PJ KK 153 5249289

<u>District I</u> 1625 N. French Dr., Hobbs, NM 88240 <u>District II</u> 1301 W. Grand Avenue, Artesia, NM 88210

District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources

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

Form C-141 Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Attached

#### **Release Notification and Corrective Action OPERATOR** Initial Report Final Report Name of Company COG Operating LLC Contact Pat Ellis Address 550 W. Texas, Suite 1300 Midland, Texas 79701 Telephone No. (432) 230-0077 Facility Name GC Federal 16 Facility Type Flowline Mineral Owner Lease No. API 30-025-39112 Surface Owner Federal NMLC 029405B LOCATION OF RELEASE Feet from the Feet from the North/South Line East/West Line County Unit Letter Section Township Range 19 17-S 32-E Lea O Latitude N 32 49.140° Longitude W 103 48.300° NATURE OF RELEASE Volume of Release 10 bbls Volume Recovered 9 bbls Type of Release: Produced Water Date and Hour of Occurrence Source of Release Date and Hour of Discovery 3/25/2011 3/25/11 12:00 p.m. Flowline If YES, To Whom? Was Immediate Notice Given? By Whom? Date and Hour If YES, Volume Impacting the Watercourse. Was a Watercourse Reached? ☐ Yes ☒ No N/A If a Watercourse was Impacted, Describe Fully.\* N/A Describe Cause of Problem and Remedial Action Taken.\* Increasing pressure inside of the flowline caused it to rupture. The flowline has been repaired and returned into service. Describe Area Affected and Cleanup Action Taken.\* Tetra Tech inspected and collected samples to define the spills extent. Soil with elevated chloride concentrations was removed and hauled to Controlled Recovery, Inc., Hobbs, NM. Once excavated to the appropriate depths, the site was backfilled with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review. 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. OIL CONSERVATION DIVISION Signature: (06 Approved by District Supervisor: Printed Name: Ike Tavarez Approval Date: Expiration Date: Title: Project Manager E-mail Address: ike.tavarez@tetratech.com Conditions of Approval:

26,12

Phone: (432) 682-4559

<sup>\*</sup> Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

# State of New Mexico Energy Minerals and Natural Resources

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate
District Office in accordance
with Rule 116 on back
side of form

#### Release Notification and Corrective Action **OPERATOR** Initial Report Final Report COG OPERATING LLC Name of Company Contact Pat Ellis 550 W. Texas, Suite 100, Midland, TX 79701 Address Telephone No. 432-230-0077 Facility Name GC Federal 16 Flowline Facility Type Lease No. (API#) 30-025-39112 Surface Owner Federal Mineral Owner NMLC-029405B LOCATION OF RELEASE Unit Letter Feet from the North/South Line | Feet from the Section Township Range East/West Line County 0 19 178 32E Lea Latitude 32 49.140 Longitude 103 48,300 NATURE OF RELEASE Type of Release Produced Water Volume of Release 10bbls Volume Recovered 9bbls Source of Release Flowline Date and Hour of Occurrence Date and Hour of Discovery 03/25/2011 03/25/2011 12:00 p.m. Was Immediate Notice Given? If YES, To Whom? ☐ Yes ☒ No ☒ Not Required By Whom? Date and Hour Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. ☐ Yes ⊠ No If a Watercourse was Impacted, Describe Fully.\* Describe Cause of Problem and Remedial Action Taken.\* Increasing pressure inside of the flowline caused it to rupture. The flowline has been repaired and returned into service. Describe Area Affected and Cleanup Action Taken.\* Initially 10bbls of produced water was released from the flowline and we were able to recover 9bbls with a vacuum truck. The release caused a spill area in the pasture measuring 20' x 30'. (The closest well to the spill site area is the GC Federal #14, API# 30-025-39110). Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD/BLM for approval prior to any significant remediation work. 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. OIL CONSERVATION DIVISION Signature: Approved by District Supervisor: Printed Name: Josh Russo Title: **HSE Coordinator** Approval Date: Expiration Date: E-mail Address: jrusso@conchoresources.com Conditions of Approval: Attached

\* Attach Additional Sheets If Necessary

Phone:

432-212-2399

04/01/2011

Date:

HOBBS OCD

		S	ITE INFORM	ATION	007.0
	<del>,</del>	Re	ort Type: W	/ork Plai	1 UCT 2 6 2011
General Site Inf	ormation:			भारत.	BEOM
Site:		<del></del>	l 16 Well Site		WE CELVED.
Company:		COG Opera			
Section, Towns	hip and Range		ction 19 - Townsl	nip 17 <b>S - R</b> a	nge 32E
Lease Number:		30-025-391			
County:		Lea County			100.00 (2.11)
GPS:		<del>- _ , - : -</del>	32.81488° N		103.80471° W
Surface Owner:		Federal	<del></del>		<u> </u>
Mineral Owner:		From the lints	mosting of User 500	CD 406	travel north on 126 1.8 miles, turn left 2.3 miles
Directions:		to location or			TRACTION OF 120 1.6 miles, turn len 2.5 miles
Release Data:			3.		
Date Released:		3/25/2011	· =		-
Type Release:	1	Produced W			
Source of Contai	mination:	Flowline fail	ure	<u> </u>	
Fluid Released:	<u>/</u> /_	10 bbls			
Fluids Recovered		9 bbls			
Official Commu			<del></del>	234	· · ·
Name:	Pat Ellis				lke Tavarez
Company:	COG Operating,	rrc			Tetra Tech
Address:	550 W. Texas Av	ve. Ste. 1300			1910 N. Big Spring
P.O. Box					
City:	Midland Texas, 7	9701		, , , , , , , , , , , , , , , , , , , ,	Midland, Texas
Phone number:	(432) 686-3023				432-682-4559
Fax:	(432) 684-7137		1		
Email:	pellis@conchore	sources.com			lke.Tavarez@tetratech.com
	1,000				
Ranking Criteria	1 \				
Depth to Groundy	vater:	<del></del>	Ranking Score	<del></del>	Sito Data
<50 ft	rator.		20	<del>                                     </del>	Site Data
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>100 ft.			0		
144-111 (a 4 ft				T	
WellHead Protecti Water Source <1,0		3.6	Ranking Score	Site Date	
Water Source >1,0			20		0
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<200 ft.	10.61.		Ranking Score 20		Site Data
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>1,000 ft.			0		0
7-4	al Danking Co				
. 101	al Ranking Scor	θ.	0	ļ	
		Accept	able Soil RRAL (n	ng/kg)	
		Benzene	Total BTEX	TPH	66.61225.
		10	50	5,000	UMOLFF3.

MALCONE MI CHURAL DEC \$ \$ 50,000 AD EXCENDE DEC \$ \$ 5012



October 20, 2011

Mr. Geoffrey Leking
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

Re: Work Plan for the COG Operating LLC., GC Federal #16 Well Site, Unit O, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico.

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the GC Federal #16 Well Site, Unit O, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.81488°, W 103.80471°. 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 March 25, 2011, and released approximately ten (10) barrels of produced water, due to a flow line rupturing in the pasture. Nine (9) barrels of standing fluids were recovered from the site. The spill was contained within a low lying area in the adjacent pasture measuring approximately 20' x 50'. The initial C-141 form is enclosed in Appendix C.

#### Groundwater

The United States Geological Survey (USGS) Well Reports did not list any wells in Section 19. To establish depth to groundwater, Tetra Tech previously installed a temporary monitor well (TMW) in Section 30 to a depth of 180' bgs and did not encounter groundwater. According to the



NMOCD groundwater map, the average depth to groundwater in this area is greater than 200' below surface. The average depth to groundwater and well log are shown in Appendix A.

### 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 April 6, 2011, Tetra Tech personnel inspected and sampled the spill area. One auger hole (AH-1) was installed using a stainless steel hand auger to assess the impacted soils. Select 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 B. The sampling results are summarized in Table 1. The auger hole location is shown on Figure 3.

Referring to Table 1, all of the submitted samples were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the auger hole, with a bottom hole sample of 13,800 mg/kg at 4-4.5'. Deeper samples were not collected due to the dense caliche formation. Based on the results, the impacted area needed to be vertically defined.

On May 17, 2011, Tetra Tech personnel supervised the installation of two (2) soil bores (SB-1 and SB-2) to a depth of 40.0' below surface. The soil boring results are summarized on Table 1. Referring to Table 1, SB-1 and SB-2 chloride concentrations significantly declined with depth at 20.0', with concentrations of 416 mg/kg and 366 mg/kg, respectively.



#### Work Plan

COG proposes to remove impacted material as highlighted (green) in Table 1. Based on the groundwater depth, the impacted area will be excavated to a depth of approximately 10.0' below surface. The remaining chloride concentrations significantly decline with depth and the chloride residual does not appear to an environmental concern. Once the excavation depths are reached, the site will be backfilled with clean material back to surface grade.

Based on the site formation, the proposed excavation depth 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. As such, Tetra Tech will excavate the soils to the maximum extent practicable. If the proposed excavation depths are not achieved, the area will be capped with a 40 mil liner at 4.0' below surface and backfilled with clean soil.

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

Respectfully submitted,

TETRA TECH

lke Tavarez

**Project Manager** 

cc: Pat Ellis - COG cc: Jim Amos - BLM

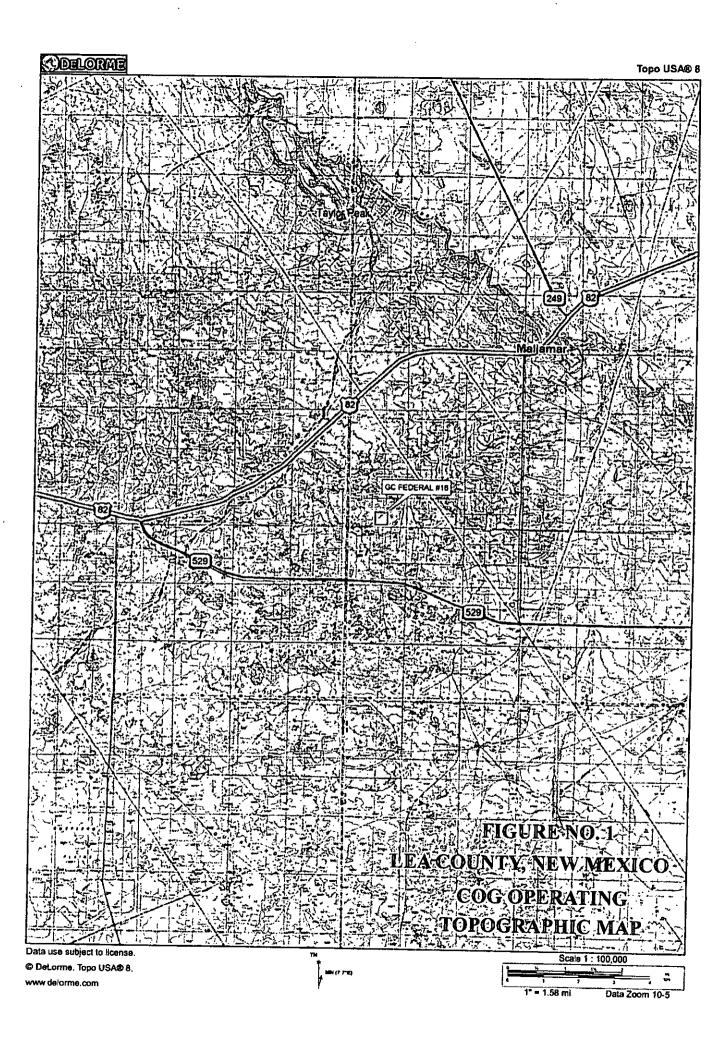
COG Operating LLC. GC Federal # 16 Well LEA COUNTY, NEW MEXICO Table 1

