

**1RP-4636**  
**CLOSURE REPORT**  
**Hamon Tank Battery**  
**Produced Water Spill**  
**Lea County, New Mexico**

Latitude: 32.5849°  
Longitude: -103.5976°

LAI Project No. 17-0175-36

October 23, 2018

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



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



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Rachel E. Owen  
Staff Geologist

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Closure Report  
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## 1.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this delineation report on behalf of Legacy Reserves Operating, LP (Legacy) for submittal to the New Mexico Oil Conservation Division (OCD) District 1 for a produced water spill at the Hamon Tank Battery (Site) located in Unit B (NW/4, NE/4), Section 7, Township 20 South, Range 34 East in Lea County, New Mexico. The geodetic position is North 32° 35' 36.28" and West 103° 35' 53.02". Figure 1 presents a topographic map. Figure 2 presents an aerial map.

### 1.1 Background

The spill occurred on March 4, 2017, due to a separator catching on fire and releasing 40 barrels (bbl) of produced water. No fluids were recovered. The separator was shut in and the majority of the released fluids were consumed by the fire, with a small pooling of fluids in the northwest corner of the caliche pad. The release was reported to the OCD District 1 (verbal communication with Ms. Olivia Yu) on March 6, 2017. On March 7, 2017 the initial C-141 was submitted and assigned remediation permit number 1RP-4636. The release is considered a major release under the current rule (19.15.29 NMAC) since the volume is greater than 25 bbl. On February 27, 2018, LAI, on behalf of Legacy, submitted a delineation plan titled, "1RP-4636 Delineation Plan Hamon Tank Battery Produced Water Spill, December 15, 2018", and approved on March 9, 2018. Appendix B presents OCD communications.

### 1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 3,615 feet above mean sea level (msl);
- The topography gently slopes towards the southwest;
- There is no surface water within 1,000 feet of the Site;
- The soils are designated as "Kermit-Palomas fine sands, 0 to 12 percent slopes", consisting of 0 to 60 inches of fine sand;
- The surface geology is of the Eolian and piedmont deposits (Holocene to middle Pleistocene)-interlayered eolian sands and piedmont-slope deposits;
- Groundwater occurs in the Ogallala formation at approximately 125 feet below ground surface (bgs);
- The nearest fresh water well is located in Unit N (SE/4, SW/4), Section 17, Township 20 South, Range 34 East, approximately 1.98 miles 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 20,000 mg/Kg

## 2.0 DELINEATION

On April 23, 2018 LAI personnel collected soil samples at ten (10) locations (DP-1 through DP-10), with direct push technology (DPT) to about 8 feet bgs. The samples were delivered under preservation and



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chain of custody to Xenco Laboratories (Xenco) in Midland, Texas. The upper samples (i.e. 0 to 1) were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) including gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO) by EPA SW-846 Methods 8015M and 8015B respectively. All samples were analyzed for chloride by EPA SW-846 Method 300.

Benzene, BTEX, TPH, and chloride were reported below the allowable concentrations of 10 mg/Kg, 50 mg/Kg, 2,500 mg/Kg, and 20,000 mg/Kg, respectively, in all samples. Table 1 presents the laboratory analytical data summary. Appendix C presents laboratory reports. Appendix D presents photographs. Appendix E presents the final C-141. Figure 3 presents an aerial map with sample locations.

### **3.0 CONCLUSION**

All sample concentrations are below the closure criteria in Table 1 of 19.15.29NMAC, therefore, Legacy requests no further action for 1RP-4636.

Tables

**Table 1**  
**1RP-4636**  
**Soil Sample Analytical Data Summary**  
**Legacy Reserves, Hamon Battery**  
**Lea County, New Mexico**

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Sample	Depth (Feet)	Collection Date	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-3	0-1	4/23/2018	<0.00200	<0.00200	<15.0	60.4	<15.0	60.4	359
	1-2	4/23/2018	-	-	-	-	-	-	<4.95
	2-3	4/23/2018	-	-	-	-	-	-	<4.99
	3-4	4/23/2018	-	-	-	-	-	-	<4.99
	4-5	4/23/2018	-	-	-	-	-	-	<4.97
HA-4	0-1	4/24/2018	<0.00202	<0.00202	<14.9	109	<14.9	109	107
	1-2	4/24/2018	-	-	-	-	-	-	<4.95
	2-3	4/24/2018	-	-	-	-	-	-	<5.00
	3-4	4/24/2018	-	-	-	-	-	-	<4.99
	4-5	4/24/2018	-	-	-	-	-	-	<4.99
DP-1	0-1	4/24/2018	<0.00198	<0.00198	<15.0	<15.0	<15.0	<15.0	<5.00
	1-2	4/24/2018	-	-	-	-	-	-	28
	2-3	4/24/2018	-	-	-	-	-	-	<4.95
	3-4	4/24/2018	-	-	-	-	-	-	<4.95
	4-6	4/24/2018	-	-	-	-	-	-	<4.99
	6-8	4/24/2018	-	-	-	-	-	-	25.8
DP-2	0-1	4/23/2018	<0.00199	<0.00199	<15.0	<15.0	<15.0	<15.0	8.53
	1-2	4/23/2018	-	-	-	-	-	-	<5.00
	2-3	4/23/2018	-	-	-	-	-	-	<4.99
	3-4	4/23/2018	-	-	-	-	-	-	<4.96
	4-6	4/23/2018	-	-	-	-	-	-	7.5
	6-7	4/23/2018	-	-	-	-	-	-	<4.98
DP-5	0-1	4/23/2018	<0.00201	<0.00201	<15.0	<15.0	<15.0	<15.0	<4.92
	1-2	4/23/2018	-	-	-	-	-	-	<4.99
	2-3	4/23/2018	-	-	-	-	-	-	<5.00
	3-4	4/23/2018	-	-	-	-	-	-	<4.99
DP-6	0-1	4/24/2018	<0.00198	<0.00198	<15.0	<15.0	<15.0	<15.0	<4.99
	1-2	4/24/2018	-	-	-	-	-	-	<4.95
	2-3	4/24/2018	-	-	-	-	-	-	<5.00
	3-4	4/24/2018	-	-	-	-	-	-	<4.97
	4-6	4/24/2018	-	-	-	-	-	-	<5.00
	6-8	4/24/2018	-	-	-	-	-	-	<4.99
DP-7	0-1	4/23/2018	<0.00200	<0.00200	<15.0	21.7	<15.0	21.7	<4.96
	1-2	4/23/2018	-	-	-	-	-	-	<4.98
	2-3	4/23/2018	-	-	-	-	-	-	<4.96
	3-4	4/23/2018	-	-	-	-	-	-	<4.90
	4-6	4/23/2018	-	-	-	-	-	-	<4.93

**Table 1**  
**1RP-4636**  
**Soil Sample Analytical Data Summary**  
**Legacy Reserves, Hamon Battery**  
**Lea County, New Mexico**

Page 2 of 2

Sample	Depth (Feet)	Collection Date	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)
<b>RRAL</b>			<b>10</b>	<b>50</b>				<b>2,500</b>	<b>10,000</b>
	6-7	4/23/2018	-	-	-	-	-	-	<4.96
<b>DP-8</b>	0-1	4/24/2018	<0.00202	<0.00202	<15.0	<15.0	<15.0	<15.0	<4.95
	1-2	4/24/2018	-	-	-	-	-	-	<5.00
	2-3	4/24/2018	-	-	-	-	-	-	<5.00
	3-4	4/24/2018	-	-	-	-	-	-	<4.98
	4-5	4/24/2018	-	-	-	-	-	-	<4.97
<b>DP-9</b>	0-1	4/23/2018	<0.00198	<0.00198	<14.9	41.5	<14.9	41.5	5.85
	1-2	4/23/2018	-	-	-	-	-	-	98.7
	2-3	4/23/2018	-	-	-	-	-	-	7.24
	3-4	4/23/2018	-	-	-	-	-	-	18
<b>DP-10</b>	0-1	4/24/2018	<0.00200	<0.00200	<15.0	<15.0	<15.0	<15.0	<4.95
	1-2	4/24/2018	-	-	-	-	-	-	<4.95
	2-3	4/24/2018	-	-	-	-	-	-	<5.00
	3-4	4/24/2018	-	-	-	-	-	-	<4.95

Notes: Laboratory analysis performed by Xenco Laboratories, Lubbock, 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)

