soil	01/29/19 12:36	01-30-2019 09:30
HA-9 (0-0.5')	9A30002-12	Soil	01/29/19 13:20	01-30-2019 09:30
HA-10 (0-0.5')	9A30002-13	Soil	01/29/19 13:45	01-30-2019 09:30
HA-11 (0-1')	9A30002-14	Soil	01/29/19 00:00	01-30-2019 09:30

HA-1 (0-0.5')

9A30002-01 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00114	mg/kg dry	1	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	ND	0.00114	mg/kg dry	1	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	ND	0.00114	mg/kg dry	1	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	ND	0.00227	mg/kg dry	1	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	ND	0.00114	mg/kg dry	1	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*102 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*99.8 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**19.5**	1.14	mg/kg dry	1	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**12.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	28.4	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	ND	28.4	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	ND	28.4	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*92.7 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*98.1 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	ND	28.4	mg/kg dry	1	[CALC]	02/05/19	02/05/19	calc	

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (0-0.5')

9A30002-02 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**0.793**	0.0222	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	**7.58**	0.0222	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	**7.77**	0.0222	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	**9.94**	0.0444	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	**6.36**	0.0222	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*90.7 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*102 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**16100**	55.6	mg/kg dry	50	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**2160**	139	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**7390**	139	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**955**	139	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*113 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*105 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**10500**	139	mg/kg dry	5	[CALC]	02/05/19	02/05/19	calc	

Larson & Associates, Inc.	Project: Legaqcy Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-3 (0-0.5')

9A30002-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	**0.0371**	0.0220	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	**3.90**	0.0220	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	**5.82**	0.0220	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	**7.80**	0.0440	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	**5.26**	0.0220	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*75.9 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*74.2 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	*S-GC*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**14100**	54.9	mg/kg dry	50	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**9.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**2610**	275	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**10100**	275	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**1530**	275	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*104 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*96.0 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**14300**	275	mg/kg dry	10	[CALC]	02/05/19	02/05/19	calc	

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (0-0.5')

9A30002-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	ND	0.0233	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	**0.553**	0.0233	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	**1.49**	0.0233	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	**2.46**	0.0465	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	**1.12**	0.0233	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*84.0 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*73.2 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	*S-GC*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**7250**	29.1	mg/kg dry	25	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**14.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**341**	145	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**3410**	145	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**626**	145	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*103 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*104 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**4380**	145	mg/kg dry	5	[CALC]	02/05/19	02/05/19	calc	

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (0-0.5')

9A30002-05 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00105	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Toluene	ND	0.00105	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Ethylbenzene	ND	0.00105	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (p/m)	ND	0.00211	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (o)	ND	0.00105	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*97.7 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*96.0 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**55.1**	1.05	mg/kg dry	1	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**5.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.3	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**65.0**	26.3	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*102 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*106 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**65.0**	26.3	mg/kg dry	1	[CALC]	02/05/19	02/05/19	calc	

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-6 (0-0.5')

9A30002-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	**0.225**	0.0211	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	**5.85**	0.0211	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	**7.55**	0.0211	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	**9.82**	0.0421	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	**6.68**	0.0211	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*110 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*97.8 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**15500**	52.6	mg/kg dry	50	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**5.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**2540**	263	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**10600**	263	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**1280**	263	mg/kg dry	10	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*107 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*89.2 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**14400**	263	mg/kg dry	10	[CALC]	02/05/19	02/05/19	calc	

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

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-7 (0-0.5')

9A30002-07 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00111	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Toluene	**0.00254**	0.00111	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Ethylbenzene	**0.00373**	0.00111	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (p/m)	**0.0179**	0.00222	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (o)	**0.0143**	0.00111	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*90.8 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*99.9 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**542**	1.11	mg/kg dry	1	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	27.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**184**	27.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**54.1**	27.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*101 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*106 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**238**	27.8	mg/kg dry	1	[CALC]	02/05/19	02/05/19	calc	

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Midland TX, 79710

Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-8 (0-1')

9A30002-08 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.0206	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	ND	0.0206	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	ND	0.0206	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	ND	0.0412	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	ND	0.0206	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*108 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*98.8 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**2370**	10.3	mg/kg dry	10	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**3.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	25.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**73.0**	25.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*126 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*132 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	*S-GC*
Total Petroleum Hydrocarbon C6-C35	**73.0**	25.8	mg/kg dry	1	[CALC]	02/05/19	02/05/19	calc	

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P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-9 (0-0.5')

9A30002-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	**0.829**	0.0575	mg/kg dry	50	P9A3104	01/31/19	02/04/19	EPA 8021B	
Toluene	**22.2**	0.0575	mg/kg dry	50	P9A3104	01/31/19	02/04/19	EPA 8021B	
Ethylbenzene	**22.5**	0.0575	mg/kg dry	50	P9A3104	01/31/19	02/04/19	EPA 8021B	
Xylene (p/m)	**31.3**	0.115	mg/kg dry	50	P9A3104	01/31/19	02/04/19	EPA 8021B	
Xylene (o)	**19.3**	0.0575	mg/kg dry	50	P9A3104	01/31/19	02/04/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*75.5 %*	*75-125*		*P9A3104*	*01/31/19*	*02/04/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*70.1 %*	*75-125*		*P9A3104*	*01/31/19*	*02/04/19*	*EPA 8021B*	*S-GC*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**15900**	57.5	mg/kg dry	50	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**13.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**3920**	144	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**8700**	144	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**1110**	144	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*124 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*105 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**13700**	144	mg/kg dry	5	[CALC]	02/05/19	02/05/19	calc	

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P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-10 (0-0.5')

9A30002-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	**0.0807**	0.0238	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Toluene	**6.52**	0.0238	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Ethylbenzene	**9.16**	0.0238	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (p/m)	**11.5**	0.0476	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Xylene (o)	**7.86**	0.0238	mg/kg dry	20	P9A3104	01/31/19	02/01/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*96.6 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*106 %*	*75-125*		*P9A3104*	*01/31/19*	*02/01/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**14800**	59.5	mg/kg dry	50	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**16.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**3020**	149	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**10900**	149	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**1420**	149	mg/kg dry	5	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*122 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*96.2 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**15400**	149	mg/kg dry	5	[CALC]	02/05/19	02/05/19	calc	

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Midland TX, 79710

Project: Legaqcy Lea Unit #10
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Project Manager: Mark Larson

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HA-11 (0-1')

9A30002-14 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	ND	0.00102	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Toluene	ND	0.00102	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Ethylbenzene	ND	0.00102	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (p/m)	ND	0.00204	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Xylene (o)	ND	0.00102	mg/kg dry	1	P9A3104	01/31/19	02/02/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*103 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*104 %*	*75-125*		*P9A3104*	*01/31/19*	*02/02/19*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**37.5**	1.02	mg/kg dry	1	P9B0302	02/03/19	02/04/19	EPA 300.0	
% Moisture	**2.0**	0.1	%	1	P9B0412	02/04/19	02/04/19	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	25.5	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C12-C28	**125**	25.5	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
>C28-C35	**38.8**	25.5	mg/kg dry	1	P9B0501	02/05/19	02/05/19	TPH 8015M	
Surrogate: 1-Chlorooctane		*121 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Surrogate: o-Terphenyl		*126 %*	*70-130*		*P9B0501*	*02/05/19*	*02/05/19*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**164**	25.5	mg/kg dry	1	[CALC]	02/05/19	02/05/19	calc	

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
Batch P9A3104 - General Preparation (GC)										
Blank (P9A3104-BLK1)				Prepared: 01/31/19 Analyzed: 02/01/19						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	*0.0567*		*"*	*0.0600*		*94.5*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.0580*		*"*	*0.0600*		*96.8*	*75-125*			
LCS (P9A3104-BS1)				Prepared: 01/31/19 Analyzed: 02/01/19						
Benzene	0.110	0.00100	mg/kg wet	0.100		110	70-130			
Toluene	0.109	0.00100	"	0.100		109	70-130			
Ethylbenzene	0.112	0.00100	"	0.100		112	70-130			
Xylene (p/m)	0.187	0.00200	"	0.200		93.7	70-130			
Xylene (o)	0.117	0.00100	"	0.100		117	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0613*		*"*	*0.0600*		*102*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.0655*		*"*	*0.0600*		*109*	*75-125*			
LCS Dup (P9A3104-BSD1)				Prepared: 01/31/19 Analyzed: 02/01/19						
Benzene	0.106	0.00100	mg/kg wet	0.100		106	70-130	3.75	20	
Toluene	0.104	0.00100	"	0.100		104	70-130	4.78	20	
Ethylbenzene	0.107	0.00100	"	0.100		107	70-130	4.87	20	
Xylene (p/m)	0.182	0.00200	"	0.200		91.1	70-130	2.78	20	
Xylene (o)	0.112	0.00100	"	0.100		112	70-130	3.75	20	
Surrogate: 1,4-Difluorobenzene	*0.0624*		*"*	*0.0600*		*104*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*0.0582*		*"*	*0.0600*		*97.0*	*75-125*			
Matrix Spike (P9A3104-MS1)		**Source: 9A30008-01**		Prepared: 01/31/19 Analyzed: 02/02/19						
Benzene	0.111	0.00135	mg/kg dry	0.135	ND	81.8	80-120			
Toluene	0.112	0.00135	"	0.135	ND	82.8	80-120			
Ethylbenzene	0.131	0.00135	"	0.135	ND	97.1	80-120			
Xylene (p/m)	0.191	0.00270	"	0.270	ND	70.8	80-120			QM-05
Xylene (o)	0.116	0.00135	"	0.135	ND	86.0	80-120			
Surrogate: 4-Bromofluorobenzene	*0.0824*		*"*	*0.0811*		*102*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*0.102*		*"*	*0.0811*		*125*	*75-125*			

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
Batch P9A3104 - General Preparation (GC)										
Matrix Spike Dup (P9A3104-MSD1)		**Source: 9A30008-01**		Prepared: 01/31/19 Analyzed: 02/02/19						
Benzene	0.0764	0.00135	mg/kg dry	0.135	ND	56.5	80-120	36.6	20	QM-05
Toluene	0.0846	0.00135	"	0.135	ND	62.6	80-120	27.7	20	QM-05
Ethylbenzene	0.101	0.00135	"	0.135	ND	74.5	80-120	26.4	20	QM-05
Xylene (p/m)	0.159	0.00270	"	0.270	ND	58.6	80-120	18.7	20	QM-05
Xylene (o)	0.0969	0.00135	"	0.135	ND	71.7	80-120	18.1	20	QM-05
Surrogate: 1,4-Difluorobenzene	*0.102*		*"*	*0.0811*		*126*	*75-125*			*S-GC*
Surrogate: 4-Bromofluorobenzene	*0.0926*		*"*	*0.0811*		*114*	*75-125*			

