

SITE INFORMATION

Report Type: Work Plan 2RP-3993

General Site Information:

Site:	Ross Gulch 8-3 SWD					
Company:	EOG Resources, Inc.					
Section, Township and Range	Unit K	Sec. 8	T 26S	R 31E		
Lease Number:	API No. 30-015-39736					
County:	Eddy County					
GPS:	32.05680° N			103.80110° W		
Surface Owner:	Private					
Mineral Owner:						
Directions:	From the intersection of HWY 285 and Longhorn Rd in rural Eddy County, travel EAST on Longhorn Rd for approximately 4.30 mi, turn EAST onto Pipeline Rd for approximately 11.5 miles, turn SOUTH onto lease road for approximately 0.5 mi, turn EAST onto lease road for approximatey 0.10 mi to location.					

Release Data:

Date Released:	11/6/2016
Type Release:	Produced Water
Source of Contamination:	Lighting Strike
Fluid Released:	1200 bbls
Fluids Recovered:	1140 bbls

Official Communication:

Name:	Zane Kurtz		Ike Tavaréz
Company:	EOG Resources, Inc.		Tetra Tech
Address:	5509 Champions Drive		4000 N. Big Spring
			Ste 401
City:	Midland Texas, 797016		Midland, Texas
Phone number:	(432) 686-3667		(432) 687-8110
Fax:			
Email:	Zane_Kurtz@eogresources.com		Ike.Tavaréz@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	130'
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:		0

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	5,000



TETRA TECH

February 8, 2017

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

Re: Work Plan for the EOG Resources, Inc., Ross Gulch 8-3 SWD, Unit K, Section 8, Township 26 South, Range 31 East, Eddy County, New Mexico. 2RP-3993

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by EOG Resources, Inc. (EOG) to assess a release that occurred at the Ross Gulch 8-3 SWD, Unit K, Section 8, Township 26 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.05680°, W 103.80110°. 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 6, 2016, and released approximately twelve hundred (1,200) barrels of produced water due to a lightning strike. Majority of the fluids were contained inside the lined facility and some fluids migrated onto the pad, measuring approximately 60' x 150'. Approximately eleven hundred and forty (1,140) barrels of produced water were recovered. The facility was dismantled for the construction of a new facility on the pad. The initial C-141 form is included in Appendix A.

Groundwater

Three (3) water wells are listed within Section 8 on the New Mexico Office of the State Engineer's database and the depth to groundwater listed for the three wells ranged from 292' to 300' below surface. The Geology and Ground-Water Resources of Eddy County, New Mexico, Ground-Water Report 3, reported two wells in Section 8 with depths to groundwater of 250' and 278.5' below surface. Additionally, according to the Chevron Texaco Groundwater Trend Map, the average depth to groundwater in this area shows depth between 275' and 300' 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.tetrattech.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 5,000 mg/kg.

Soil Assessment and Analytical Results

On December 5, 2016, Tetra Tech personnel were onsite to evaluate and sample the release area. Three (3) backhoe sample trenches (T-1, T-2, and T-3) were installed to total depths of 2.5' to 5.0' below surface. Additionally, a background trench (T-4 Background) was installed to a depth of 3.0' below surface in order to evaluate the chloride concentrations in the native soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3.

Referring to Table 1, none of the samples showed total TPH, benzene, or total BTEX concentrations above the RRAL's. The area of trenches (T-1, T-2, and T-3) detected total BTEX concentrations of 0.00350 mg/kg, 0.00352 mg/kg, and 0.00317 mg/kg at 0-1' below the RRAL's.

The area of trench (T-2) did not show a significant chloride impact to the area with a concentration high of 377 mg/kg at 0-1' below surface. However, the areas of trenches (T-1 and T-3) showed elevated chloride concentrations in the shallow soils. The area of trench (T-1) showed a chloride concentration of 5,870 mg/kg at 0-1', which then declined with depth to 673 mg/kg at 2.0' and a bottom concentration of 45.0 mg/kg at 5.0' below surface. The area of trench (T-3) showed a chloride concentration of 3,110 mg/kg at 0-1', which then declined to 212 mg/kg at 2.0' below surface. However, the chloride concentration spiked to 2,040 mg/kg at 2.5' below surface. Deeper samples were not collected with the backhoe due to a dense rock formation.

The background trench (T-4) showed chloride concentrations ranging from <50.0 mg/kg at 0-1' to 115 mg/kg at 2.0' below surface.



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Based on the laboratory results, Tetra Tech personnel returned to the site on December 28, 2016, to re-sample and attempt to penetrate the dense rock formation with a backhoe in the area of trench (T-3). One additional sample at trench (T-3) was collected at 2.0-3.0' below surface but could not penetrate the rock formation for deeper samples. Selected samples were analyzed for chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1.

Referring to Table 1, the sample at 2-3' collected at trench (T-3) showed a declining chloride concentration of 1,060 mg/kg and was not vertically defined. Again, deeper samples were not collected due to a dense rock formation. Due to the dense formation, the chloride concentration may be due to cross contamination with the upper soils sloughing into the open trench. Based on the depth to groundwater and the limited area on the facility pad, the chloride concentration detected at 2.0-3.0' do not appear to be an environmental concern.

Work Plan

Based on the laboratory results, EOG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. The areas of trenches (T-1 and T-3) will be excavated to a depth of approximately 1.0' below surface to remove the chloride impact in the shallow soils. The excavated areas will be backfilled with clean material to surface grade. 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 safety concerns for onsite personnel. As such, Tetra Tech will excavate the impacted soils to the maximum extent practicable.

Conclusion

Upon completion, a final report 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.

