

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	nRM1932350962
District RP	2RP-5704
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 32.188695 Longitude -103.829938
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	PLU 89	Site Type	Pipeline Riser
Date Release Discovered	10/08/2019	API# (if applicable)	30-015-27787 PLU 89

Unit Letter	Section	Township	Range	County
G	25	24S	30E	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) 7.04	Volume Recovered (bbls) 6.60
☒ Produced Water	Volume Released (bbls) 1401.2	Volume Recovered (bbls) 1313.4
	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)

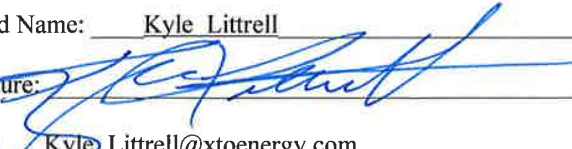
Cause of Release: While excavating for future manifold replacement, an 8" SWD transfer line was hit. Additional third party resources have been retained to assist in the remediation.

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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? An unauthorized release of fluid over 25 barrels.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? YES, by Adrian Baker: to 'Mike Bratcher'; 'Venegas, Victoria, EMNRD'; 'Rob Hamlet'; 'Jim.Griswold@state.nm.us'; 'blm_nm_cfo_spill@blm.gov' on 10/9/19 at 8:49am.	

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 <u>not</u> 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: <u>Kyle Littrell</u>	Title: <u>SH&E Supervisor</u>
Signature: 	Date: <u>10/22/2019</u>
email: <u>Kyle.Littrell@xtoenergy.com</u>	Telephone: _____
<u>OCD Only</u>	
Received by: _____	Date: _____

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Oil Conservation Division

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

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>>100</u> (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.

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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 SupervisorSignature:  Date: 01/06/2020email: Kyle_Littrell@xtoenergy.com Telephone: (432)-221-7331**OCD Only**

Received by: _____ Date: _____

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Remediation Plan

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

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

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

Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

- ☒ Extents of contamination must be fully delineated.
- ☒ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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 Coordinator _____

Signature: _____  _____ Date: 01/06/2020 _____

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

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____



LT Environmental, Inc.

3300 North "A" Street
Building 1, Unit 222
Midland, Texas 79705
432.704.5178

January 6, 2020

Mr. Mike Bratcher
New Mexico Oil Conservation Division
811 South First Street
Artesia, New Mexico 88210**RE: Closure Request
Poker Lake Unit 89
Remediation Permit Number 2RP-5704
Incident Number nRM1932350962
Eddy County, New Mexico**

Dear Mr. Bratcher:

LT Environmental, Inc. (LTE), on behalf of XTO Energy, Inc. (XTO), presents the following Closure Request detailing soil sampling and excavation activities at the Poker Lake Unit 89 (Site) in Unit G, Section 25, Township 24 South, Range 30 East, in Eddy County, New Mexico (Figure 1). The purpose of the soil sampling and excavation activities was to address impacts to soil after a crude oil and produced water release at the Site.

On October 8, 2019, an eight-inch transfer line was struck while excavating for equipment upgrades, causing a crude oil and produced water release in the excavation area and along the pipeline right of way (ROW). Approximately 7.04 barrels (bbls) of crude oil and 1,401.2 bbls of produced water were released from the eight-inch transfer line. A vacuum truck was used to recover approximately 6.6 bbls of crude oil and approximately 1,313.4 bbls of produced water. XTO reported the release to the New Mexico Oil Conservation Division (NMOCD) on a Release Notification and Corrective Action Form C-141 on October 22, 2019 and was assigned Remediation Permit (RP) Number 2RP-5704 and Incident Number (IN) of nRM1932350962. Based on the excavation activities and results from the soil confirmation and delineation sampling activities conducted to date, XTO is submitting this Closure Request and asking for no further action (NFA) for RP Number 2RP-5704.

BACKGROUND

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 depth to groundwater data from the nearest groundwater well. The nearest permitted groundwater well with depth to groundwater data is New Mexico Office of State Engineers (NMOSE) well C 02110 located approximately 1.55 miles northwest of the Site. Although, NMOSE wells C 03558 are closer to the Site, these wells were not used because depth



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to groundwater data was not available. The groundwater well has a depth to groundwater of 400 feet bgs. The total depth of the groundwater well is 600 feet bgs. Ground surface elevation at the groundwater well location is 3,412 feet, which is 29 feet lower in elevation than the Site. The closest continuously flowing water or significant watercourse to the Site is a freshwater emergent wetland located approximately 7,288 feet northwest of the Site. 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, or church. The nearest wetland is greater than 300 feet from the Site. 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. The Site Receptors are depicted on Figure 1.

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

PRELIMINARY SOIL SAMPLING

On October 14, 2019, LTE conducted reconnaissance of the Site to evaluate the release extent and collect preliminary soil samples. Surface hydrocarbon staining was observed in the release area and along the northeast to southwest trending pipeline ROW. The release extent was mapped using a handheld Global Positioning System (GPS) unit and is depicted on Figure 2. LTE personnel collected preliminary soil samples SS01 through SS07 within the release at a depth of approximately 0.5 feet bgs to assess the lateral extent of soil impacts. The discrete samples were collected using hand-auger equipment. The soil samples were screened for volatile aromatic hydrocarbons and chlorides using a photo-ionization detector (PID) and Hach® chloride QuanTab® test strips. The soil samples were placed directly into pre-cleaned glass jars, labeled with location, date, time, sampler, and method of analysis, and immediately placed on ice. The samples were shipped to Xenco Laboratories (Xenco) in Carlsbad, New Mexico, at 4 degrees Celsius (°C) under strict chain-of-custody (COC) procedures for analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021B, TPH-GRO, TPH-DRO, and TPH-oil range organics (ORO) by EPA Method 8015M/D, and chloride by EPA Method 300.0. The preliminary



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soil sample locations are presented on Figure 2. A photographic log of the Site is included as Attachment 1.

Laboratory analytical results indicated that total BTEX, TPH-GRO, TPH-DRO, TPH, and/or chloride concentrations exceeded the Closure Criteria in preliminary soil samples SS06 and SS07. Preliminary soil samples SS06 and SS07 were collected immediately adjacent to the release point. The remaining preliminary soil sample concentrations were below the Closure Criteria. Based on the laboratory analytical results, borehole sampling was scheduled to delineate the lateral and vertical extent of impacted soil and direct excavation activities. Laboratory analytical results are presented on Figure 2 and summarized in Table 1, and the laboratory analytical report is included in Attachment 3.

EXCAVATION ACTIVITIES

Hydro-excavation activities were conducted between November 21 and December 11, 2019 to remove impacted soil identified through soil sampling. Hydro-excavation was conducted in the area adjacent to the release point, above the pipeline, and parallel to both sides of the pipeline. Hydro-excavation activities were conducted to the largest extent feasible.

To direct all excavation activities, LTE screened soil samples using a PID and Hach® chloride QuanTab® test strips. Following removal of impacted soil, LTE collected 5-point composite soil samples every 200 square feet from the sidewalls (SW01 through SW05) and floor (FS01 through FS05) of the excavation. The 5-point composite samples were collected by depositing 5 aliquots of soil into a 1-gallon, resealable plastic bag, and homogenizing the samples by thoroughly mixing. The excavation soil samples were collected, handled, and analyzed as described above and submitted to Xenco in Carlsbad, New Mexico. The excavation confirmation soil sample locations are presented on Figure 3.

The excavations measured a total of approximately 1,500 square feet in area. A total of approximately 222 cubic yards of soil were removed from the excavations. Impacted soil was transported and properly disposed of at the R360 Landfill Facility located in Carlsbad, New Mexico.

DELINEATION ACTIVITIES

Between November 21 and December 2, 2019, LTE conducted borehole sampling activities to further confirm the absence of impacted soil in the subsurface in the remaining portions of the release footprint. Boreholes BH04, BH03, BH05, BH06, and BH07 were advanced within the release area via hand-auger to a depth of approximately two feet bgs. These boreholes were advanced at preliminary soil sample locations SS01 through SS05, respectively to account for two samples at each delineation borehole. Soil from the boreholes was field screened using a PID and Hach® chloride QuanTab® test strips. The delineation soil samples were collected, handled, and



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analyzed as described above and submitted to Xenco in Carlsbad, New Mexico. The delineation soil sample locations and depths are depicted on Figure 4 and lithologic/soil sampling logs are included in Attachment 2.

ANALYTICAL RESULTS

Discrete preliminary soil samples SS01 through SS07 were collected from within the release extent. Laboratory analytical results indicated that total BTEX, TPH-GRO, TPH-DRO, TPH, and/or chloride concentrations exceeded the Closure Criteria in preliminary soil samples SS06 and SS07, which were collected at the release point. Laboratory analytical results of the remaining preliminary soil samples indicated compliance with Closure Criteria.

Excavation confirmation samples were collected following removal of soil from near preliminary soil samples SS06 and SS07. Laboratory analytical results from excavation confirmation samples indicated that sidewall (SW01 through SW05) and floor (FS01 through FS05) confirmation soil samples were below Closure Criteria.

Delineation samples collected from the subsurface beneath the previously collected preliminary samples to investigate the subsurface of the release footprint that had not been excavated indicated that all delineation soil samples were below Closure Criteria. Laboratory analytical results are presented on Figures 3 and 4 and summarized in Table 1, and the laboratory analytical reports are included in Attachment 3.

CONCLUSIONS

Approximately 7.04 barrels (bbls) of crude oil and 1,401.2 bbls of produced water was released from an October 8, 2019 transfer line strike; however, approximately 6.6 bbls of crude oil and approximately 1,313.4 bbls of produced water were recovered and returned to the system. Soil located above the pipeline was excavated prior to the October 8, 2019 line strike.

Initial assessment samples SS06 and SS07 exceeded Closure Criteria and approximately 222 cubic yards of soil were hydro excavated. Laboratory analytical results for floor (FS01 through FS05) and sidewall (SW01 through SW05) confirmation soil samples indicated benzene, BTEX, GRO and DRO, TPH, and chloride concentrations were compliant with the Closure Criteria. Final delineation soil samples SS01/BH07, SS02/BH06, SS03/BH03, SS04/BH05, and SS05/BH04 were collected from within the release extent and did not exceed Closure Criteria.

Based on the excavation activities and results from the soil confirmation and delineation sampling activities conducted, XTO is submitting this Closure Request and asking for NFA for RP Number 2RP-5704 for this October 8, 2019 release. XTO further request permission to backfill the excavation. The excavation is located within the pipeline ROW and will be restored to surface conditions prior to the release.



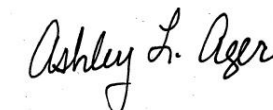
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If you have any questions or comments, please do not hesitate to contact Ms. Ashley Ager at (970) 385-1096.

Sincerely,
LT ENVIRONMENTAL, INC.



Kevin M. Axe, P.G.
Senior Geologist



Ashley L. Ager, P.G.
Senior Geologist

cc: Mr. Kyle Littrell, XTO
Mr. Robert Hamlet, NMOCD
Ms. Victoria Venegas, NMOCD
Bureau of Land Management

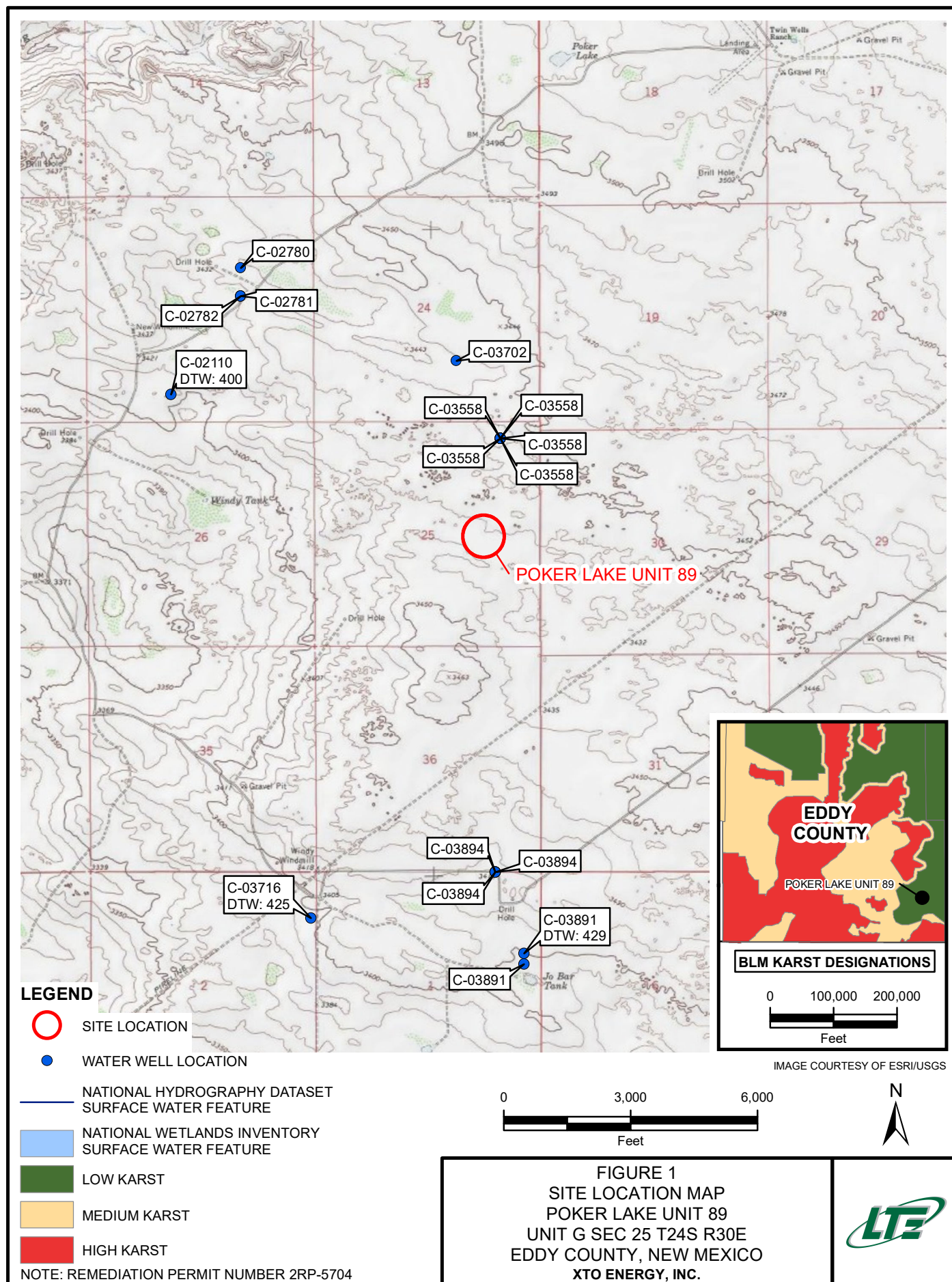
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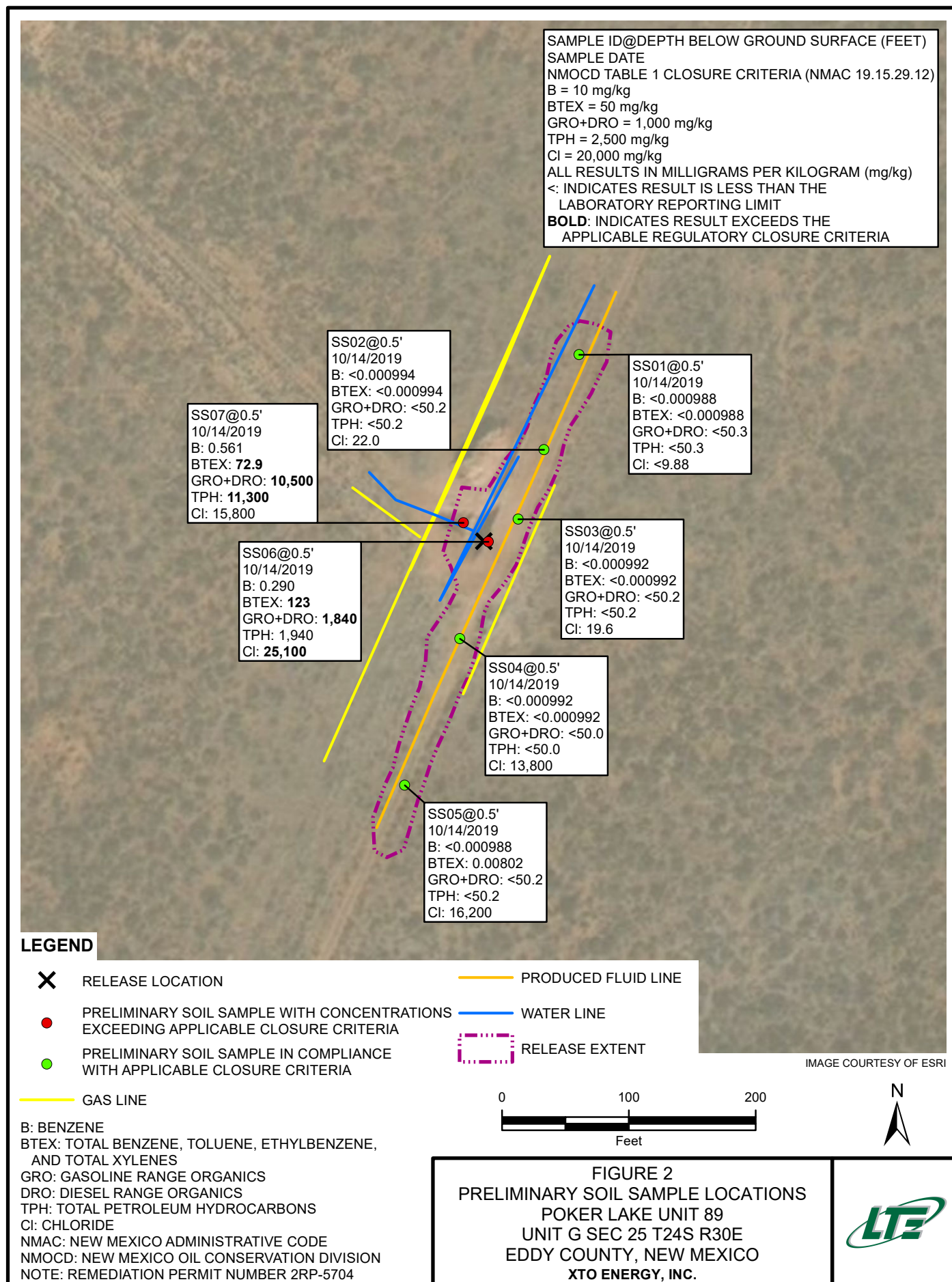
Figure 1 Site Location Map
Figure 2 Preliminary Soil Sample Locations
Figure 3 Excavation Soil Sample Locations
Figure 4 Delineation Soil Sample Locations
Figure 5 Soil Sample Locations
Table 1 Soil Analytical Results
Attachment 1 Photographic Log
Attachment 2 Lithologic/Soil Sampling Logs
Attachment 3 Laboratory Analytical Reports