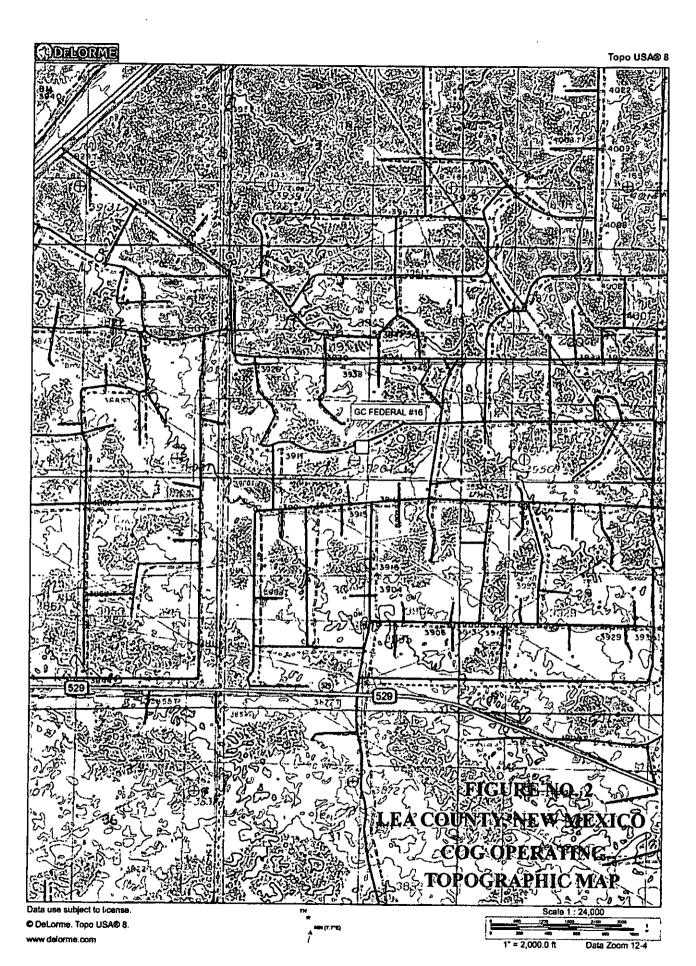
Sample	Sample	_	Depth	Soil	Soil Status	F	TPH (mg/kg)		Benzene	Toluene	Ethlybenzene	Xylene	Chloride
٥	Date	Depth (ft)	_	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	4/6/2011	0-1,		×		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	7.740
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SB-1	5/17/2011	0-1,		×					,			6 1	4,190
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		. 5.		×						1 1 2 2 1 1		Service Service	21,100
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		40,	•	×		•			•	٠,			200

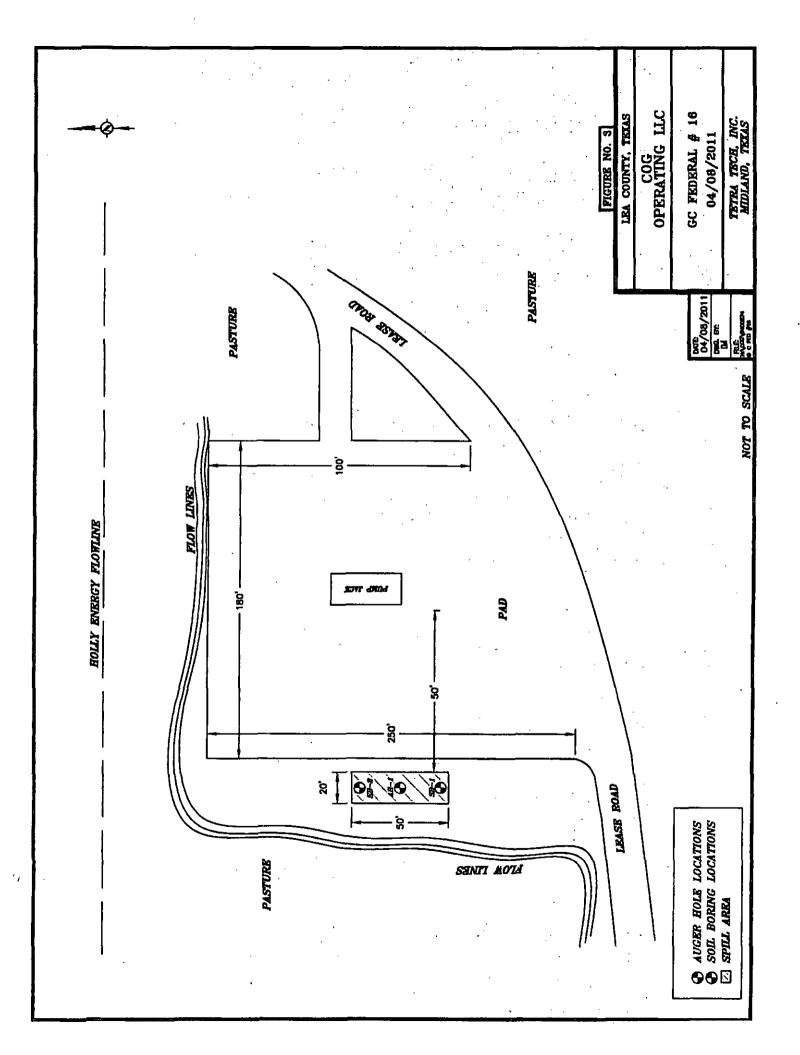
Below Excavation Bottom 858

Not Analyzed Î 🗌

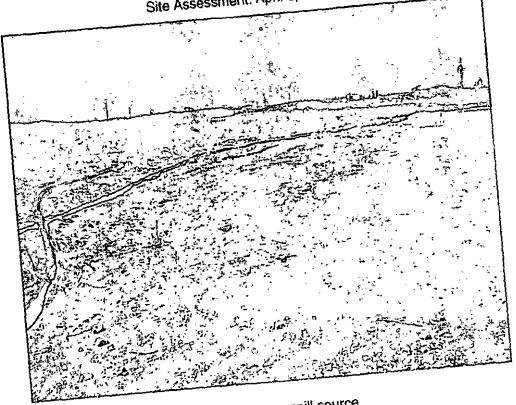
Proposed Excavated Depths



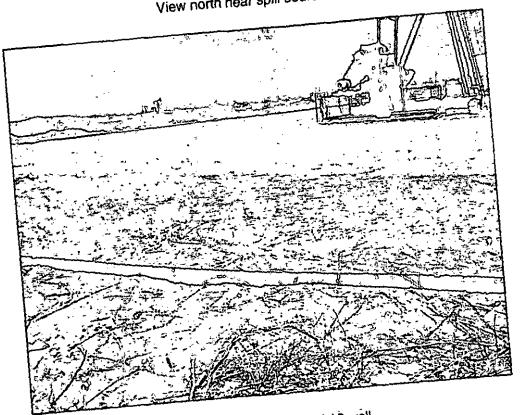




# COG Operating LLC GC Federal 16 Lea County, New Mexico Site Assessment: April 6, 2011



View north near spill source



View east - GC Federal 16 well

# Water Well Data Average Depth to Groundwater (ft) COG - GC Federal #16 Lea County, New Mexico

	16	South	;	31 Eest	<u> </u>		16 5	South	3	2 East			16 Sc	uth		East	
8	5	4	3	2	1	8	5	7	3 65	2 285	265	6	5 180	4 150	3 130	148	11142
7	ð	8	10	11	12 288	7 .	ā	9	10	11	12 215	7	8 200	9	10 182	11	12
18	17	16	15	14	13 113	18	17	16 221	15	14	13	18	17	16	15 176	14	13
9	20	21	22	23	24	19 220	20	21 210	22	23	24	19		21	22	23 120	24
10	29	28	27	26	25	30	20	28	27	26 243	25	30	29	28	27 130	26 143	25 120
1 190	32	33	34	35	38	31	32	33	34	35	38	31	32 168	33	34 160	35	36
	47	South	- <del></del>	li East	<del></del>		47.5	iouth		2 East	1280	110	17 Sc			East	
	14	30trui	13	2	1	<u>.                                    </u>	17.6	4		2 EBST	1 225	6	17 50	74		2 164	14 650
			<u> </u>	<b></b> _	<u> </u>	<u> </u>		82	3 176	60	1 225	90	3		3 185	2 184	1 104
7	В	8	10	11	12	7	6	0	10	11 70 88	12 120	7 187	173	9 16f	10	11	12
ß	17	15	15	14	13	18	17	16	15	14	13	18	17 180	18	15	14	13
19	20	21	22	23	24	19 SITE	20	21	22	23	24	19		21	22	23 116	24
30	29	28	27	26	25		29	28	27	28	25	30	29	26	27	26	25
31	32	33	34 271	35	38	31	32	33	34	35 ⊗	36	31	32	33	34	35 156	36
	18:	Bouth		31 East			18 5	iouth	3	2 East			18 Sc	uith	33	East	
5	5	14	3	2	1	8	5	4 65		2	1	8	5	4	3	2	1
<del>,                                    </del>	В	9	10	11	12	7 480 82	8	8	10	11 🐼	12	7	B 100	-	10 82	11	12 143 140
18	17	18	15	14 317	13	18 ,	17	16	15	14	13	18	17 28	16	15	14	13
10	20	21	22	23	24	19 .	20 164	21	22 429	23	24	10 >140		21	22	23	24
Ю	29	28	27	26	25	30	29	28	Z7	26	25	30 38	29	28	27	26	25
17	32	33	34	35 281	38	31	32	33	34	35	36	31	32	33	34	35	36

	New Mexico State Engineers Well Reports
	USGS Well Reports
	Geology and Groundwater Conditions in Southern Eddy, County, NM
	NMOCD - Groundwater Data
4 F	Field water level
	New Mexico Water and Infrastructure Data System
	Site - GC Federal #16
8	Tetra Tech Temporary well

# SAMPLE LOG

Boring/Well: Project Number: TMW-1 114-6400224

Client:

COG

Site Location:

**Pronghorn Section 30** Lea County, New Mexico

Location: Legals:

Township 17S Range 32E Section 30

Total Depth

180

Date Installed:

07/14/09

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
5-6		Brown fine grain sand
10-11		Buff limestone
15-16		Tan to buff calcareous sand with chert intermixed.
20-21		Tan calcareous sand
25-26		Tan fine grain sand
30-31	_	Tan to yellow sandy clay
35-36		Reddish clayey sand with gravel
40-41		Red gravelly fine grain sand
45-46	~	Red to buff gravelly calcarcous sand
50-51		Red fine grain sand
55-56		Red sandy silt
60-61		Red silty clay (dry)
65-66		Red coarse grain sandy clay
70-71	,	Red fine grain sand
75-76	,-	Red fine grain sand
80-81		Red gravelly sand
85-86	*	Red fine grain silty clay with some sand intermixed
90-91		Red fine grain silty clay with some sand intermixed
95-96		Red fine grain silty clay with some sand intermixed
100-101		Red fine grain silty clay with some sand intermixed
105-106		Tan red fine grain sand
110-111		Tan fine grain sand
115-116		Tan fine grain sand
120-121		Tan to red fine grain sand
130-131		Red clay of high plasticity (Red bed)
140-141	-	Red clay of high plasticity (Red bed)
150-151		Red clay of high plasticity (Red bed) intermixed with gravel
160-161		Red clay of high plasticity (Red bed) intermixed with gravel
170-171		Red clay of high plasticity (Red bed) intermixed with gravel
180-181		Red clay of high plasticity (Red bed)

Total Depth 181' Groundwater was not encountered Report Date: April 13, 2011

Work Order: 11040723

Page Number: 1 of 2

# **Summary Report**

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Report Date: April 13, 2011

Work Order: 11040723

Project Location: Lea Co., NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
262812	AH-1 0-1	soil	2011-04-06	00:00	2011-04-07
262813	AH-1 1-1.5	soil	2011-04-06	00:00	2011-04-07
262814	AH-1 2-2.5	aoil	2011-04-06	00:00	2011-04-07
262815	AH-1 3-3.5	soil	2011-04-06	00:00	2011-04-07
262816	AH-1 4-4.5	soil	2011-04-06	00:00	2011-04-07

			BTEX	<del></del>	TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
262812 - AH-1 0-1	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<2.00

Sample: 262812 - AH-1 0-1

Param	Flag	Result	Units	RL
Chloride		7740	mg/Kg	4.00

Sample: 262813 - AH-1 1-1.5

Param	Flag	Result	Units	RL
Chloride		4760	mg/Kg	4.00

Sample: 262814 - AH-1 2-2.5

continued ...

