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 XTO Energy	OGRID 5380
Contact Name Kyle Littrell	Contact Telephone 432-221-7331
Contact email Kyle_Littrell@xtoenergy.com	Incident # *(assigned by OCD)*
Contact mailing address 522 W. Mermod, Carlsbad, NM 88220	

Location of Release Source

Latitude 32.142026 Longitude -103.924543
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Wolverine Comp. Station	Site Type Compressor Station
Date Release Discovered 09/26/2019	API# *(if applicable)* 30-015-37700 (Muy Wayno State #001H)

Unit Letter	Section	Township	Range	County
P	12	25S	29E	EDDY

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)

☐ Crude Oil	Volume Released (bbls) 0	Volume Recovered (bbls) 0
☒ Produced Water	Volume Released (bbls) 10.04	Volume Recovered (bbls) 9.5
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Seal failure on SWD pump. The produced water filled the small containment surrounding the 2 SWD pumps spilling over the containment. Additional third party resources have been retained to assist in the remediation.

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Initial Response

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

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

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

N/A

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: Kyle Littrell Title: SH&E Supervisor

Signature: Date: 10/8/2019

email: Kyle_Littrell@xtoenergy.com Telephone:

OCD Only

Received by: Date:

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

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

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

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

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

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: Kyle Littrell Title: SH&E Supervisor

Signature: Date: 12/20/2019

email: Kyle_Littrell@xtoenergy.com Telephone: (432)-221-7331

OCD Only

Received by: Date:

Form C-141
Page 6

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

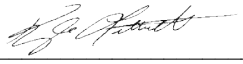
☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☒ Description of remediation activities

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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Kyle Littrell Title: SH&E Supervisor

Signature:  Date: 12/20/2019

email: Kyle_Littrell@xtoenergy.com Telephone: 432-221-7331

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:

Printed Name: Title:

LT Environmental, Inc.
3300 North "A" Street
Building 1, Unit 222
Midland, Texas 79705
432.704.5178

December 23, 2019

Mr. Mike Bratcher
New Mexico Oil Conservation Division
811 South First Street
Artesia, New Mexico 88210

RE: Closure Request
Wolverine Compressor Station- September 26, 2019 Release
Remediation Permit Number Not Assigned
PO Number: HVOPL-191008-C-1410
Eddy County, New Mexico

Dear Mr. Bratcher:

LT Environmental, Inc. (LTE), on behalf of XTO Energy, Inc. (XTO), presents the following Closure Request detailing site assessment and soil sampling activities at the Wolverine Compressor Station (Site) in Unit P, Section 12, Township 25 South, Range 29 East, in Eddy County, New Mexico (Figure 1). The purpose of the site assessment and soil sampling activities was to confirm the presence or absence of impacts to soil following the release of produced water at the Site. Based on field observations, field screening, and laboratory analytical results from soil sampling activities, XTO is submitting this Closure Request and requesting no further action (NFA) for the release event on September 26, 2019 that has not had a Remediation Permit (RP) Number assigned.

RELEASE BACKGROUND

On September 26, 2019, the seal on the salt water disposal (SWD) pump failed, resulting in a release of approximately 10.04 barrels (bbls) of produced water. The produced water filled the small containment surrounding the two SWD pumps, spilling over the containment. The seal failure was addressed by XTO personnel prior to remediation activities. A vacuum truck was dispatched to the Site to recover free-standing fluids; approximately 9.5 bbls of produced water were recovered. XTO reported the release to the New Mexico Oil Conservation Division (NMOCD) on a Release Notification and Corrective Action Form C-141 (form C-141) on October 8, 2019.

SITE CHARACTERIZATION

LTE characterized the Site according to Table 1, *Closure Criteria for Soils Impacted by a Release*, of Title 19, Chapter 15, Part 29, Section 12 (19.15.29.12) of the New Mexico Administrative Code (NMAC). Depth to groundwater at the Site is estimated to be greater than 100 feet below ground surface (bgs) based on the nearest water well data. The closest permitted water well with depth

to groundwater data is United States Geological Survey (USGS) well 320857103553301, located approximately 2,698 feet northwest of the Site. The water well has a depth to groundwater of approximately 264 feet bgs and a total depth of 385 feet bgs. The closest continuously-flowing water or significant watercourse to the Site is an intermittent dry tributary, located approximately 458 feet north of the Site and release extent. The Site is greater than 200 feet from a lakebed, sinkhole, or playa lake and greater than 300 feet from an occupied residence, school, hospital, institution, church, or wetland. The Site is greater than 1,000 feet to a freshwater well or spring and is not within a 100-year floodplain or overlying a subsurface mine. The Site is located in a low potential karst area.

CLOSURE CRITERIA

Based on the results of the site characterization, the following NMOCD Table 1 Closure Criteria (Closure Criteria) apply:

- Benzene: 10 milligrams per kilogram (mg/kg)
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX): 50 mg/kg
- Total petroleum hydrocarbons (TPH)-gasoline range organics (GRO) and TPH-diesel range organics (DRO): 1,000 mg/kg
- TPH: 2,500 mg/kg
- Chloride: 20,000 mg/kg

SITE ASSESSMENT AND SOIL SAMPLING ACTIVITIES

On October 11, 2019, LTE personnel evaluated the release extent based on information provided on the Form C-141 and visual observations. LTE personnel collected three preliminary soil samples (SS01 through SS03) within the release extent from a depth of approximately 0.5 feet bgs to assess for the presence of absence of soil impacts at the ground surface. Soil was field screened for volatile aromatic hydrocarbons and chloride utilizing a calibrated photo-ionization detector (PID) and Hach® chloride QuanTab® test strips, respectively. The release extent and preliminary soil sample locations were mapped utilizing a handheld Global Positioning System (GPS) unit and are depicted on Figure 2.

The soil samples were placed directly into pre-cleaned glass jars, labeled with the location, date, time, sampler name, method of analysis, and immediately placed on ice. The soil samples were shipped at or below 4 degrees Celsius (°C) under strict chain-of-custody (COC) procedures to Xenco Laboratories (Xenco) in Midland, Texas, for analysis of BTEX following United States Environmental Protection Agency (EPA) Method 8021B; TPH-GRO, TPH-DRO, and TPH-oil range organics (ORO) following EPA Method 8015M/D; and chloride following EPA Method 300.0.

Based on laboratory analytical results for the preliminary soil samples SS01 through SS03, excavation activities did not appear warranted; however, additional assessment activities were scheduled to further confirm the presence or absence of impacted soil. Photographic documentation was conducted during the Site visit. Photographs are included in Attachment 2.

On December 17, 2019, LTE personnel returned to the Site to oversee additional soil assessment activities. One borehole (BH01) was advanced via hand-auger, to a depth of two feet bgs, within the release extent. Two potholes (PH01 through PH02) were advanced within the release extent using a track-mounted backhoe and soil samples were obtained at depths of two feet bgs. Borehole sample BH01 was advanced at SS01, and pothole samples PH01 and PH02 were advanced at SS02 and SS03 preliminary soil sample locations, respectively.

