

SITE INFORMATION

Report Type: Closure Report 2RP-4152

General Site Information:

Site:	Michalada Federal #3D					
Company:	COG Operating LLC					
Section, Township and Range	Unit B	Sec. 03	T 22S	R 25E		
Lease Number:	API No. 30-015-35157					
County:	Eddy County					
GPS:	32.425584° N			104.383025° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of NM 524 and Jones St, travel west on Jones Rd for approx. 4.3 miles, turn north onto lease road for 1.1 miles, turn north onto lease road for 2.10 mi to location					

Release Data:

Date Released:	3/10/2017
Type Release:	Oil
Source of Contamination:	Sight Glass
Fluid Released:	12 bbls
Fluids Recovered:	5 bbls

Official Communication:

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

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	100'-125'
WellHead Protection:		
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:		
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

April 2, 2018

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

Re: Closure Report for the COG Operating LLC., Michalada Federal #3D, Unit B, Section 03, Township 22 South, Range 25 East, Eddy County, New Mexico. 2RP-4152.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to prepare a work plan and perform the remediation for a release that occurred at the Michalada Federal #3D, Unit B, Section 03, Township 22 South, Range 25 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.425584°, W 104.383025°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on March 10, 2017, and released approximately twelve (12) barrels of oil due to a broken sight glass. Approximately five (5) barrels of oil was recovered. The release occurred within the bermed facility and measured approximately 15' x 100'. The initial C-141 Form is included in Appendix A.

Groundwater

There are no water wells listed within Section 03 on the New Mexico Office of the State Engineers (NMOSE) database, USGS National Water Information System, or the Geology and Ground-water Resources of Eddy County, New Mexico (Report 3). The nearest well listed is on the NMOSE database in Township 21 South, Range 25 East, Section 33, and is located approximately 1.15 miles northwest of the site and has a reported depth to groundwater is 60 feet below surface. The approximate surface elevation of the well in Section 33 is 3,500 feet above sea level and the approximate surface elevation of the site is 3,600 feet above sea level. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 100' and 125' below surface. The groundwater data is shown in Appendix B.

Tetra Tech

4000 North Big Spring, Suite 401, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com

Regulatory

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

Soil Assessment and Analytical Results

On April 26, 2017, COG personnel were onsite to evaluate and sample the release area. Using a backhoe one (1) sample Trench (T-1) was installed in the release area. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3.

Referring to Table 1, Trench (T-1) showed TPH and Total BTEX concentrations exceeding the RRAL to a depth of 3.0' below surface, but declined below the RRAL's to 192 mg/kg and 0.814, respectively. The TPH concentrations ranged from 4,830 mg/kg (2.0') to 7,850 mg/kg (3.0') and the Total BTEX ranged from 188 mg/kg (2.0') and 358 mg/kg (2.0'). The chloride concentrations detected were not significant and all less the 200 mg/kg.

Remediation Activities

On February 13-15, 2018, Tetra Tech personnel were onsite to supervise the excavation and remediation activities. The remediation was performed in accordance to the approved work plan. The excavated areas and depths are shown on Figure 4 and highlighted (green) in Table 1. The area of trench (T-1) was excavated to approximately 3.0' below surface to remove the impacted soils.

To confirm proper removal of the impacted materials, Tetra Tech personnel collected confirmation samples from the excavation. A total of eleven (11) samples were collected (BH-1, NSW-1, SSW-1, WSW-1, BH-2, NSW-2, SSW-2, BH-3, NSW-3, SSW-3, and ESW-3). The 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 sample locations are shown on Figure 4.

Referring to Table 1, the samples collected at (BH-1, SSW-1, WSW-1, BH-2, NSW-2, BH-3, NSW-3, ESW-3, and SSW-3) did not show any TPH, benzene, or total BTEX concentrations above the RRALs. However, the areas of samples (NSW-1 and SSW-2) showed total TPH concentrations of 5,940 mg/kg and 7,510 mg/kg, respectively. The area of sample (SSW-2) also showed a total BTEX concentration of 1,470 mg/kg.



Additionally, no significant chloride concentrations were detected in the areas of (BH-1, NSW-1, SSW-1, WSW-1, BH-2, NSW-2, SSW-2, BH-3, and SSW-3). However, the areas of (NSW-3 and ESW-3) showed chloride concentrations of 1,930 mg/kg and 825 mg/kg, respectively.

Based on the laboratory results, the areas of sidewall samples (NSW-1 and SSW-2) were expanded an additional 3.0' and the areas of (NSW-3 and ESW-3) were expanded an additional 1.0' in order to remove the impacted soils. Sidewall samples were collected to verify proper removal and the area of (NSW-1) showed a TPH concentration below the laboratory reporting limits. The areas of sidewall samples (SSW-2, NSW-3, and ESW-3) showed total TPH, benzene, and total BTEX concentrations below the RRALs. Additionally, none of the areas analyzed for chloride showed significant concentrations to the soils. Once completed, the excavated area was backfilled with clean material to surface grade and the material was excavated and hauled to proper disposal.

Conclusion

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

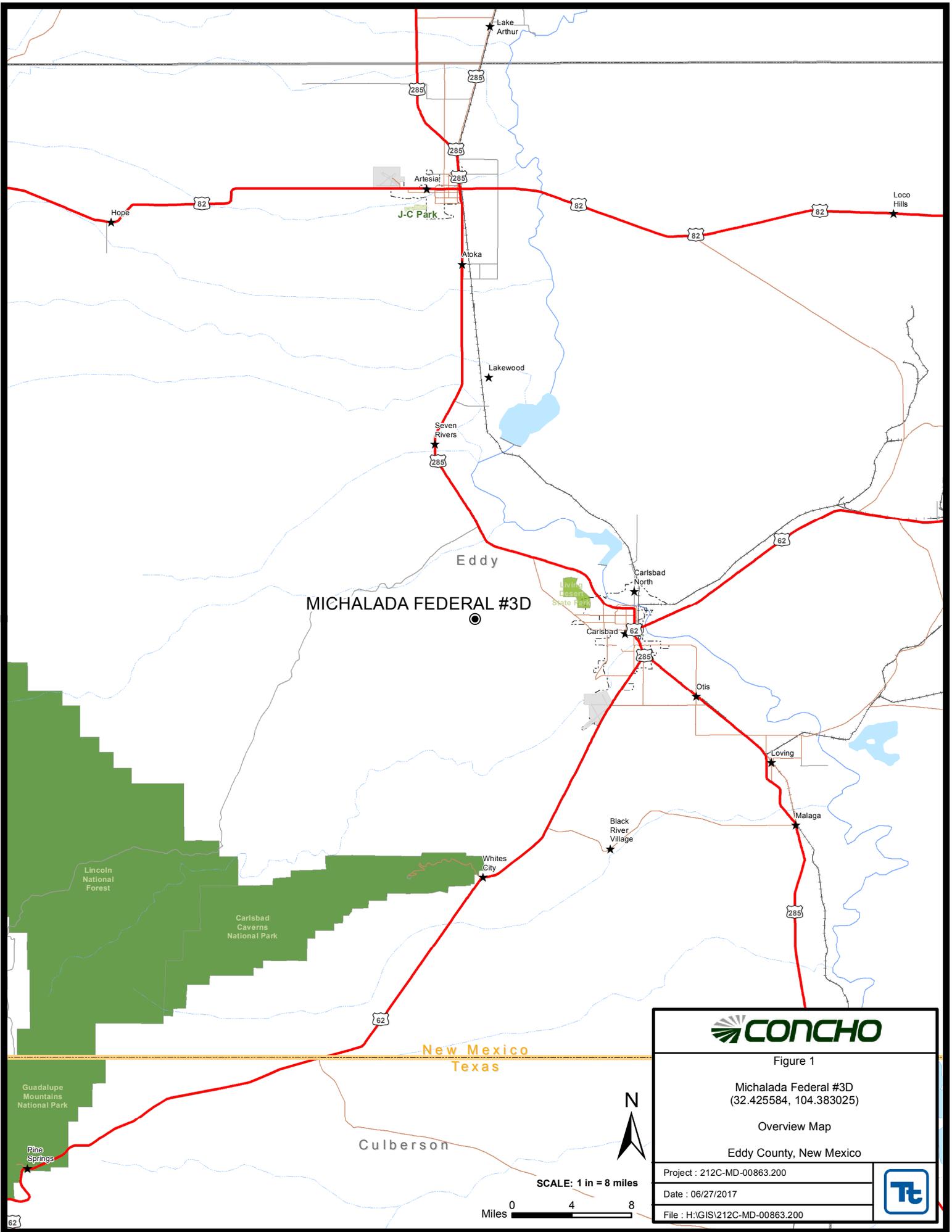
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Geologist I

Ike Tavarez,
Senior Project Manager, P.G.

cc: Robert McNeill – COG
Dakota Neel – COG
Rebecca Haskell – COG
Shelly Tucker - BLM

Figures



MICHALADA FEDERAL #3D



Figure 1

Michalada Federal #3D
(32.425584, 104.383025)

