SITE INFORMATION

Report Type: Work Plan 2RP-4487

General Site Information:						
Site:	**GJ West Coop Unit #210**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit C**	**Sec. 16**	**T 17S**	**R 29E**		
County:	**Eddy County**					
GPS:	**32.8391876° N**			**104.0830383° W**		
Surface Owner:	State					
Mineral Owner:						
Directions:	From the intersection of Lovington hwy and Valley Gas rd, go north on Valley Gas Rd for 1.5 miles. Go West on unmarked lease road for .2 miles, then turn north onto unmarked lease road. Drive northeast for another .2 miles to location.					

Release Data:	
Date Released:	11/13/2017
Type Release:	Oil
Source of Contamination:	Swedge on Production Tank
Fluid Released:	150 bbls
Fluids Recovered:	140 bbls

Official Communication:			
Name:	Robert McNeil		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	rmcneil@conchoresources.com		Ike.Tavarez@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	***10***	*75'-100'*
>100 ft.	0	
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	***0***	*0*
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	***0***	*0*
Total Ranking Score:	***10***	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	1,000

TETRA TECH

February 16, 2018

Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division, District 2
811 S. First Street
Artesia, New Mexico 88210

Re: Work Plan for the COG Operating LLC., GJ West Coop Unit #210, Unit C, Section 16, Township 17 South, Range 29 East, Eddy County, New Mexico. 2RP-4487.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess and evaluate a release that occurred at GJ West Coop Unit #210, Unit C, Section 16, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.8391876º, W 104.0830383º. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on November 13, 2017, and released approximately one hundred and fifty (150) barrels of oil due to a failed swedge on the production tank. All of the fluids remained inside of a lined containment, however breaches were found in the liner. A vacuum truck was dispatched to remove all freestanding fluids, recovering approximately one hundred and forty (140) barrels of oil. The impacted area inside the facility berm measures approximately 45' x 250'. The Initial C-141 Form is included in Appendix A.

Groundwater

No wells are listed within Section 16 in the New Mexico Office of the State Engineers database or the USGS National Water Information System. However, the State Engineers and Geology and Groundwater Resources of Eddy County, NM (Report 3) reported wells in Section 22 with depth to water of 76.0' and 80.0' below surface, respectively. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 75' and 100' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.

Soil Assessment and Analytical Results

On December 20, 2017, Tetra Tech personnel were onsite to evaluate and sample the release area. Due to access issues, only four (4) boreholes (BH-1, BH-2, BH-3, and BH-4) were installed using an air rotary rig inside the bermed facility. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1.

Referring to Table 1, the areas of boreholes (BH-1, BH-2, BH-3, and BH-4) showed hydrocarbon impact to the shallow soils. The areas of boreholes (BH-2, BH-3, and BH-4) showed benzene and total BTEX concentrations above the RRALs at 0-1' below surface. The benzene and total BTEX concentrations declined with depth to below the RRALs at 2-3' (BH-2 and BH-4) and 4'-5' below surface (BH-3). The area of borehole (BH-1) did not show any benzene or total BTEX concentrations above the RRALs.

Additionally, the areas of boreholes (BH-1, BH-2, BH-3 and BH-4) showed TPH concentrations above the RRAL, with TPH highs of 4,520 mg/kg at 2-3', 10,500 mg/kg at 0-1', 12,900 mg/kg at 0-1', and 12,400 mg/kg at 0-1' below surface, respectively. The TPH concentrations then declined below the RRAL of 58.5 mg/kg at 4'-5' (BH-1), <15.0 mg/kg at 4-5' (BH-2), 19.7 mg/kg at 4-5' (BH-3) and 30.7 mg/kg at 2-3' (BH-4).

Work Plan

According to COG, the facility will be remove prior to performing the remediation. Once the proposed remediation is complete, a new facility will be rebuilt on the pad. Based on the laboratory results, COG proposes to remove the hydrocarbon impacted soils as shown on Figure 4 and highlighted (green) on Table 1. The areas of boreholes (BH-1, BH-2, and BH-3) will be excavated to 3.0-4.0' and the area of borehole (BH-4) will be excavated to 1.0-2.0' below surface. Once the excavation depths are achieved, bottom hole confirmation samples will be collected and analyzed for TPH by EPA method 8015 modified to ensure proper removal of the impacted soils. The excavated areas will then be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safely concerns for onsite personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.