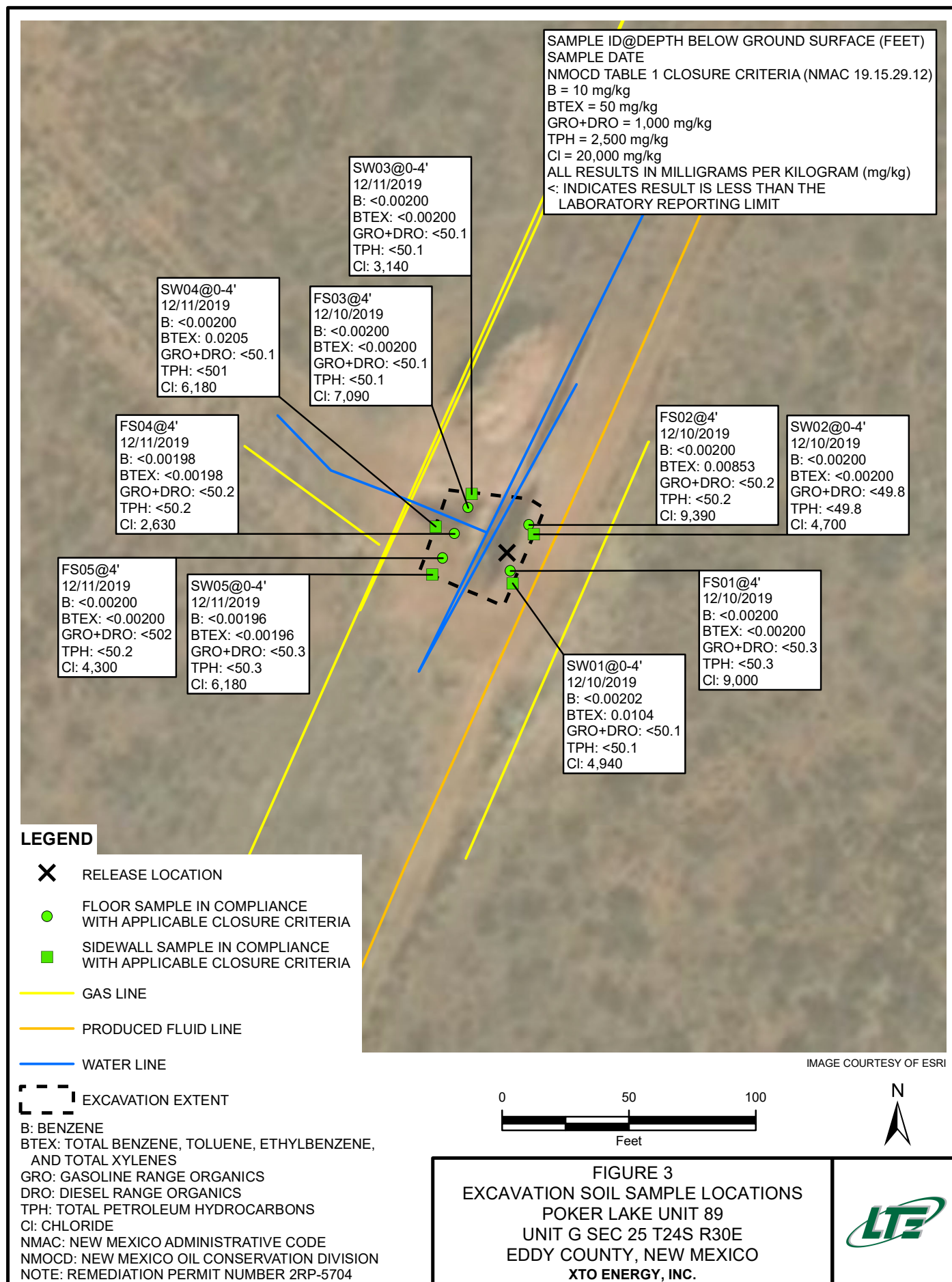


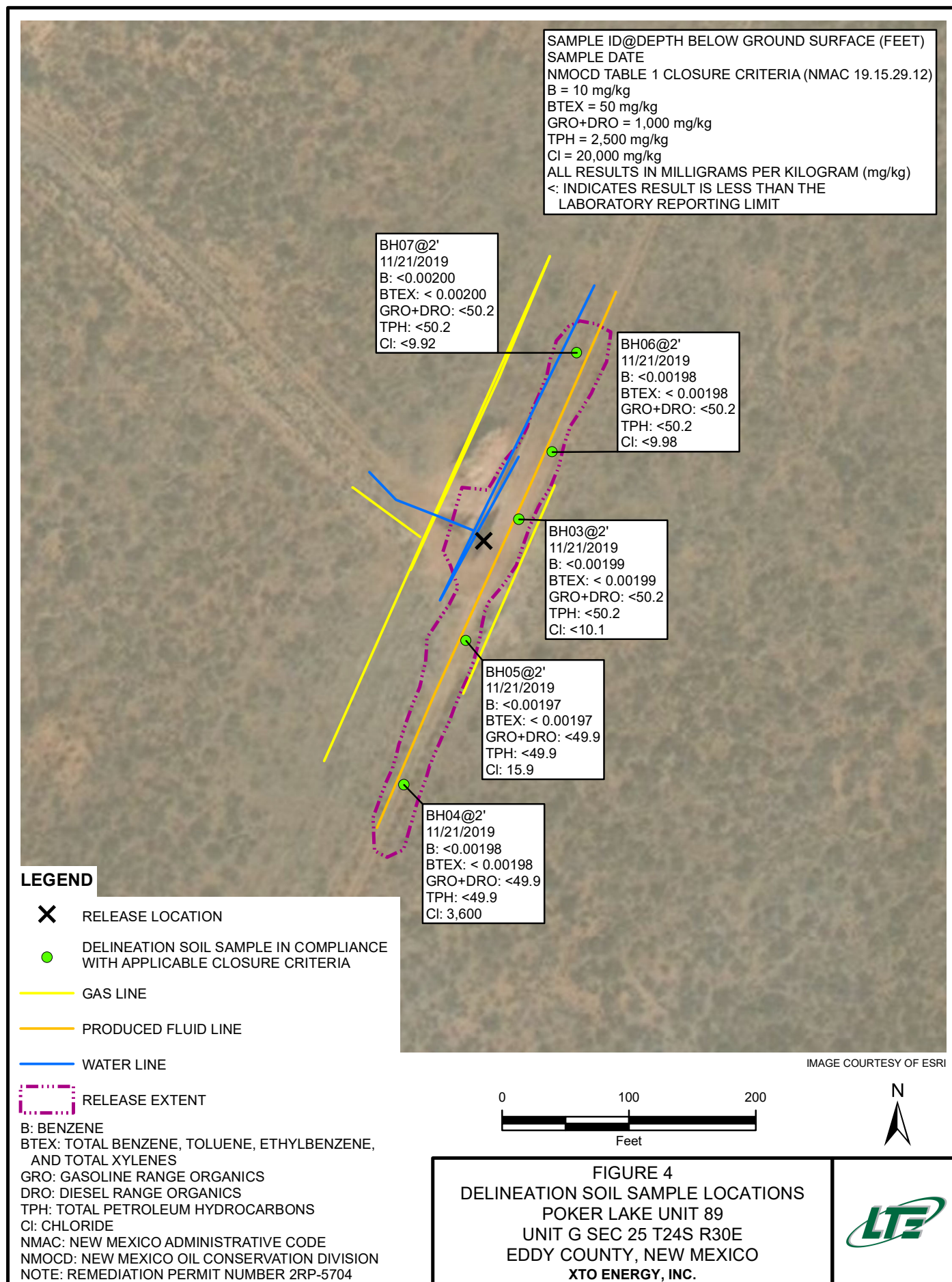
FIGURES

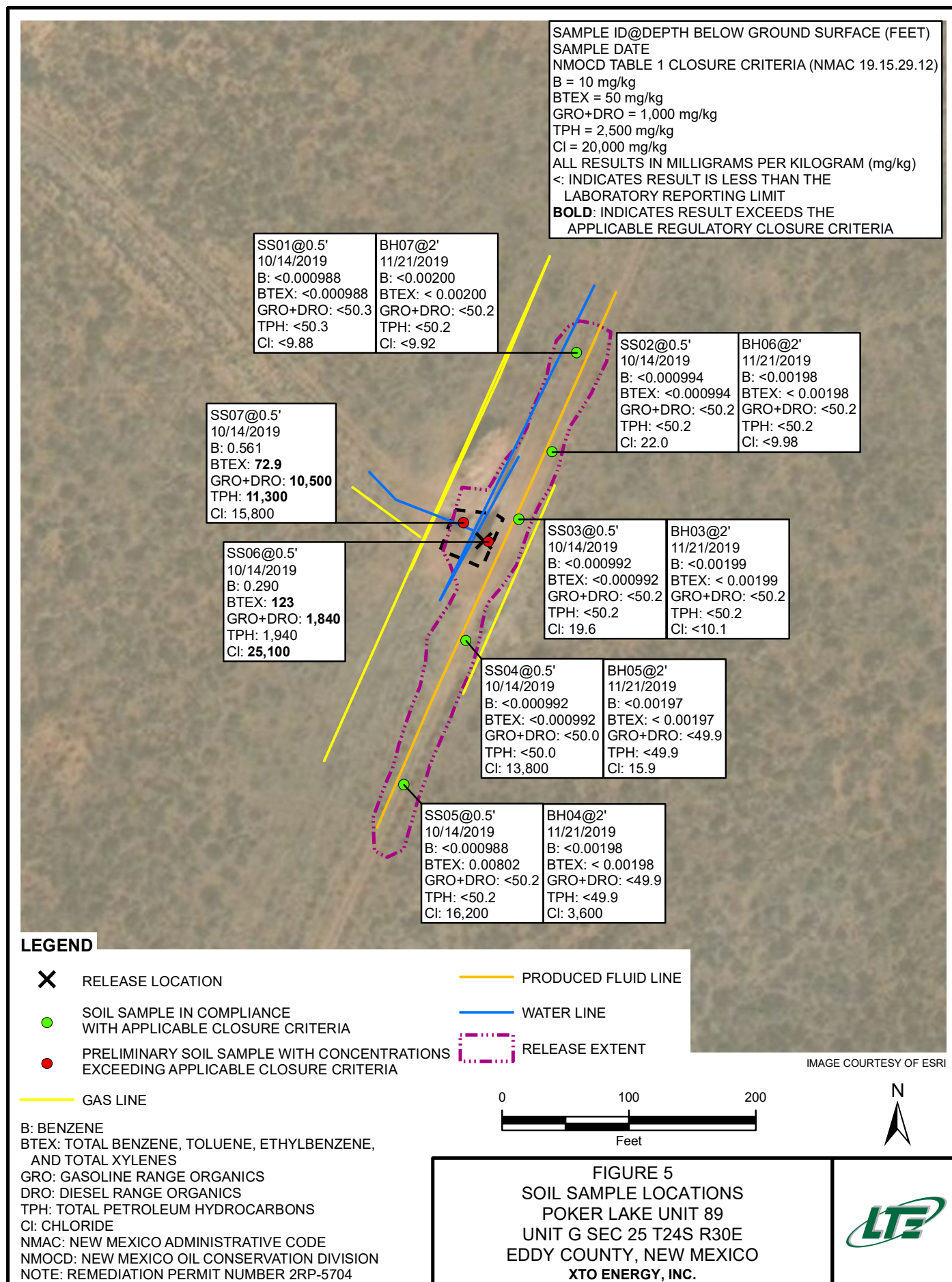












TABLES



**TABLE 1
SOIL ANALYTICAL RESULTS**

**POKER LAKE UNIT 89
REMEDIATION PERMIT NUMBER 2RP-5704
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)
NMOC Table 1 Closure Criteria			10	NE	NE	NE	50	NE	NE	NE	1,000	2,500	20,000
SS01	0.5	10/14/2019	<0.000988	<0.000988	<0.000988	<0.000988	<0.000988	<50.3	<50.3	<50.3	<50.3	<50.3	<9.88
SS02	0.5	10/14/2019	<0.000994	<0.000994	<0.000994	<0.000994	<0.000994	<50.2	<50.2	<50.2	<50.2	<50.2	22.0
SS03	0.5	10/14/2019	<0.000992	<0.000992	<0.000992	<0.000992	<0.000992	<50.2	<50.2	<50.2	<50.2	<50.2	19.6
SS04	0.5	10/14/2019	<0.000992	<0.000992	<0.000992	<0.000992	<0.000992	<50.0	<50.0	<50.0	<50.0	<50.0	13,800
SS05	0.5	10/14/2019	<0.000988	0.00265	0.00108	0.00429	0.00802	<50.2	<50.2	<50.2	<50.2	<50.2	16,200
SS06	0.5	10/14/2019	0.290	17.5	17.4	88.2	123	427	1,410	102	1,840	1,940	25,100
SS07	0.5	10/14/2019	0.561	14.8	7.28	50.3	72.9	1,530	8,930	794	10,500	11,300	15,800
BH03	2	11/21/2019	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<50.2	<50.2	<50.2	<50.2	<50.2	<10.1
BH04	2	11/21/2019	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<49.9	<49.9	<49.9	<49.9	<49.9	3,600
BH05	2	11/21/2019	<0.00197	<0.00197	<0.00197	<0.00197	<0.00197	<49.9	<49.9	<49.9	<49.9	<49.9	15.9
BH06	2	11/21/2019	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<50.2	<50.2	<50.2	<50.2	<50.2	<9.98
BH07	2	11/21/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.2	<50.2	<50.2	<50.2	<50.2	<9.92
SW01	0 - 4	12/10/2019	<0.00202	<0.00202	<0.00202	0.0104	0.0104	<50.1	<50.1	<50.1	<50.1	<50.1	4,940
SW02	0 - 4	12/10/2019	<0.00200	<0.00200	<0.00200	0.00727	0.00727	<49.8	<49.8	<49.8	<49.8	<49.8	4,700
SW03	0 - 4	12/11/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.1	<50.1	<50.1	<50.1	<50.1	3,140
SW04	0 - 4	12/11/2019	<0.00200	0.004	0.00224	0.0143	0.0205	<50.1	<50.1	<50.1	<50.1	<50.1	6,180
SW05	0 - 4	12/11/2019	<0.00196	<0.00196	<0.00196	<0.00196	<0.00196	<50.3	<50.3	<50.3	<50.3	<50.3	6,180
FS01	4	12/10/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.3	<50.3	<50.3	<50.3	<50.3	9,000
FS02	4	12/10/2019	<0.00200	<0.00200	<0.00200	0.00853	0.00853	<50.2	<50.2	<50.2	<50.2	<50.2	9,390
FS03	4	12/10/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.1	<50.1	<50.1	<50.1	<50.1	7,090
FS04	4	12/11/2019	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<50.2	<50.2	<50.2	<50.2	<50.2	2,630
FS05	4	12/11/2019	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.2	<50.2	<50.2	<50.2	<50.2	4,300

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

NMOC - 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: PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG



Photograph 1: East facing view of release point.