Report Date: April 13, 2011		Work Order: 11040723	Page	Number: 2 of 2
sample 262814 cor	ntinued	·	·	
Param	Flag	Result	Units	RL
Param	Flag	Result	Units	RL
Chloride		7100	mg/Kg	4.00
Sample: 262815	- AH-1 3-3.5			
Sample: 262815	- AH-1 3-3.5			
Sample: 262815 Param Chloride	- AH-1 3-3.5 Flag	Result 9790	Units mg/Kg	RL 4.00
Param				
Param	Flag			
Param Chloride	Flag			

# **Summary Report**

Ike Tavarez Tetra Tech

1910 N. Big Spring Street Midland, TX 79705 Report Date: June 1, 2011

Work Order: 11052328

Project Location: Lea Co., NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
267057	SB-1 0-1'	soil	2011-05-17	00:00	2011-05-23
267058	SB-1 3'	soil	2011-05-17	00:00	2011-05-23
267059	SB-1 5'	soil	2011-05-17	00:00	2011-05-23
267060	SB-1 7'	soil	2011-05-17	00:00	2011-05-23
267061	SB-1 10'	soil	2011-05-17	00:00	2011-05-23
267062	SB-1 15'	soil	2011-05-17	00:00	2011-05-23
267063	SB-1 20'	soil	2011-05-17	00:00	2011-05-23
267064	SB-1 25'	soil	2011-05-17	00:00	2011-05-23
267065	SB-1 30'	soil	2011-05-17	00:00	2011-05-23
267066	SB-1 40'	soil	2011-05-17	00:00	2011-05-23
267067	SB-2 0-1'	soil	2011-05-17	00:00	2011-05-23
267068	SB-2 3'	soil	2011-05-17	00:00	2011-05-23
267069	SB-2 5'	soil	2011-05-17	00:00	2011-05-23
267070	SB-2 7'	soil	2011-05-17	00:00	2011-05-23
267071	SB-2 10'	soil	2011-05-17	00:00	2011-05-23
267072	SB-2 15'	soil	2011-05-17	00:00	2011-05-23
267073	SB-2 20'	soil	2011-05-17	00:00	2011-05-23
267074	SB-2 25'	soil	2011-05-17	00:00	2011-05-23
267075	SB-2 30'	soil	2011-05-17	00:00	2011-05-23
267076	SB-2 40'	soil	2011-05-17	00:00	2011-05-23

Sample: 267057 - SB-1 0-1'

Param	Flag	Result	Units	RL
Chloride		4190	mg/Kg	4

Report Date: June 1, 2011	l ——————	Work Order: 11052328	Page	Number: 2 of 4
Sample: 267058 - SB-1	3,			
Param	Flag	Result	Units	RL
Chloride		11600	mg/Kg	4
Sample: 267059 - SB-1	5'			
Param	Flag	Result	Units	RL
Chloride		25600	mg/Kg	4
Sample: 267060 - SB-1	7'			
Param	Flag	Result	Units	RL
Chloride		8000	mg/Kg	4
Sample: 267061 - SB-1				
Param Chloride	Flag	Result 13000	Units mg/Kg	RL 4
Sample: 267062 - SB-1	15'			
Param	Flag	Result	Units	RL
Chloride		4110	mg/Kg	4
Sample: 267063 - SB-1	20'			
Param	Flag	Result	Units	RL
Chloride		416	mg/Kg	4
Sample: 267064 - SB-1	25'			
Param	Flag	Result	Units	RL
Chloride		1590	mg/Kg	4
Sample: 267065 - SB-1	30'			
Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Report Date: June 1, 2011		Work Order: 11052328	Page	Page Number: 3 of 4		
Sample: 267066 - SB-1	40'	;				
Param	Flag	Result	Units	RL		
Chloride	· · · · · · · · · · · · · · · · · · ·	262	mg/Kg	4		
Sample: 267067 - \$B-2 (	<b>}-1</b> ′					
Param	Flag	Result	Units	RL		
Chloride		10100	mg/Kg	4		
Sample: 267068 - SB-2 3	3'					
Param	Flag	Result	Units	RL		
Chloride		4760	mg/Kg	4		
Sample: 267069 - SB-2 8	5'					
Param	Flag	Result	Units	RL		
Chloride		21100	mg/Kg	4		
Sample: 267070 - SB-2 7	"					
Param	Flag	Result	Units	RL		
Chloride		5570	mg/Kg	4		
Sample: 267071 - SB-2 1	10'		·			
Param	Flag	Result	Units	RL		
Chloride		4010	mg/Kg	4		
Sample: 267072 - SB-2 1	15'					
Param	Flag	Result	Units	RL		
Chloride		1210	mg/Kg	4		
Sample: 267073 - SB-2 2	20'					
Param	Flag	Result	Units	RL		
Chloride	<del></del> -	386	mg/Kg	4		

Report Date: June	1, 2011	Work Order: 11052328	Page 1	Page Number: 4 of 4	
Sample: 267074	- SB-2 25'				
Param	Flag	Result	Units	RL	
Chloride		273	mg/Kg	4	
Sample: 267075			,		
Param	Flag	Result	Units	RL_	
Chloride		<200	mg/Kg	4	
Sample: 267076	- SB-2 40'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4	

			TE INFORM	ATION
		Repor	t Type: Clos	sure Report
General Site Info	ormation:			
Site:		GC Federal	16 Well Site	
Company:		COG Opera	ting LLC	
Section, Towns	hip and Range			ip 17S - Range 32E
Lease Number:		30-025-3911		
County:		Lea County		
GPS:	2020		32.81488° N	103.80471° W
Surface Owner:	· .	Federal		
Mineral Owner:				
Directions:		From the inte to location on		and CR-126, travel north on 126 1.8 miles, turn left 2.3 miles
Release Data:	Part of the Art of the		a salah s	Marie Town and the second of t
Date Released:		3/25/2011		
Type Release:		Produced W		
Source of Contar	nination:	Flowline failu	ıre	
Fluid Released:		10 bbls		
Fluids Recovered		9 bbls		
Official Commu	nication: 👵 🖟 🎉		A Land Control of the	The state of the s
Name:	Pat Ellis			lke Tavarez
Company:	COG Operating, LL	C		Tetra Tech
Address:	550 W. Texas Ave.	_		1910 N. Big Spring
P.O. Box	1000 177 1071107 1107			To the transporting
City:	Midland Texas, 797	z01	f	Midland, Texas
· · · · · · · · · · · · · · · · · · ·		01		
Phone number: -	(432) 686-3023	_	<del> </del>	432-682-4559
Fax:	(432) 684-7137			
Email:	pellis@conchoreso			Ike.Tavarez@tetratech.com
Ranking Criteria				
Depth to Groundy	vater:		Ranking Score	Site Data
<50 ft			20	
50-99 ft			10	
>100 ft.			0 .	
WellHead Protecti	on:		Ranking Score	Site Data
	000 ft., Private <200 f		20	
Water Source >1,0	000 ft., Private >200 f	<u>.</u>	0	0
Surface Body of V	Vater:		Ranking Score	Site Data
<200 ft.			20	
200 ft - 1,000 ft.			10	
>1,000 ft.			0	0
Tol	al Ranking Score:		0.	HOBBS 86D
		Accepta	ible Soil RRAL (m	ng/kg) FEB 0 6 2012
		Benzene	Total BTEX	TPH
		10	50	5,000
			·	RECEIVED

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January 26, 2012

Mr. Geoffrey Leking **Environmental Engineer Specialist** Oil Conservation Division, District 1 1625 North French Drive Hobbs, New Mexico 88240

Re: Closure Report for the COG Operating LLC., GC Federal #16 Well Site, Unit O, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico.

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the GC Federal #16 Well Site, Unit O, Section 19, Township 17 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.81488°, W 103.80471°. 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 March 25, 2011, and released approximately ten (10) barrels of produced water, due to a flow line rupturing in the pasture. Nine (9) barrels of standing fluids were recovered from the site. The spill was contained within a low lying area in the adjacent pasture measuring approximately 20' x 50'. The initial C-141 form is enclosed in Appendix C.

#### Groundwater

The United States Geological Survey (USGS) Well Reports did not list any wells in Section 19. To establish depth to groundwater, Tetra Tech previously installed a temporary monitor well (TMW) in Section 30 to a depth of 180' bgs and did not encounter groundwater. According to the



NMOCD groundwater map, the average depth to groundwater in this area is greater than 200' below surface. The average depth to groundwater and well log are shown in Appendix A.

# Regulatory

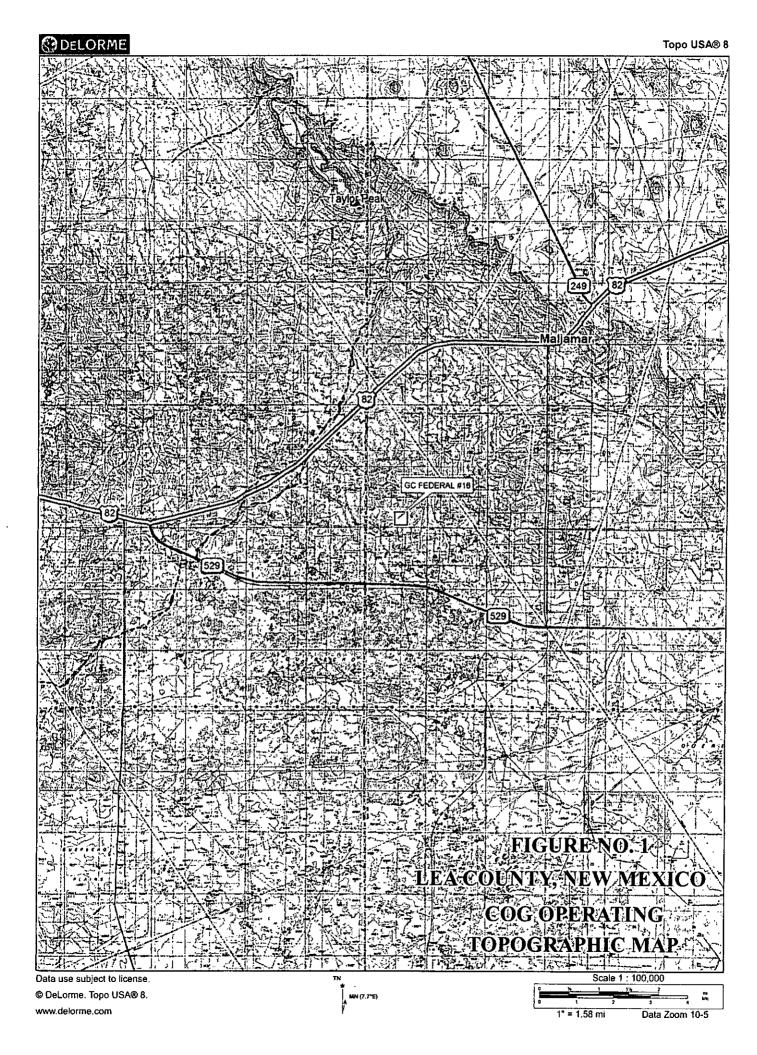
A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (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.