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 P9B0302 - * DEFAULT PREP *** **										
Blank (P9B0302-BLK1)				Prepared: 02/03/19 Analyzed: 02/04/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9B0302-BS1)				Prepared & Analyzed: 02/03/19						
Chloride	394	1.00	mg/kg wet	400		98.5	80-120			
LCS Dup (P9B0302-BSD1)				Prepared: 02/03/19 Analyzed: 02/04/19						
Chloride	404	1.00	mg/kg wet	400		101	80-120	2.61	20	
Duplicate (P9B0302-DUP1)		**Source: 9A29018-04**		Prepared: 02/03/19 Analyzed: 02/04/19						
Chloride	123	1.09	mg/kg dry		48.7			86.7	20	R3
Duplicate (P9B0302-DUP2)		**Source: 9A30002-05**		Prepared: 02/03/19 Analyzed: 02/04/19						
Chloride	50.9	1.05	mg/kg dry		55.1			7.92	20	
Matrix Spike (P9B0302-MS1)		**Source: 9A29018-04**		Prepared: 02/03/19 Analyzed: 02/04/19						
Chloride	720	1.09	mg/kg dry	543	48.7	124	80-120			QM-05
Batch P9B0412 - * DEFAULT PREP *** **										
Blank (P9B0412-BLK1)				Prepared & Analyzed: 02/04/19						
% Moisture	ND	0.1	%							
Duplicate (P9B0412-DUP1)		**Source: 9A30001-15**		Prepared & Analyzed: 02/04/19						
% Moisture	11.0	0.1	%		12.0			8.70	20	
Duplicate (P9B0412-DUP2)		**Source: 9A31003-02**		Prepared & Analyzed: 02/04/19						
% Moisture	13.0	0.1	%		12.0			8.00	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
Batch P9B0412 - * DEFAULT PREP *** **										
Duplicate (P9B0412-DUP3)		**Source: 9A31003-05**		Prepared & Analyzed: 02/04/19						
% Moisture	8.0	0.1	%		8.0			0.00	20	

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
Batch P9B0501 - TX 1005										
Blank (P9B0501-BLK1)				Prepared & Analyzed: 02/05/19						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	*130*		*"*	*100*		*130*	*70-130*			
Surrogate: o-Terphenyl	*71.8*		*"*	*50.0*		*144*	*70-130*			*S-GC*
LCS (P9B0501-BS1)				Prepared & Analyzed: 02/05/19						
C6-C12	1060	25.0	mg/kg wet	1000		106	75-125			
>C12-C28	926	25.0	"	1000		92.6	75-125			
Surrogate: 1-Chlorooctane	*126*		*"*	*100*		*126*	*70-130*			
Surrogate: o-Terphenyl	*64.5*		*"*	*50.0*		*129*	*70-130*			
LCS Dup (P9B0501-BSD1)				Prepared & Analyzed: 02/05/19						
C6-C12	1060	25.0	mg/kg wet	1000		106	75-125	0.480	20	
>C12-C28	933	25.0	"	1000		93.3	75-125	0.748	20	
Surrogate: 1-Chlorooctane	*126*		*"*	*100*		*126*	*70-130*			
Surrogate: o-Terphenyl	*63.0*		*"*	*50.0*		*126*	*70-130*			
Matrix Spike (P9B0501-MS1)	**Source: 9A30002-17**			Prepared & Analyzed: 02/05/19						
C6-C12	1050	26.6	mg/kg dry	1060	ND	98.6	75-125			
>C12-C28	908	26.6	"	1060	16.8	83.8	75-125			
Surrogate: 1-Chlorooctane	*134*		*"*	*106*		*126*	*70-130*			
Surrogate: o-Terphenyl	*61.3*		*"*	*53.2*		*115*	*70-130*			
Matrix Spike Dup (P9B0501-MSD1)	**Source: 9A30002-17**			Prepared & Analyzed: 02/05/19						
C6-C12	956	26.6	mg/kg dry	1060	ND	89.9	75-125	9.27	20	
>C12-C28	871	26.6	"	1060	16.8	80.3	75-125	4.21	20	
Surrogate: 1-Chlorooctane	*122*		*"*	*106*		*114*	*70-130*			
Surrogate: o-Terphenyl	*51.3*		*"*	*53.2*		*96.4*	*70-130*			

Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
R3	The RPD exceeded the acceptance limit due to sample matrix effects.
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.
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: Brent Barron Date: 9/4/2019

Brent Barron, Laboratory Director/Technical Director

Larson & Associates, Inc.
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Project: Legaqcy Lea Unit #10
Project Number: 18-0138-10
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- Nº 0512

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 1/30/19 PAGE 1 OF 2

PO#: LAB WORK ORDER#: 9A30002

PROJECT LOCATION OR NAME: Legacy Reserves - Lea Unit #

LAI PROJECT #: 18-0138-TO COLLECTOR: TO

Data Reported to:

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

#9A30002

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESSERVED

ANALYSES: BTEX ☒ MTBE ☐ | TRPH 418.1 ☐ | TPH 1005 ☐ | TPH 1006 ☐ | GASOLINE MOD 8015 ☒ | DIESEL - MOD 8015 ☒ | OIL - MOD 8015 ☒ | VOC 8260 ☐ | SVOC 8270 ☐ | PAH 8270 ☐ | HOLDPAH ☐ | 8081 PESTICIDES ☐ | 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TCLP - METALS (RCRA) ☐ | TCLP - PEST ☐ | TCLP VOC ☐ | HERB ☐ | Semi-VOC ☐ | TOTAL METALS (RCRA) ☐ | OTHER LIST ☐ | LEAD - TOTAL ☐ | D.W. 200.8 ☐ | TCLP ☐ | RCI ☐ | TOX ☐ | FLASHPOINT ☐ | TDS ☐ | TSS ☐ | % MOISTURE ☐ | CYANIDE ☐ | pH ☐ | HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ | PECHLORATE ☐ | CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐ M300

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	ANALYSES	FIELD NOTES
HA-1 (0-0.5')		1/29/19	11:32	S	1				X		X	Delineate chloride until 600 mg/kg is reached Delineate TPH until 2,500 mg/kg is reached
HA-2 (0-0.5')		1/29/19	11:40								X	
HA-3 (0-0.5')		1/29/19	11:47								X	
HA-4 (0-0.5')			11:54									
HA-5 (0-0.5')			12:10									
HA-6 (0-0.5')			12:16									
HA-7 (0-0.5')			12:25									
HA-8 (0-1')			12:36								X	
HA-8 (1-2')			12:41									
HA-8 (2-3')			12:48									
HA-8 (3-4')			13:00									
HA-9 (0-0.5')			13:24								X	
HA-10 (0-0.5')			13:45								X	
HA-11 (0-1')											X	
HA-11 (1-2')												
TOTAL		15										

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

1/30/19 9:30

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

1-30-19 9:30

LABORATORY:

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 1.1 THERM#: 142
CUSTDDY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☒ HAND DELIVERED

Nº 0513

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 1/30/19 PAGE 2 OF 2

PO#: LAB WORK ORDER#: 9173000

PROJECT LOCATION OR NAME: Legacy Reserves - Lea Unit #1C

LAI PROJECT #: 18-0138-10 COLLECTOR: JD

Data Reported to:

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESSERVED

ANALYSES: BTEX ☐ MTBE ☐ | TRPH 418.1 ☐ | TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☐ | DIESEL - MOD 8015 ☐ | OIL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ | PAH 8270 ☐ HOLDPAH ☐ | 8081 PESTICIDES ☐ | 8082 PCBS ☐ | 8151 HERBICIDES ☐ | TBLP - METALS (RCRA) ☐ | TCLP - PEST ☐ HERB ☐ | TCLP VOC ☐ | TOTAL METALS (RCRA) ☐ | LEAD - TOTAL ☐ | Semi-VOC ☐ | D.W. 200.8 ☐ | OTHER LIST ☐ | RCI ☐ | TOX ☐ | TCLP ☐ | TDS ☐ | TSS ☐ | FLASHPOINT ☐ | pH ☐ | % MOISTURE ☐ | HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ | CYANIDE ☐ | CHLORIDES ☐ | PECHLORATE ☐ | ANIONS ☐ | ALKALINITY ☐ | M300

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	FIELD NOTES
HA-11		1/29/19	14:05	S	1			X			Delineate chloride until 600 mg/kg & is reached
HA-11		1/29/19	14:11	S	X			X			Delineate TPH until 2,500mg/kg is reached
TOTAL											

RELINQUISHED BY: (Signature) Arin Olsen DATE/TIME 1/30/19 9:30 RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME 1-30-19 9:30 RECEIVED BY: (Signature)

LABORATORY:

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 1-1.1 THERM#: 122
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☐ HAND DELIVERED

Certificate of Analysis Summary 619599

Larson and Associates, Inc., Midland, TX

Project Name: Legacy Reserves-Lea Unit 10

Project Id: 18-0138-10
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Apr-01-19 11:32 am
Report Date: 23-APR-19
Project Manager: Holly Taylor

Analysis Requested													
	Lab Id:	619599-001		619599-002		619599-003		619599-004		619599-009		619599-010	
	Field Id:	HA-3 (0-1)		HA-3 (1-2)		HA-3 (2-3)		HA-3 (3-4)		HA-4 (0-1)		HA-4 1-2)	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-28-19 14:08		Mar-28-19 14:10		Mar-28-19 14:11		Mar-28-19 14:12		Mar-28-19 15:00		Mar-28-19 15:02	
BTEX by EPA 8021B	***Extracted:***	Apr-05-19 11:15								Apr-05-19 11:15			
	Analyzed:	Apr-05-19 20:33								Apr-05-19 20:14			
	Units/RL:	mg/kg	RL							mg/kg	RL		
Benzene		0.0773	0.0201							<0.00200	0.00200		
Toluene		0.142	0.0201							<0.00200	0.00200		
Ethylbenzene		0.402	0.0201							<0.00200	0.00200		
m,p-Xylenes		0.725	0.0402							<0.00399	0.00399		
o-Xylene		0.307	0.0201							<0.00200	0.00200		
Total Xylenes		1.03	0.0201							<0.00200	0.00200		
Total BTEX		1.65	0.0201							<0.00200	0.00200		
Chloride by EPA 300	***Extracted:***	Apr-04-19 14:00		Apr-09-19 15:45		Apr-22-19 16:40		Apr-22-19 16:40		Apr-04-19 14:00		Apr-09-19 15:45	
	Analyzed:	Apr-05-19 19:19		Apr-09-19 22:33		Apr-23-19 12:43		Apr-23-19 12:48		Apr-05-19 19:26		Apr-09-19 22:40	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		3460	24.8	1480	24.8	2960	25.2	5190	50.2	7660	49.9	994	5.03
TPH by SW8015 Mod	***Extracted:***	Apr-05-19 17:00								Apr-05-19 17:00			
	Analyzed:	Apr-06-19 08:17								Apr-06-19 08:37			
	Units/RL:	mg/kg	RL							mg/kg	RL		
Gasoline Range Hydrocarbons (GRO)		43.7	15.0							<15.0	15.0		
Diesel Range Organics (DRO)		248	15.0							<15.0	15.0		
Motor Oil Range Hydrocarbons (MRO)		35.0	15.0							<15.0	15.0		
Total TPH		327	15.0							<15.0	15.0		

