

## SITE INFORMATION

**Report Type: Closure Report      1RP-5362**

### General Site Information:

Site:	Macho State #001H					
Company:	COG Operating LLC					
Section, Township and Range	Unit D	Sec. 02	T 24S	R 33E		
Lease Number:	API No. 30-025-39884					
County:	Lea County					
GPS:	32.25163			-103.55052		
Surface Owner:	State					
Directions:	From the intersection of Delaware Basin Rd ( HWY 21) and X-L Road, turn west on X-L Road and travel approximately 3.9 miles to the end of the lease road. Turn south onto lease road and travel approximately 1.3 miles. Turn east onto lease road and travel approximately 1.1 miles to the end of the lease road. Site is adjacent south to the pad location.					

### Release Data:

<b>Date Released:</b>	1/28/2019
<b>Type Release:</b>	Produced Water
<b>Source of Contamination:</b>	Flow Line Fitting
<b>Fluid Released:</b>	10 bbls
<b>Fluids Recovered:</b>	0 bbls

### Official Communication:

<b>Name:</b>	Ike Tavaréz		Clair Gonzales
<b>Company:</b>	COG Operating, LLC		Tetra Tech
<b>Address:</b>	One Concho Center		901 West Wall Street
	600 W. Illinois Ave.		Suite 100
<b>City:</b>	Midland Texas, 79701		Midland, Texas
<b>Phone number:</b>	(432) 686-3023		(432) 687-8110
<b>Fax:</b>	(432) 684-7137		
<b>Email:</b>	<a href="mailto:itavarez@concho.com">itavarez@concho.com</a>		<a href="mailto:Clair.Gonzales@tetrattech.com">Clair.Gonzales@tetrattech.com</a>

### Site Characterization

<b>Depth to Groundwater:</b>	80' below surface
<b>Karst Potential:</b>	Low

### Recommended Remedial Action Levels (RRALs)

<b>Benzene</b>	<b>Total BTEX</b>	<b>TPH (GRO+DRO)</b>	<b>TPH (GRO+DRO+MRO)</b>	<b>Chlorides</b>
10 mg/kg	50 mg/kg	1,000 mg/kg	2,500 mg/kg	10,000 mg/kg



**TETRA TECH**

April 25, 2019

Oil Conservation Division, District 1  
1625 North French Drive  
Hobbs, New Mexico 88240

**Re: Closure Report for the COG Operating, LLC, Macho State #001H, Unit D, Section 02, Township 24 South, Range 33 East, Lea County, New Mexico. 1RP-5362**

To Whom it May Concern:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating, LLC (COG) to remediate a release that occurred at the Macho State #001H, Unit D, Section 02, Township 24 South, Range 33 East, Lea County, New Mexico (Site). The spill site coordinates are 32.25163°, -103.55052°. The site location is shown on Figures 1 and 2.

## **Background**

According to the State of New Mexico C-141 Initial Report the release was discovered on January 28, 2019. Approximately 10 barrels of produced water were released due to a fitting failure on a flow line. A vacuum truck was dispatched to remove all free-standing fluids; however, none were recovered. The release impacted the pad south of the pad, measuring approximately 30' X 100'. The initial C-141 Form is included in Appendix A.

## **Site Characterization**

A site characterization was performed for the site and no watercourses, lakebeds, sinkholes, playa lakes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, springs, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the specified distances. The site is in a low karst potential area. Two wells are in close proximity to the site are listed in the New Mexico Office of the State Engineers website. The nearest well (C 02308) is listed in Section 10, Township 24 South, Range 33 East, approximately 1.55 miles southwest of the site, and has a reported depth to groundwater of 20 feet below ground surface. It was completed in 1920. The other well (C 04014 POD4) is listed in Section 01, Township 24 South, Range 33 East, approximately 1.75 miles east of the site, and has a reported depth to groundwater of 86 feet below ground surface. The well was installed in February 2017. The groundwater data is shown in Appendix B.

**Tetra Tech**

901 W. Wall Street, Suite 100, Midland, TX 79701

Tel 432.682.4559 [www.tetrattech.com](http://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, updated August 14, 2018. 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 site characterization, the proposed RRAL for TPH is 1,000 mg/kg (GRO + DRO) and 2,500 mg/kg (GRO + DRO + MRO). Additionally, based on the site characterization, the proposed RRAL for chlorides is 10,000 mg/kg.

## **Soil Assessment and Analytical Results**

On March 15, 2019, Tetra Tech personnel were onsite to sample the release area. A total of four (4) trenches (Trench 1, Trench 2, Trench 3, and Trench 4) were installed until refusal to total depths of 2.0 – 3.0' below surface. Soil samples were collected and submitted to the laboratory 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 results of the sampling are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, the area of Trench 1 did not have benzene, total BTEX, TPH, or chlorides above their respective RRALs. Trench 2, Trench 3, and Trench 4 had reported chloride concentrations above 600 mg/kg from the assessment data. The chlorides ranged from 736 mg/kg (Trench 3 at 3.0') to 4,400 mg/kg (Trench 2 at 2.0').

## **Remediation Activities**

Tetra Tech personnel were onsite from March 18 - 20, 2019 to supervise the remediation activities. The release area was excavated to total depths between 4.0' to 4.5' below surface. A 20-mil liner was installed in the bottom hole areas of 5 and 6 to prevent further chloride migration in the subsurface. Eight (8) bottom hole and four (4) sidewall composite samples were collected every 400 square feet to ensure proper removal of the impacted soils. The samples were submitted to the laboratory to be analyzed for TPH method 8015 extended, BTEX method 8021B, and Chloride by EPA Method 300.0. The sampling results are summarized in Table 1. The excavation depths and sample locations are shown in Figure 4.

Referring to Table 1, all collected confirmation samples showed benzene, total BTEX, TPH, and chloride concentrations below the RRAL's.