## **Figures**

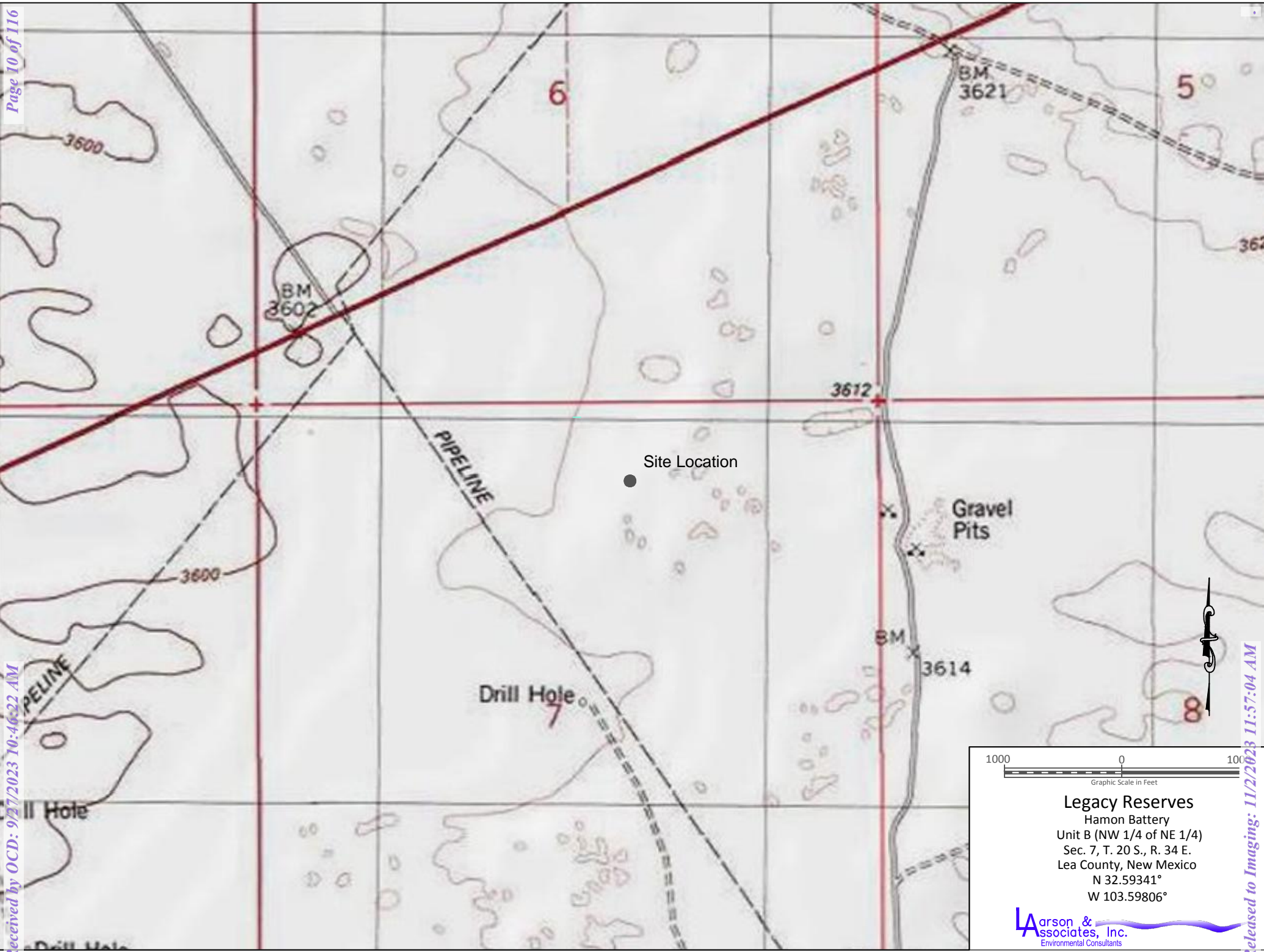
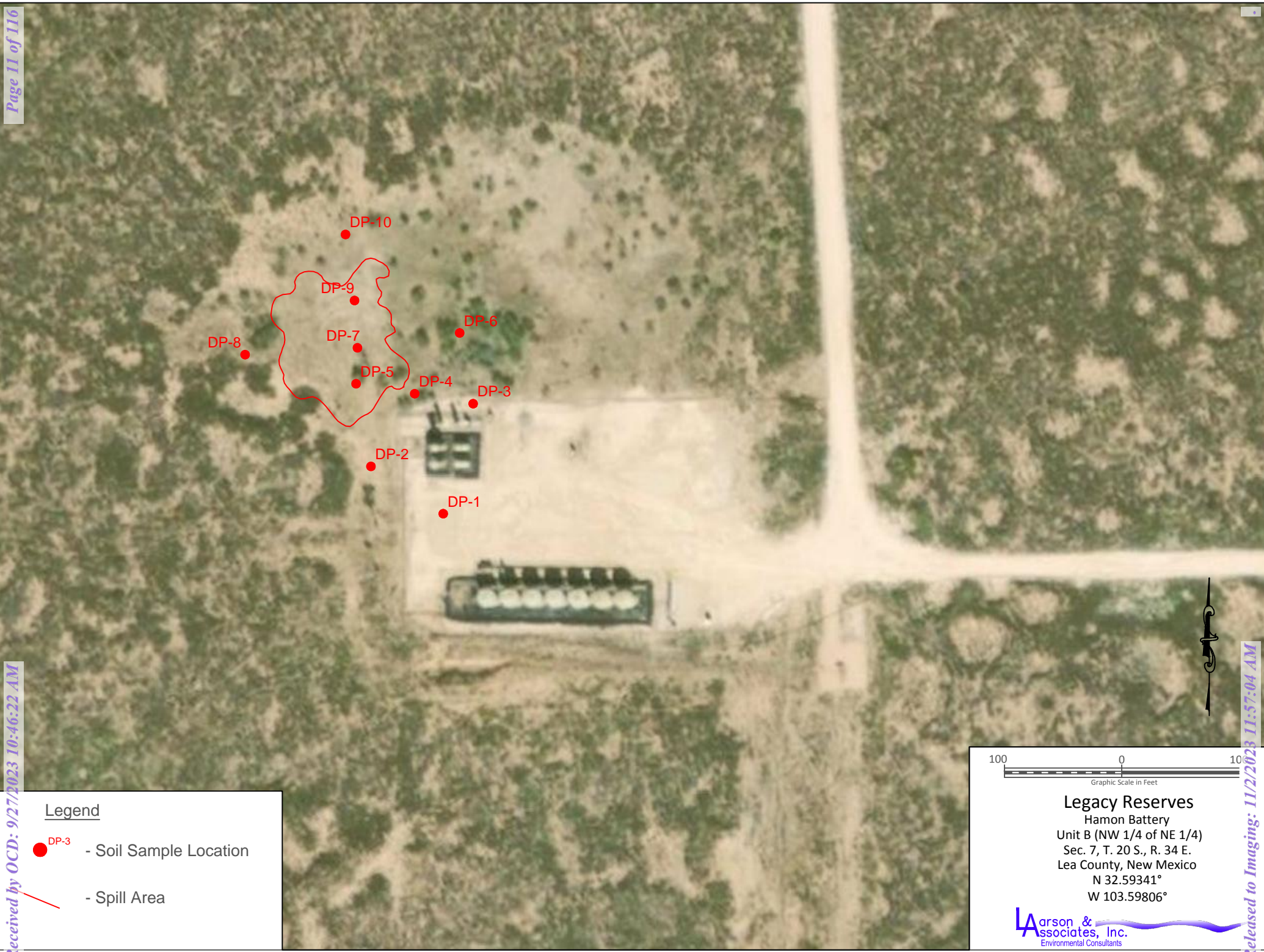


Figure 1 - Topographic Map





Legend

- DP-3 - Soil Sample Location
- - Spill Area

100 0 100  
Graphic Scale in Feet

**Legacy Reserves**  
Hamon Battery  
Unit B (NW 1/4 of NE 1/4)  
Sec. 7, T. 20 S., R. 34 E.  
Lea County, New Mexico  
N 32.59341°  
W 103.59806°

**Larson & Associates, Inc.**  
Environmental Consultants

Figure 2 - Aerial Map Showing Soil Sample Locations

**Appendix A**  
**OCD Communications**



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

State of New Mexico  
Energy Minerals and Natural Resources  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised August 8, 2011

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

## Release Notification and Corrective Action

### OPERATOR

☒ Initial Report ☐ Final Report

Name of Company – Legacy Reserves, LP	Contact – Brian Cunningham
Address – 303 W. Wall St. Suite 1800 Midland, TX 79701	Telephone No. – 432-234-9450
Facility Name – Hamon Battery	Facility Type – Tank Battery
Surface Owner – Federal	Mineral Owner – Federal
API No. – 30-025-30881	

### LOCATION OF RELEASE

Unit Letter J	Section 7	Township 20S	Range 34E	Feet from the 1650	North/South Line South	Feet from the 1980	East/West Line East	County Lea
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Latitude 32.5849 Longitude -103.5976

### NATURE OF RELEASE

Type of Release – Produced Liquid	Volume of Release – 40bbl	Volume Recovered -0
Source of Release - Separator	Date and Hour of Occurrence – 3/4/17	Date and Hour of Discovery – 10:00pm
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Olivia Yue	
By Whom? Todd Roberson	Date and Hour 4/6/17 2:00pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		

**RECEIVED**

By Olivia Yu at 7:41 am, Mar 10, 2017

Describe Cause of Problem and Remedial Action Taken.\*

A separator caught fire and caused the vessel to leak. The facility was shut in and most of the fluid was consumed by the fire.

Describe Area Affected and Cleanup Action Taken.\*

Most of the contaminate was contained inside the facility containment with a small area outside the containment. Samples will be taken and a work plan will be submitted to the NMOCD Dist. 1 office for approval.