Holly Taylor
Project Manager

Certificate of Analysis Summary 619599

Larson and Associates, Inc., Midland, TX

Project Name: Legacy Reserves-Lea Unit 10

Project Id: 18-0138-10
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Apr-01-19 11:32 am
Report Date: 23-APR-19
Project Manager: Holly Taylor

Analysis Requested								
	Lab Id:	619599-011		619599-012				
	Field Id:	HA-4 (2-3)		HA-4 (3-4)				
	Depth:							
	Matrix:	SOIL		SOIL				
	Sampled:	Mar-28-19 15:03		Mar-28-19 15:04				
Chloride by EPA 300	***Extracted:***	Apr-22-19 16:40		Apr-22-19 16:40				
	Analyzed:	Apr-23-19 12:53		Apr-23-19 12:57				
	Units/RL:	mg/kg	RL	mg/kg	RL			
Chloride		352	5.00	67.4	5.00			

Holly Taylor
Project Manager

Analytical Report 619599

for

Larson and Associates, Inc.

Project Manager: Mark Larson

Legacy Reserves-Lea Unit 10

18-0138-10

23-APR-19

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429), North Carolina (483)
Xenco-Lakeland: Florida (E84098)

23-APR-19

Project Manager: **Mark Larson**
Larson and Associates, Inc.
P. O. Box 50685
Midland, TX 79710

Reference: XENCO Report No(s): **619599**
Legacy Reserves-Lea Unit 10
Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 619599. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 619599 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Holly Taylor

Holly Taylor
Project Manager

Sample Cross Reference 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
HA-3 (0-1)	S	03-28-19 14:08		619599-001
HA-3 (1-2)	S	03-28-19 14:10		619599-002
HA-3 (2-3)	S	03-28-19 14:11		619599-003
HA-3 (3-4)	S	03-28-19 14:12		619599-004
HA-4 (0-1)	S	03-28-19 15:00		619599-009
HA-4 1-2)	S	03-28-19 15:02		619599-010
HA-4 (2-3)	S	03-28-19 15:03		619599-011
HA-4 (3-4)	S	03-28-19 15:04		619599-012
HA-3 (4-6)	S	03-28-19 14:19		Not Analyzed
HA-3 (6-8)	S	03-28-19 14:20		Not Analyzed
HA-3 (8-10)	S	03-28-19 14:33		Not Analyzed
HA-3 (10-17)	S	03-28-19 14:35		Not Analyzed
HA-4 (4-6)	S	03-28-19 15:00		Not Analyzed
HA-4 (6-8)	S	03-28-19 15:00		Not Analyzed

Sample receipt non conformances and comments:

1.001 Added chlorides to samples 003, 004, 001 and 012.

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3084836 BTEX by EPA 8021B
Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected.
Samples affected are: 619599-001.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-3 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-001	Date Collected:	03.28.19 14.08		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 14.00	Basis:	Wet Weight
Seq Number:	3084861				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**3460**	24.8	mg/kg	04.05.19 19.19		5

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	**43.7**	15.0	mg/kg	04.06.19 08.17		1
Diesel Range Organics (DRO)	C10C28DRO	**248**	15.0	mg/kg	04.06.19 08.17		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**35.0**	15.0	mg/kg	04.06.19 08.17		1
Total TPH	PHC635	**327**	15.0	mg/kg	04.06.19 08.17		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	04.06.19 08.17	
o-Terphenyl	84-15-1	98	%	70-135	04.06.19 08.17	

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-3 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-001	Date Collected:	03.28.19 14.08		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 11.15	Basis:	Wet Weight
Seq Number:	3084836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	**0.0773**	0.0201	mg/kg	04.05.19 20.33		10
Toluene	108-88-3	**0.142**	0.0201	mg/kg	04.05.19 20.33		10
Ethylbenzene	100-41-4	**0.402**	0.0201	mg/kg	04.05.19 20.33		10
m,p-Xylenes	179601-23-1	**0.725**	0.0402	mg/kg	04.05.19 20.33		10
o-Xylene	95-47-6	**0.307**	0.0201	mg/kg	04.05.19 20.33		10
Total Xylenes	1330-20-7	**1.03**	0.0201	mg/kg	04.05.19 20.33		10
Total BTEX		**1.65**	0.0201	mg/kg	04.05.19 20.33		10

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	133	%	70-130	04.05.19 20.33	**
1,4-Difluorobenzene	540-36-3	104	%	70-130	04.05.19 20.33	

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-3 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-002	Date Collected:	03.28.19 14.10		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.09.19 15.45	Basis:	Wet Weight
Seq Number:	3085140				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1480**	24.8	mg/kg	04.09.19 22.33		5

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-3 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-003	Date Collected:	03.28.19 14.11		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.22.19 16.40	Basis:	Wet Weight
Seq Number:	3086606				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2960**	25.2	mg/kg	04.23.19 12.43		5

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-3 (3-4)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-004	Date Collected:	03.28.19 14.12		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.22.19 16.40	Basis:	Wet Weight
Seq Number:	3086606				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**5190**	50.2	mg/kg	04.23.19 12.48		10

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-4 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-009	Date Collected:	03.28.19 15.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 14.00	Basis:	Wet Weight
Seq Number:	3084861				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**7660**	49.9	mg/kg	04.05.19 19.26		10

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.06.19 08.37	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.06.19 08.37	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.06.19 08.37	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.06.19 08.37	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	94	%	70-135	04.06.19 08.37	
o-Terphenyl	84-15-1	95	%	70-135	04.06.19 08.37	

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-4 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-009	Date Collected:	03.28.19 15.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 11.15	Basis:	Wet Weight
Seq Number:	3084836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	04.05.19 20.14	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.05.19 20.14	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	107	%	70-130	04.05.19 20.14	
1,4-Difluorobenzene	540-36-3	97	%	70-130	04.05.19 20.14	

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-4 1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-010	Date Collected:	03.28.19 15.02		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.09.19 15.45	Basis:	Wet Weight
Seq Number:	3085140				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**994**	5.03	mg/kg	04.09.19 22.40		1

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-4 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-011	Date Collected:	03.28.19 15.03		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.22.19 16.40	Basis:	Wet Weight
Seq Number:	3086606				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**352**	5.00	mg/kg	04.23.19 12.53		1

Certificate of Analytical Results 619599

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-4 (3-4)**	Matrix:	Soil	Date Received:	04.01.19 11.32
Lab Sample Id:	619599-012	Date Collected:	03.28.19 15.04		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.22.19 16.40	Basis:	Wet Weight
Seq Number:	3086606				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**67.4**	5.00	mg/kg	04.23.19 12.57		1

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

QC Summary 619599

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Solid Date Prep: 04.04.19
MB Sample Id: 7675138-1-BLK LCS Sample Id: 7675138-1-BKS LCSD Sample Id: 7675138-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	245	98	252	101	90-110	3	20	mg/kg	04.05.19 18:38	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Solid Date Prep: 04.09.19
MB Sample Id: 7675404-1-BLK LCS Sample Id: 7675404-1-BKS LCSD Sample Id: 7675404-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	245	98	232	93	90-110	5	20	mg/kg	04.09.19 21:46	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086606 Matrix: Solid Date Prep: 04.22.19
MB Sample Id: 7676299-1-BLK LCS Sample Id: 7676299-1-BKS LCSD Sample Id: 7676299-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	248	99	250	100	90-110	1	20	mg/kg	04.23.19 10:42	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619630-002 MS Sample Id: 619630-002 S MSD Sample Id: 619630-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	145	250	396	100	419	110	90-110	6	20	mg/kg	04.05.19 20:34	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619708-001 MS Sample Id: 619708-001 S MSD Sample Id: 619708-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2.02	252	265	104	267	105	90-110	1	20	mg/kg	04.05.19 18:59	

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

QC Summary 619599

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Soil Date Prep: 04.09.19
Parent Sample Id: 619598-009 MS Sample Id: 619598-009 S MSD Sample Id: 619598-009 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	115	250	307	77	398	113	90-110	26	20	mg/kg	04.09.19 22:06	XF

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Soil Date Prep: 04.09.19
Parent Sample Id: 620072-001 MS Sample Id: 620072-001 S MSD Sample Id: 620072-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	118	248	296	72	363	99	90-110	20	20	mg/kg	04.09.19 23:41	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086606 Matrix: Soil Date Prep: 04.22.19
Parent Sample Id: 621199-014 MS Sample Id: 621199-014 S MSD Sample Id: 621199-014 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	93.8	249	312	88	301	83	90-110	4	20	mg/kg	04.23.19 10:56	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086606 Matrix: Soil Date Prep: 04.22.19
Parent Sample Id: 621249-006 MS Sample Id: 621249-006 S MSD Sample Id: 621249-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	687	252	883	78	881	77	90-110	0	20	mg/kg	04.23.19 12:04	X

Analytical Method: **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3084906 Matrix: Solid Date Prep: 04.05.19
MB Sample Id: 7675253-1-BLK LCS Sample Id: 7675253-1-BKS LCSD Sample Id: 7675253-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	933	93	987	99	70-135	6	20	mg/kg	04.06.19 04:33	
Diesel Range Organics (DRO)	<8.13	1000	1010	101	1070	107	70-135	6	20	mg/kg	04.06.19 04:33	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	94		119		124		70-135	%	04.06.19 04:33
o-Terphenyl	94		116		122		70-135	%	04.06.19 04:33

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

QC Summary 619599

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3084906 Matrix: Soil Date Prep: 04.05.19
Parent Sample Id: 619598-001 MS Sample Id: 619598-001 S MSD Sample Id: 619598-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<7.99	998	919	92	916	92	70-135	0	20	mg/kg	04.06.19 05:34	
Diesel Range Organics (DRO)	8.12	998	992	99	1010	101	70-135	2	20	mg/kg	04.06.19 05:34	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	117		116		70-135	%	04.06.19 05:34
o-Terphenyl	112		108		70-135	%	04.06.19 05:34