Soil from the borehole and pothole locations were field screened for volatile aromatic hydrocarbons and chloride utilizing a calibrated PID and Hach® chloride QuanTab® test strips, respectively. Field screening results and observations for the borehole and each pothole were documented on a lithologic/soil sampling log and are included as Attachment 1. The delineation soil samples were collected, handled, and analyzed as described above at Xenco in Carlsbad, New Mexico. All boreholes were backfilled with the soil removed. The preliminary and delineation soil sample locations are depicted on Figure 2.

ANALYTICAL RESULTS

Laboratory analytical results indicated benzene, BTEX, TPH-GRO, TPH-DRO, TPH, and chloride concentrations were compliant with the Closure Criteria in soil samples SS01 through SS03 collected at approximately 0.5 ft bgs and in delineation soil samples BH01, PH01, and PH02 collected at two feet bgs. Laboratory analytical results are presented on Figure 2 and summarized in Table 1. The complete laboratory analytical reports are included as Attachment 3.

CONCLUSIONS

Preliminary soil samples SS01 through SS03 and delineation soil samples BH01, PH01, and PH02 were collected from within the release extent from depths ranging from 0.5 feet to two feet bgs to assess for the presence or absence of soil impacts as a result of the produced water release on September 26, 2019. Laboratory analytical results for all soil samples indicated benzene, BTEX, TPH-GRO, TPH-DRO, TPH, and chloride concentrations were compliant with the Closure Criteria. Additionally, field screening of soil indicated volatile aromatic hydrocarbons and chloride concentrations were not elevated and soil staining and petroleum hydrocarbon odors were not identified within the release extent.

Based on initial response efforts, absence of elevated field screening results, and soil sample laboratory analytical results compliant with the Closure Criteria, no impacted soil was identified

and no soil excavation was warranted as a result of the produced water release. XTO requests NFA for this release event on September 26, 2019 that that has not had a RP Number assigned. If you have any questions or comments, please do not hesitate to contact Ms. Ashley Ager at (970) 385-1096.

Sincerely,
LT ENVIRONMENTAL, INC.

Kalei Jennings
Project Environmental Scientist

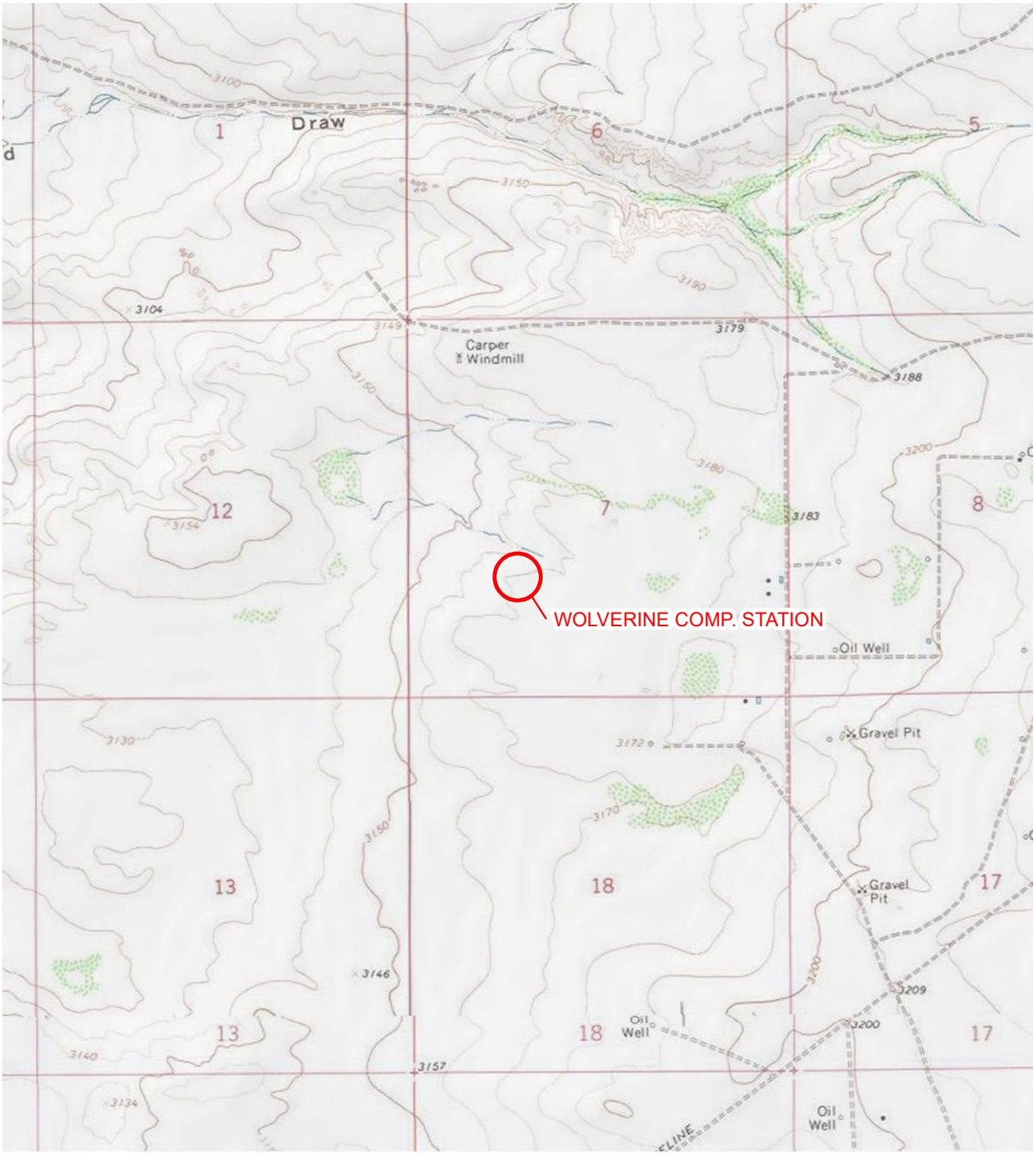
Ashley L. Ager, P.G.
Senior Geologist

cc: Kyle Littrell, XTO
Ryan Mann, State Land Office
Robert Hamlet, NMOCD
Victoria Venegas, NMOCD

Appendices:

Figure 1	Site Location Map
Figure 2	Soil Sample Locations
Table 1	Soil Analytical Results
Attachment 1	Lithologic/Soil Sampling Logs
Attachment 2	Photographic Log
Attachment 3	Laboratory Analytical Reports