Approximately 180 cubic yards of material was excavated and transported offsite for proper disposal. The area was then backfilled with clean material to surface grade.



### Revegetation Plan

The area will be seeded with a Bureau of Land Management (BLM) seed mixture for loamy sites in June 2019 in order to coincide with the rainy season in Southeastern New Mexico to aid in revegetation. Based on the soils at the site, the Bureau of Land Management (BLM) Seed Mixture 1 will be used for seeding and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a drill equipped with a depth regulator or a hand-held broadcaster and raked. If a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled.

Site inspections will be performed to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the BLM will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The BLM seed mixture details and corresponding pounds pure live seed per acre are included in Appendix D.

### **Conclusion**

Based on the laboratory results and remediation activities performed COG requests closure of this spill issue. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,  
TETRA TECH

Clair Gonzales,  
Project Manager

Kayla Taylor,  
Geologist

cc: Ike Tavarez – COG  
Dakota Neel - COG  
Rebecca Haskell - COG  
Sheldon Hitchcock - COG  
DeAnn Grant - COG

## Figures







FIGURE 1

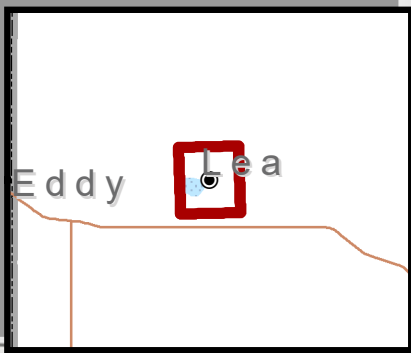
MACHO STATE #001  
(32.25163°, -103.55052°)

OVERVIEW MAP

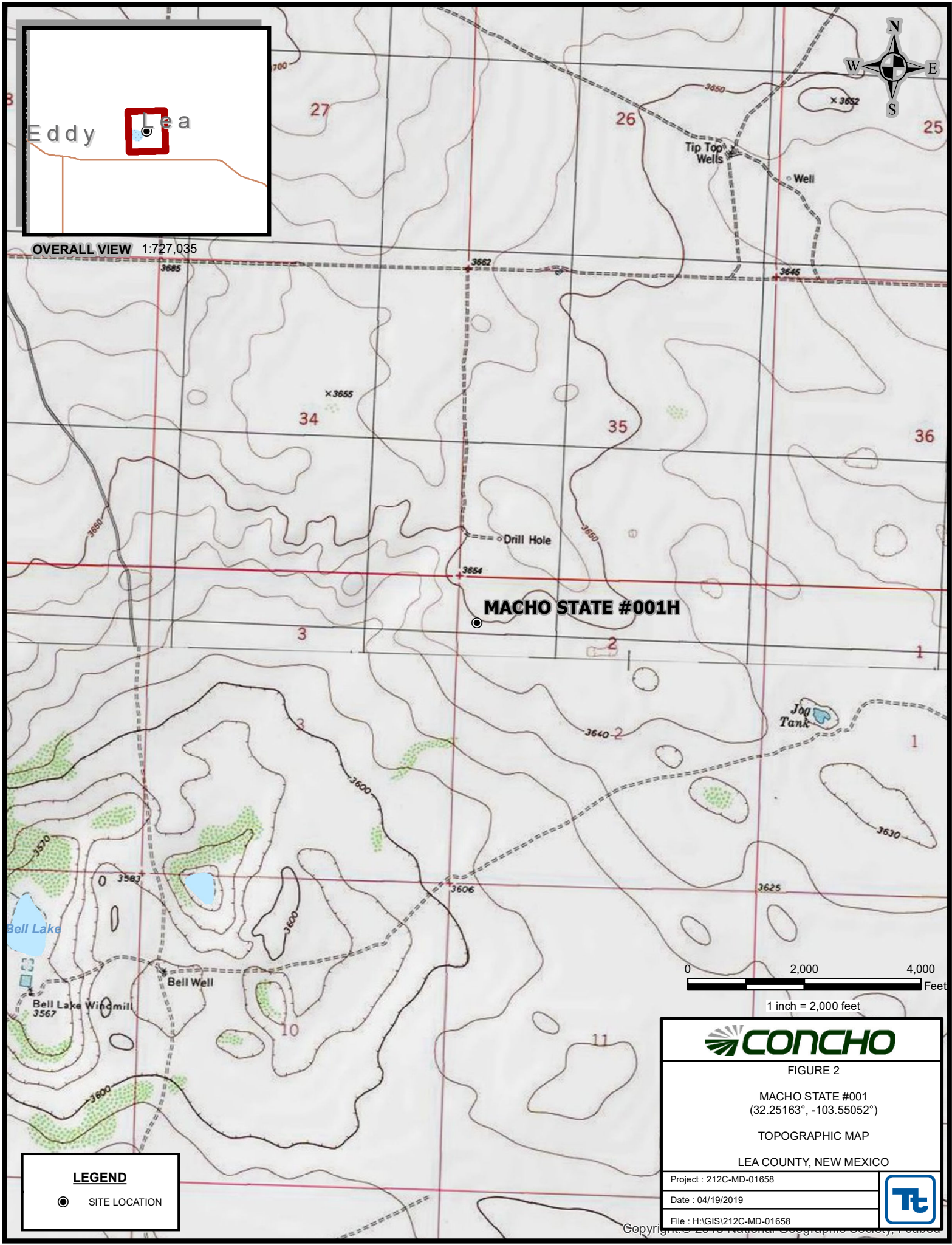
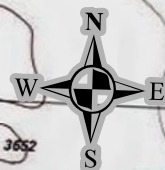
LEA COUNTY, NEW MEXICO

Project : 212C-MD-01658	
Date : 04/19/2019	
File : H:\GIS\212C-MD-01658	





OVERALL VIEW 1:727,035



**LEGEND**

● SITE LOCATION





FIGURE 2

MACHO STATE #001  
(32.25163°, -103.55052°)

