HRL COMPLIANCE SOLUTIONS
P.O. Box 1708 • Artesia, NM 88211
www.hrlcomp.com

March 26, 2018

NMOCD District II
Crystal Weaver
811 S 1st Street
Artesia, NM 88210

State Land Office
Mark Naranjo
1001 S Atkinson
Roswell, NM 88230

SUBJECT: SOIL REMEDIATION WORK PLAN FOR THE INCIDENT AT THE GJ West Coop Unit 161 Battery, Eddy COUNTY, NEW MEXICO

Ms. Weaver:

On behalf of COG Operating, LLC, HRL Compliance Solutions, Inc (HRL) has prepared this work plan that describes the assessment, initial characterization, and proposed remediation for a release associated with the GJ West Coop Unit 161 Battery release. The site is in Unit N, SECTION 16, TOWNSHIP 17S, RANGE 29E, NMPM, Eddy County, New Mexico, on State land. Figure 1 illustrates the location and surrounding area.

Table 1 below, summarizes information regarding the release.

Table 1: Release Information and Site Ranking

Name	GJ West Coop Unit 161 Battery
Company	COG Operating, LLC
RP Number	2RP-4478
API Number	30-015-35651
Location	32.8291278, -103 .0766373
Estimated Date of Release	11/2/2017
Date Reported to NMOCD	11/6/2017
Land Owner	State
Reported to	OCD
Source of Release	Flowline
Released Material	Oil and Produced Water
Released Volume	0.5 bbls oil, 4.5 bbl produced water
Recovered Volume	0.25 bbls oil, 3 bbls produced water
Net Release Volume	0.25 bbl oil, 1.5 bbl water
Nearest Waterway	6.68 miles to Red Lake
Depth to Groundwater	75 feet bgs
Nearest Domestic Water Source	< 1 mile
NMOCD Ranking	10
Response Date	3/14/2018

1.0 Background

The release at the GJ Coop Unit 161 Battery was caused due to equipment failure from a corroded steel flowline as outlined in the NMOCD C-141 report (Appendix A). The release was on location, with the liquid traveling along a lease road and slightly into an adjacent pasture. A vacuum truck was used to remove all freestanding liquid. Samples were collected from the impacted area to delineate the vertical and horizontal extent of impacts.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 5.4 miles west of Loco Hills, with an elevation of approximately 3561 feet above sea level. A search of the New Mexico State Engineer's Office (NMOSE) online water well database for groundwater wells in the vicinity of the release identified one (1) groundwater wells located within a three-mile radius of the site. After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to be between 50 and 100 feet below ground surface (bgs).

Recommended Remediation Action Levels (RRALs) are determined by the site ranking according to the NMOCD *Guidelines for Remediation of Leaks, Spills, and Releases* (1993). Table 2 presents the remediation standards and the site ranking for this location. Justification for this site ranking is found in Appendix B.

Table 2: Remediation Standards

Soil Remediation Standards	0 to 9	10 to 19	>19
Benzene	**10 PPM**	**10 PPM**	**10 PPM**
BTEX	**50 PPM**	**50 PPM**	**50 PPM**
TPH	**5000 PPM**	**1000 PPM**	**100 PPM**

Depth to Groundwater	NMOCD Numeric Rank
< 50 BGS = 20	
50' to 99' = 10	**10**
>100' = 0	
Distance to Nearest Surface Water	**NMOCD Numeric Rank**
< 200' = 20	
200' - 1000' = 10	
>1000' = 0	**0**
Well Head Protection	**NMOCD Numeric Rank**
<1000' (or <200' domestic) = 20	
> 1000' = 0	**0**
Total Site Ranking	**10**

3.0 Release Characterization

Upon receiving clearance from the underground utility locate (811) on December 4, 2017, COG field personnel assessed the impacted area. Samples were collected on 12/4/2017 to characterize the extent of impacts and calculate a volume of soil to be excavated for disposal. All samples were collected and analyzed at a Nationally Environmental Laboratory Accreditation Program (NELAP) laboratory and in accordance with NMOCD soil sampling procedures. The samples were submitted to Xenco Laboratories for analyses including chlorides by Method 300.0, volatile organics (BTEX) by Method 8021B, and MRO, DRO, and GRO by EPA Method 8015M. Sample locations are depicted in Figure 2.

4.0 Soil Remediation Workplan

HRL will begin the excavation of the impacted soils, after approval from area utilities owners via 811 and NMOCD. HRL will oversee the excavation activities. Excavation will occur to a safe depth at the T2 sample location where initial characterization samples indicated the vertical extent of impacts were greatest. Approximately six (6) inches of topsoil will be removed around the T1 and T3 sample location as shown in Figure 2. Disturbance in the pasture will be minimized. Field screening and safe work practices will determine the excavated depth. Safety is a primary concern because the leak occurred around a pipeline. Excavation may be limited due to the importance of pipeline integrity. Impacted soils will be stockpiled

on location within a lined earthen berm containment cell prior to disposal. It is anticipated that approximately 140 cubic yards of contaminated soil is to be excavated and disposed at an approved solid waste disposal facility. Clean native soils will be used to backfill the excavation and the impacted area may be recontoured to the surrounding area. The contaminated soil will be disposed of at a permitted disposal facility.

5.0 Revegetation Plan

The surface will be left in a rough condition to approximate natural surface deviations. The site will be broadcast seeded with NMSLO seed mixture "L". The site will be periodically monitored for revegetation and the development of noxious weeds. Should the site fail to re-vegetate or noxious weeds develop, HRL will contact NMSLO for mitigation strategy.

6.0 Scope and Limitations

The scope of HRL's services consist of performing site characterization and remediation, verification of release stabilization, regulatory liaison, and preparation of this work plan. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact Jennifer Knowlton at 505-238-3588.

