



CORRECTIVE ACTION REPORT

Property:

BC Cass
32.309828, -104.197419
NE ¼, NW ¼, S16 T23S R27E
Eddy County, New Mexico
NMOCD RP No.: 2RP-3907

December 21, 2016
Apex Project No. 725010112169

Prepared for:

Enterprise Field Services LLC
PO Box 4324
Houston, TX 77252
Attention: Dina Ferguson

Prepared by:

A handwritten signature in blue ink, appearing to read 'Karolanne Toby'.

Karolanne Toby
Project Manager

A handwritten signature in black ink, appearing to read 'Liz Scaggs'.

Liz Scaggs, P.G.
Division Manager

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1.0 INTRODUCTION

1.1 Site Description & Background

The BC Cass release is located within the Enterprise Field Services LLC (Enterprise) pipeline right-of-way (ROW) in the northeast (NE) ¼ of the northwest (NW) ¼ of Section 16 in Township 23 South and Range 27 East in Eddy County, New Mexico, (32.082736, -104.050094) referred to hereinafter as the "Site". The Site consists of native vegetation range land periodically interrupted by oil and gas gathering facilities including one (1) Enterprise BC Cass 16" natural gas gathering pipeline (BC Cass pipeline) which traverses the area east to west.

On April 21, 2016, Enterprise personnel initiated an emergency shut-down of the BC Cass pipeline due to a pipeline leak. Immediate response action commenced based on the Enterprise *General Release Notification, Response and Remediation Plan* (dated March 2015). Enterprise isolated the leaking portion, and the pipeline section was shut down to carry out repair activities. An initial C-141 form was submitted to the New Mexico Oil Conservation Division (NMOCD) on September 26, 2016, which estimated the volume of natural gas pipeline liquids released at five (5) barrels (bbls). This initial estimation was based on the recent excavation of affected soils and evaluation of subsurface impacts during this time. The release was identified by Enterprise on the ground surface and occurred within the Enterprise pipeline ROW.

Subsequent to the completion of remediation activities, the release amount was conservatively estimated at approximately 15 bbls based on the final dimensions of the excavation associated the release. An updated C-141 form with the updated release estimation is included in Appendix E.

A topographic map depicting the location of the Site is included as Figure 1, and a Site Vicinity Map is included as Figure 2 in Appendix A.



1.2 Project Objective

The primary objective of the corrective action activities completed at the Site was to reduce chemicals of concern (COCs) in the on-site soils to below the NMOCD Recommended Remediation Action Levels (RRALs) utilizing the New Mexico Energy, Minerals and Natural Resources Division (EMNRD) OCD's *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.

The objectives of Apex TITAN, Inc. (Apex's) scope of services were to:

- 1) Conduct field observations and guide excavation activities during response action activities utilizing a photoionization detector (PID) to measure volatile organic compounds (VOCs) and a salinity meter (ExStik) to measure chloride, as well as visual and olfactory evidence of impairment to evaluate the potential presence and extent of impacted soils associated with the release of natural gas pipeline liquids.
- 2) Collect soil samples from the release point and excavation areas based on field instrument measurements, visual and olfactory evidence of impairment for analysis of COCs.
- 3) Document all remediation activities and perform regulatory reporting associated with the project.

2.0 SITE RANKING

In accordance with the New Mexico EMNRD OCD's *Guidelines for Remediation of Leaks, Spills and Releases*, Apex utilized the general site characteristics obtained during the completion of corrective action activities and information available from the New Mexico Office of the State Engineer (OSE) to determine the appropriate "ranking" for the Site. The ranking criteria and associated scoring are provided in the following table:

Ranking Criteria			Ranking Score
Depth to Groundwater	<50 feet	20	20
	50 to 99 feet	10	
	>100 feet	0	
Wellhead Protection Area <1,000 feet from a water source, or; <200 feet from private domestic water source.	Yes	20	0
	No	0	
Distance to Surface Water Body	<200 feet	20	0
	200 to 1,000 feet	10	
	>1,000 feet	0	
Total Ranking Score			20

Based on Apex's evaluation of the scoring criteria, the Site would have a Total Ranking Score of "20". This ranking is based on the following:

- The approximate depth to the initial groundwater-bearing zone is less than 50 feet.
- No water source wells (municipal/community wells) were identified within 1,000 feet of the Site.
- The distance to the nearest surface water body is greater than 1,000 feet.

Based on a Total Ranking Score of "20", cleanup goals for soils remaining in place include:

- 10 milligrams per kilogram (mg/Kg) for benzene;
- 50 mg/Kg for total benzene, toluene, ethylbenzene and xylene (BTEX);
- 100 mg/Kg for combined total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and diesel range organics (DRO); and
- 250 mg/Kg for chloride.

3.0 RESPONSE ACTIVITIES

3.1 Soil Remediation Activities

On April 21, 2016, Enterprise personnel initiated an emergency shut-down of the BC Cass pipeline due to a pipeline leak. The leak occurred within the boundaries of the Enterprise pipeline ROW. The pipeline segment was immediately isolated and blown down to carry out repairs associated with the leak.

On July 5, 2016, additional excavation activities were conducted to determine the extent of impaired soil. Apex collected confirmation soil samples from eighteen (18) locations (CS-1 through CS-10 and CS-12 through CS-19) for laboratory analysis, from depths ranging from three and a half (3.5) to five (5) feet below ground surface (bgs) from the excavation sidewalls and floor. Based on analytical results, additional soil removal and confirmation sampling was completed on November 1 and November 9, 2016. Confirmation samples (CS-2(RE), CS-3(RE), CS-4(RE), CS-4(RE2), CS-6(RE), CS-9(RE), CS-12(RE), CS-12(RE2) and CS-17(RE)) were re-collected at depths ranging from three and a half (3.5) feet to six (6) feet bgs.

The final excavation dimensions measured approximately 120 feet long by approximately eight (8) to 12 feet wide, with varying depths ranging from five (5) to six (6) feet bgs. Excavated impacted soil was placed on poly sheet liners adjacent to the excavation. A total of approximately 206 tons of impacted soils were excavated and removed from the pipeline release impacted area, and transported off-Site for final disposal.

Subsequent to receipt of laboratory analytical data, the excavation was backfilled with clean fill material and returned to approximate original grade on November 8, 2016. On November 3 and November 4, 2016, the excavated stockpile was transported off-Site for disposal at Lea Land Disposal facility located approximately 30 miles east of Carlsbad, New Mexico.

3.2 Soil Sampling Program

Apex utilized a PID capable of detecting volatile organic compounds (VOCs) to assist in determining the extent of potential contamination.

On June 23, 2016, Apex's soil sampling program consisted of collecting one (1) confirmation sample (CS-1). Based on PID field readings collected on Site, it was determined that additional soil removal was required.

On July 5, 2016, Apex's soil sampling program consisted of collecting 15 confirmation soil samples (CS-2 through CS-10, CS-12 through CS-19). The samples were collected along the sidewalls and floor of the excavation at approximate depths of three and a half (3.5) feet and five (5) feet bgs.

On November 1, 2016, subsequent to over excavation completed based on the laboratory analytical data; Apex collected eight (8) additional confirmation soil samples (CS-2(RE), CS-3(RE), CS-4(RE), CS-4(RE2), CS-6(RE), CS-9(RE), CS-12(RE) and CS-17(RE)).

On November 9, 2016, subsequent to over excavation completed based on the laboratory analytical data; Apex collected one (1) additional confirmation soil sample (CS-12(RE2)).

Figure 3 is a Sample Location map that indicates the approximate location of the confirmation soil samples in relation to pertinent land features and general excavation boundaries (Appendix A).

The soil samples were collected and placed in laboratory prepared glassware, labeled/sealed using laboratory supplies labels, and placed on ice in a cooler, which was secured with a custody seal. The sample cooler and completed chain-of-custody forms were relinquished to Xenco Laboratories in Midland, TX for analysis.

3.3 Laboratory Analytical Methods

The soil samples were submitted for laboratory analysis of BTEX utilizing Environmental Protection Agency (EPA) SW-846 Method #8021B, TPH GRO and DRO utilizing EPA SW-846 Method #8015, and chloride utilizing EPA Method 300.

Executed chain-of-custody form and laboratory data sheets are provided in Appendix D. All samples were analyzed within specified holding times.

4.0 DATA EVALUATION

The Site is subject to regulatory oversight by the New Mexico EMNRD OCD. To address activities related to condensate releases, the New Mexico EMNRD OCD utilizes the *Guidelines for Remediation of Leaks, Spills and Releases* as guidance, in addition to the OCD rules, specifically NMAC 19.15.30 *Remediation*. These guidance documents establish investigation and abatement action requirements for sites subject to reporting and/or corrective action.

Apex compared the BTEX, TPH and chloride concentrations or laboratory sample detection limits (SDLs) associated with the soil samples collected from the Site to the OCD RRALs for sites having a total ranking score of 20.

4.1 Excavation Confirmation Samples

Laboratory analysis of the confirmation soil samples CS-2, CS-3, CS-4, CS-4(RE), CS-6, CS-9, CS-12, CS-12(RE) and CS-17 exhibited TPH GRO/DRO or chloride concentrations above the applicable OCD RRALs. Based on the results of this analytical data, additional soils were removed from the excavation and subsequent confirmation samples were collected.

Laboratory analyses of the confirmation samples collected from the final excavation (CS-1, CS-2(RE), CS-3(RE), CS-4(RE2), CS-5, CS-6(RE), CS-7, CS-8, CS-9(RE), CS-10, CS-12(RE2), CS-13 through CS-16, CS-17(RE), CS-18 and CS-19) did not exhibit benzene or total BTEX concentrations above the laboratory SDLs and/or the applicable OCD RRALs of 10 mg/Kg for benzene and 50 mg/Kg for BTEX.

Laboratory analyses of the confirmation samples collected from the final excavation (CS-1, CS-2(RE), CS-3(RE), CS-4(RE2), CS-5, CS-6(RE), CS-7, CS-8, CS-9(RE), CS-10, CS-12(RE2), CS-13 through CS-16, CS-17(RE), CS-18 and CS-19) exhibited total TPH GRO/DRO concentrations ranging from below the laboratory SDLs to 64.2 mg/Kg. The identified concentrations and the laboratory SDLs are below the OCD RRAL of 100 mg/Kg for total TPH GRO/DRO.

Laboratory analyses of the confirmation samples collected from the final excavation (CS-1, CS-2(RE), CS-3(RE), CS-4(RE2), CS-5, CS-6(RE), CS-7, CS-8, CS-9(RE), CS-10, CS-12(RE2), CS-13 through CS-16, CS-17(RE), CS-18 and CS-19) exhibited chloride concentrations ranging from below the laboratory SDLs to 241 mg/Kg. The identified concentrations and the laboratory SDLs are below the OCD RRAL of 250 mg/Kg for chloride.