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084836 Matrix: Solid Date Prep: 04.05.19
MB Sample Id: 7675208-1-BLK LCS Sample Id: 7675208-1-BKS LCSD Sample Id: 7675208-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000387	0.101	0.100	99	0.100	101	70-130	0	35	mg/kg	04.05.19 23:42	
Toluene	<0.000458	0.101	0.105	104	0.106	107	70-130	1	35	mg/kg	04.05.19 23:42	
Ethylbenzene	<0.000568	0.101	0.0999	99	0.0998	100	70-130	0	35	mg/kg	04.05.19 23:42	
m,p-Xylenes	<0.00102	0.201	0.200	100	0.200	101	70-130	0	35	mg/kg	04.05.19 23:42	
o-Xylene	<0.000346	0.101	0.100	99	0.102	103	70-130	2	35	mg/kg	04.05.19 23:42	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	91		97		99		70-130	%	04.05.19 23:42
4-Bromofluorobenzene	86		92		101		70-130	%	04.05.19 23:42

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084836 Matrix: Soil Date Prep: 04.05.19
Parent Sample Id: 620216-001 MS Sample Id: 620216-001 S MSD Sample Id: 620216-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	0.00334	0.0996	0.0954	92	0.0777	75	70-130	20	35	mg/kg	04.05.19 12:20	
Toluene	0.00400	0.0996	0.102	98	0.0855	82	70-130	18	35	mg/kg	04.05.19 12:20	
Ethylbenzene	<0.000563	0.0996	0.0955	96	0.0809	81	70-130	17	35	mg/kg	04.05.19 12:20	
m,p-Xylenes	0.00119	0.199	0.192	96	0.163	81	70-130	16	35	mg/kg	04.05.19 12:20	
o-Xylene	0.000655	0.0996	0.0980	98	0.0830	83	70-130	17	35	mg/kg	04.05.19 12:20	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		96		70-130	%	04.05.19 12:20
4-Bromofluorobenzene	101		101		70-130	%	04.05.19 12:20

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

619599

№ 0494

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants

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

DATE: 4-1-2019 PAGE 1 OF 1

PO#: ~~18-0138-10~~ LAB WORK ORDER#:

PROJECT LOCATION OR NAME: Legacy Reserves - Rea unit 10

LAI PROJECT #: 18-0138-10 COLLECTOR: TO

Data Reported to:

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	ANALYSES	FIELD NOTES
HA-3 (0-1)		3/28/19	14:08	S	1				X		X	Delineate Chloride until 600 mg/kg is reached
(1-2)			14:10								X	
(2-3)			14:11								X	
(3-4)			14:12								X	
(4-6)			14:19									
(6-8)			14:20									
(8-10)			14:33									
(10-12)			14:35									
HA-4 (0-1)			15:00							X		Delineate TPH until 2500 mg/kg is reached.
(1-2)			15:02									
(2-3)			15:03									
(3-4)			15:04									
(4-6)			15:									
(6-8)			15:									

ANALYSES: ☒ BTEX ☐ MTBE ☐ TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ GASOLINE MOD 8015 ☒ DIESEL - MOD 8015 ☒ OIL - MOD 8015 ☒ VOC 8260 ☐ SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ 8082 PCBS ☐ TBLP - METALS (RCRA) ☐ TCLP VOC ☐ TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ TOTAL METALS (RCRA) ☐ OTHER LIST ☐ LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐ RCI ☐ TOX ☐ FLASHPOINT ☐ TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ pH ☐ HEXAVALENT CHROMIUM ☐ EXPLOSIVES ☐ PECHLORATE ☐ CHLORIDE ☒ ANIONS ☐ ALKALINITY ☐ 300

TOTAL 14

RELINQUISHED BY:(Signature)	DATE/TIME 4/1/19 10:51	RECEIVED BY: (Signature) 4/1/19
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature) 1107
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)

LABORATORY: Xenco

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 0.3/0.1 THERM#: IR8
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

Final 1.001

Page 21 of 22

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 04/01/2019 11:32:43 AM

Work Order #: 619599

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**N/A**
#18 Water VOC samples have zero headspace?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 04/01/2019

Brianna Teel

Checklist reviewed by: Holly Taylor Date: 04/02/2019

Holly Taylor

Certificate of Analysis Summary 619598

Larson and Associates, Inc., Midland, TX

Project Name: Legacy Reserves-Lea Unit 10

Project Id: 18-0318-10
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Apr-01-19 11:27 am
Report Date: 24-APR-19
Project Manager: Holly Taylor

Analysis Requested													
	Lab Id:	619598-001		619598-002		619598-003		619598-007		619598-008		619598-009	
	Field Id:	HA-2 (0-1)		HA-2 (1-2)		HA-2 (2-3)		HA-6 (0-1)		HA-6 (1-2)		HA-6 (2-3)	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-29-19 11:34		Mar-29-19 11:35		Mar-29-19 11:36		Mar-29-19 11:55		Mar-29-19 11:56		Mar-29-19 11:57	
BTEX by EPA 8021B	***Extracted:***	Apr-05-19 12:00						Apr-05-19 12:00					
	Analyzed:	Apr-06-19 01:54						Apr-06-19 06:18					
	Units/RL:	mg/kg	RL					mg/kg	RL				
Benzene		<0.00199	0.00199					0.0864	0.0201				
Toluene		<0.00199	0.00199					0.0656	0.0201				
Ethylbenzene		<0.00199	0.00199					0.826	0.0201				
m,p-Xylenes		<0.00398	0.00398					1.95	0.0402				
o-Xylene		<0.00199	0.00199					1.02	0.0201				
Total Xylenes		<0.00199	0.00199					2.97	0.0201				
Total BTEX		<0.00199	0.00199					3.95	0.0201				
Chloride by EPA 300	***Extracted:***	Apr-04-19 15:20		Apr-03-19 17:00		Apr-03-19 17:00		Apr-04-19 15:20		Apr-04-19 15:20		Apr-09-19 15:45	
	Analyzed:	Apr-06-19 18:07		Apr-04-19 01:56		Apr-04-19 04:13		Apr-06-19 18:14		Apr-06-19 18:21		Apr-09-19 21:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		3790	25.1	43.5	5.03	35.1	5.00	11800	99.6	1120	4.96	115	5.00
TPH by SW8015 Mod	***Extracted:***	Apr-05-19 17:00						Apr-05-19 17:00		Apr-05-19 17:00			
	Analyzed:	Apr-06-19 05:14						Apr-06-19 06:15		Apr-06-19 06:35			
	Units/RL:	mg/kg	RL					mg/kg	RL	mg/kg	RL		
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0					411	74.8	<15.0	15.0		
Diesel Range Organics (DRO)		<15.0	15.0					3390	74.8	93.2	15.0		
Motor Oil Range Hydrocarbons (MRO)		<15.0	15.0					393	74.8	18.5	15.0		
Total TPH		<15.0	15.0					4190	74.8	112	15.0		

Holly Taylor
Project Manager

Certificate of Analysis Summary 619598

Larson and Associates, Inc., Midland, TX

Project Name: Legacy Reserves-Lea Unit 10

Project Id: 18-0318-10
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Apr-01-19 11:27 am
Report Date: 24-APR-19
Project Manager: Holly Taylor

Analysis Requested													
	Lab Id:	619598-012		619598-013		619598-018		619598-019		619598-020		619598-021	
	Field Id:	HA-8 (0-1)		HA-8 (1-2)		HA-9 (0-1)		HA-9 (1-2)		HA-9 (2-3)		HA-10 (0-1)	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Mar-29-19 12:40		Mar-29-19 12:41		Mar-29-19 13:18		Mar-29-19 13:23		Mar-29-19 13:26		Mar-29-19 13:34	
BTEX by EPA 8021B	***Extracted:***	Apr-05-19 12:00				Apr-05-19 12:00						Apr-05-19 12:00	
	Analyzed:	Apr-06-19 03:27				Apr-06-19 03:46						Apr-06-19 04:05	
	Units/RL:	mg/kg	RL			mg/kg	RL					mg/kg	RL
Benzene		<0.00200	0.00200			<0.00200	0.00200					<0.00199	0.00199
Toluene		<0.00200	0.00200			0.00273	0.00200					0.0830	0.00199
Ethylbenzene		<0.00200	0.00200			<0.00200	0.00200					1.26 D	0.398
m,p-Xylenes		<0.00401	0.00401			<0.00399	0.00399					2.72 D	0.795
o-Xylene		<0.00200	0.00200			0.00218	0.00200					1.34 D	0.398
Total Xylenes		<0.00200	0.00200			0.00218	0.00200					4.06	0.398
Total BTEX		<0.00200	0.00200			0.00491	0.00200					5.40	0.00199
Chloride by EPA 300	***Extracted:***	Apr-04-19 15:20		Apr-04-19 15:20		Apr-04-19 15:20		Apr-09-19 15:45		Apr-17-19 19:00		Apr-04-19 14:00	
	Analyzed:	Apr-06-19 18:28		Apr-06-19 18:34		Apr-06-19 18:55		Apr-09-19 22:20		Apr-18-19 01:49		Apr-05-19 19:12	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		5000	49.7	27.0	4.99	13900	100	1860	24.8	8770	99.4	10400	99.6
TPH by SW8015 Mod	***Extracted:***	Apr-05-19 17:00		Apr-05-19 17:00		Apr-05-19 17:00						Apr-05-19 17:00	
	Analyzed:	Apr-06-19 06:56		Apr-06-19 07:16		Apr-06-19 07:36						Apr-06-19 07:57	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL					mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<14.9	14.9	<14.9	14.9	<15.0	15.0					281	15.0
Diesel Range Organics (DRO)		158	14.9	<14.9	14.9	<15.0	15.0					1730	15.0
Motor Oil Range Hydrocarbons (MRO)		26.7	14.9	<14.9	14.9	<15.0	15.0					209	15.0
Total TPH		185	14.9	<14.9	14.9	<15.0	15.0					2220	15.0

Holly Taylor
Project Manager

Certificate of Analysis Summary 619598

Larson and Associates, Inc., Midland, TX

Project Name: Legacy Reserves-Lea Unit 10

Project Id: 18-0318-10
Contact: Mark Larson
Project Location:

Date Received in Lab: Mon Apr-01-19 11:27 am
Report Date: 24-APR-19
Project Manager: Holly Taylor

Analysis Requested											
	Lab Id:	619598-022		619598-023		619598-024					
	Field Id:	HA-10 (1-2)		HA-10 (2-3)		HA-10 (3-4)					
	Depth:										
	Matrix:	SOIL		SOIL		SOIL					
	Sampled:	Mar-29-19 13:38		Mar-29-19 13:41		Mar-29-19 13:44					
Chloride by EPA 300	***Extracted:***	Apr-09-19 15:45		Apr-17-19 19:00		Apr-23-19 16:00					
	Analyzed:	Apr-09-19 22:26		Apr-18-19 01:55		Apr-23-19 21:12					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		1800	24.8	1390	25.1	338	5.00				

Holly Taylor
Project Manager

Analytical Report 619598

for

Larson and Associates, Inc.