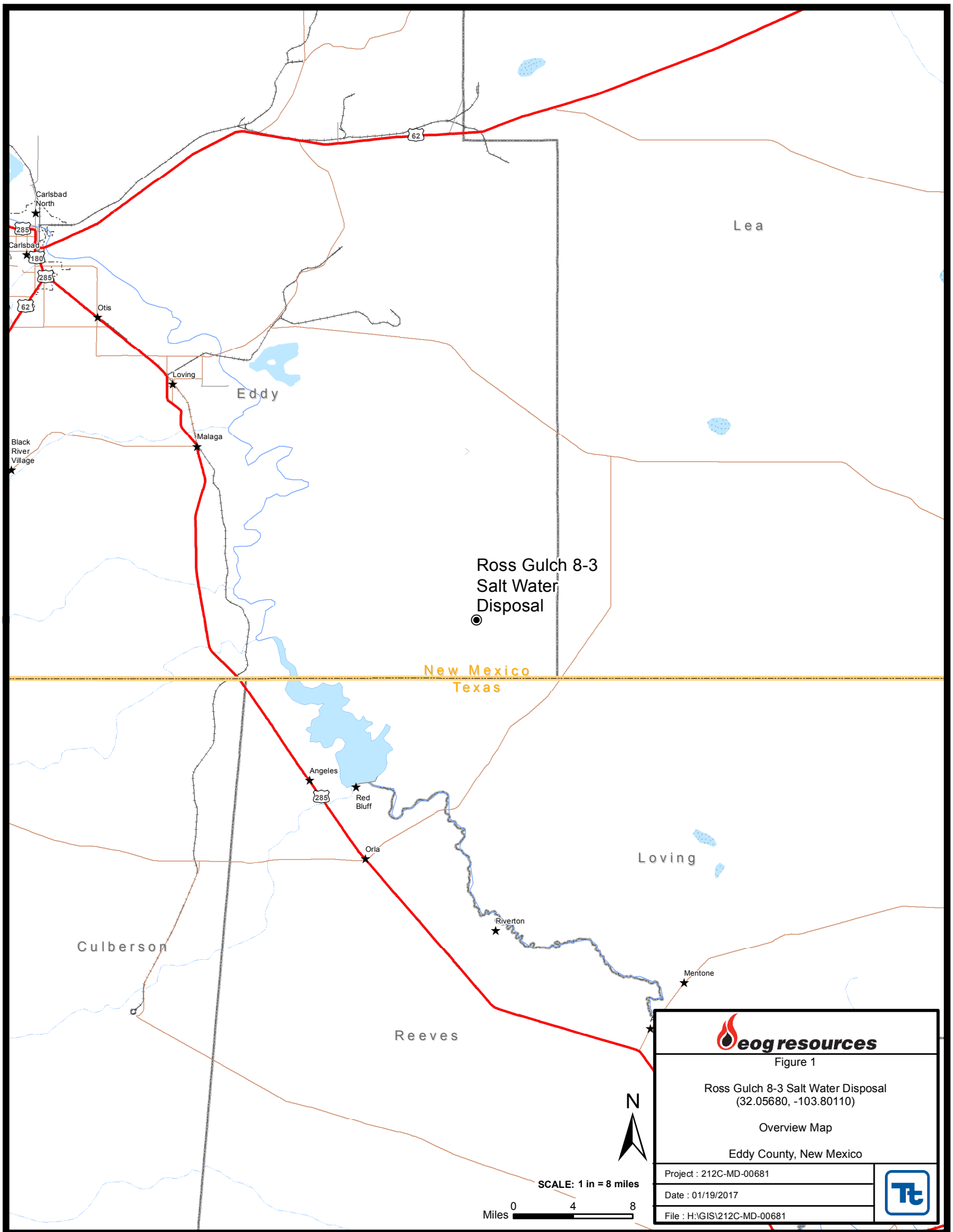
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Geologist I

Ike Tavarez,
Senior Project Manager, P.G.

cc: Zane Kurtz – EOG

Figures



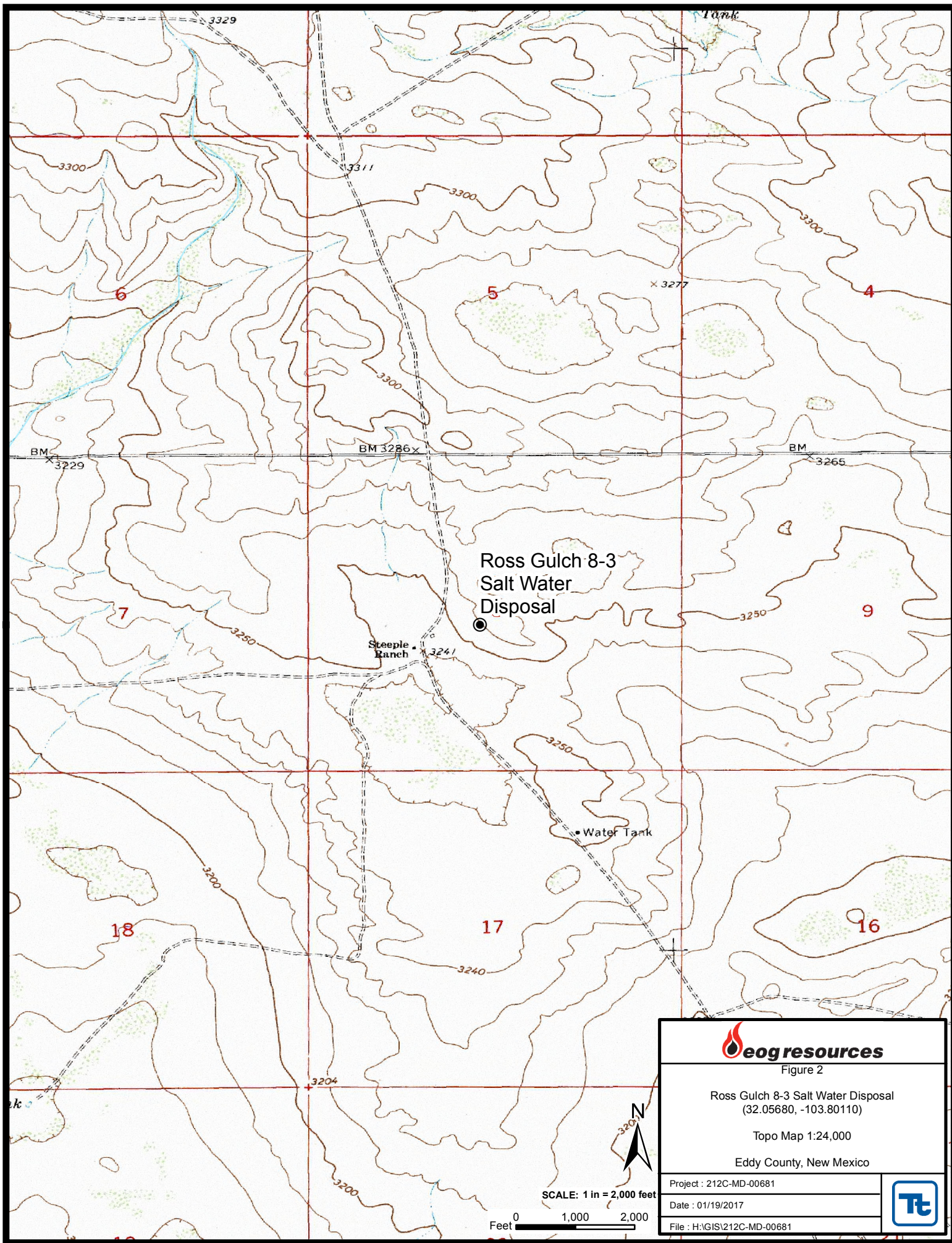


Figure 2

Ross Gulch 8-3 Salt Water Disposal
(32.05680, -103.80110)