TOPOGRAPHIC MAP

LEA COUNTY, NEW MEXICO

Project : 212C-MD-01658
Date : 04/19/2019
File : H:\GIS\212C-MD-01658





PAD



58'

PRODUCED WATER LINE

RELEASE  
SOURCE

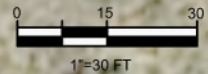
T-1

T-2

T-3

T-4

128'



**LEGEND**

-  TRENCH SAMPLE LOCATIONS
-  SPILL AREA
-  ABOVEGROUND POLY LINE



FIGURE 3

MACHO STATE #001  
(32.25163°, -103.55052°)

SPILL ASSESSMENT MAP  
LEA COUNTY, NEW MEXICO

Project: 212C-MD-01658

Date: 04/19/2019

File: H:\GIS\212C-MD-01658





PAD



RELEASE  
SOURCE

31'

PRODUCED WATER LINE

50'

45'

30'

NSW-1

BTTM-8

BTTM-7

BTTM-5

BTTM-6

WSW-1

ESW-1

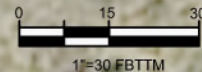
BTTM-4

BTTM-3

BTTM-1

BTTM-2

SSW-1



**LEGEND**

- BTTM BOTTOM HOLE SAMPLE LOCATIONS
- 4.0' -4.5' EXCAVATED DEPTH AREA
- 4.0' -4.5' EXCAVATED DEPTH AREA w/LINER
- ABOVEGROUND POLY LINE



FIGURE 4

MACHO STATE #001  
(32.25163°, -103.55052°)

EXCAVATION AREA & DEPTH MAP

LEA COUNTY, NEW MEXICO

ProjecBTTM: 212C-MD-01658

DaBTTMe: 04/19/2019

File: H:\GIS\212C-MD-01658



## Tables

**Table 1**  
**COG**  
**Macho State #1H**  
**Lea County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	BEB (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	ORO	Total						
Trench 1	3/15/2019	0-1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
	"	1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
	"	2	-		X	-	-	-	-	-	-	-	-	-	32.0
Trench 2	3/15/2019	0-1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	5,840
	"	1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	6,320
	"	2	-		X	-	-	-	-	-	-	-	-	-	4,400
Trench 3	3/15/2019	0-1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	1,390
	"	2	-		X	-	-	-	-	-	-	-	-	-	2,480
	"	3	-		X	-	-	-	-	-	-	-	-	-	736
Trench 4	3/15/2019	0-1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	464
	"	1	-		X	<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	1,010
	"	2	-		X	-	-	-	-	-	-	-	-	-	2,440
South Sidewall 1	3/19/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
North Sidewall 1	3/20/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	96.0
East Sidewall 1	3/20/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
West Sidewall 1	3/20/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
Bottom Hole #1	3/19/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0
Bottom Hole #2	3/19/2019	-	4-4.5	X		<10.0	12.1	<10.0	12.1	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
Bottom Hole #3	3/19/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	48.0
Bottom Hole #4	3/19/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	560
Bottom Hole #5	3/20/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	2,160
Bottom Hole #6	3/20/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	896
Bottom Hole #7	3/20/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	16.0
Bottom Hole #8	3/20/2019	-	4-4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	32.0

( - ) Not Analyzed

Excavation Depths

Photos



COG  
Macho State #001H  
Lea County, New Mexico



View Southwest – View of excavation area



View South – View of excavation area



COG  
Macho State #001H  
Lea County, New Mexico



View Southwest – View of excavation and liner installation  
at Bottom Hole 5 and 6



View North – View of excavation and liner installation at  
Bottom Hole 5 and 6

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

Form C-141  
Revised August 24, 2018  
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

## Release Notification

### Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # (assigned by OCD)
Contact mailing address	

### Location of Release Source

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# (if applicable)

Unit Letter	Section	Township	Range	County

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☐ Private (Name: \_\_\_\_\_)

### Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release



Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC?  <input type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

### Initial Response

*The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury*

<input type="checkbox"/> The source of the release has been stopped. <input type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> been undertaken, explain why:	
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.	
Printed Name: _____	Title: _____
Signature: <u>Delann O'neal</u>	Date: _____
email: _____	Telephone: _____
<b><u>OCD Only</u></b>	
Received by: <u>Ana P. Bontamonte</u>	Date: _____

Incident ID	
District RP	
Facility ID	
Application ID	

## Closure


The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.***

- ☐ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☐ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☐ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature:  \_\_\_\_\_ Date: \_\_\_\_\_

email: \_\_\_\_\_ Telephone: \_\_\_\_\_

### **OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by:  \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG Macho State #001H**  
**Lea County, New Mexico**

23 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

23 South			33 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

23 South			34 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

24 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

24 South			33 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

24 South			34 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

25 South			33 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			34 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

- 88** New Mexico State Engineers Well Reports
- 105** USGS Well Reports
- 90** Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
- Geology and Groundwater Resources of Eddy County, NM (Report 3)
- 34** NMOCD - Groundwater Data
- 123 Tetra Tech installed temporary wells and field water level
- 143** NMOCD Groundwater map well location