Submitted by:
HRL Compliance Solutions, Inc

Jennifer Knowlton
Regional Manager - Permian

Attachments:

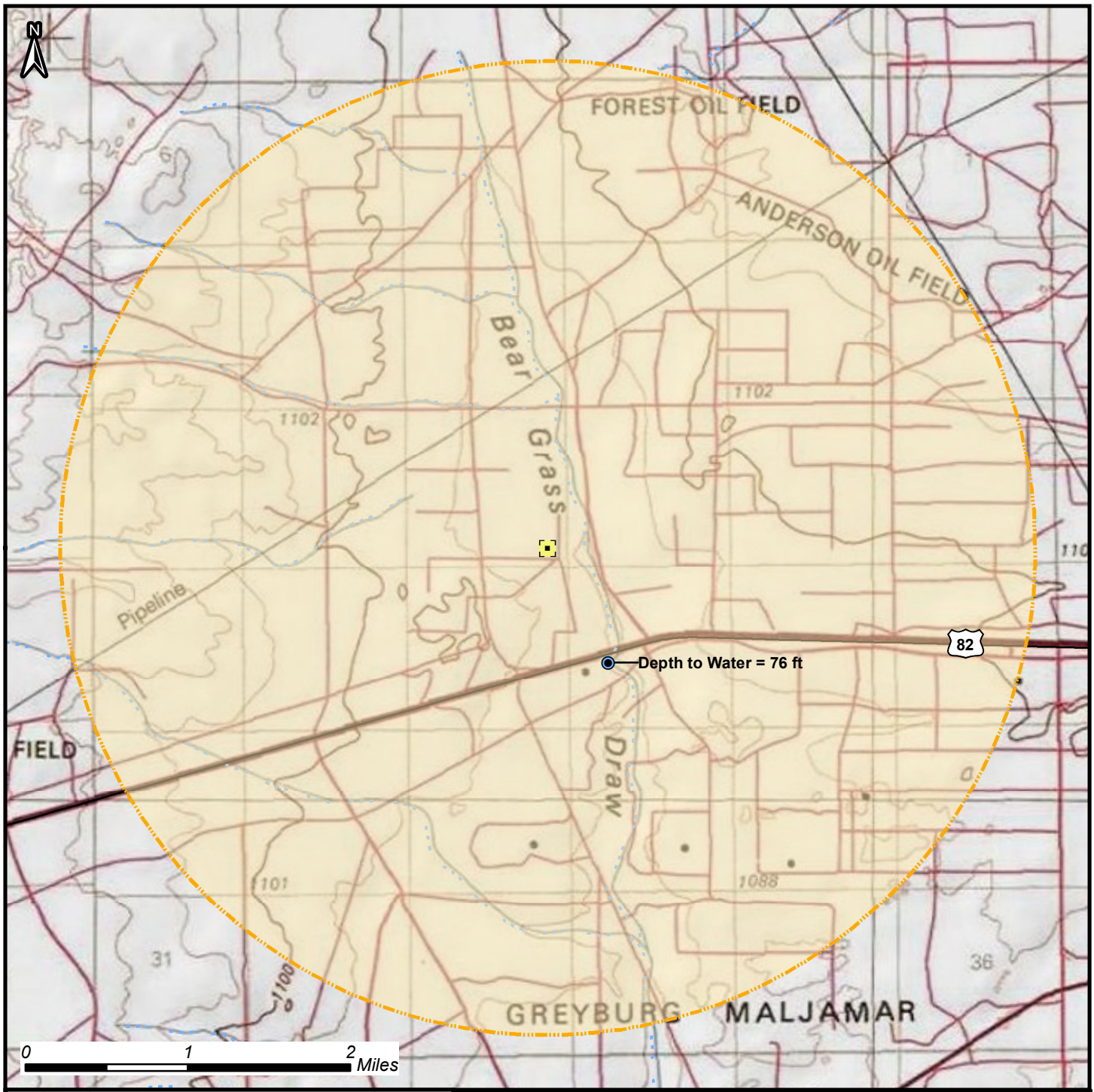
Figure 1: Vicinity and Wellhead Protection Map
Figure 2: Site and Sample Location Map

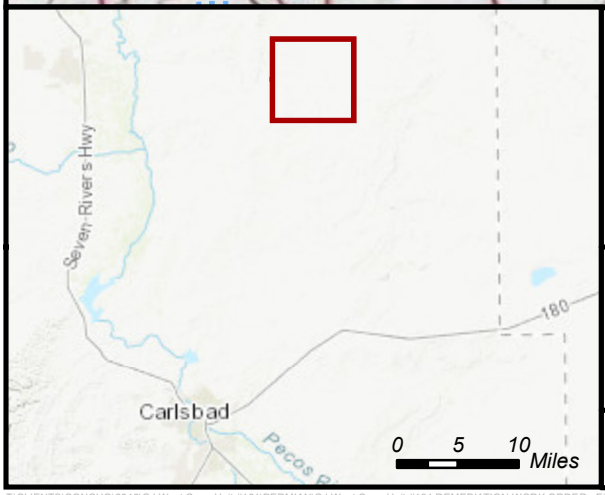
Table 3: Summary of Sample Results

Appendix A: Form C141 Initial
Appendix B: NMOSE Well Report
Appendix C: Laboratory Analytical Reports

Figure 1:

Site Vicinity Map





CONCHO

Figure 1: Location Map

GJ West Coop Unit #161

32.828734 -104.073061

Section 16, Township 17 South, Range 29 East

Features

- Site Location
- Water Well
- 3 Mile Buffer

Hydrography

- Ephemeral Stream

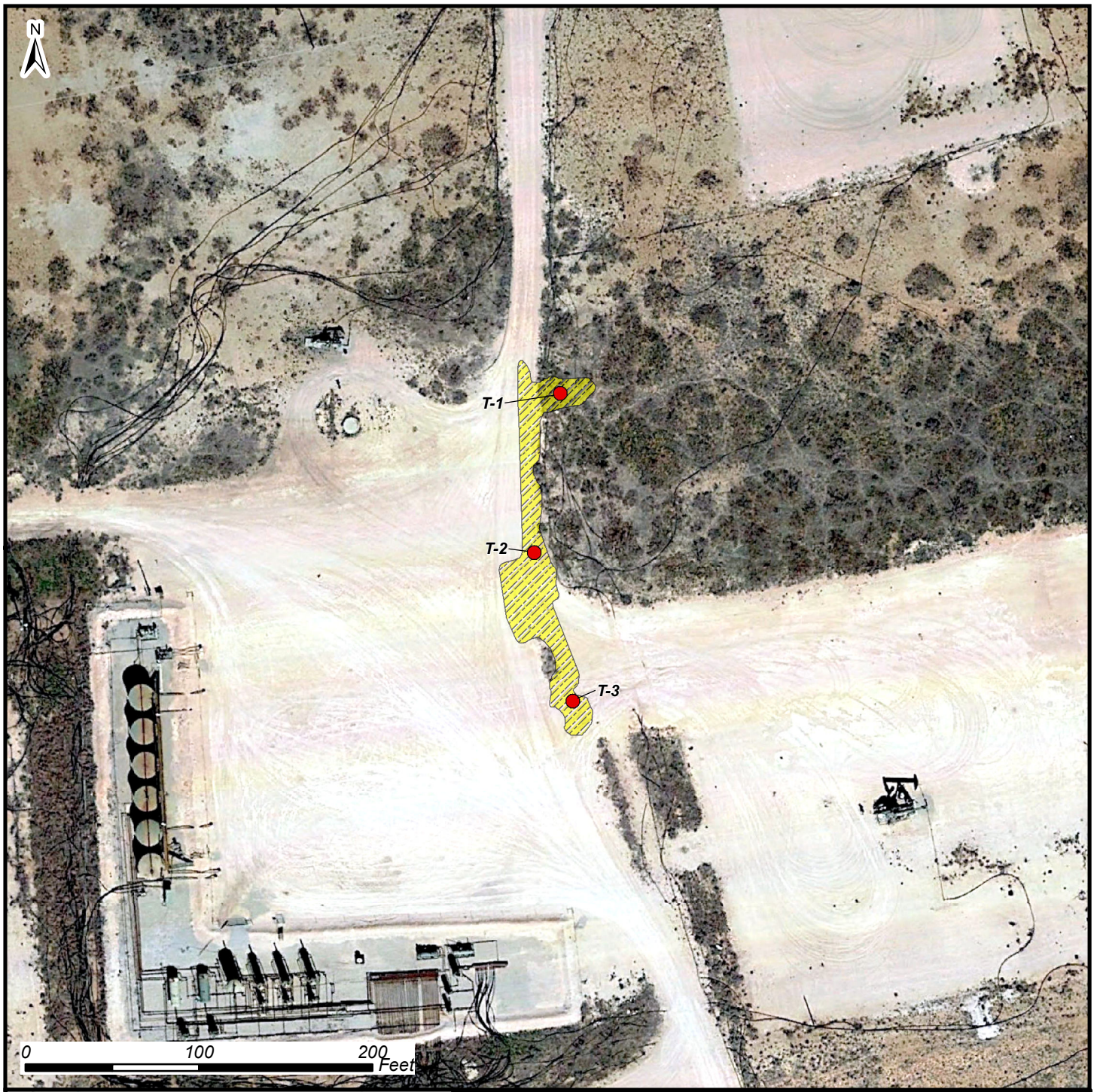
HRL COMPLIANCE SOLUTIONS

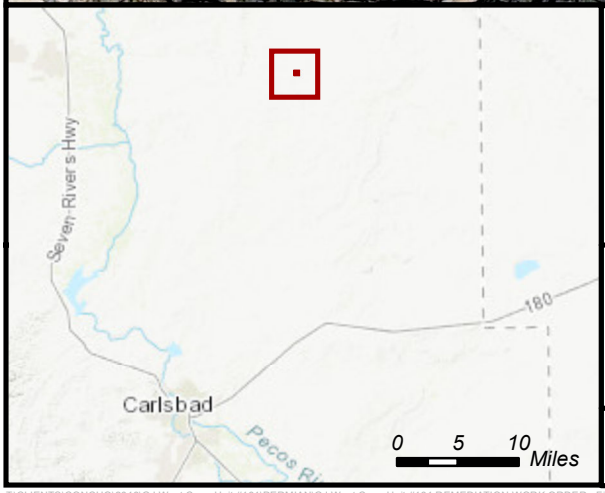
Author: E. Fought
Revision: 0
Date: 3/21/2018

T:\CLIENTS\CONCHO\2018\GJ West Coop Unit #161\PERMIAN\GJ West Coop Unit #161 REMEDIATION WORK ORDER - Figure 1 3-21-18.mxd

Figure 2:

Site and Sample Location Map





CONCHO

Figure 2: Sample Location Map

GJ West Coop Unit #161

32.828734 -104.073061

Section 16, Township 17 South, Range 29 East

Features

- Sample Location
- Impacted Area

HRL COMPLIANCE SOLUTIONS

Author: E. Fought

Revision: 0

Date: 3/22/2018

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Table 3: Analytical Results Summary

Summary of Delineation Sampling Analytical Results												
Concentrations of Benzene, BTEX, TPH & Chloride in Soil												
SAMPLE LOCATION	SAMPLE DEPTH (bgs)	SAMPLE DATE	SOIL STATUS	8021B					8015M			300.0
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYLBENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO (mg/Kg)	DRO (mg/Kg)	Total TPH (mg/Kg)	CHLORIDE (mg/Kg)
NMOCD - Guidelines for Remediation of Leaks, Spills and Releases				**10**	**NE**	**NE**	**NE**	**50**	**NE**	**NE**	**5,000**	**600**
Vertical Delination Sampling												
T1	Surface	12/4/2017	In-Situ	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<15.0	7750	9870	**21,900**
T1	1'	12/4/2017	In-Situ	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<15.0	<15.0	<15.0	9.03
T1	2'	12/4/2017	In-Situ	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<15.0	<15.0	<15.0	24.8
T1	3'	12/4/2017	In-Situ	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<15.0	<15.0	<15.0	<1.97
T1	14'	-	-	-	-	-	-	-	-	-	-	-
T1	16'	-	-	-	-	-	-	-	-	-	-	472
T2	Surface	12/4/2017	In-Situ	<0.00200	0.01	0.049	0.0957	155	18.6	153	211	**32,700**
T2	1'	12/4/2017	In-Situ	<0.00202	0.00202	<0.00202	<0.00202	0.00202	<15.0	<15.0	<15.0	**4,010**
T2	2'	12/4/2017	In-Situ	<0.00201	<0.00201	<0.00201	<0.00200	<0.00200	<15.0	<15.0	<15.0	**4,450**
T2	3'	12/4/2017	In-Situ	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<15.0	<15.0	<15.0	**11,200.0**
T2	4'	12/4/2017	In-Situ	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<15.0	<15.0	<15.0	**2,030**
T2	6'	12/4/2017	In-Situ	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<15.0	<15.0	<15.0	**1,150**
T2	8'	12/4/2017	In-Situ	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<15.0	<15.0	<15.0	**1,270**
T2	10'	12/4/2017	In-Situ	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<15.0	<15.0	<15.0	**672**
T2	12'	12/4/2017	In-Situ	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<15.0	<15.0	<15.0	261