Photograph 2: East facing view of excavation surrounding release point.



Photograph 3: North facing view of excavation surrounding release point.



Photograph 4: Northwest facing view of final excavation.

ATTACHMENT 2: LITHOLOGIC SOIL SAMPLE LOGS



 LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance - Engineering - Remediation					Identifier: BH03		Date: 11/21/19		
					Project Name: PLU 89 SWP		RP Number: not assigned		
LITHOLOGIC / SOIL SAMPLING LOG									
Lat/Long:			Field Screening:			Logged By: Ellie		Method:	
						Hole Diameter:		Total Depth:	
Comments:									
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks	
1520	D	>112	0.0	N	1			sand, trace silt, brown	
					2	2ft	S		
					3				
					4				
					6				
					8				
					10				
					12				
					14				
					16				
					18				
					20				
					12				

 LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance · Engineering · Remediation		Identifier: BH04	Date: 11/21/19					
		Project Name: PLU 89 SWD	RP Number: not assigned					
LITHOLOGIC / SOIL SAMPLING LOG		Logged By: Ellie	Method:					
Lat/Long:		Field Screening:	Hole Diameter:					
Total Depth:								
Comments:								
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
					1			
					2	28+	S	sand, trace silt, brown
					3			
					4			
					6			
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					22			
					24			
					26			
					28			
					30			
					32			
					34			
					36			
					38			
					40			
					42			
					44			
					46			
					48			
					50			
					52			
					54			
					56			
					58			
					60			
					62			
					64			
					66			
					68			
					70			
					72			
					74			
					76			
					78			
					80			
					82			
					84			
					86			
					88			
					90			
					92			
					94			
					96			
					98			
					100			

1530

D

4,460

0.0

N

 LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance · Engineering · Remediation		Identifier: BH05	Date: 11/21/19					
		Project Name: PLU 89 SWD	RP Number: not assigned					
LITHOLOGIC / SOIL SAMPLING LOG								
Lat/Long:		Field Screening:	Logged By: ELI Method:					
		Hole Diameter:	Total Depth:					
Comments:								
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
					1			
					2	28+	S	sand, trace silt, brown
					3			
					4			
					6			
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					12			

1540

D

>112

0.1

N

 LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance · Engineering · Remediation		Identifier: BMB6	Date: 1/21/19					
		Project Name: PLU 89 SWD	RP Number: not assigned					
LITHOLOGIC / SOIL SAMPLING LOG		Logged By: Ellie	Method:					
Lat/Long:		Field Screening:	Hole Diameter:					
Total Depth:								
Comments:								
Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
					1			
16.5	9	>112	0.1	N	2	28ft	S	sand, trace calcite, brown to tan
					3			
					4			
					6			
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					12			

 LT Environmental, Inc. 508 West Stevens Street Carlsbad, New Mexico 88220 Compliance · Engineering · Remediation		Identifier: BM07	Date: 4/21/19
		Project Name: PLU 89 SWP	RP Number: not assigned
LITHOLOGIC / SOIL SAMPLING LOG		Logged By: Ellie	Method:
Lat/Long:		Field Screening:	Hole Diameter:
Total Depth:		Comments:	

Moisture Content	Chloride (ppm)	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Depth	Soil/Rock Type	Lithology/Remarks
					1			
					2	2ft	S	sand, trace silt, brown
					3			
					4			
					6			
					8			
					10			
					12			
					14			
					16			
					18			
					20			
					22			

1615

D

>12

0.0

N

ATTACHMENT 3 : LABORATORY ANALYTICAL REPORTS



Analytical Report 639886

**for
LT Environmental, Inc.**

Project Manager: Dan Moir

PLU 89 SWD Line

012919246

15-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)



15-OCT-19

Project Manager: **Dan Moir**

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, CO 80003

Reference: XENCO Report No(s): **639886**

PLU 89 SWD Line

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) 639886. 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. 639886 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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

**Sample Cross Reference 639886****LT Environmental, Inc., Arvada, CO**

PLU 89 SWD Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SS01	S	10-14-19 10:50	0.5 ft	639886-001
SS02	S	10-14-19 10:52	0.5 ft	639886-002
SS03	S	10-14-19 10:53	0.5 ft	639886-003
SS04	S	10-14-19 10:54	0.5 ft	639886-004
SS05	S	10-14-19 10:56	0.5 ft	639886-005
SS06	S	10-14-19 10:57	0.5 ft	639886-006
SS07	S	10-14-19 10:59	0.5 ft	639886-007



CASE NARRATIVE

Client Name: LT Environmental, Inc.

Project Name: PLU 89 SWD Line

Project ID: 012919246
Work Order Number(s): 639886

Report Date: 15-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-3104315 BTEX by EPA 8021B

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

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 639886-007,639886-006.

Batch: LBA-3104322 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 639886-007.



Certificate of Analysis Summary 639886

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89 SWD Line

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Mon Oct-14-19 01:56 pm

Report Date: 15-OCT-19

Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	639886-001	639886-002	639886-003	639886-004	639886-005	639886-006
	<i>Field Id:</i>	SS01	SS02	SS03	SS04	SS05	SS06
	<i>Depth:</i>	0.5- ft	0.5- ft	0.5- ft	0.5- ft	0.5- ft	0.5- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Oct-14-19 10:50	Oct-14-19 10:52	Oct-14-19 10:53	Oct-14-19 10:54	Oct-14-19 10:56	Oct-14-19 10:57
BTEX by EPA 8021B	<i>Extracted:</i>	Oct-14-19 16:10	Oct-14-19 16:10	Oct-14-19 16:10	Oct-14-19 16:10	Oct-14-19 16:10	Oct-14-19 16:10
	<i>Analyzed:</i>	Oct-14-19 20:10	Oct-14-19 20:29	Oct-14-19 20:48	Oct-14-19 21:07	Oct-14-19 21:26	Oct-14-19 21:45
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	<0.000988 0.000988	0.290 0.00495
Toluene		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	0.00265 0.000988	17.5 D 0.990
Ethylbenzene		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	0.00108 0.000988	17.4 D 0.990
m,p-Xylenes		<0.00198 0.00198	<0.00199 0.00199	<0.00198 0.00198	<0.00198 0.00198	0.00291 0.00198	61.5 D 1.98
o-Xylene		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	0.00138 0.000988	26.7 D 0.990
Total Xylenes		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	0.00429 0.000988	88.2 0.990
Total BTEX		<0.000988 0.000988	<0.000994 0.000994	<0.000992 0.000992	<0.000992 0.000992	0.00802 0.000988	123 0.00495
Chloride by EPA 300	<i>Extracted:</i>	Oct-14-19 18:10	Oct-14-19 18:10	Oct-14-19 18:10	Oct-14-19 18:10	Oct-14-19 18:10	Oct-14-19 18:10
	<i>Analyzed:</i>	Oct-14-19 19:59	Oct-14-19 20:05	Oct-14-19 20:12	Oct-14-19 20:18	Oct-14-19 20:24	Oct-14-19 20:31
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		<9.88 9.88	22.0 9.98	19.6 9.90	13800 499	16200 497	25100 992
TPH by SW8015 Mod	<i>Extracted:</i>	*** ** *	*** ** *	*** ** *	*** ** *	*** ** *	*** ** *
	<i>Analyzed:</i>	Oct-14-19 23:10	Oct-14-19 23:29	Oct-14-19 23:49	Oct-15-19 00:09	Oct-15-19 00:29	Oct-15-19 01:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.3 50.3	<50.2 50.2	<50.2 50.2	<50.0 50.0	<50.2 50.2	427 50.2
Diesel Range Organics (DRO)		<50.3 50.3	<50.2 50.2	<50.2 50.2	<50.0 50.0	<50.2 50.2	1410 50.2
Motor Oil Range Hydrocarbons (MRO)		<50.3 50.3	<50.2 50.2	<50.2 50.2	<50.0 50.0	<50.2 50.2	102 50.2
Total GRO-DRO		<50.3 50.3	<50.2 50.2	<50.2 50.2	<50.0 50.0	<50.2 50.2	1840 50.2
Total TPH		<50.3 50.3	<50.2 50.2	<50.2 50.2	<50.0 50.0	<50.2 50.2	1940 50.2

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

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Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 639886

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89 SWD Line

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Mon Oct-14-19 01:56 pm

Report Date: 15-OCT-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	639886-007					
	Field Id:	SS07					
	Depth:	0.5- ft					
	Matrix:	SOIL					
	Sampled:	Oct-14-19 10:59					
BTEX by EPA 8021B	Extracted:	Oct-14-19 16:10					
	Analyzed:	Oct-14-19 22:05					
	Units/RL:	mg/kg RL					
Benzene		0.561 0.0198					
Toluene		14.8 D 0.198					
Ethylbenzene		7.28 0.0198					
m,p-Xylenes		35.0 D 0.395					
o-Xylene		15.3 D 0.198					
Total Xylenes		50.3 0.198					
Total BTEX		72.9 0.0198					
Chloride by EPA 300	Extracted:	Oct-14-19 18:10					
	Analyzed:	Oct-14-19 20:37					
	Units/RL:	mg/kg RL					
Chloride		15800 496					
TPH by SW8015 Mod	Extracted:	*** ** ** **					
	Analyzed:	Oct-15-19 00:49					
	Units/RL:	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		1530 251					
Diesel Range Organics (DRO)		8930 251					
Motor Oil Range Hydrocarbons (MRO)		794 251					
Total GRO-DRO		10500 251					
Total TPH		11300 251					

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

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Version: 1.0%

Jessica Kramer
Project Assistant



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS01	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-001	Date Collected: 10.14.19 10.50	Sample Depth: 0.5 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 18.10	Basis: Wet Weight
Seq Number: 3104255		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<9.88	9.88	mg/kg	10.14.19 19.59	U	1

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3104322	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	10.14.19 23.10	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	10.14.19 23.10	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	10.14.19 23.10	U	1
Total GRO-DRO	PHC628	<50.3	50.3	mg/kg	10.14.19 23.10	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	10.14.19 23.10	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	10.14.19 23.10	
o-Terphenyl	84-15-1	83	%	70-135	10.14.19 23.10	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS01** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-001 Date Collected: 10.14.19 10.50 Sample Depth: 0.5 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 16.10 Basis: Wet Weight
 Seq Number: 3104315

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
Toluene	108-88-3	<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
Ethylbenzene	100-41-4	<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
m,p-Xylenes	179601-23-1	<0.00198	0.00198	mg/kg	10.14.19 20.10	U	1
o-Xylene	95-47-6	<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
Total Xylenes	1330-20-7	<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
Total BTEX		<0.000988	0.000988	mg/kg	10.14.19 20.10	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	113	%	70-130	10.14.19 20.10		
1,4-Difluorobenzene	540-36-3	104	%	70-130	10.14.19 20.10		



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS02** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-002 Date Collected: 10.14.19 10.52 Sample Depth: 0.5 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 18.10 Basis: Wet Weight
 Seq Number: 3104255

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	22.0	9.98	mg/kg	10.14.19 20.05		1

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 10.14.19 12.10 Basis: Wet Weight
 Seq Number: 3104322

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	10.14.19 23.29	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	10.14.19 23.29	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	10.14.19 23.29	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	10.14.19 23.29	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	10.14.19 23.29	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	81	%	70-135	10.14.19 23.29	
o-Terphenyl	84-15-1	76	%	70-135	10.14.19 23.29	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS02** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-002 Date Collected: 10.14.19 10.52 Sample Depth: 0.5 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 16.10 Basis: Wet Weight
 Seq Number: 3104315

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
Toluene	108-88-3	<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
Ethylbenzene	100-41-4	<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
m,p-Xylenes	179601-23-1	<0.00199	0.00199	mg/kg	10.14.19 20.29	U	1
o-Xylene	95-47-6	<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
Total Xylenes	1330-20-7	<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
Total BTEX		<0.000994	0.000994	mg/kg	10.14.19 20.29	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	106	%	70-130	10.14.19 20.29		
4-Bromofluorobenzene	460-00-4	112	%	70-130	10.14.19 20.29		



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS03	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-003	Date Collected: 10.14.19 10.53	Sample Depth: 0.5 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 18.10	Basis: Wet Weight
Seq Number: 3104255		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	19.6	9.90	mg/kg	10.14.19 20.12		1

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3104322	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	10.14.19 23.49	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	10.14.19 23.49	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	10.14.19 23.49	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	10.14.19 23.49	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	10.14.19 23.49	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	94	%	70-135	10.14.19 23.49	
o-Terphenyl	84-15-1	93	%	70-135	10.14.19 23.49	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS03	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-003	Date Collected: 10.14.19 10.53	Sample Depth: 0.5 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 16.10	Basis: Wet Weight
Seq Number: 3104315		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
Toluene	108-88-3	<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
Ethylbenzene	100-41-4	<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
m,p-Xylenes	179601-23-1	<0.00198	0.00198	mg/kg	10.14.19 20.48	U	1
o-Xylene	95-47-6	<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
Total Xylenes	1330-20-7	<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
Total BTEX		<0.000992	0.000992	mg/kg	10.14.19 20.48	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	119	%	70-130	10.14.19 20.48		
1,4-Difluorobenzene	540-36-3	105	%	70-130	10.14.19 20.48		



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS04** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-004 Date Collected: 10.14.19 10.54 Sample Depth: 0.5 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 18.10 Basis: Wet Weight
 Seq Number: 3104255

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	13800	499	mg/kg	10.14.19 20.18		50

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 10.14.19 12.10 Basis: Wet Weight
 Seq Number: 3104322

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	10.15.19 00.09	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	10.15.19 00.09	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.15.19 00.09	U	1
Total GRO-DRO	PHC628	<50.0	50.0	mg/kg	10.15.19 00.09	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.15.19 00.09	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	84	%	70-135	10.15.19 00.09	
o-Terphenyl	84-15-1	78	%	70-135	10.15.19 00.09	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS04	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-004	Date Collected: 10.14.19 10.54	Sample Depth: 0.5 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 16.10	Basis: Wet Weight
Seq Number: 3104315		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
Toluene	108-88-3	<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
Ethylbenzene	100-41-4	<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
m,p-Xylenes	179601-23-1	<0.00198	0.00198	mg/kg	10.14.19 21.07	U	1
o-Xylene	95-47-6	<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
Total Xylenes	1330-20-7	<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
Total BTEX		<0.000992	0.000992	mg/kg	10.14.19 21.07	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	105	%	70-130	10.14.19 21.07		
4-Bromofluorobenzene	460-00-4	117	%	70-130	10.14.19 21.07		



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS05	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-005	Date Collected: 10.14.19 10.56	Sample Depth: 0.5 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 18.10	Basis: Wet Weight
Seq Number: 3104255		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	16200	497	mg/kg	10.14.19 20.24		50