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

Signature:	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Sergio Iglesias	Approved by Environmental Specialist:	
Title: Well Tech	Approval Date: 3/10/2017	Expiration Date:
E-mail Address: S.Iglesias@legacyLP.com	Conditions of Approval: see attached directive	Attached <input checked="" type="checkbox"/>
Date: 3-9-17	Phone: 432-25-9569	

\* Attach Additional Sheets If Necessary

1RP-4636

pOY1706928162

nOY1706927950

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 3/7/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1R-4636 has been assigned. **Please refer to this case number in all future correspondence.**

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

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

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District 1 office in Hobbs on or before 4/10/2017. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

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

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C<sub>6</sub> thru C<sub>36</sub>), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.
- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C<sub>6</sub> thru C<sub>36</sub>), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.
- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.
- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

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

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

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

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

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

**Jim Griswold**

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

**From:** [Yu, Olivia, EMNRD](#)  
**To:** [Sarah Johnson: stucker@blm.gov](#)  
**Cc:** [bcunningham@legacyp.com](#); [Mark Larson](#)  
**Subject:** RE: 1RP-4636 Hamon Tank Battery Delineation Plan  
**Date:** Friday, March 09, 2018 10:50:03 AM  
**Attachments:** [approved 1RP-4636 Hamon Tank Battery Delineation Plan.pdf](#)

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Good morning Ms. Johnson:

NMOCD approves of the proposed delineation plan for 1RP-4636 with the additional delineation locations as indicated below. Please remember to mark the release location on a scaled map in the next report.

Like approval from BLM required.

Thanks,  
Olivia

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**From:** Sarah Johnson [mailto:SJohnson@laenvironmental.com]  
**Sent:** Tuesday, February 27, 2018 3:58 PM  
**To:** Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>; stucker@blm.gov  
**Cc:** bcunningham@legacyp.com; Mark Larson <Mark@laenvironmental.com>  
**Subject:** RE: 1RP-4636 Hamon Tank Battery Delineation Plan

Dear Ms. Yu,

*Condition: Please address this concern regarding the proposed delineation plan for 1RP-4636. The initial C-141 stated that the release area was around the separator. Please provide a rationale why all except one of the delineation sample locations are located in the pasture.*

Response: The separator was located near the northwest corner of the pad and the majority of the liquid flowed northwest off the pad and pooled in the pasture. LAI has included a soil sample near the northwest corner of the pad in close proximity to the former separator. Legacy removed the separator following the incident and scraped visibly contaminated soil from the pad. LAI was called in to complete the delineation after Legacy rebuilt the tank battery. Equipment is now located over the area. LAI is proposing to collect soil samples at three (3) locations around the equipment where access is available for the direct push rig. LAI will also delineate the area where liquid pooled in the pasture northwest of the pad.

Respectfully,

Sarah Johnson  
Staff Geologist  
507 N. Marienfeld St., Suite 205  
Midland, Texas 79701

Office – 432-687-0901  
Cell – 432-664-5357  
Fax – 432-687-0456  
[sjohnson@laenvironmental.com](mailto:sjohnson@laenvironmental.com)



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**From:** Yu, Olivia, EMNRD [<mailto:Olivia.Yu@state.nm.us>]  
**Sent:** Tuesday, January 2, 2018 3:56 PM  
**To:** Sarah Johnson; [stucker@blm.gov](mailto:stucker@blm.gov)  
**Cc:** [bcunningham@legacylp.com](mailto:bcunningham@legacylp.com); Mark Larson  
**Subject:** RE: 1RP-4636 Hamon Tank Battery Delineation Plan

Ms. Johnson:

Please address this concern regarding the proposed delineation plan for 1RP-4636. The initial C-141 stated that the release area was around the separator. Please provide a rationale why all except one of the delineation sample locations are located in the pasture.

Thanks,

Olivia Yu  
Environmental Specialist  
NMOCD, District I  
[Olivia.yu@state.nm.us](mailto:Olivia.yu@state.nm.us)  
575-393-6161 x113

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

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**From:** Sarah Johnson [<mailto:SJohnson@laenvironmental.com>]  
**Sent:** Tuesday, December 26, 2017 9:41 AM  
**To:** Yu, Olivia, EMNRD <[Olivia.Yu@state.nm.us](mailto:Olivia.Yu@state.nm.us)>  
**Cc:** [bcunningham@legacylp.com](mailto:bcunningham@legacylp.com); Mark Larson <[Mark@laenvironmental.com](mailto:Mark@laenvironmental.com)>  
**Subject:** 1RP-4636 Hamon Tank Battery Delineation Plan

Dear Ms. Yu,



Larson & Associates, Inc. (LAI), on behalf of Legacy Reserves Operating, LP (Legacy), submits the attached delineation plan for a produced water spill at the Hamon Tank Battery (1RP-4636) in Lea County, New Mexico. Your approval of the delineation plan is requested. Please feel free to contact Brian Cunningham with Legacy at (575) 391-1464 or [bcunningham@legacy.com](mailto:bcunningham@legacy.com), me at (432) 687-0901 (office) or (432) 664-5357 (cell) or Mark Larson if you have any questions.

Respectfully,

Sarah Johnson  
Staff Geologist  
507 N. Marienfeld St., Suite 205  
Midland, Texas 79701  
Office – 432-687-0901  
Cell – 432-664-5357  
Fax – 432-687-0456  
[sjohnson@laenvironmental.com](mailto:sjohnson@laenvironmental.com)



**Appendix B**  
**Laboratory Reports**



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-001	583547-002	583547-003	583547-004	583547-005	583547-006
	<i>Field Id:</i>	DP-2 (0-1)	DP-2 (1-2)	DP-2 (2-3)	DP-2 (3-4)	DP-2(4-6)	DP-2 (6-7)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-23-18 11:21	Apr-23-18 11:26	Apr-23-18 11:28	Apr-23-18 11:31	Apr-23-18 11:36	Apr-23-18 11:39
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Apr-27-18 17:00					
	<i>Analyzed:</i>	Apr-27-18 21:16					
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00199 0.00199					
Toluene		<0.00199 0.00199					
Ethylbenzene		<0.00199 0.00199					
m,p-Xylenes		<0.00398 0.00398					
o-Xylene		<0.00199 0.00199					
Total Xylenes		<0.00199 0.00199					
Total BTEX		<0.00199 0.00199					
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00
	<i>Analyzed:</i>	Apr-27-18 14:14	Apr-27-18 14:20	Apr-27-18 14:26	Apr-27-18 14:32	Apr-27-18 14:56	Apr-27-18 15:02
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		8.53 4.97	<5.00 5.00	<4.99 4.99	<4.96 4.96	7.50 4.97	<4.98 4.98
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>	Apr-26-18 16:00					
	<i>Analyzed:</i>	Apr-27-18 02:13					
	<i>Units/RL:</i>	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0					
Diesel Range Organics (DRO)		<15.0 15.0					
Oil Range Hydrocarbons (ORO)		<15.0 15.0					
Total TPH		<15.0 15.0					

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Kelsey Brooks  
Project Manager





# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-007	583547-008	583547-009	583547-010	583547-011	583547-012
	<i>Field Id:</i>	DP-7 (0-1)	DP-7 (1-2)	DP-7 (2-3)	DP-7 (3-4)	DP-7 (4-6)	DP-7 (6-7)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-23-18 11:51	Apr-23-18 11:54	Apr-23-18 11:57	Apr-23-18 12:01	Apr-23-18 12:09	Apr-23-18 12:16
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Apr-27-18 17:00					
	<i>Analyzed:</i>	Apr-27-18 21:35					
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00200 0.00200					
Toluene		<0.00200 0.00200					
Ethylbenzene		<0.00200 0.00200					
m,p-Xylenes		<0.00401 0.00401					
o-Xylene		<0.00200 0.00200					
Total Xylenes		<0.00200 0.00200					
Total BTEX		<0.00200 0.00200					
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:00
	<i>Analyzed:</i>	Apr-27-18 15:20	Apr-27-18 14:38	Apr-27-18 15:26	Apr-27-18 15:32	Apr-27-18 15:38	Apr-27-18 15:43
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.96 4.96	<4.98 4.98	<4.96 4.96	<4.90 4.90	<4.93 4.93	<4.96 4.96
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>	Apr-26-18 16:00					
	<i>Analyzed:</i>	Apr-27-18 03:31					
	<i>Units/RL:</i>	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0					
Diesel Range Organics (DRO)		21.7 15.0					
Oil Range Hydrocarbons (ORO)		<15.0 15.0					
Total TPH		21.7 15.0					

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-013	583547-014	583547-015	583547-016	583547-017	583547-018
	<i>Field Id:</i>	DP-5 (0-1)	DP-5 (1-2)	DP-5 (2-3)	DP-5 (3-4)	DP-9 (0-1)	DP-9 (1-2)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-23-18 12:19	Apr-23-18 12:20	Apr-23-18 12:22	Apr-23-18 12:26	Apr-23-18 13:19	Apr-23-18 13:21
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Apr-27-18 17:00				May-01-18 08:00	
	<i>Analyzed:</i>	Apr-27-18 21:54				May-01-18 11:31	
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	
Benzene		<0.00201 0.00201				<0.00198 0.00198	
Toluene		<0.00201 0.00201				<0.00198 0.00198	
Ethylbenzene		<0.00201 0.00201				<0.00198 0.00198	
m,p-Xylenes		<0.00402 0.00402				<0.00397 0.00397	
o-Xylene		<0.00201 0.00201				<0.00198 0.00198	
Total Xylenes		<0.00201 0.00201				<0.00198 0.00198	
Total BTEX		<0.00201 0.00201				<0.00198 0.00198	
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:00	Apr-27-18 10:00	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30
	<i>Analyzed:</i>	Apr-27-18 15:49	Apr-27-18 15:55	Apr-27-18 16:31	Apr-27-18 16:49	Apr-28-18 14:31	Apr-28-18 14:37
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.92 4.92	<4.99 4.99	<5.00 5.00	<4.99 4.99	5.85 5.00	98.7 4.97
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>	Apr-26-18 16:00				Apr-26-18 16:00	
	<i>Analyzed:</i>	Apr-27-18 03:58				Apr-27-18 04:23	
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0				<14.9 14.9	
Diesel Range Organics (DRO)		<15.0 15.0				41.5 14.9	
Oil Range Hydrocarbons (ORO)		<15.0 15.0				<14.9 14.9	
Total TPH		<15.0 15.0				41.5 14.9	