FIGURES



LEGEND

SITE LOCATION

IMAGE COURTESY OF ESRI/USGS

0 2,000 4,000

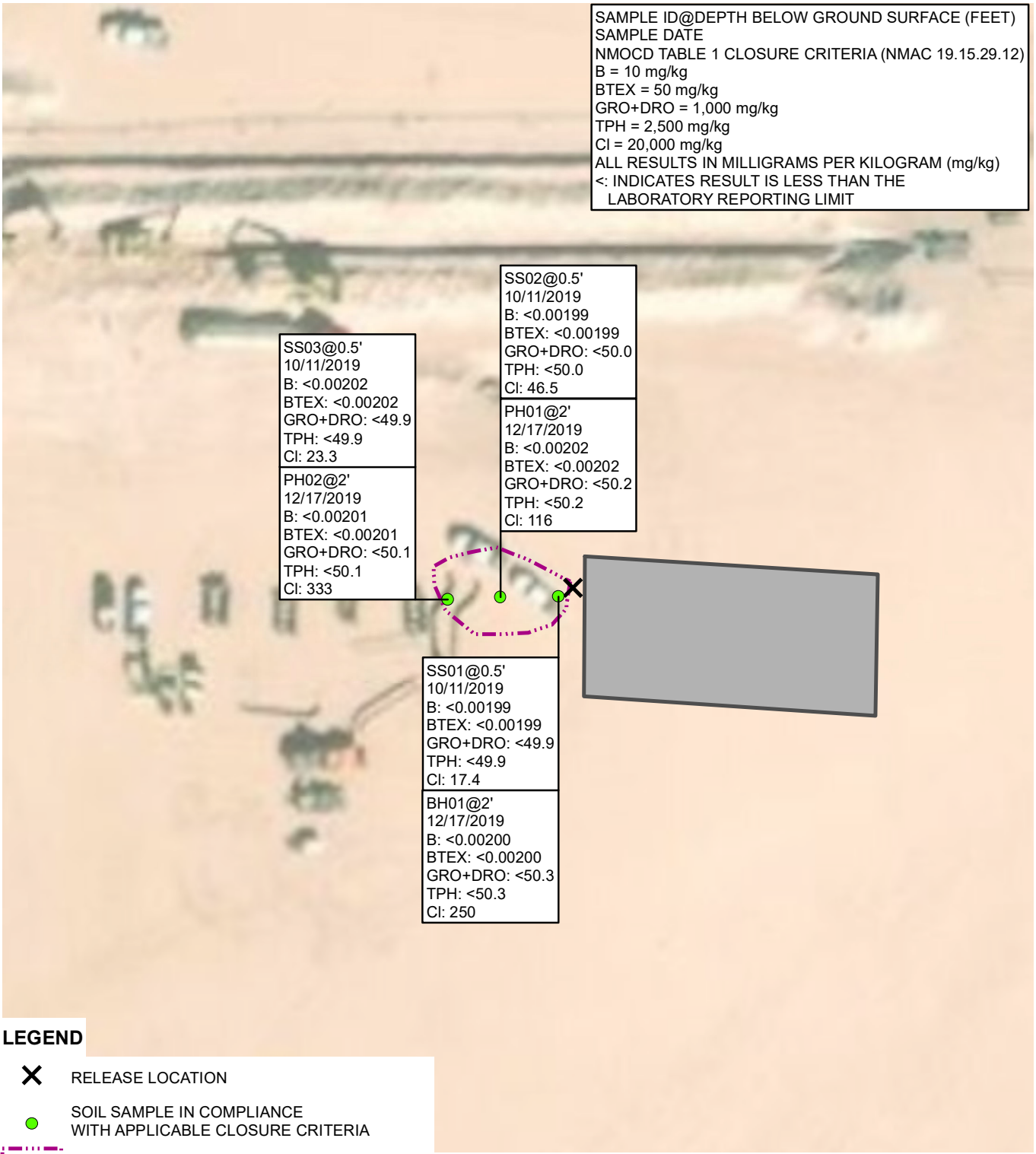
Feet

N

NOTE: REMEDIATION PERMIT NUMBER NOT ASSIGNED

FIGURE 1
SITE LOCATION MAP
WOLVERINE COMP. STATION
UNIT P SEC 12 T25S R29E
EDDY COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012919236_WOLVERINE SWD PUMP\012919236_FIG01_SL_2019.mxd



B: BENZENE
BTEX: TOTAL BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES
GRO: GASOLINE RANGE ORGANICS
DRO: DIESEL RANGE ORGANICS
TPH: TOTAL PETROLEUM HYDROCARBONS
Cl: CHLORIDE
NMAC: NEW MEXICO ADMINISTRATIVE CODE
NMOCD: NEW MEXICO OIL CONSERVATION DIVISION
NOTE: REMEDIATION PERMIT NUMBER NOT ASSIGNED

FIGURE 2
SOIL SAMPLE LOCATIONS
WOLVERINE COMPRESSOR STATION
UNIT P SEC 12 T25S R29E
EDDY COUNTY, NEW MEXICO
XTO ENERGY, INC.

P:\XTO Energy\GIS\MXD\012919236_WOLVERINE SWD PUMP\012919236_FIG03_SS LOC_2019.mxd

TABLES

TABLE 1
SOIL ANALYTICAL RESULTS

WOLVERINE COMPRESSOR STATION
REMEDIATION PERMIT NUMBER NOT ASSIGNED
EDDY COUNTY, NEW MEXICO
XTO ENERGY, INC.

Sample Name	Sample Depth (feet bgs)	Sample Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	ORO (mg/kg)	Total GRO+DRO (mg/kg)	TPH (mg/kg)	Chloride (mg/kg)
NMOCD Table 1 Closure Criteria			**10**	NE	NE	NE	**50**	NE	NE	NE	**1,000**	**2,500**	**20,000**
SS01	0.5	10/11/2019	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<49.9	<49.9	<49.9	<49.9	<49.9	17.4
SS02	0.5	10/11/2019	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<50.0	<50.0	<50.0	<50.0	<50.0	46.5
SS03	0.5	10/11/2019	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<49.9	<49.9	<49.9	<49.9	<49.9	23.3
BH01	2	12/17/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.3	<50.3	<50.3	<50.3	<50.3	250
PH01	2	12/17/2019	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<50.2	<50.2	<50.2	<50.2	<50.2	116
PH02	2	12/17/2019	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<50.1	<50.1	<50.1	<50.1	<50.1	333

Notes:

bgs - below ground surface
BTEX - benzene, toluene, ethylbenzene, and total xylenes
DRO - diesel range organics
GRO - gasoline range organics
mg/kg - milligrams per kilogram
MRO - motor oil range organics
NMAC - New Mexico Administrative Code
NMOCD - New Mexico Oil Conservation Division
NE - not established
TPH - total petroleum hydrocarbons
Bold - indicates result exceeds the applicable regulatory standard
< - indicates result is below laboratory reporting limits
Table 1 - closure criteria for soils impacted by a release per NMAC 19.15.29 August 2018

ATTACHMENT 1: LITHOLOGIC / SOIL SAMPLING LOGS

LT Environmental, Inc.
508 West Stevens Street
Carlsbad, New Mexico 88220
Compliance · Engineering · Remediation