# New Mexico Office of the State Engineer

## Water Column/Average Depth to Water

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
<a href="#">C 02308</a>		CUB	LE	1	3	1	10	24S	33E	634953	3567364*	<input type="text"/>	40	20
<a href="#">C 02309</a>		CUB	LE	2	2	2	25	24S	33E	639638	3562994*	<input type="text"/>	60	30
<a href="#">C 02310</a>		CUB	LE	2	3	2	33	24S	33E	634437	3560918*	<input type="text"/>	120	70
<a href="#">C 02311</a>		CUB	LE	2	3	2	33	24S	33E	634437	3560918*	<input type="text"/>	120	70
<a href="#">C 02430</a>		CUB	LE	3	3	3	16	24S	33E	633377	3564732*	<input type="text"/>	643	415
<a href="#">C 02431</a>		CUB	LE	4	4	4	17	24S	33E	633175	3564728*	<input type="text"/>	525	415
<a href="#">C 02432</a>		CUB	LE	4	4	4	17	24S	33E	633175	3564728*	<input type="text"/>	640	415
<a href="#">C 02563</a>		CUB	LE	1	4	2	33	24S	33E	634639	3560923*	<input type="text"/>	120	
<a href="#">C 02564</a>		CUB	LE	2	4	2	33	24S	33E	634839	3560923*	<input type="text"/>	120	
<a href="#">C 02890</a>		C	LE		2	4	29	24S	33E	633114	3562012*	<input type="text"/>	500	
<a href="#">C 03565 POD3</a>		CUB	LE		3	4	08	24S	33E	632763	3566546	<input type="text"/>		1533
<a href="#">C 03591 POD1</a>		CUB	LE	2	1	4	05	24S	33E	632731	3568518	<input type="text"/>		
<a href="#">C 03600 POD1</a>		CUB	LE	2	2	1	26	24S	33E	637275	3563023	<input type="text"/>		
<a href="#">C 03600 POD2</a>		CUB	LE	4	4	1	25	24S	33E	638824	3562329	<input type="text"/>		
<a href="#">C 03600 POD3</a>		CUB	LE	3	4	2	26	24S	33E	637784	3562340	<input type="text"/>		
<a href="#">C 03600 POD4</a>		CUB	LE	3	3	1	26	24S	33E	636617	3562293	<input type="text"/>		
<a href="#">C 03600 POD5</a>		CUB	LE	3	2	4	26	24S	33E	637857	3562020	<input type="text"/>		
<a href="#">C 03600 POD6</a>		CUB	LE	3	1	4	26	24S	33E	637383	3562026	<input type="text"/>		
<a href="#">C 03600 POD7</a>		CUB	LE	3	1	3	26	24S	33E	636726	3561968	<input type="text"/>		
<a href="#">C 03601 POD1</a>		CUB	LE	4	4	2	23	24S	33E	638124	3563937	<input type="text"/>		
<a href="#">C 03601 POD2</a>		CUB	LE	3	2	4	23	24S	33E	637846	3563588	<input type="text"/>		
<a href="#">C 03601 POD3</a>		CUB	LE	1	3	3	24	24S	33E	638142	3563413	<input type="text"/>		
<a href="#">C 03601 POD4</a>		CUB	LE	3	3	3	24	24S	33E	638162	3561375	<input type="text"/>		
<a href="#">C 03601 POD5</a>		CUB	LE	2	4	4	23	24S	33E	637988	3563334	<input type="text"/>		
<a href="#">C 03601 POD6</a>		CUB	LE	1	4	4	23	24S	33E	637834	3563338	<input type="text"/>		
<a href="#">C 03601 POD7</a>		CUB	LE	4	4	4	23	24S	33E	637946	3563170	<input type="text"/>		
<a href="#">C 03602 POD2</a>		CUB	LE	4	4	1	25	24S	33E	638824	3562329	<input type="text"/>		
<a href="#">C 03603 POD1</a>		CUB	LE	3	2	2	35	24S	33E	637805	3561225	<input type="text"/>		
<a href="#">C 03603 POD2</a>		CUB	LE	3	1	2	35	24S	33E	637384	3561167	<input type="text"/>		
<a href="#">C 03603 POD3</a>		CUB	LE	4	1	1	35	24S	33E	636890	3561092	<input type="text"/>		
<a href="#">C 03603 POD4</a>		CUB	LE	3	2	4	35	24S	33E	637789	3560461	<input type="text"/>		
<a href="#">C 03603 POD5</a>		CUB	LE	3	3	2	35	24S	33E	636745	3560767	<input type="text"/>		
<a href="#">C 03603 POD6</a>		CUB	LE	3	1	3	35	24S	33E	636749	3560447	<input type="text"/>		
<a href="#">C 03662 POD1</a>		C	LE	3	1	2	23	24S	33E	637342	3564428	<input type="text"/>	550	110
<a href="#">C 03666 POD1</a>		C	LE	2	3	4	13	24S	33E	639132	3565078	<input type="text"/>	650	390
<a href="#">C 03679 POD1</a>		C	ED	1	4	2	14	24S	33E	603567	3581547	<input type="text"/>	700	575
<a href="#">C 03917 POD1</a>		C	LE	4	1	3	13	24S	33E	638374	3565212	<input type="text"/>	600	420
<a href="#">C 04014 POD2</a>		CUB	LE	4	4	2	01	24S	33E	639656	3568917	<input type="text"/>	95	81
<a href="#">C 04014 POD3</a>		CUB	LE	2	4	2	01	24S	33E	639497	3569007	<input type="text"/>	95	87
<a href="#">C 04014 POD4</a>		CUB	LE	3	4	2	01	24S	33E	639295	3568859	<input type="text"/>	96	86
<a href="#">C 04014 POD5</a>		CUB	LE	1	4	2	01	24S	33E	639284	3569086	<input type="text"/>	95	85

Average Depth to Water: **300 feet**

Minimum Depth: **20 feet**

Maximum Depth: **1533 feet**

Record Count: 41

PLSS Search:

Township: 24S Range: 33E

\*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.





