# SITE INFORMATION

## Report Type: Closure Report

| General Site Information: | | | | | | |
|---|---|---|---|---|---|---|
| **Site:** | GJ West Coop Unit North Tank Battery | | | | | |
| **Company:** | COG Operating LLC | | | | | |
| **Section, Township and Range** | Unit G | Sec 21 | T17S | R29E | | |
| **Lease Number:** | API-30-015-26743 | | | | | |
| **County:** | Eddy County | | | | | |
| **GPS:** | 32.82072° N | | | 104.07665° W | | |
| **Surface Owner:** | State | | | | | |
| **Mineral Owner:** | | | | | | |
| **Directions:** | In Loco Hills, from the intersection of Hwy 82 and CR 217, travel west on Hwy 82 for 5.2 miles. Turn right onto lease road and travel 0.2 miles to location on left. | | | | | |

| Release Data: | |
|---|---|
| *Date Released:* | 2/22/2013 |
| *Type Release:* | Produced Water |
| *Source of Contamination:* | Plug seal on Transfer Pump |
| *Fluid Released:* | 15 bbls |
| *Fluids Recovered:* | 11 bbls |

| Official Communication: | | | |
|---|---|---|---|
| *Name:* | Robert McNeill | | Ike Tavarez |
| *Company:* | COG Operating, LLC | | Tetra Tech |
| *Address:* | One Concho Center | | 4000 N. Big Spring |
| | 600 W. Illinois Ave. | | Suite 401 |
| *City:* | Midland Texas, 79701 | | Midland, Texas |
| *Phone number:* | (432) 686-3023 | | (432) 682-4559 |
| *Fax:* | (432) 684-7137 | | |
| *Email:* | rmcneill@conchoresources.com | | ike.tavarez@tetratech.com |

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

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

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ARTESIA DISTRICT
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November 18, 2013

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

**Re: Closure Report for the COG Operating LLC., GJ West Coop Unit North, Unit G, Section 21, Township 17 South, Range 29 East, Eddy County, New Mexico.**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the GJ West Coop Unit North located in Unit G, Section 21, Township 17 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.82072°, W 104.07665°. 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 February 22, 2013, and released approximately fifteen (15) barrels of produced water from the transfer pump. To alleviate the problem, COG personnel repaired the plug seal on the transfer pump. Eleven (11) barrels of standing fluids were recovered. The spill initiated inside the tank battery and affected an area of approximately 20' X 135'. The initial C-141 form is enclosed in Appendix A.

## Groundwater

No water wells were listed within Section 21. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 100' below surface. The groundwater data is shown in Figure B.

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

## Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

## Soil Assessment and Analytical Results

On March 15, 2013, Tetra Tech personnel inspected and sampled the spill area. Four (4) auger holes (AH-1 through AH-4) were installed using a stainless steel hand auger to assess the impacted soils. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, AH-1 samples exceeded the TPH RRAL, but declined at a depth of 3.0' below surface. The remaining auger holes did not exceed the RRAL for either TPH or BTEX.

Elevated chloride concentrations were detected in all of the auger hole locations. The area of AH-1 did show a deeper chloride impact to the soils. The chloride concentrations declined with depth, but spiked at 8.0' to 1,090 mg/kg.

Auger holes (AH-2 and AH-3) showed bottom auger samples of 1,370 mg/kg at 2-2.5' and 2,770 mg/kg at 1-1.5' below surface and were not vertically defined. Deeper samples were not collected due to the dense formation encountered at the site. The area of AH-3 showed a shallow impact of 3,420 mg/kg at 0-1 and significantly declined to 209 mg/kg at 1-1.5' below surface.

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**Remedial Activities and Conclusion**

On June 13, 2013, Tetra Tech supervised the excavation of contaminated materials at the site as stated in the workplan. The excavation depths of impacted materials removed are highlighted (green) in Table 1 and shown on Figure 4. Based on the results, the area of AH-3 showed a shallow impact and was excavated to approximately 1.0' below surface. To define extents, backhoe trenches were installed in the areas of AH-1, AH-2 and AH-4.

Referring to Table 1, the areas of T-1 and T-2 were vertically defined and significantly declined with depth at 12.0' and 8.0' with chloride concentrations of 432 mg/kg and 133 mg/kg, respectively. In addition, the area of T-3 was defined at 4.0' with a chloride concentration of 685 mg/kg. Based on the field results and proximity to tanks and equipment on site, the areas were excavated to approximately 3.0', 3.5', and 2.0', respectively. A clay liner was installed in the areas of AH-1 and AH-2 to cap the remaining chloride concentrations left in place. The area of AH-3 was excavated to 1.0' below surface.

Approximately 2,560 cubic yards of soil were transported to proper disposal and the excavation backfilled with clean soil to grade.

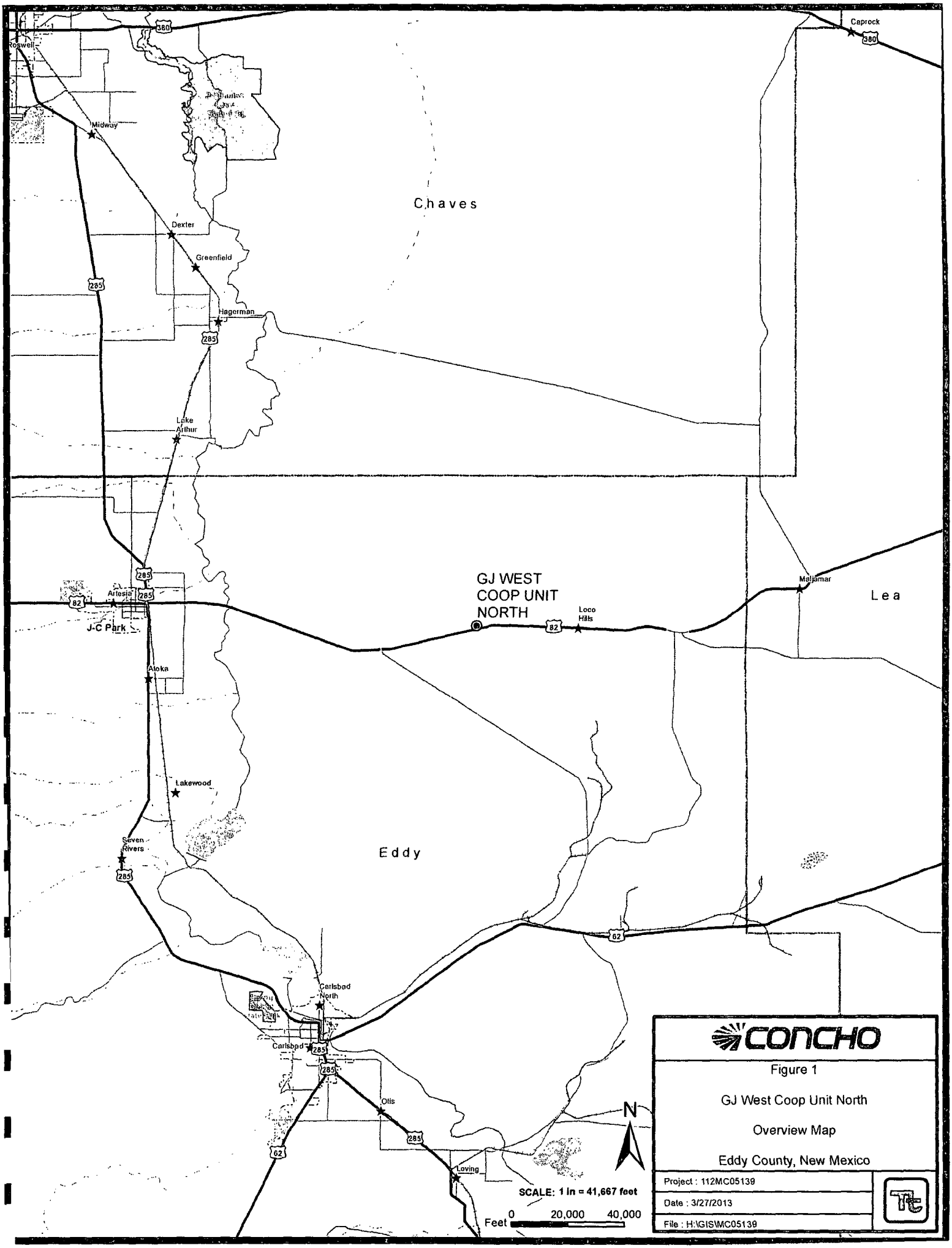
Based on the remedial activities performed, COG requests closure of the site. The final C-141 is included in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