Project Manager: Mark Larson

Legacy Reserves-Lea Unit 10

18-0318-10

24-APR-19

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429), North Carolina (483)
Xenco-Lakeland: Florida (E84098)

24-APR-19

Project Manager: **Mark Larson**
Larson and Associates, Inc.
P. O. Box 50685
Midland, TX 79710

Reference: XENCO Report No(s): **619598**
Legacy Reserves-Lea Unit 10
Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 619598. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 619598 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Holly Taylor

Holly Taylor
Project Manager

Sample Cross Reference 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
HA-2 (0-1)	S	03-29-19 11:34		619598-001
HA-2 (1-2)	S	03-29-19 11:35		619598-002
HA-2 (2-3)	S	03-29-19 11:36		619598-003
HA-6 (0-1)	S	03-29-19 11:55		619598-007
HA-6 (1-2)	S	03-29-19 11:56		619598-008
HA-6 (2-3)	S	03-29-19 11:57		619598-009
HA-8 (0-1)	S	03-29-19 12:40		619598-012
HA-8 (1-2)	S	03-29-19 12:41		619598-013
HA-9 (0-1)	S	03-29-19 13:18		619598-018
HA-9 (1-2)	S	03-29-19 13:23		619598-019
HA-9 (2-3)	S	03-29-19 13:26		619598-020
HA-10 (0-1)	S	03-29-19 13:34		619598-021
HA-10 (1-2)	S	03-29-19 13:38		619598-022
HA-10 (2-3)	S	03-29-19 13:41		619598-023
HA-10 (3-4)	S	03-29-19 13:44		619598-024
HA-2 (3-4)	S	03-29-19 11:37		Not Analyzed
HA-2 (4-6)	S	03-29-19 11:45		Not Analyzed
HA-2 (6-7)	S	03-29-19 11:46		Not Analyzed
HA-6 (3-4)	S	03-29-19 11:58		Not Analyzed
HA-6 (4-6)	S	03-29-19 12:10		Not Analyzed
HA-8 (2-3)	S	03-29-19 12:42		Not Analyzed
HA-8 (3-6)	S	03-29-19 12:43		Not Analyzed
HA-8 (4-6)	S	03-29-19 12:57		Not Analyzed
HA-8 (6-8)	S	03-29-19 12:58		Not Analyzed

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3084839 BTEX by EPA 8021B
Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected.
Samples affected are: 619598-007.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3084865 Inorganic Anions by EPA 300
Chloride Relative Percent Difference (RPD) between matrix spike and duplicate was above quality control limits.
Samples in the analytical batch are: 619598-001, -007, -008, -012, -013, -018

Lab Sample ID 619598-013 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).
Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference.
Samples in the analytical batch are: 619598-001, -007, -008, -012, -013, -018.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3084923 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.
Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.
Samples affected are: 619598-021.

Batch: LBA-3085140 Inorganic Anions by EPA 300
Chloride Relative Percent Difference (RPD) between matrix spike and duplicate was above quality control limits.
Samples in the analytical batch are: 619598-009, -019, -022

Lab Sample ID 620072-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).
Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference.
Samples in the analytical batch are: 619598-009, -019, -022.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-2 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-001	Date Collected:	03.29.19 11.34		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**3790**	25.1	mg/kg	04.06.19 18.07		5

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.06.19 05.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.06.19 05.14	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.06.19 05.14	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.06.19 05.14	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	92	%	70-135	04.06.19 05.14	
o-Terphenyl	84-15-1	91	%	70-135	04.06.19 05.14	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-2 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-001	Date Collected:	03.29.19 11.34		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 12.00	Basis:	Wet Weight
Seq Number:	3084839				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	04.06.19 01.54	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1
Total BTEX		<0.00199	0.00199	mg/kg	04.06.19 01.54	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	105	%	70-130	04.06.19 01.54	
1,4-Difluorobenzene	540-36-3	98	%	70-130	04.06.19 01.54	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-2 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-002	Date Collected:	03.29.19 11.35		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.03.19 17.00	Basis:	Wet Weight
Seq Number:	3084530				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**43.5**	5.03	mg/kg	04.04.19 01.56		1

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-2 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-003	Date Collected:	03.29.19 11.36		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.03.19 17.00	Basis:	Wet Weight
Seq Number:	3084530				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**35.1**	5.00	mg/kg	04.04.19 04.13		1

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-6 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-007	Date Collected:	03.29.19 11.55		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**11800**	99.6	mg/kg	04.06.19 18.14		20

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	**411**	74.8	mg/kg	04.06.19 06.15		5
Diesel Range Organics (DRO)	C10C28DRO	**3390**	74.8	mg/kg	04.06.19 06.15		5
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**393**	74.8	mg/kg	04.06.19 06.15		5
Total TPH	PHC635	**4190**	74.8	mg/kg	04.06.19 06.15		5

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	113	%	70-135	04.06.19 06.15	
o-Terphenyl	84-15-1	107	%	70-135	04.06.19 06.15	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-6 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-007	Date Collected:	03.29.19 11.55		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 12.00	Basis:	Wet Weight
Seq Number:	3084839				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	**0.0864**	0.0201	mg/kg	04.06.19 06.18		10
Toluene	108-88-3	**0.0656**	0.0201	mg/kg	04.06.19 06.18		10
Ethylbenzene	100-41-4	**0.826**	0.0201	mg/kg	04.06.19 06.18		10
m,p-Xylenes	179601-23-1	**1.95**	0.0402	mg/kg	04.06.19 06.18		10
o-Xylene	95-47-6	**1.02**	0.0201	mg/kg	04.06.19 06.18		10
Total Xylenes	1330-20-7	**2.97**	0.0201	mg/kg	04.06.19 06.18		10
Total BTEX		**3.95**	0.0201	mg/kg	04.06.19 06.18		10

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	227	%	70-130	04.06.19 06.18	**
1,4-Difluorobenzene	540-36-3	108	%	70-130	04.06.19 06.18	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-6 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-008	Date Collected:	03.29.19 11.56		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1120**	4.96	mg/kg	04.06.19 18.21		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.06.19 06.35	U	1
Diesel Range Organics (DRO)	C10C28DRO	**93.2**	15.0	mg/kg	04.06.19 06.35		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**18.5**	15.0	mg/kg	04.06.19 06.35		1
Total TPH	PHC635	**112**	15.0	mg/kg	04.06.19 06.35		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	88	%	70-135	04.06.19 06.35	
o-Terphenyl	84-15-1	89	%	70-135	04.06.19 06.35	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-6 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-009	Date Collected:	03.29.19 11.57		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.09.19 15.45	Basis:	Wet Weight
Seq Number:	3085140				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**115**	5.00	mg/kg	04.09.19 21.59		1

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-8 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-012	Date Collected:	03.29.19 12.40		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**5000**	49.7	mg/kg	04.06.19 18.28		10

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.06.19 06.56	U	1
Diesel Range Organics (DRO)	C10C28DRO	**158**	14.9	mg/kg	04.06.19 06.56		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**26.7**	14.9	mg/kg	04.06.19 06.56		1
Total TPH	PHC635	**185**	14.9	mg/kg	04.06.19 06.56		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	04.06.19 06.56	
o-Terphenyl	84-15-1	97	%	70-135	04.06.19 06.56	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-8 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-012	Date Collected:	03.29.19 12.40		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 12.00	Basis:	Wet Weight
Seq Number:	3084839				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	04.06.19 03.27	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.06.19 03.27	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	98	%	70-130	04.06.19 03.27	
1,4-Difluorobenzene	540-36-3	96	%	70-130	04.06.19 03.27	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-8 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-013	Date Collected:	03.29.19 12.41		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**27.0**	4.99	mg/kg	04.06.19 18.34		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.06.19 07.16	U	1
Diesel Range Organics (DRO)	C10C28DRO	<14.9	14.9	mg/kg	04.06.19 07.16	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<14.9	14.9	mg/kg	04.06.19 07.16	U	1
Total TPH	PHC635	<14.9	14.9	mg/kg	04.06.19 07.16	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	92	%	70-135	04.06.19 07.16	
o-Terphenyl	84-15-1	93	%	70-135	04.06.19 07.16	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-9 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-018	Date Collected:	03.29.19 13.18		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 15.20	Basis:	Wet Weight
Seq Number:	3084865				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**13900**	100	mg/kg	04.06.19 18.55		20

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.06.19 07.36	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.06.19 07.36	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	04.06.19 07.36	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.06.19 07.36	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	92	%	70-135	04.06.19 07.36	
o-Terphenyl	84-15-1	93	%	70-135	04.06.19 07.36	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-9 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-018	Date Collected:	03.29.19 13.18		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 12.00	Basis:	Wet Weight
Seq Number:	3084839				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.06.19 03.46	U	1
Toluene	108-88-3	**0.00273**	0.00200	mg/kg	04.06.19 03.46		1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.06.19 03.46	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	04.06.19 03.46	U	1
o-Xylene	95-47-6	**0.00218**	0.00200	mg/kg	04.06.19 03.46		1
Total Xylenes	1330-20-7	**0.00218**	0.00200	mg/kg	04.06.19 03.46		1
Total BTEX		**0.00491**	0.00200	mg/kg	04.06.19 03.46		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	96	%	70-130	04.06.19 03.46	
4-Bromofluorobenzene	460-00-4	99	%	70-130	04.06.19 03.46	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-9 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-019	Date Collected:	03.29.19 13.23		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.09.19 15.45	Basis:	Wet Weight
Seq Number:	3085140				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1860**	24.8	mg/kg	04.09.19 22.20		5

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-9 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-020	Date Collected:	03.29.19 13.26		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.17.19 19.00	Basis:	Wet Weight
Seq Number:	3086191				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**8770**	99.4	mg/kg	04.18.19 01.49		20

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-10 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-021	Date Collected:	03.29.19 13.34		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.04.19 14.00	Basis:	Wet Weight
Seq Number:	3084861				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**10400**	99.6	mg/kg	04.05.19 19.12		20

Analytical Method:	TPH by SW8015 Mod			Prep Method:	TX1005P
Tech:	ARM			% Moisture:	
Analyst:	ARM	Date Prep:	04.05.19 17.00	Basis:	Wet Weight
Seq Number:	3084906				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	**281**	15.0	mg/kg	04.06.19 07.57		1
Diesel Range Organics (DRO)	C10C28DRO	**1730**	15.0	mg/kg	04.06.19 07.57		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**209**	15.0	mg/kg	04.06.19 07.57		1
Total TPH	PHC635	**2220**	15.0	mg/kg	04.06.19 07.57		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	120	%	70-135	04.06.19 07.57	
o-Terphenyl	84-15-1	123	%	70-135	04.06.19 07.57	