Confirmation sample results are provided in Table 1 in Appendix B.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The BC Cass release is located within the Enterprise pipeline ROW in the northeast (NE) ¼ of the northwest (NW) ¼ of Section 16 in Township 23 South and Range 27 East in Eddy County, New Mexico, (32.082736, -104.050094). The Site consists of native vegetation range land periodically interrupted by oil and gas gathering facilities including one (1) Enterprise BC Cass pipeline which traverses the area east to west.

On April 21, 2016, Enterprise personnel initiated an emergency shut-down of the BC Cass pipeline due to a pipeline leak. Immediate response action commenced based on the Enterprise General Release Notification, Response and Remediation Plan (dated March 2015). Enterprise isolated the leaking portion, and the pipeline section was shut down to carry out repair activities. An initial C-141 form was submitted to the NMOCD on September 26, 2016, which estimated the volume of natural gas pipeline liquids released at 5 bbls. This initial estimation was based on the recent excavation of affected soils and evaluation of subsurface impacts during this time. The release was identified by Enterprise on the ground surface and occurred within the Enterprise pipeline ROW.

- The primary objective of the corrective action was to reduce the concentration of COC's in the on-Site soils to below the New Mexico EMNRD OCD RRALs using the New Mexico EMNRD OCD'S *Guidelines for Remediation of Leaks, Spills and Releases* as guidance.

- The final excavation dimensions measured approximately 120 feet long by approximately eight (8) to 12 feet wide, with varying depths ranging from five (5) to six (6) feet bgs. A total of approximately 206 tons of impacted soils were excavated and removed from the area impacted by the pipeline release.
- The impacted excavated soils were transported to Lea Land Disposal facility located approximately 30 miles east of Carlsbad, New Mexico. Subsequent to receipt of laboratory analysis, the excavation was backfilled with clean fill material and returned to approximate original grade.
- A total of 18 confirmation samples (CS-1, CS-2(RE), CS-3(RE), CS-4(RE2), CS-5, CS-6(RE), CS-7, CS-8, CS-9(RE), CS-10, CS-12(RE2), CS-13 through CS-16, CS-17(RE), CS-18 and CS-19) were collected from the final excavation sidewalls and floor, below the release point. Based on the laboratory analytical results, the soils remaining in place do not indicate benzene, total BTEX, total TPH GRO/DRO or chloride concentrations above the laboratory SDLs and/or the applicable OCD RRALs for a Site Total Ranking Score of 20.

Based on completed on-Site response actions and laboratory analytical results, no additional investigation and/or remediation appears warranted at this time.

6.0 STANDARD OF CARE, LIMITATIONS, AND RELIANCE

Apex's services were performed in accordance with standards customarily provided by a firm rendering the same or similar services in the area during the same time period. Apex makes no warranties, expressed or implied, as to the services performed hereunder. Additionally, Apex does not warrant the work of third parties supplying information used in the report (e.g. laboratories, regulatory agencies, or other third parties). This scope of services was performed in accordance with the scope of work agreed with the client.

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-Site activities and other services performed under this scope of work and it should be noted that this information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, or not present during these services, and Apex cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this scope of services. Environmental conditions at other areas or portions of the Site may vary from those encountered at actual sample locations. Apex's findings and recommendations are based solely upon data available to Apex at the time of these services.

This report has been prepared for the exclusive use of Enterprise, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the expressed written authorization of Enterprise and Apex. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in the proposal, the report, and Apex's Agreement. The limitation of liability defined in the agreement is the aggregate limit of Apex's liability to the client.

APPENDIX A

Figures



Google™

**Enterprise Field Services LLC
BC Cass**

Section 16, Township 23, South Range 27 East
Eddy County, New Mexico
32.309828 N, 104.197419 W

Project No. 725010112169



Apex TITAN, Inc.

12100 Ford Road, Suite 401
Dallas, Texas 75234
Phone: (469) 365-1100
www.apexcos.com

A Subsidiary of Apex Companies, LLC

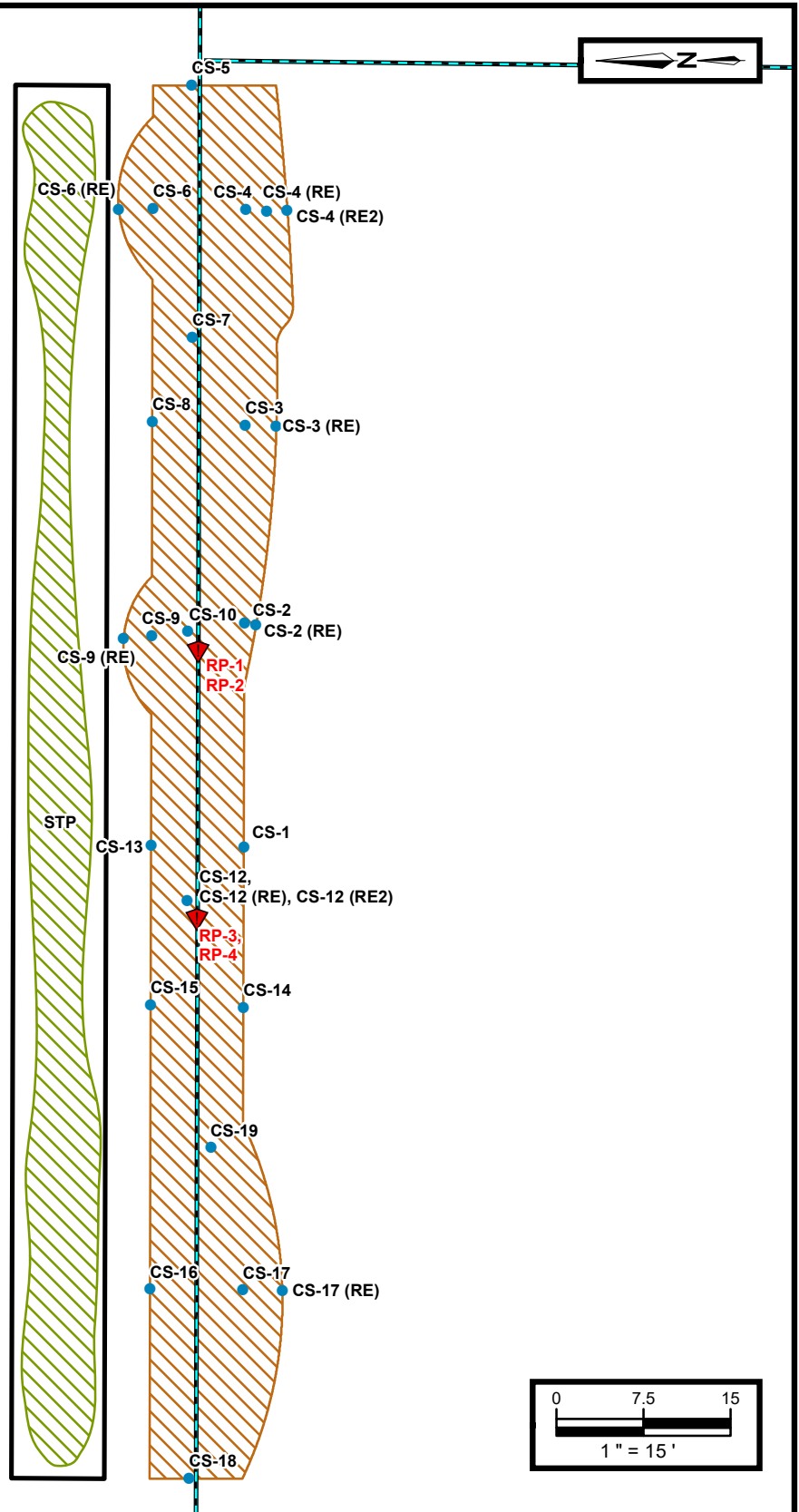
FIGURE 2

Site Vicinity Map

Aerial Photograph March 2016

LEGEND:

- Confirmation Sample Location
- Confirmation Sample Location (Not Submitted Due to Elevated Field Screenings)
- ▼ Release Point
- Enterprise Natural Gas Pipeline
- ▨ Soil Stockpile Location
- ▭ Stockpile Liner
- ▨ Extent of Excavation

**NOTE:**

Release Points 1,2 and 3, 4 Were Observed to be 1 Foot Apart and are Represented as One Point for Visualization. A Small Stockpile on a 12'x12' Liner Was Observed 40' Southeast of Eastern Edge of Excavation on Initial Site Visit

Enterprise Field Services LLC
BC Cass

Section 16, Township 23, South Range 27 East
Eddy County, New Mexico
32.309828 N, 104.197419 W

Project No. 725010112169



Apex TITAN, Inc.

12100 Ford Road, Suite 401
Dallas, Texas 75234
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A Subsidiary of Apex Companies, LLC

FIGURE 3

Site Map

APPENDIX B

Tables

TABLE 1

Soil Sample Analytical Results
BC Cass Release

Sample ID	Sample Date	Sample Depth (feet BGS)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH GRO (mg/Kg)	TPH DRO (mg/Kg)	Total TPH GRO/DRO (mg/Kg)	Chloride (mg/Kg)
New Mexico Oil Conservation Division (NMOCD) Recommended Remediation Action Levels (RRALs)											
NMOCD RRALs (Total Ranking Score: 20)			10	NE	NE	NE	50	NE	NE	100	250
Excavation Confirmation Soil Sample Analytical Results											
CS-1	6/23/2016	3.5	<0.00150	<0.00200	<0.00200	0.0105	0.0105	21.2	30.7	51.9	199
CS-2	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	67.7	67.7	295
CS-2(RE)	11/1/2016	3.5	NA								35.9
CS-3	7/5/2016	3.5	<0.00149	<0.00198	<0.00198	0.00198	0.00198	16.9	112	129	105
CS-3(RE)	11/1/2016	3.5	NA						<15.0	<15.0	NA
CS-4	7/5/2016	3.5	<0.00149	<0.00198	<0.00198	<0.00198	<0.00149	<15.0	15.9	15.9	260
CS-4(RE)	11/1/2016	3.5	NA								295
CS-4(RE2)	11/1/2016	3.5	NA								241
CS-5	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	<15.0	<15.0	10.2
CS-6	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	<15.0	<15.0	440
CS-6(RE)	11/1/2016	3.5	NA								168
CS-7	11/1/2016	5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	26.7	26.7	12.3
CS-8	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	17.6	17.6	53.6
CS-9	7/5/2016	3.5	<0.00148	<0.00198	<0.00198	0.0163	0.0163	74.6	444	519	192
CS-9(RE)	11/1/2016	3.5	NA						<15.0	30.4	30.4
CS-10	11/1/2016	5	<0.00149	<0.00199	<0.00199	<0.00199	<0.00149	<15.0	64.2	64.2	17.9
CS-12	7/5/2016	5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	24.1	1,790	1,840	24.0
CS-12(RE)	11/1/2016	5.5	NA						<15.0	129	129
CS-12(RE2)	11/9/2016	6	NA						<15.0	<15.0	NA
CS-13	7/5/2016	3.5	<0.00149	<0.00199	<0.00199	<0.00199	<0.00149	<15.0	16.4	16.4	92.2
CS-14	7/5/2016	3.5	<0.00149	<0.00198	<0.00198	<0.00198	<0.00149	<15.0	<15.0	<15.0	171
CS-15	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	18.8	18.8	77.6
CS-16	7/5/2016	3.5	<0.00149	<0.00199	<0.00199	<0.00199	<0.00149	<15.0	25.9	25.9	15.2
CS-17	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	176	176	245
CS-17(RE)	11/1/2016	3.5	NA						<15.0	16.4	16.4
CS-18	7/5/2016	3.5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	<15.0	<15.0	<9.75
CS-19	7/5/2016	5	<0.00150	<0.00200	<0.00200	<0.00200	<0.00150	<15.0	<15.0	<15.0	22.5

Note: Concentrations in **bold** and yellow exceed the applicable NMOCD RRALs

indicates area of overexcavation

BGS: below grade surface

DRO: diesel range organics

GRO: gasoline range organics

mg/Kg: milligrams per Kilogram

NA: not analyzed

NE: not established

TPH: total petroleum hydrocarbons

APPENDIX C

Photo Documentation



View of initial soil removal, facing east along pipeline ROW during remediation activities.