Conclusion

Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

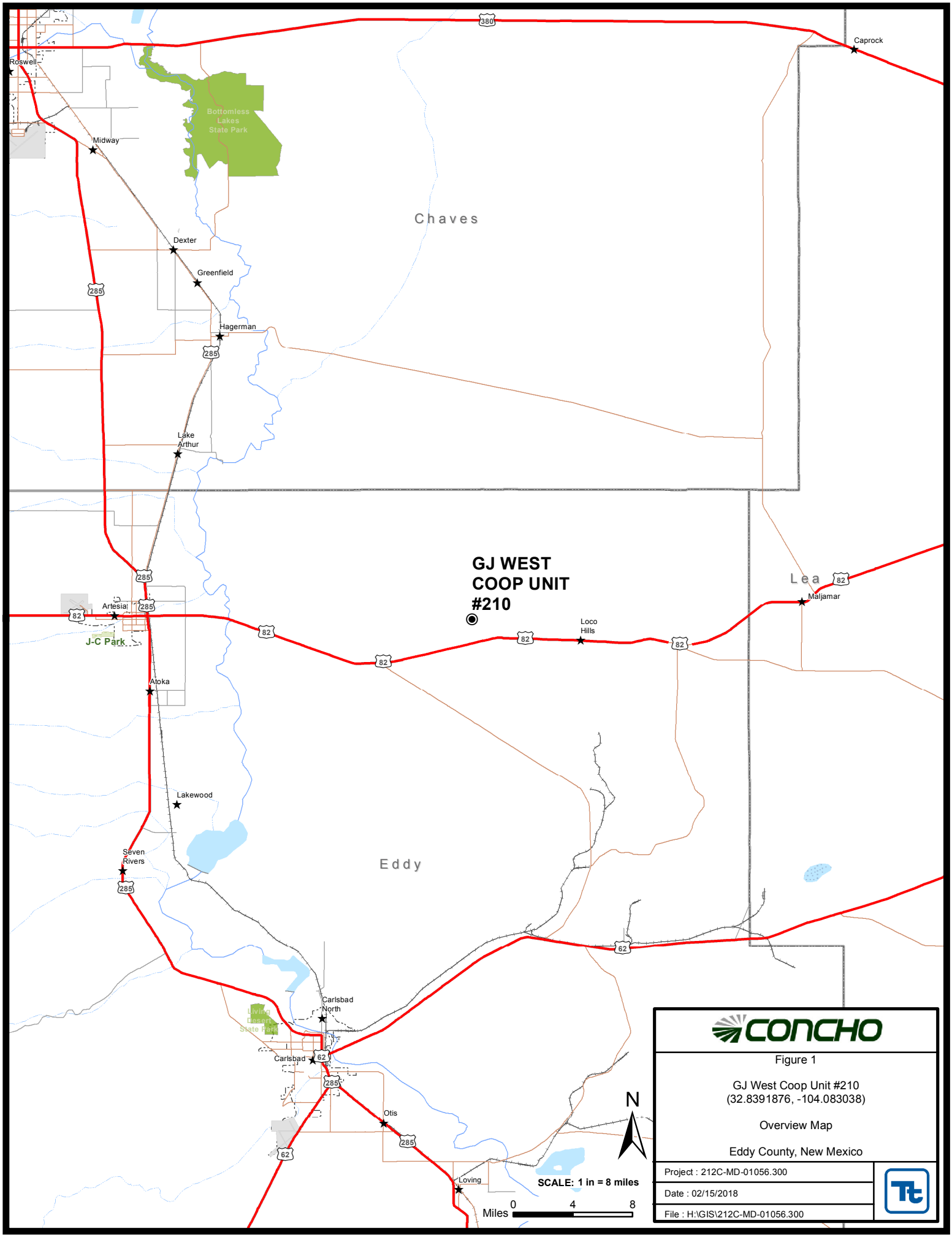
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

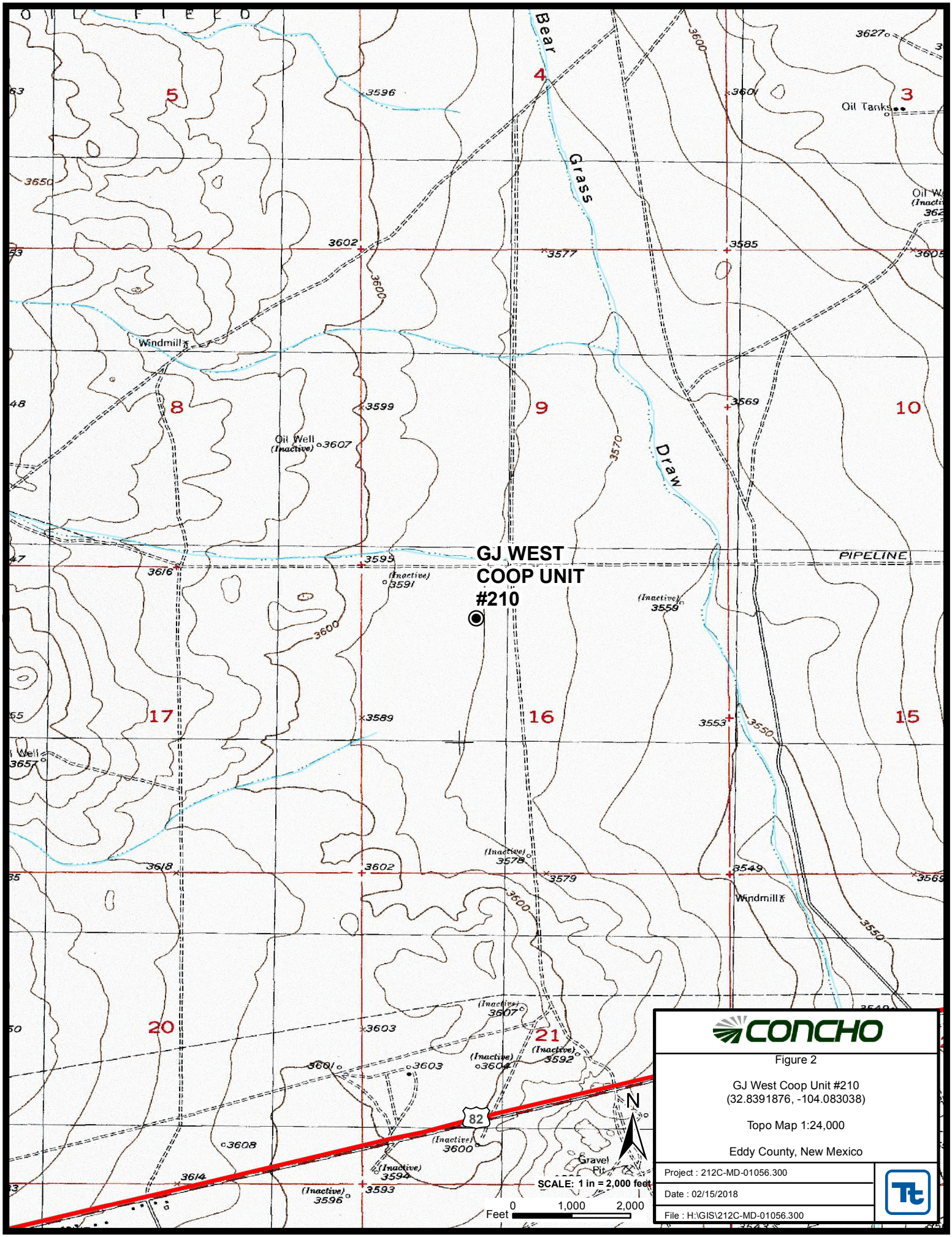
Ike Tavarez,
Senior Project Manager, P.G.