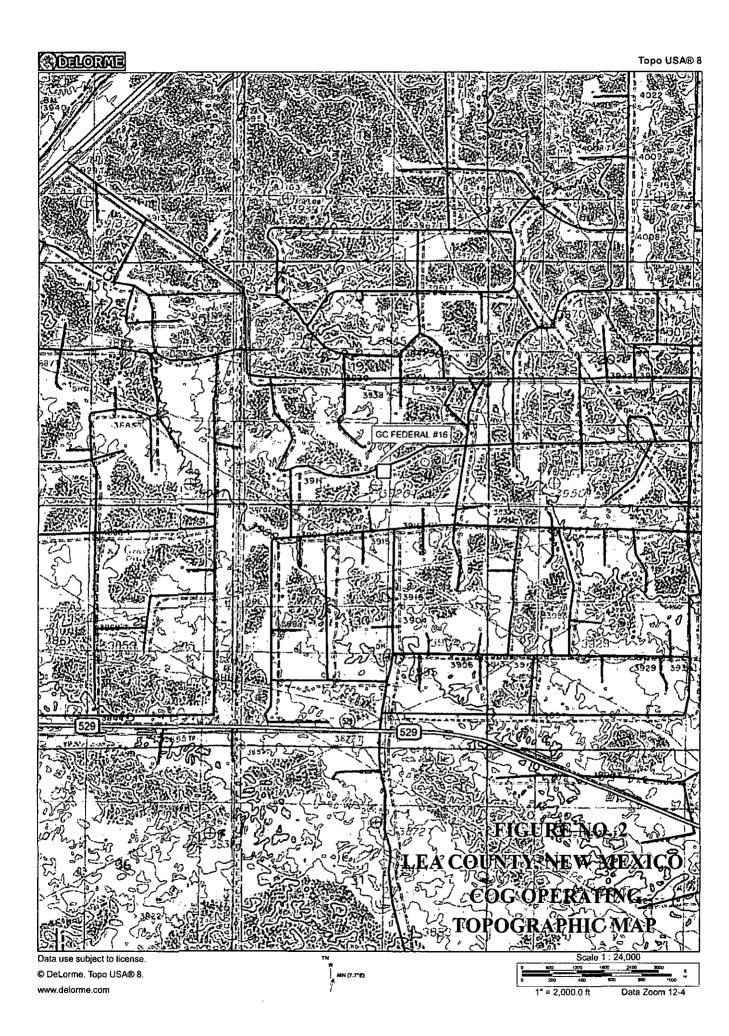
# Soil Assessment and Analytical Results

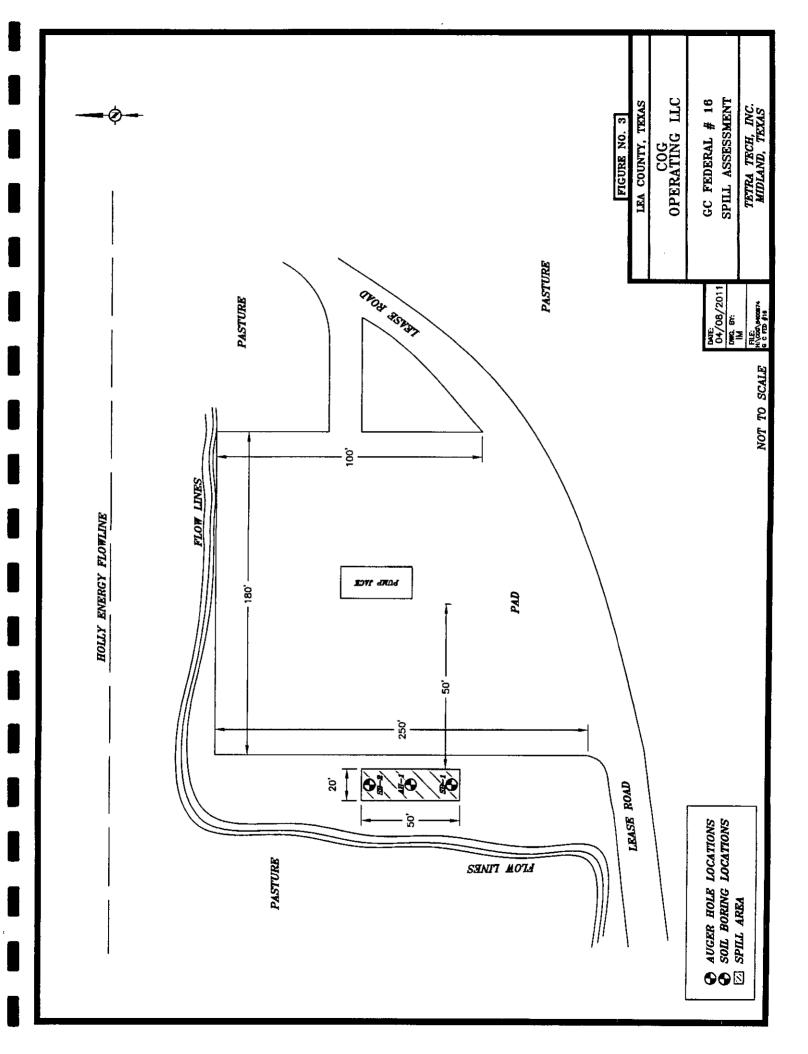
On April 6, 2011, Tetra Tech personnel inspected and sampled the spill area. One auger hole (AH-1) was installed using a stainless steel hand auger to assess the impacted soils. Select samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix B. The sampling results are summarized in Table 1. The auger hole location is shown on Figure 3.

Referring to Table 1, all of the submitted samples were below the RRAL for TPH and BTEX. Elevated chloride concentrations were detected in the auger hole, with a bottom hole sample of 13,800 mg/kg at 4-4.5'. Deeper samples were not collected due to the dense caliche formation. Based on the results, the impacted area needed to be vertically defined.

On May 17, 2011, Tetra Tech personnel supervised the installation of two (2) soil bores (SB-1 and SB-2) to a depth of 40.0' below surface. The soil boring results are summarized on Table 1. Referring to Table 1, SB-1 and SB-2 chloride concentrations significantly declined with depth at 20.0', with concentrations of 416 mg/kg and 366 mg/kg, respectively.







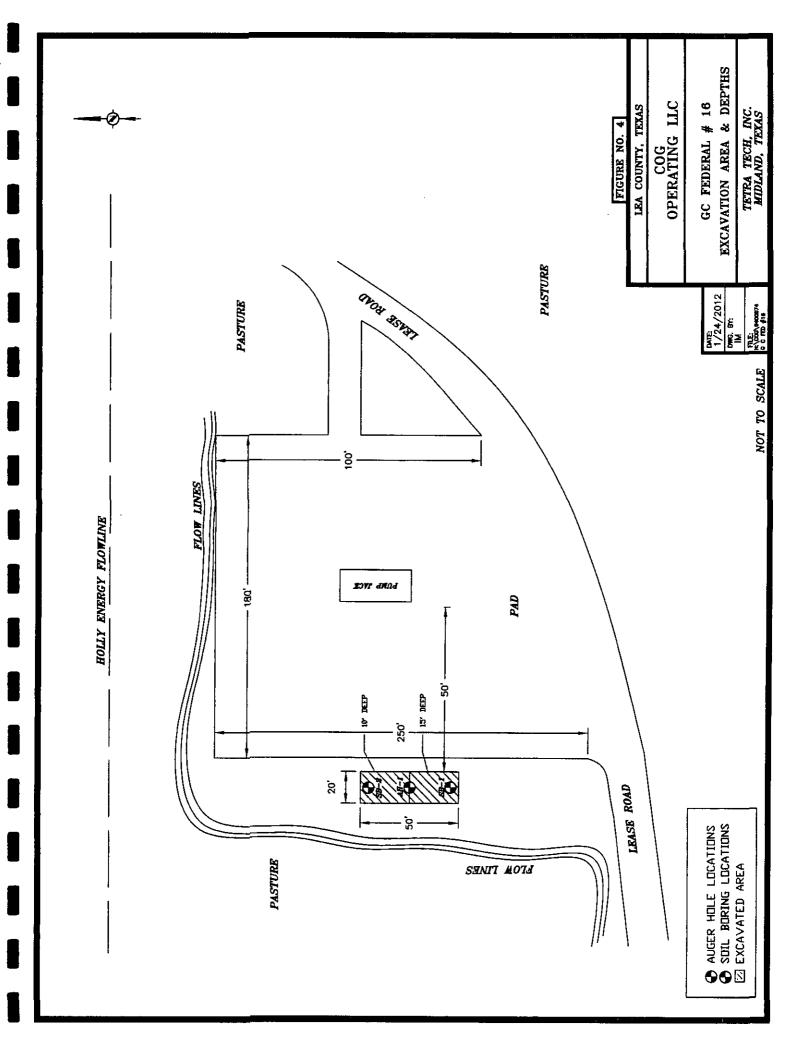


Table 1
COG Operating LLC.
GC Federal # 16 Well
LEA COUNTY, NEW MEXICO

Sample	Sample	Sample	Depth	Soil	Soil Status	ΔL	TPH (mg/kg)	(6	Benzene	Toluene	Ethlybenzene	Xylene	Chloride
_	Date	Depth (ft)	(BEB)	In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
AH-1	4/6/2011	0-1,			X	<2.00	\$50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	7,740
		1-1.5		٠ -	×	-	, - 6		•	11	1 .	84 *	4,760
		. 2-2.5			X	-	-;	-	, ,		-		7,100
		3-3.5'			X	1	-		•	, , ,		,	9,790
		4-4.5		Ì	×	•	•	-		- 47	1	-	13,800
		ı											
SB-1	5/17/2011	. 0-1			×	1		-	•	, , '	•		4,190
		. 3			X	•	•		-			6.5	11,600
		5.		,	X	-			•			* * * *	25,600
		7,			X	,	•	•		, i	1	ار ا ا	000'8
		10,			×	ŀ	·	•	•	71 71	1		13,000
		15'			×		. 1			í		, , , ,	4,110
		20,		×		-	,			1	1	-	416
		25'		×		-	-	1	1	1	•	-	1,590
		30,		×		-	•	,			r	ì	<200
		40'		×		1	-	•	•	-	1	,	262
SB-2	5/17/2011	0-1-		:	×		· ·	· .	•		t.		10,100
					×	-		1		3	-		4,760
		2.			×	•	•		•	-	t	化 14	21,100
		7			×	,	£	-		24	1	<b>.</b>	5,570
		10.			×	,	,	•	•	1	•	# * *	4,010
		15'		×		•		-			,	1	1,210
		20.		×		-	-	-	1	,	1	-	386
		25'		×		•	-	-	•	,	£	٠	273
		30,		×		-		-	,	'	-	-	<200
		40,		×		•	-	-	,	,	•	ŧ	<200

BEB Below Excavation Bottom

(--) Not Analyzed

Final Excavated Depths

# Water Well Data Average Depth to Groundwater (ft) COG - GC Federal #16 Lea County, New Mexico

	16	South	3	11 East			16 S	outh	3	2 East			16 Sc			East	
3	5	4	3	2	1	6	5	4	3	2	1	6	5 180		3 130		1
		9	10		1	<del></del>	ļ	9	<b>65</b>	266	265	ļ <del></del>	8	160	10	148	142
	8	la.	טו	11	12 288	l'	8	la	ŧŪ	ויין	12 216	l'	200	la .	182	[''	142
8	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
	"	1"	'	'-	113	ľ	1	221	1'5	'-	215	i*	182	180		143	110
19	20	21	22	23	24	19	20	21	22	23	24	19	20	21		23	24
-	-	I .		[		220		210	_	210	[ ·			[		120	
30	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
	1			1		Ĺ.		1		243	i 1	191		190		143	120
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36
190				1	<u> </u>			<u> </u>			260	190	168		160		<u> </u>
	17	South	3	1 East			17 S	outh	3	2 East			17 Sc	outh	33	East	
3	5	4	3	2	1	6	5	4	3	2	1 225	6	5	4	3 165	2 158	1 16
								82	176	60		90		<u> </u>			L
,	8	9	10	11	12	7	8	9	10	11	12	7 167	1 '	9	10	11	12
	٠	٠		- <del> </del>	4		ļ	ļ.,	1	70 88	120	<u> </u>	173	161	1.5		<del> </del>
18	17	18	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
9	20	21	22	23	24	19	20	21	22	23	24	188	180	21	22	23	165 24
3	20	12'	22	123	24	SITE	20	21	22	23	24	l'°	190	<b> </b>	22	115	24
30	29	28	27	26	25	30 ⊗	29	28	27	26	25	30	29	28	27	26	25
			-	1		Just Do	1.	-	I	"		[	i	-	-	[ ·	
31	32	33	34	35	36	31	132	33	34	35 🐼	36	31	32	33	34	35	38
	1	]	271		1 1				1	130 00	<u> </u>	1		Į.		186	
	19	South	,	1 East			18.5	outh	2	2 East		•	18 Sc	outh.	27	East	
3	5	4	13	2	11	6	5	4 85		2	11	6	5	4		2	1
	۲	Γ	ľ		l' l	ľ	ľ	"	٦	<b> </b>	l' l	ľ	ا ا	ľ	ľ	<b>[</b>	'
,	8	9	10	11	12	7 460	8	9	10	11 🛇	12	7	8 100	9	10	11	12 143
	ľ	1	1	1	400	82		1	1	130° Ory		i i		ľ	62		140
8	17	16	15	14	13	18	17	16	15		13	18	17	16	15	14	13
		1		317				84	<u> </u>	1			85				60
9	20	21	22	23	24	19	20	21	22	23	24		20	21	22	23	24
						<u> </u>	164		428			>140					195
10	29	28	27	26	25	30	29	28	27	26	25	30 36	29	28	27	26	25
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36
	1	1	1	261	1 1			1	117	1	1 I			I	177	L	L

New Mexico State Engineers Well Reports
USGS Well Reports
Geology and Groundwater Conditions In Southern Eddy, County, NM
NMOCD - Groundwater Data
Field water level
New Mexico Water and Infrastructure Data System
Site - GC Federal #16

★ Tetra Tech Temporary well

## SAMPLE LOG

Boring/Well:

TMW-1 114-6400224

Project Number: Client:

COG

Site Location:

Pronghorn Section 30

Location:

Lea County, New Mexico Township 17S Range 32E Section 30

Legals: Total Depth

180

Date Installed:

07/14/09

DEPTH (Ft)	OVM	SAMPLE DESCRIPTION
5-6		Brown fine grain sand
10-11		Buff limestone
15-16		Tan to buff calcareous sand with chert intermixed.
20-21		Tan calcareous sand
25-26		Tan fine grain sand
30-31		Tan to yellow sandy clay
35-36		Reddish clayey sand with gravel
40-41		Red gravelly fine grain sand
45-46		Red to buff gravelly calcareous sand
50-51	-	Red fine grain sand
55-56		Red sandy silt
60-61	••	Red silty clay (dry)
65-66		Red coarse grain sandy clay
70-71	-	Red fine grain sand
75-76		Red fine grain sand
80-81		Red gravelly sand
85-86		Red fine grain silty clay with some sand intermixed
90-91		Red fine grain silty clay with some sand intermixed
95-96		Red fine grain silty clay with some sand intermixed
100-101	:	Red fine grain silty clay with some sand intermixed
105-106		Tan red fine grain sand
110-111		Tan fine grain sand
115-116		Tan fine grain sand
120-121		Tan to red fine grain sand
130-131		Red clay of high plasticity (Red bed)
140-141		Red clay of high plasticity (Red bed)
150-151		Red clay of high plasticity (Red bed) intermixed with gravel
160-161		Red clay of high plasticity (Red bed) intermixed with gravel
170-171		Red clay of high plasticity (Red bed) intermixed with gravel
180-181		Red clay of high plasticity (Red bed)

Total Depth 181'

Groundwater was not encountered

Report Date: June 1, 2011 Work Order: 11052328 Page Number: 1 of 4

# **Summary Report**

Ike Tavarez Tetra Tech 1910 N. Big Spring Stree

1910 N. Big Spring Street Midland, TX 79705 Report Date: June 1, 2011

Work Order: 11052328

Project Location: Lea Co., NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

0 1	Don't de la	Marketin	Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
267057	SB-1 0-1'	soil	2011-05-17	00:00	2011-05-23
267058	SB-1 3'	soil	2011-05-17	00:00	2011-05-23
267059	SB-1 5'	soil	2011-05-17	00:00	2011-05-23
267060	SB-1 7'	soil	2011-05-17	00:00	2011-05-23
267061	SB-1 10'	soil	2011-05-17	00:00	2011-05-23
267062	SB-1 15'	soil	2011-05-17	00:00	2011-05-23
267063	SB-1 20'	soil	2011-05-17	00:00	2011-05-23
267064	SB-1 25'	soil	2011-05-17	00:00	2011-05-23
267065	SB-1 30'	soil	2011-05-17	00:00	2011-05-23
267066	SB-1 40'	soil	2011-05-17	00:00	2011-05-23
267067	SB-2 0-1'	soil	2011-05-17	00:00	2011-05-23
267068	SB-2 3'	soil	2011-05-17	00:00	2011-05-23
267069	SB-2 5'	soil	2011-05-17	00:00	2011-05-23
267070	SB-2 7'	soil	2011-05-17	00:00	2011-05-23
267071	SB-2 10'	soil	2011-05-17	00:00	2011-05-23
267072	SB-2 15'	soil	2011-05-17	00:00	2011-05-23
267073	SB-2 20'	soil	2011-05-17	00:00	2011-05-23
267074	SB-2 25'	soil	2011-05-17	00:00	2011-05-23
267075	SB-2 30'	soil	2011-05-17	00:00	2011-05-23
267076	SB-2 40'	soil	2011-05-17	00:00	2011-05-23

Sample: 267057 - SB-1 0-1'

Param	Flag	Result	Units	RL
Chloride		4190	mg/Kg	4

Report Date: June 1, 201	1	Work Order: 11052328	Page	Page Number: 2 of 4	
Sample: 267058 - SB-1	. 3'				
Param	Flag	Result	Units	RL	
Chloride		11600	mg/Kg	4	
			-		
Sample: 267059 - SB-1	. 5'				
Param	Flag	Result	Units	RL	
Chloride		25600	mg/Kg	4	
Sample: 267060 - SB-1	. 7'				
Param	Flag	· Result	Units	RL	
Chloride		8000	mg/Kg	4	
Sample: 267061 - SB-1 Param Chloride	10'	Result 13000	Units mg/Kg	RL 4	
Sample: 267062 - SB-1	15'				
Param	Flag	Result	Units	RL	
Chloride	8	4110	mg/Kg	4	
Sample: 267063 - SB-1	20'				
_		n 1.	**	77.	
Param Chloride	Flag	Result 416	Units mg/Kg	RL 4	
Onoride		410	mg/Kg	4	
Sample: 267064 - SB-1	25'				
Param	Flag	Result	Units	RL	
Chloride		1590	mg/Kg	4	
Sample: 267065 - SB-1	. 30'				
Param	Flag	Result	Units	RL	
Chloride		<200	mg/Kg	4	

Report Date: June	1, 2011	Work Order: 11052328	Page I	Number: 3 of 4
Sample: 267066 -	SB-1 40'			
Param	Flag	$\mathbf{Result}$	Units	RL
Chloride		262	mg/Kg	4
Sample: 267067 -	SB-2 0-1'			
Param	Flag	Result	Units	RL
Chloride		10100	mg/Kg	4
Sample: 267068 -	SB-2 3'			
Param	$\operatorname{Flag}$	Result	Units	RL
Chloride		4760	mg/Kg	4
Sample: 267069 -	SB-2 5'			
Param	Flag	Result	Units	RL
Chloride		21100	mg/Kg	4
Sample: 267070 -	SB-2 7'			
Param	Flag	Result	Units	RL
Chloride		5570	mg/Kg	4
Sample: 267071 -	SB-2 10'			
Param	Flag	Result	Units	RL
Chloride		4010	mg/Kg	4
Sample: 267072 -	SB-2 15'			
Param	Flag	Result	Units	RL
Chloride		1210	mg/Kg	4
Sample: 267073 -	SB-2 20'			
Param	Flag	Result	Units	RL

Report Date: June 1, 2011 Work Order: 11052328 Page Number: 4 of 4 Sample: 267074 - SB-2 25' Param Flag Result Units RLmg/Kg 273 Chloride Sample: 267075 - SB-2 30' Units Param Flag Result RLmg/Kg Chloride <200 4 Sample: 267076 - SB-2 40' Param Result Units RLFlag mg/Kg Chloride <200



6701 Amendeen Avenue, Suite 9 200 East Sunset Road, Soite E 5002 Basin Street, Suite A1

El Paso, Texas 79922 Midland, Texas 79703 Et Mouth, Taxas 76132 800 • 378 • 1296 806 • 794 • 1296 886 • 588 • 3443 915 • 585 • 3443

915+585+3443 FAX 915+585+4944 432+689+6301 FAX 432+689+6313 817+201+5260

6015 Harris Parkway, Suite 110 - Er Worth, Texas 76132 E-Mail; lab@traceadalysis.com

# Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

# Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: June 1, 2011

Work Order: 11052328

Project Location: Lea Co., NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
267057	SB-1 0-1'	soil	2011-05-17	00:00	2011-05-23
267058	SB-1 3'	soil	2011-05-17	00:00	2011-05-23
267059	SB-1 5'	soil	2011-05-17	00:00	2011-05-23
267060	SB-1 7'	soil	2011-05-17	00:00	2011-05-23
267061	SB-1 10'	soil	2011-05-17	00:00	2011-05-23
267062	SB-1 15'	soil	2011-05-17	00:00	2011-05-23
267063	SB-1 20'	soil	2011-05-17	00:00	2011-05-23
267064	SB-1 25'	soil	2011-05-17	00:00	2011-05-23
267065	SB-1 30'	soil	2011-05-17	00:00	2011-05-23
267066	SB-1 40'	soil	2011-05-17	00:00	2011-05-23
267067	SB-2 0-1'	soil	2011-05-17	00:00	2011-05-23
267068	SB-2 3'	soil	2011-05-17	00:00	2011-05-23
267069	SB-2 5'	soil	2011-05-17	00:00	2011-05-23
267070	SB-2 7'	soil	2011-05-17	00:00	2011-05-23
267071	SB-2 10'	soil	2011-05-17	00:00	2011-05-23
267072	SB-2 15'	soil	2011-05-17	00:00	2011-05-23
267073	SB-2 20'	soil	2011-05-17	00:00	2011-05-23
267074	SB-2 25'	soil	2011-05-17	00:00	2011-05-23

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
267075	SB-2 30'	soil	2011-05-17	00:00	2011-05-23
267076	SB-2 40'	soil	2011-05-17	00:00	2011-05-23

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 18 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

Michael alex

# **Report Contents**

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Sample 267060 (SB-1 7)	')			 		 			 		 	 		 	
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## Case Narrative

Samples for project COG/GC Fed. #16 Well were received by TraceAnalysis, Inc. on 2011-05-23 and assigned to work order 11052328. Samples for work order 11052328 were received intact at a temperature of 4.0 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (Titration)	SM 4500-Cl B	69419	2011-05-31 at 09:25	81787	2011-06-01 at 12:19
Chloride (Titration)	SM 4500-Cl B	69419	2011-05-31 at 09:25	81789	2011-06-01 at 12:20
Chloride (Titration)	SM 4500-Cl B	69419	2011-05-31 at 09:25	81790	2011-06-01 at 12:21

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 11052328 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 6 of 18 Lea Co., NM

# **Analytical Report**

Sample: 267057 - SB-1 0-1'

Laboratory:

Midland

Analysis:

Chloride (Titration)

QC Batch: 81787 Prep Batch:

Analytical Method:

SM 4500-Cl B 2011-06-01

Prep Method: N/A Analyzed By: AR.

69419

Date Analyzed: Sample Preparation:

2011-05-31

Prepared By: AR

RL

Parameter Flag Cert Result Units Dilution RLChloride 4190 100 4.00 mg/Kg

Sample: 267058 - SB-1 3'

Laboratory:

Midland

Analysis: QC Batch: Chloride (Titration)

81787

Prep Batch: 69419 Analytical Method: Date Analyzed:

Result

11600

SM 4500-Cl B 2011-06-01

Units

mg/Kg

Prep Method: N/A AR

Analyzed By: AR

Cert

Flag Parameter Chloride

Sample Preparation: RL 2011-05-31

Prepared By:

Dilution

100

RL4.00

Sample: 267059 - SB-1 5'

Laboratory:

Midland

69419

Analysis: QC Batch: 81787 Prep Batch:

Parameter

Chloride

Chloride (Titration)

Flag

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-06-01

2011-05-31

Prep Method: Analyzed By:

Prepared By:

N/A AR AR

RL

Cert

RLResult Units Dilution 4.00 25600 100 mg/Kg

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 7 of 18

Lea Co., NM

Sample: 267060 - SB-1 7'

Laboratory: Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

81787 69419 Date Analyzed: Sample Preparation: 2011-06-01

Analyzed By: AR

Flag

Flag

2011-05-31

Prepared By: AR

RL

Parameter Chloride

Flag Cert Result 8000

Units mg/Kg Dilution 100

RL4.00

Sample: 267061 - SB-1 10'

Laboratory: Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

Parameter

Chloride

81787 69419 Date Analyzed: Sample Preparation:

Cert

2011-06-01 2011-05-31 Analyzed By: AR Prepared By:

RL

Result

13000

Units

mg/Kg

Dilution

100

AR

RL

4.00

Sample: 267062 - SB-1 15'

Laboratory:

Analysis:

Midland

Chloride (Titration) 81787

Analytical Method: Date Analyzed:

SM 4500-Cl B

Prep Method: N/A Analyzed By:

QC Batch:

2011-06-01

AR

Prep Batch:

69419

Sample Preparation:

2011-05-31

Prepared By: AR

RL

Parameter Chloride

Cert

Result 4110

Units mg/Kg

100

Dilution

RL

4.00

Sample: 267063 - SB-1 20'

Laboratory: Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR

QC Batch: Prep Batch:

81787 69419

Date Analyzed: Sample Preparation:

2011-06-01 2011-05-31

Prepared By:

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well

Page Number: 8 of 18 Lea Co., NM

RLFlag Cert Parameter Result Units Dilution RLChloride 416 mg/Kg 50 4.00

Sample: 267064 - SB-1 25'

Laboratory:

Analysis:

Midland

Chloride (Titration)

QC Batch: 81787 Analytical Method:

SM 4500-Cl B 2011-06-01

Prep Method: N/A

69419 Prep Batch:

Date Analyzed: Sample Preparation:

2011-05-31

Analyzed By: AR Prepared By: AR.