View of exposed pipeline during remediation activities, facing northeast.



View of the length of the excavation during remediation activities, facing east.



View of excavation and stockpile during remediation activities, facing west.



View of excavation during remediation activities, facing east.



View of excavation during remediation activities, facing northeast.

APPENDIX D

Laboratory Data Reports & Chain-of-Custody Documentation

Analytical Report 532335

for
APEX/Titan

Project Manager: Karolanne Toby

BC Cass

725010112169

01-JUL-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



01-JUL-16

Project Manager: **Karolanne Toby**

APEX/Titan

505 N. Big Spring Ste. 301 A

Midland, TX 79701

Reference: XENCO Report No(s): **532335**

BC Cass

Project Address:

Karolanne Toby:

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) 532335. 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. 532335 will be filed for 60 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,

Kelsey Brooks

Project Manager

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

Certified and approved by numerous States and Agencies.

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

Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America



Sample Cross Reference 532335



APEX/Titan, Midland, TX

BC Cass

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
CS-1	S	06-23-16 16:05	- 3.5 ft	532335-001



CASE NARRATIVE



Client Name: APEX/Titan

Project Name: BC Cass

Project ID: 725010112169
Work Order Number(s): 532335

Report Date: 01-JUL-16
Date Received: 06/24/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 532335

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location:

Date Received in Lab: Fri Jun-24-16 10:45 am
Report Date: 01-JUL-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	532335-001					
	Field Id:	CS-1					
	Depth:	3.5 ft					
	Matrix:	SOIL					
	Sampled:	Jun-23-16 16:05					
BTEX by EPA 8021B	Extracted:	Jun-29-16 16:30					
	Analyzed:	Jun-29-16 19:38					
	Units/RL:	mg/kg RL					
Benzene		BRL 0.00150					
Toluene		BRL 0.00200					
Ethylbenzene		BRL 0.00200					
m,p-Xylenes		0.00641 0.00200					
o-Xylene		0.00405 0.00299					
Total Xylenes		0.0105 0.00200					
Total BTEX		0.0105 0.00150					
Inorganic Anions by EPA 300	Extracted:	Jun-30-16 17:00					
	Analyzed:	Jun-30-16 19:14					
	Units/RL:	mg/kg RL					
Chloride		199 10.0					
TPH by SW 8015B	Extracted:	Jun-28-16 07:00					
	Analyzed:	Jun-28-16 18:46					
	Units/RL:	mg/kg RL					
C6-C10 Gasoline Range Hydrocarbons		21.2 15.0					
C10-C28 Diesel Range Hydrocarbons		30.7 15.0					
Total TPH		51.9 15.0					

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

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

Kelsey Brooks
Project Manager

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532335,

Lab Batch #: 997168

Sample: 532335-001 / SMP

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/28/16 18:46

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.0	99.9	99	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

Lab Batch #: 997365

Sample: 532335-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/29/16 19:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0335	0.0300	112	80-120	

Lab Batch #: 997168

Sample: 710421-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/28/16 08:18

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	100	104	70-135	
o-Terphenyl	51.4	50.0	103	70-135	

Lab Batch #: 997365

Sample: 710521-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/29/16 18:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 997168

Sample: 710421-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/28/16 08:44

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	120	100	120	70-135	
o-Terphenyl	54.1	50.0	108	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532335,

Lab Batch #: 997365

Sample: 710521-1-BKS / BKS

Project ID: 725010112169

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/29/16 16:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 997168

Sample: 710421-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/28/16 09:09

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	125	100	125	70-135	
o-Terphenyl	55.1	50.0	110	70-135	

Lab Batch #: 997365

Sample: 710521-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 06/29/16 17:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 997168

Sample: 532377-025 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/28/16 09:57

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	128	99.9	128	70-135	
o-Terphenyl	57.5	50.0	115	70-135	

Lab Batch #: 997365

Sample: 532377-044 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/29/16 17:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0316	0.0300	105	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532335,

Lab Batch #: 997168

Sample: 532377-025 SD / MSD

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/28/16 10:22

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	122	99.9	122	70-135	
o-Terphenyl	54.3	50.0	109	70-135	

Lab Batch #: 997365

Sample: 532377-044 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 06/29/16 17:44

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0269	0.0300	90	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: BC Cass

Work Order #: 532335

Project ID: 725010112169

Analyst: PJB

Date Prepared: 06/29/2016

Date Analyzed: 06/29/2016

Lab Batch ID: 997365

Sample: 710521-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00150	0.100	0.105	105	0.100	0.100	100	5	70-130	35	
Toluene	<0.00200	0.100	0.102	102	0.100	0.0977	98	4	70-130	35	
Ethylbenzene	<0.00200	0.100	0.108	108	0.100	0.103	103	5	71-129	35	
m,p-Xylenes	<0.00200	0.200	0.221	111	0.200	0.212	106	4	70-135	35	
o-Xylene	<0.00300	0.100	0.108	108	0.100	0.105	105	3	71-133	35	

Analyst: MNR

Date Prepared: 06/30/2016

Date Analyzed: 06/30/2016

Lab Batch ID: 997412

Sample: 710538-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	262	105	250	262	105	0	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: BC Cass

Work Order #: 532335

Project ID: 725010112169

Analyst: ARM

Date Prepared: 06/28/2016

Date Analyzed: 06/28/2016

Lab Batch ID: 997168

Sample: 710421-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	885	89	1000	872	87	1	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	926	93	1000	1000	100	8	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS Recoveries

Project Name: BC Cass



Work Order #: 532335

Lab Batch #: 997412

Date Analyzed: 06/30/2016

QC- Sample ID: 532336-008 S

Reporting Units: mg/kg

Date Prepared: 06/30/2016

Batch #: 1

Project ID: 725010112169

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	1910	2500	4260	94	80-120	

Lab Batch #: 997412

Date Analyzed: 06/30/2016

QC- Sample ID: 532377-043 S

Reporting Units: mg/kg

Date Prepared: 06/30/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	44.4	305	326	92	80-120	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$
Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order #: 532335

Project ID: 725010112169

Lab Batch ID: 997365

QC- Sample ID: 532377-044 S

Batch #: 1 Matrix: Soil

Date Analyzed: 06/29/2016

Date Prepared: 06/29/2016

Analyst: PJB

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00176	0.117	0.126	108	0.118	0.105	89	18	70-130	35	
Toluene	<0.00235	0.117	0.122	104	0.118	0.103	87	17	70-130	35	
Ethylbenzene	<0.00235	0.117	0.130	111	0.118	0.108	92	18	71-129	35	
m,p-Xylenes	<0.00235	0.235	0.267	114	0.236	0.221	94	19	70-135	35	
o-Xylene	<0.00352	0.117	0.131	112	0.118	0.108	92	19	71-133	35	

Lab Batch ID: 997168

QC- Sample ID: 532377-025 S

Batch #: 1 Matrix: Soil

Date Analyzed: 06/28/2016

Date Prepared: 06/28/2016

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<17.8	1190	1050	88	1190	1000	84	5	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<17.8	1190	1250	105	1190	1200	101	4	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Project Name: BC Cass

Work Order #: 532335

Lab Batch #: 997412

Project ID: 725010112169

Date Analyzed: 06/30/2016 20:08

Date Prepared: 06/30/2016

Analyst: MNR

QC- Sample ID: 532336-008 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Inorganic Anions by EPA 300	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	1910	1910	0	20	

Lab Batch #: 997412

Date Analyzed: 06/30/2016 18:11

Date Prepared: 06/30/2016

Analyst: MNR

QC- Sample ID: 532377-043 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Inorganic Anions by EPA 300	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	44.4	37.4	17	20	

Spike Relative Difference RPD $200 * |(B-A)/(B+A)|$
 All Results are based on MDL and validated for QC purposes.
 BRL - Below Reporting Limit



APEX

Office Location

Midland, TX

Laboratory: XENCO

Address:

Contact:

Phone:

Project Manager

PO/ISO #: 785010112169

Sampler's Name

Sampler's Signature

Proj. No.

Project Name

No/Type of Containers

785010112169

BC Cass

1

Matrix

Date

Time

Identifying Marks of Sample(s)

Start Depth

End Depth

VOA

A/G 1 Lt.