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-019	583547-020	583547-021	583547-022	583547-023	583547-024
	<i>Field Id:</i>	DP-9 (2-3)	DP-9 (3-4)	DP-3 (0-1)	DP-3(1-2)	DP-3 (2-3)	DP-3 (3-4)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-23-18 13:23	Apr-23-18 13:24	Apr-23-18 13:42	Apr-23-18 13:45	Apr-23-18 13:51	Apr-23-18 13:52
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>			Apr-27-18 17:00			
	<i>Analyzed:</i>			Apr-27-18 22:31			
	<i>Units/RL:</i>			mg/kg RL			
Benzene				<0.00200 0.00200			
Toluene				<0.00200 0.00200			
Ethylbenzene				<0.00200 0.00200			
m,p-Xylenes				<0.00399 0.00399			
o-Xylene				<0.00200 0.00200			
Total Xylenes				<0.00200 0.00200			
Total BTEX				<0.00200 0.00200			
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30
	<i>Analyzed:</i>	Apr-27-18 17:07	Apr-27-18 17:25	Apr-27-18 17:31	Apr-27-18 17:37	Apr-27-18 17:43	Apr-27-18 17:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7.24 4.99	18.0 4.98	359 5.00	<4.95 4.95	<4.99 4.99	<4.99 4.99
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>			Apr-26-18 16:00			
	<i>Analyzed:</i>			Apr-27-18 04:50			
	<i>Units/RL:</i>			mg/kg RL			
Gasoline Range Hydrocarbons (GRO)				<15.0 15.0			
Diesel Range Organics (DRO)				60.4 15.0			
Oil Range Hydrocarbons (ORO)				<15.0 15.0			
Total TPH				60.4 15.0			

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-025	583547-026	583547-027	583547-028	583547-029	583547-030
	<i>Field Id:</i>	DP-3 (4-5)	DP-4 (0-1)	DP-4 (1-2)	DP-4 (2-3)	DP-4 (3-4)	DP-4 (4-5)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-23-18 13:57	Apr-24-18 09:53	Apr-24-18 09:55	Apr-24-18 10:05	Apr-24-18 10:07	Apr-24-18 10:15
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>		Apr-26-18 09:05				
	<i>Analyzed:</i>		Apr-26-18 10:14				
	<i>Units/RL:</i>		mg/kg RL				
Benzene			<0.00202 0.00202				
Toluene			<0.00202 0.00202				
Ethylbenzene			<0.00202 0.00202				
m,p-Xylenes			<0.00403 0.00403				
o-Xylene			<0.00202 0.00202				
Total Xylenes			<0.00202 0.00202				
Total BTEX			<0.00202 0.00202				
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30
	<i>Analyzed:</i>	Apr-27-18 17:55	Apr-27-18 18:13	Apr-27-18 18:19	Apr-27-18 18:37	Apr-27-18 18:43	Apr-27-18 18:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.97 4.97	107 4.99	<4.95 4.95	<5.00 5.00	<4.99 4.99	<4.99 4.99
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>		Apr-26-18 16:00				
	<i>Analyzed:</i>		Apr-27-18 05:14				
	<i>Units/RL:</i>		mg/kg RL				
Gasoline Range Hydrocarbons (GRO)			<14.9 14.9				
Diesel Range Organics (DRO)			109 14.9				
Oil Range Hydrocarbons (ORO)			<14.9 14.9				
Total TPH			109 14.9				

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-031	583547-032	583547-033	583547-034	583547-035	583547-036
	<i>Field Id:</i>	DP-8 (0-1)	DP-8 (1-2)	DP-8 (2-3)	DP-8 (3-4)	DP-8 (4-5)	DP-10 (0-1)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-24-18 10:58	Apr-24-18 10:30	Apr-24-18 10:33	Apr-24-18 10:36	Apr-24-18 10:39	Apr-24-18 10:49
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>	Apr-27-18 17:00					Apr-27-18 17:00
	<i>Analyzed:</i>	Apr-27-18 19:58					Apr-27-18 19:39
	<i>Units/RL:</i>	mg/kg RL					mg/kg RL
Benzene		<0.00202 0.00202					<0.00200 0.00200
Toluene		<0.00202 0.00202					<0.00200 0.00200
Ethylbenzene		<0.00202 0.00202					<0.00200 0.00200
m,p-Xylenes		<0.00403 0.00403					<0.00401 0.00401
o-Xylene		<0.00202 0.00202					<0.00200 0.00200
Total Xylenes		<0.00202 0.00202					<0.00200 0.00200
Total BTEX		<0.00202 0.00202					<0.00200 0.00200
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-27-18 10:30	Apr-28-18 10:45	Apr-28-18 10:45
	<i>Analyzed:</i>	Apr-27-18 18:55	Apr-27-18 19:01	Apr-27-18 19:07	Apr-27-18 19:13	Apr-28-18 11:59	Apr-28-18 11:41
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.95 4.95	<5.00 5.00	<5.00 5.00	<4.98 4.98	<4.97 4.97	<4.95 4.95
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>	Apr-26-18 16:00					Apr-26-18 16:00
	<i>Analyzed:</i>	Apr-27-18 05:41					Apr-27-18 06:06
	<i>Units/RL:</i>	mg/kg RL					mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0					<15.0 15.0
Diesel Range Organics (DRO)		<15.0 15.0					<15.0 15.0
Oil Range Hydrocarbons (ORO)		<15.0 15.0					<15.0 15.0
Total TPH		<15.0 15.0					<15.0 15.0

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-037	583547-038	583547-039	583547-040	583547-041	583547-042
	<i>Field Id:</i>	DP-10 (1-2)	DP-10 (2-3)	DP-10 (3-4)	DP-6 (0-1)	DP-6 (1-2)	DP-6 (2-3)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-24-18 10:52	Apr-24-18 10:54	Apr-24-18 10:57	Apr-24-18 11:33	Apr-24-18 11:36	Apr-24-18 11:38
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>				Apr-27-18 17:00		
	<i>Analyzed:</i>				Apr-27-18 20:18		
	<i>Units/RL:</i>				mg/kg RL		
Benzene					<0.00198 0.00198		
Toluene					<0.00198 0.00198		
Ethylbenzene					<0.00198 0.00198		
m,p-Xylenes					<0.00397 0.00397		
o-Xylene					<0.00198 0.00198		
Total Xylenes					<0.00198 0.00198		
Total BTEX					<0.00198 0.00198		
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45
	<i>Analyzed:</i>	Apr-28-18 12:05	Apr-28-18 12:11	Apr-28-18 12:17	Apr-28-18 12:35	Apr-28-18 18:09	Apr-28-18 12:47
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.95 4.95	<5.00 5.00	<4.95 4.95	<4.99 4.99	<4.95 4.95	<5.00 5.00
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>				Apr-26-18 16:00		
	<i>Analyzed:</i>				Apr-27-18 06:32		
	<i>Units/RL:</i>				mg/kg RL		
Gasoline Range Hydrocarbons (GRO)					<15.0 15.0		
Diesel Range Organics (DRO)					<15.0 15.0		
Oil Range Hydrocarbons (ORO)					<15.0 15.0		
Total TPH					<15.0 15.0		

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	583547-043	583547-044	583547-045	583547-046	583547-047	583547-048
	<i>Field Id:</i>	DP-6 (3-4)	DP-6 (4-6)	DP-6 (6-8)	DP-1 (0-1)	DP-1 (1-2)	DP-1 (2-3)
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-24-18 11:41	Apr-24-18 11:45	Apr-24-18 11:49	Apr-24-18 12:06	Apr-24-18 12:08	Apr-24-18 12:10
<b>BTEX by EPA 8021B</b>	<i>Extracted:</i>				Apr-27-18 17:00		
	<i>Analyzed:</i>				Apr-27-18 20:37		
	<i>Units/RL:</i>				mg/kg RL		
Benzene					<0.00198 0.00198		
Toluene					<0.00198 0.00198		
Ethylbenzene					<0.00198 0.00198		
m,p-Xylenes					<0.00396 0.00396		
o-Xylene					<0.00198 0.00198		
Total Xylenes					<0.00198 0.00198		
Total BTEX					<0.00198 0.00198		
<b>Inorganic Anions by EPA 300/300.1</b>	<i>Extracted:</i>	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45
	<i>Analyzed:</i>	Apr-28-18 12:53	Apr-28-18 12:59	Apr-28-18 13:05	Apr-28-18 13:23	Apr-28-18 13:29	Apr-28-18 13:49
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<4.97 4.97	<5.00 5.00	<4.99 4.99	<5.00 5.00	28.0 4.99	<4.95 4.95
<b>TPH By SW8015 Mod</b>	<i>Extracted:</i>				Apr-26-18 16:00		
	<i>Analyzed:</i>				Apr-27-18 06:57		
	<i>Units/RL:</i>				mg/kg RL		
Gasoline Range Hydrocarbons (GRO)					<15.0 15.0		
Diesel Range Organics (DRO)					<15.0 15.0		
Oil Range Hydrocarbons (ORO)					<15.0 15.0		
Total TPH					<15.0 15.0		

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Kelsey Brooks  
Project Manager