Identifier:	Date:
BH01	12/17/2019
Wolverine Compressor Station	NOT ASSIGNED

LITHOLOGIC / SOIL SAMPLING LOG

Logged By: EN	Method: Hand Auger

Lat/Long: 32.142026, -103.92453	Field Screening: Chloride, TPH	Hole Diameter: 4"	Total Depth: 2'

Comments:

Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
Dry	232	0	n	BH01	0 2	2'	SM	SILTY SAND w/ caliche, dry, brown, poorly graded, no staining, no odor
								Total Depth 2 feet bgs

LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance · Engineering · Remediation		Identifier: PH01	Date: 12/17/2019
		Wolverine Compressor Station	NOT ASSIGNED
LITHOLOGIC / SOIL SAMPLING LOG		Logged By: EN	Method: Backhoe
Lat/Long: 32.142026, -103.92453	Field Screening: Chloride, TPH	Hole Diameter: 4"	Total Depth: 2'
Comments:			

Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
					0			
Dry	<128	0	n	PH01	2	2'	SM	SILTY SAND w/ caliche, dry, brown, poorly graded, no staining, no odor
								Total Depth 2 feet bgs

LT Environmental, Inc.
508 West Stevens Street
Carlsbad, New Mexico 88220
Compliance · Engineering · Remediation

Identifier:	Date:
PH02	12/17/2019
Wolverine Compressor Station	NOT ASSIGNED

LITHOLOGIC / SOIL SAMPLING LOG

Logged By: EN	Method: Backhoe

Lat/Long: 32.142026, -103.92453	Field Screening: Chloride, TPH	Hole Diameter: 4"	Total Depth: 2'

Comments:

Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
Dry	<112	0	n	PH02	0 2	2'	SM	SILTY SAND w/ caliche, dry, brown, poorly graded, no staining, no odor
								Total Depth 2 feet bgs

ATTACHMENT 2: PHOTOGRAPHIC LOG

Eastern view of release area on caliche well pad during site assessment activities.

Project: 012919236	XTO Energy, Inc. Wolverine Compressor Station	LTE Advancing Opportunity
October 11, 2019	Photographic Log	

View of release area during delineation soil sampling activities.

Project: 012919236	XTO Energy, Inc. Wolverine Compressor Station	LTE Advancing Opportunity
December 17, 2019	Photographic Log	

ATTACHMENT 3: LABORATORY ANALYTICAL REPORTS

Analytical Report 639851

for

LT Environmental, Inc.

Project Manager: Dan Moir

Wolverine SWD Pump

012919236

17-OCT-19

Collected By: Client

1089 N Canal Street
Carlsbad, NM 88220

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

17-OCT-19

Project Manager: **Dan Moir**
LT Environmental, Inc.
4600 W. 60th Avenue
Arvada, CO 80003

Reference: XENCO Report No(s): **639851**
Wolverine SWD Pump
Project Address: Eddy County

Dan Moir:

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) 639851. 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. 639851 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,

Jessica Kramer

Jessica Kramer
Project Assistant

Sample Cross Reference 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SS01	S	10-11-19 13:49	0.5 ft	639851-001
SS02	S	10-11-19 13:50	0.5 ft	639851-002
SS03	S	10-11-19 13:51	0.5 ft	639851-003

CASE NARRATIVE

Client Name: LT Environmental, Inc.
Project Name: Wolverine SWD Pump

Project ID: *012919236*
Work Order Number(s): *639851*

Report Date: *17-OCT-19*
Date Received: *10/14/2019*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3104413 TPH by SW8015 Mod
Surrogate 1-Chlorooctane recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.
Samples affected are: 639851-003,639851-002.

Batch: LBA-3104568 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.
Analyst did not spike MSD in prep error.

Certificate of Analysis Summary 639851

LT Environmental, Inc., Arvada, CO

Project Name: Wolverine SWD Pump

Project Id: 012919236
Contact: Dan Moir
Project Location: Eddy County

Date Received in Lab: Mon Oct-14-19 09:50 am
Report Date: 17-OCT-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	639851-001		639851-002		639851-003							
	Field Id:	SS01		SS02		SS03							
	Depth:	0.5- ft		0.5- ft		0.5- ft							
	Matrix:	SOIL		SOIL		SOIL							
	Sampled:	Oct-11-19 13:49		Oct-11-19 13:50		Oct-11-19 13:51							
BTEX by EPA 8021B SUB: T104704400-19-19	***Extracted:***	Oct-16-19 16:30		Oct-16-19 16:30		Oct-16-19 16:30							
	Analyzed:	Oct-17-19 03:32		Oct-17-19 03:52		Oct-17-19 04:13							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Benzene		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
Toluene		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
Ethylbenzene		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
m,p-Xylenes		<0.00398	0.00398	<0.00398	0.00398	<0.00403	0.00403						
o-Xylene		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
Total Xylenes		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
Total BTEX		<0.00199	0.00199	<0.00199	0.00199	<0.00202	0.00202						
Chloride by EPA 300 SUB: T104704400-19-19	***Extracted:***	Oct-15-19 12:45		Oct-15-19 12:45		Oct-15-19 12:45							
	Analyzed:	Oct-16-19 08:26		Oct-15-19 14:24		Oct-16-19 08:33							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Chloride		17.4	5.00	46.5	5.00	23.3	5.05						
TPH by SW8015 Mod SUB: T104704400-19-19	***Extracted:***	Oct-15-19 12:00		Oct-15-19 12:00		Oct-15-19 12:00							
	Analyzed:	Oct-15-19 16:55		Oct-15-19 17:16		Oct-15-19 17:37							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Gasoline Range Hydrocarbons (GRO)		<49.9	49.9	<50.0	50.0	<49.9	49.9						
Diesel Range Organics (DRO)		<49.9	49.9	<50.0	50.0	<49.9	49.9						
Motor Oil Range Hydrocarbons (MRO)		<49.9	49.9	<50.0	50.0	<49.9	49.9						
Total GRO-DRO		<49.9	49.9	<50.0	50.0	<49.9	49.9						
Total TPH		<49.9	49.9	<50.0	50.0	<49.9	49.9						

Jessica Kramer
Project Assistant

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS01**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-001	Date Collected:	10.11.19 13.49	Sample Depth:	0.5 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.15.19 12.45	Basis:	Wet Weight
Seq Number:	3104425			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**17.4**	5.00	mg/kg	10.16.19 08.26		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.15.19 12.00	Basis:	Wet Weight
Seq Number:	3104413			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.15.19 16.55	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.15.19 16.55	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.15.19 16.55	U	1
Total GRO-DRO	PHC628	<49.9	49.9	mg/kg	10.15.19 16.55	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.15.19 16.55	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	79	%	70-135	10.15.19 16.55	
o-Terphenyl	84-15-1	85	%	70-135	10.15.19 16.55	