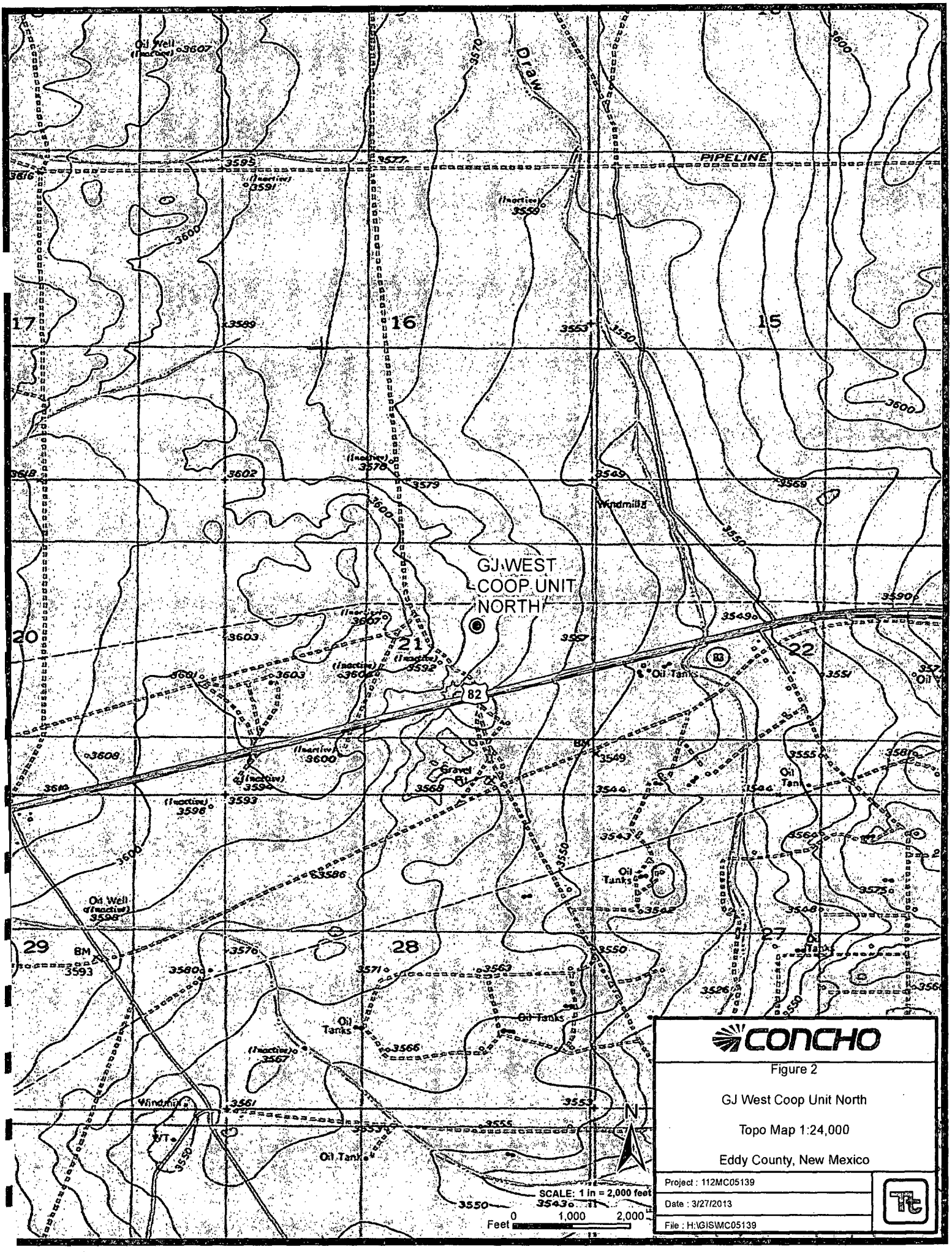
Marcus Kujawski
Staff Scientist

cc: Robert McNeill – COG

# Figures




Drawn By: Isabel Marmolejo




CONCHO

Figure 2

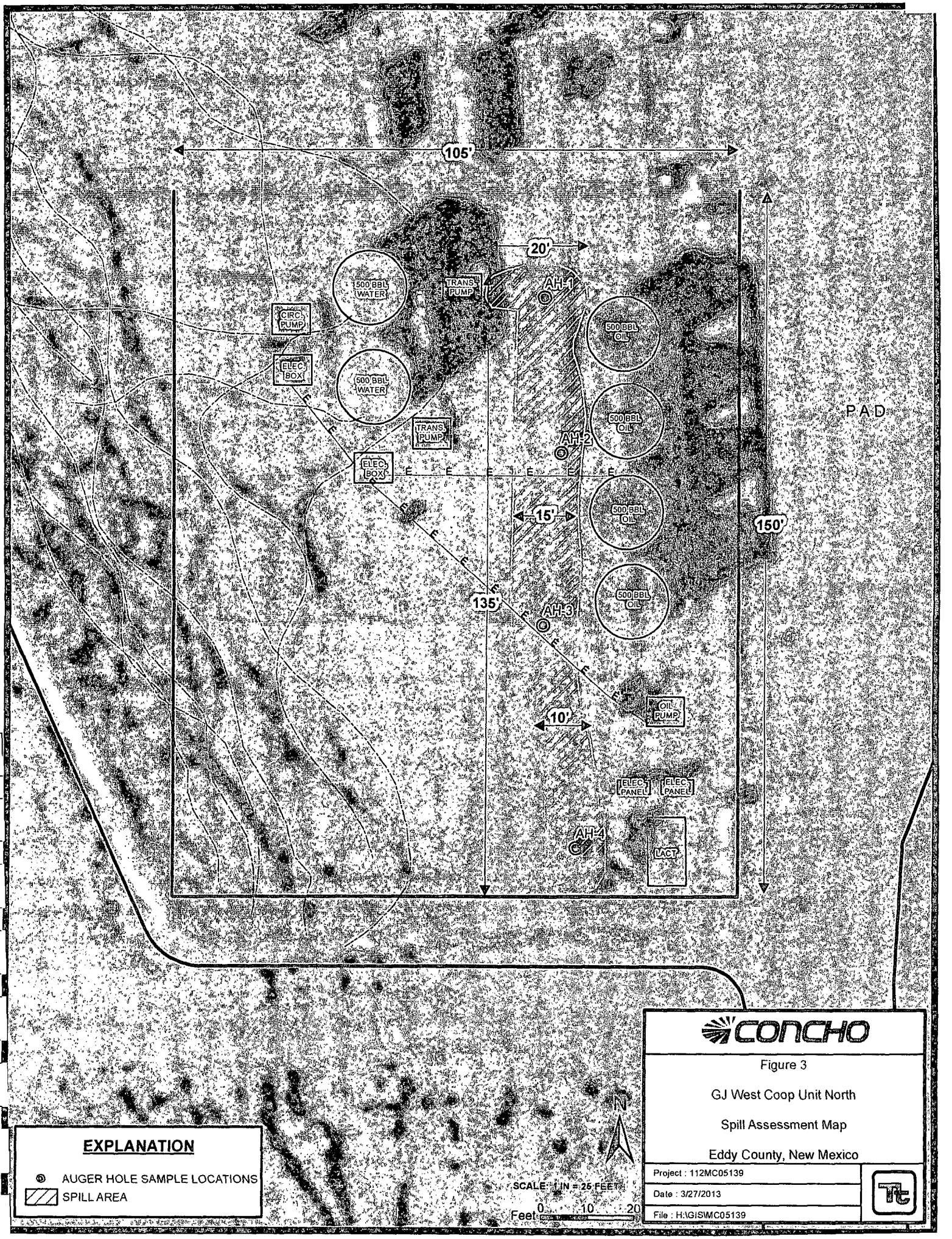
GJ West Coop Unit North

Topo Map 1:24,000

Eddy County, New Mexico

| | |
|---|---|
| Project : 112MC05139 | |
| Date : 3/27/2013 | |
| File : H:\GIS\MC05139 | |

Drawn By: Isabel Mamolpin




## EXPLANATION

- AUGER HOLE SAMPLE LOCATIONS
- SPILL AREA

CONCHO

Figure 3

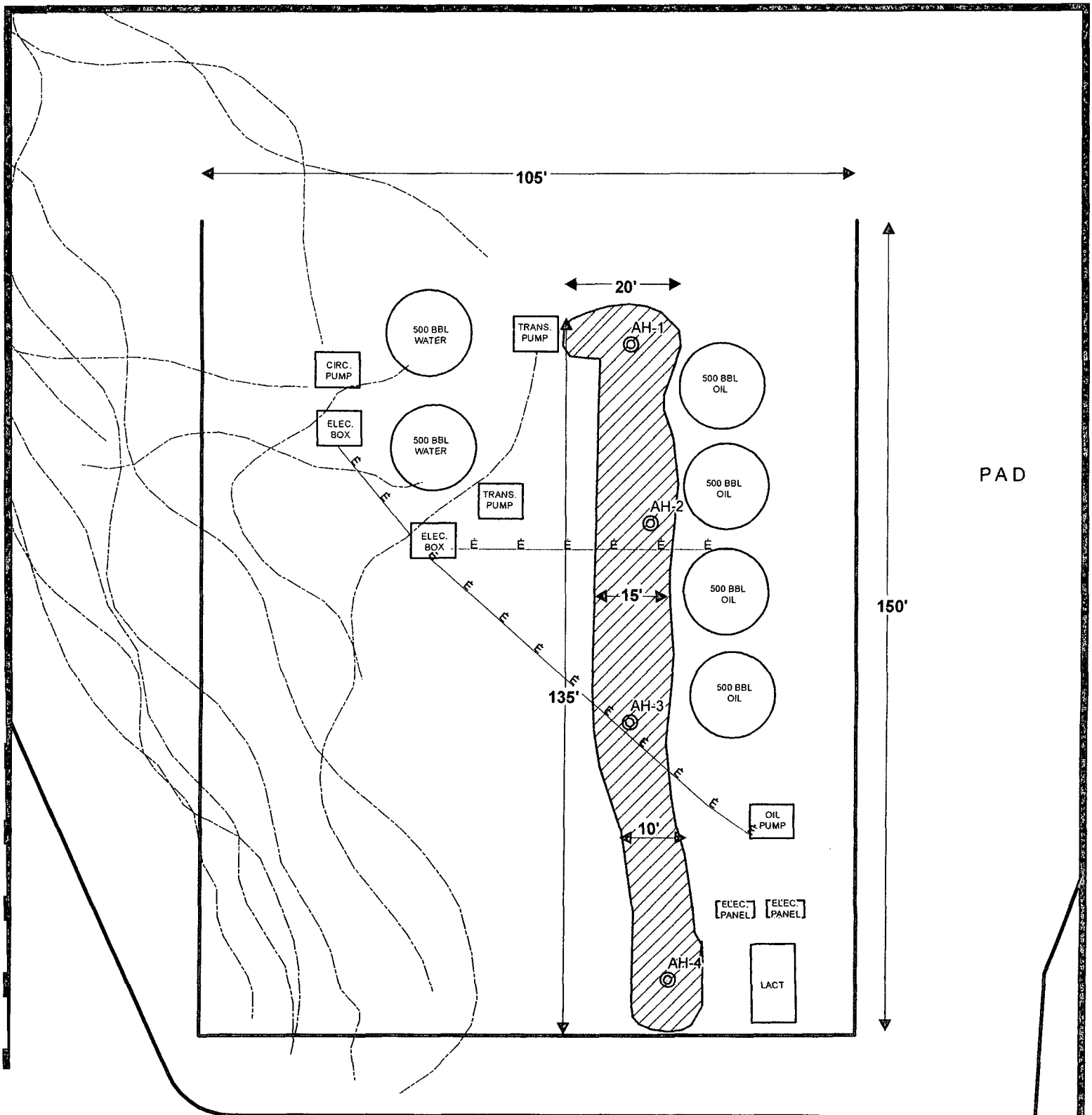
GJ West Coop Unit North

Spill Assessment Map

Eddy County, New Mexico

| | |
|---|---|
| Project : 112MC05139 | |
| Date : 3/27/2013 | |
| File : H:\GIS\MC05139 | |

Drawn By: Isabel Marmolejo




**EXPLANATION**

- AUGER HOLE SAMPLE LOCATIONS
- SPILL AREA

N

SCALE: 1 IN = 25 FEET

Feet 0 10 20

CONCHO

Figure 3

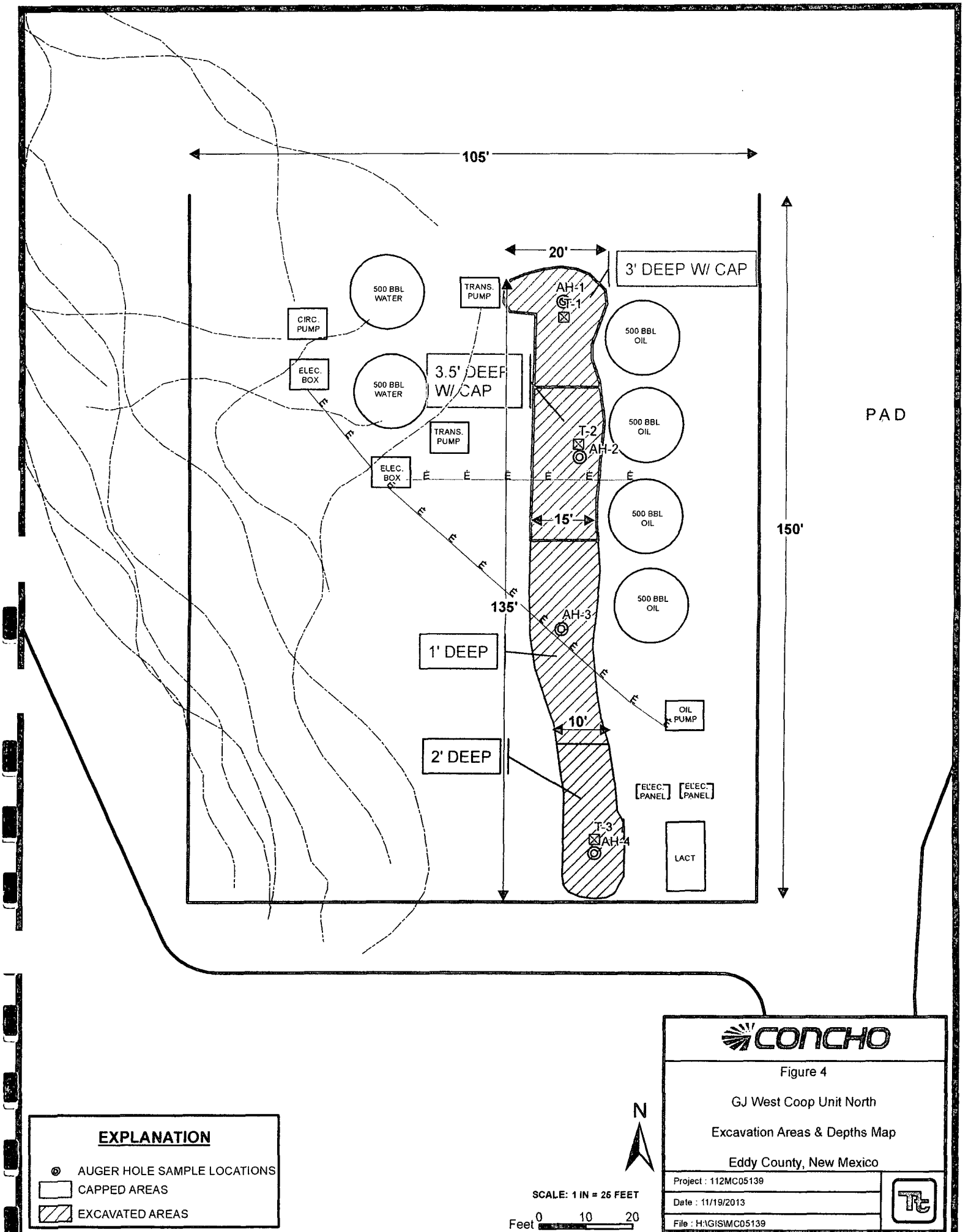
GJ West Coop Unit North

Spill Assessment Map

Eddy County, New Mexico

| | |
|---|---|
| Project : 112MC05139 | |
| Date : 3/27/2013 | |
| File : H:\GIS\MC05139 | |