250 ml

Glass Jar

P/O

5/23/2016

X CS-1

BS

X X X

Lab Sample ID (Lab Use Only)

ANALYSIS REQUESTED

Lab use only

Due Date:

Temp. of coolers when received (C°):

1.1°C

Page 1 of 1

532335

MAN 532326 CHAIN OF CUSTODY RECORD

Turn around time ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)

Date:

Time:

Received by: (Signature)

NOTES:

Relinquished by (Signature)

Date:

Time:

Received by: (Signature)

Relinquished by (Signature)

Date:

Time:

Received by: (Signature)

Relinquished by (Signature)

Date:

Time:

Received by: (Signature)

X N.M. Samples

Matrix

WW - Wastewater

W - Water

S - Soil

SD - Solid

L - Liquid

A - Air Bag

C - Charcoal tube

SL - sludge

O - Oil

VOA - 40 ml vial

A/G - Amber / Or Glass 1 Liter

250 ml - Glass wide mouth

P/O - Plastic or other

Apex TITAN, Inc. • 505 N. Big Springs Drive, Suite 301A • Midland, Texas 79701 • Office: 432-695-6070

Temp 1.1°C IR ID: R-8
Temp 1.1°C



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: APEX/Titan

Date/ Time Received: 06/24/2016 10:45:00 AM

Work Order #: 532335

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.1
#2 *Shipping container in good condition?	N/A
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	No
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by: Mary Alexis Negron
Mary Negron

Date: 06/27/2016

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks

Date: 06/27/2016

Analytical Report 532800

**for
APEX/Titan**

Project Manager: Karolanne Toby

BC Cass

725010112169

19-DEC-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



19-DEC-16

Project Manager: **Karolanne Toby**

APEX/Titan

505 N. Big Spring Ste. 301 A

Midland, TX 79701

Reference: XENCO Report No(s): **532800**

BC Cass

Project Address: New Mexico

Karolanne Toby:

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) 532800. 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. 532800 will be filed for 60 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,

Julian Martinez

Project Manager

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APEX/Titan, Midland, TX

BC Cass

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
CS-2	S	07-05-16 12:30	- 3.5 ft	532800-001
CS-3	S	07-05-16 12:33	- 3.5 ft	532800-002
CS-4	S	07-05-16 12:36	- 3.5 ft	532800-003
CS-5	S	07-05-16 12:39	- 3.5 ft	532800-004
CS-6	S	07-05-16 12:42	- 3.5 ft	532800-005
CS-8	S	07-05-16 12:48	- 3.5 ft	532800-006
CS-9	S	07-05-16 12:51	- 3.5 ft	532800-007
CS-12	S	07-05-16 13:00	- 5 ft	532800-008
CS-13	S	07-05-16 13:03	- 3.5 ft	532800-009
CS-14	S	07-05-16 13:06	- 3.5 ft	532800-010
CS-15	S	07-05-16 13:09	- 3.5 ft	532800-011
CS-16	S	07-05-16 13:12	- 3.5 ft	532800-012
CS-17	S	07-05-16 13:15	- 3.5 ft	532800-013
CS-18	S	07-05-16 13:18	- 3.5 ft	532800-014
CS-19	S	07-05-16 13:21	- 5 ft	532800-015



CASE NARRATIVE



Client Name: APEX/Titan

Project Name: BC Cass

Project ID: 725010112169
Work Order Number(s): 532800

Report Date: 19-DEC-16
Date Received: 07/06/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-997704 BTEX by EPA 8021B

Lab Sample ID 532800-001 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, m,p-Xylenes, o-Xylene 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: 532800-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015. The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analysis Summary 532800

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location: New Mexico

Date Received in Lab: Wed Jul-06-16 08:35 am
Report Date: 19-DEC-16
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532800-001	532800-002	532800-003	532800-004	532800-005	532800-006
	<i>Field Id:</i>	CS-2	CS-3	CS-4	CS-5	CS-6	CS-8
	<i>Depth:</i>	3.5 ft	3.5 ft	3.5 ft	3.5 ft	3.5 ft	3.5 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jul-05-16 12:30	Jul-05-16 12:33	Jul-05-16 12:36	Jul-05-16 12:39	Jul-05-16 12:42	Jul-05-16 12:48
BTEX by EPA 8021B	<i>Extracted:</i>	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15
	<i>Analyzed:</i>	Jul-07-16 17:30	Jul-07-16 17:46	Jul-07-16 18:02	Jul-07-16 18:18	Jul-07-16 18:34	Jul-07-16 18:51
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		BRL 0.00150	BRL 0.00149	BRL 0.00149	BRL 0.00150	BRL 0.00150	BRL 0.00150
Toluene		BRL 0.00200	BRL 0.00198	BRL 0.00198	BRL 0.00200	BRL 0.00200	BRL 0.00200
Ethylbenzene		BRL 0.00200	BRL 0.00198	BRL 0.00198	BRL 0.00200	BRL 0.00200	BRL 0.00200
m,p-Xylenes		BRL 0.00200	0.00198 0.00198	BRL 0.00198	BRL 0.00200	BRL 0.00200	BRL 0.00200
o-Xylene		BRL 0.00299	BRL 0.00297	BRL 0.00298	BRL 0.00300	BRL 0.00299	BRL 0.00299
Total Xylenes		BRL 0.00200	0.00198 0.00198	BRL 0.00198	BRL 0.00200	BRL 0.00200	BRL 0.00200
Total BTEX		BRL 0.00150	0.00198 0.00149	BRL 0.00149	BRL 0.00150	BRL 0.00150	BRL 0.00150
Inorganic Anions by EPA 300 SUB: TX104704215	<i>Extracted:</i>	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00
	<i>Analyzed:</i>	Jul-09-16 22:24	Jul-09-16 23:11	Jul-09-16 23:26	Jul-09-16 23:41	Jul-09-16 23:57	Jul-10-16 00:12
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		295 10.0	105 9.49	260 9.73	10.2 10.0	440 9.77	53.6 9.47
TPH by SW 8015B	<i>Extracted:</i>	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00
	<i>Analyzed:</i>	Jul-06-16 17:02	Jul-06-16 18:17	Jul-06-16 18:42	Jul-06-16 19:06	Jul-06-16 19:30	Jul-06-16 19:54
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
C6-C10 Gasoline Range Hydrocarbons		BRL 15.0	16.9 15.0	BRL 15.0	BRL 15.0	BRL 15.0	BRL 15.0
C10-C28 Diesel Range Hydrocarbons		67.7 15.0	112 15.0	15.9 15.0	BRL 15.0	BRL 15.0	17.6 15.0
Total TPH		67.7 15.0	129 15.0	15.9 15.0	BRL 15.0	BRL 15.0	17.6 15.0

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Julian Martinez
Project Manager



Certificate of Analysis Summary 532800

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location: New Mexico

Date Received in Lab: Wed Jul-06-16 08:35 am
Report Date: 19-DEC-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	532800-007	532800-008	532800-009	532800-010	532800-011	532800-012
	Field Id:	CS-9	CS-12	CS-13	CS-14	CS-15	CS-16
	Depth:	3.5 ft	5 ft	3.5 ft	3.5 ft	3.5 ft	3.5 ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Jul-05-16 12:51	Jul-05-16 13:00	Jul-05-16 13:03	Jul-05-16 13:06	Jul-05-16 13:09	Jul-05-16 13:12
BTEX by EPA 8021B	Extracted:	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15
	Analyzed:	Jul-07-16 19:11	Jul-07-16 19:27	Jul-07-16 19:43	Jul-07-16 20:00	Jul-07-16 20:48	Jul-07-16 21:04
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Benzene		BRL 0.00148	BRL 0.00150	BRL 0.00149	BRL 0.00149	BRL 0.00150	BRL 0.00149
Toluene		BRL 0.00198	BRL 0.00200	BRL 0.00199	BRL 0.00198	BRL 0.00200	BRL 0.00199
Ethylbenzene		BRL 0.00198	BRL 0.00200	BRL 0.00199	BRL 0.00198	BRL 0.00200	BRL 0.00199
m,p-Xylenes		0.00333 0.00198	BRL 0.00200	BRL 0.00199	BRL 0.00198	BRL 0.00200	BRL 0.00199
o-Xylene		0.0130 0.00296	BRL 0.00299	BRL 0.00299	BRL 0.00298	BRL 0.00299	BRL 0.00299
Total Xylenes		0.0163 0.00198	BRL 0.00200	BRL 0.00199	BRL 0.00198	BRL 0.00200	BRL 0.00199
Total BTEX		0.0163 0.00148	BRL 0.00150	BRL 0.00149	BRL 0.00149	BRL 0.00150	BRL 0.00149
Inorganic Anions by EPA 300 SUB: TX104704215	Extracted:	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00
	Analyzed:	Jul-10-16 00:27	Jul-10-16 00:43	Jul-10-16 00:58	Jul-10-16 01:13	Jul-10-16 01:59	Jul-10-16 02:45
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		192 9.47	24.0 9.90	92.2 9.84	171 9.60	77.6 10.1	15.2 9.29
TPH by SW 8015B	Extracted:	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00
	Analyzed:	Jul-06-16 20:18	Jul-06-16 20:43	Jul-06-16 21:08	Jul-06-16 21:33	Jul-06-16 22:24	Jul-06-16 22:50
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
C6-C10 Gasoline Range Hydrocarbons		74.6 14.9	24.1 15.0	BRL 15.0	BRL 15.0	BRL 15.0	BRL 15.0
C10-C28 Diesel Range Hydrocarbons		444 14.9	1790 15.0	16.4 15.0	BRL 15.0	18.8 15.0	25.9 15.0
Total TPH		519 14.9	1840 15.0	16.4 15.0	BRL 15.0	18.8 15.0	25.9 15.0

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Julian Martinez
Project Manager



Certificate of Analysis Summary 532800

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location: New Mexico

Date Received in Lab: Wed Jul-06-16 08:35 am
Report Date: 19-DEC-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	532800-013	532800-014	532800-015			
	Field Id:	CS-17	CS-18	CS-19			
	Depth:	3.5 ft	3.5 ft	5 ft			
	Matrix:	SOIL	SOIL	SOIL			
	Sampled:	Jul-05-16 13:15	Jul-05-16 13:18	Jul-05-16 13:21			
BTEX by EPA 8021B	Extracted:	Jul-07-16 15:15	Jul-07-16 15:15	Jul-07-16 15:15			
	Analyzed:	Jul-08-16 08:31	Jul-08-16 08:47	Jul-08-16 09:03			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Benzene		BRL 0.00150	BRL 0.00150	BRL 0.00150			
Toluene		BRL 0.00200	BRL 0.00200	BRL 0.00200			
Ethylbenzene		BRL 0.00200	BRL 0.00200	BRL 0.00200			
m,p-Xylenes		BRL 0.00200	BRL 0.00200	BRL 0.00200			
o-Xylene		BRL 0.00299	BRL 0.00299	BRL 0.00300			
Total Xylenes		BRL 0.00200	BRL 0.00200	BRL 0.00200			
Total BTEX		BRL 0.00150	BRL 0.00150	BRL 0.00150			
Inorganic Anions by EPA 300 SUB: TX104704215	Extracted:	Jul-09-16 13:00	Jul-09-16 13:00	Jul-09-16 13:00			
	Analyzed:	Jul-10-16 03:01	Jul-10-16 03:16	Jul-10-16 03:32			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
Chloride		245 9.86	BRL 9.75	22.5 9.80			
TPH by SW 8015B	Extracted:	Jul-06-16 14:00	Jul-06-16 14:00	Jul-06-16 14:00			
	Analyzed:	Jul-06-16 23:15	Jul-06-16 23:41	Jul-07-16 00:07			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
C6-C10 Gasoline Range Hydrocarbons		BRL 15.0	BRL 15.0	BRL 15.0			
C10-C28 Diesel Range Hydrocarbons		176 15.0	BRL 15.0	BRL 15.0			
Total TPH		176 15.0	BRL 15.0	BRL 15.0			