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS01**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-001	Date Collected:	10.11.19 13.49	Sample Depth:	0.5 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.16.19 16.30	Basis:	Wet Weight
Seq Number:	3104568			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.17.19 03.32	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.17.19 03.32	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	97	%	70-130	10.17.19 03.32	
1,4-Difluorobenzene	540-36-3	92	%	70-130	10.17.19 03.32	

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS02**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-002	Date Collected:	10.11.19 13.50	Sample Depth:	0.5 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.15.19 12.45	Basis:	Wet Weight
Seq Number:	3104425			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**46.5**	5.00	mg/kg	10.15.19 14.24		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.15.19 12.00	Basis:	Wet Weight
Seq Number:	3104413			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.15.19 17.16	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.15.19 17.16	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.15.19 17.16	U	1
Total GRO-DRO	PHC628	<50.0	50.0	mg/kg	10.15.19 17.16	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.15.19 17.16	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	65	%	70-135	10.15.19 17.16	**
o-Terphenyl	84-15-1	71	%	70-135	10.15.19 17.16	

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS02**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-002	Date Collected:	10.11.19 13.50	Sample Depth:	0.5 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.16.19 16.30	Basis:	Wet Weight
Seq Number:	3104568			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.17.19 03.52	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.17.19 03.52	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	83	%	70-130	10.17.19 03.52	
4-Bromofluorobenzene	460-00-4	93	%	70-130	10.17.19 03.52	

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS03**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-003	Date Collected:	10.11.19 13.51	Sample Depth:	0.5 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.15.19 12.45	Basis:	Wet Weight
Seq Number:	3104425			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**23.3**	5.05	mg/kg	10.16.19 08.33		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.15.19 12.00	Basis:	Wet Weight
Seq Number:	3104413			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	10.15.19 17.37	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	10.15.19 17.37	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.15.19 17.37	U	1
Total GRO-DRO	PHC628	<49.9	49.9	mg/kg	10.15.19 17.37	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.15.19 17.37	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	66	%	70-135	10.15.19 17.37	**
o-Terphenyl	84-15-1	72	%	70-135	10.15.19 17.37	

Certificate of Analytical Results 639851

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**SS03**	Matrix:	Soil	Date Received:	10.14.19 09.50
Lab Sample Id:	639851-003	Date Collected:	10.11.19 13.51	Sample Depth:	0.5 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.16.19 16.30	Basis:	Wet Weight
Seq Number:	3104568			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	10.17.19 04.13	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.17.19 04.13	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	96	%	70-130	10.17.19 04.13	
4-Bromofluorobenzene	460-00-4	100	%	70-130	10.17.19 04.13	

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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

QC Summary 639851

LT Environmental, Inc.

Wolverine SWD Pump

Analytical Method: Chloride by EPA 300 Prep Method: E300P
Seq Number: 3104425 Matrix: Solid Date Prep: 10.15.19
MB Sample Id: 7688137-1-BLK LCS Sample Id: 7688137-1-BKS LCSD Sample Id: 7688137-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	250	100	249	100	90-110	0	20	mg/kg	10.15.19 13:14	

Analytical Method: Chloride by EPA 300 Prep Method: E300P
Seq Number: 3104425 Matrix: Soil Date Prep: 10.15.19
Parent Sample Id: 639853-004 MS Sample Id: 639853-004 S MSD Sample Id: 639853-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	244	248	480	95	481	96	90-110	0	20	mg/kg	10.15.19 15:02	

Analytical Method: Chloride by EPA 300 Prep Method: E300P
Seq Number: 3104425 Matrix: Soil Date Prep: 10.15.19
Parent Sample Id: 639894-001 MS Sample Id: 639894-001 S MSD Sample Id: 639894-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	227	496	715	98	711	98	90-110	1	20	mg/kg	10.15.19 13:33	

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
Seq Number: 3104413 Matrix: Solid Date Prep: 10.15.19
MB Sample Id: 7688175-1-BLK LCS Sample Id: 7688175-1-BKS LCSD Sample Id: 7688175-1-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	853	85	878	88	70-135	3	20	mg/kg	10.15.19 13:05	
Diesel Range Organics (DRO)	<15.0	1000	847	85	865	87	70-135	2	20	mg/kg	10.15.19 13:05	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	71		73		87		70-135	%	10.15.19 13:05
o-Terphenyl	77		76		88		70-135	%	10.15.19 13:05

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
Seq Number: 3104413 Matrix: Solid Date Prep: 10.15.19
MB Sample Id: 7688175-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.15.19 12:44	

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

QC Summary 639851

LT Environmental, Inc.

Wolverine SWD Pump

Analytical Method: TPH by SW8015 Mod — Prep Method: SW8015P
Seq Number: 3104413 — Matrix: Soil — Date Prep: 10.15.19
Parent Sample Id: 639853-021 — MS Sample Id: 639853-021 S — MSD Sample Id: 639853-021 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	997	839	84	837	84	70-135	0	20	mg/kg	10.15.19 14:08	
Diesel Range Organics (DRO)	<15.0	997	853	86	862	86	70-135	1	20	mg/kg	10.15.19 14:08	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	77		76		70-135	%	10.15.19 14:08
o-Terphenyl	74		75		70-135	%	10.15.19 14:08

Analytical Method: BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3104568 — Matrix: Solid — Date Prep: 10.16.19
MB Sample Id: 7688218-1-BLK — LCS Sample Id: 7688218-1-BKS — LCSD Sample Id: 7688218-1-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	0.0796	80	0.0873	87	70-130	9	35	mg/kg	10.16.19 07:51	
Toluene	<0.00200	0.100	0.0871	87	0.0926	93	70-130	6	35	mg/kg	10.16.19 07:51	
Ethylbenzene	<0.00200	0.100	0.0907	91	0.0932	93	70-130	3	35	mg/kg	10.16.19 07:51	
m,p-Xylenes	<0.00400	0.200	0.181	91	0.186	93	70-130	3	35	mg/kg	10.16.19 07:51	
o-Xylene	<0.00200	0.100	0.0949	95	0.0994	99	70-130	5	35	mg/kg	10.16.19 07:51	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	86		90		94		70-130	%	10.16.19 07:51
4-Bromofluorobenzene	94		94		99		70-130	%	10.16.19 07:51

Analytical Method: BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3104568 — Matrix: Soil — Date Prep: 10.16.19
Parent Sample Id: 640051-001 — MS Sample Id: 640051-001 S — MSD Sample Id: 640051-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.00169	2	0.00295	3	70-130	54	35	mg/kg	10.16.19 08:52	X
Toluene	<0.00200	0.0998	<0.00200	0	<0.00200	0	70-130	NC	35	mg/kg	10.16.19 08:52	X
Ethylbenzene	<0.00200	0.0998	0.0466	47	0.00227	2	70-130	181	35	mg/kg	10.16.19 08:52	X
m,p-Xylenes	<0.00399	0.200	0.0782	39	0.00468	2	70-130	177	35	mg/kg	10.16.19 08:52	X
o-Xylene	<0.00200	0.0998	0.0104	10	<0.00200	0	70-130	200	35	mg/kg	10.16.19 08:52	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	82		82		70-130	%	10.16.19 08:52
4-Bromofluorobenzene	107		80		70-130	%	10.16.19 08:52