Topo Map 1:24,000

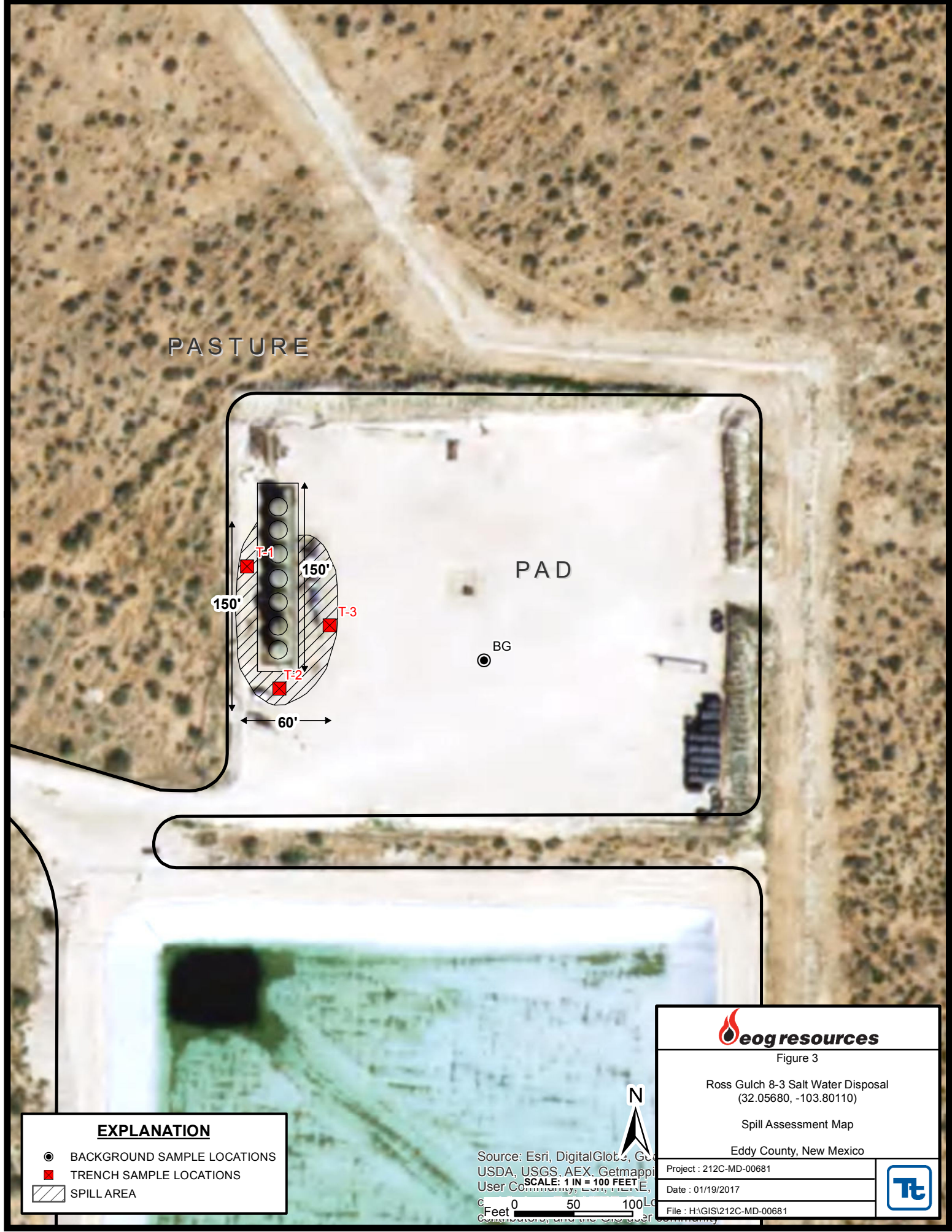
Eddy County, New Mexico

Project : 212C-MD-00681

Date : 01/19/2017

File : H:\GIS\212C-MD-00681





EXPLANATION

- BACKGROUND SAMPLE LOCATIONS
- TRENCH SAMPLE LOCATIONS
- ▨ SPILL AREA

Source: Esri, DigitalGlobe, GeoEye, USDA, USGS, AEX, Getmapping, User Community, Esri, HERE, DeLorme, and the United States Geological Survey

SCALE: 1 IN = 100 FEET

0 50 100 Feet



Figure 3

Ross Gulch 8-3 Salt Water Disposal
(32.05680, -103.80110)