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3104322	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	10.15.19 00.29	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	10.15.19 00.29	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	10.15.19 00.29	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	10.15.19 00.29	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	10.15.19 00.29	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	90	%	70-135	10.15.19 00.29	
o-Terphenyl	84-15-1	89	%	70-135	10.15.19 00.29	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: SS05	Matrix: Soil	Date Received: 10.14.19 13.56
Lab Sample Id: 639886-005	Date Collected: 10.14.19 10.56	Sample Depth: 0.5 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 10.14.19 16.10	Basis: Wet Weight
Seq Number: 3104315		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.000988	0.000988	mg/kg	10.14.19 21.26	U	1
Toluene	108-88-3	0.00265	0.000988	mg/kg	10.14.19 21.26		1
Ethylbenzene	100-41-4	0.00108	0.000988	mg/kg	10.14.19 21.26		1
m,p-Xylenes	179601-23-1	0.00291	0.00198	mg/kg	10.14.19 21.26		1
o-Xylene	95-47-6	0.00138	0.000988	mg/kg	10.14.19 21.26		1
Total Xylenes	1330-20-7	0.00429	0.000988	mg/kg	10.14.19 21.26		1
Total BTEX		0.00802	0.000988	mg/kg	10.14.19 21.26		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	121	%	70-130	10.14.19 21.26		
1,4-Difluorobenzene	540-36-3	105	%	70-130	10.14.19 21.26		



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS06** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-006 Date Collected: 10.14.19 10.57 Sample Depth: 0.5 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 18.10 Basis: Wet Weight
 Seq Number: 3104255

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	25100	992	mg/kg	10.14.19 20.31		100

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 10.14.19 12.10 Basis: Wet Weight
 Seq Number: 3104322

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	427	50.2	mg/kg	10.15.19 01.28		1
Diesel Range Organics (DRO)	C10C28DRO	1410	50.2	mg/kg	10.15.19 01.28		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	102	50.2	mg/kg	10.15.19 01.28		1
Total GRO-DRO	PHC628	1840	50.2	mg/kg	10.15.19 01.28		1
Total TPH	PHC635	1940	50.2	mg/kg	10.15.19 01.28		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	96	%	70-135	10.15.19 01.28	
o-Terphenyl	84-15-1	88	%	70-135	10.15.19 01.28	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS06** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-006 Date Collected: 10.14.19 10.57 Sample Depth: 0.5 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 16.10 Basis: Wet Weight
 Seq Number: 3104315

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	0.290	0.00495	mg/kg	10.14.19 21.45		1
Toluene	108-88-3	17.5	0.990	mg/kg	10.15.19 10.30	D	200
Ethylbenzene	100-41-4	17.4	0.990	mg/kg	10.15.19 10.30	D	200
m,p-Xylenes	179601-23-1	61.5	1.98	mg/kg	10.15.19 10.30	D	200
o-Xylene	95-47-6	26.7	0.990	mg/kg	10.15.19 10.30	D	200
Total Xylenes	1330-20-7	88.2	0.990	mg/kg	10.15.19 10.30		200
Total BTEX		123	0.00495	mg/kg	10.15.19 10.30		200
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	89	%	70-130	10.14.19 21.45		
4-Bromofluorobenzene	460-00-4	470	%	70-130	10.14.19 21.45	**	



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS07** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-007 Date Collected: 10.14.19 10.59 Sample Depth: 0.5 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 18.10 Basis: Wet Weight
 Seq Number: 3104255

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	15800	496	mg/kg	10.14.19 20.37		50

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 10.14.19 12.10 Basis: Wet Weight
 Seq Number: 3104322

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	1530	251	mg/kg	10.15.19 00.49		5
Diesel Range Organics (DRO)	C10C28DRO	8930	251	mg/kg	10.15.19 00.49		5
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	794	251	mg/kg	10.15.19 00.49		5
Total GRO-DRO	PHC628	10500	251	mg/kg	10.15.19 00.49		5
Total TPH	PHC635	11300	251	mg/kg	10.15.19 00.49		5

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	116	%	70-135	10.15.19 00.49	
o-Terphenyl	84-15-1	152	%	70-135	10.15.19 00.49	**



Certificate of Analytical Results 639886

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **SS07** Matrix: Soil Date Received: 10.14.19 13.56
 Lab Sample Id: 639886-007 Date Collected: 10.14.19 10.59 Sample Depth: 0.5 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 10.14.19 16.10 Basis: Wet Weight
 Seq Number: 3104315

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	0.561	0.0198	mg/kg	10.14.19 22.05		20
Toluene	108-88-3	14.8	0.198	mg/kg	10.15.19 10.49	D	200
Ethylbenzene	100-41-4	7.28	0.0198	mg/kg	10.14.19 22.05		20
m,p-Xylenes	179601-23-1	35.0	0.395	mg/kg	10.15.19 10.49	D	200
o-Xylene	95-47-6	15.3	0.198	mg/kg	10.15.19 10.49	D	200
Total Xylenes	1330-20-7	50.3	0.198	mg/kg	10.15.19 10.49		200
Total BTEX		72.9	0.0198	mg/kg	10.15.19 10.49		200
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	104	%	70-130	10.14.19 22.05		
4-Bromofluorobenzene	460-00-4	168	%	70-130	10.14.19 22.05	**	



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 **SQL** Sample 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 639886

LT Environmental, Inc.

PLU 89 SWD Line

Analytical Method: Chloride by EPA 300

Seq Number: 3104255

MB Sample Id: 7688098-1-BLK

Matrix: Solid

LCS Sample Id: 7688098-1-BKS

Prep Method: E300P

Date Prep: 10.14.19

LCSD Sample Id: 7688098-1-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	300	299	100	302	101	90-110	1	20	mg/kg	10.14.19 18:27	

Analytical Method: Chloride by EPA 300

Seq Number: 3104255

Parent Sample Id: 639802-006

Matrix: Soil

MS Sample Id: 639802-006 S

Prep Method: E300P

Date Prep: 10.14.19

MSD Sample Id: 639802-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	21.4	200	256	117	254	116	90-110	1	20	mg/kg	10.14.19 19:20	X

Analytical Method: TPH by SW8015 Mod

Seq Number: 3104322

MB Sample Id: 7688113-1-BLK

Matrix: Solid

LCS Sample Id: 7688113-1-BKS

Prep Method: SW8015P

Date Prep: 10.14.19

LCSD Sample Id: 7688113-1-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	818	82	829	83	70-135	1	35	mg/kg	10.14.19 20:50	
Diesel Range Organics (DRO)	<50.0	1000	739	74	760	76	70-135	3	35	mg/kg	10.14.19 20:50	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	82		104		96		70-135	%	10.14.19 20:50
o-Terphenyl	85		93		94		70-135	%	10.14.19 20:50

Analytical Method: TPH by SW8015 Mod

Seq Number: 3104322

Matrix: Solid
MB Sample Id: 7688113-1-BLK

Prep Method: SW8015P

Date Prep: 10.14.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.14.19 20:30	

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

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

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

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



QC Summary 639886

LT Environmental, Inc.

PLU 89 SWD Line

Analytical Method: TPH by SW8015 Mod

Seq Number: 3104322

Parent Sample Id: 639802-005

Matrix: Soil

MS Sample Id: 639802-005 S

Prep Method: SW8015P

Date Prep: 10.14.19

MSD Sample Id: 639802-005 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)	<50.2	1000	934	93	897	90	70-135	4	35	mg/kg	10.14.19 21:50	
Diesel Range Organics (DRO)	<50.2	1000	828	83	813	81	70-135	2	35	mg/kg	10.14.19 21:50	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	102		100		70-135	%	10.14.19 21:50
o-Terphenyl	100		98		70-135	%	10.14.19 21:50

Analytical Method: BTEX by EPA 8021B

Seq Number: 3104315

MB Sample Id: 7688133-1-BLK

Matrix: Solid

LCS Sample Id: 7688133-1-BKS

Prep Method: SW5030B

Date Prep: 10.14.19

LCSD Sample Id: 7688133-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00100	0.100	0.0948	95	0.0980	98	70-130	3	35	mg/kg	10.14.19 18:26	
Toluene	<0.00100	0.100	0.0936	94	0.0968	97	70-130	3	35	mg/kg	10.14.19 18:26	
Ethylbenzene	<0.00100	0.100	0.0972	97	0.101	101	71-129	4	35	mg/kg	10.14.19 18:26	
m,p-Xylenes	<0.00200	0.200	0.197	99	0.202	101	70-135	3	35	mg/kg	10.14.19 18:26	
o-Xylene	<0.00100	0.100	0.0968	97	0.0992	99	71-133	2	35	mg/kg	10.14.19 18:26	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	99		100		101		70-130	%	10.14.19 18:26
4-Bromofluorobenzene	98		103		102		70-130	%	10.14.19 18:26

Analytical Method: BTEX by EPA 8021B

Seq Number: 3104315

Parent Sample Id: 639886-001

Matrix: Soil

MS Sample Id: 639886-001 S

Prep Method: SW5030B

Date Prep: 10.14.19

MSD Sample Id: 639886-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000994	0.0994	0.0965	97	0.0825	83	70-130	16	35	mg/kg	10.14.19 19:04	
Toluene	<0.000994	0.0994	0.0934	94	0.0792	80	70-130	16	35	mg/kg	10.14.19 19:04	
Ethylbenzene	<0.000994	0.0994	0.0955	96	0.0803	81	71-129	17	35	mg/kg	10.14.19 19:04	
m,p-Xylenes	<0.00199	0.199	0.192	96	0.161	81	70-135	18	35	mg/kg	10.14.19 19:04	
o-Xylene	<0.000994	0.0994	0.0969	97	0.0826	83	71-133	16	35	mg/kg	10.14.19 19:04	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	105		104		70-130	%	10.14.19 19:04
4-Bromofluorobenzene	111		110		70-130	%	10.14.19 19:04

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

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

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

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

Chain of Custody

Work Order No. 0398816

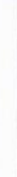
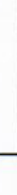
Project Manager:	Dan Moir	Bill to: (if different)	Kyle Littrell
Company Name:	LT Environmental, Inc., Permian office	Company Name:	XTO Energy
Address:	3300 North A Street	Address:	
City, State ZIP:	Midland, Tx 79705	City, State ZIP:	
Phone:	(432) 236-3849	Email:	jmmather@ltenv.com , dmoir@ltenv.com

Work Order Comments			
Program: UST/PST	☐ RP	☐ Flowfields	☐ RC ☐ Offertund
State of Project:			
Reporting Level II	☐ Level III	☐ ST/UST	☐ RP ☐ Level IV
Deliverables: EDD	☐ ADAPT	☐ Other:	

[illegible]

8RCRA	13PPM	Texas 11	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	SiO ₂	Na	Sr	Ti	Sn	U	V	Zn
TCPLP/SPLP 6010:		8RCRA	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Mn	Mo	Ni	Se	Ag	Ti	U												

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xencro, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xencro will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xencro. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xencro, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 		10/14/19 13:54	2		
3			4		
5			6		



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 10/14/2019 01:56:00 PM

Work Order #: 639886

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)?	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: 10/14/2019

Checklist reviewed by:

Jessica Kramer

Date: 10/15/2019

Analytical Report 644194

**for
LT Environmental, Inc.**

Project Manager: Dan Moir

PLU 89 SWD Riser

012919246

25-NOV-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)



25-NOV-19

Project Manager: **Dan Moir**

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, CO 80003

Reference: XENCO Report No(s): **644194**

PLU 89 SWD Riser

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) 644194. 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. 644194 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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

**Sample Cross Reference 644194****LT Environmental, Inc., Arvada, CO**

PLU 89 SWD Riser

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH01	S	11-21-19 10:40	2 ft	644194-001
BH02	S	11-21-19 14:45	4 ft	644194-003
BH03	S	11-21-19 15:20	2 ft	644194-004
BH04	S	11-21-19 15:30	2 ft	644194-005
BH05	S	11-21-19 15:40	2 ft	644194-006
BH06	S	11-21-19 16:05	2 ft	644194-007
BH07	S	11-21-19 16:15	2 ft	644194-008
BH01A	S	11-21-19 11:20	3 ft	Not Analyzed



CASE NARRATIVE

Client Name: LT Environmental, Inc.

Project Name: PLU 89 SWD Riser

Project ID: 012919246

Work Order Number(s): 644194

Report Date: 25-NOV-19

Date Received: 11/22/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3108512 BTEX by EPA 8021B

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 644194-007.

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



Certificate of Analysis Summary 644194

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89 SWD Riser

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Fri Nov-22-19 09:12 am

Report Date: 25-NOV-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	644194-001	644194-003	644194-004	644194-005	644194-006	644194-007
	Field Id:	BH01	BH02	BH03	BH04	BH05	BH06
	Depth:	2- ft	4- ft	2- ft	2- ft	2- ft	2- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Nov-21-19 10:40	Nov-21-19 14:45	Nov-21-19 15:20	Nov-21-19 15:30	Nov-21-19 15:40	Nov-21-19 16:05
BTEX by EPA 8021B	Extracted:	Nov-22-19 10:11	Nov-22-19 10:11	Nov-22-19 10:11	Nov-22-19 10:11	Nov-22-19 10:11	Nov-22-19 10:11
	Analyzed:	Nov-22-19 17:22	Nov-22-19 17:56	Nov-22-19 18:14	Nov-22-19 18:31	Nov-22-19 18:49	Nov-22-19 19:06
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
Toluene		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
Ethylbenzene		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
m,p-Xylenes		<0.00397 0.00397	<0.00398 0.00398	<0.00398 0.00398	<0.00397 0.00397	<0.00394 0.00394	<0.00395 0.00395
o-Xylene		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
Total Xylenes		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
Total BTEX		<0.00198 0.00198	<0.00199 0.00199	<0.00199 0.00199	<0.00198 0.00198	<0.00197 0.00197	<0.00198 0.00198
Chloride by EPA 300	Extracted:	Nov-22-19 11:11	Nov-22-19 11:11	Nov-22-19 11:11	Nov-22-19 11:11	Nov-22-19 11:11	Nov-22-19 11:11
	Analyzed:	Nov-22-19 16:57	Nov-22-19 17:10	Nov-22-19 17:30	Nov-22-19 17:37	Nov-22-19 17:43	Nov-22-19 17:50
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7190 200	7510 201	<10.1 10.1	3600 101	15.9 10.1	<9.98 9.98
TPH by SW8015 Mod	Extracted:	Nov-22-19 12:00	Nov-22-19 12:00	Nov-22-19 12:00	Nov-22-19 12:00	Nov-22-19 12:00	Nov-22-19 12:00
	Analyzed:	Nov-22-19 12:25	Nov-22-19 13:45	Nov-22-19 14:05	Nov-22-19 14:25	Nov-22-19 14:45	Nov-22-19 15:05
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Gasoline Range Hydrocarbons (GRO)		<50.1 50.1	<49.9 49.9	<50.2 50.2	<49.9 49.9	<49.9 49.9	<50.2 50.2
Diesel Range Organics (DRO)		<50.1 50.1	<49.9 49.9	<50.2 50.2	<49.9 49.9	<49.9 49.9	<50.2 50.2
Motor Oil Range Hydrocarbons (MRO)		<50.1 50.1	<49.9 49.9	<50.2 50.2	<49.9 49.9	<49.9 49.9	<50.2 50.2
Total GRO-DRO		<50.1 50.1	<49.9 49.9	<50.2 50.2	<49.9 49.9	<49.9 49.9	<50.2 50.2
Total TPH		<50.1 50.1	<49.9 49.9	<50.2 50.2	<49.9 49.9	<49.9 49.9	<50.2 50.2

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

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Version: 1.0%

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analysis Summary 644194

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89 SWD Riser

Project Id: 012919246
Contact: Dan Moir
Project Location: Eddy County

Date Received in Lab: Fri Nov-22-19 09:12 am

Report Date: 25-NOV-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	644194-008					
	Field Id:	BH07					
	Depth:	2- ft					
	Matrix:	SOIL					
	Sampled:	Nov-21-19 16:15					
BTEX by EPA 8021B	Extracted:	Nov-22-19 10:11					
	Analyzed:	Nov-22-19 19:23					
	Units/RL:	mg/kg RL					
Benzene		<0.00200 0.00200					
Toluene		<0.00200 0.00200					
Ethylbenzene		<0.00200 0.00200					
m,p-Xylenes		<0.00399 0.00399					
o-Xylene		<0.00200 0.00200					
Total Xylenes		<0.00200 0.00200					
Total BTEX		<0.00200 0.00200					
Chloride by EPA 300	Extracted:	Nov-22-19 11:11					
	Analyzed:	Nov-22-19 17:56					
	Units/RL:	mg/kg RL					
Chloride		<9.92 9.92					
TPH by SW8015 Mod	Extracted:	Nov-22-19 12:00					
	Analyzed:	Nov-22-19 15:25					
	Units/RL:	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<50.2 50.2					
Diesel Range Organics (DRO)		<50.2 50.2					
Motor Oil Range Hydrocarbons (MRO)		<50.2 50.2					
Total GRO-DRO		<50.2 50.2					
Total TPH		<50.2 50.2					