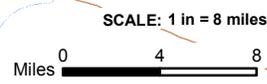
Overview Map

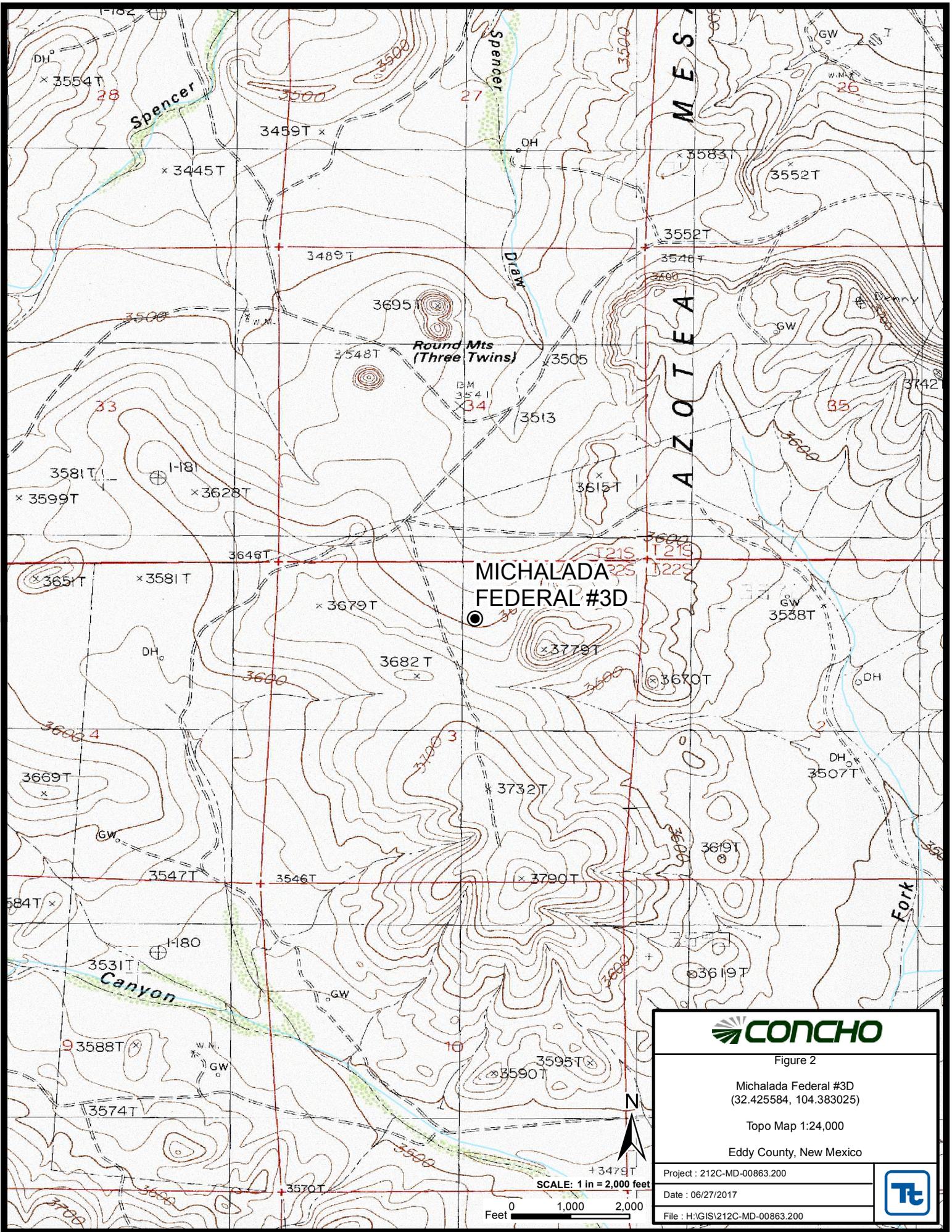
Eddy County, New Mexico

Project : 212C-MD-00863.200

Date : 06/27/2017

File : H:\GIS\212C-MD-00863.200







EXPLANATION

-  TRENCH SAMPLE LOCATIONS
-  SPILL AREA

SPILL AREA
15' x 100'



Figure 3

Michalada Federal #3D
(32.425584, 104.383025)

Spill Assessment Map

Eddy County, New Mexico

Project : 212C-MD-00863.200	
Date : 06/27/2017	
File : H:\GIS\212C-MD-00863.200	



Source: Esri, DigitalGlobe, GeoEye, USDA, USGS, AEX, Getmapping, User Community, Earthstar, CNR, © 2017
 SCALE: 1 IN = 50 FEET
 Feet 0 25 50



LEGEND

- BOREHOLE SAMPLE LOCATIONS
- SIDEWALL SAMPLE LOCATIONS
- ▨ EXCAVATED AREAS



SCALE: 1 IN = 50 FEET



Figure 4	
Michalada Federal #3D (32.425584, 104.383025)	
Excavation Areas & Depths Map	
Eddy County, New Mexico	
Project : 212C-MD-00863.200	
Date : 03/26/2018	
File : H:\GIS\212C-MD-00863.200	

Tables

Table 1
COG Operating LLC.
Michalada Federal #3D
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	C6-C10	C10-C28	C28-C35	Total						
T-1	4/26/2017	Surface	-		X	1830	4090	288	6210	0.524	9.53	12.1	99.1	121	196
	"	1	-		X	3100	2150	<150	5250	1.39	38.2	18.9	130	188	14.1
	"	2	-		X	2740	2090	<149	4830	3.27	74.6	35.7	244	358	113
	"	3	-		X	4280	3300	268	7850	3.78	67.5	31.3	209	312	24.5
	"	4	-	X		67.6	124	<15.0	192	<0.00641	<0.00641	0.101	0.713	0.814	7.39
	"	6	-	X		<15.0	<15.0	<15.0	<15.0	<0.00357	<0.00357	<0.00357	<0.00357	<0.00357	<4.97
	"	8	-	X		41.9	104	<14.9	146	<0.00364	0.0178	0.0433	0.311	0.372	16.0
"	10	-	X		133	304	22.3	459	<0.00200	0.0130	0.0418	0.404	0.459	22.2	
BH-1 (Bottomhole)	2/13/2018	-	3	X		17.2	269	<15.0	286	<0.0998	<0.0998	<0.0998	<0.0998	<0.0998	39.8
NSW-1	2/13/2018	-	-		X	1,070	4,820	50.1	5,940	<0.0998	1.20	1.80	35.9	38.9	59.0
	3/9/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	-	-	-	-	-	-
SSW-1	2/13/2018	-	-	X		308	2,400	48.5	2,760	<0.0202	0.0435	0.796	9.03	9.87	440
WSW-1	2/13/2018	-	-	X		64.5	788	<15.0	853	<0.0994	<0.0994	<0.0994	5.05	5.05	295
BH-2 (Bottomhole)	2/13/2018	-	3	X		241	2,120	26.9	2,390	<0.0199	0.0473	0.367	4.69	5.10	297
NSW-2	2/13/2018	-	-	X		743	3,780	89.8	4,610	<0.100	4.30	2.07	25.7	32.1	435
SSW-2	2/13/2018	-	-		X	2,740	4,720	47.0	7,510	0.155	18.8	173	1,280	1,470	309
	3/9/2018	-	-	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
BH-3 (Bottomhole)	2/14/2018	-	3	X		128	1,450	23.4	1,600	<0.00200	<0.00200	<0.00200	0.126	0.126	113
NSW-3	2/14/2018	-	-		X	214	1,000	<14.9	1,210	<0.0200	0.190	0.928	7.60	8.72	1930
NSW-3 (1')	2/15/2018	-	-	X		45.6	672	<15.0	718	<0.00201	<0.00201	<0.00201	0.0537	0.0537	190
SSW-3	2/14/2018	-	-	X		345	1,770	26.1	2,140	<0.0402	0.507	0.627	11.4	12.5	150
ESW-3	2/14/2018	-	-		X	497	1,900	30.4	2,430	<0.0199	0.183	<0.0199	22.8	23.0	825
ESW-3 (1')	2/15/2018	-	-	X		43.8	334	<15.0	378	<0.00202	<0.00202	<0.00202	0.0870	0.0870	36.1

(-) Not Analyzed
 Excavation Depths
 BEB Below Excavation Bottom

Photos

COG Operating LLC
Michalada Federal #3D
Eddy County, New Mexico



TETRA
TECH



View West – Excavation Area



View East – Excavation Area

COG Operating LLC
Michalada Federal #3D
Eddy County, New Mexico



TETRA TECH



View West – Backfilled Excavation



View East – Backfilled Excavation

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

Form C-141
Revised August 8, 2011

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

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

Initial Report Final Report

Name of Company: COG Operating LLC OGRID # 229137	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: Michalada Federal #003D	Facility Type: Tank Battery
Surface Owner: Federal	Mineral Owner:
API No. 30-015-35157	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	03	22S	25E	990	North	2287	East	Eddy

Latitude 32.425584 Longitude -104.383025

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 12 bbls	Volume Recovered: 5 bbls
Source of Release: Sight Glass	Date and Hour of Occurrence: March 10, 2017 11:30 am	Date and Hour of Discovery: March 10, 2017 11:30 am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was due to a broken sight glass. The sight glass was replaced.

Describe Area Affected and Cleanup Action Taken.*

The release occurred within an unlined facility. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:	
Title: Senior HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: rhaskell@concho.com	Conditions of Approval:	
Date: March 20, 2017 Phone: 432-683-7443	Attached <input type="checkbox"/>	

* Attach Additional Sheets If Necessary

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

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

Release Notification and Corrective Action

OPERATOR Initial Report Final Report

Name of Company COG Operating LLC	Contact Rebecca Haskell
Address 600 West Illinois Ave, Midland, TX 79701	Telephone No. (432) 818-2372
Facility Name Michalada Federal #3D	Facility Type Tank Battery

Surface Owner: Federal	Mineral Owner	API No. 30-015-35157
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LOCATION OF RELEASE

Unit Letter B	Section 03	Township 22S	Range 25E	Feet from the 990	North/South Line North	Feet from the 2287	East/West Line East	County Eddy
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Latitude N 32.425584° Longitude W 104.383025°

NATURE OF RELEASE

Type of Release: Oil	Volume of Release 12 bbls	Volume Recovered 5 bbls
Source of Release: Sight glass	Date and Hour of Occurrence 03/10/2017 11:30am	Date and Hour of Discovery 03/10/2017 11:30am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

The release occurred due to a broken sight glass and was contained inside the unlined facility. A vacuum truck was used to remove all freestanding fluids.