cc: Robert McNeill – COG
Dakota Neel – COG
Rebecca Haskell – COG
Crystal Weaver - NMOCD
Mark Naranjo - SLO

Figures



Mapped By: Isabel Marmolejo



CONCHO

Figure 2

GJ West Coop Unit #210
(32.8391876, -104.083038)

Topo Map 1:24,000

Eddy County, New Mexico

Project : 212C-MD-01056.300

Date : 02/15/2018

File : H:\GIS\212C-MD-01056.300

Mapped By: Isabel Marmolejo

CONCHO

Figure 3

GJ West Coop Unit #210
(32.8391876, -104.083038)

Spill Assessment Map

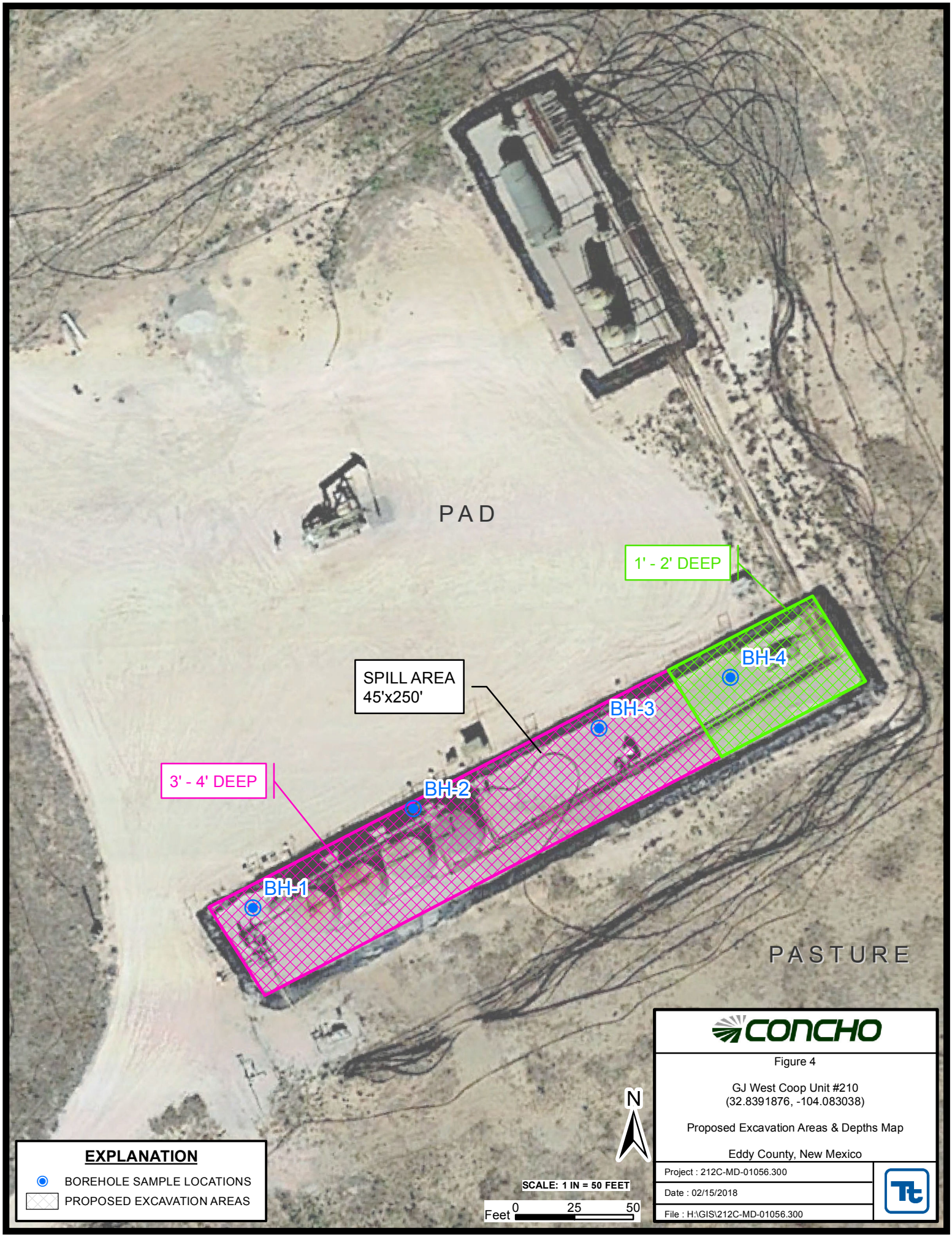
Eddy County, New Mexico

Project : 212C-MD-01056.300

Date : 02/15/2018

File : H:\GIS\212C-MD-01056.300

Mapped By: Isabel Marmolejo


PAD
1' - 2' DEEP
SPILL AREA
45'x250'
BH-4
BH-3
3' - 4' DEEP
BH-2
BH-1
PASTURE
N
SCALE: 1 IN = 50 FEET
Feet 0 25 50
EXPLANATION
BOREHOLE SAMPLE LOCATIONS
PROPOSED EXCAVATION AREAS
CONCHO
Figure 4
GJ West Coop Unit #210
(32.8391876, -104.083038)
Proposed Excavation Areas & Depths Map
Eddy County, New Mexico
Project : 212C-MD-01056.300
Date : 02/15/2018
File : H:\GIS\212C-MD-01056.300
Mapped By: Isabel Marmolejo

