

APPROVED

By Olivia Yu at 8:16 am, Mar 01, 2018

NMOCD approves of the proposed delineation plan for 1RP-3650. Permissible chloride level is 600 mg/kg.

**1RP-3650
DELINEATION PLAN
DH 5 State
Produced Water Spill
Lea County, New Mexico**

Latitude: N33° 28' 27.82"
Longitude: W-103° 28' 49.62"

LAI Project No. 17-0175-13

January 10 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



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



Sarah R. Johnson
Staff Geologist

This Page Intentionally Left Blank

Table of Contents

1.0 INTRODUCTION.....	1
1.1 Background.....	1
1.2 Physical Setting.....	1
1.3 Remediation Action Levels.....	1
2.0 DELINEATION PLAN.....	2
3.0 REMEDIATION PLAN.....	2

Figures

Figure 1	Topographic Map
Figure 2	Aerial Map Showing Proposed Sample Points

Appendices

Appendix A	Initial C-141
Appendix B	Photographs

1.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this delineation plan on behalf of Legacy Reserves Operating, LP (Legacy) for submittal to the New Mexico Oil Conservation (OCD) District I for a produced water spill at the DH 5 (Site) located in Unit I (NE/4, SE/4), Section 5, Township 10 South, Range 34 East in Lea County, New Mexico. The geodetic position is North 33° 28' 27.82" and West -103° 28' 49.62". Figure 1 presents a topographic map. Figure 2 presents an aerial map.

1.1 Background

The spill occurred on May 19, 2015, due to lightening striking a water tank and releasing 70 barrels (bbl) of produced water. Approximately 60 bbl were recovered. The release was reported to the OCD District I (verbal communication with Kelly Jones) on May 20, 2015. The initial C-141 was submitted on May 21, 2015 and assigned remediation permit number 1RP-3650. Appendix A presents the initial C-141.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 4,250 feet above mean sea level (msl);
- The surface topography slopes gradually towards the southeast;
- The nearest surface water is a seasonal playa approximately 0.25 miles southwest of the Site;
- The soils are designated as "Brownfield-Springer association, 0 to 3 percent slope", consisting of 0 to 22 inches of fine sand underlain by 22 to 60 inches of sandy clay loam;
- The surface geology is Eolian deposits from the Holocene to middle Pleistocene, the deposits consist of eolian sands;
- Groundwater occurs in the Ogallala formation at approximately 36 feet below ground surface (bgs) (1996);
- The nearest freshwater well is located in Unit J (NW/4, SE/4), Section 28, Township 9 South, Range 34 east, about 2 miles northwest of the Site.

1.3 Remediation Action Levels

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

Criteria	Result	Score
Depth-to-Groundwater	<50 Feet	20
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1,000 Horizontal Feet	0

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

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 100 mg/Kg

Depth to groundwater less than 50 feet bgs requires vertical delineation for chloride to 250 milligrams per kilogram (mg/Kg) and maintained a minimum 10 feet further in depth.