# Certificate of Analysis Summary 583547

Larson & Associates, Midland, TX

Project Name: Hamon Battery



Project Id:

Contact: Mark Larson

Project Location: Hamon Battery

Date Received in Lab: Wed Apr-25-18 08:29 am

Report Date: 21-AUG-18

Project Manager: Kelsey Brooks

<b>Analysis Requested</b>	<b>Lab Id:</b>	583547-049	583547-050	583547-051			
	<b>Field Id:</b>	DP-1 (3-4)	DP-1 (4-6)	DP-1 (6-8)			
	<b>Depth:</b>						
	<b>Matrix:</b>	SOIL	SOIL	SOIL			
	<b>Sampled:</b>	Apr-24-18 12:14	Apr-24-18 12:20	Apr-24-18 12:23			
<b>Inorganic Anions by EPA 300/300.1</b>	<b>Extracted:</b>	Apr-28-18 10:45	Apr-28-18 10:45	Apr-28-18 10:45			
	<b>Analyzed:</b>	Apr-28-18 13:55	Apr-28-18 14:01	Apr-28-18 14:07			
	<b>Units/RL:</b>	mg/kg RL	mg/kg RL	mg/kg RL			
Chloride		<4.95 4.95	<4.99 4.99	25.8 5.00			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Kelsey Brooks  
Project Manager



# Analytical Report 583547

for  
**Larson & Associates**

**Project Manager: Mark Larson**

**Hamon Battery**

**21-AUG-18**

Collected By: Client



**1211 W. Florida Ave, Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-18-27), 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 (T104704221-18-13)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-17)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-16)

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)

Xenco-Lakeland: Florida (E84098)



21-AUG-18

Project Manager: **Mark Larson**

**Larson & Associates**

P.O. Box 50685

Midland, TX 79710

Reference: XENCO Report No(s): **583547**

**Hamon Battery**

Project Address: Hamon Battery

**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) 583547. 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. 583547 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,

A handwritten signature in black ink, appearing to read 'Kelsey Brooks', written over a horizontal line.

**Kelsey Brooks**

Project Manager

***Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.***

*Certified and approved by numerous States and Agencies.*

*A Small Business and Minority Status Company that delivers SERVICE and QUALITY*

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



## Sample Cross Reference 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
DP-2 (0-1)	S	04-23-18 11:21		583547-001
DP-2 (1-2)	S	04-23-18 11:26		583547-002
DP-2 (2-3)	S	04-23-18 11:28		583547-003
DP-2 (3-4)	S	04-23-18 11:31		583547-004
DP-2(4-6)	S	04-23-18 11:36		583547-005
DP-2 (6-7)	S	04-23-18 11:39		583547-006
DP-7 (0-1)	S	04-23-18 11:51		583547-007
DP-7 (1-2)	S	04-23-18 11:54		583547-008
DP-7 (2-3)	S	04-23-18 11:57		583547-009
DP-7 (3-4)	S	04-23-18 12:01		583547-010
DP-7 (4-6)	S	04-23-18 12:09		583547-011
DP-7 (6-7)	S	04-23-18 12:16		583547-012
DP-5 (0-1)	S	04-23-18 12:19		583547-013
DP-5 (1-2)	S	04-23-18 12:20		583547-014
DP-5 (2-3)	S	04-23-18 12:22		583547-015
DP-5 (3-4)	S	04-23-18 12:26		583547-016
DP-9 (0-1)	S	04-23-18 13:19		583547-017
DP-9 (1-2)	S	04-23-18 13:21		583547-018
DP-9 (2-3)	S	04-23-18 13:23		583547-019
DP-9 (3-4)	S	04-23-18 13:24		583547-020
DP-3 (0-1)	S	04-23-18 13:42		583547-021
DP-3(1-2)	S	04-23-18 13:45		583547-022
DP-3 (2-3)	S	04-23-18 13:51		583547-023
DP-3 (3-4)	S	04-23-18 13:52		583547-024
DP-3 (4-5)	S	04-23-18 13:57		583547-025
DP-4 (0-1)	S	04-24-18 09:53		583547-026
DP-4 (1-2)	S	04-24-18 09:55		583547-027
DP-4 (2-3)	S	04-24-18 10:05		583547-028
DP-4 (3-4)	S	04-24-18 10:07		583547-029
DP-4 (4-5)	S	04-24-18 10:15		583547-030
DP-8 (0-1)	S	04-24-18 10:58		583547-031
DP-8 (1-2)	S	04-24-18 10:30		583547-032
DP-8 (2-3)	S	04-24-18 10:33		583547-033
DP-8 (3-4)	S	04-24-18 10:36		583547-034
DP-8 (4-5)	S	04-24-18 10:39		583547-035
DP-10 (0-1)	S	04-24-18 10:49		583547-036
DP-10 (1-2)	S	04-24-18 10:52		583547-037
DP-10 (2-3)	S	04-24-18 10:54		583547-038
DP-10 (3-4)	S	04-24-18 10:57		583547-039
DP-6 (0-1)	S	04-24-18 11:33		583547-040
DP-6 (1-2)	S	04-24-18 11:36		583547-041
DP-6 (2-3)	S	04-24-18 11:38		583547-042
DP-6 (3-4)	S	04-24-18 11:41		583547-043

**Sample Cross Reference 583547****Larson & Associates, Midland, TX****Hamon Battery**

DP-6 (4-6)	S	04-24-18 11:45	583547-044
DP-6 (6-8)	S	04-24-18 11:49	583547-045
DP-1 (0-1)	S	04-24-18 12:06	583547-046
DP-1 (1-2)	S	04-24-18 12:08	583547-047
DP-1 (2-3)	S	04-24-18 12:10	583547-048
DP-1 (3-4)	S	04-24-18 12:14	583547-049
DP-1 (4-6)	S	04-24-18 12:20	583547-050
DP-1 (6-8)	S	04-24-18 12:23	583547-051



## CASE NARRATIVE

**Client Name:** *Larson & Associates*

**Project Name:** *Hamon Battery*

Project ID:

Work Order Number(s): 583547

Report Date: 21-AUG-18

Date Received: 04/25/2018

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**Sample receipt non conformance and comments:**

Revision for sample name changes per Ashton Thielke e-mail 08/21-- KB

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**Sample receipt non conformance and comments per sample:**

None

**Analytical non conformance and comments:**

Batch: LBA-3048006 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3048366 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3048584 BTEX by EPA 8021B

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-2 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-001

Date Collected: 04.23.18 11.21

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	8.53	4.97	mg/kg	04.27.18 14.14		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 02.13	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 02.13	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 02.13	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 02.13	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	103	%	70-135	04.27.18 02.13	
o-Terphenyl	84-15-1	113	%	70-135	04.27.18 02.13	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-2 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-001

Date Collected: 04.23.18 11.21

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	04.27.18 21.16	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
Total BTEX		<0.00199	0.00199	mg/kg	04.27.18 21.16	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	99	%	70-130	04.27.18 21.16		
4-Bromofluorobenzene	460-00-4	94	%	70-130	04.27.18 21.16		



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-2 (1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-002

Date Collected: 04.23.18 11.26

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.27.18 14.20	U	1





## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-2 (2-3)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-003

Date Collected: 04.23.18 11.28

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 14.26	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-2 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-004

Date Collected: 04.23.18 11.31

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.96	4.96	mg/kg	04.27.18 14.32	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-2(4-6)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-005

Date Collected: 04.23.18 11.36

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7.50	4.97	mg/kg	04.27.18 14.56		1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-2 (6-7)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-006

Date Collected: 04.23.18 11.39

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.98	4.98	mg/kg	04.27.18 15.02	U	1



# Certificate of Analytical Results 583547

## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-7 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-007

Date Collected: 04.23.18 11.51

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.96	4.96	mg/kg	04.27.18 15.20	U	1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 03.31	U	1
<b>Diesel Range Organics (DRO)</b>	C10C28DRO	<b>21.7</b>	15.0	mg/kg	04.27.18 03.31		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 03.31	U	1
<b>Total TPH</b>	PHC635	<b>21.7</b>	15.0	mg/kg	04.27.18 03.31		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	102	%	70-135	04.27.18 03.31	
o-Terphenyl	84-15-1	99	%	70-135	04.27.18 03.31	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-7 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-007

Date Collected: 04.23.18 11.51

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	04.27.18 21.35	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.27.18 21.35	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
4-Bromofluorobenzene	460-00-4	95	%	70-130	04.27.18 21.35		
1,4-Difluorobenzene	540-36-3	97	%	70-130	04.27.18 21.35		



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-7 (1-2)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-008

Date Collected: 04.23.18 11.54

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.98	4.98	mg/kg	04.27.18 14.38	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-7 (2-3)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-009

Date Collected: 04.23.18 11.57

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.96	4.96	mg/kg	04.27.18 15.26	U	1





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-7 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-010

Date Collected: 04.23.18 12.01

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.90	4.90	mg/kg	04.27.18 15.32	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-7 (4-6)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-011

Date Collected: 04.23.18 12.09

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.93	4.93	mg/kg	04.27.18 15.38	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-7 (6-7)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-012

Date Collected: 04.23.18 12.16

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.96	4.96	mg/kg	04.27.18 15.43	U	1



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-5 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-013

Date Collected: 04.23.18 12.19

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.92	4.92	mg/kg	04.27.18 15.49	U	1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 03.58	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 03.58	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 03.58	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 03.58	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	103	%	70-135	04.27.18 03.58	
o-Terphenyl	84-15-1	99	%	70-135	04.27.18 03.58	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-5 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-013