RL

Result Parameter Flag Cert Units Dilution RLChloride 1590 mg/Kg 100 4.00

Sample: 267065 - SB-1 30'

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 81787 Prep Batch: 69419 Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-06-01

Prep Method: N/A Analyzed By: AR

Prepared By:

Sample Preparation: 2011-05-31 AR

RLParameter Flag Cert Result Units Dilution RLChloride <200 mg/Kg 50 4.00

Sample: 267066 - SB-1 40'

Laboratory: Midland

Prep Batch:

Chloride

Analysis: Chloride (Titration) QC Batch: 81789

69419

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-06-01 2011-05-31

Prep Method: N/A Analyzed By: ARPrepared By: AR

Flag Cert Parameter

RLUnits Result Dilution RL262 mg/Kg 50 4.00

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 9 of 18

Lea Co., NM

Sample: 267067 - SB-2 0-1'

Laboratory: Analysis:

Midland

Chloride (Titration)

Analytical Method:

Cert

Cert

SM 4500-Cl B

Prep Method: N/A

QC Batch: 81789 Prep Batch: 69419 Date Analyzed: Sample Preparation:

2011-06-01 2011-05-31

Analyzed By: ARPrepared By: AR

RL

Parameter Chloride

Flag

Result 10100

Units mg/Kg Dilution 100

RL4.00

Sample: 267068 - SB-2 3'

Laboratory: Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: Prep Batch:

81789 69419 Date Analyzed: 2011-06-01 Sample Preparation: 2011-05-31 Analyzed By: AR Prepared By: AR

RL

Parameter Chloride

Flag

Result 4760

Units mg/Kg Dilution

100

RL

4.00

Sample: 267069 - SB-2 5'

Laboratory:

Prep Batch:

Midland

Analysis: QC Batch:

Chloride (Titration)

81789 69419 Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-06-01

Prep Method: N/A Analyzed By: AR

Sample Preparation:

2011-05-31

Prepared By: AR

RL

Parameter Cert Flag Result Units Dilution RLChloride 21100 mg/Kg 100 4.00

Sample: 267070 - SB-2 7'

Laboratory:

QC Batch:

Prep Batch:

Midland

Analysis: Chloride (Titration)

81789 69419

Analytical Method: Date Analyzed: Sample Preparation: SM 4500-Cl B 2011-06-01 2011-05-31

Prep Method: N/A Analyzed By: AR Prepared By: AR

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 10 of 18

Lea Co., NM

			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			5570	mg/Kg	100	4.00

Sample: 267071 - SB-2 10'

Laboratory:

Midland

Analysis:

Chloride (Titration)

Analytical Method:

SM 4500-Cl B 2011-06-01

Prep Method: N/A

QC Batch: Prep Batch:

81789 69419

Date Analyzed: Sample Preparation:

2011-05-31

Analyzed By: ARPrepared By: AR

100

Flag Cert

Parameter Chloride

RLResult 4010

Units mg/Kg Dilution RL

4.00

Sample: 267072 - SB-2 15'

Laboratory:

Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A

QC Batch: 81789 Prep Batch: 69419 Date Analyzed: Sample Preparation:

2011-06-01 2011-05-31 Analyzed By: AR AR

RL

Prepared By:

Parameter Flag Cert Result Units Dilution RLChloride 1210 mg/Kg 100 4.00

Sample: 267073 - SB-2 20'

Laboratory:

Analysis:

Midland

Chloride (Titration)

Analytical Method:

SM 4500-Cl B

Prep Method: N/A Analyzed By: AR

QC Batch: 81789 Prep Batch: 69419 Date Analyzed: Sample Preparation:

2011-06-01 2011-05-31

Prepared By: AR

RL

Parameter Flag Cert Result Units Dilution RLChloride 386 mg/Kg 50 4.00

Report Date: June 1, 2011 Work Order: 11052328 Page Number: 11 of 18 114-6400874 COG/GC Fed. #16 Well Lea Co., NM Sample: 267074 - SB-2 25' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 81789 Date Analyzed: 2011-06-01 Analyzed By: AR Prep Batch: 69419 Sample Preparation: 2011-05-31 Prepared By: AR, RLParameter Flag Cert Result Dilution RLUnits Chloride 273 mg/Kg 50 4.00

Sample: 267075 - SB-2 30' Laboratory: Midland Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 81789 Date Analyzed: 2011-06-01 Analyzed By: AR Prep Batch: 69419 Sample Preparation: 2011-05-31 Prepared By: ARRLParameter Cert Result Dilution Flag Units RLChloride <200 mg/Kg 50 4.00

Sample: 267076 - SB-2 40' Laboratory: Midland Chloride (Titration) Analysis: Analytical Method: SM 4500-Cl B Prep Method: N/A QC Batch: 81790 Date Analyzed: 2011-06-01 Analyzed By: AR Prep Batch: 69419 Sample Preparation: 2011-05-31 Prepared By: AR RLParameter Cert Result Flag Units Dilution RL

<200

mg/Kg

50

4.00

Chloride

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 12 of 18

Lea Co., NM

## Method Blanks

Method Blank (1)

QC Batch: 81787

QC Batch: 81787 Date Analyzed: 2011-06-01 Analyzed By: AR

Prep Batch: 69419

QC Preparation: 2011-05-31 Prepared By: AR

MDL

Parameter Flag Cert Result Units RL<3.85 Chloride mg/Kg

Method Blank (1)

QC Batch: 81789

QC Batch: 81789 Prep Batch: 69419

2011-06-01 Date Analyzed: QC Preparation: 2011-05-31

Analyzed By: AR Prepared By: AR

MDL

Parameter Flag Cert Result Units RLChloride <3.85 mg/Kg 4

Method Blank (1)

QC Batch: 81790

QC Batch: 81790 Prep Batch: 69419

Date Analyzed: 2011-06-01 QC Preparation: 2011-05-31 Analyzed By: AR Prepared By: AR

MDL

Flag Cert RLParameter Result Units Chloride <3.85 mg/Kg

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 13 of 18

Lea Co., NM

# **Laboratory Control Spikes**

Laboratory Control Spike (LCS-1)

QC Batch:

81787 Prep Batch: 69419 Date Analyzed:

2011-06-01

Analyzed By: AR

QC Preparation:

2011-05-31

Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			96.3	mg/Kg	1	100	<3.85	96	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			104	mg/Kg	1	100	<3.85	104	85 - 115	8	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 69419

81789

Date Analyzed:

2011-06-01 QC Preparation: 2011-05-31 Analyzed By: AR Prepared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			97.5	mg/Kg	1	100	<3.85	98	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			103	mg/Kg	1	100	<3.85	103	85 - 115	6	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 69419

81790

Date Analyzed: QC Preparation:

2011-06-01 2011-05-31 Analyzed By: AR Prepared By: AR.

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 14 of 18

Lea Co., NM

			LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			97.2	mg/Kg	1	100	<3.85	97	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	$\mathbf{F}$	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			102	mg/Kg	1	100	< 3.85	102	85 - 115	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1)

Spiked Sample: 267065

QC Batch: 81787 Prep Batch: 69419 Spiked Sample. 207003

Date Analyzed: 2011-06-01 QC Preparation: 2011-05-31

6-01 Analyzed By: AR 5-31 Prepared By: AR

MS Spike Matrix Rec. Param F C Result Units Dil. Amount Result Rec. Limit Chloride 10300 mg/Kg 100 10000 <385 103 80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10600	mg/Kg	100	10000	<385	106	80 - 120	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1)

Spiked Sample: 267075

QC Batch: 81789 Prep Batch: 69419 Date Analyzed: 2011-06-01 QC Preparation: 2011-05-31

Analyzed By: AR Prepared By: AR

MS Spike Matrix Rec. Param F  $\mathbf{C}$ Result Units Dil. Result Limit Amount Rec. Chloride 9920 100 10000 <385 80 - 120 mg/Kg 99

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		Rec.		RPD
Param	F	$\mathbf{C}$	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			10100	mg/Kg	100	10000	<385	101	80 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 15 of 18

Lea Co., NM

Matrix Spike (MS-1)

Spiked Sample: 267093

QC Batch: 81790 Prep Batch: 69419 Date Analyzed: QC Preparation:

2011-06-01 2011-05-31

Analyzed By: AR

Prepared By: AR

			MS			Spike	Matrix		Rec.
Param	${f F}$	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			12400	mg/Kg	100	10000	2030	104	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			MSD			Spike	Matrix		Rec.		RPD
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			12800	mg/Kg	100	10000	2030 .	108	80 - 120	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 16 of 18 Lea Co., NM

# Calibration Standards

Standard (ICV-1)

QC Batch: 81787

Date Analyzed: 2011-06-01

Analyzed By: AR

				ICVs True	ICVs Found	ICVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	97.2	97	85 - 115	2011-06-01

Standard (CCV-1)

QC Batch: 81787

Date Analyzed: 2011-06-01

Analyzed By: AR

					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param	-	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	100	103	103	85 - 115	2011-06-01

Standard (ICV-1)

QC Batch: 81789

Date Analyzed: 2011-06-01

Analyzed By: AR

				ICVs	ICVs	<b>ICVs</b>	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2011-06-01

Standard (CCV-1)

QC Batch: 81789

Date Analyzed: 2011-06-01

Analyzed By: AR

Chloride			mg/Kg	100	99.6	100	85 - 115	2011-06-01
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 17 of 18

Lea Co., NM

Standard (ICV-1)

QC Batch: 81790

Date Analyzed: 2011-06-01

Analyzed By: AR

				<b>ICVs</b>	ICVs	ICVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	99.2	99	85 - 115	2011-06-01

Standard (CCV-1)

QC Batch: 81790

Date Analyzed: 2011-06-01

Analyzed By: AR

				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-06-01

114-6400874

Work Order: 11052328 COG/GC Fed. #16 Well Page Number: 18 of 18 Lea Co., NM

# **Appendix**

## **Laboratory Certifications**

	Certifying	Certification	Laboratory
C	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

## Standard Flags

- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
  - U The analyte is not detected above the SDL

#### **Attachments**

The scanned attachments will follow this page.

Please note, each attachment may consist of more than one page.

PAGE: 0F: 2-	ANALYSIS REQUEST	(Circle or Specify Method No.)		4 Pd 4A F	8 Ba Cd 8 Ba Cd 860/626	MOD.  6 Ag	BTEX 8028 BTEX 8028 BTEX 8016  RCRA Metal TCLP Metal TCLP Volatil TCLP Som I RCB GC.MS Vol. Pest, 8080	<b>X</b>	>>	×	***	×	***	M.	X	×	X	SAMPLED BY: (Print & Initial K: A Date: 5/18/11	SAMPLE SHIPPED BY (Circle) AIRBILL #:	МТО	**	The Towns Authorized	
	Custody Record				PRESERVATIVE	(N//	NONE ICE NOO3 LITTERED (A NOWHELL OE	)   	×	× =	><	>× -	×	X	X	× =	× =	1.57.C: :000	Date:	Time: Date:	True:	AME	
7 - 1	Request of Chain of Custo	•	TETRATECH 1910 N. Big Spring St.	Midiand, lexas /9/U5 (432) 682-4559 • Fax (432) 682-3946	SITE MANAGER:  TKC TAMES	GC Federal #16	1	58-1 0-1	3,	۶,		(0,	15,	20'	,57	30'	, Q,	Time: 7/23/11 Re 20/10 87: (Spansons)	Deta: RECEIVED BY: (Signature)	Date: RECEIVED BY: (Signature)	Time: RECEIVED BY: (Scinerium)	ZPP: OMTE:	REMARKS:
	is Redne		4			74 PROJECT NAME:	Ш	<b>≯</b>													47	STATE: TX	1
	Analysis				CLIENT NAME:	PROJECT NO: 1 [4-6400874	LAB I.D. DATE	ris tsotale	958	959	Oleo Oleo	)%	ඌ	୧୩୦	hao	Obs	) જાણ	REJINGUISHED BY: (Signature	RELINDIDSHED BY: (Standyle)	RELINGUISHED BY: (Signature)	RECEIVING LABORATORY	CITY MIDCAND STATE	SAMPLE CONDITION WHEN F