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

Chain of Custody

Work Order No: 639851

XENCO LABORATORIES

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296
Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000)

www.xenco.com Page 1 of 1

Project Manager:	Dan Moir	Bill to: (if different)	Kyle Littrell
Company Name:	LT Environmental, Inc., Permian office	Company Name:	XTO Energy
Address:	3300 North A Street	Address:	
City, State ZIP:	Midland, Tx 79705	City, State ZIP:	
Phone:	(432) 236-3849	Email:	wmather@ltenv.com, dmoir@ltenv.com

Work Order Comments

Program: UST/PST ☐ RP ☐ Brownfields ☐ RC ☐ Superfund ☐
State of Project:
Reporting: Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

Project Name:	Wolverine SWD Pump	Turn Around	
Project Number:	012919236	Routine	☑
P.O. Number:	Eddy County	Rush:	
Sampler's Name:	William Mather	Due Date:	

SAMPLE RECEIPT				
Temp Blank:	(Yes) No	Wet Ice:	(Yes) No	
Temperature (°C):	1.8	Thermometer ID		
Received Intact:	(Yes) No	T-NM-007		
Cooler Custody Seals:	Yes (No) N/A	Correction Factor:	-0.2	
Sample Custody Seals:	Yes (No) N/A	Total Containers:	3	

ANALYSIS REQUEST

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	TPH (EPA 8015)	BTEX (EPA 0=8021)	Chloride (EPA 300.0)	Sample Comments
SS01	s	10/14/2019	13:49	0.5	1	x	x	x	discrete
SS02	s	10/14/2019	13:50	0.5	1	x	x	x	discrete
SS03	s	10/14/2019	13:51	0.5	1	x	x	x	discrete
		10/11/19 WM							

Work Order Notes

TAT starts the day recevied by the lab, if received by 4:30pm

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn
Circle Method(s) and Metal(s) to be analyzed **TCLP / SPLP 6010**: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U **1631 / 245.1 / 7470 / 7471** : Hg

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1		10/14/19 0950	2		
3			4		
5			6		

Revised Date 051418 Rev. 2018.1

Inter-Office Shipment

IOS Number **50001**

Date/Time: 10/14/19 12:58
Lab# From: **Carlsbad**
Lab# To: **Midland**

Created by: Elizabeth Mcclellan
Delivery Priority:
Air Bill No.: 776713829817

Please send report to: Jessica Kramer
Address: 1089 N Canal Street
E-Mail: jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
639851-001	S	SS01	10/11/19 13:49	SW8021B	BTEX by EPA 8021B	10/18/19	10/25/19	JKR	BR4FBZ BZ BZME EBZ X	
639851-001	S	SS01	10/11/19 13:49	SW8015MOD_NM	TPH by SW8015 Mod	10/18/19	10/25/19	JKR	GRO-DRO PHCC10C28 PH	
639851-001	S	SS01	10/11/19 13:49	E300_CL	Chloride by EPA 300	10/18/19	04/08/20	JKR	CL	
639851-002	S	SS02	10/11/19 13:50	SW8015MOD_NM	TPH by SW8015 Mod	10/18/19	10/25/19	JKR	GRO-DRO PHCC10C28 PH	
639851-002	S	SS02	10/11/19 13:50	SW8021B	BTEX by EPA 8021B	10/18/19	10/25/19	JKR	BR4FBZ BZ BZME EBZ X	
639851-002	S	SS02	10/11/19 13:50	E300_CL	Chloride by EPA 300	10/18/19	04/08/20	JKR	CL	
639851-003	S	SS03	10/11/19 13:51	SW8015MOD_NM	TPH by SW8015 Mod	10/18/19	10/25/19	JKR	GRO-DRO PHCC10C28 PH	
639851-003	S	SS03	10/11/19 13:51	SW8021B	BTEX by EPA 8021B	10/18/19	10/25/19	JKR	BR4FBZ BZ BZME EBZ X	
639851-003	S	SS03	10/11/19 13:51	E300_CL	Chloride by EPA 300	10/18/19	04/08/20	JKR	CL	

Inter Office Shipment or Sample Comments:

Relinquished By: Elizabeth McClellan

Date Relinquished: 10/14/2019

Received By: Brianna Teel

Date Received: 10/15/2019 10:56

Cooler Temperature: 0.3

XENCO Laboratories

Inter Office Report- Sample Receipt Checklist

Sent To: Midland

IOS #: 50001

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient
Temperature Measuring device used : R8

Sent By: Elizabeth McClellan **Date Sent:** 10/14/2019 12:58 PM

Received By: Brianna Teel **Date Received:** 10/15/2019 10:56 AM

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	.3	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received with appropriate temperature?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**	
#5 *Custody Seals Signed and dated for Containers/coolers	**Yes**	
#6 *IOS present?	**Yes**	
#7 Any missing/extra samples?	**No**	
#8 IOS agrees with sample label(s)/matrix?	**Yes**	
#9 Sample matrix/ properties agree with IOS?	**Yes**	
#10 Samples in proper container/ bottle?	**Yes**	
#11 Samples properly preserved?	**Yes**	
#12 Sample container(s) intact?	**Yes**	
#13 Sufficient sample amount for indicated test(s)?	**Yes**	
#14 All samples received within hold time?	**Yes**	

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

NonConformance:

Corrective Action Taken:

Nonconformance Documentation

Contact: _____ **Contacted by :** _____ **Date:** _____

Checklist reviewed by: Brianna Teel Date: 10/15/2019

Brianna Teel

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 10/14/2019 09:50:00 AM

Work Order #: 639851

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

Temperature Measuring device used : T-NM-007

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	1.8	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received on ice?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**	
#5 Custody Seals intact on sample bottles?	**N/A**	
#6*Custody Seals Signed and dated?	**N/A**	
#7 *Chain of Custody present?	**Yes**	
#8 Any missing/extra samples?	**No**	
#9 Chain of Custody signed when relinquished/ received?	**Yes**	
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**	
#11 Container label(s) legible and intact?	**Yes**	
#12 Samples in proper container/ bottle?	**Yes**	
#13 Samples properly preserved?	**Yes**	
#14 Sample container(s) intact?	**Yes**	
#15 Sufficient sample amount for indicated test(s)?	**Yes**	
#16 All samples received within hold time?	**Yes**	
#17 Subcontract of sample(s)?	**Yes**	Subbed to Midland
#18 Water VOC samples have zero headspace?	**N/A**	

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

Analyst: PH Device/Lot#:

Checklist completed by: Elizabeth McClellan Date: 10/14/2019

Checklist reviewed by: Jessica Kramer Date: 10/15/2019

Analytical Report 646678

for

LT Environmental, Inc.