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

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Version: 1.1%

Jessica Kramer
Project Assistant



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH01** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-001 Date Collected: 11.21.19 10.40 Sample Depth: 2 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 11.11 Basis: Wet Weight
 Seq Number: 3108482

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7190	200	mg/kg	11.22.19 16.57		20

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 11.22.19 12.00 Basis: Wet Weight
 Seq Number: 3108478

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	11.22.19 12.25	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	11.22.19 12.25	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	11.22.19 12.25	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	11.22.19 12.25	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	11.22.19 12.25	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	100	%	70-135	11.22.19 12.25	
o-Terphenyl	84-15-1	103	%	70-135	11.22.19 12.25	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH01	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-001	Date Collected: 11.21.19 10.40	Sample Depth: 2 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 10.11	Basis: Wet Weight
Seq Number: 3108512		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	11.22.19 17.22	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
Total BTEX		<0.00198	0.00198	mg/kg	11.22.19 17.22	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4		114	%	70-130	11.22.19 17.22	
1,4-Difluorobenzene	540-36-3		95	%	70-130	11.22.19 17.22	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH02** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-003 Date Collected: 11.21.19 14.45 Sample Depth: 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 11.11 Basis: Wet Weight
 Seq Number: 3108482

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7510	201	mg/kg	11.22.19 17.10		20

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 11.22.19 12.00 Basis: Wet Weight
 Seq Number: 3108478

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	11.22.19 13.45	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	11.22.19 13.45	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	11.22.19 13.45	U	1
Total GRO-DRO	PHC628	<49.9	49.9	mg/kg	11.22.19 13.45	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	11.22.19 13.45	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	106	%	70-135	11.22.19 13.45	
o-Terphenyl	84-15-1	114	%	70-135	11.22.19 13.45	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH02	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-003	Date Collected: 11.21.19 14.45	Sample Depth: 4 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 10.11	Basis: Wet Weight
Seq Number: 3108512		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	11.22.19 17.56	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
Total BTEX		<0.00199	0.00199	mg/kg	11.22.19 17.56	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3		95	%	70-130	11.22.19 17.56	
4-Bromofluorobenzene	460-00-4		116	%	70-130	11.22.19 17.56	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH03** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-004 Date Collected: 11.21.19 15.20 Sample Depth: 2 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 11.11 Basis: Wet Weight
 Seq Number: 3108482

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<10.1	10.1	mg/kg	11.22.19 17.30	U	1

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 11.22.19 12.00 Basis: Wet Weight
 Seq Number: 3108478

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	11.22.19 14.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	11.22.19 14.05	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	11.22.19 14.05	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	11.22.19 14.05	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	11.22.19 14.05	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	92	%	70-135	11.22.19 14.05	
o-Terphenyl	84-15-1	96	%	70-135	11.22.19 14.05	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH03** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-004 Date Collected: 11.21.19 15.20 Sample Depth: 2 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 10.11 Basis: Wet Weight
 Seq Number: 3108512

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	11.22.19 18.14	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
Total BTEX		<0.00199	0.00199	mg/kg	11.22.19 18.14	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4		115	%	70-130	11.22.19 18.14	
1,4-Difluorobenzene	540-36-3		93	%	70-130	11.22.19 18.14	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH04	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-005	Date Collected: 11.21.19 15.30	Sample Depth: 2 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 11.11	Basis: Wet Weight
Seq Number: 3108482		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3600	101	mg/kg	11.22.19 17.37		10

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3108478	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	11.22.19 14.25	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	11.22.19 14.25	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	11.22.19 14.25	U	1
Total GRO-DRO	PHC628	<49.9	49.9	mg/kg	11.22.19 14.25	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	11.22.19 14.25	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	94	%	70-135	11.22.19 14.25	
o-Terphenyl	84-15-1	98	%	70-135	11.22.19 14.25	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH04**

Matrix: Soil

Date Received: 11.22.19 09.12

Lab Sample Id: 644194-005

Date Collected: 11.21.19 15.30

Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 11.22.19 10.11

Basis: Wet Weight

Seq Number: 3108512

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	11.22.19 18.31	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
Total BTEX		<0.00198	0.00198	mg/kg	11.22.19 18.31	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3		95	%	70-130	11.22.19 18.31	
4-Bromofluorobenzene	460-00-4		116	%	70-130	11.22.19 18.31	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH05	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-006	Date Collected: 11.21.19 15.40	Sample Depth: 2 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 11.11	Basis: Wet Weight
Seq Number: 3108482		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	15.9	10.1	mg/kg	11.22.19 17.43		1

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3108478	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	11.22.19 14.45	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	11.22.19 14.45	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	11.22.19 14.45	U	1
Total GRO-DRO	PHC628	<49.9	49.9	mg/kg	11.22.19 14.45	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	11.22.19 14.45	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	109	%	70-135	11.22.19 14.45	
o-Terphenyl	84-15-1	115	%	70-135	11.22.19 14.45	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH05	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-006	Date Collected: 11.21.19 15.40	Sample Depth: 2 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 10.11	Basis: Wet Weight
Seq Number: 3108512		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
Toluene	108-88-3	<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
Ethylbenzene	100-41-4	<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
m,p-Xylenes	179601-23-1	<0.00394	0.00394	mg/kg	11.22.19 18.49	U	1
o-Xylene	95-47-6	<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
Total Xylenes	1330-20-7	<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
Total BTEX		<0.00197	0.00197	mg/kg	11.22.19 18.49	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	97	%	70-130	11.22.19 18.49		
4-Bromofluorobenzene	460-00-4	127	%	70-130	11.22.19 18.49		



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH06** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-007 Date Collected: 11.21.19 16.05 Sample Depth: 2 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 11.11 Basis: Wet Weight
 Seq Number: 3108482

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<9.98	9.98	mg/kg	11.23.19 11.39	U	1

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 11.22.19 12.00 Basis: Wet Weight
 Seq Number: 3108478

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	11.22.19 15.05	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	11.22.19 15.05	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	11.22.19 15.05	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	11.22.19 15.05	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	11.22.19 15.05	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	99	%	70-135	11.22.19 15.05	
o-Terphenyl	84-15-1	101	%	70-135	11.22.19 15.05	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH06**

Matrix: Soil

Date Received: 11.22.19 09.12

Lab Sample Id: 644194-007

Date Collected: 11.21.19 16.05

Sample Depth: 2 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 11.22.19 10.11

Basis: Wet Weight

Seq Number: 3108512

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
m,p-Xylenes	179601-23-1	<0.00395	0.00395	mg/kg	11.22.19 19.06	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
Total BTEX		<0.00198	0.00198	mg/kg	11.22.19 19.06	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	135	%	70-130	11.22.19 19.06	**	
1,4-Difluorobenzene	540-36-3	88	%	70-130	11.22.19 19.06		



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: BH07	Matrix: Soil	Date Received: 11.22.19 09.12
Lab Sample Id: 644194-008	Date Collected: 11.21.19 16.15	Sample Depth: 2 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 11.22.19 11.11	Basis: Wet Weight
Seq Number: 3108482		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<9.92	9.92	mg/kg	11.22.19 17.56	U	1

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3108478	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	11.22.19 15.25	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	11.22.19 15.25	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	11.22.19 15.25	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	11.22.19 15.25	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	11.22.19 15.25	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	84	%	70-135	11.22.19 15.25	
o-Terphenyl	84-15-1	88	%	70-135	11.22.19 15.25	



Certificate of Analytical Results 644194

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Riser

Sample Id: **BH07** Matrix: Soil Date Received: 11.22.19 09.12
 Lab Sample Id: 644194-008 Date Collected: 11.21.19 16.15 Sample Depth: 2 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 11.22.19 10.11 Basis: Wet Weight
 Seq Number: 3108512

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	11.22.19 19.23	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
Total BTEX		<0.00200	0.00200	mg/kg	11.22.19 19.23	U	1
% Recovery							
Surrogate	Cas Number			Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4		120	%	70-130	11.22.19 19.23	
1,4-Difluorobenzene	540-36-3		95	%	70-130	11.22.19 19.23	



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 **SQL** 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 644194

LT Environmental, Inc.

PLU 89 SWD Riser

Analytical Method: Chloride by EPA 300

Seq Number: 3108482

MB Sample Id: 7691019-1-BLK

Matrix: Solid

LCS Sample Id: 7691019-1-BKS

Prep Method: E300P

Date Prep: 11.22.19

LCSD Sample Id: 7691019-1-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	258	103	265	106	90-110	3	20	mg/kg	11.22.19 14:59	

Analytical Method: Chloride by EPA 300

Seq Number: 3108482

Parent Sample Id: 644187-010

Matrix: Soil

MS Sample Id: 644187-010 S

Prep Method: E300P

Date Prep: 11.22.19

MSD Sample Id: 644187-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2320	200	2510	95	2510	95	90-110	0	20	mg/kg	11.22.19 15:17	

Analytical Method: Chloride by EPA 300

Seq Number: 3108482

Parent Sample Id: 644191-010

Matrix: Soil

MS Sample Id: 644191-010 S

Prep Method: E300P

Date Prep: 11.22.19

MSD Sample Id: 644191-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	327	197	541	109	528	103	90-110	2	20	mg/kg	11.22.19 16:44	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3108478

MB Sample Id: 7691010-1-BLK

Matrix: Solid

LCS Sample Id: 7691010-1-BKS

Prep Method: SW8015P

Date Prep: 11.22.19

LCSD Sample Id: 7691010-1-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	894	89	861	86	70-135	4	35	mg/kg	11.22.19 11:08	
Diesel Range Organics (DRO)	<50.0	1000	1040	104	986	99	70-135	5	35	mg/kg	11.22.19 11:08	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	98		111		123		70-135	%	11.22.19 11:08
o-Terphenyl	102		109		106		70-135	%	11.22.19 11:08

Analytical Method: TPH by SW8015 Mod

Seq Number: 3108478

Matrix: Solid
MB Sample Id: 7691010-1-BLK

Prep Method: SW8015P

Date Prep: 11.22.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	11.22.19 10:48	

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

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

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

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



QC Summary 644194

LT Environmental, Inc.

PLU 89 SWD Riser

Analytical Method: TPH by SW8015 Mod

Seq Number: 3108478

Parent Sample Id: 644194-001

Matrix: Soil

MS Sample Id: 644194-001 S

Prep Method: SW8015P

Date Prep: 11.22.19

MSD Sample Id: 644194-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<13.9	999	1010	101	910	91	70-135	10	35	mg/kg	11.22.19 12:45	
Diesel Range Organics (DRO)	35.6	999	1160	113	1040	100	70-135	11	35	mg/kg	11.22.19 12:45	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	118		127		70-135	%	11.22.19 12:45
o-Terphenyl	123		108		70-135	%	11.22.19 12:45

Analytical Method: BTEX by EPA 8021B

Seq Number: 3108512

MB Sample Id: 7691039-1-BLK

Matrix: Solid

LCS Sample Id: 7691039-1-BKS

Prep Method: SW5030B

Date Prep: 11.22.19

LCSD Sample Id: 7691039-1-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	0.0924	92	0.0935	94	70-130	1	35	mg/kg	11.22.19 11:35	
Toluene	<0.00200	0.100	0.0870	87	0.0876	88	70-130	1	35	mg/kg	11.22.19 11:35	
Ethylbenzene	<0.00200	0.100	0.0945	95	0.0957	96	71-129	1	35	mg/kg	11.22.19 11:35	
m,p-Xylenes	<0.00400	0.200	0.188	94	0.190	95	70-135	1	35	mg/kg	11.22.19 11:35	
o-Xylene	<0.00200	0.100	0.0926	93	0.0938	94	71-133	1	35	mg/kg	11.22.19 11:35	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		94		95		70-130	%	11.22.19 11:35
4-Bromofluorobenzene	113		106		108		70-130	%	11.22.19 11:35

Analytical Method: BTEX by EPA 8021B

Seq Number: 3108512

Parent Sample Id: 644184-001

Matrix: Soil

MS Sample Id: 644184-001 S

Prep Method: SW5030B

Date Prep: 11.22.19

MSD Sample Id: 644184-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0988	0.0957	97	0.102	103	70-130	6	35	mg/kg	11.22.19 12:09	
Toluene	0.000888	0.0988	0.0884	89	0.0959	96	70-130	8	35	mg/kg	11.22.19 12:09	
Ethylbenzene	<0.00198	0.0988	0.0949	96	0.103	104	71-129	8	35	mg/kg	11.22.19 12:09	
m,p-Xylenes	<0.000988	0.198	0.187	94	0.205	104	70-135	9	35	mg/kg	11.22.19 12:09	
o-Xylene	<0.00198	0.0988	0.0922	93	0.101	102	71-133	9	35	mg/kg	11.22.19 12:09	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		98		70-130	%	11.22.19 12:09
4-Bromofluorobenzene	106		117		70-130	%	11.22.19 12:09

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

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

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

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



Chain of Custody

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

Phoenicia, AZ (480-385-0900) Atlanta, GA (770-449-8800) Tampa, FL (813-620-2000)

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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	☐ ST/UST	☐ RP ☐ Level IV
Deliverables: EDD	☐ ADaPT	☐	Other:

Project Name:	1200 W. 1st St. NW	Turn Around
Project Number:	012919246	Routine ☐
P.O. Number:	Eddy County	Rush: 24 hours
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				
Cooler Custody Seals:	Yes	MD	N/A	Correction Factor:	-0.2	
Sample Custody Seals:	Yes	NO	N/A	Total Containers:	8	

[illegible]

Total 200.7 / 6010 200.8 / 6020:

Circle Method(s) and Metal(s) to be analyzed

[illegible]

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 <i>Elizabeth M. [Signature]</i>	<i>[Signature]</i>	11/22/19 9:05
3 <i>[Signature]</i>	<i>[Signature]</i>	11/22/19 9:12
5 <i>[Signature]</i>	<i>[Signature]</i>	



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 11/22/2019 09:12:00 AM

Work Order #: 644194

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)?	1.4
#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: 11/22/2019

Checklist reviewed by:

Jessica Kramer

Date: 11/23/2019

Analytical Report 644772

**for
LT Environmental, Inc.**

Project Manager: Dan Moir

PLU 89 SWD Line

012919246

03-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)



03-DEC-19

Project Manager: **Dan Moir**

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, CO 80003

Reference: XENCO Report No(s): **644772**

PLU 89 SWD Line

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) 644772. 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. 644772 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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



Sample Cross Reference 644772

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH08	S	12-02-19 11:35	6 ft	644772-001
BH08A	S	12-02-19 11:50	7 ft	644772-002

**CASE NARRATIVE****Client Name: LT Environmental, Inc.****Project Name: PLU 89 SWD Line**

Project ID: 012919246
Work Order Number(s): 644772

Report Date: 03-DEC-19
Date Received: 12/02/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3109146 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 644679-001 S.