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Julian Martinez
Project Manager

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997629

Sample: 532800-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 17:02

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	84.1	99.8	84	70-135	
o-Terphenyl	42.2	49.9	85	70-135	

Lab Batch #: 997629

Sample: 532800-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 18:17

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	89.7	99.9	90	70-135	
o-Terphenyl	43.7	50.0	87	70-135	

Lab Batch #: 997629

Sample: 532800-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 18:42

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	89.6	99.9	90	70-135	
o-Terphenyl	43.2	50.0	86	70-135	

Lab Batch #: 997629

Sample: 532800-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 19:06

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	91.3	99.8	91	70-135	
o-Terphenyl	43.9	49.9	88	70-135	

Lab Batch #: 997629

Sample: 532800-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 19:30

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	94.0	99.8	94	70-135	
o-Terphenyl	44.5	49.9	89	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997629

Sample: 532800-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 19:54

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.7	99.8	94	70-135	
o-Terphenyl	45.4	49.9	91	70-135	

Lab Batch #: 997629

Sample: 532800-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 20:18

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.7	99.6	94	70-135	
o-Terphenyl	45.1	49.8	91	70-135	

Lab Batch #: 997629

Sample: 532800-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 20:43

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.6	99.9	95	70-135	
o-Terphenyl	46.6	50.0	93	70-135	

Lab Batch #: 997629

Sample: 532800-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 21:08

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.3	100	86	70-135	
o-Terphenyl	39.5	50.0	79	70-135	

Lab Batch #: 997629

Sample: 532800-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 21:33

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	100	104	70-135	
o-Terphenyl	49.9	50.0	100	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997629

Sample: 532800-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 22:24

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	92.6	99.7	93	70-135	
o-Terphenyl	44.8	49.9	90	70-135	

Lab Batch #: 997629

Sample: 532800-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 22:50

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	85.7	99.8	86	70-135	
o-Terphenyl	41.1	49.9	82	70-135	

Lab Batch #: 997629

Sample: 532800-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 23:15

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	91.0	99.8	91	70-135	
o-Terphenyl	43.2	49.9	87	70-135	

Lab Batch #: 997629

Sample: 532800-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 23:41

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	90.3	99.7	91	70-135	
o-Terphenyl	44.1	49.9	88	70-135	

Lab Batch #: 997629

Sample: 532800-015 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 00:07

SURROGATE RECOVERY STUDY					
TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	93.6	99.9	94	70-135	
o-Terphenyl	45.1	50.0	90	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997704

Sample: 532800-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 17:30

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0312	0.0300	104	80-120	

Lab Batch #: 997704

Sample: 532800-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 17:46

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0308	0.0300	103	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	80-120	

Lab Batch #: 997704

Sample: 532800-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 18:02

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	80-120	

Lab Batch #: 997704

Sample: 532800-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 18:18

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0307	0.0300	102	80-120	

Lab Batch #: 997704

Sample: 532800-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 18:34

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0316	0.0300	105	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997704

Sample: 532800-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 18:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0313	0.0300	104	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	80-120	

Lab Batch #: 997704

Sample: 532800-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 19:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0332	0.0300	111	80-120	

Lab Batch #: 997704

Sample: 532800-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 19:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0294	0.0300	98	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 997704

Sample: 532800-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 19:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0297	0.0300	99	80-120	

Lab Batch #: 997704

Sample: 532800-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 20:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997704

Sample: 532800-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 20:48

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 997704

Sample: 532800-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 21:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 997704

Sample: 532800-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/08/16 08:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0278	0.0300	93	80-120	

Lab Batch #: 997704

Sample: 532800-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/08/16 08:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	80-120	
4-Bromofluorobenzene	0.0300	0.0300	100	80-120	

Lab Batch #: 997704

Sample: 532800-015 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/08/16 09:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0316	0.0300	105	80-120	
4-Bromofluorobenzene	0.0306	0.0300	102	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997629

Sample: 710696-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/06/16 15:48

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.1	100	97	70-135	
o-Terphenyl	48.2	50.0	96	70-135	

Lab Batch #: 997704

Sample: 710720-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/07/16 17:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 997629

Sample: 710696-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/06/16 16:13

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	100	121	70-135	
o-Terphenyl	54.8	50.0	110	70-135	

Lab Batch #: 997704

Sample: 710720-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/07/16 15:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 997629

Sample: 710696-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/06/16 16:38

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	100	123	70-135	
o-Terphenyl	56.3	50.0	113	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 532800, 532800

Project ID: 725010112169

Lab Batch #: 997704

Sample: 710720-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 07/07/16 16:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0307	0.0300	102	80-120	
4-Bromofluorobenzene	0.0311	0.0300	104	80-120	

Lab Batch #: 997629

Sample: 532800-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 17:27

SURROGATE RECOVERY STUDY

TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	108	99.8	108	70-135	
o-Terphenyl	47.6	49.9	95	70-135	

Lab Batch #: 997704

Sample: 532800-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 16:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0342	0.0300	114	80-120	

Lab Batch #: 997629

Sample: 532800-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/06/16 17:52

SURROGATE RECOVERY STUDY

TPH by SW 8015B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	87.8	99.7	88	70-135	
o-Terphenyl	35.6	49.9	71	70-135	

Lab Batch #: 997704

Sample: 532800-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 07/07/16 16:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0313	0.0300	104	80-120	
4-Bromofluorobenzene	0.0326	0.0300	109	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: BC Cass

Work Order #: 532800, 532800

Project ID: 725010112169

Analyst: PJB

Date Prepared: 07/07/2016

Date Analyzed: 07/07/2016

Lab Batch ID: 997704

Sample: 710720-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B		Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes												
Benzene		<0.00150	0.100	0.0920	92	0.100	0.0975	98	6	70-130	35	
Toluene		<0.00200	0.100	0.0901	90	0.100	0.0953	95	6	70-130	35	
Ethylbenzene		<0.00200	0.100	0.0937	94	0.100	0.0982	98	5	71-129	35	
m,p-Xylenes		<0.00200	0.200	0.193	97	0.200	0.202	101	5	70-135	35	
o-Xylene		<0.00300	0.100	0.0954	95	0.100	0.0994	99	4	71-133	35	

Analyst: DHE

Date Prepared: 07/09/2016

Date Analyzed: 07/09/2016

Lab Batch ID: 997791

Sample: 710783-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300		Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes												
Chloride		<1.00	10.0	10.3	103	10.0	10.3	103	0	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: BC Cass

Work Order #: 532800, 532800

Project ID: 725010112169

Analyst: ARM

Date Prepared: 07/06/2016

Date Analyzed: 07/06/2016

Lab Batch ID: 997629

Sample: 710696-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	902	90	1000	898	90	0	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	1010	101	1000	997	100	1	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order #: 532800

Project ID: 725010112169

Lab Batch ID: 997704

QC- Sample ID: 532800-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 07/07/2016

Date Prepared: 07/07/2016

Analyst: PJB

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00150	0.0998	0.0633	63	0.0998	0.0558	56	13	70-130	35	X
Toluene	<0.00200	0.0998	0.0602	60	0.0998	0.0526	53	13	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0522	52	0.0998	0.0470	47	10	71-129	35	X
m,p-Xylenes	<0.00200	0.200	0.118	59	0.200	0.102	51	15	70-135	35	X
o-Xylene	<0.00299	0.0998	0.0643	64	0.0998	0.0557	56	14	71-133	35	X

Lab Batch ID: 997791

QC- Sample ID: 532800-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 07/09/2016

Date Prepared: 07/09/2016

Analyst: DHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	295	100	395	100	100	393	98	1	80-120	20	

Lab Batch ID: 997791

QC- Sample ID: 532800-011 S

Batch #: 1 Matrix: Soil

Date Analyzed: 07/10/2016

Date Prepared: 07/09/2016

Analyst: DHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	77.6	101	183	104	101	184	105	1	80-120	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order # : 532800

Project ID: 725010112169

Lab Batch ID: 997629

QC- Sample ID: 532800-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 07/06/2016

Date Prepared: 07/06/2016

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	998	891	89	997	899	90	1	70-135	35	
C10-C28 Diesel Range Hydrocarbons	67.7	998	974	91	997	1050	99	8	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



APEX

Office Location

Midland, TX

Laboratory: KENCO

Address:

Midland, TX

Contact:

Phone:

PO/ISO #: 725010112169

Project Manager: Caroline Tody

Sampler's Signature

Proj. No.

Project Name

No/Type of Containers

725010112169

BC CASS

15

Matrix

Date

Time

Identifying Marks of Sample(s)

Start Depth

End Depth

VOA

A/G 1 L

250 ml

Glass Jar

P/O

S 7/5/12 1230

1233

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CS-3

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XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: APEX/Titan

Date/ Time Received: 07/06/2016 08:35:00 AM

Work Order #: 532800

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.4
#2 *Shipping container in good condition?	N/A
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	Yes subcontract to xenco houston
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Carley Owens

Carley Owens

Date: 07/06/2016

Checklist reviewed by:

Kelsey Brooks

Kelsey Brooks

Date: 07/06/2016

Analytical Report 539588

**for
APEX/Titan**

Project Manager: Karolanne Toby

BC Cass

725010112169

09-NOV-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

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09-NOV-16

Project Manager: **Karolanne Toby**

APEX/Titan

505 N. Big Spring Ste. 301 A

Midland, TX 79701

Reference: XENCO Report No(s): **539588**

BC Cass

Project Address:

Karolanne Toby:

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) 539588. 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. 539588 will be filed for 60 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,

Kelsey Brooks

Project Manager

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APEX/Titan, Midland, TX

BC Cass

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
CS-2 (RE)	S	11-01-16 09:30	3.5 ft	539588-001
CS-3 (RE)	S	11-01-16 09:35	3.5 ft	539588-002
CS-6 (RE)	S	11-01-16 09:45	3.5 ft	539588-003
CS-9 (RE)	S	11-01-16 09:50	3.5 ft	539588-004
CS-17 (RE)	S	11-01-16 10:00	3.5 ft	539588-005
CS-4 (RE)	S	11-01-16 16:20	3.5 ft	539588-006
CS-4 (RE-2)	S	11-01-16 16:25	3.5 ft	539588-009
CS-7	S	11-01-16 14:30	5 ft	539588-012
CS-10	S	11-01-16 14:35	5 ft	539588-013
CS-12 (RE)	S	11-01-16 14:40	5.5 ft	539588-014
CS-6 (RE-2)	S	11-01-16 15:30	3.5 ft	Not Analyzed
CS-3 (RE-2)	S	11-01-16 16:10	3.5 ft	Not Analyzed
CS-17 (RE-2)	S	11-01-16 16:00	3.5 ft	Not Analyzed
CS-2 (RE-2)	S	11-01-16 16:15	3.5 ft	Not Analyzed