Project Manager: Dan Moir

Wolverine SWD Pump

2RP-5676

18-DEC-19

Collected By: Client

1089 N Canal Street
Carlsbad, NM 88220

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

18-DEC-19

Project Manager: **Dan Moir**
LT Environmental, Inc.
4600 W. 60th Avenue
Arvada, CO 80003

Reference: XENCO Report No(s): **646678**
Wolverine SWD Pump
Project Address: Eddy County

Dan Moir:

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) 646678. 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. 646678 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,

Jessica Kramer

Jessica Kramer
Project Assistant

Sample Cross Reference 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH01	S	12-17-19 11:45	2 ft	646678-001
PH01	S	12-17-19 11:55	2 ft	646678-002
PH02	S	12-17-19 12:15	2 ft	646678-003

CASE NARRATIVE

Client Name: LT Environmental, Inc.

Project Name: Wolverine SWD Pump

Project ID:	*2RP-5676*	Report Date:	*18-DEC-19*
Work Order Number(s):	*646678*	Date Received:	*12/17/2019*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3110868 BTEX by EPA 8021B

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

Certificate of Analysis Summary 646678

LT Environmental, Inc., Arvada, CO

Project Name: Wolverine SWD Pump

Project Id: 2RP-5676
Contact: Dan Moir
Project Location: Eddy County

Date Received in Lab: Tue Dec-17-19 02:45 pm
Report Date: 18-DEC-19
Project Manager: Jessica Kramer

Analysis Requested											
	Lab Id:	646678-001		646678-002		646678-003					
	Field Id:	BH01		PH01		PH02					
	Depth:	2- ft		2- ft		2- ft					
	Matrix:	SOIL		SOIL		SOIL					
	Sampled:	Dec-17-19 11:45		Dec-17-19 11:55		Dec-17-19 12:15					
BTEX by EPA 8021B	*Extracted:*	Dec-17-19 17:57		Dec-17-19 17:57		Dec-17-19 17:57					
	Analyzed:	Dec-18-19 03:02		Dec-18-19 03:21		Dec-18-19 03:40					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Benzene		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
Toluene		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
Ethylbenzene		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
m,p-Xylenes		<0.00399	0.00399	<0.00403	0.00403	<0.00402	0.00402				
o-Xylene		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
Total Xylenes		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
Total BTEX		<0.00200	0.00200	<0.00202	0.00202	<0.00201	0.00201				
Chloride by EPA 300	*Extracted:*	Dec-17-19 17:59		Dec-17-19 17:59		Dec-17-19 17:59					
	Analyzed:	Dec-17-19 21:40		Dec-17-19 21:47		Dec-17-19 21:53					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		250	10.0	116	9.98	333	9.96				
TPH by SW8015 Mod	*Extracted:*	Dec-17-19 17:00		Dec-17-19 17:00		Dec-17-19 17:00					
	Analyzed:	Dec-17-19 20:12		Dec-17-19 20:12		Dec-17-19 20:31					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)		<50.3	50.3	<50.2	50.2	<50.1	50.1				
Diesel Range Organics (DRO)		<50.3	50.3	<50.2	50.2	<50.1	50.1				
Motor Oil Range Hydrocarbons (MRO)		<50.3	50.3	<50.2	50.2	<50.1	50.1				
Total GRO-DRO		<50.3	50.3	<50.2	50.2	<50.1	50.1				
Total TPH		<50.3	50.3	<50.2	50.2	<50.1	50.1				

Jessica Kramer
Project Assistant

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**BH01**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-001	Date Collected:	12.17.19 11.45	Sample Depth:	2 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.59	Basis:	Wet Weight
Seq Number:	3110875				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**250**	10.0	mg/kg	12.17.19 21.40		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DTH			% Moisture:	
Analyst:	DTH	Date Prep:	12.17.19 17.00	Basis:	Wet Weight
Seq Number:	3110877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	12.17.19 20.12	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	12.17.19 20.12	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	12.17.19 20.12	U	1
Total GRO-DRO	PHC628	<50.3	50.3	mg/kg	12.17.19 20.12	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	12.17.19 20.12	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	115	%	70-135	12.17.19 20.12	
o-Terphenyl	84-15-1	126	%	70-135	12.17.19 20.12	

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**BH01**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-001	Date Collected:	12.17.19 11.45	Sample Depth:	2 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.57	Basis:	Wet Weight
Seq Number:	3110868				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	12.18.19 03.02	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.18.19 03.02	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.18.19 03.02	
4-Bromofluorobenzene	460-00-4	125	%	70-130	12.18.19 03.02	

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**PH01**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-002	Date Collected:	12.17.19 11.55	Sample Depth:	2 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.59	Basis:	Wet Weight
Seq Number:	3110875				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**116**	9.98	mg/kg	12.17.19 21.47		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DTH			% Moisture:	
Analyst:	DTH	Date Prep:	12.17.19 17.00	Basis:	Wet Weight
Seq Number:	3110877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	12.17.19 20.12	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	12.17.19 20.12	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	12.17.19 20.12	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	12.17.19 20.12	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	12.17.19 20.12	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	116	%	70-135	12.17.19 20.12	
o-Terphenyl	84-15-1	121	%	70-135	12.17.19 20.12	

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**PH01**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-002	Date Collected:	12.17.19 11.55	Sample Depth:	2 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.57	Basis:	Wet Weight
Seq Number:	3110868				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1
m,p-Xylenes	179601-23-1	<0.00403	0.00403	mg/kg	12.18.19 03.21	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1
Total BTEX		<0.00202	0.00202	mg/kg	12.18.19 03.21	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.18.19 03.21	
4-Bromofluorobenzene	460-00-4	123	%	70-130	12.18.19 03.21	

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**PH02**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-003	Date Collected:	12.17.19 12.15	Sample Depth:	2 ft

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.59	Basis:	Wet Weight
Seq Number:	3110875				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**333**	9.96	mg/kg	12.17.19 21.53		1

Analytical Method:	TPH by SW8015 Mod			Prep Method:	SW8015P
Tech:	DTH			% Moisture:	
Analyst:	DTH	Date Prep:	12.17.19 17.00	Basis:	Wet Weight
Seq Number:	3110877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	12.17.19 20.31	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	12.17.19 20.31	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	12.17.19 20.31	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	12.17.19 20.31	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	12.17.19 20.31	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	117	%	70-135	12.17.19 20.31	
o-Terphenyl	84-15-1	126	%	70-135	12.17.19 20.31	

Certificate of Analytical Results 646678

LT Environmental, Inc., Arvada, CO

Wolverine SWD Pump

Sample Id:	**PH02**	Matrix:	Soil	Date Received:	12.17.19 14.45
Lab Sample Id:	646678-003	Date Collected:	12.17.19 12.15	Sample Depth:	2 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	12.17.19 17.57	Basis:	Wet Weight
Seq Number:	3110868				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	12.18.19 03.40	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1
Total BTEX		<0.00201	0.00201	mg/kg	12.18.19 03.40	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	98	%	70-130	12.18.19 03.40	
4-Bromofluorobenzene	460-00-4	115	%	70-130	12.18.19 03.40	

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

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

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

+ NELAC certification not offered for this compound.