Tables

Table 1
COG Operating LLC.
GJ West Coop Unit #210
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (in)	BEB Sample Depth (in)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)
				In-Situ	Removed	GRO	DRO	ORO	Total					
BH-1	12/20/2017	0-1	-	X		515	1,410	297	**2,200**	0.0663	0.162	0.160	0.357	0.746
	"	2-3	-	X		1,300	2,730	491	**4,520**	0.979	4.58	4.80	13.7	21.1
	"	4-5	-	X		27.9	30.6	<14.9	58.5	-	-	-	-	-
	"	6-7	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-
	"	9-10	-	X		46.6	103	<14.9	150	-	-	-	-	-
BH-2	12/21/2017	0-1	-	X		4,450	5,060	1,000	**10,500**	**37.3**	131	83.5	137	**388**
	"	2-3	-	X		786	3,350	709	**4,850**	0.276	1.09	2.34	8.09	11.8
	"	4-5	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-
	"	6-7	-	X		120	98.9	18.4	237	-	-	-	-	-
	"	9-10	-	X		<14.9	<14.9	<14.9	<14.9	-	-	-	-	-
BH-3	12/21/2017	0-1	-	X		3,840	7,690	1,320	**12,900**	**23.9**	68.2	43.1	97.8	**233**
	"	2-3	-	X		1,250	1,710	307	**3,270**	3.74	15.3	11.50	20.5	**51.0**
	"	4-5	-	X		<15.0	19.7	<15.0	19.7	<0.0100	<0.0100	<0.0100	0.0535	0.0535
	"	6-7	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-
	"	9-10	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-
BH-4	12/21/2017	0-1	-	X		4,570	6,630	1,160	**12,400**	**12.0**	39.6	34.1	58.7	**144**
	"	2-3	-	X		<15.0	30.7	<15.0	30.7	0.00410	0.0117	0.0185	0.0469	0.0812

Proposed Excavation Depths

(-) Not Analyzed

Photos

COG Operating LLC
GJ West Coop Unit #210
Eddy County, New Mexico

View West – Area of BH-1

View East – Area of BH-2

COG Operating LLC
GJ West Coop Unit #210
Eddy County, New Mexico

View East – Area of BH-3

View East – Area of BH-4

Appendix A

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

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: **COG Operating, LLC** (OGRID# 229137)	Contact: **Robert McNeill**
Address: **600 West Illinois Avenue, Midland TX 79701**	Telephone No.: **432-683-7443**
Facility Name: **GJ West Coop Unit #210**	Facility Type: **Tank Battery**

Surface Owner: State	Mineral Owner: State	API No.: 30-015-36703

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	16	17S	29E	990	North	1650	West	Eddy

Latitude: 32.8391876 **Longitude:** -104.0830383 NAD83

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 150bbls	Volume Recovered: 140bbls
Source of Release: Swedge on production tank	Date and Hour of Occurrence: 11/13/2017 9:00am	Date and Hour of Discovery: 11/13/2017 9:00am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher & Crystal Weaver-NMOCD Amber Groves-NMSLO	
By Whom? Dakota Neel	Date and Hour: 11/13/2017 12:30pm	
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.*
Swedge on production tank failed due to corrosion. The fittings were replaced.

Describe Area Affected and Cleanup Action Taken.*

All of the fluid remained inside of the lined containment. A vacuum truck was dispatched to recover all freestanding fluids. Concho will have the spill area evaluated for 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: Sheldon Hitchcock	OIL CONSERVATION DIVISION	
Printed Name: Sheldon L. Hitchcock	Approved by Environmental Specialist:	
Title: HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: slhitchcock@concho.com	Conditions of Approval:	Attached ☐
Date: 11/15/2017 Phone: 575-746-2010		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - GJ West Coop Unit #210
Eddy County, New Mexico

16 South 28 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 **61**	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

16 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 **220** **dry**	13
19 110	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

16 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

17 South 28 East

6	5	4	3	2 **28**	1
7	8	9	10	11	12
18	17	16	15	14 80	13
19 224	20	21	22 **45** 79	23	24
30	29	28	27	26	25
31	32	33	34	35 **258**	36

17 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22 **76** 80	23	24
30	29 **210** **208**	28	27	26	25
31	32	33	34	35 153	36

17 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20 **80**	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

18 South 28 East

6	5	4 **108**	3	2 **55**	1
7 **49**	8 **81** **69**	9	10	11	12
18	17	16	15 **80**	14	13
19	20	21 **226**	22	23	24
30 **137**	29	28	27	26	25
31	32	33	34	35 65	36

18 South 29 East

6	5	4	3	2	1
7	8	9	10 **95**	11	12
18	17	16	15	14	13
19	20	21	22	23	24 158
30	29	28	27	26	25
31	32	33	34	35	36

18 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23 **44**	24
30	29	28	27	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

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

Average Depth to Water: **76 feet**

Minimum Depth: **76 feet**

Maximum Depth: **76 feet**

Record Count: 1

PLSS Search:

Township: 17S **Range:** 29E

Appendix C

Analytical Report 571931

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

GJ West Coop Unit #210

212C-MD-01056.300

04-JAN-18

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)

04-JAN-18

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **571931**
GJ West Coop Unit #210
Project Address: Eddy Co, NM

Ike Tavarez:

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) 571931. 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. 571931 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 571931