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-10 (0-1)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-021	Date Collected:	03.29.19 13.34		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	04.05.19 12.00	Basis:	Wet Weight
Seq Number:	3084923				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	04.06.19 04.05	U	1
Toluene	108-88-3	**0.0830**	0.00199	mg/kg	04.06.19 04.05		1
Ethylbenzene	100-41-4	**1.26**	0.398	mg/kg	04.08.19 12.50	D	200
m,p-Xylenes	179601-23-1	**2.72**	0.795	mg/kg	04.08.19 12.50	D	200
o-Xylene	95-47-6	**1.34**	0.398	mg/kg	04.08.19 12.50	D	200
Total Xylenes	1330-20-7	**4.06**	0.398	mg/kg	04.08.19 12.50		200
Total BTEX		**5.40**	0.00199	mg/kg	04.08.19 12.50		200

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	97	%	70-130	04.06.19 04.05	
4-Bromofluorobenzene	460-00-4	490	%	70-130	04.06.19 04.05	**

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-10 (1-2)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-022	Date Collected:	03.29.19 13.38		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.09.19 15.45	Basis:	Wet Weight
Seq Number:	3085140				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1800**	24.8	mg/kg	04.09.19 22.26		5

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-10 (2-3)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-023	Date Collected:	03.29.19 13.41		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SPC			% Moisture:	
Analyst:	SPC	Date Prep:	04.17.19 19.00	Basis:	Wet Weight
Seq Number:	3086191				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1390**	25.1	mg/kg	04.18.19 01.55		5

Certificate of Analytical Results 619598

Larson and Associates, Inc., Midland, TX

Legacy Reserves-Lea Unit 10

Sample Id:	**HA-10 (3-4)**	Matrix:	Soil	Date Received:	04.01.19 11.27
Lab Sample Id:	619598-024	Date Collected:	03.29.19 13.44		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	04.23.19 16.00	Basis:	Wet Weight
Seq Number:	3086701				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**338**	5.00	mg/kg	04.23.19 21.12		1

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084530 Matrix: Solid Date Prep: 04.03.19
MB Sample Id: 7675002-1-BLK LCS Sample Id: 7675002-1-BKS LCSD Sample Id: 7675002-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	0.977	250	267	107	267	107	90-110	0	20	mg/kg	04.04.19 01:36	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Solid Date Prep: 04.04.19
MB Sample Id: 7675138-1-BLK LCS Sample Id: 7675138-1-BKS LCSD Sample Id: 7675138-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	245	98	252	101	90-110	3	20	mg/kg	04.05.19 18:38	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084865 Matrix: Solid Date Prep: 04.04.19
MB Sample Id: 7675143-1-BLK LCS Sample Id: 7675143-1-BKS LCSD Sample Id: 7675143-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	271	108	226	90	90-110	18	20	mg/kg	04.06.19 16:39	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Solid Date Prep: 04.09.19
MB Sample Id: 7675404-1-BLK LCS Sample Id: 7675404-1-BKS LCSD Sample Id: 7675404-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	245	98	232	93	90-110	5	20	mg/kg	04.09.19 21:46	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Solid Date Prep: 04.17.19
MB Sample Id: 7676024-1-BLK LCS Sample Id: 7676024-1-BKS LCSD Sample Id: 7676024-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	249	100	252	101	90-110	1	20	mg/kg	04.17.19 23:20	

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086701 Matrix: Solid Date Prep: 04.23.19
MB Sample Id: 7676388-1-BLK LCS Sample Id: 7676388-1-BKS LCSD Sample Id: 7676388-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	246	98	249	100	90-110	1	20	mg/kg	04.23.19 20:29	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084530 Matrix: Soil Date Prep: 04.03.19
Parent Sample Id: 619598-002 MS Sample Id: 619598-002 S MSD Sample Id: 619598-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	43.5	252	317	109	317	109	90-110	0	20	mg/kg	04.04.19 02:05	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084530 Matrix: Soil Date Prep: 04.03.19
Parent Sample Id: 619598-003 MS Sample Id: 619598-003 S MSD Sample Id: 619598-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	35.1	250	307	109	305	108	90-110	1	20	mg/kg	04.04.19 04:23	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619630-002 MS Sample Id: 619630-002 S MSD Sample Id: 619630-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	145	250	396	100	419	110	90-110	6	20	mg/kg	04.05.19 20:34	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084861 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619708-001 MS Sample Id: 619708-001 S MSD Sample Id: 619708-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2.02	252	265	104	267	105	90-110	1	20	mg/kg	04.05.19 18:59	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* | (C-E) / (C+E) |
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084865 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619567-016 MS Sample Id: 619567-016 S MSD Sample Id: 619567-016 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	19.1	252	295	109	283	105	90-110	4	20	mg/kg	04.06.19 16:59	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3084865 Matrix: Soil Date Prep: 04.04.19
Parent Sample Id: 619598-013 MS Sample Id: 619598-013 S MSD Sample Id: 619598-013 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	27.0	250	233	82	302	110	90-110	26	20	mg/kg	04.06.19 18:41	XF

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Soil Date Prep: 04.09.19
Parent Sample Id: 619598-009 MS Sample Id: 619598-009 S MSD Sample Id: 619598-009 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	115	250	307	77	398	113	90-110	26	20	mg/kg	04.09.19 22:06	XF

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3085140 Matrix: Soil Date Prep: 04.09.19
Parent Sample Id: 620072-001 MS Sample Id: 620072-001 S MSD Sample Id: 620072-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	118	248	296	72	363	99	90-110	20	20	mg/kg	04.09.19 23:41	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Soil Date Prep: 04.17.19
Parent Sample Id: 620782-002 MS Sample Id: 620782-002 S MSD Sample Id: 620782-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	279	250	514	94	507	91	90-110	1	20	mg/kg	04.18.19 17:07	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* | (C-E) / (C+E) |
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086191 Matrix: Soil Date Prep: 04.17.19
Parent Sample Id: 620948-004 MS Sample Id: 620948-004 S MSD Sample Id: 620948-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2.16	252	254	100	258	102	90-110	2	20	mg/kg	04.17.19 23:40	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086701 Matrix: Soil Date Prep: 04.23.19
Parent Sample Id: 619598-024 MS Sample Id: 619598-024 S MSD Sample Id: 619598-024 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	338	250	578	96	565	91	90-110	2	20	mg/kg	04.24.19 08:44	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3086701 Matrix: Soil Date Prep: 04.23.19
Parent Sample Id: 620657-024 MS Sample Id: 620657-024 S MSD Sample Id: 620657-024 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	7800	248	10100	927	10100	927	90-110	0	20	mg/kg	04.24.19 09:58	X

Analytical Method: **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3084906 Matrix: Solid Date Prep: 04.05.19
MB Sample Id: 7675253-1-BLK LCS Sample Id: 7675253-1-BKS LCSD Sample Id: 7675253-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	933	93	987	99	70-135	6	20	mg/kg	04.06.19 04:33	
Diesel Range Organics (DRO)	<8.13	1000	1010	101	1070	107	70-135	6	20	mg/kg	04.06.19 04:33	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	94		119		124		70-135	%	04.06.19 04:33
o-Terphenyl	94		116		122		70-135	%	04.06.19 04:33

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **TPH by SW8015 Mod** Prep Method: TX1005P
Seq Number: 3084906 Matrix: Soil Date Prep: 04.05.19
Parent Sample Id: 619598-001 MS Sample Id: 619598-001 S MSD Sample Id: 619598-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<7.99	998	919	92	916	92	70-135	0	20	mg/kg	04.06.19 05:34	
Diesel Range Organics (DRO)	8.12	998	992	99	1010	101	70-135	2	20	mg/kg	04.06.19 05:34	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	117		116		70-135	%	04.06.19 05:34
o-Terphenyl	112		108		70-135	%	04.06.19 05:34

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084839 Matrix: Solid Date Prep: 04.05.19
MB Sample Id: 7675213-1-BLK LCS Sample Id: 7675213-1-BKS LCSD Sample Id: 7675213-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000383	0.0996	0.0925	93	0.0923	92	70-130	0	35	mg/kg	04.05.19 21:29	
Toluene	<0.000454	0.0996	0.0980	98	0.0973	97	70-130	1	35	mg/kg	04.05.19 21:29	
Ethylbenzene	<0.000563	0.0996	0.0920	92	0.0905	91	70-130	2	35	mg/kg	04.05.19 21:29	
m,p-Xylenes	<0.00101	0.199	0.182	91	0.181	91	70-130	1	35	mg/kg	04.05.19 21:29	
o-Xylene	<0.000343	0.0996	0.0930	93	0.0942	94	70-130	1	35	mg/kg	04.05.19 21:29	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	91		97		98		70-130	%	04.05.19 21:29
4-Bromofluorobenzene	90		94		100		70-130	%	04.05.19 21:29

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084923 Matrix: Solid Date Prep: 04.08.19
MB Sample Id: 7675279-1-BLK LCS Sample Id: 7675279-1-BKS LCSD Sample Id: 7675279-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000383	0.0996	0.0933	94	0.0933	93	70-130	0	35	mg/kg	04.08.19 22:20	
Toluene	<0.000454	0.0996	0.0991	99	0.100	100	70-130	1	35	mg/kg	04.08.19 22:20	
Ethylbenzene	<0.000563	0.0996	0.0934	94	0.0945	95	70-130	1	35	mg/kg	04.08.19 22:20	
m,p-Xylenes	<0.00101	0.199	0.188	94	0.190	95	70-130	1	35	mg/kg	04.08.19 22:20	
o-Xylene	<0.000343	0.0996	0.0946	95	0.0957	96	70-130	1	35	mg/kg	04.08.19 22:20	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	91		97		97		70-130	%	04.08.19 22:20
4-Bromofluorobenzene	87		91		93		70-130	%	04.08.19 22:20

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

[D] = 100*(C-A) / B
RPD = 200* | (C-E) / (C+E) |
[D] = 100 * (C) / [B]
Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

QC Summary 619598

Larson and Associates, Inc.