Date Collected: 04.23.18 12.19

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	04.27.18 21.54	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
Total BTEX		<0.00201	0.00201	mg/kg	04.27.18 21.54	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	95	%	70-130	04.27.18 21.54		
4-Bromofluorobenzene	460-00-4	92	%	70-130	04.27.18 21.54		



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-5 (1-2)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-014

Date Collected: 04.23.18 12.20

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.00

Basis: Wet Weight

Seq Number: 3048237

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 15.55	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-5 (2-3)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-015

Date Collected: 04.23.18 12.22

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.27.18 16.31	U	1





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-5 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-016

Date Collected: 04.23.18 12.26

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 16.49	U	1



# Certificate of Analytical Results 583547

## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-9 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-017

Date Collected: 04.23.18 13.19

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	5.85	5.00	mg/kg	04.28.18 14.31		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.27.18 04.23	U	1
Diesel Range Organics (DRO)	C10C28DRO	41.5	14.9	mg/kg	04.27.18 04.23		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<14.9	14.9	mg/kg	04.27.18 04.23	U	1
Total TPH	PHC635	41.5	14.9	mg/kg	04.27.18 04.23		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	101	%	70-135	04.27.18 04.23	
o-Terphenyl	84-15-1	99	%	70-135	04.27.18 04.23	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-9 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-017

Date Collected: 04.23.18 13.19

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.01.18 08.00

Basis: Wet Weight

Seq Number: 3048584

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	05.01.18 11.31	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
Total BTEX		<0.00198	0.00198	mg/kg	05.01.18 11.31	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
4-Bromofluorobenzene	460-00-4	99	%	70-130	05.01.18 11.31		
1,4-Difluorobenzene	540-36-3	93	%	70-130	05.01.18 11.31		



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-9 (1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-018

Date Collected: 04.23.18 13.21

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	98.7	4.97	mg/kg	04.28.18 14.37		1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-9 (2-3)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-019

Date Collected: 04.23.18 13.23

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7.24	4.99	mg/kg	04.27.18 17.07		1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-9 (3-4)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-020

Date Collected: 04.23.18 13.24

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	18.0	4.98	mg/kg	04.27.18 17.25		1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-3 (0-1)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-021

Date Collected: 04.23.18 13.42

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	359	5.00	mg/kg	04.27.18 17.31		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 04.50	U	1
Diesel Range Organics (DRO)	C10C28DRO	60.4	15.0	mg/kg	04.27.18 04.50		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 04.50	U	1
Total TPH	PHC635	60.4	15.0	mg/kg	04.27.18 04.50		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	108	%	70-135	04.27.18 04.50	
o-Terphenyl	84-15-1	111	%	70-135	04.27.18 04.50	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-3 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-021

Date Collected: 04.23.18 13.42

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	04.27.18 22.31	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.27.18 22.31	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
4-Bromofluorobenzene	460-00-4	101	%	70-130	04.27.18 22.31		
1,4-Difluorobenzene	540-36-3	105	%	70-130	04.27.18 22.31		





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-3(1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-022

Date Collected: 04.23.18 13.45

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.27.18 17.37	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-3 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-023

Date Collected: 04.23.18 13.51

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 17.43	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-3 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-024

Date Collected: 04.23.18 13.52

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 17.49	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-3 (4-5)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-025

Date Collected: 04.23.18 13.57

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.97	4.97	mg/kg	04.27.18 17.55	U	1



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-4 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-026

Date Collected: 04.24.18 09.53

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	107	4.99	mg/kg	04.27.18 18.13		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<14.9	14.9	mg/kg	04.27.18 05.14	U	1
Diesel Range Organics (DRO)	C10C28DRO	109	14.9	mg/kg	04.27.18 05.14		1
Oil Range Hydrocarbons (ORO)	PHCG2835	<14.9	14.9	mg/kg	04.27.18 05.14	U	1
Total TPH	PHC635	109	14.9	mg/kg	04.27.18 05.14		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	104	%	70-135	04.27.18 05.14	
o-Terphenyl	84-15-1	106	%	70-135	04.27.18 05.14	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-4 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-026

Date Collected: 04.24.18 09.53

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.26.18 09.05

Basis: Wet Weight

Seq Number: 3048006

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	04.26.18 10.14	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
Total BTEX		<0.00202	0.00202	mg/kg	04.26.18 10.14	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	103	%	70-130	04.26.18 10.14		
4-Bromofluorobenzene	460-00-4	106	%	70-130	04.26.18 10.14		



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-4 (1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-027

Date Collected: 04.24.18 09.55

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.27.18 18.19	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-4 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-028

Date Collected: 04.24.18 10.05

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.27.18 18.37	U	1





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-4 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-029

Date Collected: 04.24.18 10.07

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 18.43	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-4 (4-5)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-030

Date Collected: 04.24.18 10.15

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.27.18 18.49	U	1



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-8 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-031

Date Collected: 04.24.18 10.58

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.27.18 18.55	U	1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 05.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 05.41	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 05.41	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 05.41	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	109	%	70-135	04.27.18 05.41	
o-Terphenyl	84-15-1	110	%	70-135	04.27.18 05.41	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-8 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-031

Date Collected: 04.24.18 10.58

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	04.27.18 19.58	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
Total BTEX		<0.00202	0.00202	mg/kg	04.27.18 19.58	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	108	%	70-130	04.27.18 19.58		
4-Bromofluorobenzene	460-00-4	102	%	70-130	04.27.18 19.58		



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-8 (1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-032

Date Collected: 04.24.18 10.30

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.27.18 19.01	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-8 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-033

Date Collected: 04.24.18 10.33

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.27.18 19.07	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-8 (3-4)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-034

Date Collected: 04.24.18 10.36

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: OJS

% Moisture:

Analyst: SCM

Date Prep: 04.27.18 10.30

Basis: Wet Weight

Seq Number: 3048238

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.98	4.98	mg/kg	04.27.18 19.13	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-8 (4-5)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-035

Date Collected: 04.24.18 10.39

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.97	4.97	mg/kg	04.28.18 11.59	U	1





# Certificate of Analytical Results 583547

## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-10 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-036

Date Collected: 04.24.18 10.49

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 11.41	U	1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 06.06	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 06.06	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 06.06	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 06.06	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	103	%	70-135	04.27.18 06.06	
o-Terphenyl	84-15-1	98	%	70-135	04.27.18 06.06	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-10 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-036

Date Collected: 04.24.18 10.49

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	04.27.18 19.39	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
Total BTEX		<0.00200	0.00200	mg/kg	04.27.18 19.39	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
4-Bromofluorobenzene	460-00-4	96	%	70-130	04.27.18 19.39		
1,4-Difluorobenzene	540-36-3	99	%	70-130	04.27.18 19.39		



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-10 (1-2)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-037

Date Collected: 04.24.18 10.52

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 12.05	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-10 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-038

Date Collected: 04.24.18 10.54

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.28.18 12.11	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-10 (3-4)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-039

Date Collected: 04.24.18 10.57

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 12.17	U	1



# Certificate of Analytical Results 583547

## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-6 (0-1**  
 Lab Sample Id: 583547-040

Matrix: Soil  
 Date Collected: 04.24.18 11.33

Date Received: 04.25.18 08.29

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: SCM

Analyst: SCM

Seq Number: 3048260

Prep Method: E300P

% Moisture:

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.28.18 12.35	U	1

Analytical Method: TPH By SW8015 Mod

Tech: ARM

Analyst: ARM

Seq Number: 3048192

Prep Method: TX1005P

% Moisture:

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 06.32	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 06.32	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 06.32	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 06.32	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	112	%	70-135	04.27.18 06.32	
o-Terphenyl	84-15-1	114	%	70-135	04.27.18 06.32	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-6 (0-1)**  
 Lab Sample Id: 583547-040

Matrix: Soil  
 Date Collected: 04.24.18 11.33

Date Received: 04.25.18 08.29

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	04.27.18 20.18	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
Total BTEX		<0.00198	0.00198	mg/kg	04.27.18 20.18	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	99	%	70-130	04.27.18 20.18		
4-Bromofluorobenzene	460-00-4	90	%	70-130	04.27.18 20.18		



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-6 (1-2)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-041

Date Collected: 04.24.18 11.36

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 18.09	U	1





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-6 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-042

Date Collected: 04.24.18 11.38

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.28.18 12.47	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-6 (3-4)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-043

Date Collected: 04.24.18 11.41

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.97	4.97	mg/kg	04.28.18 12.53	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-6 (4-6)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-044

Date Collected: 04.24.18 11.45

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.28.18 12.59	U	1



## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-6 (6-8)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-045

Date Collected: 04.24.18 11.49

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.28.18 13.05	U	1



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-1 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-046

Date Collected: 04.24.18 12.06

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.00	5.00	mg/kg	04.28.18 13.23	U	1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 04.26.18 16.00

Basis: Wet Weight

Seq Number: 3048192

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<15.0	15.0	mg/kg	04.27.18 06.57	U	1
Diesel Range Organics (DRO)	C10C28DRO	<15.0	15.0	mg/kg	04.27.18 06.57	U	1
Oil Range Hydrocarbons (ORO)	PHCG2835	<15.0	15.0	mg/kg	04.27.18 06.57	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	04.27.18 06.57	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	109	%	70-135	04.27.18 06.57	
o-Terphenyl	84-15-1	110	%	70-135	04.27.18 06.57	