Tetra Tech- Midland, Midland, TX

GJ West Coop Unit #210

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH-1 0-1	S	12-20-17 00:00		571931-001
BH-1 2-3	S	12-20-17 00:00		571931-002
BH-2 0-1	S	12-21-17 00:00		571931-009
BH-2 2-3	S	12-21-17 00:00		571931-010
BH-3 0-1	S	12-21-17 00:00		571931-018
BH-3 2-3	S	12-21-17 00:00		571931-019
BH-3 4-5	S	12-21-17 00:00		571931-020
BH-4 0-1	S	12-21-17 00:00		571931-026
BH-4 2-3	S	12-21-17 00:00		571931-027
BH-1 4-5	S	12-20-17 00:00		Not Analyzed
BH-1 6-7	S	12-20-17 00:00		Not Analyzed
BH-1 9-10	S	12-20-17 00:00		Not Analyzed
BH-1 14-15	S	12-20-17 00:00		Not Analyzed
BH-1 19-20	S	12-20-17 00:00		Not Analyzed
BH-1 24-25	S	12-20-17 00:00		Not Analyzed
BH-2 4-5	S	12-21-17 00:00		Not Analyzed
BH-2 6-7	S	12-21-17 00:00		Not Analyzed
BH-2 9-10	S	12-21-17 00:00		Not Analyzed
BH-2 14-15	S	12-21-17 00:00		Not Analyzed
BH-2 19-20	S	12-21-17 00:00		Not Analyzed
BH-2 24-25	S	12-21-17 00:00		Not Analyzed
BH-2 29-30	S	12-21-17 00:00		Not Analyzed
BH-3 6-7	S	12-21-17 00:00		Not Analyzed
BH-3 9-10	S	12-21-17 00:00		Not Analyzed
BH-3 14-15	S	12-21-17 00:00		Not Analyzed
BH-3 19-20	S	12-21-17 00:00		Not Analyzed
BH-3 24-25	S	12-21-17 00:00		Not Analyzed
BH-4 4-5	S	12-21-17 00:00		Not Analyzed
BH-4 6-7	S	12-21-17 00:00		Not Analyzed
BH-4 9-10	S	12-21-17 00:00		Not Analyzed
BH-4 14-15	S	12-21-17 00:00		Not Analyzed
BH-4 19-20	S	12-21-17 00:00		Not Analyzed
BH-4 24-25	S	12-21-17 00:00		Not Analyzed

Client Name: Tetra Tech- Midland

Project Name: GJ West Coop Unit #210

Project ID: *212C-MD-01056.300*
Work Order Number(s): *571931*

Report Date: *04-JAN-18*
Date Received: *12/21/2017*

Sample receipt non conformances and comments:

01/02/18: added Btex on BH-3 @ 4-5' per Clair Gonzales.

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3036675 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3036802 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3037056 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3037186 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3037361 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 571931

Tetra Tech- Midland, Midland, TX

Project Name: GJ West Coop Unit #210

Project Id: 212C-MD-01056.300
Contact: Ike Tavarez
Project Location: Eddy Co, NM

Date Received in Lab: Thu Dec-21-17 02:48 pm
Report Date: 04-JAN-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	571931-001		571931-002		571931-009		571931-010		571931-018		571931-019	
	Field Id:	BH-1 0-1		BH-1 2-3		BH-2 0-1		BH-2 2-3		BH-3 0-1		BH-3 2-3	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-20-17 00:00		Dec-20-17 00:00		Dec-21-17 00:00		Dec-21-17 00:00		Dec-21-17 00:00		Dec-21-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Dec-21-17 17:00		Dec-22-17 09:30		Dec-28-17 10:00		Dec-22-17 09:30		Dec-26-17 10:00		Dec-22-17 09:30	
	Analyzed:	Dec-22-17 10:12		Dec-22-17 18:14		Dec-28-17 23:30		Dec-22-17 17:55		Dec-27-17 07:26		Dec-22-17 19:11	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		0.0663	0.00200	0.979	0.100	37.3	0.994	0.276	0.100	23.9	0.501	3.74	0.101
Toluene		0.162	0.00200	1.58	0.100	131	0.994	1.09	0.100	68.2	0.501	15.3	0.101
Ethylbenzene		0.160	0.00200	4.80	0.100	83.5	0.994	2.34	0.100	43.4	0.501	11.5	0.101
m,p-Xylenes		0.261	0.00399	9.67	0.200	99.4	1.99	4.36	0.200	70.5	1.00	15.0	0.201
o-Xylene		0.0964	0.00200	4.03	0.100	37.2	0.994	3.73	0.100	27.3	0.501	5.46	0.101
Total Xylenes		0.357	0.00200	13.7	0.100	137	0.994	8.09	0.100	97.8	0.501	20.5	0.101
Total BTEX		0.746	0.00200	21.1	0.100	388	0.994	11.8	0.100	233	0.501	51.0	0.101
TPH By SW8015 Mod	***Extracted:***	Dec-21-17 16:00		Dec-21-17 16:00		Dec-21-17 16:00		Dec-21-17 16:00		Dec-21-17 16:00		Dec-21-17 16:00	
	Analyzed:	Dec-22-17 06:13		Dec-22-17 06:35		Dec-22-17 06:56		Dec-22-17 07:17		Dec-22-17 07:36		Dec-22-17 08:37	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		515	14.9	1300	74.9	4450	74.9	786	75.0	3840	74.8	1250	14.9
Diesel Range Organics (DRO)		1410	14.9	2730	74.9	5060	74.9	3350	75.0	7690	74.8	1710	14.9
Oil Range Hydrocarbons (ORO)		297	14.9	491	74.9	1000	74.9	709	75.0	1320	74.8	307	14.9
Total TPH		2220	14.9	4520	74.9	10500	74.9	4850	75.0	12900	74.8	3270	14.9

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 571931

Tetra Tech- Midland, Midland, TX

Project Name: GJ West Coop Unit #210

Project Id: 212C-MD-01056.300
Contact: Ike Tavarez
Project Location: Eddy Co, NM

Date Received in Lab: Thu Dec-21-17 02:48 pm
Report Date: 04-JAN-18
Project Manager: Kelsey Brooks

Analysis Requested									
	Lab Id:	571931-020		571931-026		571931-027			
	Field Id:	BH-3 4-5		BH-4 0-1		BH-4 2-3			
	Depth:								
	Matrix:	SOIL		SOIL		SOIL			
	Sampled:	Dec-21-17 00:00		Dec-21-17 00:00		Dec-21-17 00:00			
BTEX by EPA 8021B	***Extracted:***	Jan-03-18 14:00		Dec-22-17 09:30		Dec-22-17 09:30			
	Analyzed:	Jan-03-18 17:20		Dec-22-17 19:28		Dec-22-17 15:57			
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL		
Benzene		<0.0100	0.0100	12.0	0.198	0.00410	0.00201		
Toluene		<0.0100	0.0100	39.6	0.198	0.0117	0.00201		
Ethylbenzene		<0.0100	0.0100	34.1	0.198	0.0185	0.00201		
m,p-Xylenes		0.0535	0.0200	42.2	0.396	0.0310	0.00402		
o-Xylene		<0.0100	0.0100	16.5	0.198	0.0159	0.00201		
Total Xylenes		0.0535	0.0100	58.7	0.198	0.0469	0.00201		
Total BTEX		0.0535	0.0100	144	0.198	0.0812	0.00201		
TPH By SW8015 Mod	***Extracted:***			Dec-21-17 16:00		Dec-21-17 16:00			
	Analyzed:			Dec-22-17 08:58		Dec-22-17 09:18			
	Units/RL:			mg/kg	RL	mg/kg	RL		
Gasoline Range Hydrocarbons (GRO)				4570	74.9	<15.0	15.0		
Diesel Range Organics (DRO)				6630	74.9	30.7	15.0		
Oil Range Hydrocarbons (ORO)				1160	74.9	<15.0	15.0		
Total TPH				12400	74.9	30.7	15.0		