Spill Assessment Map

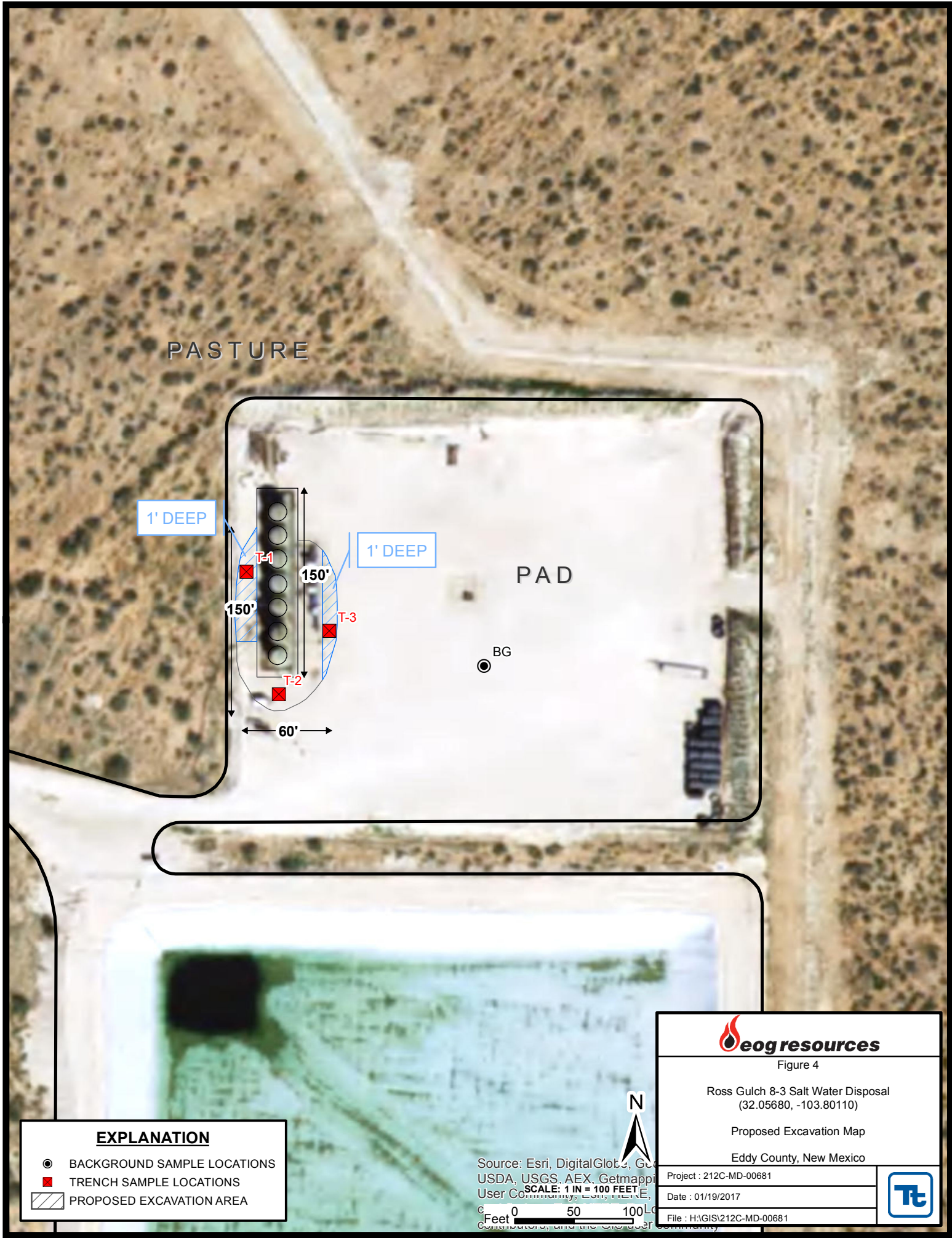
Eddy County, New Mexico

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Date : 01/19/2017

File : H:\GIS\212C-MD-00681





Tables

Table 1
EOG Resources
Ross Gulch 8-3 Salt Water Disposal
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
Trench 1	12/5/2016	0-1	-	X		<15.0	<15.0	<15.0	<0.00149	<0.00198	0.00350	<0.00198	0.00350	5,870
	"	2	-	X		-	-	-	-	-	-	-	-	673
	"	4	-	X		-	-	-	-	-	-	-	-	113
	"	5	-	X		-	-	-	-	-	-	-	-	45
Trench 2	12/5/2016	0-1	-	X		<15.0	<15.0	<15.0	<0.00151	<0.00201	0.00352	<0.00201	0.00352	377
	"	2	-	X		-	-	-	-	-	-	-	-	146
	"	4	-	X		-	-	-	-	-	-	-	-	60.4
	"	5	-	X		-	-	-	-	-	-	-	-	175
Trench 3	12/5/2016	0-1	-	X		<15.0	<15.0	<15.0	<0.00150	<0.00200	0.00317	<0.00200	0.00317	3,110
	"	2	-	X		-	-	-	-	-	-	-	-	212
	"	2.5	-	X		-	-	-	-	-	-	-	-	2,040
Trench 3 (AH-1) *	12/28/2016	2-3	-	X		-	-	-	-	-	-	-	-	1,060
Trench 4 (background)	12/5/2016	0-1	-	X		-	-	-	-	-	-	-	-	<50.0
	"	2	-	X		-	-	-	-	-	-	-	-	115
	"	3	-	X		-	-	-	-	-	-	-	-	81.9

(-) Not Analyzed
(BEB) Below Excavation Bottom
 Proposed Excavation Depths
* Resampled

Photos

EOG Resources, Inc.
Ross Gulch 8-3 SWD
Eddy County, New Mexico



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View North – Area of T-1



View North – Area of T-2

EOG Resources, Inc.
Ross Gulch 8-3 SWD
Eddy County, New Mexico



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View North – Area of T-3



View North – Area of T-4 Background

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 August 8, 2011

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 EOG Resources, Inc.	Contact Zane Kurtz
Address 5509 Champions Drive, Midland, TX 79706	Telephone No. 432-425-2023
Facility Name Ross Gulch 8-3 SWD	Facility Type active well

Surface Owner FEE	Mineral Owner	API No. 30-015-39736
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LOCATION OF RELEASE

Unit Letter K	Section 8	Township 26S	Range 31E	Feet from the 2455	North/South Line S	Feet from the 2452	East/West Line S	County Eddy
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Latitude 32.0567 **Longitude** -103.8011

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 1200bbls	Volume Recovered 1140 bbls
Source of Release Lightning strike	Date and Hour of Occurrence 11-6-16	Date and Hour of Discovery 11-6-16
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.	

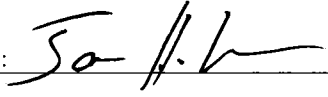
If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

A water tank was struck by lightning that rolled in from a bad storm on 11-6-16. Due to the strike, approximately 1200 bbls of produced water leaked in and around the containment. Vacuum trucks were called in to remove all standing fluids and recovered 1140 bbls of produced water. The facility was shut down and will be dismantled. A new facility will be built on the same pad to the North. Once moved, a 3rd party will begin cleanup efforts to evaluate the release. Further actions will be determined at that time.