Drawn By: Isabel Mamolejo




**EXPLANATION**

- AUGER HOLE SAMPLE LOCATIONS
- CAPPED AREAS
- EXCAVATED AREAS

N

SCALE: 1 IN = 25 FEET

Feet 0 10 20

CONCHO

Figure 4

GJ West Coop Unit North

Excavation Areas & Depths Map

Eddy County, New Mexico

| | |
|---|---|
| Project : 112MC05139 | |
| Date : 11/19/2013 | |
| File : H:\GIS\MC05139 | |

Drawn By: Isabel Marmolejo

**Table 1**
**COG Operating LLC.**
**GJ West Co-op Unit North**
**Eddy County, New Mexico**

| Sample ID | Sample Date | BEB Sample Depth (ft) | Excavation Bottom Depth (ft) | Soil Status | | TPH (mg/kg) | | | Benzene (mg/kg) | Toluene (mg/kg) | Ethlybenzene (mg/kg) | Xylene (mg/kg) | Total BTEX (mg/kg) | Chloride (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In-Situ | Removed | GRO | DRO | Total | | | | | | |
| AH-1 | 3/20/2013 | 0-1 | 0 | | X | 1,410 | 4,410 | 5,820 | <0.400 | <0.400 | 2.30 | 8.06 | 10.4 | 4,430 |
| | " | 1-1.5 | " | | X | 949 | 5,060 | 6,009 | | | | | | 1,840 |
| | " | 2-2.5 | " | | X | 880 | 5,990 | 6,870 | | | | | | 1,260 |
| | " | 3-3.5 | 3 | | X | 5.25 | <50.0 | 5.25 | | | | | | 1,090 |
| | " | 4-4.5 | " | X | | - | - | - | - | - | - | - | - | 1,120 |
| | " | 5-5.5 | " | X | | - | - | - | - | - | - | - | - | 950 |
| | " | 6-6.5 | " | X | | - | - | - | - | - | - | - | - | 882 |
| | " | 7-7.5 | " | X | | - | - | - | - | - | - | - | - | 969 |
| | " | 8-8.5 | " | X | | - | - | - | - | - | - | - | - | 1,090 |
| T-1 | 6/13/2013 | 0 | 0 | | X | | | | | | | | | 5,200 |
| | " | 2 | " | | X | | | | | | | | | 2,330 |
| | " | 4 | " | X | | - | - | - | - | - | - | - | - | 2,330 |
| | " | 6 | " | X | | - | - | - | - | - | - | - | - | 1,920 |
| | " | 8 | " | X | | - | - | - | - | - | - | - | - | 1,090 |
| | " | 10 | " | X | | - | - | - | - | - | - | - | - | 2,920 |
| | " | 12 | " | X | | - | - | - | - | - | - | - | - | 432 |
| AH-2 | 3/20/2013 | 0-1 | 0 | | X | <4.00 | <50.0 | <50.0 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | 2,630 |
| | " | 1-1.5 | " | | X | | | | | | | | | 2,090 |
| | " | 2-2.5 | " | | X | | | | | | | | | 1,370 |
| T-2 | 6/14/2013 | 0 | 0 | | X | | | | | | | | | 21,100 |
| | " | 2 | " | | X | | | | | | | | | 2,050 |
| | " | 4 | " | X | | - | - | - | - | - | - | - | - | 3,930 |
| | " | 6 | " | X | | - | - | - | - | - | - | - | - | 1,590 |
| | " | 8 | " | X | | - | - | - | - | - | - | - | - | 133 |
| | " | 10 | " | X | | - | - | - | - | - | - | - | - | 295 |
| | " | 12 | " | X | | - | - | - | - | - | - | - | - | 261 |
| AH-3 | 3/20/2013 | 0-1 | 0 | | X | <4.00 | <50.0 | <50.0 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | 3,420 |
| | " | 1-1.5 | " | X | | - | - | - | - | - | - | - | - | 209 |
| | " | 2-2.5 | " | X | | - | - | - | - | - | - | - | - | 67.9 |

# Table 1
## COG Operating LLC.
## GJ West Co-op Unit North
## Eddy County, New Mexico

| Sample ID | Sample Date | BEB Sample Depth (ft) | Excavation Bottom Depth (ft) | Soil Status | | TPH (mg/kg) | | | Benzene (mg/kg) | Toluene (mg/kg) | Ethlybenzene (mg/kg) | Xylene (mg/kg) | Total BTEX (mg/kg) | Chloride (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | In-Situ | Removed | GRO | DRO | Total | | | | | | |
| AH-4 | 3/20/2013 | 0-1 | 0 | | X | 20.2 | 66.8 | 87.0 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | <0.0200 | 4,370 |
| | " | 1-1.5 | " | | X | - | - | - | - | - | - | - | - | 2,770 |
| T-3 | 6/14/2013 | 0 | 0 | | X | - | - | - | - | - | - | - | - | 1,650 |
| | " | 2 | " | | X | - | - | - | - | - | - | - | - | 1,330 |
| | " | 4 | " | X | | - | - | - | - | - | - | - | - | 685 |
| | " | 6 | " | X | | - | - | - | - | - | - | - | - | 752 |
| | " | 8 | " | X | | - | - | - | - | - | - | - | - | 468 |
| | " | 10 | " | X | | - | - | - | - | - | - | - | - | 444 |
| | " | 12 | " | X | | - | - | - | - | - | - | - | - | 362 |

( - ) Not Analyzed

(BEB) Below Excavation Bottom

Excavated Depths

Clay Material

# Photos

COG Operating LLC
GJ West Coop North Tank
Battery
Eddy County, New Mexico

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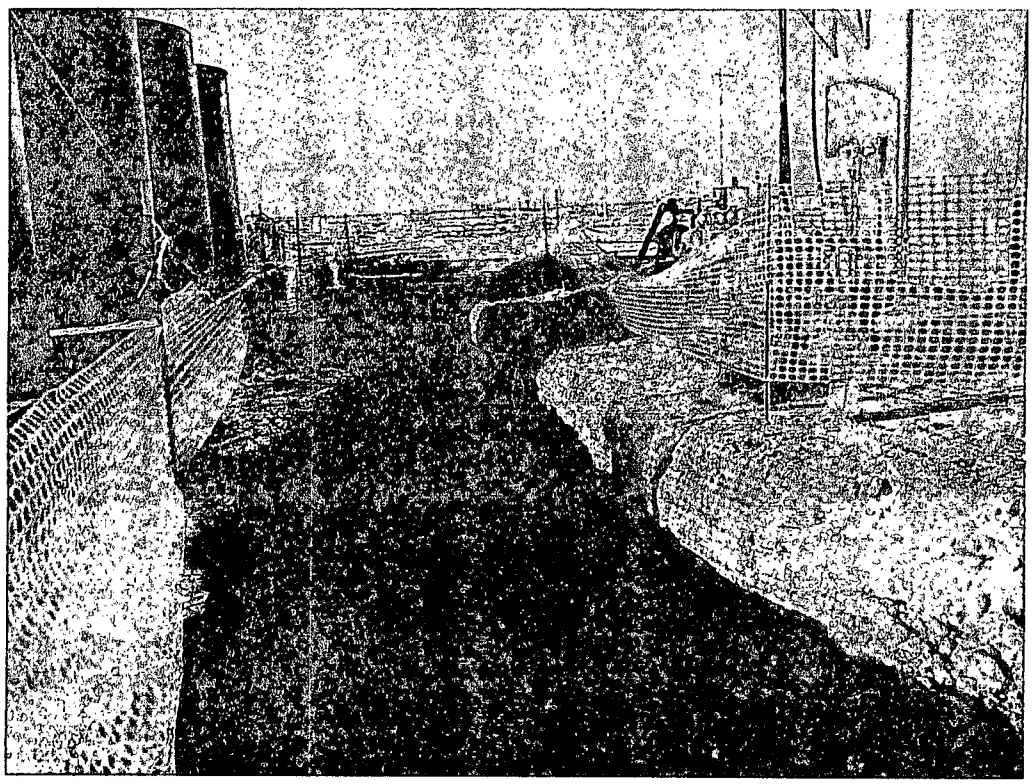
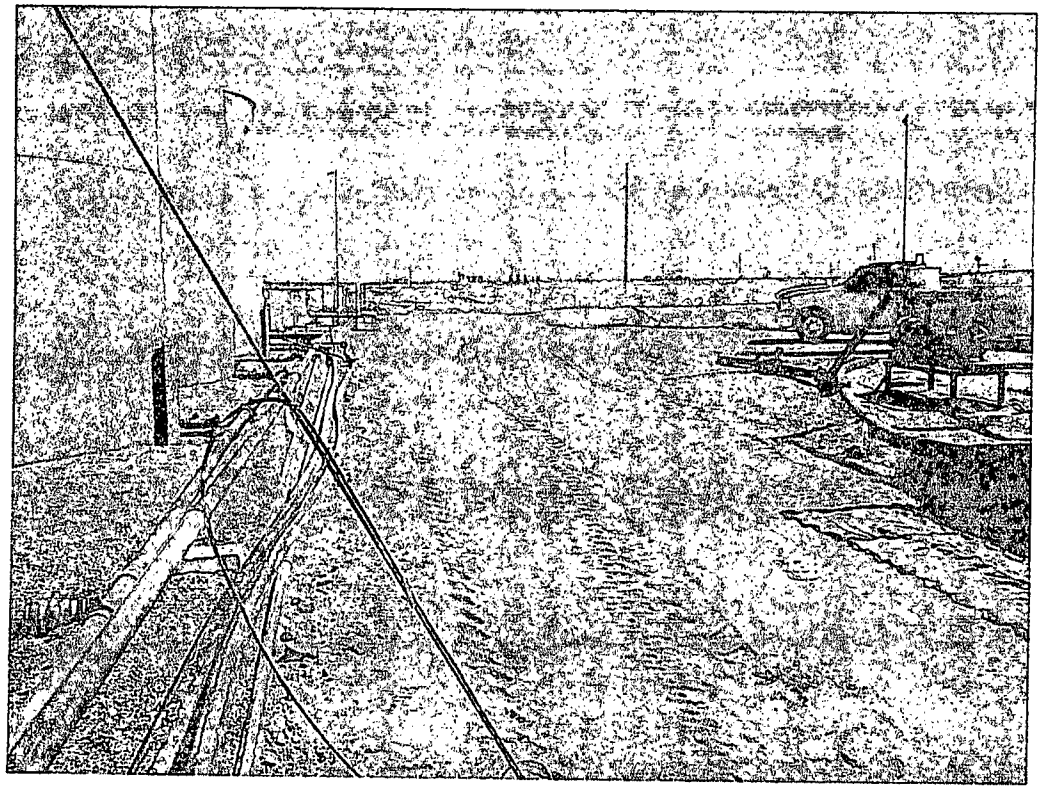
View North – AH-1 area at 1.0'



View South – AH-3 and AH-4 areas

COG Operating LLC
GJ West Coop North Tank
Battery
Eddy County, New Mexico



View South – AH-2 through AH-4 areas backfilled

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# Appendix A

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

| | |
|---|---|
| Name of Company **COG Operating LLC** | Contact **Robert McNeill** |
| Address 600 **W. Illinois Ave, Midland, Texas 79701** | Telephone No. **(432) 685-4332** |
| Facility Name **GJ West Coop Unit North** | Facility Type **Tank Battery** |

| | | |
|---|---|---|
| Surface Owner: State | Mineral Owner | Lease No. (API#) 30-015-26743 |

## LOCATION OF RELEASE

| Unit Letter | Section | Township | Range | Feet from the | North/South Line | Feet from the | East/West Line | County |
|---|---|---|---|---|---|---|---|---|
| G | 21 | 17S | 29E | | | | | |

**Latitude** N 32.82102° **Longitude** W 104.07601°

## NATURE OF RELEASE

| | | |
|---|---|---|
| Type of Release: Produced Water | Volume of Release 15 bbls | Volume Recovered 11 bbls |
| Source of Release: Plug seal failed on valute covering on transfer pump | Date and Hour of Occurrence 2/22/2013 | Date and Hour of Discovery 2/22/2013 7:00 am |
| Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required | If YES, To Whom? | |
| By Whom? | Date and Hour | |
| Was a Watercourse Reached? ☐ Yes ☒ No | If YES, Volume Impacting the Watercourse. N/A | |

If a Watercourse was Impacted, Describe Fully.*

N/A

**NM OIL CONSERVATION**
ARTESIA DISTRICT
JUN 04 2014
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Describe Cause of Problem and Remedial Action Taken.*

The valute covering had the wrong material for the plug. Replaced the failed plug with a stainless plug.