Kelsey Brooks
Project 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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036677 **Sample:** 571931-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 06:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	86.0	99.6	86	70-135	
o-Terphenyl	37.2	49.8	75	70-135	

Lab Batch #: 3036677 **Sample:** 571931-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 06:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.3	99.8	88	70-135	
o-Terphenyl	43.3	49.9	87	70-135	

Lab Batch #: 3036677 **Sample:** 571931-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 06:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	87.9	99.9	88	70-135	
o-Terphenyl	41.0	50.0	82	70-135	

Lab Batch #: 3036677 **Sample:** 571931-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 07:17

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	100	89	70-135	
o-Terphenyl	41.1	50.0	82	70-135	

Lab Batch #: 3036677 **Sample:** 571931-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 07:36

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	99.7	93	70-135	
o-Terphenyl	40.0	49.9	80	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036677 **Sample:** 571931-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 08:37

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.8	99.6	91	70-135	
o-Terphenyl	40.0	49.8	80	70-135	

Lab Batch #: 3036677 **Sample:** 571931-026 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 08:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.4	99.8	98	70-135	
o-Terphenyl	41.4	49.9	83	70-135	

Lab Batch #: 3036677 **Sample:** 571931-027 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 09:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.4	99.8	92	70-135	
o-Terphenyl	49.2	49.9	99	70-135	

Lab Batch #: 3036675 **Sample:** 571931-001 / SMP **Batch:** 1 **Matrix:** Soil

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

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0320	0.0300	107	80-120	
4-Bromofluorobenzene	0.0319	0.0300	106	80-120	

Lab Batch #: 3036802 **Sample:** 571931-027 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 15:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0262	0.0300	87	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036802 **Sample:** 571931-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 17:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0242	0.0300	81	80-120	
4-Bromofluorobenzene	0.0306	0.0300	102	80-120	

Lab Batch #: 3036802 **Sample:** 571931-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 18:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0247	0.0300	82	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

Lab Batch #: 3036802 **Sample:** 571931-019 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 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	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 3036802 **Sample:** 571931-026 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 19:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3037056 **Sample:** 571931-018 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/27/17 07:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	80-120	
4-Bromofluorobenzene	0.0336	0.0300	112	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3037186 **Sample:** 571931-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 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	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0258	0.0300	86	80-120	

Lab Batch #: 3037361 **Sample:** 571931-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 01/03/18 17:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0265	0.0300	88	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3036675 **Sample:** 7636472-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 02:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3036677 **Sample:** 7636450-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 02:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	80.3	100	80	70-135	
o-Terphenyl	41.5	50.0	83	70-135	

Lab Batch #: 3036802 **Sample:** 7636560-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 13:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0287	0.0300	96	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3037056 **Sample:** 7636696-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/26/17 10:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	80-120	
4-Bromofluorobenzene	0.0243	0.0300	81	80-120	

Lab Batch #: 3037186 **Sample:** 7636780-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 16:54

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	0.0251	0.0300	84	80-120	

Lab Batch #: 3037361 **Sample:** 7636913-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 01/03/18 15:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 3036675 **Sample:** 7636472-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:09

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	0.0299	0.0300	100	80-120	

Lab Batch #: 3036677 **Sample:** 7636450-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 03:10

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	77.3	100	77	70-135	
o-Terphenyl	40.7	50.0	81	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036802 **Sample:** 7636560-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 11:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 3037056 **Sample:** 7636696-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/26/17 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	0.0339	0.0300	113	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 3037186 **Sample:** 7636780-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 15:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

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

Lab Batch #: 3037361 **Sample:** 7636913-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 01/03/18 13:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	80-120	
4-Bromofluorobenzene	0.0277	0.0300	92	80-120	

Lab Batch #: 3036675 **Sample:** 7636472-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 00:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036677 **Sample:** 7636450-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 03:32

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	79.2	100	79	70-135	
o-Terphenyl	41.8	50.0	84	70-135	

Lab Batch #: 3036802 **Sample:** 7636560-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/22/17 11:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	80-120	

Lab Batch #: 3037056 **Sample:** 7636696-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/26/17 08:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0341	0.0300	114	80-120	
4-Bromofluorobenzene	0.0339	0.0300	113	80-120	

Lab Batch #: 3037186 **Sample:** 7636780-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 12/28/17 15:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3037361 **Sample:** 7636913-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 01/03/18 13:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0297	0.0300	99	80-120	
4-Bromofluorobenzene	0.0284	0.0300	95	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3036675 **Sample:** 571798-009 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 00:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3036677 **Sample:** 571800-013 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	74.4	99.8	75	70-135	
o-Terphenyl	40.5	49.9	81	70-135	

Lab Batch #: 3036802 **Sample:** 571876-002 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 11:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0313	0.0300	104	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

Lab Batch #: 3037056 **Sample:** 572035-035 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/26/17 09:09

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	0.0277	0.0300	92	80-120	

Lab Batch #: 3037186 **Sample:** 572178-011 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 15:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0331	0.0300	110	80-120	
4-Bromofluorobenzene	0.0355	0.0300	118	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3037361 **Sample:** 572446-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 01/03/18 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	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0340	0.0300	113	80-120	

Lab Batch #: 3036675 **Sample:** 571798-009 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 01:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0325	0.0300	108	80-120	

Lab Batch #: 3036677 **Sample:** 571800-013 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 04:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	82.6	99.9	83	70-135	
o-Terphenyl	43.6	50.0	87	70-135	

Lab Batch #: 3036802 **Sample:** 571876-002 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/22/17 12:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	80-120	
4-Bromofluorobenzene	0.0309	0.0300	103	80-120	

Lab Batch #: 3037056 **Sample:** 572035-035 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/26/17 09:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0287	0.0300	96	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 Unit #210

Work Orders : 571931,

Project ID: 212C-MD-01056.300

Lab Batch #: 3037186 **Sample:** 572178-011 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 12/28/17 15:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0338	0.0300	113	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3037361 **Sample:** 572446-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 01/03/18 14:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0294	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.