# Certificate of Analytical Results 583547



## Larson & Associates, Midland, TX

### Hamon Battery

Sample Id: **DP-1 (0-1)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-046

Date Collected: 04.24.18 12.06

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 04.27.18 17.00

Basis: Wet Weight

Seq Number: 3048366

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
m,p-Xylenes	179601-23-1	<0.00396	0.00396	mg/kg	04.27.18 20.37	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
Total BTEX		<0.00198	0.00198	mg/kg	04.27.18 20.37	U	1
<b>Surrogate</b>	<b>Cas Number</b>	<b>% Recovery</b>	<b>Units</b>	<b>Limits</b>	<b>Analysis Date</b>	<b>Flag</b>	
1,4-Difluorobenzene	540-36-3	103	%	70-130	04.27.18 20.37		
4-Bromofluorobenzene	460-00-4	103	%	70-130	04.27.18 20.37		



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-1 (1-2)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-047

Date Collected: 04.24.18 12.08

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	28.0	4.99	mg/kg	04.28.18 13.29		1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-1 (2-3)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-048

Date Collected: 04.24.18 12.10

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 13.49	U	1





## Certificate of Analytical Results 583547



## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-1 (3-4)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-049

Date Collected: 04.24.18 12.14

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	04.28.18 13.55	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: DP-1 (4-6)

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-050

Date Collected: 04.24.18 12.20

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.99	4.99	mg/kg	04.28.18 14.01	U	1



## Certificate of Analytical Results 583547

## Larson &amp; Associates, Midland, TX

## Hamon Battery

Sample Id: **DP-1 (6-8)**

Matrix: Soil

Date Received: 04.25.18 08.29

Lab Sample Id: 583547-051

Date Collected: 04.24.18 12.23

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: SCM

% Moisture:

Analyst: SCM

Date Prep: 04.28.18 10.45

Basis: Wet Weight

Seq Number: 3048260

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	25.8	5.00	mg/kg	04.28.18 14.07		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



## Larson &amp; Associates

Hamon Battery

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048237

Matrix: Solid

Prep Method: E300P

MB Sample Id: 7643537-1-BLK

LCS Sample Id: 7643537-1-BKS

Date Prep: 04.27.18

LCSD Sample Id: 7643537-1-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	245	98	90-110	0	20	mg/kg	04.27.18 13:02	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048238

Matrix: Solid

Prep Method: E300P

MB Sample Id: 7643538-1-BLK

LCS Sample Id: 7643538-1-BKS

Date Prep: 04.27.18

LCSD Sample Id: 7643538-1-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	261	104	261	104	90-110	0	20	mg/kg	04.27.18 16:19	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048260

Matrix: Solid

Prep Method: E300P

MB Sample Id: 7643621-1-BLK

LCS Sample Id: 7643621-1-BKS

Date Prep: 04.28.18

LCSD Sample Id: 7643621-1-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	252	101	90-110	2	20	mg/kg	04.28.18 11:30	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048237

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583547-008

MS Sample Id: 583547-008 S

Date Prep: 04.27.18

MSD Sample Id: 583547-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.98	249	246	99	253	102	90-110	3	20	mg/kg	04.27.18 14:44	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048237

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583556-003

MS Sample Id: 583556-003 S

Date Prep: 04.27.18

MSD Sample Id: 583556-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.96	248	266	107	265	107	90-110	0	20	mg/kg	04.27.18 13:20	

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



## Larson &amp; Associates

Hamon Battery

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048238

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583547-015

MS Sample Id: 583547-015 S

Date Prep: 04.27.18

MSD Sample Id: 583547-015 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	260	104	256	102	90-110	2	20	mg/kg	04.27.18 16:37	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048238

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583547-025

MS Sample Id: 583547-025 S

Date Prep: 04.27.18

MSD Sample Id: 583547-025 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.97	249	268	108	272	109	90-110	1	20	mg/kg	04.27.18 18:01	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048260

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583547-036

MS Sample Id: 583547-036 S

Date Prep: 04.28.18

MSD Sample Id: 583547-036 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.95	248	238	96	243	98	90-110	2	20	mg/kg	04.28.18 11:47	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3048260

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 583547-045

MS Sample Id: 583547-045 S

Date Prep: 04.28.18

MSD Sample Id: 583547-045 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<4.99	250	240	96	246	98	90-110	2	20	mg/kg	04.28.18 13:11	

## Analytical Method: TPH By SW8015 Mod

Seq Number: 3048192

Matrix: Solid

Prep Method: TX1005P

MB Sample Id: 7643598-1-BLK

LCS Sample Id: 7643598-1-BKS

Date Prep: 04.26.18

LCSD Sample Id: 7643598-1-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)	<15.0	1000	1020	102	1120	112	70-135	9	20	mg/kg	04.27.18 01:22	
Diesel Range Organics (DRO)	<15.0	1000	1030	103	1090	109	70-135	6	20	mg/kg	04.27.18 01:22	

## Surrogate

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	108		118		121		70-135	%	04.27.18 01:22
o-Terphenyl	111		117		124		70-135	%	04.27.18 01:22

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



## Larson &amp; Associates

## Hamon Battery

Analytical Method: TPH By SW8015 Mod

Seq Number: 3048192

Parent Sample Id: 583547-001

Matrix: Soil

MS Sample Id: 583547-001 S

Prep Method: TX1005P

Date Prep: 04.26.18

MSD Sample Id: 583547-001 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)	<15.0	998	1100	110	1080	108	70-135	2	20	mg/kg	04.27.18 02:40	
Diesel Range Organics (DRO)	<15.0	998	1060	106	1060	106	70-135	0	20	mg/kg	04.27.18 02:40	

## Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	120		120		70-135	%	04.27.18 02:40
o-Terphenyl	119		119		70-135	%	04.27.18 02:40

Analytical Method: BTEX by EPA 8021B

Seq Number: 3048006

MB Sample Id: 7643475-1-BLK

Matrix: Solid

LCS Sample Id: 7643475-1-BKS

Prep Method: SW5030B

Date Prep: 04.26.18

LCSD Sample Id: 7643475-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.100	0.123	123	0.121	120	70-130	2	35	mg/kg	04.26.18 07:58	
Toluene	<0.00201	0.100	0.119	119	0.116	115	70-130	3	35	mg/kg	04.26.18 07:58	
Ethylbenzene	<0.00201	0.100	0.125	125	0.122	121	70-130	2	35	mg/kg	04.26.18 07:58	
m,p-Xylenes	<0.00402	0.201	0.258	128	0.253	125	70-130	2	35	mg/kg	04.26.18 07:58	
o-Xylene	<0.00201	0.100	0.126	126	0.126	125	70-130	0	35	mg/kg	04.26.18 07:58	

## Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	94		107		110		70-130	%	04.26.18 07:58
4-Bromofluorobenzene	84		104		101		70-130	%	04.26.18 07:58

Analytical Method: BTEX by EPA 8021B

Seq Number: 3048366

MB Sample Id: 7643696-1-BLK

Matrix: Solid

LCS Sample Id: 7643696-1-BKS

Prep Method: SW5030B

Date Prep: 04.27.18

LCSD Sample Id: 7643696-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.100	0.116	116	0.115	114	70-130	1	35	mg/kg	04.27.18 17:24	
Toluene	<0.00201	0.100	0.112	112	0.111	110	70-130	1	35	mg/kg	04.27.18 17:24	
Ethylbenzene	<0.00201	0.100	0.118	118	0.118	117	70-130	0	35	mg/kg	04.27.18 17:24	
m,p-Xylenes	<0.00402	0.201	0.242	120	0.243	120	70-130	0	35	mg/kg	04.27.18 17:24	
o-Xylene	<0.00201	0.100	0.120	120	0.121	120	70-130	1	35	mg/kg	04.27.18 17:24	

## Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		101		100		70-130	%	04.27.18 17:24
4-Bromofluorobenzene	91		102		95		70-130	%	04.27.18 17:24

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



## Larson &amp; Associates

Hamon Battery

## Analytical Method: BTEX by EPA 8021B

Seq Number: 3048584

MB Sample Id: 7643843-1-BLK

Matrix: Solid

LCS Sample Id: 7643843-1-BKS

Prep Method: SW5030B

Date Prep: 05.01.18

LCSD Sample Id: 7643843-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.114	114	0.115	114	70-130	1	35	mg/kg	05.01.18 08:58	
Toluene	<0.00200	0.100	0.110	110	0.111	110	70-130	1	35	mg/kg	05.01.18 08:58	
Ethylbenzene	<0.00200	0.100	0.111	111	0.112	111	70-130	1	35	mg/kg	05.01.18 08:58	
m,p-Xylenes	<0.00401	0.200	0.228	114	0.231	114	70-130	1	35	mg/kg	05.01.18 08:58	
o-Xylene	<0.00200	0.100	0.114	114	0.115	114	70-130	1	35	mg/kg	05.01.18 08:58	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	96		102		106		70-130	%	05.01.18 08:58
4-Bromofluorobenzene	100		101		102		70-130	%	05.01.18 08:58