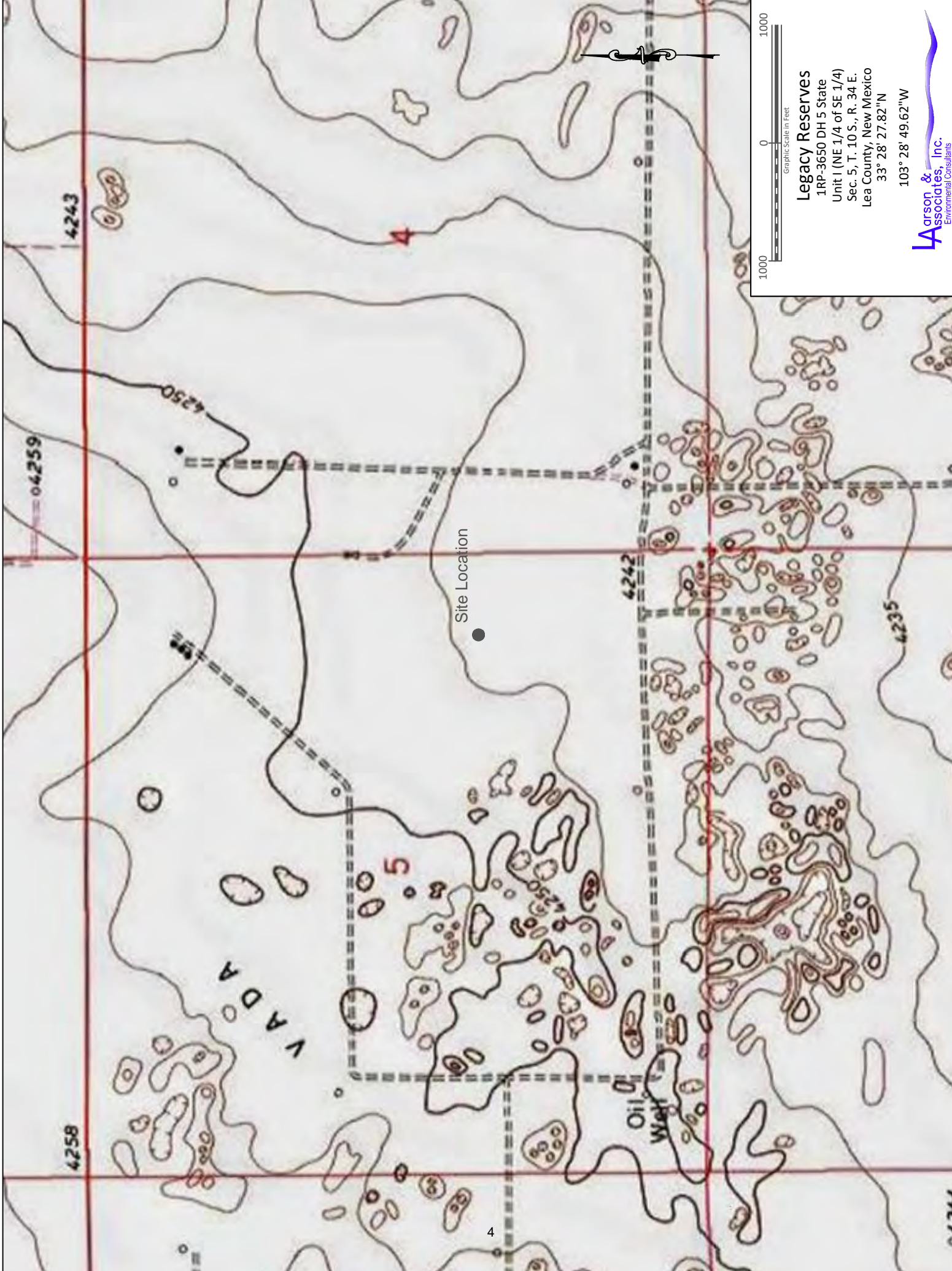
2.0 DELINEATION PLAN

LAI proposes to collect soil samples at two (2) locations within the tank battery containment. The samples will be collected at 1 foot intervals to approximately 4 feet bgs and 2 foot intervals to approximately 12 feet bgs using direct push technology (DPT) depending on subsurface conditions. Additional samples will be collected in each cardinal direction (north, south, east and west) of tank battery at the same depth intervals for horizontal delineation. The soil samples will be delivered under chain of custody and preservation to XENCO Laboratories (Xenco) in Midland, Texas. the laboratory will analyze the upper samples (0 to 1 foot), 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 8021B and 8015M. All samples will be analyzed for chloride by EPA Method and 300 until the delineation requirements are achieved. Pending laboratory results, further delineation will be determined to reach cleanup level standards. Figure 2 presents an aerial map showing proposed soil sample locations. Appendix B presents photographs.

3.0 REMEDIATION PLAN

Legacy will include a remediation plan in the delineation report to be submitted to the OCD upon receipt of the laboratory report.

Figures



Legacy Reserves

1RP-3650 DH 5 State

Unit 1 (NE 1/4 of SE 1/4)

Sec. 5, T. 10 S., R. 34 E.

Lea County, New Mexico

33° 28' 27.82"N

103° 28' 49.62"W

Larson &
Associates, Inc.
Environmental Consultants

Figure 1 - Topographic Map



Legend

- Spill Area

- Proposed Sample Location

Legacy Reserves

1RP-3650 DH 5 State

Unit 1 (NE 1/4 of SE 1/4)

Sec. 5, T. 10 S., R. 34 E.

Lea County, New Mexico

33° 28' 27.82"N

103° 28' 49.62"W

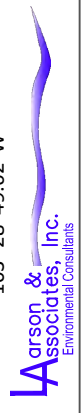


Figure 2 - Aerial Map Showing Proposed Sample Location

Appendix A

Initial C-141

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised 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	Contact Jesse Garcia	
Address P.O Box 10848	Telephone No. 432-853-3535	
Facility Name DH 5 State	Facility Type Oil	
Surface Owner	Mineral Owner	API No.3002538292

LOCATION OF RELEASE

Unit Letter	Section 5	Township 10S	Range 34 E	Feet from the 2160'	North/South Line South	Feet from the 660'	East/West Line East	County Lea
-------------	--------------	-----------------	---------------	------------------------	---------------------------	-----------------------	------------------------	------------

Latitude 33.474911 Longitude -103.379675

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 70	Volume Recovered 60
Source of Release Water Tank	Date and Hour of Occurrence 9.AM	Date and Hour of Discovery 9.00 AM
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Kellie Jones within 1 day	
By Whom? Jesse Garcia	Date and Hour 5/20/15 3.00 PM	
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.*		


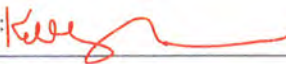
RECEIVED

By OCD District 1 at 10:17 am, May 27, 2015

Describe Cause of Problem and Remedial Action Taken.*
Lighting Strike , Water inside berm picked up

Describe Area Affected and Cleanup Action Taken.*
Getting crew to pick up any affected soil and have it hauled to a Waste site and fill in any spot with clean soil.

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

Signature: 	OIL CONSERVATION DIVISION		
Printed Name: Jesse Garcia	Approved by Environmental Specialist: 		
Title: Foreman	Approval Date: 05/27/2015	Expiration Date: 08/27/2015	
E-mail Address: jgarcia@legacyp.com	Conditions of Approval: Site samples required. Delineate and remediate as per MNOCD guides. Geotag photographs of remediation required.		Attached <input type="checkbox"/> 240974 1RP-3650
Date: 5.21.15	Phone: 432-853-3535		

* Attach Additional Sheets If Necessary

pKJ1514737758
nKJ1514737541

Appendix B

Photographs



Site Location



Site Prior to Remediation Viewing Northwest, September 15, 2017



Site Prior to Remediation Viewing Southeast, September 15, 2017



Site Prior to Remediation Viewing South, September 15, 2017