BS / BSD Recoveries

Project Name: GJ West Coop Unit #210

Work Order #: 571931 **Project ID:** 212C-MD-01056.300

Analyst: ALJ **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036675 **Sample:** 7636472-1-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	0.0872	87	0.100	0.0854	85	2	70-130	35	
Toluene	<0.00200	0.0998	0.0805	81	0.100	0.0788	79	2	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0871	87	0.100	0.0848	85	3	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.172	86	0.201	0.167	83	3	70-135	35	
o-Xylene	<0.00200	0.0998	0.0824	83	0.100	0.0798	80	3	71-133	35	

Analyst: ALJ **Date Prepared:** 12/22/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036802 **Sample:** 7636560-1-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	<0.00198	0.0990	0.0915	92	0.0994	0.0894	90	2	70-130	35	
Toluene	<0.00198	0.0990	0.0852	86	0.0994	0.0831	84	2	70-130	35	
Ethylbenzene	<0.00198	0.0990	0.0925	93	0.0994	0.0913	92	1	71-129	35	
m,p-Xylenes	<0.00396	0.198	0.182	92	0.199	0.180	90	1	70-135	35	
o-Xylene	<0.00198	0.0990	0.0851	86	0.0994	0.0849	85	0	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 Unit #210

Work Order #: 571931 **Project ID:** 212C-MD-01056.300

Analyst: ALJ **Date Prepared:** 12/26/2017 **Date Analyzed:** 12/26/2017

Lab Batch ID: 3037056 **Sample:** 7636696-1-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	<0.00199	0.0996	0.0748	75	0.100	0.0752	75	1	70-130	35	
Toluene	<0.00199	0.0996	0.0748	75	0.100	0.0765	77	2	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.0759	76	0.100	0.0777	78	2	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.161	81	0.201	0.160	80	1	70-135	35	
o-Xylene	<0.00199	0.0996	0.0773	78	0.100	0.0791	79	2	71-133	35	

Analyst: ALJ **Date Prepared:** 12/28/2017 **Date Analyzed:** 12/28/2017

Lab Batch ID: 3037186 **Sample:** 7636780-1-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	0.0872	87	0.100	0.0836	84	4	70-130	35	
Toluene	<0.00200	0.0998	0.0823	82	0.100	0.0788	79	4	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0931	93	0.100	0.0888	89	5	71-129	35	
m,p-Xylenes	<0.00399	0.200	0.184	92	0.200	0.175	88	5	70-135	35	
o-Xylene	<0.00200	0.0998	0.0858	86	0.100	0.0820	82	5	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 Unit #210

Work Order #: 571931 **Project ID:** 212C-MD-01056.300

Analyst: ALJ **Date Prepared:** 01/03/2018 **Date Analyzed:** 01/03/2018

Lab Batch ID: 3037361 **Sample:** 7636913-1-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	0.0894	89	0.100	0.0877	88	2	70-130	35	
Toluene	<0.00202	0.101	0.0840	83	0.100	0.0825	83	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0941	93	0.100	0.0914	91	3	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.185	92	0.201	0.180	90	3	70-135	35	
o-Xylene	<0.00202	0.101	0.0865	86	0.100	0.0846	85	2	71-133	35	

Analyst: ARM **Date Prepared:** 12/21/2017 **Date Analyzed:** 12/22/2017

Lab Batch ID: 3036677 **Sample:** 7636450-1-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	813	81	1000	851	85	5	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	845	85	1000	866	87	2	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 Unit #210

Work Order # : 571931 **Project ID:** 212C-MD-01056.300

Lab Batch ID: 3036675 **QC- Sample ID:** 571798-009 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/21/2017 **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	<0.00201	0.100	0.0767	77	0.101	0.0767	76	0	70-130	35	
Toluene	<0.00201	0.100	0.0707	71	0.101	0.0702	70	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0745	75	0.101	0.0747	74	0	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.146	73	0.202	0.147	73	1	70-135	35	
o-Xylene	<0.00201	0.100	0.0694	69	0.101	0.0702	70	1	71-133	35	X

Lab Batch ID: 3036802 **QC- Sample ID:** 571876-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/22/2017 **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	<0.00198	0.0990	0.0745	75	0.0994	0.0688	69	8	70-130	35	X
Toluene	<0.00198	0.0990	0.0674	68	0.0994	0.0613	62	9	70-130	35	X
Ethylbenzene	<0.00198	0.0990	0.0717	72	0.0994	0.0652	66	9	71-129	35	X
m,p-Xylenes	<0.00396	0.198	0.141	71	0.199	0.128	64	10	70-135	35	X
o-Xylene	<0.00198	0.0990	0.0666	67	0.0994	0.0614	62	8	71-133	35	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 Unit #210

Work Order # : 571931 **Project ID:** 212C-MD-01056.300

Lab Batch ID: 3037056 **QC- Sample ID:** 572035-035 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/26/2017 **Date Prepared:** 12/26/2017 **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	<0.00202	0.101	0.0474	47	0.100	0.0528	53	11	70-130	35	X
Toluene	<0.00202	0.101	0.0426	42	0.100	0.0490	49	14	70-130	35	X
Ethylbenzene	<0.00202	0.101	0.0477	47	0.100	0.0538	54	12	71-129	35	X
m,p-Xylenes	<0.00403	0.202	0.0942	47	0.200	0.107	54	13	70-135	35	X
o-Xylene	<0.00202	0.101	0.0459	45	0.100	0.0504	50	9	71-133	35	X