Describe Area Affected and Cleanup Action Taken.*

COG personnel inspected site and collected samples to define spills extent. Tetra Tech supervised the remediation activities and excavated the area to 3.0' to remove the impacted soils. The 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 <input type="checkbox"/>
Date: 04/02/18	Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary



Certificate of Analysis Summary 552078



COG Operating LLC, Artesia, NM

Project Name: Michalada Federal #003D

Project Id:
Contact: Aaron Lieb
Project Location: Michalada Federal #003D

Date Received in Lab: Fri Apr-28-17 11:00 am
Report Date: 05-MAY-17
Project Manager: Liz Givens

<i>Analysis Requested</i>	<i>Lab Id:</i>	552078-001	552078-002	552078-003	552078-004	552078-005	552078-006
	<i>Field Id:</i>	T1- Surface	T1- 1'	T1- 2'	T1- 3'	T1- 4'	T1- 6'
	<i>Depth:</i>		1 ft	2 ft	3 ft	4 ft	6 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-26-17 09:30	Apr-26-17 09:35	Apr-26-17 09:40	Apr-26-17 09:45	Apr-26-17 09:47	Apr-26-17 10:00
BTEX by EPA 8021B	<i>Extracted:</i>	May-03-17 09:00	May-03-17 09:00	May-03-17 09:00	May-03-17 09:00	May-04-17 11:55	May-03-17 16:00
	<i>Analyzed:</i>	May-03-17 13:58	May-03-17 14:14	May-03-17 14:34	May-03-17 14:50	May-05-17 12:00	May-04-17 14:09
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Benzene		0.524 0.499	1.39 1.00	3.27 1.00	3.78 1.01	<0.00641 0.00641	<0.00357 0.00357
Toluene		9.53 0.499	38.2 1.00	74.6 1.00	67.5 1.01	<0.00641 0.00641	<0.00357 0.00357
Ethylbenzene		12.1 0.499	18.9 1.00	35.7 1.00	31.3 1.01	0.101 0.00641	<0.00357 0.00357
m,p-Xylenes		74.4 0.998	97.7 2.01	193 2.00	165 2.02	0.496 0.0128	<0.00714 0.00714
o-Xylene		24.7 0.499	32.0 1.00	51.4 1.00	44.2 1.01	0.217 0.00641	<0.00357 0.00357
Total Xylenes		99.1 0.499	130 1.00	244 1.00	209 1.01	0.713 0.00641	<0.00357 0.00357
Total BTEX		121 0.499	188 1.00	358 1.00	312 1.01	0.814 0.00641	<0.00357 0.00357
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	May-03-17 16:00	May-03-17 16:00				
	<i>Analyzed:</i>	May-03-17 22:30	May-03-17 22:53	May-03-17 23:01	May-03-17 23:08	May-03-17 23:16	May-03-17 23:39
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Chloride		196 5.00	14.1 5.00	113 4.88	24.5 4.86	7.39 4.98	<4.97 4.97
TPH By SW8015 Mod	<i>Extracted:</i>	May-01-17 13:00	May-01-17 13:00				
	<i>Analyzed:</i>	May-01-17 20:02	May-01-17 20:21	May-01-17 20:41	May-01-17 20:59	May-01-17 21:18	May-01-17 21:38
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
C6-C10 Gasoline Range Hydrocarbons		1830 150	3100 150	2740 149	4280 150	67.6 15.0	<15.0 15.0
C10-C28 Diesel Range Hydrocarbons		4090 150	2150 150	2090 149	3300 150	124 15.0	<15.0 15.0
C28-C35 Oil Range Hydrocarbons		288 150	<150 150	<149 149	268 150	<15.0 15.0	<15.0 15.0
Total TPH		6210 150	5250 150	4830 149	7850 150	192 15.0	<15.0 15.0

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

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

Brandi Ritcherson

Brandi Ritcherson
Project Manager



Certificate of Analysis Summary 552078



COG Operating LLC, Artesia, NM

Project Name: Michalada Federal #003D

Project Id:
Contact: Aaron Lieb
Project Location: Michalada Federal #003D

Date Received in Lab: Fri Apr-28-17 11:00 am
Report Date: 05-MAY-17
Project Manager: Liz Givens

<i>Analysis Requested</i>	<i>Lab Id:</i>	552078-007	552078-008			
	<i>Field Id:</i>	T1- 8'	T1- 10'			
	<i>Depth:</i>	8 ft	10 ft			
	<i>Matrix:</i>	SOIL	SOIL			
	<i>Sampled:</i>	Apr-26-17 10:05	Apr-26-17 10:10			
BTEX by EPA 8021B	<i>Extracted:</i>	May-03-17 16:00	May-03-17 09:00			
	<i>Analyzed:</i>	May-04-17 13:53	May-03-17 17:48			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL			
Benzene		<0.00364 0.00364	<0.00200 0.00200			
Toluene		0.0178 0.00364	0.0130 0.00200			
Ethylbenzene		0.0433 0.00364	0.0418 0.00200			
m,p-Xylenes		0.163 0.00727	0.276 0.00399			
o-Xylene		0.148 0.00364	0.128 0.00200			
Total Xylenes		0.311 0.00364	0.404 0.00200			
Total BTEX		0.372 0.00364	0.459 0.00200			
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	May-03-17 16:00	May-03-17 16:00			
	<i>Analyzed:</i>	May-03-17 23:46	May-03-17 23:54			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL			
Chloride		16.0 4.93	22.2 4.88			
TPH By SW8015 Mod	<i>Extracted:</i>	May-01-17 13:00	May-01-17 13:00			
	<i>Analyzed:</i>	May-01-17 21:57	May-01-17 22:16			
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL			
C6-C10 Gasoline Range Hydrocarbons		41.9 14.9	133 15.0			
C10-C28 Diesel Range Hydrocarbons		104 14.9	304 15.0			
C28-C35 Oil Range Hydrocarbons		<14.9 14.9	22.3 15.0			
Total TPH		146 14.9	459 15.0			

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

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

Brandi Ritcherson
Project Manager

Analytical Report 552078

for
COG Operating LLC

Project Manager: Aaron Lieb

Michalada Federal #003D

05-MAY-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

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

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



05-MAY-17

Project Manager: **Aaron Lieb**
COG Operating LLC
2407 Pecos Avenue
Artesia, NM 88210

Reference: XENCO Report No(s): **552078**
Michalada Federal #003D
Project Address: Michalada Federal #003D

Aaron Lieb:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 552078. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 552078 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Brandi Ritcherson

Project Manager

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

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Sample Cross Reference 552078



COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1- Surface	S	04-26-17 09:30		552078-001
T1- 1'	S	04-26-17 09:35	- 1 ft	552078-002
T1- 2'	S	04-26-17 09:40	- 2 ft	552078-003
T1- 3'	S	04-26-17 09:45	- 3 ft	552078-004
T1- 4'	S	04-26-17 09:47	- 4 ft	552078-005
T1- 6'	S	04-26-17 10:00	- 6 ft	552078-006
T1- 8'	S	04-26-17 10:05	- 8 ft	552078-007
T1- 10'	S	04-26-17 10:10	- 10 ft	552078-008



CASE NARRATIVE

Client Name: COG Operating LLC

Project Name: Michalada Federal #003D

Project ID:
Work Order Number(s): 552078

Report Date: 05-MAY-17
Date Received: 04/28/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3016416 BTEX by EPA 8021B

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

Batch: LBA-3016591 BTEX by EPA 8021B

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

Batch: LBA-3016595 BTEX by EPA 8021B

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

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: **T1- Surface**

Matrix: Soil

Date Received: 04.28.17 11.00

Lab Sample Id: 552078-001

Date Collected: 04.26.17 09.30

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MGO

% Moisture:

Analyst: MGO

Date Prep: 05.03.17 16.00

Basis: Wet Weight

Seq Number: 3016455

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	196	5.00	mg/kg	05.03.17 22.30		1

Analytical Method: TPH By SW8015 Mod

Prep Method: TX1005P

Tech: ARM

% Moisture:

Analyst: ARM

Date Prep: 05.01.17 13.00

Basis: Wet Weight

Seq Number: 3016254

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	1830	150	mg/kg	05.01.17 20.02		10
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	4090	150	mg/kg	05.01.17 20.02		10
C28-C35 Oil Range Hydrocarbons	PHCG2835	288	150	mg/kg	05.01.17 20.02		10
Total TPH	PHC635	6210	150	mg/kg	05.01.17 20.02		10

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	93	%	70-135	05.01.17 20.02	
o-Terphenyl	84-15-1	103	%	70-135	05.01.17 20.02	

COG Operating LLC, Artesia, NM Michalada Federal #003D

Sample Id: **T1- Surface**

Matrix: Soil

Date Received: 04.28.17 11.00

Lab Sample Id: 552078-001

Date Collected: 04.26.17 09.30

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.03.17 09.00

Basis: Wet Weight

Seq Number: 3016416

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	0.524	0.499	mg/kg	05.03.17 13.58		250
Toluene	108-88-3	9.53	0.499	mg/kg	05.03.17 13.58		250
Ethylbenzene	100-41-4	12.1	0.499	mg/kg	05.03.17 13.58		250
m,p-Xylenes	179601-23-1	74.4	0.998	mg/kg	05.03.17 13.58		250
o-Xylene	95-47-6	24.7	0.499	mg/kg	05.03.17 13.58		250
Total Xylenes	1330-20-7	99.1	0.499	mg/kg	05.03.17 13.58		250
Total BTEX		121	0.499	mg/kg	05.03.17 13.58		250
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	106	%	80-120	05.03.17 13.58		
4-Bromofluorobenzene	460-00-4	89	%	80-120	05.03.17 13.58		