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

QC Summary 646678

LT Environmental, Inc.

Wolverine SWD Pump

Analytical Method: Chloride by EPA 300 Prep Method: E300P
Seq Number: 3110875 Matrix: Solid Date Prep: 12.17.19
MB Sample Id: 7692671-1-BLK LCS Sample Id: 7692671-1-BKS LCSD Sample Id: 7692671-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	250	268	107	268	107	90-110	0	20	mg/kg	12.17.19 21:03	

Analytical Method: Chloride by EPA 300 Prep Method: E300P
Seq Number: 3110875 Matrix: Soil Date Prep: 12.17.19
Parent Sample Id: 646666-001 MS Sample Id: 646666-001 S MSD Sample Id: 646666-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1.76	202	214	105	214	106	90-110	0	20	mg/kg	12.17.19 21:22	

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
Seq Number: 3110877 Matrix: Solid Date Prep: 12.17.19
MB Sample Id: 7692669-1-BLK LCS Sample Id: 7692669-1-BKS LCSD Sample Id: 7692669-1-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)	<50.0	1000	1110	111	1130	113	70-135	2	35	mg/kg	12.17.19 15:55	
Diesel Range Organics (DRO)	<50.0	1000	1210	121	1190	119	70-135	2	35	mg/kg	12.17.19 15:55	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	120		129		129		70-135	%	12.17.19 15:55
o-Terphenyl	130		130		132		70-135	%	12.17.19 15:55

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
Seq Number: 3110877 Matrix: Solid Date Prep: 12.17.19
MB Sample Id: 7692669-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	12.17.19 15:55	

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

QC Summary 646678

LT Environmental, Inc.

Wolverine SWD Pump

Analytical Method: TPH by SW8015 Mod — Prep Method: SW8015P
Seq Number: 3110877 — Matrix: Soil — Date Prep: 12.17.19
Parent Sample Id: 646590-006 — MS Sample Id: 646590-006 S — MSD Sample Id: 646590-006 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)	<50.1	1000	1030	103	858	86	70-135	18	35	mg/kg	12.17.19 16:35	
Diesel Range Organics (DRO)	<50.1	1000	890	89	759	76	70-135	16	35	mg/kg	12.17.19 16:35	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	109		100		70-135	%	12.17.19 16:35
o-Terphenyl	109		97		70-135	%	12.17.19 16:35

Analytical Method: BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3110868 — Matrix: Solid — Date Prep: 12.17.19
MB Sample Id: 7692670-1-BLK — LCS Sample Id: 7692670-1-BKS — LCSD Sample Id: 7692670-1-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	0.0829	83	0.0904	90	70-130	9	35	mg/kg	12.18.19 00:03	
Toluene	<0.00200	0.100	0.0831	83	0.0908	91	70-130	9	35	mg/kg	12.18.19 00:03	
Ethylbenzene	<0.00200	0.100	0.0809	81	0.0884	88	71-129	9	35	mg/kg	12.18.19 00:03	
m,p-Xylenes	<0.00400	0.200	0.170	85	0.186	93	70-135	9	35	mg/kg	12.18.19 00:03	
o-Xylene	<0.00200	0.100	0.0871	87	0.0956	96	71-133	9	35	mg/kg	12.18.19 00:03	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		103		103		70-130	%	12.18.19 00:03
4-Bromofluorobenzene	110		116		116		70-130	%	12.18.19 00:03

Analytical Method: BTEX by EPA 8021B — Prep Method: SW5030B
Seq Number: 3110868 — Matrix: Soil — Date Prep: 12.17.19
Parent Sample Id: 646679-001 — MS Sample Id: 646679-001 S — MSD Sample Id: 646679-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0861	86	0.0865	86	70-130	0	35	mg/kg	12.18.19 01:19	
Toluene	<0.00200	0.100	0.0883	88	0.0899	89	70-130	2	35	mg/kg	12.18.19 01:19	
Ethylbenzene	<0.00200	0.100	0.0872	87	0.0892	88	71-129	2	35	mg/kg	12.18.19 01:19	
m,p-Xylenes	<0.00401	0.200	0.183	92	0.188	93	70-135	3	35	mg/kg	12.18.19 01:19	
o-Xylene	<0.00200	0.100	0.0947	95	0.0962	95	71-133	2	35	mg/kg	12.18.19 01:19	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		104		70-130	%	12.18.19 01:19
4-Bromofluorobenzene	122		126		70-130	%	12.18.19 01:19

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

Chain of Custody

XENCO LABORATORIES

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296
Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000)

Work Order No: 646678

www.xenco.com Page 1 of 1

Project Manager:	Dan Moir	Bill to: (if different)	Kyle Littrell
Company Name:	LT Environmental, Inc., Permian office	Company Name:	XTO Energy
Address:	3300 North A Street	Address:	
City, State ZIP:	Midland, Tx 79705	City, State ZIP:	
Phone:	(432) 236-3849	Email:	enaka@ltenv.com, dmoir@ltenv.com

Work Order Comments

Program: UST/PST ☐ RP ☐ Brownfields ☐ RC ☐ Superfund ☐
State of Project:
Reporting: Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

Project Name:	Wolverine SWD Pump	Turn Around	
Project Number:	2RP-5676	Routine ☐	
P.O. Number:	Eddy County	Rush: 24 hour	
Sampler's Name:	Elizabeth Naka	Due Date:	

SAMPLE RECEIPT				
Temp Blank:	Yes (No)	Wet Ice:	Yes (No)	
Temperature (°C):	1.4	Thermometer ID		
Received Intact:	(Yes) No	T-NM-007		
Cooler Custody Seals:	Yes No (N/A)	Correction Factor:	-0.2	
Sample Custody Seals:	Yes No (N/A)	Total Containers:	3	

ANALYSIS REQUEST

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	TPH (EPA 8015)	BTEX (EPA 0=8021)	Chloride (EPA 300.0)
BH01	S	12/17/19	1145	2'	1	X	X	X
PH01	↓	↓	1155	↓	↓	↓	↓	↓
PH02	↓	↓	1215	↓	↓	↓	↓	↓

Work Order Notes

TAT starts the day recevied by the lab, if received by 4:30pm

Sample Comments

discrete
↓

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed **TCLP / SPLP 6010**: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U **1631 / 245.1 / 7470 / 7471** : Hg

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1		12/17/19 14:45	2		
3			4		
5			6		

Revised Date 051418 Rev. 2018.1

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 12/17/2019 02:45:00 PM

Work Order #: 646678

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

Temperature Measuring device used : T-NM-007

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	1.6
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6*Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

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

Analyst: PH Device/Lot#:

Checklist completed by: Elizabeth McClellan Date: 12/17/2019

Checklist reviewed by: Jessica Kramer Date: 12/18/2019