Describe Area Affected and Cleanup Action Taken.*

Initially approximately 15 bbls were released due to a faulty seal on the transfer pump. 11 bbls were recovered by a vacuum truck and all free fluids were recovered. The spill was contained inside the facility walls. Tetra Tech inspected site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade 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.

| | |
|---|---|
| Signature: | OIL CONSERVATION DIVISION |
| Printed Name: Ike Tavarez | Approved by District Supervisor: |
| Title: Project Manager | Approval Date: / Expiration Date: |
| E-mail Address: Ike.Tavarez@TetraTech.com | Conditions of Approval: / Attached ☐ |
| Date: 11/18/2013 Phone: (432) 682-4559 | |

* Attach Additional Sheets If Necessary

# Appendix B

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

**16 South 28 East**

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

**16 South 29 East**

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

**16 South 30 East**

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

**17 South 28 East**

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

**17 South 29 East**

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

**17 South 30 East**

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

**18 South 28 East**

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

**18 South 29 East**

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

**18 South 30 East**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 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
- Field water level
- New Mexico Water and Infrastructure Data System

# Appendix C

# Summary Report

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

Report Date: March 29, 2013

Work Order: 13032140

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 324247 | AH-1 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324248 | AH-1 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324249 | AH-1 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324250 | AH-1 3-3.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324251 | AH-1 4-4.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324252 | AH-1 5-5.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324253 | AH-1 6-6.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324254 | AH-1 7-7.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324255 | AH-1 8-8.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324256 | AH-2 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324257 | AH-2 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324258 | AH-2 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324259 | AH-3 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324260 | AH-3 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324261 | AH-3 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324262 | AH-4 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324263 | AH-4 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |

| Sample - Field Code | BTEX Benzene (mg/Kg) | BTEX Toluene (mg/Kg) | BTEX Ethylbenzene (mg/Kg) | BTEX Xylene (mg/Kg) | TPH DRO - NEW DRO (mg/Kg) | TPH GRO GRO (mg/Kg) |
|---|---|---|---|---|---|---|
| **324247 - AH-1 0-1'** | <0.400 [1] | <0.400 | **2.30** | **8.06** | **4410** | **1410** Qs |
| **324248 - AH-1 1-1.5'** | | | | | **5060** | **949** |
| **324249 - AH-1 2-2.5'** | | | | | **5990** Qs | **880** |
| **324250 - AH-1 3-3.5'** | | | | | <50.0 Qs | **5.25** |
| **324256 - AH-2 0-1'** | <0.0200 | <0.0200 | <0.0200 | <0.0200 | <50.0 | <4.00 Qs |
| **324259 - AH-3 0-1'** | <0.0200 | <0.0200 | <0.0200 | <0.0200 | <50.0 | <4.00 Qs |

*continued ...*

[1] Dilution due to hydrocarbons.

*... continued*

| Sample - Field Code | BTEX Benzene (mg/Kg) | Toluene (mg/Kg) | Ethylbenzene (mg/Kg) | Xylene (mg/Kg) | TPH DRO - NEW DRO (mg/Kg) | TPH GRO GRO (mg/Kg) |
|---|---|---|---|---|---|---|
| **324262 - AH-4 0-1'** | <0.0200 | <0.0200 | <0.0200 | <0.0200 | **66.8** | **20.2** Qs |

**Sample: 324247 - AH-1 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **4430** | mg/Kg | 4 |

**Sample: 324248 - AH-1 1-1.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1840** | mg/Kg | 4 |

**Sample: 324249 - AH-1 2-2.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1260** | mg/Kg | 4 |

**Sample: 324250 - AH-1 3-3.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1090** | mg/Kg | 4 |

**Sample: 324251 - AH-1 4-4.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1120** | mg/Kg | 4 |

**Sample: 324252 - AH-1 5-5.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **950** | mg/Kg | 4 |

**Sample: 324253 - AH-1 6-6.5'**

*continued ...*

*sample 324253 continued ...*

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **882** | mg/Kg | 4 |

**Sample: 324254 - AH-1 7-7.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **969** | mg/Kg | 4 |

**Sample: 324255 - AH-1 8-8.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1090** | mg/Kg | 4 |

**Sample: 324256 - AH-2 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2630** | mg/Kg | 4 |

**Sample: 324257 - AH-2 1-1.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2090** | mg/Kg | 4 |

**Sample: 324258 - AH-2 2-2.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1370** | mg/Kg | 4 |

**Sample: 324259 - AH-3 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **3420** | mg/Kg | 4 |

**Sample: 324260 - AH-3 1-1.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **209** | mg/Kg | 4 |

**Sample: 324261 - AH-3 2-2.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **67.9** | mg/Kg | 4 |

**Sample: 324262 - AH-4 0-1'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **4370** | mg/Kg | 4 |

**Sample: 324263 - AH-4 1-1.5'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2770** | mg/Kg | 4 |

TRACEANALYSIS, INC.

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## 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: March 29, 2013

Work Order: 13032140

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

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

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 324247 | AH-1 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324248 | AH-1 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324249 | AH-1 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324250 | AH-1 3-3.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324251 | AH-1 4-4.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324252 | AH-1 5-5.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324253 | AH-1 6-6.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324254 | AH-1 7-7.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324255 | AH-1 8-8.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324256 | AH-2 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324257 | AH-2 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324258 | AH-2 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324259 | AH-3 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324260 | AH-3 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324261 | AH-3 2-2.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324262 | AH-4 0-1' | soil | 2013-03-20 | 00:00 | 2013-03-21 |
| 324263 | AH-4 1-1.5' | soil | 2013-03-20 | 00:00 | 2013-03-21 |

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 36 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

# Report Contents

# Case Narrative

Samples for project COG/GJ West Co-op Unit North were received by TraceAnalysis, Inc. on 2013-03-21 and assigned to work order 13032140. Samples for work order 13032140 were received intact at a temperature of 4.3 C.

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

| Test | Method | Prep Batch | Prep Date | QC Batch | Analysis Date |
|---|---|---|---|---|---|
| BTEX | S 8021B | 84755 | 2013-03-27 at 09:59 | 100054 | 2013-03-27 at 10:07 |
| Chloride (Titration) | SM 4500-Cl B | 84773 | 2013-03-26 at 12:26 | 100116 | 2013-03-29 at 11:12 |
| Chloride (Titration) | SM 4500-Cl B | 84773 | 2013-03-26 at 12:26 | 100130 | 2013-03-29 at 14:34 |
| TPH DRO - NEW | S 8015 D | 84737 | 2013-03-25 at 10:00 | 100032 | 2013-03-26 at 11:30 |
| TPH DRO - NEW | S 8015 D | 84785 | 2013-03-27 at 08:00 | 100084 | 2013-03-28 at 08:53 |
| TPH DRO - NEW | S 8015 D | 84805 | 2013-03-28 at 08:00 | 100104 | 2013-03-29 at 08:43 |
| TPH GRO | S 8015 D | 84757 | 2013-03-27 at 10:20 | 100055 | 2013-03-27 at 10:21 |
| TPH GRO | S 8015 D | 84824 | 2013-03-29 at 14:04 | 100129 | 2013-03-29 at 14:05 |

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 13032140 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.

# Analytical Report

**Sample: 324247 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 100054 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84755 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene | U | 1 | <0.400 | mg/Kg | 20 | 0.0200 |
| Toluene | | 1 | <0.400 | mg/Kg | 20 | 0.0200 |
| Ethylbenzene | | 1 | **2.30** | mg/Kg | 20 | 0.0200 |
| Xylene | | 1 | **8.06** | mg/Kg | 20 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 37.2 | mg/Kg | 20 | 40.0 | 93 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 37.2 | mg/Kg | 20 | 40.0 | 93 | 70 - 130 |

**Sample: 324247 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **4430** | mg/Kg | 10 | 4.00 |

**Sample: 324247 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100032 | Date Analyzed: | 2013-03-26 | Analyzed By: | CW |
| Prep Batch: | 84737 | Sample Preparation: | 2013-03-25 | Prepared By: | CW |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | **4410** | mg/Kg | 5 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | 468 | mg/Kg | 5 | 100 | 468 | 70 - 130 |

**Sample: 324247 - AH-1 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100055 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84757 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Qs | 1 | **1410** | mg/Kg | 20 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 34.0 | mg/Kg | 20 | 40.0 | 85 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | Qsr | Qsr | 58.0 | mg/Kg | 20 | 40.0 | 145 | 70 - 130 |

**Sample: 324248 - AH-1 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1840** | mg/Kg | 10 | 4.00 |

**Sample: 324248 - AH-1 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100084 | Date Analyzed: | 2013-03-28 | Analyzed By: | CW |
| Prep Batch: | 84785 | Sample Preparation: | 2013-03-27 | Prepared By: | CW |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | **5060** | mg/Kg | 5 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsc | Qsc | 444 | mg/Kg | 5 | 100 | 444 | 70 - 130 |

**Sample: 324248 - AH-1 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100129 | Date Analyzed: | 2013-03-29 | Analyzed By: | AH |
| Prep Batch: | 84824 | Sample Preparation: | 2013-03-28 | Prepared By: | AH |

| Parameter | Flag | Cert | Result | RL | Units | Dilution | RL |
|---|---|---|---|---|---|---|---|
| GRO | | 1 | **949** | | mg/Kg | 20 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 35.7 | mg/Kg | 20 | 40.0 | 89 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 48.0 | mg/Kg | 20 | 40.0 | 120 | 70 - 130 |

**Sample: 324249 - AH-1 2-2.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL | Units | Dilution | RL |
|---|---|---|---|---|---|---|---|
| Chloride | | | **1260** | | mg/Kg | 10 | 4.00 |

**Sample: 324249 - AH-1 2-2.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100104 | Date Analyzed: | 2013-03-29 | Analyzed By: | CW |
| Prep Batch: | 84805 | Sample Preparation: | 2013-03-28 | Prepared By: | CW |

| Parameter | Flag | Cert | Result | RL | Units | Dilution | RL |
|---|---|---|---|---|---|---|---|
| DRO | Qs | 1 | **5990** | | mg/Kg | 5 | 50.0 |

| Surrogate | | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | | 480 | mg/Kg | 5 | 100 | 480 | 70 - 130 |

**Sample: 324249 - AH-1 2-2.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100129 | Date Analyzed: | 2013-03-29 | Analyzed By: | AH |
| Prep Batch: | 84824 | Sample Preparation: | 2013-03-28 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | | 1 | **880** | mg/Kg | 20 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 34.9 | mg/Kg | 20 | 40.0 | 87 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 44.1 | mg/Kg | 20 | 40.0 | 110 | 70 - 130 |

**Sample: 324250 - AH-1 3-3.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1090** | mg/Kg | 10 | 4.00 |

**Sample: 324250 - AH-1 3-3.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100104 | Date Analyzed: | 2013-03-29 | Analyzed By: | CW |
| Prep Batch: | 84805 | Sample Preparation: | 2013-03-28 | Prepared By: | CW |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | Jb,Qs | 1 | <50.0 | mg/Kg | 1 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 113 | mg/Kg | 1 | 100 | 113 | 70 - 130 |

**Sample: 324250 - AH-1 3-3.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100129 | Date Analyzed: | 2013-03-29 | Analyzed By: | AH |
| Prep Batch: | 84824 | Sample Preparation: | 2013-03-28 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | | | **5.25** | mg/Kg | 1 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.74 | mg/Kg | 1 | 2.00 | 87 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.92 | mg/Kg | 1 | 2.00 | 96 | 70 - 130 |

**Sample: 324251 - AH-1 4-4.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1120** | mg/Kg | 10 | 4.00 |

**Sample: 324252 - AH-1 5-5.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

*continued ...*

*sample 324252 continued ...*

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **950** | mg/Kg | 10 | 4.00 |