## Analytical Method: BTEX by EPA 8021B

Seq Number: 3048006

Parent Sample Id: 583547-026

Matrix: Soil

MS Sample Id: 583547-026 S

Prep Method: SW5030B

Date Prep: 04.26.18

MSD Sample Id: 583547-026 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00199	0.0996	0.0989	99	0.107	107	70-130	8	35	mg/kg	04.26.18 08:37	
Toluene	<0.00199	0.0996	0.0925	93	0.0982	98	70-130	6	35	mg/kg	04.26.18 08:37	
Ethylbenzene	<0.00199	0.0996	0.0963	97	0.0970	97	70-130	1	35	mg/kg	04.26.18 08:37	
m,p-Xylenes	<0.00398	0.199	0.201	101	0.200	100	70-130	0	35	mg/kg	04.26.18 08:37	
o-Xylene	<0.00199	0.0996	0.107	107	0.101	101	70-130	6	35	mg/kg	04.26.18 08:37	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		111		70-130	%	04.26.18 08:37
4-Bromofluorobenzene	100		105		70-130	%	04.26.18 08:37

## Analytical Method: BTEX by EPA 8021B

Seq Number: 3048366

Parent Sample Id: 583547-036

Matrix: Soil

MS Sample Id: 583547-036 S

Prep Method: SW5030B

Date Prep: 04.27.18

MSD Sample Id: 583547-036 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.101	0.0991	98	0.103	102	70-130	4	35	mg/kg	04.27.18 18:03	
Toluene	<0.00201	0.101	0.0933	92	0.0974	96	70-130	4	35	mg/kg	04.27.18 18:03	
Ethylbenzene	<0.00201	0.101	0.0936	93	0.0996	99	70-130	6	35	mg/kg	04.27.18 18:03	
m,p-Xylenes	<0.00402	0.201	0.193	96	0.203	100	70-130	5	35	mg/kg	04.27.18 18:03	
o-Xylene	<0.00201	0.101	0.0986	98	0.101	100	70-130	2	35	mg/kg	04.27.18 18:03	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	105		101		70-130	%	04.27.18 18:03
4-Bromofluorobenzene	101		100		70-130	%	04.27.18 18:03

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





## Larson &amp; Associates

## Hamon Battery

Analytical Method: BTEX by EPA 8021B

Seq Number: 3048584

Parent Sample Id: 584081-002

Matrix: Soil

MS Sample Id: 584081-002 S

Prep Method: SW5030B

Date Prep: 05.01.18

MSD Sample Id: 584081-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.0918	92	0.0814	81	70-130	12	35	mg/kg	05.01.18 09:41	
Toluene	<0.00200	0.0998	0.0822	82	0.0687	69	70-130	18	35	mg/kg	05.01.18 09:41	X
Ethylbenzene	<0.00200	0.0998	0.0785	79	0.0632	63	70-130	22	35	mg/kg	05.01.18 09:41	X
m,p-Xylenes	<0.00399	0.200	0.161	81	0.127	64	70-130	24	35	mg/kg	05.01.18 09:41	X
o-Xylene	<0.00200	0.0998	0.0812	81	0.0690	69	70-130	16	35	mg/kg	05.01.18 09:41	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		108		70-130	%	05.01.18 09:41
4-Bromofluorobenzene	102		110		70-130	%	05.01.18 09:41

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





Final 1.001

**Arson & Associates, Inc.**  
Environmental Consultants

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

Data Reported to:

DATE: 4/25/18 PO #: 583547 LAB WORK ORDER #: 13 OF 24  
PROJECT LOCATION OR NAME: Hamon Battery  
LAI PROJECT #: 17-0175-30 COLLECTOR: JW/DP

TIME ZONE: Time zone/State:	S=SOIL W=WATER A=AIR	P=PAINT SL=SLUDGE OT=OTHER	Matrix	# of Containers	PRESERVATION				ANALYSES	FIELD NOTES
					HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/>	ICE		
HA-4 (0-1)										
(1-2)										
(2-3)										
(3-4)										
(4-5)										
DP-8 (0-1)										
(1-2)										
(2-3)										
(3-4)										
(4-5)										
DP-10 (0-1)										
(1-2)										
(2-3)										
(3-4)										
TOTAL										





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

Data Reported to:

DATE: 4/25/18  
PO #:   
PROJECT LOCATION OR NAME: Harmon Battery  
LAI PROJECT #: 17-0175-30 COLLECTOR: JWIPS

PAGE 44 OF 44

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		TIME ZONE: Time zone/State:		PRESERVATION		ANALYSES		FIELD NOTES	
MST								HCl		BTEX <input checked="" type="checkbox"/> MTBE <input type="checkbox"/>			
Field Sample I.D.		Lab #	Date	Time	Matrix	# of Containers		HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/>	TRPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/>			
DP-10 (0-1)	412418	11:33	S	1				ICE	UNPRESERVED	GASOLINE MOD 8015 <input checked="" type="checkbox"/>	DIESEL - MOD 8015 <input checked="" type="checkbox"/>	VOC 8260 <input type="checkbox"/>	SVOC 8270 <input type="checkbox"/>
(1-2)		11:34								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(2-3)		11:38								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(3-4)		11:41								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(4-6)		11:45								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(6-8)		11:49								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
DP-1 (0-1)		12:04								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(1-2)		12:08								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(2-3)		12:10								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(3-4)		12:14								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(4-6)		12:10								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
(6-8)		12:23								8081 PESTICIDES <input type="checkbox"/>	8082 PCBS <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>	TCLP - METALS (RCRA) <input type="checkbox"/>
TOTAL													
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		TURN AROUND TIME		LABORATORY USE ONLY:			
Jesse W. McCallum		4/25/18		Jesse W. McCallum		4/25/18		NORMAL <input checked="" type="checkbox"/>		R Temp: 6.2		IR ID: R-8	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		OTHER <input type="checkbox"/>		C CF: (0-6: -0.2°C)		F USED	
Jesse W. McCallum		4/25/18		Jesse W. McCallum		4/25/18				C CF: (6-23: +0.2°C)			
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME				Corrected Temp: 6.4			
Jesse W. McCallum		4/25/18		Jesse W. McCallum		4/25/18							

## **Appendix C**

### **Photographs**

1RP-4636  
Hamon Tank Battery  
October 23, 2018



Site Prior to Remediation Viewing East, October 2, 2017



Site Prior to Remediation Viewing North, October 2, 2017



1RP-4636  
Hamon Tank Battery  
October 23, 2018



Site Prior to Remediation Viewing South, October 2, 2017



Site Prior to Remediation Viewing North West



1RP-4636  
Hamon Tank Battery  
October 23, 2018



Site Prior to Remediation Viewing South, October 2, 2017

## **Appendix D**

### **Final 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	
District RP	
Facility ID	
Application ID	

## Release Notification

### Responsible Party

Responsible Party Legacy Reserves Operating, LP	OGRID 240974
Contact Name Brian Cunningham	Contact Telephone 432-234-9450
Contact email bcunningham@legacylp.com	Incident # (assigned by OCD) 1RP-4636
Contact mailing address 303 W. Wall Street, Suite 1300 Midland, TX 79701	

### Location of Release Source

Latitude 32.5849° Longitude -103.5976°  
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Hamon Battery	Site Type Tank Battery
Date Release Discovered 3/4/2017	API# (if applicable) 30-025-30881

Unit Letter	Section	Township	Range	County
J	7	20S	34E	Lea

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (Name: \_\_\_\_\_)

### Nature and Volume of Release

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

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls) 40 bbls	Volume Recovered (bbls) 0 bbls
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

#### Cause of Release

A separator caught on fire, causing the vessel to leak.

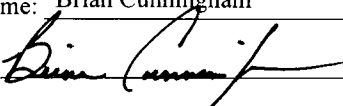
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Was this a major release as defined by 19.15.29.7(A) NMAC?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? The volume of produced water was greater than 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? A verbal notice was given to Olivia Yu on 3/6/2017.	

### Initial Response

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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input checked="" type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> 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: <u>Brian Cunningham</u>	Title: <u>Production Foreman</u>
Signature: <u></u>	Date: <u>10/1/2018</u>
email: <u>bcunningham@legacyp.com</u>	Telephone: <u>432-234-9450</u>
<b><u>OCD Only</u></b>  Received by: _____ Date: _____	

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## 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?	125 (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.

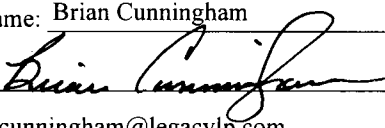
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Printed Name: Brian CunninghamTitle: Production ForemanSignature: Date: 10/1/2018email: bcunningham@legacylp.comTelephone: 432-234-9450**OCD Only**

Received by: \_\_\_\_\_

Date: \_\_\_\_\_

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## Remediation Plan

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

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

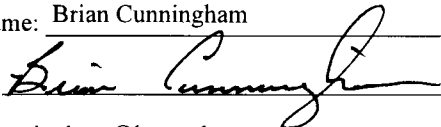
**Deferral Requests Only:** *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ 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.

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Printed Name: Brian Cunningham

Title: Production Foreman

Signature: 

Date: 10/1/2018

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: \_\_\_\_\_

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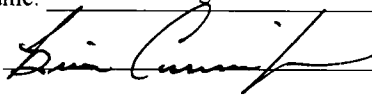
## Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist:** *Each of the following items must be included in the closure report.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities


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Printed Name: Brian Cunningham Title: Production Foreman  
 Signature:  Date: 10/1/2018  
 email: bcunningham@legacylp.com Telephone: 432-234-9450

### OCD Only

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by:  Date: 11/2/2023  
 Printed Name: Ashley Maxwell Title: Environmental Specialist



**District I**  
1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720  
**District II**  
811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720  
**District III**  
1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

CONDITIONS  
  
Action 269513

CONDITIONS

Operator: LEGACY RESERVES OPERATING, LP 15 Smith Road Midland, TX 79705	OGRID: 240974
	Action Number: 269513
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	None	11/2/2023