Legacy Reserves-Lea Unit 10

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084839 Matrix: Soil Date Prep: 04.05.19
Parent Sample Id: 619979-001 MS Sample Id: 619979-001 S MSD Sample Id: 619979-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000388	0.101	0.0944	93	0.0828	83	70-130	13	35	mg/kg	04.05.19 22:07	
Toluene	<0.000459	0.101	0.101	100	0.0878	89	70-130	14	35	mg/kg	04.05.19 22:07	
Ethylbenzene	<0.000569	0.101	0.0935	93	0.0814	82	70-130	14	35	mg/kg	04.05.19 22:07	
m,p-Xylenes	<0.00102	0.202	0.184	91	0.161	81	70-130	13	35	mg/kg	04.05.19 22:07	
o-Xylene	<0.000347	0.101	0.0958	95	0.0842	85	70-130	13	35	mg/kg	04.05.19 22:07	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	98		98		70-130	%	04.05.19 22:07
4-Bromofluorobenzene	101		100		70-130	%	04.05.19 22:07

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3084923 Matrix: Soil Date Prep: 04.08.19
Parent Sample Id: 619719-001 MS Sample Id: 619719-001 S MSD Sample Id: 619719-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000387	0.101	0.0597	59	0.0765	77	70-130	25	35	mg/kg	04.08.19 22:58	X
Toluene	<0.000458	0.101	0.0615	61	0.0799	80	70-130	26	35	mg/kg	04.08.19 22:58	X
Ethylbenzene	<0.000568	0.101	0.0552	55	0.0729	73	70-130	28	35	mg/kg	04.08.19 22:58	X
m,p-Xylenes	<0.00102	0.201	0.110	55	0.145	73	70-130	27	35	mg/kg	04.08.19 22:58	X
o-Xylene	0.000399	0.101	0.0562	55	0.0742	74	70-130	28	35	mg/kg	04.08.19 22:58	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	98		98		70-130	%	04.08.19 22:58
4-Bromofluorobenzene	100		102		70-130	%	04.08.19 22:58

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

6104598

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 4/1/2019 PAGE 1 OF 2

PO#: LAB WORK ORDER#:

PROJECT LOCATION OR NAME: Legacy Reserves Lea Unit 10

LAI PROJECT #: 18-0138-10 COLLECTOR: TO

Data Reported to:

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESSERVED

ANALYSES: BTEX ☒ MTBE ☐ | TRPH 418.1 ☐ | TPH 1005 ☒ | TPH 1006 ☐ | GASOLINE MOD 8015 ☒ | DIESEL - MOD 8015 ☒ | OIL - MOD 8015 ☒ | VOC 8260 ☐ | SVOC 8270 ☐ | PAH 8270 ☐ | HOLDPAH ☐ | 8081 PESTICIDES ☐ | 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TBLP - METALS (RCRA) ☐ | TCLP - PEST ☐ | HERB ☐ | TCLP VOC ☐ | Semi-VOC ☐ | TOTAL METALS (RCRA) ☐ | OTHER LIST ☐ | LEAD - TOTAL ☐ | D.W. 200.8 ☐ | TCLP ☐ | RCI ☐ | TOX ☐ | FLASHPOINT ☐ | TDS ☐ | TSS ☐ | % MOISTURE ☐ | pH ☐ | HEXAVALENT CHROMIUM ☐ | CYANIDE ☐ | EXPLOSIVES ☐ | PECHLORATE ☐ | CHLORIDE ☒ ANIONS ☐ | ALKALINITY ☐ | 300.0

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	BTEX ☒	TPH 1005 ☒	GASOLINE MOD 8015 ☒	DIESEL - MOD 8015 ☒	OIL - MOD 8015 ☒	pH ☐	300.0	FIELD NOTES
HA-2 (0-1)		3/29/19	11:34	S	1				X		X	X	X	X		X		Delineate Chloride until 600 mg/kg is reached
(1-2)			11:35															
(2-3)			11:36															
(3-4)			11:37															
(4-6)			11:45															
(6-7)			11:46															
HA-6 (0-1)			11:55								X							Delineate TPH Until 2500 mg/kg is reached
(1-2)			11:56															
(2-3)			11:57															
(3-4)			11:58															
(4-6)			12:10															
HA-8 (0-1)			12:40								X							
(1-2)			12:41															
(2-3)			12:42															
(3-6)			12:43															

TOTAL 15+9=24

RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
Brenda Bills	4/1/19 10:45	[illegible] 4/1/19 1157
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)

LABORATORY: Xenco

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 03/0.2 THERM#: 98
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

Nº 0430

CHAIN-OF-CUSTODY

619598

Larson & Associates, Inc.
Environmental Consultants

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

Data Reported to:

DATE: 4-1-2019 PAGE 2 OF 2

PO#: LAB WORK ORDER#:

PROJECT LOCATION OR NAME: Legacy Reserves - Lea Unit 10

LAI PROJECT #: 18-0138-10 COLLECTOR: TO

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

PRESERVATION: HCl | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE | UNPRESSERVED

ANALYSES: BTEX ☒ MTBE ☐ | TRPH 418.1 ☐ | TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☒ | DIESEL - MOD 8015 ☒ | OIL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ | 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TBLP - METALS (RCRA) ☐ TCLP VOC ☐ | TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ | TOTAL METALS (RCRA) ☐ OTHER LIST ☐ | LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐ | RCI ☐ TOX ☐ FLASHPOINT ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | pH ☐ HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ PECHLORATE ☐ | CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐ | 300.0

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	BTEX ☒ MTBE ☐	TRPH 418.1 ☐	TPH 1005 ☐ TPH 1006 ☐	GASOLINE MOD 8015 ☒	DIESEL - MOD 8015 ☒	OIL - MOD 8015 ☐	VOC 8260 ☐	SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐	8081 PESTICIDES ☐ 8151 HERBICIDES ☐	8082 PCBS ☐	TBLP - METALS (RCRA) ☐ TCLP VOC ☐	TCLP - PEST ☐ HERB ☐ Semi-VOC ☐	TOTAL METALS (RCRA) ☐ OTHER LIST ☐	LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐	RCI ☐ TOX ☐ FLASHPOINT ☐	TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐	300.0	FIELD NOTES
HA-8 (4-6)		3/29/19	12:57	S	1				X			X	X	X	X														X		Delineate Chloride until 600 mg/kg is reached
(6-8)			12:58																													
HA-9 (0-1)			13:18								X																					
(1-2)			13:23																													
(2-3)			13:26																													
HA-10 (0-1)			13:34								X																					
(1-2)			13:38																													Delineate TPH until 2500 mg/kg is reached.
(2-3)			13:41																													
(3-4)			13:44																													

TOTAL 9+15 = 24

RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
Brenda Salinas	4/1/19 10:45	[illegible] 4/1/19 1137
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)

LABORATORY: Xenco

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP: 0.3/0.2 THERM#: NB
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☐ HAND DELIVERED

Final 1.000

Page 37 of 38

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 04/01/2019 11:27:00 AM

Work Order #: 619598

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**N/A**
#18 Water VOC samples have zero headspace?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 04/02/2019
Brianna Teel

Checklist reviewed by: Holly Taylor Date: 04/02/2019
Holly Taylor

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

PBELAB

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Lea Unit #10

Project Number: 18-0138-10

Location: NM

Lab Order Number: 9J02003

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704516-18-9

Report Date: 10/08/19

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

Project: Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-3 @ (5')	9J02003-01	Soil	10/01/19 00:00	10-02-2019 09:54
HA-3 @ (10')	9J02003-02	Soil	10/01/19 00:00	10-02-2019 09:54
HA-3 @ (15')	9J02003-03	Soil	10/01/19 00:00	10-02-2019 09:54
HA-3 @ (20')	9J02003-04	Soil	10/01/19 00:00	10-02-2019 09:54
HA-9 @ (5')	9J02003-05	Soil	10/01/19 00:00	10-02-2019 09:54
HA-9 @ (10')	9J02003-06	Soil	10/01/19 00:00	10-02-2019 09:54
HA-9 @ (15')	9J02003-07	Soil	10/01/19 00:00	10-02-2019 09:54
HA-9 @ (20')	9J02003-08	Soil	10/01/19 00:00	10-02-2019 09:54

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

Project: Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-3 @ (5')

9J02003-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**4150**	26.9	mg/kg dry	25	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-3 @ (10')

9J02003-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**85.8**	1.11	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-3 @ (15')

9J02003-03 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**150**	1.11	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-3 @ (20')

9J02003-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**114**	1.06	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-9 @ (5')

9J02003-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**11.4**	1.03	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**3.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-9 @ (10')

9J02003-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**189**	1.08	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-9 @ (15')

9J02003-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**173**	1.06	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

Larson & Associates, Inc.	Project: Lea Unit #10	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 18-0138-10	
Midland TX, 79710	Project Manager: Mark Larson	

HA-9 @ (20')

9J02003-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**145**	1.05	mg/kg dry	1	P9J0307	10/03/19	10/04/19	EPA 300.0	
% Moisture	**5.0**	0.1	%	1	P9J0301	10/03/19	10/03/19	ASTM D2216	

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

Project: Lea Unit #10
Project Number: 18-0138-10
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 P9J0301 - * DEFAULT PREP *** **										
Blank (P9J0301-BLK1)				Prepared & Analyzed: 10/03/19						
% Moisture	ND	0.1	%							
Duplicate (P9J0301-DUP1)		**Source: 9J02004-05**		Prepared & Analyzed: 10/03/19						
% Moisture	1.0	0.1	%		1.0			0.00	20	
Duplicate (P9J0301-DUP2)		**Source: 9J02006-09**		Prepared & Analyzed: 10/03/19						
% Moisture	9.0	0.1	%		10.0			10.5	20	
Batch P9J0307 - * DEFAULT PREP *** **										
Blank (P9J0307-BLK1)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	ND	1.00	mg/kg wet							
LCS (P9J0307-BS1)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	400	1.00	mg/kg wet	400		100	80-120			
LCS Dup (P9J0307-BSD1)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	402	1.00	mg/kg wet	400		100	80-120	0.294	20	
Calibration Blank (P9J0307-CCB1)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9J0307-CCB2)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	0.00		mg/kg wet							
Calibration Check (P9J0307-CCV1)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	19.8		mg/kg	20.0		99.0	0-200			

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 P9J0307 - * DEFAULT PREP *** **										
Calibration Check (P9J0307-CCV2)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	20.2		mg/kg	20.0		101	0-200			
Calibration Check (P9J0307-CCV3)				Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	21.3		mg/kg	20.0		106	0-200			
Matrix Spike (P9J0307-MS1)		**Source: 9J02003-01**		Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	7580	26.9	mg/kg dry	2690	4150	128	80-120			
Matrix Spike (P9J0307-MS2)		**Source: 9J02004-03**		Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	1800	5.10	mg/kg dry	510	1290	101	80-120			
Matrix Spike Dup (P9J0307-MSD1)		**Source: 9J02003-01**		Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	7500	26.9	mg/kg dry	2690	4150	125	80-120	1.09	20	
Matrix Spike Dup (P9J0307-MSD2)		**Source: 9J02004-03**		Prepared: 10/03/19 Analyzed: 10/04/19						
Chloride	1830	5.10	mg/kg dry	510	1290	106	80-120	1.38	20	