Certificate of Analytical Results 552078



COG Operating LLC, Artesia, NM Michalada Federal #003D

Sample Id: T1- 1'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-002	Date Collected: 04.26.17 09.35	Sample Depth: 1 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	14.1	5.00	mg/kg	05.03.17 22.53		1

Analytical Method: TPH By SW8015 Mod		Prep Method: TX1005P
Tech: ARM		% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00	Basis: Wet Weight
Seq Number: 3016254		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	3100	150	mg/kg	05.01.17 20.21		10
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	2150	150	mg/kg	05.01.17 20.21		10
C28-C35 Oil Range Hydrocarbons	PHCG2835	<150	150	mg/kg	05.01.17 20.21	U	10
Total TPH	PHC635	5250	150	mg/kg	05.01.17 20.21		10
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	109	%	70-135	05.01.17 20.21		
o-Terphenyl	84-15-1	95	%	70-135	05.01.17 20.21		

COG Operating LLC, Artesia, NM Michalada Federal #003D

Sample Id: T1- 1'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-002	Date Collected: 04.26.17 09.35	Sample Depth: 1 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: ALJ		% Moisture:
Analyst: ALJ	Date Prep: 05.03.17 09.00	Basis: Wet Weight
Seq Number: 3016416		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	1.39	1.00	mg/kg	05.03.17 14.14		500
Toluene	108-88-3	38.2	1.00	mg/kg	05.03.17 14.14		500
Ethylbenzene	100-41-4	18.9	1.00	mg/kg	05.03.17 14.14		500
m,p-Xylenes	179601-23-1	97.7	2.01	mg/kg	05.03.17 14.14		500
o-Xylene	95-47-6	32.0	1.00	mg/kg	05.03.17 14.14		500
Total Xylenes	1330-20-7	130	1.00	mg/kg	05.03.17 14.14		500
Total BTEX		188	1.00	mg/kg	05.03.17 14.14		500
%							
Surrogate	Cas Number	Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	81	%	80-120	05.03.17 14.14		
4-Bromofluorobenzene	460-00-4	81	%	80-120	05.03.17 14.14		

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 2'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-003	Date Collected: 04.26.17 09.40	Sample Depth: 2 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	113	4.88	mg/kg	05.03.17 23.01		1

Analytical Method: TPH By SW8015 Mod	Prep Method: TX1005P
Tech: ARM	% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00
Seq Number: 3016254	Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	2740	149	mg/kg	05.01.17 20.41		10
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	2090	149	mg/kg	05.01.17 20.41		10
C28-C35 Oil Range Hydrocarbons	PHCG2835	<149	149	mg/kg	05.01.17 20.41	U	10
Total TPH	PHC635	4830	149	mg/kg	05.01.17 20.41		10

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	95	%	70-135	05.01.17 20.41	
o-Terphenyl	84-15-1	107	%	70-135	05.01.17 20.41	

COG Operating LLC, Artesia, NM Michalada Federal #003D

Sample Id: T1- 2'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-003	Date Collected: 04.26.17 09.40	Sample Depth: 2 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: ALJ		% Moisture:
Analyst: ALJ	Date Prep: 05.03.17 09.00	Basis: Wet Weight
Seq Number: 3016416		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	3.27	1.00	mg/kg	05.03.17 14.34		500
Toluene	108-88-3	74.6	1.00	mg/kg	05.03.17 14.34		500
Ethylbenzene	100-41-4	35.7	1.00	mg/kg	05.03.17 14.34		500
m,p-Xylenes	179601-23-1	193	2.00	mg/kg	05.03.17 14.34		500
o-Xylene	95-47-6	51.4	1.00	mg/kg	05.03.17 14.34		500
Total Xylenes	1330-20-7	244	1.00	mg/kg	05.03.17 14.34		500
Total BTEX		358	1.00	mg/kg	05.03.17 14.34		500
%							
Surrogate	Cas Number	Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	96	%	80-120	05.03.17 14.34		
1,4-Difluorobenzene	540-36-3	98	%	80-120	05.03.17 14.34		

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 3'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-004	Date Collected: 04.26.17 09.45	Sample Depth: 3 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	24.5	4.86	mg/kg	05.03.17 23.08		1

Analytical Method: TPH By SW8015 Mod	Prep Method: TX1005P
Tech: ARM	% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00
Seq Number: 3016254	Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	4280	150	mg/kg	05.01.17 20.59		10
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	3300	150	mg/kg	05.01.17 20.59		10
C28-C35 Oil Range Hydrocarbons	PHCG2835	268	150	mg/kg	05.01.17 20.59		10
Total TPH	PHC635	7850	150	mg/kg	05.01.17 20.59		10

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	111	%	70-135	05.01.17 20.59	
o-Terphenyl	84-15-1	105	%	70-135	05.01.17 20.59	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 3'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-004	Date Collected: 04.26.17 09.45	Sample Depth: 3 ft
Analytical Method: BTEX by EPA 8021B		Prep Method: SW5030B
Tech: ALJ		% Moisture:
Analyst: ALJ	Date Prep: 05.03.17 09.00	Basis: Wet Weight
Seq Number: 3016416		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	3.78	1.01	mg/kg	05.03.17 14.50		500
Toluene	108-88-3	67.5	1.01	mg/kg	05.03.17 14.50		500
Ethylbenzene	100-41-4	31.3	1.01	mg/kg	05.03.17 14.50		500
m,p-Xylenes	179601-23-1	165	2.02	mg/kg	05.03.17 14.50		500
o-Xylene	95-47-6	44.2	1.01	mg/kg	05.03.17 14.50		500
Total Xylenes	1330-20-7	209	1.01	mg/kg	05.03.17 14.50		500
Total BTEX		312	1.01	mg/kg	05.03.17 14.50		500
%							
Surrogate	Cas Number	Recovery	Units	Limits	Analysis Date	Flag	
4-Bromofluorobenzene	460-00-4	85	%	80-120	05.03.17 14.50		
1,4-Difluorobenzene	540-36-3	99	%	80-120	05.03.17 14.50		

COG Operating LLC, Artesia, NM Michalada Federal #003D

Sample Id: T1- 4'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-005	Date Collected: 04.26.17 09.47	Sample Depth: 4 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7.39	4.98	mg/kg	05.03.17 23.16		1

Analytical Method: TPH By SW8015 Mod	Prep Method: TX1005P
Tech: ARM	% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00
Seq Number: 3016254	Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	67.6	15.0	mg/kg	05.01.17 21.18		1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	124	15.0	mg/kg	05.01.17 21.18		1
C28-C35 Oil Range Hydrocarbons	PHCG2835	<15.0	15.0	mg/kg	05.01.17 21.18	U	1
Total TPH	PHC635	192	15.0	mg/kg	05.01.17 21.18		1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1-Chlorooctane	111-85-3	101	%	70-135	05.01.17 21.18		
o-Terphenyl	84-15-1	110	%	70-135	05.01.17 21.18		

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: **T1- 4'**
 Lab Sample Id: 552078-005

Matrix: Soil
 Date Collected: 04.26.17 09.47

Date Received: 04.28.17 11.00
 Sample Depth: 4 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.04.17 11.55

Basis: Wet Weight

Seq Number: 3016595

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00641	0.00641	mg/kg	05.05.17 12.00	U	1
Toluene	108-88-3	<0.00641	0.00641	mg/kg	05.05.17 12.00	U	1
Ethylbenzene	100-41-4	0.101	0.00641	mg/kg	05.05.17 12.00		1
m,p-Xylenes	179601-23-1	0.496	0.0128	mg/kg	05.05.17 12.00		1
o-Xylene	95-47-6	0.217	0.00641	mg/kg	05.05.17 12.00		1
Total Xylenes	1330-20-7	0.713	0.00641	mg/kg	05.05.17 12.00		1
Total BTEX		0.814	0.00641	mg/kg	05.05.17 12.00		1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	85		%	80-120	05.05.17 12.00	
4-Bromofluorobenzene	460-00-4	97		%	80-120	05.05.17 12.00	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 6'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-006	Date Collected: 04.26.17 10.00	Sample Depth: 6 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.97	4.97	mg/kg	05.03.17 23.39	U	1

Analytical Method: TPH By SW8015 Mod		Prep Method: TX1005P
Tech: ARM		% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00	Basis: Wet Weight
Seq Number: 3016254		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	<15.0	15.0	mg/kg	05.01.17 21.38	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	<15.0	15.0	mg/kg	05.01.17 21.38	U	1
C28-C35 Oil Range Hydrocarbons	PHCG2835	<15.0	15.0	mg/kg	05.01.17 21.38	U	1
Total TPH	PHC635	<15.0	15.0	mg/kg	05.01.17 21.38	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	99	%	70-135	05.01.17 21.38	
o-Terphenyl	84-15-1	106	%	70-135	05.01.17 21.38	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: **T1- 6'**
 Lab Sample Id: 552078-006

Matrix: Soil
 Date Collected: 04.26.17 10.00

Date Received: 04.28.17 11.00
 Sample Depth: 6 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.03.17 16.00