Lab Batch ID: 3037186 **QC- Sample ID:** 572178-011 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/28/2017 **Date Prepared:** 12/28/2017 **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	0.0968	97	0.101	0.0871	86	11	70-130	35	
Toluene	<0.00200	0.100	0.0873	87	0.101	0.0760	75	14	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0887	89	0.101	0.0821	81	8	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.174	87	0.201	0.162	81	7	70-135	35	
o-Xylene	<0.00200	0.100	0.0829	83	0.101	0.0776	77	7	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 Unit #210

Work Order # : 571931 **Project ID:** 212C-MD-01056.300

Lab Batch ID: 3037361 **QC- Sample ID:** 572446-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 01/03/2018 **Date Prepared:** 01/03/2018 **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	0.0693	69	0.0998	0.0670	67	3	70-130	35	X
Toluene	<0.00200	0.100	0.0615	62	0.0998	0.0588	59	4	70-130	35	X
Ethylbenzene	0.00532	0.100	0.0736	68	0.0998	0.0717	67	3	71-129	35	X
m,p-Xylenes	0.00481	0.200	0.141	68	0.200	0.138	67	2	70-135	35	X
o-Xylene	<0.00200	0.100	0.0662	66	0.0998	0.0647	65	2	71-133	35	X

Lab Batch ID: 3036677 **QC- Sample ID:** 571800-013 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 12/22/2017 **Date Prepared:** 12/21/2017 **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	998	823	82	999	830	83	1	70-135	35	
Diesel Range Organics (DRO)	<15.0	998	851	85	999	853	85	0	70-135	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B

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

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

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.

Analysis Request of Chain of Custody Record

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

571931

Client Name: COG

Site Manager: Ike Tavarez

Project Name: GJ West Coop Unit #210

Project Location (county, state): Eddy Co NM

Project #: 212C-MD-01056.300

Invoice to: COG

Receiving Laboratory: Xenco

Sampler Signature: Dan Lenzales

Comments: Run deeper samples if benzene exceeds 10 mg/kg, total BTEX exceeds 50mg/kg or TPH exceeds 1,000 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE HCL	PRESERVATIVE HNO_3	PRESERVATIVE ICE	# CONTAINERS	FILTERED (Y/N)
	BH-1 0-1	12/20/17			X			X	1	
	" 2-3				X			X	1	
	" 4-5				X			X	1	
	" 6-7				X			X	1	
	" 9-10				X			X	1	
	" 14-15				X			X	1	
	" 19-20				X			X	1	
	" 24-25				X			X	1	
	BH-2 0-1	12/21/17			X			X	1	
	" 2-3	"			X			X	1	

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
X		X	X																
X		X	X																
X		X	X																
X		X	X																

Relinquished by: Dan Lenzales Date: 12/21/17 Time: 1448

Received by: J KRAMER Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature

(Circle) HAND

REMARKS:

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Temp: 0.8 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: -1.0

ORIGINAL COPY

Final 1.001

Analysis Request of Chain of Custody Record

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571931

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Receiving Laboratory:

Sampler Signature:

Comments: See page 1

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE			# CONTAINERS	FILTERED (Y/N)
	BH-2 4-5	12/21/17			X				X				
	" 6-7												
	" 9-10												
	" 14-15												
	" 19-20												
	" 24-25												
	" 29-30												
	BH-3 0-1												
	" 2-3												
	" 4-5												

ANALYSIS REQUEST (Circle or Specify Method No.)

	BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance					Hold
			X	X																				
			X	X																				

Relinquished by: Date: 12/21/17 Time: 1448

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature

(Circle) HAND

REMARKS:

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

Temp: 0.8 IR ID: R-8

CF: (0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: -1.0

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571931

Client Name: COG

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Project Name: GJ West Coop Unit #210

Project Location: (county, state) Eddy Co NM

Project #: 212C-MD-01056.300

Invoice to: COG

Receiving Laboratory:

Sampler Signature:

Comments: see page 1

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE			# CONTAINERS	FILTERED (Y/N)
	BH-3 6-7	12/21/17			X				X				
	" 9-10												
	" 14-15												
	" 19-20												
	" 24-25												
	BH-4 0-1												
	" 2-3												
	" 4-5												
	" 6-7												
	" 9-10												

ANALYSIS REQUEST
(Circle or Specify Method No.)

	BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	X		X																				
	X		X																				

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Relinquished by: Date: 12/21/17 Time: 1448

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature

REMARKS:

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Temp: -0.8 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: -1.0

(Circle) H

ORIGINAL COPY

Analysis Request of Chain of Custody Record

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571931

Client Name: COG

Site Manager: Ike Tavarez

Project Name: GJ West Coop Unit #210

Project Location: (county, state) Eddy Co NM

Project #: 212C-MD-01056.300

Invoice to: COG

Receiving Laboratory:

Sampler Signature:

Comments: Seepage I

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)
	BH-4 14-15	12/21/17			X				X				
	" 19-20				X				X				
	" 24-25	↓			X				X				

ANALYSIS REQUEST
(Circle or Specify Method No.)

BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
	X		X																			

Final 1.001

Page 27 of 28

Relinquished by: Date: 12/21/17 Time: 1448

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature

(Circle) HAI

REMARKS:

☐ RUSH: Same Day 24 hr 48 hr 72 hr

☐ Rush Charges Authorized

Temp: -0.8 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: -1.0

ORIGINAL COPY

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 12/21/2017 02:48:00 PM

Work Order #: 571931

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

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

Analyst: PH Device/Lot#:

Checklist completed by: Shawnee Smith Date: 12/21/2017
Shawnee Smith

Checklist reviewed by: Kelsey Brooks Date: 12/27/2017
Kelsey Brooks