Describe Area Affected and Cleanup Action Taken.*

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: 	OIL CONSERVATION DIVISION		
Printed Name: Jamon Hohensee	Approved by Environmental Specialist:		
Title: Environmental Representative	Approval Date:	Expiration Date:	
E-mail Address: jamon_hohensee@eogresources.com	Conditions of Approval:		Attached ☐
Date: 11/10/16	Phone: 432-686-3630		

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
EOG - Ross Gulch 8-3 SWD
Eddy County, New Mexico

25 South			30 East		
6	5	4	3	2	1
7	264		9	295	
18	17	16	15	14	13
19	20	21	265	22	23
30	29	28	268	27	26
31	32	33	34	35	36

26 South			30 East		
6	5	4	3	2	1
7	179				
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	180
31	32	33	34	35	36

25 South			31 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	390	22	23
30	29	28	290	27	26
31	32	33	34	35	36

26 South			31 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

25 South			32 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

26 South			32 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	333	22	23
30	29	28	180	27	26
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	POD		Q Q Q							X	Y	Depth Well	Depth Water	Water Column
	Sub-Code	basin	County	64	16	4	Sec	Tws	Rng					
C 01777	C	ED				08	26S	31E	613245	3547409*		325	300	25
C 02090		ED		4	4	01	26S	31E	620329	3548533*		350	335	15
C 02248		ED	1	2	3	08	26S	31E	612942	3547316*		300	292	8
C 02249		ED	1	2	3	08	26S	31E	612942	3547316*		300	292	8
C 03554 POD1	CUB	ED	2	1	4	01	26S	31E	620547	3549148		630	300	330
C 03639 POD1	CUB	ED	3	4	2	01	26S	31E	620168	3549279		700	365	335

Average Depth to Water: **314 feet**

Minimum Depth: **292 feet**

Maximum Depth: **365 feet**

Record Count: 6

PLSS Search:

Township: 26S

Range: 31E

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

Appendix C

Analytical Report 541643

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

EOG - Ross Gulch 8-3 SWD

212C-MD-00681

15-DEC-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

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

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



15-DEC-16

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **541643**

EOG - Ross Gulch 8-3 SWD

Project Address: Eddy Co, NM

Ike Tavaréz:

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) 541643. 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. 541643 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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

Certified and approved by numerous States and Agencies.

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

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

Tetra Tech- Midland, Midland, TX

EOG - Ross Gulch 8-3 SWD

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Trench #1 0-1'	S	12-05-16 00:00	0 - 1 ft	541643-001
Trench #1 2'	S	12-05-16 00:00	- 2 ft	541643-002
Trench #1 4'	S	12-05-16 00:00	- 4 ft	541643-003
Trench #1 5'	S	12-05-16 00:00	- 5 ft	541643-004
Trench #2 0-1'	S	12-05-16 00:00	0 - 1 ft	541643-005
Trench #2 2'	S	12-05-16 00:00	- 2 ft	541643-006
Trench #2 4'	S	12-05-16 00:00	- 4 ft	541643-007
Trench #2 5'	S	12-05-16 00:00	- 5 ft	541643-008
Trench #3 0-1'	S	12-05-16 00:00	0 - 1 ft	541643-009
Trench #3 2'	S	12-05-16 00:00	- 2 ft	541643-010
Trench #3 2.5'	S	12-05-16 00:00	- 2.5 ft	541643-011
Trench #4 0-1' Background	S	12-05-16 00:00	0 - 1 ft	541643-012
Trench #4 2' Background	S	12-05-16 00:00	- 2 ft	541643-013
Trench #4 3' Background	S	12-05-16 00:00	- 3 ft	541643-014



CASE NARRATIVE



Client Name: Tetra Tech- Midland

Project Name: EOG - Ross Gulch 8-3 SWD

Project ID: 212C-MD-00681
Work Order Number(s): 541643

Report Date: 15-DEC-16
Date Received: 12/08/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3005304 BTEX by EPA 8021B

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



Certificate of Analysis Summary 541643

Tetra Tech- Midland, Midland, TX

Project Name: EOG - Ross Gulch 8-3 SWD



Project Id: 212C-MD-00681

Contact: Ike Tavaréz

Project Location: Eddy Co, NM

Date Received in Lab: Thu Dec-08-16 09:40 am

Report Date: 15-DEC-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	541643-001	541643-002	541643-003	541643-004	541643-005	541643-006
	<i>Field Id:</i>	Trench #1 0-1'	Trench #1 2'	Trench #1 4'	Trench #1 5'	Trench #2 0-1'	Trench #2 2'
	<i>Depth:</i>	0-1 ft	2 ft	4 ft	5 ft	0-1 ft	2 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-08-16 15:00				Dec-08-16 15:00	
	<i>Analyzed:</i>	Dec-08-16 22:42				Dec-08-16 22:59	
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	
Benzene		<0.00149 0.00149				<0.00151 0.00151	
Toluene		<0.00198 0.00198				<0.00201 0.00201	
Ethylbenzene		0.00350 0.00198				0.00352 0.00201	
m,p-Xylenes		<0.00198 0.00198				<0.00201 0.00201	
o-Xylene		<0.00297 0.00297				<0.00301 0.00301	
Total Xylenes		<0.00198 0.00198				<0.00201 0.00201	
Total BTEX		0.00350 0.00149				0.00352 0.00151	
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Dec-12-16 17:25	Dec-12-16 17:25	Dec-12-16 17:25	Dec-12-16 17:25	Dec-12-16 17:25	Dec-12-16 17:25
	<i>Analyzed:</i>	Dec-12-16 20:16	Dec-12-16 20:30	Dec-12-16 20:37	Dec-12-16 20:44	Dec-12-16 20:51	Dec-12-16 20:58
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		5870 100	673 50.0	113 5.00	45.1 5.00	377 5.00	146 50.0
TPH By SW8015 Mod	<i>Extracted:</i>	Dec-14-16 07:00				Dec-14-16 07:00	
	<i>Analyzed:</i>	Dec-14-16 15:38				Dec-14-16 16:01	
	<i>Units/RL:</i>	mg/kg RL				mg/kg RL	
C6-C10 Gasoline Range Hydrocarbons		<15.0 15.0				<15.0 15.0	
C10-C28 Diesel Range Hydrocarbons		<15.0 15.0				<15.0 15.0	
C28-C35 Oil Range Hydrocarbons		<15.0 15.0				<15.0 15.0	
Total TPH		<15.0 15.0				<15.0 15.0	