3/13/19 7:27 AM


WATER COLUMN/ AVERAGE DEPTH  
TO WATER

# COG Macho State #001 H

Karst Potential

## Legend

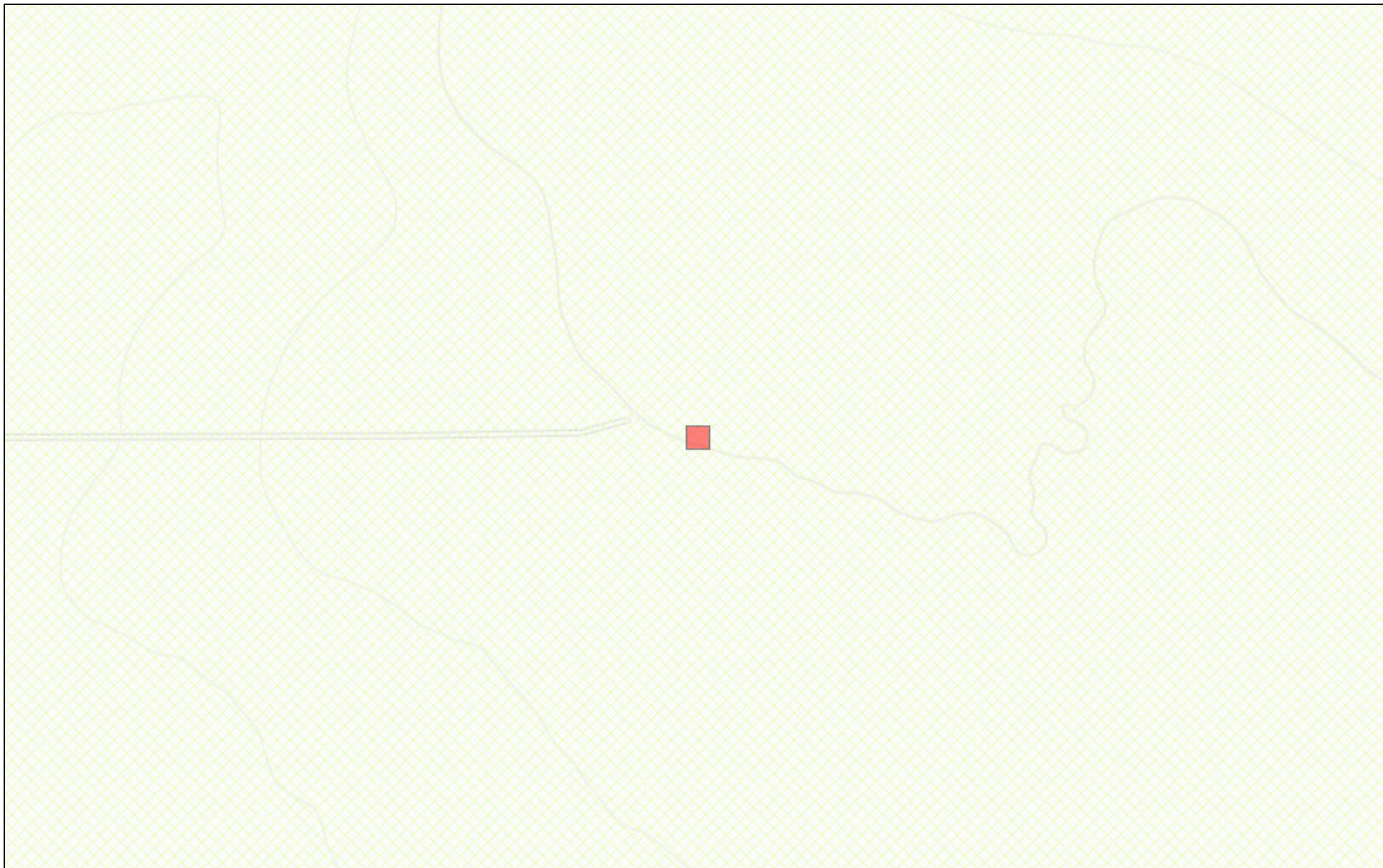
-  32.25163, -103.55052
-  High
-  Low
-  Medium

 32.25163, -103.55052

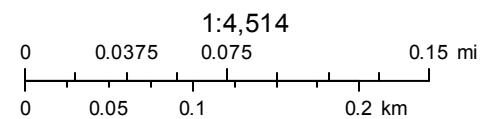




# New Mexico NFHL Data



March 13, 2019



FEMA  
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

## Appendix C



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

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March 20, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MACHO STATE 1H

Enclosed are the results of analyses for samples received by the laboratory on 03/15/19 14:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 1 ( 0-1' ) (H901021-01)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTX	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.9 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	03/18/2019	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 89.2 % 41-142

Surrogate: 1-Chlorooctadecane 92.1 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 1 ( 1' ) (H901021-02)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTX	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.9 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	03/18/2019	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 101 % 41-142

Surrogate: 1-Chlorooctadecane 105 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 1 ( 2' ) (H901021-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	03/18/2019	ND	416	104	400	3.77		

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 2 ( 0-1' ) (H901021-04)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTX	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.2 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	5840	16.0	03/18/2019	ND	416	104	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 98.2 % 41-142

Surrogate: 1-Chlorooctadecane 102 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 2 ( 1' ) (H901021-05)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTX	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.6 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	6320	16.0	03/18/2019	ND	416	104	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 94.8 % 41-142

Surrogate: 1-Chlorooctadecane 99.0 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 2 ( 2' ) (H901021-06)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	4400	16.0	03/18/2019	ND	416	104	400	3.77		

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 3 ( 0-1' ) (H901021-07)**

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTEx	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.0 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	03/18/2019	ND	416	104	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 95.7 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 3 ( 1' ) (H901021-08)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/18/2019	ND	2.06	103	2.00	1.38	
Toluene*	<0.050	0.050	03/18/2019	ND	1.87	93.7	2.00	0.598	
Ethylbenzene*	<0.050	0.050	03/18/2019	ND	1.93	96.7	2.00	0.318	
Total Xylenes*	<0.150	0.150	03/18/2019	ND	6.08	101	6.00	0.282	
Total BTX	<0.300	0.300	03/18/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 97.7 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1390	16.0	03/18/2019	ND	416	104	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 89.0 % 41-142