Table 3: Analytical Results Summary (continued)

Summary of Delineation Sampling Analytical Results												
Concentrations of Benzene, BTEX, TPH & Chloride in Soil												
SAMPLE LOCATION	SAMPLE DEPTH (bgs)	SAMPLE DATE	SOIL STATUS	8021B					8015M			300.0
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYLBENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO (mg/Kg)	DRO (mg/Kg)	Total TPH (mg/Kg)	CHLORIDE (mg/Kg)
NMOCD - Guidelines for Remediation of Leaks, Spills and Releases				**10**	**NE**	**NE**	**NE**	**50**	**NE**	**NE**	**5,000**	**600**
Vertical Delination Sampling												
T3	Surface	12/4/2017	In-Situ	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<15	18.7	18.7	**24,200**
T3	1'	12/4/2017	In-Situ	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<15.0	<15.0	<15.0	23.1
T3	2'	12/4/2017	In-Situ	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<15.0	<15.0	<15.0	5.74
T3	3'	12/4/2017	In-Situ	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<15.0	<15.0	<15.0	27.5
T3	4'	12/4/2017	In-Situ	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<15.0	<15.0	<15.0	10.6
T3	5'	12/4/2017	In-Situ	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<15.0	<15.0	<15.0	825.0
T3	8'	-	-									

mg/Kg - milligrams per Kilogram

— = Not Established

Concentrations in **BOLD** exceed the NMOCD Guidelines

Proposed excavted area

Appendix A: Form C141 Initial

NM OIL CONSERVATION
ARTESIA DISTRICT
NOV 06 2017
RECEIVED

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised April 3, 2017

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

Release Notification and Corrective Action

nAB1731257717

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC 229137	Contact: Robert McNeil
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: G J West Coop Unit #161	Facility Type: Flowline

Surface Owner: State	Mineral Owner: State	API No. 30-015-35651

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
J	16	17S	29E	2310	South	1650	East	Eddy

Latitude 32.8337212 Longitude -104.0766373 NAD83

NATURE OF RELEASE

Type of Release: Oil & Produced Water	Volume of Release: 0.5 bbl. Oil & 4.5 bbl. PW	Volume Recovered: 0.25 bbl. Oil & 3 bbl. PW
Source of Release: Steel Flowline	Date and Hour of Occurrence: November 2, 2017 6:45 am	Date and Hour of Discovery: November 2, 2017 6:45 am
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was due to corrosion of a steel flowline. The section of flowline was replaced with poly.

Describe Area Affected and Cleanup Action Taken.*

The release was on location, along a lease road and within the adjacent pasture. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to 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: Rebecca Haskell

Printed Name: Rebecca Haskell

Title: Senior HSE Coordinator

E-mail Address: rhaskell@concho.com

Date: November 6, 2017 Phone: 432-683-7443

OIL CONSERVATION DIVISION

Approved by Environmental Specialist:

Approval Date: 11/8/17 Expiration Date: N/A

Conditions of Approval: See Attached

Attached: 2RP-4478

* Attach Additional Sheets If Necessary

Appendix B: NMOSE Well Report

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
RA 11807 POD1		ED	1	2	3	22	17S	29E	587360	3631585	1288	131	76	55

Average Depth to Water: **76 feet**

Minimum Depth: **76 feet**

Maximum Depth: **76 feet**

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 586757.57 **Northing (Y):** 3632724.77 **Radius:** 4828

Appendix C: Laboratory Analytical Reports

Analytical Report 570433

for

COG Operating, LLC

Project Manager: Sheldon Hitchcock

GJ West Coop #161

15-DEC-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

15-DEC-17

Project Manager: **Sheldon Hitchcock**
COG Operating, LLC
600 W Illinois
Midland, TX 79701

Reference: XENCO Report No(s): **570433**
GJ West Coop #161
Project Address:

Sheldon Hitchcock:

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) 570433. 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. 570433 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Mike Kimmel
Client Services Manager

Sample Cross Reference 570433

COG Operating, LLC, Midland, TX

GJ West Coop #161

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 0'	S	12-04-17 09:00	0	570433-001
T-1 1'	S	12-04-17 09:02	1	570433-002
T-1 2'	S	12-04-17 09:04	2	570433-003
T-1 3'	S	12-04-17 09:06	3	570433-004
T-2 0'	S	12-04-17 09:20	0	570433-005
T-2 1'	S	12-04-17 09:22	1	570433-006
T-2 2'	S	12-04-17 09:24	2	570433-007
T-2 3'	S	12-04-17 09:26	3	570433-008
T-2 4'	S	12-04-17 09:36	4	570433-009
T-2 6'	S	12-04-17 09:34	6	570433-010
T-2 8'	S	12-04-17 09:36	8	570433-011
T-2 10'	S	12-04-17 09:38	10	570433-012
T-2 12'	S	12-04-17 10:00	12	570433-013
T-3 0'	S	12-04-17 10:02	0	570433-014
T-3 1'	S	12-04-17 10:04	1	570433-015
T-3 2"	S	12-04-17 10:06	2	570433-016
T-3 3'	S	12-04-17 10:08	3	570433-017
T-3 4'	S	12-04-17 10:10	4	570433-018
T-3 5'	S	12-04-17 10:12	5	570433-019

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3035491 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3035735 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3035752 Chloride by EPA 300
Lab Sample ID 570433-012 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).
Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference.
Samples in the analytical batch are: 570433-012, -013, -014, -015, -016, -017, -018, -019.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analysis Summary 570433

COG Operating, LLC, Midland, TX

Project Name: GJ West Coop #161

Project Id:

Contact: Sheldon Hitchcock

Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am

Report Date: 15-DEC-17

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	570433-001		570433-002		570433-003		570433-004		570433-005		570433-006	
	Field Id:	T-1 0'		T-1 1'		T-1 2'		T-1 3'		T-2 0'		T-2 1'	
	Depth:	0-		1-		2-		3-		0-		1-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-04-17 09:00		Dec-04-17 09:02		Dec-04-17 09:04		Dec-04-17 09:06		Dec-04-17 09:20		Dec-04-17 09:22	
BTEX by EPA 8021B	***Extracted:***	Dec-10-17 09:15		Dec-10-17 09:15		Dec-10-17 09:15		Dec-10-17 09:15		Dec-10-17 09:15		Dec-10-17 09:30	
	Analyzed:	Dec-11-17 17:13		Dec-11-17 17:32		Dec-11-17 17:51		Dec-11-17 18:10		Dec-11-17 18:29		Dec-11-17 21:55	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	<0.00200	0.00200	<0.00202	0.00202
Toluene		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	0.0100	0.00200	0.00202	0.00202
Ethylbenzene		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	0.0490	0.00200	<0.00202	0.00202
m,p-Xylenes		<0.00398	0.00398	<0.00397	0.00397	<0.00401	0.00401	<0.00404	0.00404	0.0672	0.00401	<0.00404	0.00404
o-Xylene		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	0.0285	0.00200	<0.00202	0.00202
Total Xylenes		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	0.0957	0.00200	<0.00202	0.00202
Total BTEX		<0.00199	0.00199	<0.00198	0.00198	<0.00200	0.00200	<0.00202	0.00202	0.155	0.00200	0.00202	0.00202
Chloride by EPA 300	***Extracted:***	Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30	
	Analyzed:	Dec-08-17 21:21		Dec-08-17 21:27		Dec-08-17 21:45		Dec-08-17 21:51		Dec-08-17 22:08		Dec-08-17 22:14	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		21900	250	9.03	4.94	24.8	4.91	<4.97	4.97	32700	249	4010	24.9
TPH by SW8015 Mod	***Extracted:***	Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00	
	Analyzed:	Dec-09-17 05:23		Dec-08-17 14:36		Dec-08-17 15:38		Dec-08-17 15:58		Dec-08-17 16:18		Dec-08-17 16:38	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	18.6	14.9	<15.0	15.0
Diesel Range Organics (DRO)		7750	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	153	14.9	<15.0	15.0
Oil Range Hydrocarbons (ORO)		2120	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	39.3	14.9	<15.0	15.0
Total TPH		9870	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	211	14.9	<15.0	15.0

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 570433

COG Operating, LLC, Midland, TX

Project Name: GJ West Coop #161

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am
Report Date: 15-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	570433-007		570433-008		570433-009		570433-010		570433-011		570433-012	
	Field Id:	T-2 2'		T-2 3'		T-2 4'		T-2 6'		T-2 8'		T-2 10'	
	Depth:	2-		3-		4-		6-		8-		10-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-04-17 09:24		Dec-04-17 09:26		Dec-04-17 09:36		Dec-04-17 09:34		Dec-04-17 09:36		Dec-04-17 09:38	
BTEX by EPA 8021B	***Extracted:***	Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30	
	Analyzed:	Dec-11-17 22:14		Dec-11-17 22:33		Dec-11-17 22:52		Dec-11-17 23:11		Dec-11-17 23:30		Dec-11-17 23:49	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
Toluene		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
Ethylbenzene		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
m,p-Xylenes		<0.00402	0.00402	<0.00399	0.00399	<0.00398	0.00398	<0.00403	0.00403	<0.00402	0.00402	<0.00399	0.00399
o-Xylene		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
Total Xylenes		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
Total BTEX		<0.00201	0.00201	<0.00200	0.00200	<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00200	0.00200
Chloride by EPA 300	***Extracted:***	Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 14:30		Dec-08-17 16:00	
	Analyzed:	Dec-08-17 22:20		Dec-08-17 22:26		Dec-08-17 22:32		Dec-08-17 22:38		Dec-08-17 22:44		Dec-09-17 00:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		4450	49.8	11200	99.6	2030	25.0	1150	25.0	1270	24.8	672	4.95
TPH by SW8015 Mod	***Extracted:***	Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00	
	Analyzed:	Dec-08-17 16:57		Dec-08-17 17:17		Dec-08-17 17:38		Dec-08-17 17:57		Dec-08-17 18:56		Dec-08-17 19:18	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0
Diesel Range Organics (DRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0
Total TPH		<15.0	15.0	<15.0	15.0	<15.0	15.0	<14.9	14.9	<15.0	15.0	<15.0	15.0

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 570433

COG Operating, LLC, Midland, TX

Project Name: GJ West Coop #161

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am
Report Date: 15-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	570433-013		570433-014		570433-015		570433-016		570433-017		570433-018	
	Field Id:	T-2 12'		T-3 0'		T-3 1'		T-3 2"		T-3 3'		T-3 4'	
	Depth:	12-		0-		1-		2-		3-		4-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-04-17 10:00		Dec-04-17 10:02		Dec-04-17 10:04		Dec-04-17 10:06		Dec-04-17 10:08		Dec-04-17 10:10	
BTEX by EPA 8021B	***Extracted:***	Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30		Dec-10-17 09:30	
	Analyzed:	Dec-12-17 00:08		Dec-12-17 00:25		Dec-12-17 00:44		Dec-12-17 01:40		Dec-12-17 01:58		Dec-12-17 02:17	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
Toluene		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
Ethylbenzene		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
m,p-Xylenes		<0.00397	0.00397	<0.00396	0.00396	<0.00402	0.00402	<0.00402	0.00402	<0.00398	0.00398	<0.00399	0.00399
o-Xylene		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
Total Xylenes		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
Total BTEX		<0.00198	0.00198	<0.00198	0.00198	<0.00201	0.00201	<0.00201	0.00201	<0.00199	0.00199	<0.00200	0.00200
Chloride by EPA 300	***Extracted:***	Dec-08-17 16:00		Dec-08-17 16:00		Dec-08-17 16:00		Dec-08-17 16:00		Dec-08-17 16:00		Dec-08-17 16:00	
	Analyzed:	Dec-09-17 01:06		Dec-09-17 01:12		Dec-09-17 01:18		Dec-09-17 01:24		Dec-09-17 01:42		Dec-09-17 01:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		261	4.98	24200	248	23.1	4.96	5.74	4.95	27.5	4.94	10.6	4.96
TPH by SW8015 Mod	***Extracted:***	Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00		Dec-08-17 11:00	
	Analyzed:	Dec-08-17 19:38		Dec-08-17 19:58		Dec-08-17 20:19		Dec-08-17 20:41		Dec-08-17 21:01		Dec-08-17 21:20	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Diesel Range Organics (DRO)		<15.0	15.0	18.7	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Oil Range Hydrocarbons (ORO)		<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Total TPH		<15.0	15.0	18.7	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 570433