CASE NARRATIVE



Client Name: APEX/Titan

Project Name: BC Cass

Project ID: 725010112169
Work Order Number(s): 539588

Report Date: 09-NOV-16
Date Received: 11/02/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3003192 BTEX by EPA 8021B

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



Certificate of Analysis Summary 539588

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location:

Date Received in Lab: Wed Nov-02-16 08:43 am
Report Date: 09-NOV-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	539588-001	539588-002	539588-003	539588-004	539588-005	539588-006
	Field Id:	CS-2 (RE)	CS-3 (RE)	CS-6 (RE)	CS-9 (RE)	CS-17 (RE)	CS-4 (RE)
	Depth:	3.5- ft	3.5- ft	3.5- ft	3.5- ft	3.5- ft	3.5- ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Nov-01-16 09:30	Nov-01-16 09:35	Nov-01-16 09:45	Nov-01-16 09:50	Nov-01-16 10:00	Nov-01-16 16:20
Inorganic Anions by EPA 300	Extracted:	Nov-02-16 13:06		Nov-02-16 13:06			Nov-02-16 13:06
	Analyzed:	Nov-02-16 13:06		Nov-02-16 13:27			Nov-02-16 13:34
	Units/RL:	mg/kg RL		mg/kg RL			mg/kg RL
Chloride		35.9 5.00		168 5.00			295 5.00
TPH by SW 8015B	Extracted:		Nov-02-16 11:00		Nov-02-16 11:00	Nov-02-16 11:00	
	Analyzed:		Nov-02-16 15:06		Nov-02-16 16:02	Nov-02-16 16:26	
	Units/RL:		mg/kg RL		mg/kg RL	mg/kg RL	
C6-C10 Gasoline Range Hydrocarbons			<15.0 15.0		<15.0 15.0	<15.0 15.0	
C10-C28 Diesel Range Hydrocarbons			<15.0 15.0		30.4 15.0	16.4 15.0	
Total TPH			<15.0 15.0		30.4 15.0	16.4 15.0	

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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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 539588

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location:

Date Received in Lab: Wed Nov-02-16 08:43 am
Report Date: 09-NOV-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	539588-009	539588-012	539588-013	539588-014		
	Field Id:	CS-4 (RE-2)	CS-7	CS-10	CS-12 (RE)		
	Depth:	3.5- ft	5- ft	5- ft	5.5- ft		
	Matrix:	SOIL	SOIL	SOIL	SOIL		
	Sampled:	Nov-01-16 16:25	Nov-01-16 14:30	Nov-01-16 14:35	Nov-01-16 14:40		
BTEX by EPA 8021B	Extracted:		Nov-02-16 11:00	Nov-02-16 11:00			
	Analyzed:		Nov-02-16 14:19	Nov-02-16 14:57			
	Units/RL:		mg/kg RL	mg/kg RL			
	Benzene		<0.00150 0.00150	<0.00149 0.00149			
	Toluene		<0.00200 0.00200	<0.00199 0.00199			
	Ethylbenzene		<0.00200 0.00200	<0.00199 0.00199			
	m,p-Xylenes		<0.00200 0.00200	<0.00199 0.00199			
	o-Xylene		<0.00300 0.00300	<0.00298 0.00298			
Inorganic Anions by EPA 300	Extracted:	Nov-08-16 10:00	Nov-02-16 13:06	Nov-02-16 13:06			
	Analyzed:	Nov-08-16 11:57	Nov-02-16 13:41	Nov-02-16 13:48			
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL			
	Chloride	241 5.00	12.3 5.00	17.9 5.00			
	Extracted:		Nov-02-16 11:00	Nov-02-16 11:00	Nov-02-16 11:00		
	Analyzed:		Nov-02-16 16:51	Nov-02-16 17:15	Nov-02-16 17:41		
	Units/RL:		mg/kg RL	mg/kg RL	mg/kg RL		
	C6-C10 Gasoline Range Hydrocarbons		<15.0 15.0	<15.0 15.0	<15.0 15.0		
TPH by SW 8015B	C10-C28 Diesel Range Hydrocarbons		26.7 15.0	64.2 15.0	129 15.0		
	Total TPH		26.7 15.0	64.2 15.0	129 15.0		

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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Kelsey Brooks
Project Manager

- 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

+ NELAC certification not offered for this compound.

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

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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 539588,

Lab Batch #: 3003192

Sample: 539588-012 / SMP

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 14:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3003192

Sample: 539588-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 14:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

Lab Batch #: 3003196

Sample: 539588-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 15:06

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.7	99.9	96	70-135	
o-Terphenyl	52.2	50.0	104	70-135	

Lab Batch #: 3003196

Sample: 539588-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 16:02

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	100	105	70-135	
o-Terphenyl	52.8	50.0	106	70-135	

Lab Batch #: 3003196

Sample: 539588-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 16:26

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.7	109	70-135	
o-Terphenyl	55.6	49.9	111	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 539588,

Project ID: 725010112169

Lab Batch #: 3003196

Sample: 539588-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 16:51

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.8	107	70-135	
o-Terphenyl	53.7	49.9	108	70-135	

Lab Batch #: 3003196

Sample: 539588-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 17:15

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.8	110	70-135	
o-Terphenyl	56.5	49.9	113	70-135	

Lab Batch #: 3003196

Sample: 539588-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 17:41

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.8	106	70-135	
o-Terphenyl	54.9	49.9	110	70-135	

Lab Batch #: 3003192

Sample: 715677-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 12:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0326	0.0300	109	80-120	

Lab Batch #: 3003196

Sample: 715657-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 13:09

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	100	109	70-135	
o-Terphenyl	57.7	50.0	115	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 539588,

Lab Batch #: 3003192

Sample: 715677-1-BKS / BKS

Project ID: 725010112169

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 11:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0299	0.0300	100	80-120	

Lab Batch #: 3003192

Sample: 715657-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 13:39

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	100	127	70-135	
o-Terphenyl	59.8	50.0	120	70-135	

Lab Batch #: 3003192

Sample: 715677-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 11:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0313	0.0300	104	80-120	

Lab Batch #: 3003192

Sample: 715657-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/02/16 14:08

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	57.6	50.0	115	70-135	

Lab Batch #: 3003192

Sample: 539589-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 11:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0357	0.0300	119	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 539588,

Lab Batch #: 3003196

Sample: 539560-001 S / MS

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 22:11

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	124	99.9	124	70-135	
o-Terphenyl	63.2	50.0	126	70-135	

Lab Batch #: 3003192

Sample: 539589-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 12:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

Lab Batch #: 3003196

Sample: 539560-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/02/16 22:38

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	99.8	122	70-135	
o-Terphenyl	57.9	49.9	116	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Project Name: BC Cass

Work Order #: 539588

Project ID: 725010112169

Analyst: PJB

Date Prepared: 11/02/2016

Date Analyzed: 11/02/2016

Lab Batch ID: 3003192

Sample: 715677-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00150	0.100	0.0920	92	0.100	0.104	104	12	70-130	35	
Toluene	<0.00200	0.100	0.0914	91	0.100	0.105	105	14	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0973	97	0.100	0.109	109	11	71-129	35	
m,p-Xylenes	<0.00200	0.200	0.200	100	0.200	0.222	111	10	70-135	35	
o-Xylene	<0.00300	0.100	0.0984	98	0.100	0.109	109	10	71-133	35	

Analyst: MNR

Date Prepared: 11/02/2016

Date Analyzed: 11/02/2016

Lab Batch ID: 3003173

Sample: 715638-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	246	98	250	249	100	1	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes

Project Name: BC Cass

Work Order #: 539588

Project ID: 725010112169

Analyst: MNR

Date Prepared: 11/08/2016

Date Analyzed: 11/08/2016

Lab Batch ID: 3003523

Sample: 715859-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	237	95	250	246	98	4	90-110	20	

Analyst: ARM

Date Prepared: 11/02/2016

Date Analyzed: 11/02/2016

Lab Batch ID: 3003196

Sample: 715657-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	972	97	1000	942	94	3	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	939	94	1000	908	91	3	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order #: 539588

Project ID: 725010112169

Lab Batch ID: 3003192

QC- Sample ID: 539589-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/02/2016

Date Prepared: 11/02/2016

Analyst: PJB

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00149	0.0992	0.0754	76	0.100	0.0908	91	19	70-130	35	
Toluene	<0.00198	0.0992	0.0743	75	0.100	0.0918	92	21	70-130	35	
Ethylbenzene	<0.00198	0.0992	0.0790	80	0.100	0.0942	94	18	71-129	35	
m,p-Xylenes	<0.00198	0.198	0.166	84	0.200	0.194	97	16	70-135	35	
o-Xylene	<0.00298	0.0992	0.0841	85	0.100	0.0957	96	13	71-133	35	

Lab Batch ID: 3003173

QC- Sample ID: 539588-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/02/2016

Date Prepared: 11/02/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	35.9	250	282	98	250	283	99	0	90-110	20	

Lab Batch ID: 3003173

QC- Sample ID: 539635-001 S

Batch #: 1 Matrix: Solid

Date Analyzed: 11/03/2016

Date Prepared: 11/02/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	8.51	250	233	90	250	241	93	3	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order #: 539588

Project ID: 725010112169

Lab Batch ID: 3003523

QC- Sample ID: 539906-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/08/2016

Date Prepared: 11/08/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1300	250	1550	100	250	1560	104	1	90-110	20	

Lab Batch ID: 3003523

QC- Sample ID: 539912-003 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/08/2016

Date Prepared: 11/08/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	3450	1250	4610	93	1250	4690	99	2	90-110	20	

Lab Batch ID: 3003196

QC- Sample ID: 539560-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/02/2016

Date Prepared: 11/02/2016

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	999	926	93	998	839	84	10	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	999	863	86	998	808	81	7	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