Surrogate: 1-Chlorooctadecane 92.6 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 3 ( 2' ) (H901021-09)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2480	16.0	03/18/2019	ND	416	104	400	3.77		

**Sample ID: TRENCH 3 ( 3' ) (H901021-10)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	736	16.0	03/18/2019	ND	416	104	400	3.77	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 4 ( 0-1' ) (H901021-11)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/19/2019	ND	2.08	104	2.00	0.400	
Toluene*	<0.050	0.050	03/19/2019	ND	1.92	95.9	2.00	1.25	
Ethylbenzene*	<0.050	0.050	03/19/2019	ND	1.97	98.4	2.00	1.39	
Total Xylenes*	<0.150	0.150	03/19/2019	ND	5.99	99.8	6.00	0.300	
Total BTX	<0.300	0.300	03/19/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 97.0 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	464	16.0	03/18/2019	ND	416	104	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 94.0 % 41-142

Surrogate: 1-Chlorooctadecane 96.8 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 4 ( 1' ) (H901021-12)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/19/2019	ND	2.08	104	2.00	0.400	
Toluene*	<0.050	0.050	03/19/2019	ND	1.92	95.9	2.00	1.25	
Ethylbenzene*	<0.050	0.050	03/19/2019	ND	1.97	98.4	2.00	1.39	
Total Xylenes*	<0.150	0.150	03/19/2019	ND	5.99	99.8	6.00	0.300	
Total BTEX	<0.300	0.300	03/19/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 94.2 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1010	16.0	03/18/2019	ND	416	104	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/16/2019	ND	186	92.8	200	20.3	
DRO >C10-C28*	<10.0	10.0	03/16/2019	ND	212	106	200	18.0	
EXT DRO >C28-C36	<10.0	10.0	03/16/2019	ND					

Surrogate: 1-Chlorooctane 97.3 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/15/2019	Sampling Date:	03/15/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: TRENCH 4 ( 2' ) (H901021-13)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2440	16.0	03/18/2019	ND	416	104	400	3.77		

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

## Analysis Request of Chain of Custody Record

Page 1 of 2



## Tetra Tech, Inc.

901W Wall Street, Ste 100  
Midland, Texas 79705  
Tel (432) 682-4559  
Fax (432) 682-3946

Client Name: <b>COA</b>		Site Manager: <b>CLAIR GONZALES</b>	
Project Name: <b>212-MO-01658 MACHO STATE IN (1.28.19)</b>			
Project Location: <b>LEA CO, NM</b>		Project #: <b>212-MO-01658</b>	
Invoice to: <b>COA - 1165 TAVAREZ</b>			
Receiving Laboratory: <b>CARDINAL</b>		Sampler Signature: <b>CONNIE M. TONY L</b>	
Comments:			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD		# CONTAINERS	FILTERED (Y/N)		
		DATE	TIME	WATER	SOIL	HCL	HNO <sub>3</sub>			ICE	None
1	TRENCH 1 (0-1')	3/15/19		X				X	1	2	
2	TRENCH 1 (1')	3/15/19		X				X	1	2	
3	TRENCH 1 (2')	3/15/19		X				X	1	2	
4	TRENCH 2 (0-1')	3/15/19		X				X	1	2	
5	TRENCH 2 (1')	3/15/19		X				X	1	2	
6	TRENCH 2 (2')	3/15/19		X				X	1	2	
7	TRENCH 3 (0-1')	3/15/19		X				X	1	2	
8	TRENCH 3 (1')	3/15/19		X				X	1	2	
9	TRENCH 3 (2')	3/15/19		X				X	1	2	
10	TRENCH 3 (3')	3/15/19		X				X	1	2	

LAB USE ONLY	REMARKS:	ANALYSIS REQUEST (Circle or Specify Method No.)																			
		BTEX 8021B	BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	
<input checked="" type="checkbox"/>	STANDARD - BTEX + TPH																				
<input checked="" type="checkbox"/>	RUSH: Same Day																				
<input type="checkbox"/>	Rush Charges Authorized																				
<input type="checkbox"/>	Special Report Limits or TRRP Report																				

ORIGINAL COPY

(Circle) HAND DELIVERED FEDEX UPS Tracking #:



## Analysis Request of Chain of Custody Record



Tetra Tech, Inc.

 901W Wall Street, Ste 100  
 Midland, Texas 79705  
 Tel (432) 682-4559  
 Fax (432) 682-3946

Client Name:

COC

Site Manager:

CLAIR CONTRALES

Project Name:

MACHO STATE 1H (1.28.14)

Project Location:

LEA COUNTY

Project #:

212C-ND-0165B

Invoice to:

COC - LKE TAVAREZ

Receiving Laboratory:

LABORIAL

Sampler Signature:

CONNER M. TONY L

Comments:

## SAMPLE IDENTIFICATION

LAB #

H901021

LAB USE ONLY

## SAMPLING

YEAR: 2019

DATE

TIME

## MATRIX

WATER  
SOIL

## PRESERVATIVE METHOD

HCL  
HNO<sub>3</sub>  
ICE  
None

# CONTAINERS

FILTERED (Y/N)

BTX 8021B BTX 8260B

TPH TX1005 (Ext to C35)

TPH 8015M ( GRO - DRO - ORO - MRO)

PAH 8270C

Total Metals Ag As Ba Cd Cr Pb Se Hg

TCLP Metals Ag As Ba Cd Cr Pb Se Hg

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC/MS Vol. 8260B / 624

GC/MS Semi. Vol. 8270C/625

PCB's 8082 / 608

NORM

PLM (Asbestos)

Chloride

Chloride Sulfate TDS

General Water Chemistry (see attached list)

Anion/Cation Balance

Hold

## ANALYSIS REQUEST

(Circle or Specify Method No.)