COG Operating, LLC, Midland, TX

Project Name: GJ West Coop #161

Project Id:
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Thu Dec-07-17 11:15 am
Report Date: 15-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	570433-019					
	Field Id:	T-3 5'					
	Depth:	5-					
	Matrix:	SOIL					
	Sampled:	Dec-04-17 10:12					
BTEX by EPA 8021B	***Extracted:***	Dec-10-17 09:30					
	Analyzed:	Dec-12-17 02:34					
	Units/RL:	mg/kg	RL				
Benzene		<0.00200	0.00200				
Toluene		<0.00200	0.00200				
Ethylbenzene		<0.00200	0.00200				
m,p-Xylenes		<0.00401	0.00401				
o-Xylene		<0.00200	0.00200				
Total Xylenes		<0.00200	0.00200				
Total BTEX		<0.00200	0.00200				
Chloride by EPA 300	***Extracted:***	Dec-08-17 16:00					
	Analyzed:	Dec-09-17 01:54					
	Units/RL:	mg/kg	RL				
Chloride		825	5.00				
TPH by SW8015 Mod	***Extracted:***	Dec-08-17 11:00					
	Analyzed:	Dec-08-17 21:42					
	Units/RL:	mg/kg	RL				
Gasoline Range Hydrocarbons (GRO)		<15.0	15.0				
Diesel Range Organics (DRO)		<15.0	15.0				
Oil Range Hydrocarbons (ORO)		<15.0	15.0				
Total TPH		<15.0	15.0				

Mike Kimmel
Client Services Manager

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

Form 2 - Surrogate Recoveries

Project Name: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035462 **Sample:** 570433-001 / DL **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 14:16

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.1	99.7	86	70-135	
o-Terphenyl	47.3	49.9	95	70-135	

Lab Batch #: 3035462 **Sample:** 570433-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 14:36

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.8	99.7	84	70-135	
o-Terphenyl	42.0	49.9	84	70-135	

Lab Batch #: 3035462 **Sample:** 570433-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 15:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.9	99.8	89	70-135	
o-Terphenyl	45.1	49.9	90	70-135	

Lab Batch #: 3035462 **Sample:** 570433-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 15:58

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.5	99.8	87	70-135	
o-Terphenyl	44.1	49.9	88	70-135	

Lab Batch #: 3035462 **Sample:** 570433-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 16:18

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.4	99.6	81	70-135	
o-Terphenyl	43.5	49.8	87	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035462 **Sample:** 570433-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 16:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.2	99.8	86	70-135	
o-Terphenyl	45.0	49.9	90	70-135	

Lab Batch #: 3035462 **Sample:** 570433-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 16:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.6	99.9	89	70-135	
o-Terphenyl	46.1	50.0	92	70-135	

Lab Batch #: 3035462 **Sample:** 570433-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 17:17

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	85.0	99.9	85	70-135	
o-Terphenyl	45.0	50.0	90	70-135	

Lab Batch #: 3035462 **Sample:** 570433-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 17:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.0	99.7	88	70-135	
o-Terphenyl	45.3	49.9	91	70-135	

Lab Batch #: 3035462 **Sample:** 570433-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 17:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.3	99.6	91	70-135	
o-Terphenyl	47.3	49.8	95	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035462 **Sample:** 570433-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 18:56

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.6	99.7	91	70-135	
o-Terphenyl	46.0	49.9	92	70-135	

Lab Batch #: 3035462 **Sample:** 570433-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 19:18

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.0	99.8	90	70-135	
o-Terphenyl	44.6	49.9	89	70-135	

Lab Batch #: 3035462 **Sample:** 570433-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 19:38

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	75.5	99.8	76	70-135	
o-Terphenyl	38.0	49.9	76	70-135	

Lab Batch #: 3035462 **Sample:** 570433-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 19:58

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.4	100	93	70-135	
o-Terphenyl	48.7	50.0	97	70-135	

Lab Batch #: 3035462 **Sample:** 570433-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 20:19

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.3	99.9	92	70-135	
o-Terphenyl	46.9	50.0	94	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035462 **Sample:** 570433-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 20:41

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	74.7	100	75	70-135	
o-Terphenyl	40.2	50.0	80	70-135	

Lab Batch #: 3035462 **Sample:** 570433-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 21:01

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	83.9	99.7	84	70-135	
o-Terphenyl	43.5	49.9	87	70-135	

Lab Batch #: 3035462 **Sample:** 570433-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 21:20

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.2	99.7	91	70-135	
o-Terphenyl	47.5	49.9	95	70-135	

Lab Batch #: 3035462 **Sample:** 570433-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 21:42

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.0	99.9	87	70-135	
o-Terphenyl	43.9	50.0	88	70-135	

Lab Batch #: 3035462 **Sample:** 570433-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/09/17 05:23

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	78.5	99.7	79	70-135	
o-Terphenyl	42.8	49.9	86	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035491 **Sample:** 570433-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 17:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0250	0.0300	83	80-120	

Lab Batch #: 3035491 **Sample:** 570433-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 17:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3035491 **Sample:** 570433-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 17:51

SURROGATE RECOVERY STUDY

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

Lab Batch #: 3035491 **Sample:** 570433-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 18:10

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	0.0268	0.0300	89	80-120	

Lab Batch #: 3035491 **Sample:** 570433-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 18:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0322	0.0300	107	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035735 **Sample:** 570433-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 21:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 3035735 **Sample:** 570433-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 22:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0272	0.0300	91	80-120	

Lab Batch #: 3035735 **Sample:** 570433-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 22:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

Lab Batch #: 3035735 **Sample:** 570433-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 22:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

Lab Batch #: 3035735 **Sample:** 570433-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 23:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0281	0.0300	94	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035735 **Sample:** 570433-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 23:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3035735 **Sample:** 570433-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 23:49

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	0.0277	0.0300	92	80-120	

Lab Batch #: 3035735 **Sample:** 570433-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 00:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0267	0.0300	89	80-120	

Lab Batch #: 3035735 **Sample:** 570433-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 00:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0280	0.0300	93	80-120	

Lab Batch #: 3035735 **Sample:** 570433-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 00:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0274	0.0300	91	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035735 **Sample:** 570433-016 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 01:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	80-120	
4-Bromofluorobenzene	0.0271	0.0300	90	80-120	

Lab Batch #: 3035735 **Sample:** 570433-017 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 01:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0282	0.0300	94	80-120	