Basis: Wet Weight

Seq Number: 3016591

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
Toluene	108-88-3	<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
Ethylbenzene	100-41-4	<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
m,p-Xylenes	179601-23-1	<0.00714	0.00714	mg/kg	05.04.17 14.09	U	1
o-Xylene	95-47-6	<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
Total Xylenes	1330-20-7	<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
Total BTEX		<0.00357	0.00357	mg/kg	05.04.17 14.09	U	1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	91		%	80-120	05.04.17 14.09	
1,4-Difluorobenzene	540-36-3	107		%	80-120	05.04.17 14.09	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 8'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-007	Date Collected: 04.26.17 10.05	Sample Depth: 8 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	16.0	4.93	mg/kg	05.03.17 23.46		1

Analytical Method: TPH By SW8015 Mod	Prep Method: TX1005P
Tech: ARM	% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00
Seq Number: 3016254	Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	41.9	14.9	mg/kg	05.01.17 21.57		1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	104	14.9	mg/kg	05.01.17 21.57		1
C28-C35 Oil Range Hydrocarbons	PHCG2835	<14.9	14.9	mg/kg	05.01.17 21.57	U	1
Total TPH	PHC635	146	14.9	mg/kg	05.01.17 21.57		1
Surrogate		Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
	1-Chlorooctane	111-85-3	101	%	70-135	05.01.17 21.57	
	o-Terphenyl	84-15-1	108	%	70-135	05.01.17 21.57	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: **T1- 8'**
 Lab Sample Id: 552078-007

Matrix: Soil
 Date Collected: 04.26.17 10.05

Date Received: 04.28.17 11.00
 Sample Depth: 8 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.03.17 16.00

Basis: Wet Weight

Seq Number: 3016591

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00364	0.00364	mg/kg	05.04.17 13.53	U	1
Toluene	108-88-3	0.0178	0.00364	mg/kg	05.04.17 13.53		1
Ethylbenzene	100-41-4	0.0433	0.00364	mg/kg	05.04.17 13.53		1
m,p-Xylenes	179601-23-1	0.163	0.00727	mg/kg	05.04.17 13.53		1
o-Xylene	95-47-6	0.148	0.00364	mg/kg	05.04.17 13.53		1
Total Xylenes	1330-20-7	0.311	0.00364	mg/kg	05.04.17 13.53		1
Total BTEX		0.372	0.00364	mg/kg	05.04.17 13.53		1
			%				
Surrogate	Cas Number	Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	111	%	80-120	05.04.17 13.53		
4-Bromofluorobenzene	460-00-4	87	%	80-120	05.04.17 13.53		

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: T1- 10'	Matrix: Soil	Date Received: 04.28.17 11.00
Lab Sample Id: 552078-008	Date Collected: 04.26.17 10.10	Sample Depth: 10 ft
Analytical Method: Inorganic Anions by EPA 300/300.1		Prep Method: E300P
Tech: MGO		% Moisture:
Analyst: MGO	Date Prep: 05.03.17 16.00	Basis: Wet Weight
Seq Number: 3016455		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	22.2	4.88	mg/kg	05.03.17 23.54		1

Analytical Method: TPH By SW8015 Mod	Prep Method: TX1005P
Tech: ARM	% Moisture:
Analyst: ARM	Date Prep: 05.01.17 13.00
Seq Number: 3016254	Basis: Wet Weight

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
C6-C10 Gasoline Range Hydrocarbons	PHC610	133	15.0	mg/kg	05.01.17 22.16		1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	304	15.0	mg/kg	05.01.17 22.16		1
C28-C35 Oil Range Hydrocarbons	PHCG2835	22.3	15.0	mg/kg	05.01.17 22.16		1
Total TPH	PHC635	459	15.0	mg/kg	05.01.17 22.16		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	123	%	70-135	05.01.17 22.16	
o-Terphenyl	84-15-1	127	%	70-135	05.01.17 22.16	

COG Operating LLC, Artesia, NM

Michalada Federal #003D

Sample Id: **T1- 10'**
 Lab Sample Id: 552078-008

Matrix: Soil
 Date Collected: 04.26.17 10.10

Date Received: 04.28.17 11.00
 Sample Depth: 10 ft

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: ALJ

% Moisture:

Analyst: ALJ

Date Prep: 05.03.17 09.00

Basis: Wet Weight

Seq Number: 3016416

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	05.03.17 17.48	U	1
Toluene	108-88-3	0.0130	0.00200	mg/kg	05.03.17 17.48		1
Ethylbenzene	100-41-4	0.0418	0.00200	mg/kg	05.03.17 17.48		1
m,p-Xylenes	179601-23-1	0.276	0.00399	mg/kg	05.03.17 17.48		1
o-Xylene	95-47-6	0.128	0.00200	mg/kg	05.03.17 17.48		1
Total Xylenes	1330-20-7	0.404	0.00200	mg/kg	05.03.17 17.48		1
Total BTEX		0.459	0.00200	mg/kg	05.03.17 17.48		1
Surrogate	Cas Number	% Recovery		Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	86		%	80-120	05.03.17 17.48	
1,4-Difluorobenzene	540-36-3	97		%	80-120	05.03.17 17.48	

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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COG Operating LLC
Michalada Federal #003D

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3016455

MB Sample Id: 724006-1-BLK

Matrix: Solid

LCS Sample Id: 724006-1-BKS

Prep Method: E300P

Date Prep: 05.03.17

LCSD Sample Id: 724006-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	254	102	257	103	90-110	1	20	mg/kg	05.03.17 22:15	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3016455

Parent Sample Id: 552078-001

Matrix: Soil

MS Sample Id: 552078-001 S

Prep Method: E300P

Date Prep: 05.03.17

MSD Sample Id: 552078-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	196	250	472	110	468	109	90-110	1	20	mg/kg	05.03.17 22:38	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3016455

Parent Sample Id: 552079-003

Matrix: Soil

MS Sample Id: 552079-003 S

Prep Method: E300P

Date Prep: 05.03.17

MSD Sample Id: 552079-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	65.7	249	384	128	379	126	90-110	1	20	mg/kg	05.04.17 00:24	X

Analytical Method: TPH By SW8015 Mod

Seq Number: 3016254

MB Sample Id: 723889-1-BLK

Matrix: Solid

LCS Sample Id: 723889-1-BKS

Prep Method: TX1005P

Date Prep: 05.01.17

LCSD Sample Id: 723889-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	1000	983	98	999	100	70-135	2	35	mg/kg	05.01.17 13:42	
C10-C28 Diesel Range Hydrocarbons	<15.0	1000	988	99	1010	101	70-135	2	35	mg/kg	05.01.17 13:42	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	98		86		107		70-135	%	05.01.17 13:42
o-Terphenyl	105		83		106		70-135	%	05.01.17 13:42



COG Operating LLC
Michalada Federal #003D

Analytical Method: TPH By SW8015 Mod

Seq Number: 3016254

Parent Sample Id: 552075-001

Matrix: Soil
MS Sample Id: 552075-001 S

Prep Method: TX1005P

Date Prep: 05.01.17

MSD Sample Id: 552075-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
C6-C10 Gasoline Range Hydrocarbons	<15.0	999	908	91	912	91	70-135	0	35	mg/kg	05.01.17 15:42	
C10-C28 Diesel Range Hydrocarbons	<15.0	999	910	91	934	93	70-135	3	35	mg/kg	05.01.17 15:42	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	102		101		70-135	%	05.01.17 15:42
o-Terphenyl	104		100		70-135	%	05.01.17 15:42

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016416

MB Sample Id: 724012-1-BLK

Matrix: Solid
LCS Sample Id: 724012-1-BKS

Prep Method: SW5030B

Date Prep: 05.03.17

LCSD Sample Id: 724012-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00199	0.0996	0.106	106	0.104	105	70-130	2	35	mg/kg	05.03.17 09:36	
Toluene	<0.00199	0.0996	0.103	103	0.0983	99	70-130	5	35	mg/kg	05.03.17 09:36	
Ethylbenzene	<0.00199	0.0996	0.114	114	0.119	120	71-129	4	35	mg/kg	05.03.17 09:36	
m,p-Xylenes	<0.00398	0.199	0.219	110	0.227	115	70-135	4	35	mg/kg	05.03.17 09:36	
o-Xylene	<0.00199	0.0996	0.116	116	0.111	112	71-133	4	35	mg/kg	05.03.17 09:36	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	103		106		91		80-120	%	05.03.17 09:36
4-Bromofluorobenzene	84		101		111		80-120	%	05.03.17 09:36

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016591

MB Sample Id: 724088-1-BLK

Matrix: Solid
LCS Sample Id: 724088-1-BKS

Prep Method: SW5030B

Date Prep: 05.03.17

LCSD Sample Id: 724088-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00199	0.0996	0.0990	99	0.0954	96	70-130	4	35	mg/kg	05.04.17 06:45	
Toluene	<0.00199	0.0996	0.101	101	0.0945	95	70-130	7	35	mg/kg	05.04.17 06:45	
Ethylbenzene	<0.00199	0.0996	0.114	114	0.106	106	71-129	7	35	mg/kg	05.04.17 06:45	
m,p-Xylenes	<0.00398	0.199	0.220	111	0.205	103	70-135	7	35	mg/kg	05.04.17 06:45	
o-Xylene	<0.00199	0.0996	0.104	104	0.109	109	71-133	5	35	mg/kg	05.04.17 06:45	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		93		100		80-120	%	05.04.17 06:45
4-Bromofluorobenzene	94		98		112		80-120	%	05.04.17 06:45