**Sample: 324253 - AH-1 6-6.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **882** | mg/Kg | 10 | 4.00 |

**Sample: 324254 - AH-1 7-7.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100116 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **969** | mg/Kg | 10 | 4.00 |

**Sample: 324255 - AH-1 8-8.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1090** | mg/Kg | 10 | 4.00 |

**Sample: 324256 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 100054 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84755 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Toluene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Ethylbenzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Xylene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.90 | mg/Kg | 1 | 2.00 | 95 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.81 | mg/Kg | 1 | 2.00 | 90 | 70 - 130 |

**Sample: 324256 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2630** | mg/Kg | 10 | 4.00 |

**Sample: 324256 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100032 | Date Analyzed: | 2013-03-26 | Analyzed By: | CW |
| Prep Batch: | 84737 | Sample Preparation: | 2013-03-25 | Prepared By: | CW |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | | 1 | <50.0 | mg/Kg | 1 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 94.8 | mg/Kg | 1 | 100 | 95 | 70 - 130 |

**Sample: 324256 - AH-2 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100055 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84757 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Qs | 1 | <4.00 | mg/Kg | 1 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.70 | mg/Kg | 1 | 2.00 | 85 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.85 | mg/Kg | 1 | 2.00 | 92 | 70 - 130 |

**Sample: 324257 - AH-2 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2090** | mg/Kg | 10 | 4.00 |

**Sample: 324258 - AH-2 2-2.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1370** | mg/Kg | 10 | 4.00 |

**Sample: 324259 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 100054 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84755 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Toluene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Ethylbenzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Xylene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.91 | mg/Kg | 1 | 2.00 | 96 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.74 | mg/Kg | 1 | 2.00 | 87 | 70 - 130 |

**Sample: 324259 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **3420** | mg/Kg | 10 | 4.00 |

**Sample: 324259 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100032 | Date Analyzed: | 2013-03-26 | Analyzed By: | CW |
| Prep Batch: | 84737 | Sample Preparation: | 2013-03-25 | Prepared By: | CW |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | J6 | 1 | <50.0 | mg/Kg | 1 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 82.4 | mg/Kg | 1 | 100 | 82 | 70 - 130 |

**Sample: 324259 - AH-3 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100055 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84757 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Q5 | 1 | <4.00 | mg/Kg | 1 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.71 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.73 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |

**Sample: 324260 - AH-3 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **209** | mg/Kg | 5 | 4.00 |

**Sample: 324261 - AH-3 2-2.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **67.9** | mg/Kg | 5 | 4.00 |

**Sample: 324262 - AH-4 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | BTEX | Analytical Method: | S 8021B | Prep Method: | S 5035 |
| QC Batch: | 100054 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84755 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Benzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Toluene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Ethylbenzene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |
| Xylene | U | 1 | <0.0200 | mg/Kg | 1 | 0.0200 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.90 | mg/Kg | 1 | 2.00 | 95 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.72 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |

**Sample: 324262 - AH-4 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **4370** | mg/Kg | 10 | 4.00 |

**Sample: 324262 - AH-4 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH DRO - NEW | Analytical Method: | S 8015 D | Prep Method: | N/A |
| QC Batch: | 100032 | Date Analyzed: | 2013-03-26 | Analyzed By: | CW |
| Prep Batch: | 84737 | Sample Preparation: | 2013-03-25 | Prepared By: | CW |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| DRO | B | 1 | **66.8** | mg/Kg | 1 | 50.0 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 106 | mg/Kg | 1 | 100 | 106 | 70 - 130 |

**Sample: 324262 - AH-4 0-1'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | TPH GRO | Analytical Method: | S 8015 D | Prep Method: | S 5035 |
| QC Batch: | 100055 | Date Analyzed: | 2013-03-27 | Analyzed By: | AH |
| Prep Batch: | 84757 | Sample Preparation: | 2013-03-26 | Prepared By: | AH |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| GRO | Qs | 1 | **20.2** | mg/Kg | 1 | 4.00 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.70 | mg/Kg | 1 | 2.00 | 85 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.83 | mg/Kg | 1 | 2.00 | 92 | 70 - 130 |

**Sample: 324263 - AH-4 1-1.5'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | Sample Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2770** | mg/Kg | 10 | 4.00 |

# Method Blanks

**Method Blank (1)** QC Batch: 100032

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW
Prep Batch: 84737 | QC Preparation: 2013-03-25 | Prepared By: CW

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| DRO | | 1 | 21.7 | mg/Kg | 50 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 97.3 | mg/Kg | 1 | 100 | 97 | 70 - 130 |

**Method Blank (1)** QC Batch: 100054

QC Batch: 100054 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84755 | QC Preparation: 2013-03-27 | Prepared By: AH

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Benzene | | 1 | <0.00810 | mg/Kg | 0.02 |
| Toluene | | 1 | <0.00750 | mg/Kg | 0.02 |
| Ethylbenzene | | 1 | <0.00730 | mg/Kg | 0.02 |
| Xylene | | 1 | <0.00700 | mg/Kg | 0.02 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.91 | mg/Kg | 1 | 2.00 | 96 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.79 | mg/Kg | 1 | 2.00 | 90 | 70 - 130 |

**Method Blank (1)** QC Batch: 100055

QC Batch: 100055 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84757 | QC Preparation: 2013-03-27 | Prepared By: AH

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| GRO | | | <2.32 | mg/Kg | 4 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.72 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.75 | mg/Kg | 1 | 2.00 | 88 | 70 - 130 |

**Method Blank (1)** QC Batch: 100084

QC Batch: 100084 | Date Analyzed: 2013-03-28 | Analyzed By: CW
Prep Batch: 84785 | QC Preparation: 2013-03-27 | Prepared By: CW

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| DRO | | | 8.83 | mg/Kg | 50 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 102 | mg/Kg | 1 | 100 | 102 | 70 - 130 |

**Method Blank (1)** QC Batch: 100104

QC Batch: 100104 | Date Analyzed: 2013-03-29 | Analyzed By: CW
Prep Batch: 84805 | QC Preparation: 2013-03-28 | Prepared By: CW

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| DRO | | | 13.0 | mg/Kg | 50 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | | | 106 | mg/Kg | 1 | 100 | 106 | 70 - 130 |

**Method Blank (1)** QC Batch: 100116

QC Batch: 100116 | Date Analyzed: 2013-03-29 | Analyzed By: AR
Prep Batch: 84773 | QC Preparation: 2013-03-26 | Prepared By: AR

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

**Method Blank (1)** QC Batch: 100129

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 100129 | Date Analyzed: | 2013-03-29 | Analyzed By: | AH |
| Prep Batch: | 84824 | QC Preparation: | 2013-03-29 | Prepared By: | AH |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| GRO | | | <2.32 | mg/Kg | 4 |

| Surrogate | Flag | Cert | Result | Units | Dilution | Spike Amount | Percent Recovery | Recovery Limits |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | | | 1.74 | mg/Kg | 1 | 2.00 | 87 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | | | 1.72 | mg/Kg | 1 | 2.00 | 86 | 70 - 130 |

**Method Blank (1)** QC Batch: 100130

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 100130 | Date Analyzed: | 2013-03-29 | Analyzed By: | AR |
| Prep Batch: | 84773 | QC Preparation: | 2013-03-26 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

# Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW
Prep Batch: 84737 | QC Preparation: 2013-03-25 | Prepared By: CW

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 255 | mg/Kg | 1 | 250 | 21.7 | 93 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 259 | mg/Kg | 1 | 250 | 21.7 | 95 | 70 - 130 | 2 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 112 | 114 | mg/Kg | 1 | 100 | 112 | 114 | 70 - 130 |

### Laboratory Control Spike (LCS-1)

QC Batch: 100054 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84755 | QC Preparation: 2013-03-27 | Prepared By: AH

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.92 | mg/Kg | 1 | 2.00 | <0.00810 | 96 | 70 - 130 |
| Toluene | | 1 | 1.89 | mg/Kg | 1 | 2.00 | <0.00750 | 94 | 70 - 130 |
| Ethylbenzene | | 1 | 1.90 | mg/Kg | 1 | 2.00 | <0.00730 | 95 | 70 - 130 |
| Xylene | | 1 | 5.69 | mg/Kg | 1 | 6.00 | <0.00700 | 95 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.87 | mg/Kg | 1 | 2.00 | <0.00810 | 94 | 70 - 130 | 3 | 20 |
| Toluene | | 1 | 1.83 | mg/Kg | 1 | 2.00 | <0.00750 | 92 | 70 - 130 | 3 | 20 |
| Ethylbenzene | | 1 | 1.85 | mg/Kg | 1 | 2.00 | <0.00730 | 92 | 70 - 130 | 3 | 20 |
| Xylene | | 1 | 5.57 | mg/Kg | 1 | 6.00 | <0.00700 | 93 | 70 - 130 | 2 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.90 | 1.91 | mg/Kg | 1 | 2.00 | 95 | 96 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.83 | 1.86 | mg/Kg | 1 | 2.00 | 92 | 93 | 70 - 130 |

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

QC Batch: 100055 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84757 | QC Preparation: 2013-03-27 | Prepared By: AH

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 17.9 | mg/Kg | 1 | 20.0 | <2.32 | 90 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 18.9 | mg/Kg | 1 | 20.0 | <2.32 | 94 | 70 - 130 | 5 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.72 | 1.77 | mg/Kg | 1 | 2.00 | 86 | 88 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.83 | 1.84 | mg/Kg | 1 | 2.00 | 92 | 92 | 70 - 130 |

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

QC Batch: 100084 | Date Analyzed: 2013-03-28 | Analyzed By: CW
Prep Batch: 84785 | QC Preparation: 2013-03-27 | Prepared By: CW

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 231 | mg/Kg | 1 | 250 | 8.83 | 89 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 229 | mg/Kg | 1 | 250 | 8.83 | 88 | 70 - 130 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 107 | 110 | mg/Kg | 1 | 100 | 107 | 110 | 70 - 130 |

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

QC Batch: 100104 | Date Analyzed: 2013-03-29 | Analyzed By: CW
Prep Batch: 84805 | QC Preparation: 2013-03-28 | Prepared By: CW

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 251 | mg/Kg | 1 | 250 | 13 | 95 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 255 | mg/Kg | 1 | 250 | 13 | 97 | 70 - 130 | 2 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 114 | 115 | mg/Kg | 1 | 100 | 114 | 115 | 70 - 130 |

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

QC Batch: 100116 | Date Analyzed: 2013-03-29 | Analyzed By: AR
Prep Batch: 84773 | QC Preparation: 2013-03-26 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2600 | mg/Kg | 1 | 2500 | <3.85 | 104 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2510 | mg/Kg | 1 | 2500 | <3.85 | 100 | 85 - 115 | 4 | 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: 100129 | Date Analyzed: 2013-03-29 | Analyzed By: AH
Prep Batch: 84824 | QC Preparation: 2013-03-29 | Prepared By: AH

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | 17.8 | mg/Kg | 1 | 20.0 | <2.32 | 89 | 70 - 130 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | 2 | 1 | 17.5 | mg/Kg | 1 | 20.0 | <2.32 | 88 | 70 - 130 | 2 | 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 | Dil. | Spike Amount | LCS Rec. | LCSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.89 | 1.77 | mg/Kg | 1 | 2.00 | 94 | 88 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.80 | 1.78 | mg/Kg | 1 | 2.00 | 90 | 89 | 70 - 130 |

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

QC Batch: 100130 | Date Analyzed: 2013-03-29 | Analyzed By: AR
Prep Batch: 84773 | QC Preparation: 2013-03-26 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2380 | mg/Kg | 1 | 2500 | <3.85 | 95 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2530 | mg/Kg | 1 | 2500 | <3.85 | 101 | 85 - 115 | 6 | 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: 323806

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW
Prep Batch: 84737 | QC Preparation: 2013-03-25 | Prepared By: CW

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 263 | mg/Kg | 1 | 250 | <6.88 | 105 | 70 - 130 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 284 | mg/Kg | 1 | 250 | <6.88 | 114 | 70 - 130 | 8 | 20 |

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

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| n-Tricosane | 113 | 118 | mg/Kg | 1 | 100 | 113 | 118 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 324601