Lab Batch #: 3035735 **Sample:** 570433-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 02:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3035735 **Sample:** 570433-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/12/17 02:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3035462 **Sample:** 7635721-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/08/17 13:14

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.8	100	94	70-135	
o-Terphenyl	52.2	50.0	104	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035491 **Sample:** 7635714-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/10/17 19:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0244	0.0300	81	80-120	

Lab Batch #: 3035735 **Sample:** 7635894-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/11/17 21:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3035462 **Sample:** 7635721-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/08/17 13:36

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.4	100	98	70-135	
o-Terphenyl	52.9	50.0	106	70-135	

Lab Batch #: 3035491 **Sample:** 7635714-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/10/17 17:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0283	0.0300	94	80-120	
4-Bromofluorobenzene	0.0278	0.0300	93	80-120	

Lab Batch #: 3035735 **Sample:** 7635894-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/11/17 19:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0293	0.0300	98	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035462 **Sample:** 7635721-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/08/17 13:56

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.6	100	93	70-135	
o-Terphenyl	49.6	50.0	99	70-135	

Lab Batch #: 3035491 **Sample:** 7635714-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/10/17 17:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0284	0.0300	95	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 3035735 **Sample:** 7635894-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/11/17 20:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3035462 **Sample:** 570433-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 14:57

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.3	99.9	90	70-135	
o-Terphenyl	45.6	50.0	91	70-135	

Lab Batch #: 3035491 **Sample:** 570416-007 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/10/17 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	0.0298	0.0300	99	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	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: GJ West Coop #161

Work Orders : 570433,

Project ID:

Lab Batch #: 3035735 **Sample:** 570433-006 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 20:23

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	0.0300	0.0300	100	80-120	

Lab Batch #: 3035462 **Sample:** 570433-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/08/17 15:17

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.7	99.9	80	70-135	
o-Terphenyl	42.1	50.0	84	70-135	

Lab Batch #: 3035491 **Sample:** 570416-007 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/10/17 18:36

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	0.0318	0.0300	106	80-120	

Lab Batch #: 3035735 **Sample:** 570433-006 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/11/17 20:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0292	0.0300	97	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: GJ West Coop #161

Work Order #: 570433 **Project ID:**

Analyst: ALJ **Date Prepared:** 12/10/2017 **Date Analyzed:** 12/10/2017

Lab Batch ID: 3035491 **Sample:** 7635714-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00200	0.0998	0.105	105	0.100	0.109	109	4	70-130	35	
Toluene	<0.00200	0.0998	0.0993	99	0.100	0.103	103	4	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0991	99	0.100	0.104	104	5	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.190	95	0.201	0.200	100	5	70-135	35	
o-Xylene	<0.00200	0.0998	0.0943	94	0.100	0.0992	99	5	71-133	35	

Analyst: ALJ **Date Prepared:** 12/10/2017 **Date Analyzed:** 12/11/2017

Lab Batch ID: 3035735 **Sample:** 7635894-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B 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
Benzene	<0.00202	0.101	0.110	109	0.100	0.106	106	4	70-130	35	
Toluene	<0.00202	0.101	0.106	105	0.100	0.101	101	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.106	105	0.100	0.102	102	4	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.204	101	0.200	0.196	98	4	70-135	35	
o-Xylene	<0.00202	0.101	0.100	99	0.100	0.0960	96	4	71-133	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

BS / BSD Recoveries

Project Name: GJ West Coop #161

Work Order #: 570433 **Project ID:**

Analyst: MNV **Date Prepared:** 12/08/2017 **Date Analyzed:** 12/08/2017

Lab Batch ID: 3035521 **Sample:** 7635707-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 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
Chloride	<5.00	250	272	109	250	261	104	4	90-110	20	

Analyst: MNV **Date Prepared:** 12/08/2017 **Date Analyzed:** 12/09/2017

Lab Batch ID: 3035752 **Sample:** 7635709-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 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
Chloride	<5.00	250	255	102	250	259	104	2	90-110	20	

Analyst: ARM **Date Prepared:** 12/08/2017 **Date Analyzed:** 12/08/2017

Lab Batch ID: 3035462 **Sample:** 7635721-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod 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
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1040	104	1000	972	97	7	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1060	106	1000	1030	103	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: GJ West Coop #161

Work Order # : 570433 **Project ID:**

Lab Batch ID: 3035491 **QC- Sample ID:** 570416-007 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/10/2017 **Date Prepared:** 12/10/2017 **Analyst:** ALJ

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	<0.00200	0.100	0.0923	92	0.101	0.0934	92	1	70-130	35	
Toluene	<0.00200	0.100	0.0803	80	0.101	0.0787	78	2	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0801	80	0.101	0.0711	70	12	71-129	35	X
m,p-Xylenes	<0.00401	0.200	0.147	74	0.201	0.139	69	6	70-135	35	X
o-Xylene	<0.00200	0.100	0.0737	74	0.101	0.0639	63	14	71-133	35	X

Lab Batch ID: 3035735 **QC- Sample ID:** 570433-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/11/2017 **Date Prepared:** 12/10/2017 **Analyst:** ALJ

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	<0.00200	0.0998	0.0895	90	0.100	0.0944	94	5	70-130	35	
Toluene	0.00202	0.0998	0.0826	81	0.100	0.0851	83	3	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0776	78	0.100	0.0795	80	2	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.148	74	0.201	0.152	76	3	70-135	35	
o-Xylene	<0.00200	0.0998	0.0735	74	0.100	0.0745	75	1	71-133	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.

Form 3 - MS / MSD Recoveries

Project Name: GJ West Coop #161

Work Order # : 570433 **Project ID:**

Lab Batch ID: 3035521 **QC- Sample ID:** 570210-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/08/2017 **Date Prepared:** 12/08/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride 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	510	247	735	91	247	751	98	2	90-110	20	

Lab Batch ID: 3035521 **QC- Sample ID:** 570433-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/08/2017 **Date Prepared:** 12/08/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride 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	9.03	247	260	102	247	262	102	1	90-110	20	

Lab Batch ID: 3035752 **QC- Sample ID:** 570433-012 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/09/2017 **Date Prepared:** 12/08/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride 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	672	248	886	86	248	902	93	2	90-110	20	X

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.