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 541643

Tetra Tech- Midland, Midland, TX

Project Name: EOG - Ross Gulch 8-3 SWD



Project Id: 212C-MD-00681

Contact: Ike Tavaréz

Project Location: Eddy Co, NM

Date Received in Lab: Thu Dec-08-16 09:40 am

Report Date: 15-DEC-16

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	541643-007	541643-008	541643-009	541643-010	541643-011	541643-012
	Field Id:	Trench #2 4'	Trench #2 5'	Trench #3 0-1'	Trench #3 2'	Trench #3 2.5'	Trench #4 0-1' Background
	Depth:	4 ft	5 ft	0-1 ft	2 ft	2.5 ft	0-1 ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00	Dec-05-16 00:00
BTEX by EPA 8021B	Extracted:			Dec-08-16 15:00			
	Analyzed:			Dec-08-16 23:14			
	Units/RL:			mg/kg RL			
Benzene				<0.00150 0.00150			
Toluene				<0.00200 0.00200			
Ethylbenzene				0.00317 0.00200			
m,p-Xylenes				<0.00200 0.00200			
o-Xylene				<0.00301 0.00301			
Total Xylenes				<0.00200 0.00200			
Total BTEX				0.00317 0.00150			
Inorganic Anions by EPA 300/300.1	Extracted:	Dec-12-16 17:25	Dec-13-16 14:18	Dec-13-16 14:18	Dec-13-16 14:18	Dec-13-16 14:18	Dec-13-16 14:18
	Analyzed:	Dec-12-16 21:05	Dec-13-16 17:32	Dec-13-16 17:53	Dec-13-16 18:00	Dec-13-16 18:07	Dec-13-16 18:28
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		60.4 5.00	175 5.00	3110 50.0	212 5.00	2040 25.0	<50.0 50.0
TPH By SW8015 Mod	Extracted:			Dec-14-16 07:00			
	Analyzed:			Dec-14-16 16:23			
	Units/RL:			mg/kg RL			
C6-C10 Gasoline Range Hydrocarbons				<15.0 15.0			
C10-C28 Diesel Range Hydrocarbons				<15.0 15.0			
C28-C35 Oil Range Hydrocarbons				<15.0 15.0			
Total TPH				<15.0 15.0			

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 541643

Tetra Tech- Midland, Midland, TX

Project Name: EOG - Ross Gulch 8-3 SWD



Project Id: 212C-MD-00681

Contact: Ike Tavaréz

Project Location: Eddy Co, NM

Date Received in Lab: Thu Dec-08-16 09:40 am

Report Date: 15-DEC-16

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	541643-013	541643-014				
	Field Id:	Trench #4 2' Background	Trench #4 3' Background				
	Depth:	2 ft	3 ft				
	Matrix:	SOIL	SOIL				
	Sampled:	Dec-05-16 00:00	Dec-05-16 00:00				
Inorganic Anions by EPA 300/300.1	Extracted:	Dec-13-16 14:18	Dec-13-16 14:18				
	Analyzed:	Dec-13-16 18:35	Dec-13-16 18:42				
	Units/RL:	mg/kg RL	mg/kg RL				
Chloride		115 50.0	81.9 25.0				

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Kelsey Brooks
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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



Form 2 - Surrogate Recoveries

Project Name: EOG - Ross Gulch 8-3 SWD

Work Orders : 541643,

Lab Batch #: 3005304

Sample: 541643-001 / SMP

Project ID: 212C-MD-00681

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/16 22:42

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	0.0341	0.0300	114	80-120	

Lab Batch #: 3005304

Sample: 541643-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/16 22:59

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	0.0351	0.0300	117	80-120	

Lab Batch #: 3005304

Sample: 541643-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/16 23:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0312	0.0300	104	80-120	
4-Bromofluorobenzene	0.0317	0.0300	106	80-120	

Lab Batch #: 3005750

Sample: 541643-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/14/16 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	90.9	100	91	70-135	
o-Terphenyl	43.8	50.0	88	70-135	

Lab Batch #: 3005750

Sample: 541643-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/14/16 16:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.0	99.9	94	70-135	
o-Terphenyl	45.9	50.0	92	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: EOG - Ross Gulch 8-3 SWD

Work Orders : 541643,

Lab Batch #: 3005750

Sample: 541643-009 / SMP

Project ID: 212C-MD-00681

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/14/16 16:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	91.6	99.7	92	70-135	
o-Terphenyl	43.5	49.9	87	70-135	

Lab Batch #: 3005304

Sample: 717020-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/16 21:21

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	80-120	
4-Bromofluorobenzene	0.0319	0.0300	106	80-120	

Lab Batch #: 3005750

Sample: 717305-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/14/16 09:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.3	100	99	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

Lab Batch #: 3005304

Sample: 717020-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/16 19:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0327	0.0300	109	80-120	

Lab Batch #: 3005750

Sample: 717305-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/14/16 09:48

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	120	100	120	70-135	
o-Terphenyl	49.2	50.0	98	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



Form 2 - Surrogate Recoveries

Project Name: EOG - Ross Gulch 8-3 SWD

Work Orders : 541643,

Lab Batch #: 3005304

Sample: 717020-1-BSD / BSD

Project ID: 212C-MD-00681

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/08/16 19:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0314	0.0300	105	80-120	
4-Bromofluorobenzene	0.0321	0.0300	107	80-120	

Lab Batch #: 3005750

Sample: 717305-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/14/16 10:10

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	121	100	121	70-135	
o-Terphenyl	50.3	50.0	101	70-135	

Lab Batch #: 3005304

Sample: 541624-011 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/16 20:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0338	0.0300	113	80-120	
4-Bromofluorobenzene	0.0340	0.0300	113	80-120	

Lab Batch #: 3005750

Sample: 541854-065 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/14/16 18:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	122	99.8	122	70-135	
o-Terphenyl	50.7	49.9	102	70-135	

Lab Batch #: 3005304

Sample: 541624-011 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/08/16 20:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0329	0.0300	110	80-120	
4-Bromofluorobenzene	0.0338	0.0300	113	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: EOG - Ross Gulch 8-3 SWD

Work Orders : 541643,

Lab Batch #: 3005750

Sample: 541854-065 SD / MSD

Project ID: 212C-MD-00681

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/14/16 18:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	100	127	70-135	
o-Terphenyl	53.6	50.0	107	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