QC Batch: 100054 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84755 | QC Preparation: 2013-03-27 | Prepared By: AH

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.93 | mg/Kg | 1 | 2.00 | <0.00810 | 96 | 70 - 130 |
| Toluene | | 1 | 1.97 | mg/Kg | 1 | 2.00 | <0.00750 | 98 | 70 - 130 |
| Ethylbenzene | | 1 | 2.06 | mg/Kg | 1 | 2.00 | <0.00730 | 103 | 70 - 130 |
| Xylene | | 1 | 6.13 | mg/Kg | 1 | 6.00 | <0.00700 | 102 | 70 - 130 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | 1.71 | mg/Kg | 1 | 2.00 | <0.00810 | 86 | 70 - 130 | 12 | 20 |
| Toluene | | 1 | 1.73 | mg/Kg | 1 | 2.00 | <0.00750 | 86 | 70 - 130 | 13 | 20 |
| Ethylbenzene | | 1 | 1.81 | mg/Kg | 1 | 2.00 | <0.00730 | 90 | 70 - 130 | 13 | 20 |
| Xylene | | 1 | 5.41 | mg/Kg | 1 | 6.00 | <0.00700 | 90 | 70 - 130 | 12 | 20 |

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

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.92 | 1.93 | mg/Kg | 1 | 2 | 96 | 96 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.70 | 1.80 | mg/Kg | 1 | 2 | 85 | 90 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 324225

QC Batch: 100055 | Date Analyzed: 2013-03-27 | Analyzed By: AH
Prep Batch: 84757 | QC Preparation: 2013-03-27 | Prepared By: AH

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| GRO | Qs | Qs | 15.2 | mg/Kg | 1 | 20.0 | 6.58 | 43 | 70 - 130 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | Qs | Qs | 14.3 | mg/Kg | 1 | 20.0 | 6.58 | 39 | 70 - 130 | 6 | 20 |

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

| Surrogate | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|
| Trifluorotoluene (TFT) | 1.63 | 1.69 | mg/Kg | 1 | 2 | 82 | 84 | 70 - 130 |
| 4-Bromofluorobenzene (4-BFB) | 1.92 | 1.86 | mg/Kg | 1 | 2 | 96 | 93 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 324248

QC Batch: 100084 | Date Analyzed: 2013-03-28 | Analyzed By: CW
Prep Batch: 84785 | QC Preparation: 2013-03-27 | Prepared By: CW

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 5310 | mg/Kg | 5 | 250 | 5060 | 100 | 70 - 130 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | 5320 | mg/Kg | 5 | 250 | 5060 | 104 | 70 - 130 | 0 | 20 |

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

| Surrogate | | | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | 596 | 474 | mg/Kg | 5 | 100 | 596 | 474 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 324249

QC Batch: 100104 | Date Analyzed: 2013-03-29 | Analyzed By: CW
Prep Batch: 84805 | QC Preparation: 2013-03-28 | Prepared By: CW

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| DRO | Qs | Qs | 4890 | mg/Kg | 5 | 250 | 5990 | -440 | 70 - 130 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DRO | Qs | Qs | 4930 | mg/Kg | 5 | 250 | 5990 | -424 | 70 - 130 | 1 | 20 |

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

| Surrogate | | | MS Result | MSD Result | Units | Dil. | Spike Amount | MS Rec. | MSD Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| n-Tricosane | Qsr | Qsr | 474 | 430 | mg/Kg | 5 | 100 | 474 | 430 | 70 - 130 |

**Matrix Spike (MS-1)** Spiked Sample: 324254

QC Batch: 100116 | Date Analyzed: 2013-03-29 | Analyzed By: AR
Prep Batch: 84773 | QC Preparation: 2013-03-26 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 3220 | mg/Kg | 10 | 2500 | 969 | 90 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 3530 | mg/Kg | 10 | 2500 | 969 | 102 | 78.9 - 121 | 9 | 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: 324263

QC Batch: 100130 | Date Analyzed: 2013-03-29 | Analyzed By: AR
Prep Batch: 84773 | QC Preparation: 2013-03-26 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 4800 | mg/Kg | 10 | 2500 | 2770 | 81 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 4980 | mg/Kg | 10 | 2500 | 2770 | 88 | 78.9 - 121 | 4 | 20 |

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

# Calibration Standards

**Standard (CCV-1)**

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 244 | 98 | 80 - 120 | 2013-03-26 |

**Standard (CCV-2)**

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 270 | 108 | 80 - 120 | 2013-03-26 |

**Standard (CCV-3)**

QC Batch: 100032 | Date Analyzed: 2013-03-26 | Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 252 | 101 | 80 - 120 | 2013-03-26 |

**Standard (CCV-1)**

QC Batch: 100054 | Date Analyzed: 2013-03-27 | Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0841 | 84 | 80 - 120 | 2013-03-27 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0827 | 83 | 80 - 120 | 2013-03-27 |

*continued ...*

*standard continued ...*

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0832 | 83 | 80 - 120 | 2013-03-27 |
| Xylene | | 1 | mg/kg | 0.300 | 0.248 | 83 | 80 - 120 | 2013-03-27 |

**Standard (CCV-2)**

QC Batch: 100054 Date Analyzed: 2013-03-27 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.0882 | 88 | 80 - 120 | 2013-03-27 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0861 | 86 | 80 - 120 | 2013-03-27 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0860 | 86 | 80 - 120 | 2013-03-27 |
| Xylene | | 1 | mg/kg | 0.300 | 0.256 | 85 | 80 - 120 | 2013-03-27 |

**Standard (CCV-3)**

QC Batch: 100054 Date Analyzed: 2013-03-27 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Benzene | | 1 | mg/kg | 0.100 | 0.100 | 100 | 80 - 120 | 2013-03-27 |
| Toluene | | 1 | mg/kg | 0.100 | 0.0977 | 98 | 80 - 120 | 2013-03-27 |
| Ethylbenzene | | 1 | mg/kg | 0.100 | 0.0973 | 97 | 80 - 120 | 2013-03-27 |
| Xylene | | 1 | mg/kg | 0.300 | 0.291 | 97 | 80 - 120 | 2013-03-27 |

**Standard (CCV-1)**

QC Batch: 100055 Date Analyzed: 2013-03-27 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.920 | 92 | 80 - 120 | 2013-03-27 |

**Standard (CCV-2)**

QC Batch: 100055 Date Analyzed: 2013-03-27 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.882 | 88 | 80 - 120 | 2013-03-27 |

**Standard (CCV-3)**

QC Batch: 100055 Date Analyzed: 2013-03-27 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | 1 | mg/Kg | 1.00 | 0.834 | 83 | 80 - 120 | 2013-03-27 |

**Standard (CCV-1)**

QC Batch: 100084 Date Analyzed: 2013-03-28 Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 250 | 100 | 80 - 120 | 2013-03-28 |

**Standard (CCV-2)**

QC Batch: 100084 Date Analyzed: 2013-03-28 Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 231 | 92 | 80 - 120 | 2013-03-28 |

**Standard (CCV-1)**

QC Batch: 100104 Date Analyzed: 2013-03-29 Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 262 | 105 | 80 - 120 | 2013-03-29 |

**Standard (CCV-2)**

QC Batch: 100104 Date Analyzed: 2013-03-29 Analyzed By: CW

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| DRO | | 1 | mg/Kg | 250 | 258 | 103 | 80 - 120 | 2013-03-29 |

**Standard (CCV-1)**

QC Batch: 100116 Date Analyzed: 2013-03-29 Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 101 | 101 | 85 - 115 | 2013-03-29 |

**Standard (CCV-2)**

QC Batch: 100116 Date Analyzed: 2013-03-29 Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.5 | 100 | 85 - 115 | 2013-03-29 |

**Standard (CCV-1)**

QC Batch: 100129 Date Analyzed: 2013-03-29 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | , | mg/Kg | 1.00 | 0.893 | 89 | 80 - 120 | 2013-03-29 |

**Standard (CCV-2)**

QC Batch: 100129 Date Analyzed: 2013-03-29 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | , | mg/Kg | 1.00 | 0.894 | 89 | 80 - 120 | 2013-03-29 |

**Standard (CCV-3)**

QC Batch: 100129 Date Analyzed: 2013-03-29 Analyzed By: AH

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| GRO | | , | mg/Kg | 1.00 | 0.859 | 86 | 80 - 120 | 2013-03-29 |

**Standard (CCV-1)**

QC Batch: 100130 Date Analyzed: 2013-03-29 Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 100 | 100 | 85 - 115 | 2013-03-29 |

**Standard (CCV-2)**

QC Batch: 100130 Date Analyzed: 2013-03-29 Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.6 | 100 | 85 - 115 | 2013-03-29 |

# Appendix

## Report Definitions

| Name | Definition |
|---|---|
| MDL | Method Detection Limit |
| MQL | Minimum Quantitation Limit |
| SDL | Sample Detection Limit |

## Laboratory Certifications

| C | Certifying Authority | Certification Number | Laboratory Location |
|---|---|---|---|
| - | NCTRCA | WFWB384444Y0909 | TraceAnalysis |
| - | DBE | VN 20657 | TraceAnalysis |
| - | HUB | 1752439743100-86536 | TraceAnalysis |
| - | WBE | 237019 | TraceAnalysis |
| 1 | NELAP | T104704392-12-4 | Midland |

## 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. |
| MI1 | Split peak or shoulder peak |
| MI2 | Instrument software did not integrate |
| MI3 | Instrument software misidentified the peak |
| MI4 | Instrument software integrated improperly |
| MI5 | Baseline correction |
| 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 |

## Result Comments

1 Dilution due to hydrocarbons.
2 MS/MSD was not spiked due to analyst error, LCS/LCSD show batch to be under control.

## Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

13032140

# Analysis Request of Chain of Custody Record

PAGE: 1 OF: 2


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


ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: GJ West Coop Unit North
Eddy Co NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 324247 | 3/20 | | S | | X | AH-1 0-1' | 1 | | | | X | | X | X | | | | | | | | | | X | | | | |
| 248 | | | | | | 1-1.5' | | | | | | | | | | | | | | | | | | | | | | |
| 249 | | | | | | 2-2.5' | | | | | | | | | | | | | | | | | | | | | | |
| 250 | | | | | | 3-3.5' | | | | | | | | | | | | | | | | | | | | | | |
| 251 | | | | | | 4-4.5' | | | | | | | | | | | | | | | | | | | | | | |
| 252 | | | | | | 5-5.5' | | | | | | | | | | | | | | | | | | | | | | |
| 253 | | | | | | 6-6.5' | | | | | | | | | | | | | | | | | | | | | | |
| 254 | | | | | | 7-7.5' | | | | | | | | | | | | | | | | | | | | | | |
| 255 | | | | | | 8-8.5' | | | | | | | | | | | | | | | | | | | | | | |
| 256 | | | | | | AH-2 0-1' | | | | | | | X | X | | | | | | | | | | | | | | |

RELINQUISHED BY: (Signature) — Date: 3-21-13 Time: 1520
RECEIVED BY: (Signature) — Date: 3-21-13 Time: 15:20
SAMPLED BY: (Print & Initial) TF — Date: 3-20-13 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS
AIRBILL #:
OTHER:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
TETRA TECH CONTACT PERSON: Ike
Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 4.3°C

REMARKS: Run deeper sample if TPH exceeds 1000 mg/kg Run deeper sample if Benzene exceeds 10 mg/kg and Total BTEX exceeds 50 mg/kg. Midland ok

Please fill out all copies - Laboratory retains Yellow copy / Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

13032140

# Analysis Request of Chain of Custody Record

PAGE: 2 OF: 2


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


CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: GJ West Coop Unit North Eddy Co NM

ANALYSIS REQUEST (Circle or Specify Method No.)