11815 mg 7 RUSH Charge. Authorizad: Results by: Major Antona/Cations, pH, TDS Ö AIRBILL F. . Accounting receives Gold copy. Circle or Specify Method No. ANALYSIS REQUEST 809/809 . Jaoq M PAGE Tauce PCB.# 8080\208 **CC'W2 29W! APP 8510/852** SAMPLE SHIPPED BY (CITCA)
FEDEX
GIÁND DELIVERED
UPS SAMPLED BY: (Print & Innital) CC'W2 API' 8540/8580/854 ЮĦ TC:P Somi Volatiles TOLP Volatiles IRE - Return Orginal copy to Tetra Tech - Project Manager retains Plnk copy TCLP Metals Ag &a Ba Cd Vr Pd Hg Se RCHA Metals Ag As Ba Cd Cr Pb Hg Se (EXt 10 \$32) 2001XI 8042 MOD. BTEX 80219 PRESERVATIVE METHOD NONE **Analysis Request of Chain of Custody Record** ICE EONH Date: HCF FILTERED (YAV) NUMBER OF CONTAINERS (432) 682-4559 • Fax (432) 682-3946 RECEIVED BY: (Signature) RECEIVED BY: (Signature) LOR CO., NO SAMPLE IDENTIFICATION **TETRA TECH** SITE MANAGER: TKC Talanet 1910 N. Big Spring St. Midland, Texas 79705 #10 Folem 5 800 #: 1053338 ٠ڙي Š Ň 0 57 1 3 3 ð **SB-2** ن ئ Perter in PROJECT N 8ARD COMP Please fill out all copies STATE: 17 XIRTAM CONTROL STATE
CONTROL

SAMPLE CONDITION WHEN RECEIVED: TIME PROJECT NO.: ADDRESS MYD CHAIG REUNOUISHED BY: (Signature) RELINDUISHED BY: (Signature RECEIVING LABORATORY: 201 201 15/17 वीम यन 07क 名 क्र LAB I.D. NUMBER 36 45 SQ Q B 140

Report Date: April 13, 2011 Work Order: 11040723 Page Number: 1 of 2

## **Summary Report**

Tom Franklin Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Report Date: April 13, 2011

Work Order: 11040723

Project Location: Lea Co, NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
262812	AH-1 0-1	soil	2011-04-06	00:00	2011-04-07
262813	AH-1 1-1.5	soil	2011-04-06	00:00	2011-04-07
262814	AH-1 2-2.5	soil	2011-04-06	00:00	2011-04-07
262815	AH-1 3-3.5	soil	2011-04-06	00:00	2011-04-07
262816	AH-1 4-4.5	soil	2011-04-06	00:00	2011-04-07

		]	BTEX		TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
262812 - AH-1 0-1	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	< 2.00

Sample: 262812 - AH-1 0-1

Param	Flag	Result	Units	RL
Chloride		7740	mg/Kg	4.00

Sample: 262813 - AH-1 1-1.5

Param	Flag	Result	Units	RL
Chloride		4760	mg/Kg	4.00

Sample: 262814 - AH-1 2-2.5

continued . . .

Report Date: Apr	il 13, 2011	Work Order: 11040723	Pag	Page Number: 2 of 2	
sample 262814 cor	ntinued				
Param	Flag	Result	Units	RL	
Param	Flag	Result	Units	RL	
Chloride		7100	mg/Kg	4.00	
Param	Flag	Result	Units	RL	
Param Chloride	Flag	Result 9790	Units mg/Kg	RL 4.00	
Sample: 262816	- AH-1 4-4.5				
Param	Flag	Result	Units	RL	
Chloride		13800			



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1

5002 Basin Street, Suite A1 Midland, lexas 79922 6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132

Lubbock, Texas 79424 El Paso, Texas 79922 Midland, Texas 79703 800+378+1296 888+588+3443

806 • 794 • 1296 915 • 585 • 3443 432 • 689 • 6301 817 • 201 • 5260

FAX 806 • 794 • 1298 FAX 915 • 585 • 4944 FAX 432 • 689 • 6313

E-Mail; lab@traceanalysis.com

### Certifications

**WBENC**: 237019

HUB: NCTRCA

1752439743100-86536 WFWB38444Y0909 **DBE:** VN 20657

## **NELAP Certifications**

Lubbock: T104704219-08-TX

LELAP-02003 Kansas E-10317 El Paso: T104704221-08-TX

LELAP-02002

Midland: T104704392-08-TX

## Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: April 13, 2011

Work Order: 11040723

Project Location: Lea Co., NM

Project Name: COG/GC Fed. #16 Well

Project Number: 114-6400874

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	11116	Date
Sample	Description	Matrix	Taken	Taken	Received
262812	AH-1 ()-1	soil	2011-04-06	00:00	2011-04-07
262813	AH-1 1-1.5	soil	2011-04-06	00:00	2011-04-07
262814	AH-1 2-2.5	soil	2011-04-06	00:00	2011-04-07
262815	AH-1 3-3.5	soil	2011-04-06	00:00	2011-04-07
262816	AH-1 4-4.5	soil	2011-04-06	00:00	2011-04-07

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 13 pages and shall not be reproduced except in its entirety, without written approval of

 ${\bf Trace Analysis, \, Inc.}$ 

Michael abel

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

#### Standard Flags

 $\, B\,$  -  $\,$  The sample contains less than ten times the concentration found in the method blank.

## Case Narrative

Samples for project COG/GC Fed. #16 Well were received by TraceAnalysis, Inc. on 2011-04-07 and assigned to work order 11040723. Samples for work order 11040723 were received intact at a temperature of 4.4 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	68059	2011-04-08 at 08:03	80199	2011-04-08 at 08:03
Chloride (Titration)	SM 4500-Cl B	68087	2011-04-11 at 09:47	80268	2011-04-12 at 15:17
TPH DRO - NEW	S 8015 D	68032	2011-04-07 at 10:44	80168	2011-04-07 at 10:44
TPH GRO	S 8015 D	68059	2011-04-08 at 08:03	80200	2011-04-08 at 08:03

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 11040723 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: April 13, 2011 114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 4 of 13 Lea Co., NM

## Analytical Report

Sample: 262812 - AH-1 0-1

Laboratory: Midland

Analysis: BTEX QC Batch: 80199 Prep Batch: 68059

Analytical Method: S 8021B Date Analyzed:

2011-04-08 2011-04-08 Sample Preparation:

Prep Method: S 5035 Analyzed By: ME

ME

Prepared By:

		RL			
Parameter	$\mathbf{Flag}$	Result	Units	Dilution	RL
Benzene		< 0.0200	mg/Kg	1	0.0200
Toluene		< 0.0200	mg/Kg	1	0.0200
Ethylbenzene		< 0.0200	mg/Kg	1	0.0200
Xylene		< 0.0200	mg/Kg	1	0.0200

					$\mathbf{Spike}$	Percent	Recovery
Surrogate	Flag	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)		2.42	mg/Kg	1	2.00	121	52.8 - 137
4-Bromoffuorobenzene (4-BFB)		2.64	mg/Kg	1	2.00	132	38.4 - 157

Sample: 262812 - AH-1 0-1

Laboratory: Midland

Prep Batch:

Analysis: Chloride (Titration) QC Batch: 80268

68087

Analytical Method: SM 4500-Cl B Date Analyzed: 2011-04-12 Sample Preparation: 2011-04-11

Prep Method: N/A Analyzed By: ARPrepared By: AR.

RLDilution Parameter Units RLFlag Result mg/Kg 100 Chloride 7740 4.00

Sample: 262812 - AH-1 0-1

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 80168 Prep Batch: 68032 Analytical Method: S 8015 D Date Analyzed: 2011-04-07 Sample Preparation: 2011-04-07

Prep Method: N/A Analyzed By: kg Prepared By: kg

RL

Parameter	Flag	Result	Units	Dilution	RL
DRO	···	< 50.0	mg/Kg	1	50.0

114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 5 of 13

Lea Co., NM

					Spike	Percent	Recovery
Surrogate	$\operatorname{Flag}$	Result	Units	Dilution	Amount	Recovery	Limits
n-Tricosane		89.6	mg/Kg	1	100	90	70 - 130

Sample: 262812 - AH-1 0-1

Laboratory:

Midland

TPH GRO Analysis: QC Batch: 80200 Prep Batch: 68059

Analytical Method: Date Analyzed:

S 8015 D 2011-04-08 Sample Preparation: 2011-04-08 Prep Method: S 5035 Analyzed By: ME

ME

Prepared By:

RL

Parameter	Flag	Result	Units	Dilution	RL
GRO		< 2.00	mg/Kg	1	2.00

					Spike	Percent	Recovery
Surrogate	$\mathbf{Flag}$	Result	Units	Dilution	${f Amount}$	Recovery	Limits
Triffuorotoluene (TFT)		2.39	mg/Kg	1	2.00	120	48.5 - 152
4-Bromofluorobenzene (4-BFB)		2.35	mg/Kg	1	2.00	118	42 - 159

Sample: 262813 - AH-1 1-1.5

Laboratory:

Midland

Chloride (Titration) Analysis: QC Batch: 80268 Prep Batch: 68087

Analytical Method: Date Analyzed: Sample Preparation:

SM 4500-Cl B 2011-04-12 2011-04-11

Prep Method: N/A Analyzed By: AR. Prepared By: AR.

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		4760	ing/Kg	100	4.00

Sample: 262814 - AH-1 2-2.5

68087

Laboratory:

Prep Batch:

Midland

Chloride (Titration) Analysis: 80268 QC Batch:

Analytical Method: Date Analyzed:

SM 4500-Cl B 2011-04-12

2011-04-11

Prep Method: N/A Analyzed By: AR. Prepared By: AR.

RL

Parameter	Flag	Result	Units	Dilution	RL
Chloride		7100	mg/Kg	100	4.00

Sample Preparation:

Page Number: 6 of 13 Report Date: April 13, 2011 Work Order: 11040723 114-6400874 COG/GC Fed. #16 Well Lea Co., NM Sample: 262815 - AH-1 3-3.5 Laboratory: Midland Analysis: Analytical Method: Prep Method: N/A Chloride (Titration) SM 4500-Cl B QC Batch: 80268 Date Analyzed: 2011-04-12 Analyzed By: AR. Prep Batch: 68087 Sample Preparation: 2011-04-11 Prepared By: AR. RLDilution RLParameter Flag Result Units Chloride 9790 mg/Kg 100 4.00 Sample: 262816 - AH-1 4-4.5 Midland Laboratory: Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A 2011-04-12 QC Batch: 80268 Date Analyzed: Analyzed By: ARPrep Batch: Sample Preparation: Prepared By: 68087 2011-04-11 AR. RLParameter Flag Result Units Dilution RLChloride 13800 mg/Kg 100 4.00 Method Blank (1) QC Batch: 80168 Analyzed By: kg QC Batch: 80168 Date Analyzed: 2011-04-07 Prep Batch: 68032 QC Preparation: 2011-04-07 Prepared By: MDL Units RLParameter Result Flag DRO <15.7 mg/Kg 50 Percent Spike Recovery Dilution Recovery Limits Surrogate Flag Result Units Amount n-Tricosane 96.9 mg/Kg 100 97 70 - 130 Method Blank (1) QC Batch: 80199 QC Batch: 80199 Date Analyzed: 2011-04-08 Analyzed By: ME Prep Batch: 68059 QC Preparation: 2011-04-08 Prepared By: ME

MDL

Result

< 0.0118

Flag

Parameter

Benzene

RL

0.02

continued ...