Relinquished by:

Date: Time:

Relinquished by:

Date: Time:

Relinquished by:

Date: Time:

Received by:

Date: Time:

Received by:

Date: Time:

Received by:

Date: Time:

LAB USE ONLY

REMARKS:

STANDARD

BTX + TPH

Sample Temperature

76.497

Special Report Limits or TRRP Report

Rush: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

3.42

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

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March 20, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MACHO STATE 1H

Enclosed are the results of analyses for samples received by the laboratory on 03/19/19 16:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/19/2019	Sampling Date:	03/19/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #1 ( 4.0-4.5' BEB ) (H901063-01)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/20/2019	ND	2.07	103	2.00	0.276	
Toluene*	<0.050	0.050	03/20/2019	ND	1.89	94.7	2.00	0.0452	
Ethylbenzene*	<0.050	0.050	03/20/2019	ND	1.98	98.8	2.00	1.30	
Total Xylenes*	<0.150	0.150	03/20/2019	ND	6.02	100	6.00	1.85	
Total BTX	<0.300	0.300	03/20/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 94.3 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	03/20/2019	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	214	107	200	4.20	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	195	97.5	200	12.0	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 92.3 % 41-142

Surrogate: 1-Chlorooctadecane 87.1 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/19/2019	Sampling Date:	03/19/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #2 ( 4.0-4.5' BEB ) (H901063-02)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/20/2019	ND	2.07	103	2.00	0.276	
Toluene*	<0.050	0.050	03/20/2019	ND	1.89	94.7	2.00	0.0452	
Ethylbenzene*	<0.050	0.050	03/20/2019	ND	1.98	98.8	2.00	1.30	
Total Xylenes*	<0.150	0.150	03/20/2019	ND	6.02	100	6.00	1.85	
Total BTX	<0.300	0.300	03/20/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 91.8 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	03/20/2019	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	214	107	200	4.20	
DRO >C10-C28*	12.1	10.0	03/20/2019	ND	195	97.5	200	12.0	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 80.4 % 41-142

Surrogate: 1-Chlorooctadecane 80.6 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/19/2019	Sampling Date:	03/19/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #3 ( 4.0-4.5' BEB ) (H901063-03)**

BTEx 8021B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/20/2019	ND	2.07	103	2.00	0.276		
Toluene*	<0.050	0.050	03/20/2019	ND	1.89	94.7	2.00	0.0452		
Ethylbenzene*	<0.050	0.050	03/20/2019	ND	1.98	98.8	2.00	1.30		
Total Xylenes*	<0.150	0.150	03/20/2019	ND	6.02	100	6.00	1.85		
Total BTEX	<0.300	0.300	03/20/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 93.4 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	48.0	16.0	03/20/2019	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	214	107	200	4.20	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	195	97.5	200	12.0	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 87.8 % 41-142

Surrogate: 1-Chlorooctadecane 85.6 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

 TETRA TECH  
 CLAIR GONZALES  
 901 WEST WALL STREET , STE 100  
 MIDLAND TX, 79701  
 Fax To: (432) 682-3946

Received:	03/19/2019	Sampling Date:	03/19/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #4 ( 4.0-4.5' BEB ) (H901063-04)**

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/20/2019	ND	2.07	103	2.00	0.276	
Toluene*	<0.050	0.050	03/20/2019	ND	1.89	94.7	2.00	0.0452	
Ethylbenzene*	<0.050	0.050	03/20/2019	ND	1.98	98.8	2.00	1.30	
Total Xylenes*	<0.150	0.150	03/20/2019	ND	6.02	100	6.00	1.85	
Total BTEx	<0.300	0.300	03/20/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.6 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	560	16.0	03/20/2019	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	214	107	200	4.20	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	195	97.5	200	12.0	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 85.7 % 41-142

Surrogate: 1-Chlorooctadecane 83.0 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/19/2019	Sampling Date:	03/19/2019
Reported:	03/20/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: SOUTH # 1 SIDEWALL (H901063-05)**

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/20/2019	ND	2.07	103	2.00	0.276	
Toluene*	<0.050	0.050	03/20/2019	ND	1.89	94.7	2.00	0.0452	
Ethylbenzene*	<0.050	0.050	03/20/2019	ND	1.98	98.8	2.00	1.30	
Total Xylenes*	<0.150	0.150	03/20/2019	ND	6.02	100	6.00	1.85	
Total BTEx	<0.300	0.300	03/20/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 91.1 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	03/20/2019	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	214	107	200	4.20	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	195	97.5	200	12.0	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 91.2 % 41-142

Surrogate: 1-Chlorooctadecane 88.5 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

# Tetra Tech, Inc.

901 W Wall Street, Ste 100  
Midland, Texas 79705  
Tel (432) 682-4559  
Fax (432) 682-3946

005

Clair Gonzalez

Machos State 7H (1.28.19)

Lea County, NM

212E-MD-01658

COG-Ike Tavaraz

Cardinal

Conner	Moehring
Tony	Leganda

Comments:

ANALYSIS REQUEST  
(Circle or Specify Method No.)

**Hold**

Date: 12/15 Time: 1747

Date: 01/02/2020

Date: Time:

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received by. \_\_\_\_\_ Date. \_\_\_\_\_

Date: Time:

Date: Time:

Date: \_\_\_\_\_ Time: \_\_\_\_\_

REMARKS:

## STANDARD

☒ RUSH: Same Day (24 hr) 48 hr 72 hr

☐ Rush Charges Authorized

	Special Report Limits or TRRP Report
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(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

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March 21, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: MACHO STATE 1H

Enclosed are the results of analyses for samples received by the laboratory on 03/20/19 15:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: NORTH 1 SIDEWALL (H901079-01)**

BTEX 8021B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700		
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776		
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76		
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46		
Total BTEX	<0.300	0.300	03/21/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 92.8 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	96.0	16.0	03/21/2019	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 111 % 41-142

Surrogate: 1-Chlorooctadecane 111 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: EAST 1 SIDEWALL (H901079-02)**