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 8081/608 | Chlorides | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 257 | 3/20 | | S | | X | AH-2 1-1.5' | 1 | | | | X | | | | | | | | | | | | | X | | | | |
| 258 | | | | | | 2-2.5' | | | | | | | | | | | | | | | | | | | | | | |
| 259 | | | | | | AH-3 0-1' | | | | | | | X | X | | | | | | | | | | | | | | |
| 260 | | | | | | 1-1.5' | | | | | | | | | | | | | | | | | | | | | | |
| 261 | | | | | | 2-2.5' | | | | | | | | | | | | | | | | | | | | | | |
| 262 | | | | | | AH-4 0-1' | | | | | | | X | X | | | | | | | | | | | | | | |
| 263 | | | | | | 1-1.5' | | | | | | | | | | | | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| RELINQUISHED BY: (Signature) | Date: 3-21-13 Time: 1520 | RECEIVED BY: (Signature) | Date: 3-21-13 Time: 15:20 |
| SAMPLED BY: (Print & Initial) JF | Date: 3-20-13 Time: | | |
| RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: |
| SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS | AIRBILL #: OTHER: | | |
| RELINQUISHED BY: (Signature) | Date: Time: | RECEIVED BY: (Signature) | Date: Time: |
| TETRA TECH CONTACT PERSON: Ike | Results by: | | |
| RECEIVING LABORATORY: Trace ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE: | RECEIVED BY: (Signature) DATE: TIME: | | RUSH Charges Authorized: Yes No |
| SAMPLE CONDITION WHEN RECEIVED: 4.3°C | REMARKS: | | |

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

13032140

# Analysis Request of Chain of Custody Record

PAGE: 1 OF: 2


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


ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: GJ West Coop Unit North
Eddy Co NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD (Ext. to C35) TX1005 | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 8081/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 324247 | 3/20 | | S | | X | AH-1 0-1' | 1 | | | | X | | X | X | | | | | | | | | | | X | | | | |
| 248 | | | | | | 1-1.5' | | | | | | | | X | | | | | | | | | | | | | | | |
| 249 | | | | | | 2-2.5' | | | | | | | | X | | | | | | | | | | | | | | | |
| 250 | | | | | | 3-3.5' | | | | | | | | X | | | | | | | | | | | | | | | |
| 251 | | | | | | 4-4.5' | | | | | | | | | | | | | | | | | | | | | | | |
| 252 | | | | | | 5-5.5' | | | | | | | | | | | | | | | | | | | | | | | |
| 253 | | | | | | 6-6.5' | | | | | | | | | | | | | | | | | | | | | | | |
| 254 | | | | | | 7-7.5' | | | | | | | | | | | | | | | | | | | | | | | |
| 255 | | | | | | 8-8.5' | | | | | | | | | | | | | | | | | | | | | | | |
| 256 | | | | | | AH-2 0-1' | | | | | | | X | X | | | | | | | | | | | | | | | |

RELINQUISHED BY: (Signature) — Date: 3-21-13 Time: 1520
RECEIVED BY: (Signature) — Date: 3-21-13 Time: 15:20
SAMPLED BY: (Print & Initial) TF — Date: 3-20-13 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS OTHER
AIRBILL #: MAR 29 2013

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:

RECEIVING LABORATORY: Xenco
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

TETRA TECH CONTACT PERSON: Ike
Results by:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 4.3°C

REMARKS: Run deeper sample if TPH exceeds 1000 mg/kg Run deeper sample if Benzene exceeds 10 mg/kg and Total BTEX exceeds 50 mg/kg. Midland acc

AH

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13032140

# Analysis Request of Chain of Custody Record

PAGE: 2 OF: 2


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


ANALYSIS REQUEST
*(Circle or Specify Method No.)*

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 11AMC05139

PROJECT NAME: GJ West Coop Unit North Eddy Co NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 257 | 3/20 | | S | X | | AH-2 1-1.5' | | | | | X | |
| 258 | | | | | | 2-2.5' | | | | | | |
| 259 | | | | | | AH-3 0-1' | | | | | | |
| 260 | | | | | | 1-1.5' | | | | | | |
| 261 | | | | | | 2-2.5' | | | | | | |
| 262 | | | | | | AH-4 0-1' | | | | | | |
| 263 | ↓ | | ↓ | ↓ | ↓ | 1-1.5' | ↓ | | | | ↓ | |

| BTEX 8021B | TPH 8015 MOD.: TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chlorides | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | X | | | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | |
| X | X | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| X | X | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

RELINQUISHED BY: (Signature) — Date: 3-21-13 Time: 1520
RECEIVED BY: (Signature) — Date: 3-21-13 Time: 15:20
SAMPLED BY: (Print & Initial) TF — Date: 3-20-13 Time:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS
AIRBILL #:
OTHER:

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

TETRA TECH CONTACT PERSON: Ike

*Results by:*

*RUSH Charges Authorized:* Yes No

SAMPLE CONDITION WHEN RECEIVED: 4.3°C

REMARKS: AH

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

# Summary Report

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

Report Date: July 1, 2013

Work Order: 13062541

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 333232 | T1 (AH-1) 0' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333233 | T1 (AH-1) 2' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333234 | T1 (AH-1) 4' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333235 | T1 (AH-1) 6' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333236 | T1 (AH-1) 8' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333237 | T1 (AH-1) 10' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333238 | T1 (AH-1) 12' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333239 | T2 (AH-2) 0' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333240 | T2 (AH-2) 2' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333241 | T2 (AH-2) 4' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333242 | T2 (AH-2) 6' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333243 | T2 (AH-2) 8' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333244 | T2 (AH-2) 10' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333245 | T2 (AH-2) 12' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333246 | T3 (AH-4) 0' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333247 | T3 (AH-4) 2' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333248 | T3 (AH-4) 4' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333249 | T3 (AH-4) 6' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333250 | T3 (AH-4) 8' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333251 | T3 (AH-4) 10' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333252 | T3 (AH-4) 12' | soil | 2013-06-14 | 00:00 | 2013-06-25 |

**Sample: 333232 - T1 (AH-1) 0'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **5200** | mg/Kg | 4 |

**Sample: 333233 - T1 (AH-1) 2'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2330** | mg/Kg | 4 |

**Sample: 333234 - T1 (AH-1) 4'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2330** | mg/Kg | 4 |

**Sample: 333235 - T1 (AH-1) 6'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1920** | mg/Kg | 4 |

**Sample: 333236 - T1 (AH-1) 8'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1090** | mg/Kg | 4 |

**Sample: 333237 - T1 (AH-1) 10'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2920** | mg/Kg | 4 |

**Sample: 333238 - T1 (AH-1) 12'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **432** | mg/Kg | 4 |

**Sample: 333239 - T2 (AH-2) 0'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **21100** | mg/Kg | 4 |

**Sample: 333240 - T2 (AH-2) 2'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **2050** | mg/Kg | 4 |

**Sample: 333241 - T2 (AH-2) 4'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **3930** | mg/Kg | 4 |

**Sample: 333242 - T2 (AH-2) 6'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1590** | mg/Kg | 4 |

**Sample: 333243 - T2 (AH-2) 8'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **133** | mg/Kg | 4 |

**Sample: 333244 - T2 (AH-2) 10'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **295** | mg/Kg | 4 |

**Sample: 333245 - T2 (AH-2) 12'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **261** | mg/Kg | 4 |

**Sample: 333246 - T3 (AH-4) 0'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1650** | mg/Kg | 4 |

**Sample: 333247 - T3 (AH-4) 2'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1330** | mg/Kg | 4 |

**Sample: 333248 - T3 (AH-4) 4'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **685** | mg/Kg | 4 |

**Sample: 333249 - T3 (AH-4) 6'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **752** | mg/Kg | 4 |

**Sample: 333250 - T3 (AH-4) 8'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **468** | mg/Kg | 4 |

**Sample: 333251 - T3 (AH-4) 10'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **444** | mg/Kg | 4 |

**Sample: 333252 - T3 (AH-4) 12'**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **362** | mg/Kg | 4 |

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.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: July 1, 2013

Work Order: 13062541

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

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

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 333232 | T1 (AH-1) 0' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333233 | T1 (AH-1) 2' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333234 | T1 (AH-1) 4' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333235 | T1 (AH-1) 6' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333236 | T1 (AH-1) 8' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333237 | T1 (AH-1) 10' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333238 | T1 (AH-1) 12' | soil | 2013-06-13 | 00:00 | 2013-06-25 |
| 333239 | T2 (AH-2) 0' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333240 | T2 (AH-2) 2' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333241 | T2 (AH-2) 4' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333242 | T2 (AH-2) 6' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333243 | T2 (AH-2) 8' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333244 | T2 (AH-2) 10' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333245 | T2 (AH-2) 12' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333246 | T3 (AH-4) 0' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333247 | T3 (AH-4) 2' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333248 | T3 (AH-4) 4' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333249 | T3 (AH-4) 6' | soil | 2013-06-14 | 00:00 | 2013-06-25 |

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 333250 | T3 (AH-4) 8' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333251 | T3 (AH-4) 10' | soil | 2013-06-14 | 00:00 | 2013-06-25 |
| 333252 | T3 (AH-4) 12' | soil | 2013-06-14 | 00:00 | 2013-06-25 |

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.



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

# Report Contents

# Analytical Report

**Sample: 333232 - T1 (AH-1) 0'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **5200** | mg/Kg | 10 | 4.00 |

**Sample: 333233 - T1 (AH-1) 2'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2330** | mg/Kg | 10 | 4.00 |

**Sample: 333234 - T1 (AH-1) 4'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2330** | mg/Kg | 10 | 4.00 |

**Sample: 333235 - T1 (AH-1) 6'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1920** | mg/Kg | 10 | 4.00 |

**Sample: 333236 - T1 (AH-1) 8'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1090** | mg/Kg | 10 | 4.00 |

**Sample: 333237 - T1 (AH-1) 10'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2920** | mg/Kg | 10 | 4.00 |

**Sample: 333238 - T1 (AH-1) 12'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **432** | mg/Kg | 5 | 4.00 |

**Sample: 333239 - T2 (AH-2) 0'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **21100** | mg/Kg | 10 | 4.00 |

**Sample: 333240 - T2 (AH-2) 2'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **2050** | mg/Kg | 10 | 4.00 |

**Sample: 333241 - T2 (AH-2) 4'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **3930** | mg/Kg | 10 | 4.00 |

**Sample: 333242 - T2 (AH-2) 6'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1590** | mg/Kg | 10 | 4.00 |

**Sample: 333243 - T2 (AH-2) 8'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **133** | mg/Kg | 5 | 4.00 |

**Sample: 333244 - T2 (AH-2) 10'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **295** | mg/Kg | 5 | 4.00 |

**Sample: 333245 - T2 (AH-2) 12'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **261** | mg/Kg | 5 | 4.00 |

**Sample: 333246 - T3 (AH-4) 0'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1650** | mg/Kg | 10 | 4.00 |

**Sample: 333247 - T3 (AH-4) 2'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **1330** | mg/Kg | 10 | 4.00 |

**Sample: 333248 - T3 (AH-4) 4'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **685** | mg/Kg | 5 | 4.00 |

**Sample: 333249 - T3 (AH-4) 6'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **752** | mg/Kg | 5 | 4.00 |

**Sample: 333250 - T3 (AH-4) 8'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **468** | mg/Kg | 5 | 4.00 |

**Sample: 333251 - T3 (AH-4) 10'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **444** | mg/Kg | 5 | 4.00 |

**Sample: 333252 - T3 (AH-4) 12'**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | Sample Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | RL Result | Units | Dilution | RL |
|---|---|---|---|---|---|---|
| Chloride | | | **362** | mg/Kg | 5 | 4.00 |

# Method Blanks

**Method Blank (1)** QC Batch: 102725

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 102725 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | QC Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

**Method Blank (1)** QC Batch: 102726

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 102726 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | QC Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

**Method Blank (1)** QC Batch: 102727

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 102727 | Date Analyzed: | 2013-07-01 | Analyzed By: | AR |
| Prep Batch: | 86906 | QC Preparation: | 2013-06-25 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

# Laboratory Control Spikes

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

QC Batch: 102725 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2630 | mg/Kg | 1 | 2500 | <3.85 | 105 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2500 | mg/Kg | 1 | 2500 | <3.85 | 100 | 85 - 115 | 5 | 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: 102726 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2480 | mg/Kg | 1 | 2500 | <3.85 | 99 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2620 | mg/Kg | 1 | 2500 | <3.85 | 105 | 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: 102727 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2690 | mg/Kg | 1 | 2500 | <3.85 | 108 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2620 | mg/Kg | 1 | 2500 | <3.85 | 105 | 85 - 115 | 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: 333237

QC Batch: 102725 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 5190 | mg/Kg | 10 | 2500 | 2920 | 91 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 5410 | mg/Kg | 10 | 2500 | 2920 | 100 | 78.9 - 121 | 4 | 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: 333247