COG Operating LLC
Michalada Federal #003D

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016595

MB Sample Id: 724125-1-BLK

Matrix: Solid

LCS Sample Id: 724125-1-BKS

Prep Method: SW5030B

Date Prep: 05.04.17

LCSD Sample Id: 724125-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00201	0.100	0.101	101	0.0978	97	70-130	3	35	mg/kg	05.04.17 15:47	
Toluene	<0.00201	0.100	0.0980	98	0.103	102	70-130	5	35	mg/kg	05.04.17 15:47	
Ethylbenzene	<0.00201	0.100	0.111	111	0.120	119	71-129	8	35	mg/kg	05.04.17 15:47	
m,p-Xylenes	<0.00402	0.201	0.217	108	0.235	116	70-135	8	35	mg/kg	05.04.17 15:47	
o-Xylene	<0.00201	0.100	0.102	102	0.102	101	71-133	0	35	mg/kg	05.04.17 15:47	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	110		105		105		80-120	%	05.04.17 15:47
4-Bromofluorobenzene	96		102		96		80-120	%	05.04.17 15:47

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016416

Parent Sample Id: 552077-033

Matrix: Soil

MS Sample Id: 552077-033 S

Prep Method: SW5030B

Date Prep: 05.03.17

MSD Sample Id: 552077-033 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	0.00274	0.101	0.0803	77	0.0810	77	70-130	1	35	mg/kg	05.03.17 10:41	
Toluene	<0.00203	0.101	0.0740	73	0.0757	75	70-130	2	35	mg/kg	05.03.17 10:41	
Ethylbenzene	<0.00203	0.101	0.0747	74	0.0764	76	71-129	2	35	mg/kg	05.03.17 10:41	
m,p-Xylenes	0.0125	0.203	0.138	62	0.131	59	70-135	5	35	mg/kg	05.03.17 10:41	X
o-Xylene	<0.00203	0.101	0.0813	80	0.0776	77	71-133	5	35	mg/kg	05.03.17 10:41	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	117		117		80-120	%	05.03.17 10:41
4-Bromofluorobenzene	113		106		80-120	%	05.03.17 10:41

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016591

Parent Sample Id: 552196-001

Matrix: Soil

MS Sample Id: 552196-001 S

Prep Method: SW5030B

Date Prep: 05.03.17

MSD Sample Id: 552196-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00375	0.187	0.160	86	0.151	82	70-130	6	35	mg/kg	05.04.17 07:18	
Toluene	<0.00375	0.187	0.149	80	0.136	74	70-130	9	35	mg/kg	05.04.17 07:18	
Ethylbenzene	<0.00375	0.187	0.144	77	0.136	74	71-129	6	35	mg/kg	05.04.17 07:18	
m,p-Xylenes	<0.00749	0.375	0.280	75	0.252	68	70-135	11	35	mg/kg	05.04.17 07:18	X
o-Xylene	<0.00375	0.187	0.139	74	0.131	71	71-133	6	35	mg/kg	05.04.17 07:18	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	115		109		80-120	%	05.04.17 07:18
4-Bromofluorobenzene	113		112		80-120	%	05.04.17 07:18



COG Operating LLC
Michalada Federal #003D

Analytical Method: BTEX by EPA 8021B

Seq Number: 3016595

Parent Sample Id: 552076-014

Matrix: Soil

MS Sample Id: 552076-014 S

Prep Method: SW5030B

Date Prep: 05.04.17

MSD Sample Id: 552076-014 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00202	0.101	0.0819	81	0.0764	77	70-130	7	35	mg/kg	05.04.17 16:52	
Toluene	<0.00202	0.101	0.0843	83	0.0775	78	70-130	8	35	mg/kg	05.04.17 16:52	
Ethylbenzene	<0.00202	0.101	0.0923	91	0.0902	91	71-129	2	35	mg/kg	05.04.17 16:52	
m,p-Xylenes	<0.00403	0.202	0.178	88	0.172	86	70-135	3	35	mg/kg	05.04.17 16:52	
o-Xylene	<0.00202	0.101	0.0948	94	0.0887	89	71-133	7	35	mg/kg	05.04.17 16:52	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	90		104		80-120	%	05.04.17 16:52
4-Bromofluorobenzene	98		117		80-120	%	05.04.17 16:52



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Xenco Quote #
 Xenco Job # **553070**

Client / Reporting Information		Project Information		Analytical Information		Matrix Codes	
Company Name / Branch: COG Operating LLC		Project Name/Number: Michalada Federal #003D		Xenco Quote #		Xenco Job #	
Company Address: 2407 PECOS Avenue Atesia NM 88210		Project Location: Michalada Federal:		Date Time:		Date Time:	
Email: alleb@concho.com dree12@concho.com rhaskell@concho.com		Invoice To: COG Operating LLC Attn: Robert McNeill 600 W. Illinois Midland TX 79701		Date Time:		Date Time:	
Project Contact: Aaron Lieb		PO Number:		Date Time:		Date Time:	
Sampler's Name- Aaron Lieb		Data Deliverable Information		Date Time:		Date Time:	

No.	Field ID / Point of Collection	Collection		Matrix	# of bottles	HCI	Number of preserved bottles							Notes	Field Comments
		Sample Depth	Date				Time	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH		
1	TI - Surface	surf	4/16/17	9:30am	5	1									TPH BTEX Chloride
2	TI - 1'			9:35am	1	1									
3	TI - 2'			9:40am	1	1									
4	TI - 3'			9:45am	1	1									
5	TI - 4'			9:47am	1	1									
6	TI - 6'			10:00am	1	1									
7	TI - 8'			10:05am	1	1									
8	TI - 10'			10:10am	1	1									
9															
10	Turnaround Time (Business days)														

<input type="checkbox"/> Same Day TAT <input type="checkbox"/> Next Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 3 Day EMERGENCY		<input type="checkbox"/> 5 Day TAT <input type="checkbox"/> 7 Day TAT <input type="checkbox"/> Contract TAT <input type="checkbox"/> TRRP Checklist		<input type="checkbox"/> Level II Std QC <input type="checkbox"/> Level III Std QC+ Forms <input type="checkbox"/> Level 3 (CLP Forms) <input type="checkbox"/> TRRP Checklist		<input type="checkbox"/> Level IV (Full Data Pkg/raw data) <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> UST / RG-411		TAT Starts Day received by Lab, if received by 5:00 pm SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY		FED-EX / UPS- Tracking #	
Relinquished by Sampler:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:	
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:	

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at \$5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

Client: COG Operating LLC

Date/ Time Received: 04/28/2017 11:00:00 AM

Work Order #: 552078

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R9

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

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

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer
 Jessica Kramer

Date: 05/01/2017

Checklist reviewed by: Brandi Ritcherson
 Brandi Ritcherson

Date: 05/01/2017

Analytical Report 576852

for
Tetra Tech- Midland

Project Manager: Ike Tavaréz

Michalada Fed #3D

212C-MD-00863

26-FEB-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



26-FEB-18

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

Reference: XENCO Report No(s): **576852**
Michalada Fed #3D
Project Address: Eddy Co, NM

Ike Tavarez:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 576852. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 576852 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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Sample Cross Reference 576852



Tetra Tech- Midland, Midland, TX

Michalada Fed #3D

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
NSW-1	S	02-13-18 10:00		576852-001
SSW-1	S	02-13-18 10:05		576852-002
WSW-1	S	02-13-18 10:10		576852-003
BH-1	S	02-13-18 10:15		576852-004
NSW-2	S	02-13-18 15:00		576852-005
SSW-2	S	02-13-18 15:05		576852-006
BH-2	S	02-13-18 15:10		576852-007
NSW-3	S	02-14-18 13:00		576852-008
SSW-3	S	02-14-18 13:05		576852-009
ESW-1	S	02-14-18 13:10		576852-010
BH-3	S	02-14-18 13:15		576852-011
NSW-3 (1')	S	02-15-18 09:40		576852-012
ESW-1 (1')	S	02-15-18 12:00		576852-013



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Michalada Fed #3D

Project ID: 212C-MD-00863
Work Order Number(s): 576852

Report Date: 26-FEB-18
Date Received: 02/16/2018

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3041950 BTEX by EPA 8021B

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

Batch: LBA-3041960 BTEX by EPA 8021B

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

Batch: LBA-3041964 BTEX by EPA 8021B

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

Batch: LBA-3041987 BTEX by EPA 8021B

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 576852-010.