CHAIN OF CUSTODY RECORD

 APEX Office Location <u>Midland, TX</u>		Laboratory: <u>KENCO</u> Address: <u>Midland, TX</u> Contact: _____ Phone: _____		ANALYSIS REQUESTED <div style="transform: rotate(-45deg); transform-origin: center;"> TPA analysis BTEX results 1/24/16 </div>		Lab use only Due Date: _____ Temp. of coolers when received (C°): <u>4</u> 1 2 3 4 5 Page <u>2</u> of <u>2</u>	
		Project Manager <u>Karolanne Tobey</u> Sampler's Name <u>Georgiana McSwane</u> PO/ISO #: <u>725010112169</u> Sampler's Signature <u>[Signature]</u>		Temp: <u>4.0</u> IR ID: <u>R-8</u> CF: <u>+</u> 0.1 Corrected Temp: <u>4.1</u>		Lab Sample ID (Lab Use Only) <u>529588</u>	
Proj. No. <u>725010112169</u> Project Name <u>BC Cass</u> No/Type of Containers <u>14</u>		Matrix <u>S</u> Date <u>1/1/16</u> Time <u>1615</u> <u>1</u> <u>1430</u> <u>1</u> <u>1435</u> <u>S</u> <u>1/1/16</u> <u>1440</u>		Identifying Marks of Sample(s) <u>CS-2 (CRE-2)</u> <u>CS-7</u> <u>CS-10</u> <u>CS-12 (CRE)</u>		Start Depth <u>3.5'</u> <u>5'</u> <u>5'</u> <u>5.5'</u>	
End Depth _____ VOA _____ A/G _____ 250 _____ Glass _____ P/O _____		X X		X X X X		X X X X	
Turn around time <input type="checkbox"/> Normal <input type="checkbox"/> 25% Rush <input type="checkbox"/> 50% Rush <input checked="" type="checkbox"/> 100% Rush		Relinquished by (Signature) <u>[Signature]</u> Date: <u>1/2/16</u> Time: <u>0800</u> Relinquished by (Signature) <u>[Signature]</u> Date: <u>1/2/16</u> Time: <u>0843</u> Relinquished by (Signature) <u>[Signature]</u> Date: _____ Time: _____ Relinquished by (Signature) _____ Date: _____ Time: _____		Received by: (Signature) <u>[Signature]</u> Date: <u>1/2/16</u> Time: <u>0800</u> Received by: (Signature) <u>[Signature]</u> Date: <u>1/2/16</u> Time: <u>0843</u> Received by: (Signature) _____ Date: _____ Time: _____ Received by: (Signature) _____ Date: _____ Time: _____		NOTES: <u># 24 hour re-scan</u> <u># NM samples</u>	
Matrix Container <u>WW - Wastewater</u> <u>VOA - 40 ml vial</u>		W - Water A/G - Amber / Or Glass 1 Liter		S - Soil SD - Solid 250 ml - Glass wide mouth		L - Liquid 250 ml - Glass wide mouth	
C - Charcoal tube P/O - Plastic or other		SL - sludge		O - Oil		_____	



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: APEX/Titan

Date/ Time Received: 11/02/2016 08:43:00 AM

Work Order #: 539588

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	4.1
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	No
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Julian Martinez

Date: 11/02/2016

Checklist reviewed by:

Kelsey Brooks

Date: 11/02/2016

Analytical Report 540107

**for
APEX/Titan**

Project Manager: Karolanne Toby

BC Cass

725010112169

10-NOV-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

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10-NOV-16

Project Manager: **Karolanne Toby**

APEX/Titan

505 N. Big Spring Ste. 301 A

Midland, TX 79701

Reference: XENCO Report No(s): **540107**

BC Cass

Project Address:

Karolanne Toby:

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) 540107. 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. 540107 will be filed for 60 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,

Kelsey Brooks

Project Manager

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Sample Cross Reference 540107



APEX/Titan, Midland, TX

BC Cass

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
CS-12 (RE-2)	S	11-09-16 10:30	6 ft	540107-001



CASE NARRATIVE



Client Name: APEX/Titan

Project Name: BC Cass

Project ID: 725010112169
Work Order Number(s): 540107

Report Date: 10-NOV-16
Date Received: 11/09/2016

Sample receipt non conformances and comments:

NM SAMPLES
24 HOUR RUSH

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 540107

APEX/Titan, Midland, TX

Project Name: BC Cass



Project Id: 725010112169
Contact: Karolanne Toby
Project Location:

Date Received in Lab: Wed Nov-09-16 06:15 pm
Report Date: 10-NOV-16
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	540107-001					
	Field Id:	CS-12 (RE-2)					
	Depth:	6- ft					
	Matrix:	SOIL					
	Sampled:	Nov-09-16 10:30					
TPH by SW 8015B	Extracted:	Nov-09-16 19:00					
	Analyzed:	Nov-09-16 22:00					
	Units/RL:	mg/kg RL					
C6-C10 Gasoline Range Hydrocarbons			<15.0	15.0			
C10-C28 Diesel Range Hydrocarbons			<15.0	15.0			
Total TPH			<15.0	15.0			

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

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

Version: 1.9%

Kelsey Brooks
Project Manager

- 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

+ NELAC certification not offered for this compound.

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

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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 540107,

Lab Batch #: 3003592

Sample: 540107-001 / SMP

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/09/16 22:00

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.9	101	70-135	
o-Terphenyl	48.8	50.0	98	70-135	

Lab Batch #: 3003592

Sample: 715914-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/09/16 20:22

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	100	119	70-135	
o-Terphenyl	59.0	50.0	118	70-135	

Lab Batch #: 3003592

Sample: 715914-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/09/16 20:46

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	124	100	124	70-135	
o-Terphenyl	64.6	50.0	129	70-135	

Lab Batch #: 3003592

Sample: 715914-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 11/09/16 21:10

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	100	129	70-135	
o-Terphenyl	61.4	50.0	123	70-135	

Lab Batch #: 3003592

Sample: 540107-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/09/16 22:26

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	48.9	50.0	98	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: BC Cass

Work Orders : 540107,

Lab Batch #: 3003592

Sample: 540107-001 SD / MSD

Project ID: 725010112169

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 11/09/16 22:50

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	99.8	115	70-135	
o-Terphenyl	49.5	49.9	99	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: BC Cass

Work Order #: 540107

Project ID: 725010112169

Analyst: ARM

Date Prepared: 11/09/2016

Date Analyzed: 11/09/2016

Lab Batch ID: 3003592

Sample: 715914-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	995	100	1000	963	96	3	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	1030	103	1000	956	96	7	70-135	35	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: BC Cass

Work Order # : 540107

Project ID: 725010112169

Lab Batch ID: 3003592

QC- Sample ID: 540107-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 11/09/2016

Date Prepared: 11/09/2016

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	882	88	998	807	81	9	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	842	84	998	832	83	1	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: APEX/Titan

Date/ Time Received: 11/09/2016 06:15:00 PM

Work Order #: 540107

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	.8
#2 *Shipping container in good condition?	N/A
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	N/A
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO ₃ , HCL, H ₂ SO ₄ ? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Jessica Kramer

Jessica Kramer

Date: 11/10/2016

Checklist reviewed by:

Kelsey Brooks

Kelsey Brooks

Date: 11/10/2016

APPENDIX E

NMOCD C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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

Form C-141
Revised August 8, 2011

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

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company <i>Enterprise Field Services LLC</i>	Contact <i>Alena Polk</i>	
<i>PO Box 4324, Houston, TX 77210</i>	Telephone No. <i>575-706-4926</i>	
Facility Name <i>Pipeline ROW, BC CASS 16"</i>	Facility Type: <i>Gas Gathering Pipeline</i>	
Surface Owner <i>State of New Mexico</i>	Mineral Owner <i>NA - Pipeline</i>	Lease No. <i>NA</i>

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
<i>C</i>	<i>16</i>	<i>23S</i>	<i>27E</i>	<i>480</i>	<i>South</i>	<i>600</i>	<i>West</i>	<i>Eddy</i>

Latitude: *N 32.309828* Longitude: *W -104.197419*

NATURE OF RELEASE

Type of Release <i>Natural Gas and pipeline liquid</i>	Volume of Release: <i>12 MCF gas/ 5 bbl liquids</i>	Volume Recovered: <i>N/A</i>
Source of Release <i>Pipeline Leak</i>	Date and Hour of Occurrence <i>4/21/2016 @ 14:00 MST</i>	Date and Hour of Discovery <i>4/21/2016 @ 14:00 MST</i>
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Natural gas and pipeline liquid was released due to a pipeline leak. Pipeline segment was isolated, blown down, and repaired following standard one-call. About 5 bbls of liquid released.

Describe Area Affected and Cleanup Action Taken.*

A liquid spill of about 5bbl of pipeline liquids as part of the leak. All liquids were confined to the right of way. Remediation actions will follow the Enterprise Products, General Release Notification, Response and Remediation Plan (March 9, 2015), housekeeping standards.

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

Signature:	<u>OIL CONSERVATION DIVISION</u>		
Printed Name: <i>Jon E. Fields</i>	Approved by District Supervisor:		
Title: <i>Director, Field Environmental</i>	Approval Date:	Expiration Date:	
E-mail Address: jefields@eprod.com	Conditions of Approval:		Attached <input type="checkbox"/>
Date: Phone: <i>713-381-6684</i>			

* Attach Additional Sheets If Necessary

APPENDIX F

Waste Manifests

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Triple T's

NON-HAZARDOUS WASTE MANIFEST

NO 116104

1. PAGE ___ OF ___

2. TRAILER NO. 35

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3. COMPANY NAME

Enterprise Field Services LLC

PHONE NO.

(575) 885-7236

4. ADDRESS

P.O BOX 1508

CITY

Carlsbad

STATE

NM 88221

ZIP

5. PICK-UP DATE

11/3/2018

6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:

Non-Regulated, Non Hazardous Waste

8. CONTAINERS

No. 1

Type CM

9. TOTAL QUANTITY

10. UNIT Wt/Vol.

11. TEXAS WASTE ID

b.

c.

WT:

38,940

38,340

12. COMMENTS OR SPECIAL INSTRUCTIONS:

B C CASE

TOTAL 77280

13. WASTE PROFILE NO.

14.

IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME

Kin Slaughter

PHONE NO

575-887-4048

24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME

SIGNATURE

DATE

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16. TRANSPORTER (1)

NAME:

NEW MEXICO RENTALS

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT: ALLEN WALKER

EMERGENCY PHONE: (575) 942-1257

17. TRANSPORTER (2)

NAME:

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

EMERGENCY PHONE:

18. TRANSPORTER (1): Acknowledgment of receipt of material

PRINTED/TYPED NAME

Sam Sosa

SIGNATURE

DATE

11/3/2018

19. TRANSPORTER (2): Acknowledgment of receipt of material

PRINTED/TYPED NAME

SIGNATURE

DATE

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Lea Land, LLC

ADDRESS:

Mile Marker 64, U.S. Hwy 62/180,
30 Miles East of Carlsbad, NM

PHONE:

575-887-4048

PERMIT NO.

WM-01-035 - New Mexico

20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE

Santa Gonzalez

CELL NO.