QC Batch: 102726 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 3960 | mg/Kg | 10 | 2500 | 1330 | 105 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 3620 | mg/Kg | 10 | 2500 | 1330 | 92 | 78.9 - 121 | 9 | 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: 333252

QC Batch: 102727 | Date Analyzed: 2013-07-01 | Analyzed By: AR
Prep Batch: 86906 | QC Preparation: 2013-06-25 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2790 | mg/Kg | 5 | 2500 | 362 | 97 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2940 | mg/Kg | 5 | 2500 | 362 | 103 | 78.9 - 121 | 5 | 20 |

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

# Calibration Standards

**Standard (CCV-1)**

QC Batch: 102725 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.4 | 99 | 85 - 115 | 2013-07-01 |

**Standard (CCV-2)**

QC Batch: 102725 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 101 | 101 | 85 - 115 | 2013-07-01 |

**Standard (CCV-1)**

QC Batch: 102726 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 101 | 101 | 85 - 115 | 2013-07-01 |

**Standard (CCV-2)**

QC Batch: 102726 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.2 | 99 | 85 - 115 | 2013-07-01 |

**Standard (CCV-1)**

QC Batch: 102727 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 101 | 101 | 85 - 115 | 2013-07-01 |

**Standard (CCV-2)**

QC Batch: 102727 | Date Analyzed: 2013-07-01 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.3 | 99 | 85 - 115 | 2013-07-01 |

# Appendix

## Report Definitions

| Name | Definition |
|---|---|
| MDL | Method Detection Limit |
| MQL | Minimum Quantitation Limit |
| SDL | Sample Detection Limit |

## Laboratory Certifications

| C | Certifying Authority | Certification Number | Laboratory 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. |
| MI1 | Split peak or shoulder peak |
| MI2 | Instrument software did not integrate |
| MI3 | Instrument software misidentified the peak |
| MI4 | Instrument software integrated improperly |
| MI5 | Baseline correction |
| 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.

13062541

# Analysis Request of Chain of Custody Record

PAGE: 1 OF: 3


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


ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: COG / GJ West 100D North Unit Eddy Co, NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/825 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 333232 | 6/13 | | S | | X | T1 (AH1) 0' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 233 | | | | | | 2' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 234 | | | | | | 4' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 235 | | | | | | 6' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 236 | | | | | | 8' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 237 | | | | | | 10' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 238 | | | | | | 12' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 239 | 6/14 | | | | | T2 (AH2) 0' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 240 | | | | | | 2' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |
| 241 | | | | | | 4' | 1 | | | | | X | | | | | | | | | | | | | X | | | | |

RELINQUISHED BY: (Signature) — Date: 6/14/13 Time: 1900
RECEIVED BY: (Signature) Jeanne Fitch — Date: 6-25-13 Time: 1030

RELINQUISHED BY: (Signature) Jeanne Fitch — Date: 6-25-13 Time: 1105
RECEIVED BY: (Signature) — Date: 6/25/13 Time: 11:08

RELINQUISHED BY: (Signature) — Date: Time:
RECEIVED BY: (Signature) — Date: Time:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

SAMPLED BY: (Print & Initial) RC — Date: 6/14/13 Time: 1500

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS
HAND DELIVERED UPS
AIRBILL #:
OTHER:

TETRA TECH CONTACT PERSON: Ike Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 1.50

REMARKS: Midland all

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

1306 2541

# Analysis Request of Chain of Custody Record


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




ANALYSIS REQUEST
*(Circle or Specify Method No.)*

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112NC05139

PROJECT NAME: COG - GJ West Loop North Unit Eddy Co, NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 242 | 6/14 | | S | | X | T2 (AH2) 6' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 243 | | | S | | X | 8' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 244 | | | S | | X | 10' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 245 | | | S | | X | 12' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 246 | | | S | | X | T3 (AH 4) 0' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 247 | | | S | | X | 2' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 248 | | | S | | X | 4' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 249 | | | S | | X | 6' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 250 | | | S | | X | 8' | 1 | | | | | X | | | | | | | | | | | | X | | | | |
| 29 | | | S | | X | 10' | 1 | | | | | X | | | | | | | | | | | | X | | | | |

RELINQUISHED BY: (Signature) — Date: 6/14/13 Time: 1900
RECEIVED BY: (Signature) — Date: 6-25-13 Time: 1030
SAMPLED BY: (Print & Initial) RP — Date: 6/14/13 Time: 1900

RELINQUISHED BY: (Signature) Jaime Fitch — Date: 6-25-13 Time: 1100
RECEIVED BY: (Signature) — Date: 6/25/13 Time: 1108
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) — Date: — Time:
TETRA TECH CONTACT PERSON: Ike Tavarez — Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 1.5°

REMARKS:

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

13062541

# Analysis Request of Chain of Custody Record


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


PAGE: 3 OF: 3

ANALYSIS REQUEST
*(Circle or Specify Method No.)*

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: COG / G3 West Coop North Unit Eddy Co, NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 252 | 6/4 | | S | X | X | BT3(1-44) 12' | 1 | | | | | X | | | | | | | | | | | | X | | | | |

RELINQUISHED BY: (Signature) — Date: 6/24/13 Time: 1900
RECEIVED BY: (Signature) — Date: 6-25-13 Time: 1030
SAMPLED BY: (Print & Initial) — Date: 6/24/13 Time: 1605

RELINQUISHED BY: (Signature) — Date: 6-25-13 Time: 1108
RECEIVED BY: (Signature) — Date: 6/25/13 Time: 11:08
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) — Date: — Time:
TETRA TECH CONTACT PERSON: Ike Tavarez — Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 1.8°

REMARKS:

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

# Summary Report

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

Report Date: July 5, 2013

Work Order: 13062643

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 333410 | CS 3 (AH-3) 1' BH | soil | 2013-06-17 | 00:00 | 2013-06-26 |

**Sample: 333410 - CS 3 (AH-3) 1' BH**

| Param | Flag | Result | Units | RL |
|---|---|---|---|---|
| Chloride | | **1320** | mg/Kg | 4 |

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.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: July 5, 2013

Work Order: 13062643

Project Location: Eddy Co., NM
Project Name: COG/GJ West Co-op Unit North
Project Number: 112MC05139

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

| Sample | Description | Matrix | Date Taken | Time Taken | Date Received |
|---|---|---|---|---|---|
| 333410 | CS 3 (AH-3) 1' BH | soil | 2013-06-17 | 00:00 | 2013-06-26 |

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.



Michael Abel

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

# Report Contents

# Case Narrative

Samples for project COG/GJ West Co-op Unit North were received by TraceAnalysis, Inc. on 2013-06-26 and assigned to work order 13062643. Samples for work order 13062643 were received intact at a temperature of 10.8 C. Sample was received on ice.

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

| Test | Method | Prep Batch | Prep Date | QC Batch | Analysis Date |
|---|---|---|---|---|---|
| Chloride (Titration) | SM 4500-Cl B | 87050 | 2013-07-02 at 10:20 | 102806 | 2013-07-03 at 13:57 |

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 13062643 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.

# Analytical Report

**Sample: 333410 - CS 3 (AH-3) 1' BH**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Midland | | | | |
| Analysis: | Chloride (Titration) | Analytical Method: | SM 4500-Cl B | Prep Method: | N/A |
| QC Batch: | 102806 | Date Analyzed: | 2013-07-03 | Analyzed By: | AR |
| Prep Batch: | 87050 | Sample Preparation: | 2013-07-02 | Prepared By: | AR |

| Parameter | Flag | Cert | Result | RL | Units | Dilution | RL |
|---|---|---|---|---|---|---|---|
| Chloride | | | **1320** | | mg/Kg | 10 | 4.00 |

# Method Blanks

**Method Blank (1)** QC Batch: 102806

| | | | | | |
|---|---|---|---|---|---|
| QC Batch: | 102806 | Date Analyzed: | 2013-07-03 | Analyzed By: | AR |
| Prep Batch: | 87050 | QC Preparation: | 2013-07-02 | Prepared By: | AR |

| Parameter | Flag | Cert | MDL Result | Units | RL |
|---|---|---|---|---|---|
| Chloride | | | <3.85 | mg/Kg | 4 |

# Laboratory Control Spikes

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

QC Batch: 102806 | Date Analyzed: 2013-07-03 | Analyzed By: AR
Prep Batch: 87050 | QC Preparation: 2013-07-02 | Prepared By: AR

| Param | F | C | LCS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2670 | mg/Kg | 1 | 2500 | <3.85 | 107 | 85 - 115 |

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

| Param | F | C | LCSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2580 | mg/Kg | 1 | 2500 | <3.85 | 103 | 85 - 115 | 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: 333419

QC Batch: 102806 | Date Analyzed: 2013-07-03 | Analyzed By: AR
Prep Batch: 87050 | QC Preparation: 2013-07-02 | Prepared By: AR

| Param | F | C | MS Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 5540 | mg/Kg | 10 | 2500 | 2810 | 109 | 78.9 - 121 |

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

| Param | F | C | MSD Result | Units | Dil. | Spike Amount | Matrix Result | Rec. | Rec. Limit | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 5460 | mg/Kg | 10 | 2500 | 2810 | 106 | 78.9 - 121 | 1 | 20 |

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

# Calibration Standards

### Standard (CCV-1)

QC Batch: 102806 | Date Analyzed: 2013-07-03 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 99.9 | 100 | 85 - 115 | 2013-07-03 |

### Standard (CCV-2)

QC Batch: 102806 | Date Analyzed: 2013-07-03 | Analyzed By: AR

| Param | Flag | Cert | Units | CCVs True Conc. | CCVs Found Conc. | CCVs Percent Recovery | Percent Recovery Limits | Date Analyzed |
|---|---|---|---|---|---|---|---|---|
| Chloride | | | mg/Kg | 100 | 100 | 100 | 85 - 115 | 2013-07-03 |

# Appendix

## Report Definitions

| Name | Definition |
|---|---|
| MDL | Method Detection Limit |
| MQL | Minimum Quantitation Limit |
| SDL | Sample Detection Limit |

## Laboratory Certifications

| C | Certifying Authority | Certification Number | Laboratory 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. |
| MI1 | Split peak or shoulder peak |
| MI2 | Instrument software did not integrate |
| MI3 | Instrument software misidentified the peak |
| MI4 | Instrument software integrated improperly |
| MI5 | Baseline correction |
| 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.

13062643

# Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1


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


ANALYSIS REQUEST
*(Circle or Specify Method No.)*

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112MC05139

PROJECT NAME: COG / GJ West Coop North Unit
Eddy Co, NM

| LAB I.D. NUMBER | DATE 2013 | TIME | MATRIX | COMP. | GRAB | SAMPLE IDENTIFICATION | NUMBER OF CONTAINERS | FILTERED (Y/N) | PRESERVATIVE METHOD: HCL | HNO3 | ICE | NONE | BTEX 8021B | TPH 8015 MOD. TX1005 (Ext. to C35) | PAH 8270 | RCRA Metals Ag As Ba Cd Cr Pb Hg Se | TCLP Metals Ag As Ba Cd Vr Pd Hg Se | TCLP Volatiles | TCLP Semi Volatiles | RCI | GC.MS Vol. 8240/8260/624 | GC.MS Semi. Vol. 8270/625 | PCB's 8080/608 | Pest. 808/608 | Chloride | Gamma Spec. | Alpha Beta (Air) | PLM (Asbestos) | Major Anions/Cations, pH, TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 333410 | 6/17 | | S | | X | CS3 (AH3) 1' BH | 1 | | | | | | | | | | | | | | | | | X | | | | |

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) Jaime Fitch — Date: 06-24-13 — Time: 0900
SAMPLED BY: (Print & Initial) IK — Date: 06-17-13 — Time:

RELINQUISHED BY: (Signature) Jaime Fitch — Date: 06-24-13 — Time: 1537
RECEIVED BY: (Signature) — Date: 06/24/13 — Time: 15:37
SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS — AIRBILL #: — OTHER:

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) — Date: — Time:
TETRA TECH CONTACT PERSON: Ike Tavarez — Results by:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: ZIP:
CONTACT: PHONE: DATE: TIME:
RECEIVED BY: (Signature)

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:

REMARKS: Midland - All

Please fill out all copies - Laboratory retains Yellow copy - Return Orginal copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.