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



Certificate of Analysis Summary 576852



Tetra Tech- Midland, Midland, TX

Project Name: Michalada Fed #3D

Project Id: 212C-MD-00863
Contact: Ike Tavarez
Project Location: Eddy Co, NM

Date Received in Lab: Fri Feb-16-18 03:30 pm
Report Date: 26-FEB-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	576852-001	576852-002	576852-003	576852-004	576852-005	576852-006
	<i>Field Id:</i>	NSW-1	SSW-1	WSW-1	BH-1	NSW-2	SSW-2
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Feb-13-18 10:00	Feb-13-18 10:05	Feb-13-18 10:10	Feb-13-18 10:15	Feb-13-18 15:00	Feb-13-18 15:05
BTEX by EPA 8021B	<i>Extracted:</i>	Feb-22-18 08:00	Feb-22-18 16:50	Feb-20-18 15:00	Feb-20-18 15:00	Feb-20-18 15:00	Feb-20-18 15:00
	<i>Analyzed:</i>	Feb-22-18 11:43	Feb-22-18 22:38	Feb-22-18 00:22	Feb-22-18 00:41	Feb-22-18 03:33	Feb-22-18 03:52
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.0998 0.0998	<0.0202 0.0202	<0.0994 0.0994	<0.0998 0.0998	<0.100 0.100	0.155 0.101
Toluene		1.20 0.0998	0.0435 0.0202	<0.0994 0.0994	<0.0998 0.0998	4.30 0.100	18.8 0.101
Ethylbenzene		1.80 0.0998	0.796 0.0202	<0.0994 0.0994	<0.0998 0.0998	2.07 0.100	173 D 2.50
m,p-Xylenes		26.8 0.200	6.27 0.0403	1.98 0.199	<0.200 0.200	18.8 0.201	973 D 5.00
o-Xylene		9.14 0.0998	2.76 0.0202	3.07 0.0994	<0.0998 0.0998	6.89 0.100	306 D 2.50
Total Xylenes		35.9 0.0998	9.03 0.0202	5.05 0.0994	<0.0998 0.0998	25.7 0.100	1280 2.50
Total BTEX		38.9 0.0998	9.87 0.0202	5.05 0.0994	<0.0998 0.0998	32.1 0.100	1470 0.101
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Feb-23-18 10:50	Feb-23-18 10:50	Feb-23-18 13:30	Feb-23-18 13:30	Feb-23-18 13:30	Feb-23-18 13:30
	<i>Analyzed:</i>	Feb-23-18 15:03	Feb-23-18 15:19	Feb-23-18 16:06	Feb-23-18 16:22	Feb-23-18 16:28	Feb-23-18 16:33
	<i>Units/RL:</i>	mg/kg RL					
Chloride		59.0 5.00	440 5.02	295 4.94	39.8 5.00	435 4.99	309 4.94
TPH By SW8015 Mod	<i>Extracted:</i>	Feb-20-18 17:00					
	<i>Analyzed:</i>	Feb-20-18 23:58	Feb-21-18 00:26	Feb-21-18 00:52	Feb-21-18 01:18	Feb-21-18 01:46	Feb-21-18 03:05
	<i>Units/RL:</i>	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		1070 15.0	308 15.0	64.5 15.0	17.2 15.0	743 15.0	2740 15.0
Diesel Range Organics (DRO)		4820 15.0	2400 15.0	788 15.0	269 15.0	3780 15.0	4720 15.0
Oil Range Hydrocarbons (ORO)		50.1 15.0	48.5 15.0	<15.0 15.0	<15.0 15.0	89.8 15.0	47.0 15.0
Total TPH		5940 15.0	2760 15.0	853 15.0	286 15.0	4610 15.0	7510 15.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 576852

Tetra Tech- Midland, Midland, TX

Project Name: Michalada Fed #3D



Project Id: 212C-MD-00863

Contact: Ike Tavarez

Project Location: Eddy Co, NM

Date Received in Lab: Fri Feb-16-18 03:30 pm

Report Date: 26-FEB-18

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	576852-007	576852-008	576852-009	576852-010	576852-011	576852-012
	<i>Field Id:</i>	BH-2	NSW-3	SSW-3	ESW-1	BH-3	NSW-3 (1')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Feb-13-18 15:10	Feb-14-18 13:00	Feb-14-18 13:05	Feb-14-18 13:10	Feb-14-18 13:15	Feb-15-18 09:40
BTEX by EPA 8021B	<i>Extracted:</i>	Feb-22-18 16:50	Feb-22-18 16:50	Feb-22-18 08:00	Feb-23-18 08:00	Feb-23-18 08:00	Feb-22-18 16:50
	<i>Analyzed:</i>	Feb-22-18 23:16	Feb-22-18 22:57	Feb-22-18 15:32	Feb-23-18 12:32	Feb-23-18 12:13	Feb-22-18 22:00
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
	Benzene	<0.0199 0.0199	<0.0200 0.0200	<0.0402 0.0402	<0.0199 0.0199	<0.00200 0.00200	<0.00201 0.00201
	Toluene	0.0473 0.0199	0.190 0.0200	0.507 0.0402	0.183 0.0199	<0.00200 0.00200	<0.00201 0.00201
	Ethylbenzene	0.367 0.0199	0.928 0.0200	0.627 0.0402	<0.0199 0.0199	<0.00200 0.00200	<0.00201 0.00201
	m,p-Xylenes	3.15 0.0398	5.53 0.0399	8.23 0.0803	16.5 D 0.199	0.0799 0.00401	0.0289 0.00402
	o-Xylene	1.54 0.0199	2.07 0.0200	3.17 0.0402	6.29 D 0.0996	0.0465 0.00200	0.0248 0.00201
Total Xylenes	4.69 0.0199	7.60 0.0200	11.4 0.0402	22.8 0.0996	0.126 0.00200	0.0537 0.00201	
Total BTEX	5.10 0.0199	8.72 0.0200	12.5 0.0402	23.0 0.0199	0.126 0.00200	0.0537 0.00201	
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Feb-23-18 13:30	Feb-23-18 13:30				
	<i>Analyzed:</i>	Feb-23-18 16:49	Feb-23-18 16:54	Feb-23-18 16:59	Feb-23-18 17:05	Feb-23-18 17:10	Feb-23-18 17:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Chloride	297 5.00	1930 24.9	150 5.01	825 4.88	113 5.01	190 4.88	
TPH By SW8015 Mod	<i>Extracted:</i>	Feb-20-18 17:00	Feb-21-18 10:00				
	<i>Analyzed:</i>	Feb-21-18 03:33	Feb-21-18 04:00	Feb-21-18 04:28	Feb-21-18 04:54	Feb-21-18 05:22	Feb-21-18 22:37
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
	Gasoline Range Hydrocarbons (GRO)	241 15.0	214 14.9	345 15.0	497 15.0	128 15.0	45.6 15.0
	Diesel Range Organics (DRO)	2120 15.0	1000 14.9	1770 15.0	1900 15.0	1450 15.0	672 15.0
Oil Range Hydrocarbons (ORO)	26.9 15.0	<14.9 14.9	26.1 15.0	30.4 15.0	23.4 15.0	<15.0 15.0	
Total TPH	2390 15.0	1210 14.9	2140 15.0	2430 15.0	1600 15.0	718 15.0	

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 576852



Tetra Tech- Midland, Midland, TX

Project Name: Michalada Fed #3D

Project Id: 212C-MD-00863

Contact: Ike Tavarez

Project Location: Eddy Co, NM

Date Received in Lab: Fri Feb-16-18 03:30 pm

Report Date: 26-FEB-18

Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	576852-013				
	Field Id:	ESW-1 (1')				
	Depth:					
	Matrix:	SOIL				
	Sampled:	Feb-15-18 12:00				
BTEX by EPA 8021B	Extracted:	Feb-22-18 16:50				
	Analyzed:	Feb-22-18 22:19				
	Units/RL:	mg/kg RL				
	Benzene	<0.00202 0.00202				
	Toluene	<0.00202 0.00202				
	Ethylbenzene	<0.00202 0.00202				
	m,p-Xylenes	0.0429 0.00404				
	o-Xylene	0.0441 0.00202				
Total Xylenes	0.0870 0.00202					
Total BTEX	0.0870 0.00202					
Inorganic Anions by EPA 300/300.1	Extracted:	Feb-23-18 13:30				
	Analyzed:	Feb-23-18 17:34				
	Units/RL:	mg/kg RL				
Chloride	36.1 4.98					
TPH By SW8015 Mod	Extracted:	Feb-21-18 10:00				
	Analyzed:	Feb-21-18 23:05				
	Units/RL:	mg/kg RL				
	Gasoline Range Hydrocarbons (GRO)	43.8 15.0				
	Diesel Range Organics (DRO)	334 15.0				
	Oil Range Hydrocarbons (ORO)	<15.0 15.0				
Total TPH	378 15.0					

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Kelsey Brooks
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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5332 Blackberry Drive, San Antonio TX 78238	(214) 902 0300	(214) 351-9139
1211 W Florida Ave, Midland, TX 79701	(210) 509-3334	(210) 509-3335
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(432) 563-1800	(432) 563-1713
	(602) 437-0330	



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041816

Sample: 576852-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/20/18 23:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	99.9	127	70-135	
o-Terphenyl	48.5	50.0	97	70-135	

Lab Batch #: 3041816

Sample: 576852-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 00:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	117	100	117	70-135	
o-Terphenyl	62.4	50.0	125	70-135	

Lab Batch #: 3041816

Sample: 576852-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 00:52

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	128	99.8	128	70-135	
o-Terphenyl	64.5	49.9	129	70-135	

Lab Batch #: 3041816

Sample: 576852-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 01:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	99.9	114	70-135	
o-Terphenyl	58.0	50.0	116	70-135	

Lab Batch #: 3041816

Sample: 576852-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 01:46

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	99.7	126	70-135	
o-Terphenyl	40.9	49.9	82	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041816

Sample: 576852-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 03:05

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	99.7	121	70-135	
o-Terphenyl	40.0	49.9	80	70-135	

Lab Batch #: 3041816

Sample: 576852-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 03:33

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	116	99.8	116	70-135	
o-Terphenyl	63.7	49.9	128	70-135	

Lab Batch #: 3041816

Sample: 576852-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 04:00

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	116	99.6	116	70-135	
o-Terphenyl	63.6	49.8	128	70-135	

Lab Batch #: 3041816

Sample: 576852-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 04:28

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	120	99.9	120	70-135	
o-Terphenyl	63.1	50.0	126	70-135	

Lab Batch #: 3041816

Sample: 576852-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 04:54

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	99.9	123	70-135	
o-Terphenyl	63.6	50.0	127	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041816

Sample: 576852-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 05:22

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	99.8	115	70-135	
o-Terphenyl	63.1	49.9	126	70-135	

Lab Batch #: 3041818

Sample: 576852-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 22:37

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	100	123	70-135	
o-Terphenyl	64.2	50.0	128	70-135	

Lab Batch #: 3041818

Sample: 576852-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 23:05

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	118	99.7	118	70-135	
o-Terphenyl	57.6	49.9	115	70-135	