Batch: LBA-3109160 BTEX by EPA 8021B

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

Batch: LBA-3109171 Chloride by EPA 300

Lab Sample ID 644772-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 644772-001, -002.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analysis Summary 644772

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89 SWD Line

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Mon Dec-02-19 03:19 pm

Report Date: 03-DEC-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	644772-001	644772-002				
	Field Id:	BH08	BH08A				
	Depth:	6- ft	7- ft				
	Matrix:	SOIL	SOIL				
	Sampled:	Dec-02-19 11:35	Dec-02-19 11:50				
BTEX by EPA 8021B	Extracted:	Dec-02-19 16:00	Dec-02-19 16:00				
	Analyzed:	Dec-03-19 05:09	Dec-03-19 05:28				
	Units/RL:	mg/kg RL	mg/kg RL				
Benzene		<0.0200	0.0200	<0.0196	0.0196		
Toluene		<0.0200	0.0200	<0.0196	0.0196		
Ethylbenzene		<0.0200	0.0200	0.0434	0.0196		
m,p-Xylenes		0.114	0.0400	0.344	0.0392		
o-Xylene		0.0489	0.0200	0.161	0.0196		
Total Xylenes		0.163	0.0200	0.505	0.0196		
Total BTEX		0.163	0.0200	0.548	0.0196		
Chloride by EPA 300	Extracted:	Dec-02-19 16:00	Dec-02-19 16:00				
	Analyzed:	Dec-02-19 17:32	Dec-02-19 17:53				
	Units/RL:	mg/kg RL	mg/kg RL				
Chloride		1440 D	50.0	8970 D	499		
TPH by SW8015 Mod	Extracted:	Dec-02-19 16:00	Dec-02-19 16:00				
	Analyzed:	Dec-02-19 21:52	Dec-02-19 21:52				
	Units/RL:	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<50.2	50.2	<49.9	49.9		
Diesel Range Organics (DRO)		244	50.2	459	49.9		
Motor Oil Range Hydrocarbons (MRO)		<50.2	50.2	<49.9	49.9		
Total GRO-DRO		244	50.2	459	49.9		
Total TPH		244	50.2	459	49.9		

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

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer

Jessica Kramer
Project Assistant



Certificate of Analytical Results 644772

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **BH08** Matrix: Soil Date Received: 12.02.19 15.19
 Lab Sample Id: 644772-001 Date Collected: 12.02.19 11.35 Sample Depth: 6 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.02.19 16.00 Basis: Wet Weight
 Seq Number: 3109171

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1440	50.0	mg/kg	12.03.19 10.59	D	50

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.02.19 16.00 Basis: Wet Weight
 Seq Number: 3109146

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	12.02.19 21.52	U	1
Diesel Range Organics (DRO)	C10C28DRO	244	50.2	mg/kg	12.02.19 21.52		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	12.02.19 21.52	U	1
Total GRO-DRO	PHC628	244	50.2	mg/kg	12.02.19 21.52		1
Total TPH	PHC635	244	50.2	mg/kg	12.02.19 21.52		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	114	%	70-135	12.02.19 21.52	
o-Terphenyl	84-15-1	120	%	70-135	12.02.19 21.52	



Certificate of Analytical Results 644772

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **BH08** Matrix: Soil Date Received: 12.02.19 15.19
 Lab Sample Id: 644772-001 Date Collected: 12.02.19 11.35 Sample Depth: 6 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.02.19 16.00 Basis: Wet Weight
 Seq Number: 3109160

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.0200	0.0200	mg/kg	12.03.19 05.09	U	1
Toluene	108-88-3	<0.0200	0.0200	mg/kg	12.03.19 05.09	U	1
Ethylbenzene	100-41-4	<0.0200	0.0200	mg/kg	12.03.19 05.09	U	1
m,p-Xylenes	179601-23-1	0.114	0.0400	mg/kg	12.03.19 05.09		1
o-Xylene	95-47-6	0.0489	0.0200	mg/kg	12.03.19 05.09		1
Total Xylenes	1330-20-7	0.163	0.0200	mg/kg	12.03.19 05.09		1
Total BTEX		0.163	0.0200	mg/kg	12.03.19 05.09		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	101	%	70-130	12.03.19 05.09		
4-Bromofluorobenzene	460-00-4	115	%	70-130	12.03.19 05.09		



Certificate of Analytical Results 644772

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: BH08A	Matrix: Soil	Date Received: 12.02.19 15.19
Lab Sample Id: 644772-002	Date Collected: 12.02.19 11.50	Sample Depth: 7 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.02.19 16.00	Basis: Wet Weight
Seq Number: 3109171		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	8970	499	mg/kg	12.03.19 11.18	D	50

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3109146	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	12.02.19 21.52	U	1
Diesel Range Organics (DRO)	C10C28DRO	459	49.9	mg/kg	12.02.19 21.52		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	12.02.19 21.52	U	1
Total GRO-DRO	PHC628	459	49.9	mg/kg	12.02.19 21.52		1
Total TPH	PHC635	459	49.9	mg/kg	12.02.19 21.52		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	104	%	70-135	12.02.19 21.52	
o-Terphenyl	84-15-1	115	%	70-135	12.02.19 21.52	



Certificate of Analytical Results 644772

LT Environmental, Inc., Arvada, CO

PLU 89 SWD Line

Sample Id: **BH08A**

Matrix: Soil

Date Received: 12.02.19 15.19

Lab Sample Id: 644772-002

Date Collected: 12.02.19 11.50

Sample Depth: 7 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.02.19 16.00

Basis: Wet Weight

Seq Number: 3109160

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.0196	0.0196	mg/kg	12.03.19 05.28	U	1
Toluene	108-88-3	<0.0196	0.0196	mg/kg	12.03.19 05.28	U	1
Ethylbenzene	100-41-4	0.0434	0.0196	mg/kg	12.03.19 05.28		1
m,p-Xylenes	179601-23-1	0.344	0.0392	mg/kg	12.03.19 05.28		1
o-Xylene	95-47-6	0.161	0.0196	mg/kg	12.03.19 05.28		1
Total Xylenes	1330-20-7	0.505	0.0196	mg/kg	12.03.19 05.28		1
Total BTEX		0.548	0.0196	mg/kg	12.03.19 05.28		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	114	%	70-130	12.03.19 05.28		
1,4-Difluorobenzene	540-36-3	101	%	70-130	12.03.19 05.28		



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 **SQL** 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 644772

LT Environmental, Inc.

PLU 89 SWD Line

Analytical Method: Chloride by EPA 300

Seq Number: 3109171

MB Sample Id: 7691461-1-BLK

Matrix: Solid

LCS Sample Id: 7691461-1-BKS

Prep Method: E300P

Date Prep: 12.02.19

LCSD Sample Id: 7691461-1-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	262	105	264	106	90-110	1	20	mg/kg	12.02.19 15:40	

Analytical Method: Chloride by EPA 300

Seq Number: 3109171

Parent Sample Id: 644679-001

Matrix: Soil

MS Sample Id: 644679-001 S

Prep Method: E300P

Date Prep: 12.02.19

MSD Sample Id: 644679-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.1	201	220	109	219	108	90-110	0	20	mg/kg	12.02.19 15:58	

Analytical Method: Chloride by EPA 300

Seq Number: 3109171

Parent Sample Id: 644772-001

Matrix: Soil

MS Sample Id: 644772-001 S

Prep Method: E300P

Date Prep: 12.02.19

MSD Sample Id: 644772-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1440	247	14600	5328	14600	5243	90-110	0	20	mg/kg	12.03.19 11:05	X

Analytical Method: TPH by SW8015 Mod

Seq Number: 3109146

MB Sample Id: 7691483-1-BLK

Matrix: Solid

LCS Sample Id: 7691483-1-BKS

Prep Method: SW8015P

Date Prep: 12.02.19

LCSD Sample Id: 7691483-1-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	879	88	976	98	70-135	10	35	mg/kg	12.02.19 19:14	
Diesel Range Organics (DRO)	<50.0	1000	1070	107	1140	114	70-135	6	35	mg/kg	12.02.19 19:14	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	118		120		132		70-135	%	12.02.19 19:14
o-Terphenyl	120		122		131		70-135	%	12.02.19 19:14

Analytical Method: TPH by SW8015 Mod

Seq Number: 3109146

Matrix: Solid
MB Sample Id: 7691483-1-BLK

Prep Method: SW8015P

Date Prep: 12.02.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	12.02.19 19:14	

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

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

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

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



QC Summary 644772

LT Environmental, Inc.

PLU 89 SWD Line

Analytical Method: TPH by SW8015 Mod

Seq Number: 3109146

Parent Sample Id: 644679-001

Matrix: Soil

MS Sample Id: 644679-001 S

Prep Method: SW8015P

Date Prep: 12.02.19

MSD Sample Id: 644679-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.0	1000	983	98	898	89	70-135	9	35	mg/kg	12.03.19 09:09	
Diesel Range Organics (DRO)	<50.0	1000	1250	125	1100	109	70-135	13	35	mg/kg	12.03.19 09:09	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	135		119		70-135	%	12.03.19 09:09
o-Terphenyl	136	**	125		70-135	%	12.03.19 09:09

Analytical Method: BTEX by EPA 8021B

Seq Number: 3109160

MB Sample Id: 7691464-1-BLK

Matrix: Solid

LCS Sample Id: 7691464-1-BKS

Prep Method: SW5030B

Date Prep: 12.02.19

LCSD Sample Id: 7691464-1-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	0.0856	86	0.0885	89	70-130	3	35	mg/kg	12.02.19 21:17	
Toluene	<0.00200	0.100	0.0854	85	0.0908	91	70-130	6	35	mg/kg	12.02.19 21:17	
Ethylbenzene	<0.00200	0.100	0.0839	84	0.0901	90	71-129	7	35	mg/kg	12.02.19 21:17	
m,p-Xylenes	<0.00400	0.200	0.177	89	0.191	96	70-135	8	35	mg/kg	12.02.19 21:17	
o-Xylene	<0.00200	0.100	0.0900	90	0.0977	98	71-133	8	35	mg/kg	12.02.19 21:17	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	99		102		101		70-130	%	12.02.19 21:17
4-Bromofluorobenzene	108		114		114		70-130	%	12.02.19 21:17

Analytical Method: BTEX by EPA 8021B

Seq Number: 3109160

Parent Sample Id: 644679-001

Matrix: Soil

MS Sample Id: 644679-001 S

Prep Method: SW5030B

Date Prep: 12.02.19

MSD Sample Id: 644679-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.0836	83	0.0744	74	70-130	12	35	mg/kg	12.02.19 22:59	
Toluene	<0.00202	0.101	0.0847	84	0.0780	78	70-130	8	35	mg/kg	12.02.19 22:59	
Ethylbenzene	<0.00202	0.101	0.0843	83	0.0776	78	71-129	8	35	mg/kg	12.02.19 22:59	
m,p-Xylenes	<0.000760	0.202	0.178	88	0.165	82	70-135	8	35	mg/kg	12.02.19 22:59	
o-Xylene	<0.00202	0.101	0.0897	89	0.0853	85	71-133	5	35	mg/kg	12.02.19 22:59	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	100		98		70-130	%	12.02.19 22:59
4-Bromofluorobenzene	111		119		70-130	%	12.02.19 22:59

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

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

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

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



Houston, TX (281) 240-4200 Dallas, TX (214) 902-0300 San Antonio, TX (210) 509-3333
Midland, TX (432-70+5440) El Paso, TX (915) 585-3443 Lubbock, TX (806) 794-1296
Phoenix, AZ (480-355-0900) Atlanta, GA (770-449-8800) Tampa, FL (813) 281-1111
Hobbs, NM (575-392-7550)

Work Order No: 144772

Chain of Custody

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 State of Project: Reporting Level II ☐ Level III ☐ ST/UST ☐ RP ☒ Level IV ☐ Deliverables: EDD ☐ ADAPT ☐ Other:	☐ RP ☐ Brownfields ☐ RC ☐ Superfund ☐

Project Name:	PLU 89 SWD Line	Turn Around
Project Number:	012919246	Routine ☐
P.O. Number:	Eddy County	Rush: 3day
Sampler's Name:	Elizabeth Naka	Due Date:

SAMPLE RECEIPT		Temp Blank:	Yes	No	Wet Ice:	Yes	No
Temperature (°C):		0.8			Thermometer ID		
Received intact:		Yes	No		+ - N/A - 007		
Cooler Custody Seals:		Yes	No	N/A	Correction Factor:	- 0.2	
Sample Custody Seals:		Yes	No	N/A	Total Containers:	2	

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number	TPH (EP)	BTEX (E)	Chloride	Sample Comments
BH08	S	12/2/19	1135	6'	-	X	X	X	discrete
BH08A	✓	✓	1156	7'	✓	✓	✓	✓	
<i>discrete area</i>									

Total	200.7 / 6010	200.8 / 6020:	
<i>Circle Method(s) and Metals(s) to be analyzed</i>			
8RCRA	13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO ₂ Na Sr Ti Sn U V Zn		
TCLP / SPLP 6010:	8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U		
			1631 / 245; 1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 <i>Elizabeth Mclan</i>	<i>[Signature]</i>	12/2/19 15:19	2		
3			4		
5			6		



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 12/02/2019 03:19:00 PM

Work Order #: 644772

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)?	.8
#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: 12/02/2019

Checklist reviewed by:

Jessica Kramer

Date: 12/03/2019

Analytical Report 645890

**for
LT Environmental, Inc.**

Project Manager: Dan Moir

PLU 89

012919246

12-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)



12-DEC-19

Project Manager: **Dan Moir**

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, CO 80003

Reference: XENCO Report No(s): **645890**

PLU 89

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) 645890. 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. 645890 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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

**Sample Cross Reference 645890****LT Environmental, Inc., Arvada, CO**

PLU 89

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
FS01	S	12-10-19 12:29	4 ft	645890-001
FS02	S	12-10-19 13:23	4 ft	645890-002
FS03	S	12-10-19 14:09	4 ft	645890-003
SW01	S	12-10-19 14:20	0 - 4 ft	645890-004
SW02	S	12-10-19 14:21	0 - 4 ft	645890-005



CASE NARRATIVE

Client Name: LT Environmental, Inc.

Project Name: PLU 89

Project ID: 012919246

Work Order Number(s): 645890

Report Date: 12-DEC-19

Date Received: 12/11/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3110184 Chloride by EPA 300

Lab Sample ID 645890-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 645890-001, -002, -003, -004, -005.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3110217 BTEX by EPA 8021B

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



Certificate of Analysis Summary 645890

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Wed Dec-11-19 12:20 pm

Report Date: 12-DEC-19

Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	645890-001	645890-002	645890-003	645890-004	645890-005	
	Field Id:	FS01	FS02	FS03	SW01	SW02	
	Depth:	4- ft	4- ft	4- ft	0-4 ft	0-4 ft	
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	
	Sampled:	Dec-10-19 12:29	Dec-10-19 13:23	Dec-10-19 14:09	Dec-10-19 14:20	Dec-10-19 14:21	
BTEX by EPA 8021B	Extracted:	Dec-11-19 13:00	Dec-11-19 13:00	Dec-11-19 13:00	Dec-11-19 13:00	Dec-11-19 13:00	
	Analyzed:	Dec-11-19 16:28	Dec-11-19 22:19	Dec-11-19 17:06	Dec-11-19 17:25	Dec-11-19 17:44	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	
Toluene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	
Ethylbenzene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00200 0.00200	
m,p-Xylenes		<0.00401 0.00401	0.00524 0.00399	<0.00401 0.00401	0.00585 0.00403	0.00426 0.00401	
o-Xylene		<0.00200 0.00200	0.00329 0.00200	<0.00200 0.00200	0.00458 0.00202	0.00301 0.00200	
Total Xylenes		<0.00200 0.00200	0.00853 0.00200	<0.00200 0.00200	0.0104 0.00202	0.00727 0.00200	
Total BTEX		<0.00200 0.00200	0.00853 0.00200	<0.00200 0.00200	0.0104 0.00202	0.00727 0.00200	
Chloride by EPA 300	Extracted:	Dec-11-19 13:54	Dec-11-19 13:54	Dec-11-19 13:54	Dec-11-19 13:54	Dec-11-19 13:54	
	Analyzed:	Dec-11-19 15:38	Dec-11-19 15:56	Dec-11-19 16:01	Dec-11-19 16:07	Dec-11-19 16:36	
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Chloride		9000 100	9390 100	7090 49.9	4940 49.6	4700 49.5	
TPH by SW8015 Mod	Extracted:	Dec-11-19 16:40	Dec-11-19 16:40	Dec-11-19 16:40	Dec-11-19 16:40	Dec-11-19 16:40	
	Analyzed:	Dec-11-19 17:41	Dec-11-19 18:01	Dec-11-19 18:21	Dec-11-19 18:21	Dec-11-19 18:41	
	Units/RL:	mg/kg RL	mg/kg 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	<50.1 50.1	<49.8 49.8	
Diesel Range Organics (DRO)		<50.3 50.3	<50.2 50.2	<50.1 50.1	<50.1 50.1	<49.8 49.8	
Motor Oil Range Hydrocarbons (MRO)		<50.3 50.3	<50.2 50.2	<50.1 50.1	<50.1 50.1	<49.8 49.8	
Total GRO-DRO		<50.3 50.3	<50.2 50.2	<50.1 50.1	<50.1 50.1	<49.8 49.8	
Total TPH		<50.3 50.3	<50.2 50.2	<50.1 50.1	<50.1 50.1	<49.8 49.8	