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700	
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776	
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76	
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46	
Total BTEx	<0.300	0.300	03/21/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.3 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	03/21/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 108 % 41-142

Surrogate: 1-Chlorooctadecane 105 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: WEST 1 SIDEWALL (H901079-03)**

BTEx 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700	
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776	
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76	
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46	
Total BTEx	<0.300	0.300	03/21/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 93.1 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	03/21/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 113 % 41-142

Surrogate: 1-Chlorooctadecane 109 % 37.6-147

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #5 ( 4.0-4.5' BEB ) (H901079-04)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700	
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776	
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76	
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46	
Total BTX	<0.300	0.300	03/21/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.7 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2160	16.0	03/21/2019	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/20/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/20/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/20/2019	ND					

Surrogate: 1-Chlorooctane 105 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #6 ( 4.0-4.5' BEB ) (H901079-05)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700	
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776	
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76	
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46	
Total BTX	<0.300	0.300	03/21/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.4 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	896	16.0	03/21/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/21/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/21/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/21/2019	ND					

Surrogate: 1-Chlorooctane 97.6 % 41-142

Surrogate: 1-Chlorooctadecane 93.3 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

TETRA TECH  
CLAIR GONZALES  
901 WEST WALL STREET , STE 100  
MIDLAND TX, 79701  
Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #7 ( 4.0-4.5' BEB ) (H901079-06)**

BTX 8021B		mg/kg		Analyzed By: ms					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700	
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776	
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76	
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46	
Total BTEX	<0.300	0.300	03/21/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 93.8 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	03/21/2019	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/21/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/21/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/21/2019	ND					

Surrogate: 1-Chlorooctane 110 % 41-142

Surrogate: 1-Chlorooctadecane 105 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

 TETRA TECH  
 CLAIR GONZALES  
 901 WEST WALL STREET , STE 100  
 MIDLAND TX, 79701  
 Fax To: (432) 682-3946

Received:	03/20/2019	Sampling Date:	03/20/2019
Reported:	03/21/2019	Sampling Type:	Soil
Project Name:	MACHO STATE 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01658 ( 1/28/19 )	Sample Received By:	Tamara Oldaker
Project Location:	COG - LEA CO NM		

**Sample ID: BOTTOM HOLE #8 ( 4.0-4.5' BEB ) (H901079-07)**

BTEx 8021B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	03/21/2019	ND	1.97	98.7	2.00	0.0700		
Toluene*	<0.050	0.050	03/21/2019	ND	1.85	92.6	2.00	0.776		
Ethylbenzene*	<0.050	0.050	03/21/2019	ND	1.89	94.6	2.00	1.76		
Total Xylenes*	<0.150	0.150	03/21/2019	ND	5.75	95.8	6.00	1.46		
Total BTEx	<0.300	0.300	03/21/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.0 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	03/21/2019	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/21/2019	ND	208	104	200	2.86	
DRO >C10-C28*	<10.0	10.0	03/21/2019	ND	206	103	200	3.94	
EXT DRO >C28-C36	<10.0	10.0	03/21/2019	ND					

Surrogate: 1-Chlorooctane 106 % 41-142

Surrogate: 1-Chlorooctadecane 102 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



CLAIR GONZALES

MACHO ST. 1H (1.28.12)

212C-MD-01658

COU-1KE TRAVELED

CARDINAL

CONDIZ MOEHRING

TONY LECARDA

ANALYSIS REQUEST  
(Circle or Specify Method No.)

**Hold**

3.20.19 15:25

Date: Time:

Date: \_\_\_\_\_ Time: \_\_\_\_\_

☒ RUSH: Same Day 24 hr 48 hr 72 hr

Special Report Limits or TRRP Report

(Circle) HAND DELIVERED ) FEDEX UPS Tracking #:

ORIGINAL COPY

## Appendix D

## Lea County, New Mexico

### SE—Simona fine sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* dmr2

*Elevation:* 3,000 to 4,200 feet

*Mean annual precipitation:* 10 to 15 inches

*Mean annual air temperature:* 58 to 62 degrees F

*Frost-free period:* 190 to 205 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Simona and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Simona

##### Setting

*Landform:* Plains

*Landform position (three-dimensional):* Rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Calcareous eolian deposits derived from sedimentary rock

##### Typical profile

*A - 0 to 8 inches:* fine sandy loam

*Bk - 8 to 16 inches:* gravelly fine sandy loam

*Bkm - 16 to 26 inches:* cemented material

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* 7 to 20 inches to petrocalcic

*Natural drainage class:* Well drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 35 percent

*Gypsum, maximum in profile:* 1 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 2.0

*Available water storage in profile:* Very low (about 2.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 6s

*Land capability classification (nonirrigated): 7s*  
*Hydrologic Soil Group: D*  
*Ecological site: Shallow Sandy (R042XC002NM)*  
*Hydric soil rating: No*

#### **Minor Components**

##### **Kimbrough**

*Percent of map unit: 8 percent*  
*Ecological site: Very Shallow 16-21" PZ (R077CY037TX)*  
*Hydric soil rating: No*

##### **Lea**

*Percent of map unit: 7 percent*  
*Ecological site: Limy Upland 16-21" PZ (R077CY028TX)*  
*Hydric soil rating: No*

## **Data Source Information**

Soil Survey Area: Lea County, New Mexico  
Survey Area Data: Version 15, Sep 12, 2018



BLM SERIAL #:

COMPANY REFERENCE:

### 3.1 Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

<u>Species</u>	<u>lb/acre</u>
Plains lovegrass ( <i>Eragrostis intermedia</i> )	0.5
Sand dropseed ( <i>Sporobolus cryptandrus</i> )	1.0
Sideoats grama ( <i>Bouteloua curtipendula</i> )	5.0
Plains bristlegrass ( <i>Setaria macrostachya</i> )	2.0

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed