

APPROVED

By Olivia Yu at 11:06 am, Oct 04, 2017

NMOCD approves of the proposed delineation for 1RP-4721 with one condition:

Delineate to 600 mg/kg chlorides. Laboratory analyses must demonstrate chloride levels were obtained and maintained at 3-4 ft. further in depth.

1RP-4721

DELINEATION PLAN

EMSU Well #410 Produced Water Spill

Lea County, New Mexico

Latitude: N32° 28' 37.80"

Longitude: W103° 18' 24.39"

LAI Project No. 17-0182-01

September 20, 2017

Prepared for:

XTO Energy, Inc.

500 West Illinois Ave., Suite 100

Midland, Texas 79701

Prepared by:

Larson & Associates, Inc.

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Midland, Texas 79701



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Certified Professional Geologist #10490



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1.0 INTRODUCTION

This delineation plan is submitted to the New Mexico Oil Conservation Division (OCD) District 1 on behalf of XTO Energy, Inc. (XTO) for a produced water spill near the Eunice Monument South Unit (EMSU) Well #410 (Site) located in Unit K (NE/4, SW/4), Section 18, Township 21 South, Range 36 East, in Lea County, New Mexico. The geodetic position is latitude North 32° 28' 37.80" and longitude West 103° 18' 24.39". Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

1.1 Background

The spill occurred on June 3, 2017, after the injection line ruptured causing approximately 135.79 barrels (bbl) of produced water to be released onto the lease road and into the pasture. Approximately 120 bbl were recovered. The release covered an area estimated at approximately 5,834 square feet or about 0.133 acre. The surface owner is the United States of America (USA) administered by the Department of the Interior Bureau of Land Management (BLM). On June 5, 2017, XTO submitted the initial C-141 to OCD District 1 which assigned the release remediation permit 1RP-4721 with conditions. Attachment A presents the initial C-141.

1.2 Physical Setting

The physical setting is as follows:

- Elevation is approximately 3,670 feet above mean sea level (amsl);
- Topography slopes towards the east;
- The nearest surface water feature is small seasonal depression (playa) located about 500 feet west (up gradient) from the Site;
- The soils are designated as "Pyote and maljamar fine sands", consisting of approximately 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches derived from sedimentary rock;
- The upper geological unit is the Tertiary-age Blackwater Draw and Ogallala formations, in descending order, comprised of very fine to medium-grained quartz sand and gravel, with minor amount of silt and clay with indistinct to massive crossbeds;
- The Ogallala formation is underlain by clay, silty clay, shale and sandstone of the Chinle formation (Triassic) and is about 300 feet thick;
- According to records from the U.S. Geological Survey (U.S.G.S.) and State of New Mexico Office of the State Engineer (OSE) the nearest fresh water well is located in Unit H (SE/4, SE/4), Section 18, Township 21 South, Range 36 East or about 2,800 feet northeast (cross gradient) from the Site;
- Depth to groundwater in the well was reported at approximately 233.83 feet below ground surface (bgs) in 1996.

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, August 13, 1993”:

Criteria	Result	Score
Depth-to-Groundwater	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

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

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

Depth to groundwater greater than 100 feet bgs requires vertical delineation for chloride to 1,000 milligrams per kilogram (mg/Kg).

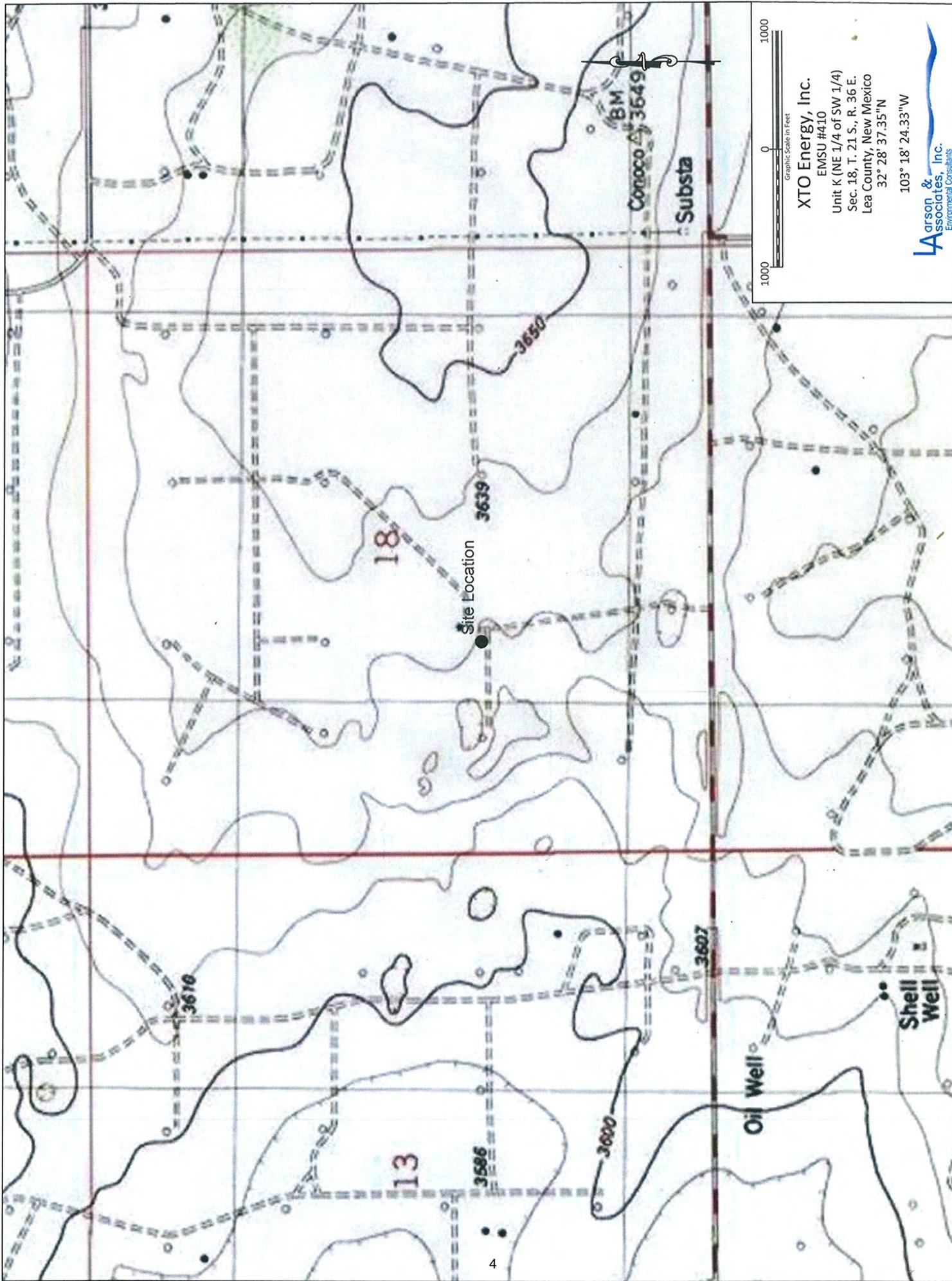
2.0 DELINEATION PLAN

LAI proposes to direct push technology (DPT) to collect soil samples at eight (8) locations inside the spill area for vertical delineation and eight (8) locations outside the spill area for horizontal delineation. Soil samples will be collected from each location at 1 foot increments to about 4 feet bgs and 2 foot increments to approximately 12 feet bgs depending on subsurface conditions. The samples will be tested in the field for chloride using QuanTab® chloride test strips (300 - 6,000 mg/L). Additional samples may be collected if chloride is not delineated vertically to 1,000 mg/Kg with an additional ten (10) vertical feet below the deepest sample from each location as allowed by subsurface conditions. The samples will be delivered to Permian Environmental lab (PBEL) in Midland, Texas, under preservation and chain of custody. The laboratory will analyze the upper samples (0 to 1 foot) for 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, respectively. All samples will be analyzed for chloride by EPA Method 300. Figure 3 presents the approximate boring locations.

3.0 REMEDIATION PLAN

XTO will submit a report following receipt of the laboratory analysis that will include a plan to remediate the spill.

Figures



XTO Energy, Inc.
EMSU #410
Unit K (NE 1/4 of SW 1/4)
Sec. 18, T. 21 S., R. 36 E.
Lea County, New Mexico
32° 28' 37.35"N
103° 18' 24.33"W



Figure 1 - Topographic Map



XTO Energy, Inc.
 EMSU #410
 Unit K (NE 1/4 of SW 1/4)
 Sec. 18, T. 21 S., R. 36 E.
 Lea County, New Mexico
 32° 28' 37.35"N
 103° 18' 24.33"W

Larson & Associates, Inc.
 Environmental Consultants

Legend

- Well MSU #410
- Proposed Sample Location
- Excavation Area
- Spill Area

Figure 2 - Aerial Map

Attachment A

Initial C-141

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

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

Form C-141
Revised April 3, 2017

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

Release Notification and Corrective Action

OPERATOR

Initial Report Final Report

Name of Company	XTO Energy	Contact	Shannon Walker
Address	500 W Illinois St. Suite 100 Midland Texas 79701	Telephone No.	432-661-4649
Facility Name	EMSU 410 WIW	Facility Type	Injection
Surface Owner	BLM	Mineral Owner	BLM
		API No.	3002530281

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County	
K	18	21S	36E						
Latitude <u>32° 28' 37.80" N</u>				Longitude <u>103° 18' 24.39" W</u>				NAD83	

NATURE OF RELEASE

Type of Release	Produced Water	Volume of Release	135.79 bbls	Volume Recovered	120 bbls
Source of Release	Injection Line	Date and Hour of Occurrence	6/3/2017	Date and Hour of Discovery	6/3/2017
Was Immediate Notice Given?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required				
By Whom?	Date and Hour				
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If a Watercourse was Impacted, Describe Fully.*					

RECEIVED
By Olivia Yu at 12:58 pm, Jun 13, 2017

Describe Cause of Problem and Remedial Action Taken.*
Injection line ruptured causing produced water to spill on pasture and road. Cleaned up all standing fluids with vacuum truck. Will clean area to NMOCD standards.

Describe Area Affected and Cleanup Action Taken.*
Pasture and Lease Road. All standing fluid cleaned up with vacuum truck.

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: <i>Shannon Walker</i>	OIL CONSERVATION DIVISION	
Printed Name: Shannon Walker	Approved by Environmental Specialist: <i>oy</i>	
Title: Production Foreman	Approval Date: 6/13/2017	Expiration Date:
E-mail Address: shannon_walker@xtoenergy.com	Conditions of Approval: see attached directive	Attached <input checked="" type="checkbox"/>
Date: 6/5/17	Phone: 432-661-4649	

* Attach Additional Sheets If Necessary

1RP-4721 **FOY1716446806** **NOY1716446999**
pOY1716447243

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 6/5/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1RP-4721 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 7/13/2017. 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; C₆ thru C₃₆), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.
- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.
- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.
- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

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

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

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

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

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

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

Attachment B

Photographs



Excavation Prior to Remediation Viewing East



Excavated Soil Viewing East



Site Prior to Remediation Viewing South



Site Prior to Remediation Viewing West



Site Prior to Remediation Viewing East



Site Prior to Remediation Viewing North