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

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer
Project Assistant



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS01** Matrix: Soil Date Received: 12.11.19 12.20
 Lab Sample Id: 645890-001 Date Collected: 12.10.19 12.29 Sample Depth: 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 13.54 Basis: Wet Weight
 Seq Number: 3110184

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9000	100	mg/kg	12.11.19 15.38		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 16.40 Basis: Wet Weight
 Seq Number: 3110222

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	12.11.19 17.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	12.11.19 17.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	12.11.19 17.41	U	1
Total GRO-DRO	PHC628	<50.3	50.3	mg/kg	12.11.19 17.41	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	12.11.19 17.41	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	73	%	70-135	12.11.19 17.41	
o-Terphenyl	84-15-1	75	%	70-135	12.11.19 17.41	



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS01**

Matrix: Soil

Date Received: 12.11.19 12.20

Lab Sample Id: 645890-001

Date Collected: 12.10.19 12.29

Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 13.00

Basis: Wet Weight

Seq Number: 3110217

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	12.11.19 16.28	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.11.19 16.28	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	111	%	70-130	12.11.19 16.28		
1,4-Difluorobenzene	540-36-3	102	%	70-130	12.11.19 16.28		



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS02** Matrix: Soil Date Received: 12.11.19 12.20
 Lab Sample Id: 645890-002 Date Collected: 12.10.19 13.23 Sample Depth: 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 13.54 Basis: Wet Weight
 Seq Number: 3110184

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	9390	100	mg/kg	12.11.19 15.56		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 16.40 Basis: Wet Weight
 Seq Number: 3110222

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	12.11.19 18.01	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	12.11.19 18.01	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	12.11.19 18.01	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	12.11.19 18.01	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	12.11.19 18.01	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	82	%	70-135	12.11.19 18.01	
o-Terphenyl	84-15-1	88	%	70-135	12.11.19 18.01	



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS02**

Matrix: Soil

Date Received: 12.11.19 12.20

Lab Sample Id: 645890-002

Date Collected: 12.10.19 13.23

Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 13.00

Basis: Wet Weight

Seq Number: 3110217

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.11.19 22.19	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.11.19 22.19	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.11.19 22.19	U	1
m,p-Xylenes	179601-23-1	0.00524	0.00399	mg/kg	12.11.19 22.19		1
o-Xylene	95-47-6	0.00329	0.00200	mg/kg	12.11.19 22.19		1
Total Xylenes	1330-20-7	0.00853	0.00200	mg/kg	12.11.19 22.19		1
Total BTEX		0.00853	0.00200	mg/kg	12.11.19 22.19		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	119	%	70-130	12.11.19 22.19		
1,4-Difluorobenzene	540-36-3	103	%	70-130	12.11.19 22.19		



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: FS03	Matrix: Soil	Date Received: 12.11.19 12.20
Lab Sample Id: 645890-003	Date Collected: 12.10.19 14.09	Sample Depth: 4 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.11.19 13.54	Basis: Wet Weight
Seq Number: 3110184		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7090	49.9	mg/kg	12.11.19 16.01		5

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3110222	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	12.11.19 18.21	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	76	%	70-135	12.11.19 18.21	
o-Terphenyl	84-15-1	78	%	70-135	12.11.19 18.21	



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS03** Matrix: Soil Date Received: 12.11.19 12.20
 Lab Sample Id: 645890-003 Date Collected: 12.10.19 14.09 Sample Depth: 4 ft
 Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 13.00 Basis: Wet Weight
 Seq Number: 3110217

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	12.11.19 17.06	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.11.19 17.06	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	103	%	70-130	12.11.19 17.06		
4-Bromofluorobenzene	460-00-4	117	%	70-130	12.11.19 17.06		



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW01** Matrix: Soil Date Received: 12.11.19 12.20
 Lab Sample Id: 645890-004 Date Collected: 12.10.19 14.20 Sample Depth: 0 - 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 13.54 Basis: Wet Weight
 Seq Number: 3110184

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4940	49.6	mg/kg	12.11.19 16.07		5

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 16.40 Basis: Wet Weight
 Seq Number: 3110222

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	12.11.19 18.21	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	12.11.19 18.21	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	128	%	70-135	12.11.19 18.21	
o-Terphenyl	84-15-1	135	%	70-135	12.11.19 18.21	



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW01**

Matrix: Soil

Date Received: 12.11.19 12.20

Lab Sample Id: 645890-004

Date Collected: 12.10.19 14.20

Sample Depth: 0 - 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 13.00

Basis: Wet Weight

Seq Number: 3110217

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	12.11.19 17.25	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	12.11.19 17.25	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	12.11.19 17.25	U	1
m,p-Xylenes	179601-23-1	0.00585	0.00403	mg/kg	12.11.19 17.25		1
o-Xylene	95-47-6	0.00458	0.00202	mg/kg	12.11.19 17.25		1
Total Xylenes	1330-20-7	0.0104	0.00202	mg/kg	12.11.19 17.25		1
Total BTEX		0.0104	0.00202	mg/kg	12.11.19 17.25		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	106	%	70-130	12.11.19 17.25		
4-Bromofluorobenzene	460-00-4	121	%	70-130	12.11.19 17.25		



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: SW02	Matrix: Soil	Date Received: 12.11.19 12.20
Lab Sample Id: 645890-005	Date Collected: 12.10.19 14.21	Sample Depth: 0 - 4 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.11.19 13.54	Basis: Wet Weight
Seq Number: 3110184		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4700	49.5	mg/kg	12.11.19 16.36		5

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3110222	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	12.11.19 18.41	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	12.11.19 18.41	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	12.11.19 18.41	U	1
Total GRO-DRO	PHC628	<49.8	49.8	mg/kg	12.11.19 18.41	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	12.11.19 18.41	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	82	%	70-135	12.11.19 18.41	
o-Terphenyl	84-15-1	82	%	70-135	12.11.19 18.41	



Certificate of Analytical Results 645890

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW02**

Matrix: Soil

Date Received: 12.11.19 12.20

Lab Sample Id: 645890-005

Date Collected: 12.10.19 14.21

Sample Depth: 0 - 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 13.00

Basis: Wet Weight

Seq Number: 3110217

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.11.19 17.44	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.11.19 17.44	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.11.19 17.44	U	1
m,p-Xylenes	179601-23-1	0.00426	0.00401	mg/kg	12.11.19 17.44		1
o-Xylene	95-47-6	0.00301	0.00200	mg/kg	12.11.19 17.44		1
Total Xylenes	1330-20-7	0.00727	0.00200	mg/kg	12.11.19 17.44		1
Total BTEX		0.00727	0.00200	mg/kg	12.11.19 17.44		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.11.19 17.44		
4-Bromofluorobenzene	460-00-4	119	%	70-130	12.11.19 17.44		



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 **SQL** Sample 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 645890

LT Environmental, Inc.

PLU 89

Analytical Method: Chloride by EPA 300

Seq Number: 3110184

MB Sample Id: 7692208-1-BLK

Matrix: Solid

LCS Sample Id: 7692208-1-BKS

Prep Method: E300P

Date Prep: 12.11.19

LCSD Sample Id: 7692208-1-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	259	104	262	105	90-110	1	20	mg/kg	12.11.19 12:39	

Analytical Method: Chloride by EPA 300

Seq Number: 3110184

Parent Sample Id: 645890-001

Matrix: Soil

MS Sample Id: 645890-001 S

Prep Method: E300P

Date Prep: 12.11.19

MSD Sample Id: 645890-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	9000	200	9160	80	9170	85	90-110	0	20	mg/kg	12.11.19 15:44	X

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110222

MB Sample Id: 7692253-1-BLK

Matrix: Solid

LCS Sample Id: 7692253-1-BKS

Prep Method: SW8015P

Date Prep: 12.11.19

LCSD Sample Id: 7692253-1-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	973	97	923	92	70-135	5	35	mg/kg	12.11.19 17:18	
Diesel Range Organics (DRO)	<50.0	1000	823	82	807	81	70-135	2	35	mg/kg	12.11.19 17:18	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	71		100		95		70-135	%	12.11.19 17:18
o-Terphenyl	74		93		91		70-135	%	12.11.19 17:18

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110222

Matrix: Solid
MB Sample Id: 7692253-1-BLK

Prep Method: SW8015P

Date Prep: 12.11.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	12.11.19 16:58	

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

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

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

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



QC Summary 645890

LT Environmental, Inc.

PLU 89

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110222

Parent Sample Id: 645890-001

Matrix: Soil

MS Sample Id: 645890-001 S

Prep Method: SW8015P

Date Prep: 12.11.19

MSD Sample Id: 645890-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.0	1000	925	93	869	86	70-135	6	35	mg/kg	12.11.19 17:41	
Diesel Range Organics (DRO)	<50.0	1000	832	83	772	76	70-135	7	35	mg/kg	12.11.19 17:41	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	98		91		70-135	%	12.11.19 17:41
o-Terphenyl	99		86		70-135	%	12.11.19 17:41

Analytical Method: BTEX by EPA 8021B

Seq Number: 3110217

MB Sample Id: 7692204-1-BLK

Matrix: Solid

LCS Sample Id: 7692204-1-BKS

Prep Method: SW5030B

Date Prep: 12.11.19

LCSD Sample Id: 7692204-1-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	0.0954	95	0.0930	93	70-130	3	35	mg/kg	12.11.19 14:53	
Toluene	<0.00200	0.100	0.0966	97	0.0956	96	70-130	1	35	mg/kg	12.11.19 14:53	
Ethylbenzene	<0.00200	0.100	0.0953	95	0.0950	95	71-129	0	35	mg/kg	12.11.19 14:53	
m,p-Xylenes	<0.00400	0.200	0.201	101	0.201	101	70-135	0	35	mg/kg	12.11.19 14:53	
o-Xylene	<0.00200	0.100	0.101	101	0.102	102	71-133	1	35	mg/kg	12.11.19 14:53	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		104		103		70-130	%	12.11.19 14:53
4-Bromofluorobenzene	108		115		116		70-130	%	12.11.19 14:53

Analytical Method: BTEX by EPA 8021B

Seq Number: 3110217

Parent Sample Id: 645890-001

Matrix: Soil

MS Sample Id: 645890-001 S

Prep Method: SW5030B

Date Prep: 12.11.19

MSD Sample Id: 645890-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.101	0.106	105	0.0782	77	70-130	30	35	mg/kg	12.11.19 15:24	
Toluene	<0.00201	0.101	0.104	103	0.0866	86	70-130	18	35	mg/kg	12.11.19 15:24	
Ethylbenzene	<0.00201	0.101	0.0978	97	0.0816	81	71-129	18	35	mg/kg	12.11.19 15:24	
m,p-Xylenes	<0.00402	0.201	0.205	102	0.173	86	70-135	17	35	mg/kg	12.11.19 15:24	
o-Xylene	<0.00201	0.101	0.104	103	0.0864	86	71-133	18	35	mg/kg	12.11.19 15:24	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	107		99		70-130	%	12.11.19 15:24
4-Bromofluorobenzene	122		123		70-130	%	12.11.19 15:24

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

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

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

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



Chain of Custody

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, Carlsbad, NM (575) 988-3199, Phoenix, AZ (480) 355-0900
 Tampa, FL (813) 620-2000, Tallahassee, FL (850) 756-0747, Delray Beach, FL (561) 689-6701
 Atlanta, GA (770) 449-8800

Work Order No:

245890

www.xenco.com

Page 1 of 1

Project Manager:	Dan Moir	Bill to: (if different)	Kyle Littlell
Company Name:	LT Environmental, Inc., Permian Office	Company Name:	XTO Energy, Inc.
Address:	3300 North A Street	Address:	3104 E Greene St
City, State ZIP:	Midland, TX 79705	City, State ZIP:	Carlsbad, NM 88220
Phone:	(432) 236-3849	Email:	fsmith@ltenv.com, dmoir@ltenv.com

Program: ☐ UST/PS ☐ PRP ☐ Brownfields ☐ RRP ☐ Superfund State of Project:	
Reporting Level: ☐ Level 1 ☐ Level 2 ☐ Level 3	Deliverables: ☐ EDD ☐ ADAPT ☐ Other:

ANALYSIS REQUEST

Work Order Notes

Project Name:	PLU 89	Turn Around	Routine: ☐
Project Number:	012919246	Rush: 24 hrs	
PO #:	eddy county	Due Date:	
Sampler's Name:	Fatima Smith	Temp Blank:	☒ Yes ☐ No
Temperature (°C):	2.4	Thermometer ID	T-NM-007
Received In tact:	☒ Yes ☐ No	Correction Factor:	-0.2
Cooler Custody Seals:	☒ Yes ☐ No	Total Containers:	5
Sample Custody Seals:	☒ Yes ☐ No		

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	TPH (EPA 8015)	BTEX (EPA 0-8021)	Chloride (EPA 300.0)										
ES01	S	12/10/19	1229	4'	1	X	X	X										
ES02	S	12/10/19	1323	4'	1	X	X	X										
ES03	S	12/10/19	1409	4'	1	X	X	X										
SW01	S	12/10/19	1420	0-4'	1	X	X	X										
SW02	S	12/10/19	1421	0-4'	1	X	X	X										

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 Ti Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed

TCIP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U

1631 / 245.1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 <i>[Signature]</i>	<i>[Signature]</i>	12/11/19 12:20	2		
3			4		
5			6		



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 12/11/2019 12:20:00 PM

Work Order #: 645890

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)?	2.6
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	No
#5 Custody Seals intact on sample bottles?	No
#6* Custody Seals Signed and dated?	No
#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
#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:

Martha Castro

Date: 12/11/2019

Checklist reviewed by:

Jessica Kramer

Date: 12/12/2019

Analytical Report 646007

for
LT Environmental, Inc.

Project Manager: Dan Moir

PLU 89

012919246

12-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)



12-DEC-19

Project Manager: **Dan Moir**

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, CO 80003

Reference: XENCO Report No(s): **646007**

PLU 89

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) 646007. 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. 646007 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Assistant

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

Certified and approved by numerous States and Agencies.

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

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

**Sample Cross Reference 646007****LT Environmental, Inc., Arvada, CO**

PLU 89

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SW03	S	12-11-19 13:50	0 - 4 ft	646007-001
SW04	S	12-11-19 14:25	0 - 4 ft	646007-002
SW05	S	12-11-19 14:14	0 - 4 ft	646007-003
FS04	S	12-11-19 14:00	4 ft	646007-004
FS05	S	12-11-19 14:02	4 ft	646007-005



CASE NARRATIVE

Client Name: LT Environmental, Inc.

Project Name: PLU 89

Project ID: 012919246
Work Order Number(s): 646007

Report Date: 12-DEC-19
Date Received: 12/11/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3110219 BTEX by EPA 8021B

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

Batch: LBA-3110251 TPH by SW8015 Mod

Surrogate o-Terphenyl recovered above QC limits. Matrix interferences is suspected.

Samples affected are: 646007-005,646007-003.



Certificate of Analysis Summary 646007

LT Environmental, Inc., Arvada, CO

Project Name: PLU 89

Project Id: 012919246

Contact: Dan Moir

Project Location: Eddy County

Date Received in Lab: Wed Dec-11-19 04:50 pm

Report Date: 12-DEC-19

Project Manager: Jessica Kramer

<i>Analysis Requested</i>	<i>Lab Id:</i>	646007-001	646007-002	646007-003	646007-004	646007-005	
	<i>Field Id:</i>	SW03	SW04	SW05	FS04	FS05	
	<i>Depth:</i>	0-4 ft	0-4 ft	0-4 ft	4- ft	4- ft	
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	
	<i>Sampled:</i>	Dec-11-19 13:50	Dec-11-19 14:25	Dec-11-19 14:14	Dec-11-19 14:00	Dec-11-19 14:02	
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	
	<i>Analyzed:</i>	Dec-12-19 03:25	Dec-12-19 03:45	Dec-12-19 04:04	Dec-12-19 04:23	Dec-12-19 04:42	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
Toluene		<0.00200 0.00200	0.00400 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
Ethylbenzene		<0.00200 0.00200	0.00224 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
m,p-Xylenes		<0.00399 0.00399	0.0102 0.00399	<0.00393 0.00393	<0.00397 0.00397	<0.00399 0.00399	
o-Xylene		<0.00200 0.00200	0.00408 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
Total Xylenes		<0.00200 0.00200	0.0143 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
Total BTEX		<0.00200 0.00200	0.0205 0.00200	<0.00196 0.00196	<0.00198 0.00198	<0.00200 0.00200	
Chloride by EPA 300	<i>Extracted:</i>	Dec-11-19 17:34	Dec-11-19 17:34	Dec-11-19 17:34	Dec-11-19 17:34	Dec-11-19 17:34	
	<i>Analyzed:</i>	Dec-11-19 20:47	Dec-11-19 20:54	Dec-11-19 21:00	Dec-11-19 21:06	Dec-11-19 21:12	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Chloride		3140 99.6	6180 99.2	6180 99.0	2630 83.9	4300 100	
TPH by SW8015 Mod	<i>Extracted:</i>	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	Dec-11-19 17:00	
	<i>Analyzed:</i>	Dec-11-19 22:02	Dec-11-19 22:42	Dec-11-19 22:42	Dec-11-19 23:02	Dec-11-19 23:02	
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	
Gasoline Range Hydrocarbons (GRO)		<50.1 50.1	<50.1 50.1	<50.3 50.3	<50.2 50.2	<50.2 50.2	
Diesel Range Organics (DRO)		<50.1 50.1	<50.1 50.1	<50.3 50.3	<50.2 50.2	<50.2 50.2	
Motor Oil Range Hydrocarbons (MRO)		<50.1 50.1	<50.1 50.1	<50.3 50.3	<50.2 50.2	<50.2 50.2	
Total GRO-DRO		<50.1 50.1	<50.1 50.1	<50.3 50.3	<50.2 50.2	<50.2 50.2	
Total TPH		<50.1 50.1	<50.1 50.1	<50.3 50.3	<50.2 50.2	<50.2 50.2	

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

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Jessica Kramer
Project Assistant



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW03** Matrix: Soil Date Received: 12.11.19 16.50
 Lab Sample Id: 646007-001 Date Collected: 12.11.19 13.50 Sample Depth: 0 - 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 17.34 Basis: Wet Weight
 Seq Number: 3110204

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	3140	99.6	mg/kg	12.11.19 20.47		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 17.00 Basis: Wet Weight
 Seq Number: 3110251

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	12.11.19 22.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	12.11.19 22.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	12.11.19 22.02	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	12.11.19 22.02	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	12.11.19 22.02	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	114	%	70-135	12.11.19 22.02	
o-Terphenyl	84-15-1	126	%	70-135	12.11.19 22.02	



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW03**

Matrix: Soil

Date Received: 12.11.19 16.50

Lab Sample Id: 646007-001

Date Collected: 12.11.19 13.50

Sample Depth: 0 - 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 17.00

Basis: Wet Weight

Seq Number: 3110219

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	12.12.19 03.25	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.12.19 03.25	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.12.19 03.25		
4-Bromofluorobenzene	460-00-4	113	%	70-130	12.12.19 03.25		



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: SW04	Matrix: Soil	Date Received: 12.11.19 16.50
Lab Sample Id: 646007-002	Date Collected: 12.11.19 14.25	Sample Depth: 0 - 4 ft
Analytical Method: Chloride by EPA 300		Prep Method: E300P
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.11.19 17.34	Basis: Wet Weight
Seq Number: 3110204		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6180	99.2	mg/kg	12.11.19 20.54		10

Analytical Method: TPH by SW8015 Mod	Prep Method: SW8015P
Tech: DTH	% Moisture:
Analyst: DTH	Basis: Wet Weight
Seq Number: 3110251	

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.1	50.1	mg/kg	12.11.19 22.42	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.1	50.1	mg/kg	12.11.19 22.42	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.1	50.1	mg/kg	12.11.19 22.42	U	1
Total GRO-DRO	PHC628	<50.1	50.1	mg/kg	12.11.19 22.42	U	1
Total TPH	PHC635	<50.1	50.1	mg/kg	12.11.19 22.42	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	105	%	70-135	12.11.19 22.42	
o-Terphenyl	84-15-1	107	%	70-135	12.11.19 22.42	



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW04**

Matrix: Soil

Date Received: 12.11.19 16.50

Lab Sample Id: 646007-002

Date Collected: 12.11.19 14.25

Sample Depth: 0 - 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 17.00

Basis: Wet Weight

Seq Number: 3110219

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.12.19 03.45	U	1
Toluene	108-88-3	0.00400	0.00200	mg/kg	12.12.19 03.45		1
Ethylbenzene	100-41-4	0.00224	0.00200	mg/kg	12.12.19 03.45		1
m,p-Xylenes	179601-23-1	0.0102	0.00399	mg/kg	12.12.19 03.45		1
o-Xylene	95-47-6	0.00408	0.00200	mg/kg	12.12.19 03.45		1
Total Xylenes	1330-20-7	0.0143	0.00200	mg/kg	12.12.19 03.45		1
Total BTEX		0.0205	0.00200	mg/kg	12.12.19 03.45		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.12.19 03.45		
4-Bromofluorobenzene	460-00-4	122	%	70-130	12.12.19 03.45		



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW05** Matrix: Soil Date Received: 12.11.19 16.50
 Lab Sample Id: 646007-003 Date Collected: 12.11.19 14.14 Sample Depth: 0 - 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 17.34 Basis: Wet Weight
 Seq Number: 3110204

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6180	99.0	mg/kg	12.11.19 21.00		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 17.00 Basis: Wet Weight
 Seq Number: 3110251

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.3	50.3	mg/kg	12.11.19 22.42	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.3	50.3	mg/kg	12.11.19 22.42	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.3	50.3	mg/kg	12.11.19 22.42	U	1
Total GRO-DRO	PHC628	<50.3	50.3	mg/kg	12.11.19 22.42	U	1
Total TPH	PHC635	<50.3	50.3	mg/kg	12.11.19 22.42	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	131	%	70-135	12.11.19 22.42	
o-Terphenyl	84-15-1	140	%	70-135	12.11.19 22.42	**



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **SW05**

Matrix: Soil

Date Received: 12.11.19 16.50

Lab Sample Id: 646007-003

Date Collected: 12.11.19 14.14

Sample Depth: 0 - 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: MAB

% Moisture:

Analyst: MAB

Date Prep: 12.11.19 17.00

Basis: Wet Weight

Seq Number: 3110219

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
Toluene	108-88-3	<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
Ethylbenzene	100-41-4	<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
m,p-Xylenes	179601-23-1	<0.00393	0.00393	mg/kg	12.12.19 04.04	U	1
o-Xylene	95-47-6	<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
Total Xylenes	1330-20-7	<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
Total BTEX		<0.00196	0.00196	mg/kg	12.12.19 04.04	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	102	%	70-130	12.12.19 04.04		
4-Bromofluorobenzene	460-00-4	123	%	70-130	12.12.19 04.04		



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS04** Matrix: Soil Date Received: 12.11.19 16.50
 Lab Sample Id: 646007-004 Date Collected: 12.11.19 14.00 Sample Depth: 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 17.34 Basis: Wet Weight
 Seq Number: 3110204

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	2630	83.9	mg/kg	12.11.19 21.06		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 17.00 Basis: Wet Weight
 Seq Number: 3110251

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	12.11.19 23.02	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	110	%	70-135	12.11.19 23.02	
o-Terphenyl	84-15-1	114	%	70-135	12.11.19 23.02	



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: FS04	Matrix: Soil	Date Received: 12.11.19 16.50
Lab Sample Id: 646007-004	Date Collected: 12.11.19 14.00	Sample Depth: 4 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.11.19 17.00	Basis: Wet Weight
Seq Number: 3110219		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	12.12.19 04.23	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
Total BTEX		<0.00198	0.00198	mg/kg	12.12.19 04.23	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	112	%	70-130	12.12.19 04.23		
1,4-Difluorobenzene	540-36-3	100	%	70-130	12.12.19 04.23		



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: **FS05** Matrix: Soil Date Received: 12.11.19 16.50
 Lab Sample Id: 646007-005 Date Collected: 12.11.19 14.02 Sample Depth: 4 ft
 Analytical Method: Chloride by EPA 300 Prep Method: E300P
 Tech: MAB % Moisture:
 Analyst: MAB Date Prep: 12.11.19 17.34 Basis: Wet Weight
 Seq Number: 3110204

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	4300	100	mg/kg	12.11.19 21.12		10

Analytical Method: TPH by SW8015 Mod Prep Method: SW8015P
 Tech: DTH % Moisture:
 Analyst: DTH Date Prep: 12.11.19 17.00 Basis: Wet Weight
 Seq Number: 3110251

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Total GRO-DRO	PHC628	<50.2	50.2	mg/kg	12.11.19 23.02	U	1
Total TPH	PHC635	<50.2	50.2	mg/kg	12.11.19 23.02	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	125	%	70-135	12.11.19 23.02	
o-Terphenyl	84-15-1	136	%	70-135	12.11.19 23.02	**



Certificate of Analytical Results 646007

LT Environmental, Inc., Arvada, CO

PLU 89

Sample Id: FS05	Matrix: Soil	Date Received: 12.11.19 16.50
Lab Sample Id: 646007-005	Date Collected: 12.11.19 14.02	Sample Depth: 4 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: MAB		% Moisture:
Analyst: MAB	Date Prep: 12.11.19 17.00	Basis: Wet Weight
Seq Number: 3110219		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	12.12.19 04.42	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
Total BTEX		<0.00200	0.00200	mg/kg	12.12.19 04.42	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	120	%	70-130	12.12.19 04.42		
1,4-Difluorobenzene	540-36-3	104	%	70-130	12.12.19 04.42		



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 **SQL** Sample 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 646007

LT Environmental, Inc.

PLU 89

Analytical Method: Chloride by EPA 300

Seq Number: 3110204

MB Sample Id: 7692228-1-BLK

Matrix: Solid

LCS Sample Id: 7692228-1-BKS

Prep Method: E300P

Date Prep: 12.11.19

LCSD Sample Id: 7692228-1-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	265	106	263	105	90-110	1	20	mg/kg	12.11.19 18:32	

Analytical Method: Chloride by EPA 300

Seq Number: 3110204

Parent Sample Id: 645968-001

Matrix: Soil

MS Sample Id: 645968-001 S

Prep Method: E300P

Date Prep: 12.11.19

MSD Sample Id: 645968-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	248	200	456	104	461	106	90-110	1	20	mg/kg	12.11.19 18:49	

Analytical Method: Chloride by EPA 300

Seq Number: 3110204

Parent Sample Id: 646001-002

Matrix: Soil

MS Sample Id: 646001-002 S

Prep Method: E300P

Date Prep: 12.11.19

MSD Sample Id: 646001-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	233	200	428	98	417	93	90-110	3	20	mg/kg	12.11.19 20:04	

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110251

MB Sample Id: 7692245-1-BLK

Matrix: Solid

LCS Sample Id: 7692245-1-BKS

Prep Method: SW8015P

Date Prep: 12.11.19

LCSD Sample Id: 7692245-1-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	1090	109	963	96	70-135	12	35	mg/kg	12.11.19 21:41	
Diesel Range Organics (DRO)	<50.0	1000	954	95	1010	101	70-135	6	35	mg/kg	12.11.19 21:41	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	96		114		117		70-135	%	12.11.19 21:41
o-Terphenyl	101		111		112		70-135	%	12.11.19 21:41

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110251

Matrix: Solid
MB Sample Id: 7692245-1-BLK

Prep Method: SW8015P

Date Prep: 12.11.19

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	12.11.19 21:41	

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

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

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

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



QC Summary 646007

LT Environmental, Inc.

PLU 89

Analytical Method: TPH by SW8015 Mod

Seq Number: 3110251

Parent Sample Id: 646007-001

Matrix: Soil

MS Sample Id: 646007-001 S

Prep Method: SW8015P

Date Prep: 12.11.19

MSD Sample Id: 646007-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<49.8	996	909	91	1080	108	70-135	17	35	mg/kg	12.11.19 22:22	
Diesel Range Organics (DRO)	<49.8	996	827	83	982	98	70-135	17	35	mg/kg	12.11.19 22:22	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	102		119		70-135	%	12.11.19 22:22
o-Terphenyl	99		117		70-135	%	12.11.19 22:22

Analytical Method: BTEX by EPA 8021B

Seq Number: 3110219

MB Sample Id: 7692236-1-BLK

Matrix: Solid

LCS Sample Id: 7692236-1-BKS

Prep Method: SW5030B

Date Prep: 12.11.19

LCSD Sample Id: 7692236-1-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	0.0933	93	0.0909	91	70-130	3	35	mg/kg	12.12.19 01:43	
Toluene	<0.00200	0.100	0.0951	95	0.0931	93	70-130	2	35	mg/kg	12.12.19 01:43	
Ethylbenzene	<0.00200	0.100	0.0935	94	0.0919	92	71-129	2	35	mg/kg	12.12.19 01:43	
m,p-Xylenes	<0.00400	0.200	0.198	99	0.194	97	70-135	2	35	mg/kg	12.12.19 01:43	
o-Xylene	<0.00200	0.100	0.101	101	0.0995	100	71-133	1	35	mg/kg	12.12.19 01:43	

Surrogate

	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		104		103		70-130	%	12.12.19 01:43
4-Bromofluorobenzene	109		119		121		70-130	%	12.12.19 01:43

Analytical Method: BTEX by EPA 8021B

Seq Number: 3110219

Parent Sample Id: 646007-001

Matrix: Soil

MS Sample Id: 646007-001 S

Prep Method: SW5030B

Date Prep: 12.11.19

MSD Sample Id: 646007-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00198	0.0992	0.0896	90	0.0942	95	70-130	5	35	mg/kg	12.12.19 02:22	
Toluene	0.00103	0.0992	0.0893	89	0.0954	95	70-130	7	35	mg/kg	12.12.19 02:22	
Ethylbenzene	0.000729	0.0992	0.0850	85	0.0907	91	71-129	6	35	mg/kg	12.12.19 02:22	
m,p-Xylenes	0.00222	0.198	0.179	89	0.194	96	70-135	8	35	mg/kg	12.12.19 02:22	
o-Xylene	0.00131	0.0992	0.0912	91	0.0986	98	71-133	8	35	mg/kg	12.12.19 02:22	

Surrogate

	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	104		105		70-130	%	12.12.19 02:22
4-Bromofluorobenzene	121		119		70-130	%	12.12.19 02:22

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

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

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

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



Chain of Custody

Houston, TX (281) 240-4200, Dallas, TX (214) 902-0300, San Antonio, TX (210) 505-3334
Midland, TX (432) 704-5440, El Paso, TX (915) 585-3443, Lubbock, TX (806) 794-1296
Hobbs, NM (575) 382-7550, Carlsbad, NM (575) 988-3199, Phoenix, AZ (480) 355-0900
Tampa, FL (813) 620-2000, Tallahassee, FL (850) 756-0747, Delray Beach, FL (561) 889-6701
Atlanta, GA (770) 445-8800

Work Order No: W495007

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Project Manager:	Dan Moir	Bill to: (if different)	Kyle Littrell
Company Name:	LT Environmental, Inc., Permian Office	Company Name:	XTO Energy, Inc.
Address:	3300 North A Street	Address:	3104 E Greene St
City, State ZIP:	Midland, TX 79705	City, State ZIP:	Carlsbad, NM 88220
Phone:	(432) 236-3849	Email:	fsmith@ltenv.com, dmoir@ltenv.com

Work Order Comments Program: UST/PS ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐ State of Project: Reporting Level ☐ Level ☒ PST/UST ☒ TRRP ☐ Level ☐ Deliverables: EDD ☐ ADAPT ☐ Other:			
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[illegible]

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xencio, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xencio will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of service. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xencio, but not analyzed. These terms will be enforced unless previously negotiated.

Circle Method(s) and Metal(s) to be analyzed	Total 200.7 / 6010	200.8 / 6020:
8RCRA	13PPM	Texas 11
8RCRA	Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO ₂ Na Sr Ti Sn U V Zn	
TCLP / SPLP 6010:	8RCRA	Sb As Ba Be B Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U
		1631 / 245.1 / 7470 / 7471 : Hg

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 <i>[Signature]</i>	<i>[Signature]</i>	12/22/19 12/22/19 16:50	2		
3 <i>[Signature]</i>		12/11/19 cc	4		
5			6		



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: LT Environmental, Inc.

Date/ Time Received: 12/11/2019 04:50:00 PM

Work Order #: 646007

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)?	.4
#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: 12/11/2019

Checklist reviewed by:

Jessica Kramer

Date: 12/12/2019