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

Project: Lea Unit #10
Project Number: 18-0138-10
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

ROI	Received on Ice
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: Brent Barron Date: 10/8/2019

Brent Barron, Laboratory Director/Technical Director

№ 0784

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 10/2/2019 PAGE 1 OF 1

PO#: LAB WORK ORDER#: 9J02003

PROJECT LOCATION OR NAME: Lea Unit #10

LAI PROJECT #: 18-013B-10 COLLECTOR: RO

Data Reported to:

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	ANALYSES: BTEX ☐ MTBE ☐	TRPH 418.1 ☐	TPH 1005 ☐ TPH 1006 ☐	GASOLINE MOD 8015 ☐	DIESEL - MOD 8015 ☐	OIL - MOD 8015 ☐	VOC 8260 ☐	SVOC 8270 ☐	PAH 8270 ☐ HOLDPAH ☐	8081 PESTICIDES ☐	8151 HERBICIDES ☐	8082 PCBS ☐	TBLP - METALS (RCRA) ☐	TCLP - METALS (RCRA) ☐ TCLP VOC ☐	TCLP - PEST ☐ HERB ☐ Semi-VOC ☐	TOTAL METALS (RCRA) ☐ OTHER LIST ☐	LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐	RCI ☐ TOX ☐ FLASHPOINT ☐	TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐ M300	FIELD NOTES
HA-3 (5')	1	10/1/19		S	1				X																						X		
HA-3 (10')	2	"		"	"				"																						"		
HA-3 (15')	3	"		"	"				"																						"		
HA-3 (20')	4	"		"	"				"																						"		
HA-9 (5')	5	"		"	"				"																						"		
HA-9 (10')	6	"		"	"				"																						"		
HA-9 (15')	7	"		"	"				"																						"		
HA-9 (20')	8	"		"	"				"																						"		

TOTAL 8

RELINQUISHED BY:(Signature) Rachel Owen DATE/TIME 10-2-19/9:54 RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME 10-2-19 7954 RECEIVED BY: (Signature)

LABORATORY: DBEL

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

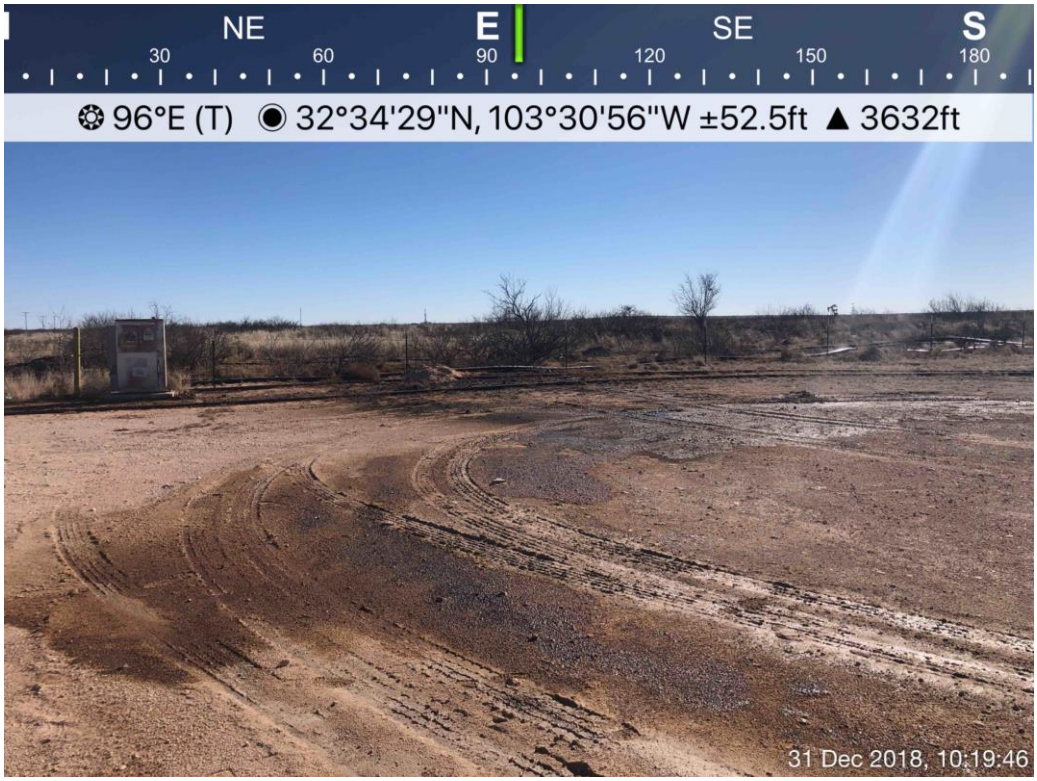
LABORATORY USE ONLY:
RECEIVING TEMP: 1.3-2.3 THERM#: CF1, 12
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

Appendix D

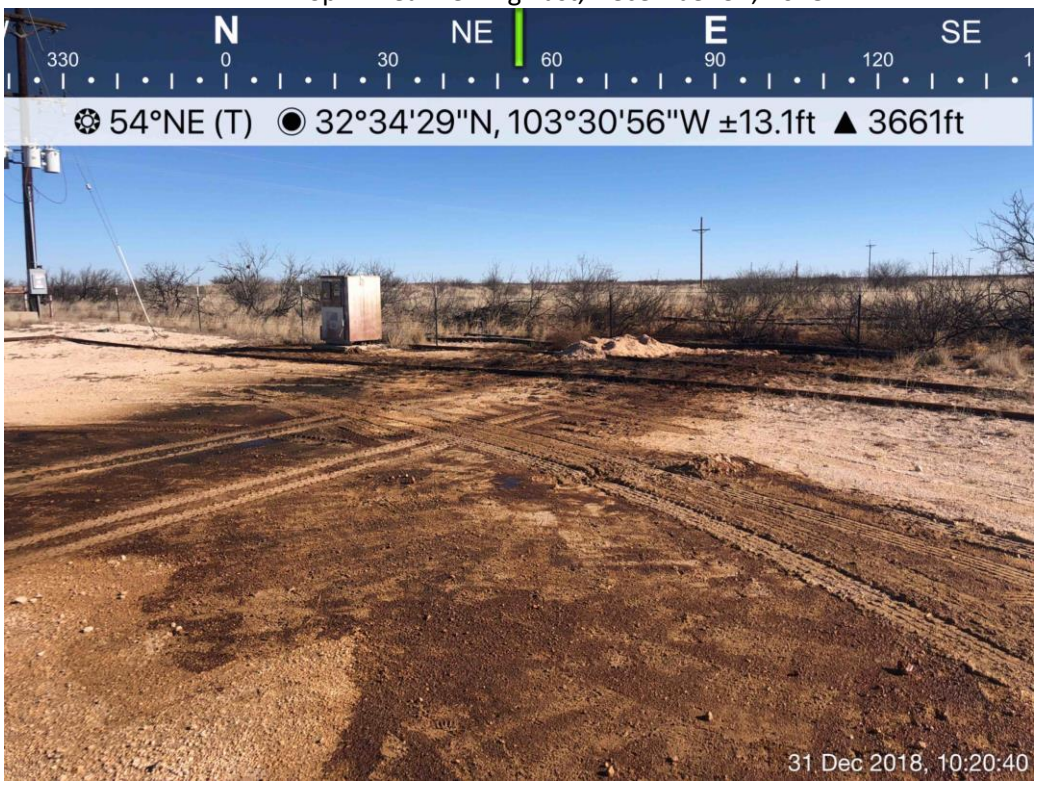
Photographs

Lea Unit #10, Viewing North, December 31, 2018

Spill Area Viewing West, December 31, 2018

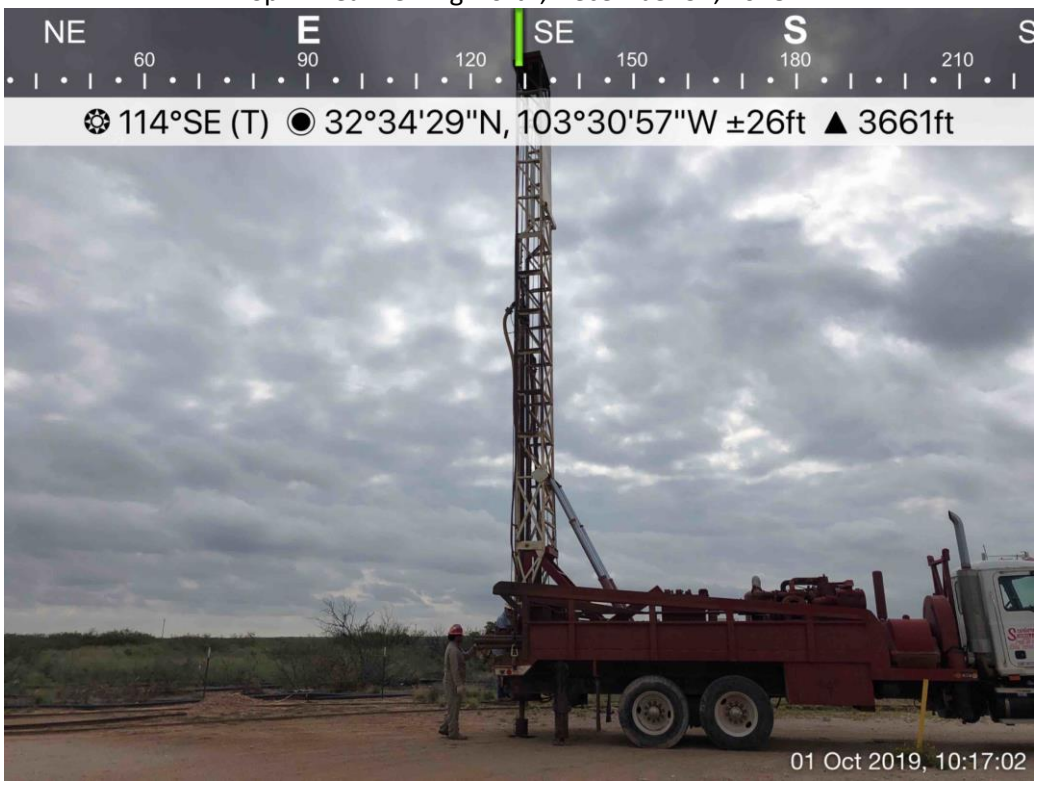


Spill Area Viewing East, December 31, 2018



Spill Area Viewing Northeast, December 31, 2018

Spill Area Viewing North, December 31, 2018



Delineation with an Air Rotary Drilling Rig, Viewing Southeast, October 01, 2019