Units

mg/Kg

Report Date: April 13, 2 114-6400874	011	Work Order: 11040723 COG/GC Fed. #16 Well				Page Nu	mber: 7 of 13 Lea Co., NM
method blank continued.	• •						
Parameter	Flag		MD Resu		Uni	ts	RL
Toluene	1 108		< 0.0060		mg/l		0.02
Ethylbenzene			< 0.0085	0	mg/l		0.02
Xylene			< 0.0061	3	mg/l	Kg	0.02
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	· · · · · · · · · · · · · · · · · · ·	1.66	mg/Kg	1	2.00	83	66.6 - 122
4-Bromoffuorobenzene (4-	BFB)	1.76	mg/Kg	1	2.00	88	55.4 - 124
Method Blank (1) QC Batch: 80200	QC Batch: 80200	Date Ana	dyzed: 20:	11-04-08		Analyz	ed By: ME
Prep Batch: 68059		QC Prepa		1-04-08		Prepare	
Parameter	Flag		MDL Result		Unit	s	m RL
GRO			< 0.753		mg/K		2
		<del></del> -					
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	1106	1.63	mg/Kg		2.00	82	67.6 - 150
4-Bromoffuorobenzene (4-	BFB)	1.59	mg/Kg	1	2.00	80	52.4 - 130
Method Blank (1) QC Batch: 80268 Prep Batch: 68087	QC Batch: 80268	Date Ans QC Prepa		11-04-12 11-04-11		Analyz Prepare	
Parameter	Flag		Result		Units	<b>;</b>	RL
Chloride			<3.85		mg/K		4
Laboratory Control Sp QC Batch: 80168	oike (LCS-1)	Date An	alyzed: 20	11-()4-()7		Analy	zed By: kg

continued ...

114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 8 of 13 Lea Co., NM

control spikes continued ...

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Danem	LCS	Unito	T):1	Spike	Matrix	Dan	Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	216	mg/Kg	1	250	<15.7	86	47.5 - 144.1

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCSD			$\mathbf{Spike}$	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	$_{ m Limit}$	RPD	Limit
DR()	202	mg/Kg	1	250	<15.7	81	47.5 - 144.1	7	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	$_{ m Units}$	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	101	101	mg/Kg	1	100	101	101	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch: 68059

80199

Date Analyzed: QC Preparation: 2011-04-08 2011-04-08

Analyzed By: ME Prepared By: ME

LCS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit Benzene 2.00 101 81.9 - 108 2.02 mg/Kg 1 < 0.0118 Toluene 2.00 104 81.9 - 107 2.07 mg/Kg 1 < 0.00600 Ethylbenzene 2.10mg/Kg 1 2.00 < 0.00850 105 78.4 - 107Xylene 6.29mg/Kg 1 6.00 < 0.00613 105 79.1 - 107

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene	2.02	mg/Kg	1	2.00	< 0.0118	101	81.9 - 108	0	20
Toluene	2.08	mg/Kg	1	2.00	< 0.00600	104	81.9 - 107	0	20
Ethylbenzene	2.10	mg/Kg	1	2.00	< 0.00850	105	78.4 - 107	0	20
Xylene	6.33	mg/Kg	1	6.00	< 0.00613	106	79.1 - 107	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Díl.	Spike Amount	LCS Rec.	$egin{array}{c}  ext{LCSD} \  ext{Rec.} \end{array}$	Rec. Limit
Trifluorotoluene (TFT)	2.07	1.79	mg/Kg	1	2.00	104	90	70.2 - 114
4-Bromoffuorobenzene (4-BFB)	2.34	2.02	mg/Kg	1	2.00	117	101	69.8 - 121

114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 9 of 13 Lea Co., NM

Laboratory Control Spike (LCS-1)

QC Batch: 80200 Prep Batch: 68059 Date Analyzed: 2011-04-08 QC Preparation: 2011-04-08 Analyzed By: ME Prepared By: ME

LCS Spike Matrix Rec. Dil. Limit Param Result Units Amount Result Rec.  $\overline{GRO}$ 18.3 mg/Kg 20.0 < 0.753 60.9 - 95.4 1

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

RPD LCSD Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit RPD Limit GRO < 0.753 60.9 - 95.4 20 18.4 1 20.0 92 0 mg/Kg

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.91	1.92	mg/Kg	1	2.00	96	96	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.97	1.99	mg/Kg	1	2.00	98	100	68.2 - 132

#### Laboratory Control Spike (LCS-1)

QC Batch: 80268 Prep Batch: 68087 Date Analyzed: 2011-04-12 QC Preparation: 2011-04-11 Analyzed By: AR Prepared By: AR

LCS Spike Matrix Rec. Param Result Units Dil. Amount Result Rec. Limit Chloride 100 < 3.85 96 85 - 115 96.0 mg/Kg

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	104	mg/Kg	1	100	<3.85	104	85 - 115	8	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 262812

QC Batch: 80168 Prep Batch: 68032 Date Analyzed: 2011-04-07 QC Preparation: 2011-04-07 Analyzed By: kg Prepared By: kg

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO	209	mg/Kg	1	250	<15.7	84	11.7 - 152.3

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 10 of 13 Lea Co., NM

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO	202	mg/Kg	1	250	<15.7	81	11.7 - 152.3	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	${f Amount}$	Rec.	Rec.	Limit
n-Tricosane	98.7	99.8	mg/Kg	1	100	99	100	70 - 130

Matrix Spike (MS-1) Spiked Sample: 262896

QC Batch: 80199 Prep Batch: 68059 Date Analyzed: 2011-04-08 QC Preparation: 2011-04-08 Analyzed By: ME Prepared By: ME

	MS			Spike	Matrix		Rec.
Param	Result	$\operatorname{Units}$	Dil.	Amount	Result	Rec.	Limit
Benzene	2.07	mg/Kg	1	2.00	< 0.0118	104	80.5 - 112
Toluene	2.18	$_{ m mg/Kg}$	1	2.00	< 0.00600	109	82.4 - 113
Ethylbenzene	2.26	mg/Kg	. 1	2.00	< 0.00850	113	83.9 - 114
Xylene	6.80	mg/Kg	1	6.00	< 0.00613	113	84 - 114

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

		MSD			Spike	Matrix		Rec.		RPD
Param		Result	Units	Dil.	${f Amount}$	Result	Rec.	Limit	RPD	$_{ m Limit}$
Benzene		2.16	mg/Kg	1	2.00	< 0.0118	108	80.5 - 112	4	20
Toluene	1	2.30	mg/Kg	1	2.00	< 0.00600	115	82.4 - 113	5	20
Ethylbenzene	2	2.40	mg/Kg	1	2.00	< 0.00850	120	83.9 - 114	6	20
Xylene	3	7.18	mg/Kg	1	6.00	< 0.00613	120	84 - 114	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

		MS	MSD			Spike	MS	MSD	Rec.
Surrogate		Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	4	2.50	2.30	mg/Kg	1	2	125	115	41.3 - 117
4-Bromofluorobenzene (4-BFB)	5	2.70	2.54	mg/Kg	1	2	135	127	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 262812

QC Batch: 80200 Prep Batch: 68059 Date Analyzed: 2011-04-08 QC Preparation: 2011-04-08

Analyzed By: ME Prepared By: ME

<sup>&</sup>lt;sup>1</sup>MSD analyte out of range. MS/MSD has a RPD within limits. Therfore, MS shows extraction occured properly.

<sup>&</sup>lt;sup>2</sup>MSD analyte out of range. MS/MSD has a RPD within limits. Therfore, MS shows extraction occurred properly.

<sup>&</sup>lt;sup>3</sup>MSD analyte out of range. MS/MSD has a RPD within limits. Therfore, MS shows extraction occured properly.

<sup>&</sup>lt;sup>4</sup>High surrogate recovery due to peak interference.

<sup>&</sup>lt;sup>5</sup>High surrogate recovery due to peak interference.

114 - 6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 11 of 13

Lea Co., NM

	MS			Spike	Matrix		Rec.
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit
GRO	21.0	mg/Kg	1	20.0	< 0.753	105	61.8 - 114

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
GRO	21.6	mg/Kg	1	20.0	< 0.753	108	61.8 - 114	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

·	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Triffuorotoluene (TFT)	2.27	1.90	mg/Kg	1	2	114	95	50 - 162
4-Bromofluorobenzene (4-BFB)	2.39	2.03	mg/Kg	1	2	120	102	50 - 162

Matrix Spike (MS-1)

Spiked Sample: 262822

QC Batch: 80268

Date Analyzed:

2011-04-12 2011-04-11 Analyzed By: AR Prepared By: AR

Prep Batch: 68087 QC Preparation:

MS Spike Matrix Rec. Param Result Units Dil. Result Amount Rec. Limit Chloride 9940 100 10000 <385 97 80 - 120 mg/Kg

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	MSD			Spike	Matrix		Rec.		RPD
Param	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride	10100	mg/Kg	100	10000	<385	99	80 - 120	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

#### Standard (CCV-2)

QC Batch: 80168

Date Analyzed: 2011-04-07

Analyzed By: kg

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Paranı	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
DRO		mg/Kg	250	205	82	80 - 120	2011-04-07

#### Standard (CCV-3)

QC Batch: 80168

Date Analyzed: 2011-04-07

Analyzed By: kg

114-6400874

Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 12 of 13

Lea Co., NM

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	$\operatorname{Conc}$	Recovery	Limits	Analyzed
DRO		mg/Kg	250	259	104	80 - 120	2011-04-07

#### Standard (CCV-1)

QC Batch: 80199

Date Analyzed: 2011-04-08

Analyzed By: ME

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzeue		mg/Kg	0.100	0.116	116	80 - 120	2011-04-08
Toluene		mg/Kg	0.100	0.119	119	80 - 120	2011-04-08
Ethylbenzene		mg/Kg	0.100	0.118	118	80 - 120	2011-04-08
Xylene		mg/Kg	0.300	0.357	119	80 - 120	2011-04-08

### Standard (CCV-2)

QC Batch: 80199

Date Analyzed: 2011-04-08

Analyzed By: ME

Param	$\operatorname{Flag}$	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.103	103	80 - 120	2011-04-08
Toluene		mg/Kg	0.100	0.107	107	80 - 120	2011-04-08
Ethylbenzene		mg/Kg	0.100	0.105	105	80 - 120	2011-04-08
Xylene		mg/Kg	0.300	0.319	106	80 - 120	2011-04-08

#### Standard (CCV-1)

QC Batch: 80200

Date Analyzed: 2011-04-08

Analyzed By: ME

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		mg/Kg	1.00	1.06	106	80 - 120	2011-04-08

#### Standard (CCV-2)

QC Batch: 80200

Date Analyzed: 2011-04-08

Analyzed By: ME

Report Date: April 13, 2011 114-6400874 Work Order: 11040723 COG/GC Fed. #16 Well Page Number: 13 of 13 Lea Co., NM

	•		CCVs	$CCV_{S}$	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GR()		mg/Kg	1.00	1.08	108	80 - 120	2011-04-08

### Standard (ICV-1)

QC Batch: 80268

Date Analyzed: 2011-04-12

Analyzed By: AR.

			ICVs	ICVs	<b>ICVs</b>	Percent	
Param	Flag	Units	True Conc.	Found Conc.	Percent Recovery	Recovery Limits	Date Analyzed
Chloride	гац	mg/Kg	100	102	102	85 - 115	2011-04-12
CHOUGE		mg/reg	100	102	102	00 - 110	2011-04-12

## Standard (CCV-1)

QC Batch: 80268

Date Analyzed: 2011-04-12

Analyzed By: AR.

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	100	97.6	98	85 - 115	2011-04-12

AIFFBILL #:\_ OTHER. ANALYSIS REQUEST (Circle or Specify Method No.) Alpha Beta (Air) PAGE BCB# 8090/809 GC:MS Semi. Vol. 8270/625 RETHA TECH CONTACT PERSO W8 API' 8540\8560\654 TCLP Motals Ag As Be Cd Vr Pd Hg Se ACRA Metata Ag As Ba Cd Cr Pb Hg Se 0128 HA9 Hab BOTE MOD TX1005 BLEX 8021B PRESERVATIVE METHOD NONE Request of Chain of Custody Record BOI EONH нсг FILTERED (Y/N) NUMBER OF CONTAINERS (432) 682-4559 • Fax (432) 682-3946 RECEIVED BY: (Signature) SAMPLE IDENTIFICATION STE MANAGER:
The Rueper **TETRA TECH** 1910 N. Big Spring St. Midland, Texas 79705 KUD 井:11040733 Date: April 12011 Time: 1830 Date: 1-11011 × 44-12/14. PROJECT NAME: X 44. 50% ₽¥¥Đ COMP স XIRTAM Ÿ 4 vj TIME 51800M2 Analysis RELINCUISHED BY: (Signature) DATE 60 CLIENT NAME: LAB I.D. NUMBER 262812 333 8/6 214 3

Major Anlona/Cations, pH, TDS

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RUSH Charge Authorized: Results by:

3700

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RECEIVED 8Y: (Signature)

DATE

STATE X

RECEIVING LABORATORY: 21 PACE