DATE

11/3/2018

TIME

9:35

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Triple T's

NON-HAZARDOUS WASTE MANIFEST

NO 116105

1. PAGE ___ OF ___

2. TRAILER NO.

34

G E N E R A T O R	3. COMPANY NAME Enterprise Field Services LLC PHONE NO. (575) 885-7236	4. ADDRESS P.O BOX 1508 CITY Carlsbad STATE NM 88221 ZIP	5. PICK-UP DATE 11/3/2018		
	6. TNRCC I.D. NO.				
	7. NAME OR DESCRIPTION OF WASTE SHIPPED: Non-Regulated, Non Hazardous Waste	8. CONTAINERS No. 1 Type CM	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
	12. COMMENTS OR SPECIAL INSTRUCTIONS: B C CASE TOTAL @ 83960		13. WASTE PROFILE NO.		
T R A N S P O R T E R S	14. IN CASE OF EMERGENCY OR SPILL, CONTACT NAME Kin Slaughter PHONE NO 575-887-4048 24-HOUR EMERGENCY NO.				
	15. GENERATOR'S CERTIFICATION: I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC				
	PRINTED/TYPED NAME		SIGNATURE		DATE
	16. TRANSPORTER (1) NAME: NEW MEXICO RENTALS TEXAS I.D. NO. IN CASE OF EMERGENCY CONTACT: ALLEN WALKER EMERGENCY PHONE: (575) 942-1257		17. TRANSPORTER (2) NAME: TEXAS I.D. NO. IN CASE OF EMERGENCY CONTACT: EMERGENCY PHONE:		
D I S P O S I T A L Y	18. TRANSPORTER (1): Acknowledgment of receipt of material PRINTED/TYPED NAME Ruth Saenz SIGNATURE [Signature] DATE 11/3/2018		19. TRANSPORTER (2): Acknowledgment of receipt of material PRINTED/TYPED NAME _____ SIGNATURE _____ DATE _____		
	20. COMMENTS				
	21. DISPOSAL FACILITY'S CERTIFICATION: I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.				
	AUTHORIZED SIGNATURE [Signature]		CELL NO.	DATE 11/3/2018	TIME 10:00
Lea Land, LLC		ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM		PHONE: 575-887-4048	
PERMIT NO. WM-01-035 - New Mexico					

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Triple T3

NON-HAZARDOUS WASTE MANIFEST

NO 116106

1. PAGE ___ OF ___

2. TRAILER NO. 39

G E N E R A T O R	3. COMPANY NAME Enterprise Field Services LLC	4. ADDRESS P.O BOX 1508	5. PICK-UP DATE 11/3/2016			
	PHONE NO. (575) 885-7238	CITY Carlsbad	STATE NM	ZIP 88221		
	6. TNRCC I.D. NO.					
	7. NAME OR DESCRIPTION OF WASTE SHIPPED: Non-Regulated, Non Hazardous Waste		8. CONTAINERS No. 1 Type CM	9. TOTAL QUANTITY	10. UNIT Wt/Vol.	11. TEXAS WASTE ID #
T R A N S P O R T E R S	b.					
	c.					
	d. WT: 40020 41,460					
	12. COMMENTS OR SPECIAL INSTRUCTIONS: B C CASE		13. WASTE PROFILE NO.			
D I S P O S I T Y	14. IN CASE OF EMERGENCY OR SPILL, CONTACT					
	NAME Kin Slaughter		PHONE NO 575-887-4048		24-HOUR EMERGENCY NO.	
	15. GENERATOR'S CERTIFICATION: I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC					
	PRINTED/TYPED NAME			SIGNATURE		DATE
T R A N S P O R T E R S	16. TRANSPORTER (1)			17. TRANSPORTER (2)		
	NAME: NEW MEXICO RENTALS			NAME:		
	TEXAS I.D. NO.			TEXAS I.D. NO.		
	IN CASE OF EMERGENCY CONTACT: ALLEN WALKER			IN CASE OF EMERGENCY CONTACT:		
D I S P O S I T Y	EMERGENCY PHONE: (575) 942-1257			EMERGENCY PHONE:		
	18. TRANSPORTER (1): Acknowledgment of receipt of material			19. TRANSPORTER (2): Acknowledgment of receipt of material		
	PRINTED/TYPED NAME Mike Galt			PRINTED/TYPED NAME		
	SIGNATURE [Signature] DATE 11/3/2016			SIGNATURE DATE		
D I S P O S I T Y	Lea Land, LLC		ADDRESS: Mile Marker 64, U.S. Hwy 62/180, 30 Miles East of Carlsbad, NM		PHONE: 575-887-4048	
	PERMIT NO. WM-01-035 - New Mexico		20. COMMENTS			
	21. DISPOSAL FACILITY'S CERTIFICATION: I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.					
	AUTHORIZED SIGNATURE Santos Gonzalez		CELL NO.		DATE 11/3/2016	TIME 10:05

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Water Const

NON-HAZARDOUS WASTE MANIFEST

NO 116111

1. PAGE ___ OF ___

2. TRAILER NO.

28

G 3. COMPANY NAME
Enterprise Field Services LLC

4. ADDRESS
P.O BOX 1508

5. PICK-UP DATE
11/4/2018

PHONE NO.
(575) 885-7236

CITY
Carlsbad

STATE
NM 88221

ZIP

6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:

a. Non-Regulated, Non-Hazardous Waste

8. CONTAINERS
No. 1 Type CM

9. TOTAL
QUANTITY

10. UNIT
Wt/Vol.

11. TEXAS
WASTE ID #

d. WT:

40,840 4,120

12. COMMENTS OR SPECIAL INSTRUCTIONS:

BC CASS

13. WASTE PROFILE NO.

TO 81960

14. IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME
Kin Slaughter

PHONE NO
575-887-4048

24-HOUR EMERGENCY NO.

15. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME

SIGNATURE

DATE

16. TRANSPORTER (1)

NAME: NEW MEXICO RENTALS

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT: ALLEN WALKER

EMERGENCY PHONE: (575) 842-1257

17. TRANSPORTER (2)

NAME:

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

EMERGENCY PHONE:

18. TRANSPORTER (1): Acknowledgment of receipt of material

PRINTED/TYPED NAME Jose Sotelo Jr

SIGNATURE DATE 11/4/2018

19. TRANSPORTER (2): Acknowledgment of receipt of material

PRINTED/TYPED NAME

SIGNATURE DATE

Lea Land, LLC

ADDRESS:

Mile Marker 64, U.S. Hwy 62/180,
30 Miles East of Carlsbad, NM

PHONE:

575-887-4048

PERMIT NO.

WM-01-035 - New Mexico

20. COMMENTS

21. DISPOSAL FACILITY'S CERTIFICATION: I hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE

CELL NO.

DATE 11/4/2018

TIME 8:50

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Triple TS

NON-HAZARDOUS WASTE MANIFEST

NO 116112

1. PAGE ___ OF ___

2. TRAILER NO. 34

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3. COMPANY NAME

Enterprise Field Services LLC

PHONE NO.

(575) 885-7236

4. ADDRESS

P.O BOX 1508

CITY

Carlsbad

STATE

NM 88221

ZIP

5. PICK-UP DATE

11/4/2016

6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:

a. Non-Regulated, Non Hazardous Waste

b.

c.

d. WT:

44,020

12. COMMENTS OR SPECIAL INSTRUCTIONS:

B C CASS

8. CONTAINERS

No.

Type

1

CM

9. TOTAL QUANTITY

10. UNIT Wt/Vol.

11. TEXAS WASTE ID #

IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME

Kin Slaughter

PHONE NO

575-887-4048

24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME

SIGNATURE

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16. TRANSPORTER (1)

NAME:

NEW MEXICO RENTALS

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

ALLEN WALKER

EMERGENCY PHONE:

(575) 942-1257

18. TRANSPORTER (1): Acknowledgment of receipt of material

PRINTED/TYPED NAME

Allen Walker

SIGNATURE

DATE

11/4/2016

17. TRANSPORTER (2)

NAME:

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

EMERGENCY PHONE:

19. TRANSPORTER (2): Acknowledgment of receipt of material

PRINTED/TYPED NAME

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Lea Land, LLC

ADDRESS:

Mile Marker 64, U.S. Hwy 62/180,
30 Miles East of Carlsbad, NM

PHONE:

575-887-4048

PERMIT NO.

WM-01-035 - New Mexico

20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE

Santos Gonzalez

CELL NO.

DATE 11/4/2016

TIME

8:55

GENERATOR: COPIES 1 & 6

DISPOSAL SITE: COPIES 2 & 3

TRANSPORTERS: COPIES 4 & 5

COPY 1

LEA LAND DISPOSAL SITE NEW MEXICO

MILE MARKER #64 US HWY 62/180 • 30 MILES EAST OF CARLSBAD, NM • PHONE (575) 887-4048

LEA LAND, LLC

1300 WEST MAIN STREET • OKLAHOMA CITY, OK 73106 • PHONE (405) 236-4257

Triple T's

NON-HAZARDOUS WASTE MANIFEST

NO 116113

1. PAGE ___ OF ___

2. TRAILER NO.

39

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3. COMPANY NAME

Enterprise Field Services LLC

4. ADDRESS

P.O BOX 1508

5. PICK-UP DATE

11/4/2018

PHONE NO.

(575) 885-7236

CITY

Carlsbad

STATE

NM 88221

ZIP

6. TNRCC I.D. NO.

7. NAME OR DESCRIPTION OF WASTE SHIPPED:

Non-Regulated, Non-Hazardous Waste

8. CONTAINERS

No.

Type

9. TOTAL

QUANTITY

10. UNIT

Wt/Vol.

11. TEXAS

WASTE ID #

a.

b.

c.

WT:

d.

43,200

12. COMMENTS OR SPECIAL INSTRUCTIONS:

B C CASE

13. WASTE PROFILE NO.

14.

IN CASE OF EMERGENCY OR SPILL, CONTACT

NAME

Kin Slaughter

PHONE NO

575-887-4048

24-HOUR EMERGENCY NO.

15. **GENERATOR'S CERTIFICATION:** I Hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations, and are the same materials previously approved by LEA LAND, LLC

PRINTED/TYPED NAME

SIGNATURE

DATE

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16.

TRANSPORTER (1)

NAME:

NEW MEXICO RENTALS

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

ALLEN WALKER

EMERGENCY PHONE:

(575) 942-1257

17.

TRANSPORTER (2)

NAME:

TEXAS I.D. NO.

IN CASE OF EMERGENCY CONTACT:

EMERGENCY PHONE:

18. **TRANSPORTER (1):** Acknowledgment of receipt of material

PRINTED/TYPED NAME

SIGNATURE

DATE

11/4/2018

19. **TRANSPORTER (2):** Acknowledgment of receipt of material

PRINTED/TYPED NAME

SIGNATURE

DATE

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Lea Land, LLC

ADDRESS:

Mile Marker 64, U.S. Hwy 62/180,
30 Miles East of Carlsbad, NM

PHONE:

575-887-4048

PERMIT NO.

WM-01-035 - New Mexico

20. COMMENTS

21. **DISPOSAL FACILITY'S CERTIFICATION:** I Hereby certify that the above described wastes were delivered to this facility, that the facility is authorized and permitted to receive such wastes.

AUTHORIZED SIGNATURE

CELL NO.

DATE 11/4/2018

TIME

9:15

GENERATOR: COPIES 1 & 6

DISPOSAL SITE: COPIES 2 & 3

TRANSPORTERS: COPIES 4 & 5

COPY 1