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

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



BS / BSD Recoveries



Project Name: EOG - Ross Gulch 8-3 SWD

Work Order #: 541643

Project ID: 212C-MD-00681

Analyst: ALJ

Date Prepared: 12/08/2016

Date Analyzed: 12/08/2016

Lab Batch ID: 3005304

Sample: 717020-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00149	0.0994	0.0774	78	0.0998	0.0767	77	1	70-130	35	
Toluene	<0.00199	0.0994	0.0737	74	0.0998	0.0723	72	2	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0787	79	0.0998	0.0771	77	2	71-129	35	
m,p-Xylenes	<0.00199	0.199	0.159	80	0.200	0.155	78	3	70-135	35	
o-Xylene	<0.00298	0.0994	0.0797	80	0.0998	0.0779	78	2	71-133	35	

Analyst: SLU

Date Prepared: 12/12/2016

Date Analyzed: 12/12/2016

Lab Batch ID: 3005469

Sample: 717126-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	258	103	250	262	105	2	90-110	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: EOG - Ross Gulch 8-3 SWD

Work Order #: 541643

Project ID: 212C-MD-00681

Analyst: SLU

Date Prepared: 12/13/2016

Date Analyzed: 12/13/2016

Lab Batch ID: 3005600

Sample: 717181-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	266	106	250	264	106	1	90-110	20	

Analyst: ARM

Date Prepared: 12/14/2016

Date Analyzed: 12/14/2016

Lab Batch ID: 3005750

Sample: 717305-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	864	86	1000	874	87	1	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	926	93	1000	958	96	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: EOG - Ross Gulch 8-3 SWD

Work Order # : 541643

Project ID: 212C-MD-00681

Lab Batch ID: 3005304

QC- Sample ID: 541624-011 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/08/2016

Date Prepared: 12/08/2016

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	<0.00151	0.100	0.0813	81	0.100	0.0752	75	8	70-130	35	
Toluene	<0.00201	0.100	0.0772	77	0.100	0.0709	71	9	70-130	35	
Ethylbenzene	0.00204	0.100	0.0821	80	0.100	0.0759	74	8	71-129	35	
m,p-Xylenes	<0.00201	0.201	0.163	81	0.200	0.150	75	8	70-135	35	
o-Xylene	<0.00301	0.100	0.0810	81	0.100	0.0756	76	7	71-133	35	

Lab Batch ID: 3005469

QC- Sample ID: 541513-034 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/12/2016

Date Prepared: 12/12/2016

Analyst: SLU

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	14.8	250	268	101	250	256	96	5	90-110	20	

Lab Batch ID: 3005469

QC- Sample ID: 541522-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/12/2016

Date Prepared: 12/12/2016

Analyst: SLU

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	735	765	1460	95	765	1530	104	5	90-110	20	

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

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

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

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



Form 3 - MS / MSD Recoveries



Project Name: EOG - Ross Gulch 8-3 SWD

Work Order # : 541643

Project ID: 212C-MD-00681

Lab Batch ID: 3005600

QC- Sample ID: 541643-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/13/2016

Date Prepared: 12/13/2016

Analyst: SLU

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	175	250	428	101	250	416	96	3	90-110	20	

Lab Batch ID: 3005600

QC- Sample ID: 541731-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/13/2016

Date Prepared: 12/13/2016

Analyst: SLU

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	20.5	250	265	98	250	270	100	2	90-110	20	

Lab Batch ID: 3005750

QC- Sample ID: 541854-065 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/14/2016

Date Prepared: 12/14/2016

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
C6-C10 Gasoline Range Hydrocarbons	<15.0	998	941	94	1000	1000	100	6	70-135	35	
C10-C28 Diesel Range Hydrocarbons	<15.0	998	1010	101	1000	1030	103	2	70-135	35	

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

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

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

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

Analysis Request of Chain of Custody Record

5411643

PAGE: 1 OF: 2



TETRA TECH
1910 N. Big Spring St.
Midland, Texas 79705
(432) 682-4559 • Fax (432) 682-3946

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: **EOG**

SITE MANAGER: **Ike Tovar**

PROJECT NO.: **212C-MD-00681**

PROJECT NAME: **Ross Gulch 8-3 SWD**

LAB I.D. NUMBER

DATE

MATRIX

COMP.

GRAB

SAMPLE IDENTIFICATION

NUMBER OF CONTAINERS

FILTERED (Y/N)

HCL

HNO3

ICE

NONE

PRESERVATIVE METHOD

BTEX 802 JB

TPH 8015 MOD. TX1005 (Ext. to C35)

PAH 8270

RCRA Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Metals Ag As Ba Cd Vr Pd Hg Se

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC.MS Vol. 8240/8260/624

GC.MS Semi. Vol. 8270/625

PCB's 8080/608

Pest. 808/608

Chloride

Gamma Spec.

Alpha Beta (Air)

PLM (Asbestos)

Major Anions/Cations, pH, TDS

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	PRESERVATIVE METHOD	ANALYSIS REQUEST
	12/1/16		S			Trench #1 0-1	1						X	BTEX 802 JB
						Trench #1 2'	1						X	TPH 8015 MOD. TX1005 (Ext. to C35)
						Trench 1 4'	1						X	PAH 8270
						Trench 1 5'	1						X	RCRA Metals Ag As Ba Cd Cr Pb Hg Se
						Trench #1 2 0-1	1						X	TCLP Metals Ag As Ba Cd Vr Pd Hg Se
						Trench #2 2'	1						X	TCLP Volatiles
						Trench #2 4'	1						X	TCLP Semi Volatiles
						Trench #2 5'	1						X	RCI
						Trench #3 0-1	1						X	GC.MS Vol. 8240/8260/624
						Trench #3 2'	1						X	GC.MS Semi. Vol. 8270/625
						Trench #3 4'	1						X	PCB's 8080/608
						Trench #3 5'	1						X	Pest. 808/608
						Trench #3 6'	1						X	Chloride
						Trench #3 7'	1						X	Gamma Spec.
						Trench #3 8'	1						X	Alpha Beta (Air)
						Trench #3 9'	1						X	PLM (Asbestos)
						Trench #3 10'	1						X	Major Anions/Cations, pH, TDS

RELINQUISHED BY: (Signature) *[Signature]* Date: **12-5-16** RECEIVED BY: (Signature) *[Signature]* Date: **12-5-16**

RELINQUISHED BY: (Signature) *[Signature]* Date: **12-5-16** RECEIVED BY: (Signature) *[Signature]* Date: **12-5-16**

RELINQUISHED BY: (Signature) *[Signature]* Date: **12-5-16** RECEIVED BY: (Signature) *[Signature]* Date: **12-5-16**