Form 3 - MS / MSD Recoveries

Project Name: GJ West Coop #161

Work Order # : 570433 **Project ID:**

Lab Batch ID: 3035752 **QC- Sample ID:** 570434-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/09/2017 **Date Prepared:** 12/08/2017 **Analyst:** MNV

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride 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	132	248	372	97	248	375	98	1	90-110	20	

Lab Batch ID: 3035462 **QC- Sample ID:** 570433-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/08/2017 **Date Prepared:** 12/08/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod 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
Gasoline Range Hydrocarbons (GRO)	<15.0	999	1010	101	999	888	89	13	70-135	35	
Diesel Range Organics (DRO)	<15.0	999	1080	108	999	988	99	9	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
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CHAIN OF CUSTODY

Page 1 Of 2

XENCO LABORATORIES

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Dallas Texas (214-902-0300) | Midland, Texas (432-704-5251)

www.xenco.com

Xenco Quote # | Xenco Job # 570433

Client / Reporting Information

Company Name / Branch: COG Operating, LLC

Company Address: 2407 Pecos Ave. Artesia NM 88210

Email: slhitchcock@concho.com Phone No: 575-703-6475
dneel2@concho.com; alieb@concho.com; rhaskell@concho.com

Project Contact: Sheldon Hitchcock

Samplers's Name: Sheldon Hitchcock

Project Information

Project Name/Number: GJ West Coop #161

Project Location:

Invoice To: COG Operating, LLC
Attn: Robert McNeill
600 W. Illnois Ave.
Midland Tx, 79701

PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-1 0'	0	12/4/17	9:00	S	1								/	X	X	X	
2	T-1 1'	1		9:02	S	1								/	X	X	X	
3	T-1 2'	2		9:04	S	1								/	X	X	X	
4	T-1 3'	3		9:06	S	1								/	X	X	X	
5	T-2 0'	0		9:20	S	1								/	X	X	X	
6	T-2 1'	1		9:22	S	1								/	X	X	X	
7	T-2 2'	2		9:24	S	1								/	X	X	X	
8	T-2 3'	3		9:26	S	1								/	X	X	X	
9	T-2 4'	4		9:36	S	1								/	X	X	X	
10					S	1												

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☒ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

Temp: 2.3°C IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.1°C

FE...

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Sheldon Hitchcock	12-7-17 0925	S. Butler			
2						9/7 11:15
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice: X — Cooler Temp. 5.6 — Thermo. Corr. Factor

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CHAIN OF CUSTODY

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Dallas Texas (214-902-0300) | Midland, Texas (432-704-5251)

www.xenco.com

Xenco Quote # | Xenco Job # 570433

Client / Reporting Information

Company Name / Branch: COG Operating, LLC

Company Address: 2407 Pecos Ave. Artesia NM 88210

Email: slhitchcock@concho.com Phone No: 575-703-6475

dneel2@concho.com; alieb@concho.com; rhaskell@concho.com

Project Contact: Sheldon Hitchcock

Samplers's Name: Sheldon Hitchcock

Project Information

Project Name/Number: GJ West Coop #161

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Attn: Robert McNeill
600 W. Illnois Ave.
Midland Tx, 79701

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No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-2 6'	6	12/4/17	9:34	S	1								X	X	X	X	
2	T-2 8'	8		9:36	S	1								X	X	X	X	
3	T-2 10'	10		9:38	S	1								X	X	X	X	
4	T-2 12'	12		10:00	S	1								X	X	X	X	
5	T-3 0'	0		10:02	S	1								X	X	X	X	
6	T-3 1'	1		10:04	S	1								X	X	X	X	
7	T-3 2'	2		10:06	S	1								X	X	X	X	
8	T-3 3'	3		10:08	S	1								X	X	X	X	
9	T-3 4'	4		10:10	S	1								X	X	X	X	
10	T-35'	5		10:12	S	1								X	X	X	X	

Turnaround Time (Business days)

- [ ] Same Day TAT
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- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

Temp: 2.3 °C IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.1 °C

FED-EX / UPS: Tracking #

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	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Sheldon Hitchcock	12/7 0928	1 S Butler	2		2 9/7
3	Relinquished by:	Date Time:	Received By:	Relinquished By: 4	Date Time:	Received By: 4 11:18
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice: X

Cooler Temp. 5.6 | Thermo. Corr. Factor

CHAIN OF CUSTODY

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No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	None	TPH EXTENDED	BTEX	CHLORIDES	Field Comments
1	T-1 0'	0	12/4/17	9:00	S	1								/	X	X	X	
2	T-1 1'	1		9:02	S	1								/	X	X	X	
3	T-1 2'	2		9:04	S	1								/	X	X	X	
4	T-1 3'	3		9:06	S	1								/	X	X	X	
5	T-2 0'	0		9:20	S	1								/	X	X	X	
6	T-2 1'	1		9:22	S	1								/	X	X	X	
7	T-2 2'	2		9:24	S	1								/	X	X	X	
8	T-2 3'	3		9:26	S	1								/	X	X	X	
9	T-2 4'	4		9:30	S	1								/	X	X	X	
10					S	1								/				

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FED-EX

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3	Relinquished by:	Date Time:	Received By:	Relinquished By: 4	Date Time:	Received By: 4
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Cooler Temp. 5.6 Thermo. Corr. Factor

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CHAIN OF CUSTODY

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2	T-2 8'	8		9:36	S	1								X	X	X	X	
3	T-2 10'	10		9:38	S	1								X	X	X	X	
4	T-2 12'	12		10:00	S	1								X	X	X	X	
5	T-3 0'	0		10:02	S	1								X	X	X	X	
6	T-3 1'	1		10:04	S	1								X	X	X	X	
7	T-3 2'	2		10:06	S	1								X	X	X	X	
8	T-3 3'	3		10:08	S	1								X	X	X	X	
9	T-3 4'	4		10:10	S	1								X	X	X	X	
10	T-3 5'	5		10:12	S	1								X	X	X	X	

Turnaround Time (Business days)

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- ☐ Level IV (Full Data Pkg /raw data)
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- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Notes:

Temp: 2.3 °c IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.1 °c

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XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: COG Operating, LLC

Date/ Time Received: 12/07/2017 11:15:00 AM

Work Order #: 570433

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)?	2.1
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**No**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

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

Analyst: PH Device/Lot#:

Checklist completed by: Shawnee Smith Date: 12/07/2017
Shawnee Smith

Checklist reviewed by: Mike Kimmel Date: 12/14/2017
Mike Kimmel