RECEIVING LABORATORY: **XEROX** RECEIVED BY: (Signature) *[Signature]* Date: **12-5-16**

ADDRESS: **Midland** STATE: **TX** ZIP: **79707** PHONE: **79707** DATE: **12-5-16** TIME: **9:45**

SAMPLE CONDITION WHEN RECEIVED: **REMARKS:** *but deeper depth if 70th record 5.00 miles*

SAMPLED BY: (Print & Initial) **Mc Ann** Date: **12-1-16**

SAMPLE SHIPPED BY: (Circle) **FEDX** Date: **12-1-16**

HAND DELIVERED: **UPS** Date: **12-1-16**

TETRA TECH CONTACT PERSON: **Ike Tovar** Results by: **Ike Tovar**

RUSH Charges Authorized: **Yes** No

Temp: **IR.D.R-8**
CF: + 0.1 **2.2**
Corrected Temp: **2.3**

but deeper depth if 70th record 5.00 miles
Run depth sample if sample occurs to 19119 or 19128134



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 12/08/2016 09:40:00 AM

Work Order #: 541643

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)?	2.3
#2 *Shipping container in good condition?	N/A
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	N/A
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Jessica Kramer

Jessica Kramer

Date: 12/08/2016

Checklist reviewed by:

Kelsey Brooks

Kelsey Brooks

Date: 12/08/2016

Analytical Report 543108

**for
Tetra Tech- Midland**

Project Manager: Ike Tavaréz

EOG - Ross Gulch 8-3 SWD

212C-MD-00681

09-JAN-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

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

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



09-JAN-17

Project Manager: **Ike Tavaréz**

Tetra Tech- Midland

4000 N. Big Spring Suite 401

Midland, TX 79705

Reference: XENCO Report No(s): **543108**

EOG - Ross Gulch 8-3 SWD

Project Address: Lea Co NM

Ike Tavaréz:

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) 543108. 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. 543108 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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Sample Cross Reference 543108



Tetra Tech- Midland, Midland, TX

EOG - Ross Gulch 8-3 SWD

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
2-3 AH1	S	12-28-16 00:00	2 - 3 ft	543108-003
0-1 AH1	S	12-28-16 00:00	0 - 1 ft	Not Analyzed
1-2 AH1	S	12-28-16 00:00	1 - 2 ft	Not Analyzed



CASE NARRATIVE



Client Name: Tetra Tech- Midland

Project Name: EOG - Ross Gulch 8-3 SWD

Project ID: 212C-MD-00681
Work Order Number(s): 543108

Report Date: 09-JAN-17
Date Received: 12/30/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 543108

Tetra Tech- Midland, Midland, TX

Project Name: EOG - Ross Gulch 8-3 SWD



Project Id: 212C-MD-00681

Contact: Ike Tavaréz

Project Location: Lea Co NM

Date Received in Lab: Fri Dec-30-16 12:00 pm

Report Date: 09-JAN-17

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	543108-003					
	Field Id:	2-3 AH1					
	Depth:	2-3 ft					
	Matrix:	SOIL					
	Sampled:	Dec-28-16 00:00					
Inorganic Anions by EPA 300/300.1	Extracted:	Jan-05-17 17:00					
	Analyzed:	Jan-05-17 23:56					
	Units/RL:	mg/kg RL					
Chloride		1060 25.0					

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

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

Kelsey Brooks
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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 9701 Harry Hines Blvd , Dallas, TX 75220
 5332 Blackberry Drive, San Antonio TX 78238
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Phone	Fax
(281) 240-4200	(281) 240-4280
(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



BS / BSD Recoveries



Project Name: EOG - Ross Gulch 8-3 SWD

Work Order #: 543108

Project ID: 212C-MD-00681

Analyst: MNR

Date Prepared: 01/05/2017

Date Analyzed: 01/05/2017

Lab Batch ID: 3007054

Sample: 718136-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	245	98	250	241	96	2	90-110	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: EOG - Ross Gulch 8-3 SWD

Work Order #: 543108

Project ID: 212C-MD-00681

Lab Batch ID: 3007054

QC- Sample ID: 542888-013 S

Batch #: 1 Matrix: Soil

Date Analyzed: 01/05/2017

Date Prepared: 01/05/2017

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 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	<5.00	250	251	100	250	263	105	5	90-110	20	

Lab Batch ID: 3007054

QC- Sample ID: 543111-005 S

Batch #: 1 Matrix: Soil

Date Analyzed: 01/06/2017

Date Prepared: 01/05/2017

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1300	250	1560	104	250	1560	104	0	90-110	20	

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

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

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

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

Analysis Request of Chain of Custody Record



TETRA TECH

1910 N. Big Spring St.
Midland, Texas 79705

(432) 682-4559 • Fax (432) 682-3946

PAGE: 1

OF: 1

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME:

EOG

SITE MANAGER:

The Turner

PROJECT NO.:

18-05-16-00681

PROJECT NAME:

Mass Gulch 8-3 SWD

LAB I.D. NUMBER

DATE

TIME

MATRIX

COMP.

GRAB

SAMPLE IDENTIFICATION

NUMBER OF CONTAINERS

FILTERED (Y/N)

HCL

HNO3

ICE

NONE

PRESERVATIVE METHOD

BTEX 8021B

TPH 8015 MOD. TX1005 (Ext. to C35)

PAH 8270

RCRA Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Metals Ag As Ba Cd Vr Pd Hg Se

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC.MS Vol. 8240/8260/624

GC.MS Semi. Vol. 8270/625

PCB's 8080/608

Pest. 808/608

Chloride

Gamma Spec.

Alpha Beta (Air)

PLM (Asbestos)

Major Anions/Cations, pH, TDS

RELINQUISHED BY: (Signature)

RELINQUISHED BY: (Signature)

RELINQUISHED BY: (Signature)

RECEIVING LABORATORY:

ADDRESS:

CITY:

STATE:

TEMP:

IR ID: R-8

CF: + 0.1

0.30c

0.40c

Corrected Temp:

0.40c

REMARKS:

Hold other 2 samples

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)

DATE:

TIME:

RECEIVED BY: (Signature)



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 12/30/2016 12:00:00 PM

Work Order #: 543108

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

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

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Jessica Kramer

Jessica Kramer

Date: 12/30/2016

Checklist reviewed by:

Kelsey Brooks

Kelsey Brooks

Date: 12/30/2016