Lab Batch #: 3041964

Sample: 576852-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 00:22

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	80-120	
4-Bromofluorobenzene	0.0328	0.0300	109	80-120	

Lab Batch #: 3041964

Sample: 576852-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 00:41

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041964

Sample: 576852-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 03:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	80-120	
4-Bromofluorobenzene	0.0308	0.0300	103	80-120	

Lab Batch #: 3041960

Sample: 576852-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 03:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	80-120	
4-Bromofluorobenzene	0.0310	0.0300	103	80-120	

Lab Batch #: 3041960

Sample: 576852-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 11:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0241	0.0300	80	80-120	
4-Bromofluorobenzene	0.0317	0.0300	106	80-120	

Lab Batch #: 3041960

Sample: 576852-006 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 15:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3041960

Sample: 576852-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 15:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041950

Sample: 576852-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 22:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0255	0.0300	85	80-120	
4-Bromofluorobenzene	0.0353	0.0300	118	80-120	

Lab Batch #: 3041950

Sample: 576852-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 22:19

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

Lab Batch #: 3041950

Sample: 576852-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 22:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	80-120	
4-Bromofluorobenzene	0.0360	0.0300	120	80-120	

Lab Batch #: 3041950

Sample: 576852-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 22:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0347	0.0300	116	80-120	

Lab Batch #: 3041950

Sample: 576852-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 23:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0243	0.0300	81	80-120	
4-Bromofluorobenzene	0.0300	0.0300	100	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041987

Sample: 576852-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/23/18 12:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

Lab Batch #: 3041987

Sample: 576852-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/23/18 12:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	80-120	
4-Bromofluorobenzene	0.0434	0.0300	145	80-120	**

Lab Batch #: 3041987

Sample: 576852-010 / DL

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/23/18 14:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	80-120	
4-Bromofluorobenzene	0.0356	0.0300	119	80-120	

Lab Batch #: 3041816

Sample: 7639520-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/20/18 19:36

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	100	121	70-135	
o-Terphenyl	63.2	50.0	126	70-135	

Lab Batch #: 3041818

Sample: 7639556-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 11:16

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	92.8	100	93	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041964

Sample: 7639673-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 22:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	80-120	
4-Bromofluorobenzene	0.0298	0.0300	99	80-120	

Lab Batch #: 3041960

Sample: 7639666-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 08:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0251	0.0300	84	80-120	
4-Bromofluorobenzene	0.0319	0.0300	106	80-120	

Lab Batch #: 3041950

Sample: 7639669-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 20:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	80-120	
4-Bromofluorobenzene	0.0303	0.0300	101	80-120	

Lab Batch #: 3041987

Sample: 7639672-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/23/18 10:00

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	80-120	
4-Bromofluorobenzene	0.0321	0.0300	107	80-120	

Lab Batch #: 3041816

Sample: 7639520-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/20/18 20:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	100	107	70-135	
o-Terphenyl	54.3	50.0	109	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041818

Sample: 7639556-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 11:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	100	119	70-135	
o-Terphenyl	56.5	50.0	113	70-135	

Lab Batch #: 3041964

Sample: 7639673-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 20:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	80-120	
4-Bromofluorobenzene	0.0324	0.0300	108	80-120	

Lab Batch #: 3041960

Sample: 7639666-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 07:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	80-120	
4-Bromofluorobenzene	0.0334	0.0300	111	80-120	

Lab Batch #: 3041950

Sample: 7639669-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 18:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0320	0.0300	107	80-120	

Lab Batch #: 3041987

Sample: 7639672-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/23/18 07:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	80-120	
4-Bromofluorobenzene	0.0332	0.0300	111	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041816

Sample: 7639520-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/20/18 20:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	100	123	70-135	
o-Terphenyl	63.8	50.0	128	70-135	

Lab Batch #: 3041816

Sample: 7639556-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 12:08

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	100	109	70-135	
o-Terphenyl	52.9	50.0	106	70-135	

Lab Batch #: 3041964

Sample: 7639673-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/21/18 20:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	80-120	
4-Bromofluorobenzene	0.0336	0.0300	112	80-120	

Lab Batch #: 3041960

Sample: 7639666-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 07:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0264	0.0300	88	80-120	
4-Bromofluorobenzene	0.0328	0.0300	109	80-120	

Lab Batch #: 3041950

Sample: 7639669-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/22/18 18:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0254	0.0300	85	80-120	
4-Bromofluorobenzene	0.0335	0.0300	112	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041987

Sample: 7639672-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 02/23/18 08:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0350	0.0300	117	80-120	

Lab Batch #: 3041816

Sample: 576780-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/20/18 21:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	99.9	119	70-135	
o-Terphenyl	58.4	50.0	117	70-135	

Lab Batch #: 3041818

Sample: 576847-007 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 13:53

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.7	108	70-135	
o-Terphenyl	52.7	49.9	106	70-135	

Lab Batch #: 3041964

Sample: 576848-003 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 20:53

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	80-120	

Lab Batch #: 3041960

Sample: 576402-004 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 07:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0335	0.0300	112	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041950

Sample: 576848-004 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 18:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

Lab Batch #: 3041987

Sample: 576848-010 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/23/18 08:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	80-120	
4-Bromofluorobenzene	0.0357	0.0300	119	80-120	

Lab Batch #: 3041816

Sample: 576780-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/20/18 21:48

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	100	126	70-135	
o-Terphenyl	59.7	50.0	119	70-135	

Lab Batch #: 3041818

Sample: 576847-007 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 14:19

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	99.8	119	70-135	
o-Terphenyl	57.0	49.9	114	70-135	

Lab Batch #: 3041964

Sample: 576848-003 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/21/18 21:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0262	0.0300	87	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Fed #3D

Work Orders : 576852,

Project ID: 212C-MD-00863

Lab Batch #: 3041960

Sample: 576402-004 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 16:59

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0346	0.0300	115	80-120	

Lab Batch #: 3041950

Sample: 576848-004 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/22/18 19:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	80-120	
4-Bromofluorobenzene	0.0348	0.0300	116	80-120	

Lab Batch #: 3041987

Sample: 576848-010 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 02/23/18 09:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



BS / BSD Recoveries



Project Name: Michalada Fed #3D

Work Order #: 576852

Project ID: 212C-MD-00863

Analyst: ALJ

Date Prepared: 02/22/2018

Date Analyzed: 02/22/2018

Lab Batch ID: 3041960

Sample: 7639666-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00199	0.0994	0.103	104	0.0998	0.0888	89	15	70-130	35	
Toluene	<0.00199	0.0994	0.111	112	0.0998	0.0928	93	18	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.124	125	0.0998	0.0992	99	22	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.247	124	0.200	0.196	98	23	70-135	35	
o-Xylene	<0.00199	0.0994	0.120	121	0.0998	0.0950	95	23	71-133	35	

Analyst: ALJ

Date Prepared: 02/22/2018

Date Analyzed: 02/22/2018

Lab Batch ID: 3041950

Sample: 7639669-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00200	0.100	0.0907	91	0.0994	0.0880	89	3	70-130	35	
Toluene	<0.00200	0.100	0.0965	97	0.0994	0.0937	94	3	70-130	35	
Ethylbenzene	<0.00200	0.100	0.105	105	0.0994	0.103	104	2	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.207	104	0.199	0.204	103	1	70-135	35	
o-Xylene	<0.00200	0.100	0.100	100	0.0994	0.101	102	1	71-133	35	

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

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

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

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: Michalada Fed #3D

Work Order #: 576852

Project ID: 212C-MD-00863

Analyst: ALJ

Date Prepared: 02/23/2018

Date Analyzed: 02/23/2018

Lab Batch ID: 3041987

Sample: 7639672-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00202	0.101	0.0930	92	0.100	0.0843	84	10	70-130	35	
Toluene	<0.00202	0.101	0.0996	99	0.100	0.0910	91	9	70-130	35	
Ethylbenzene	<0.00202	0.101	0.114	113	0.100	0.104	104	9	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.224	111	0.201	0.205	102	9	70-135	35	
o-Xylene	<0.00202	0.101	0.110	109	0.100	0.101	101	9	71-133	35	

Analyst: ALJ

Date Prepared: 02/20/2018

Date Analyzed: 02/21/2018

Lab Batch ID: 3041964

Sample: 7639673-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00199	0.0994	0.0823	83	0.100	0.0935	94	13	70-130	35	
Toluene	<0.00199	0.0994	0.0887	89	0.100	0.101	101	13	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.102	103	0.100	0.117	117	14	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.201	101	0.201	0.229	114	13	70-135	35	
o-Xylene	<0.00199	0.0994	0.0994	100	0.100	0.114	114	14	71-133	35	

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

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

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

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: Michalada Fed #3D

Work Order #: 576852

Project ID: 212C-MD-00863

Analyst: OJS

Date Prepared: 02/23/2018

Date Analyzed: 02/23/2018

Lab Batch ID: 3041974

Sample: 7639670-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	271	108	250	272	109	0	90-110	20	

Analyst: OJS

Date Prepared: 02/23/2018

Date Analyzed: 02/23/2018

Lab Batch ID: 3042082

Sample: 7639674-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	258	103	250	258	103	0	90-110	20	

Analyst: ARM

Date Prepared: 02/20/2018

Date Analyzed: 02/20/2018

Lab Batch ID: 3041816

Sample: 7639520-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	906	91	1000	1050	105	15	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	986	99	1000	1130	113	14	70-135	35	

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

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

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

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: Michalada Fed #3D

Work Order #: 576852

Project ID: 212C-MD-00863

Analyst: ARM

Date Prepared: 02/21/2018

Date Analyzed: 02/21/2018

Lab Batch ID: 3041818

Sample: 7639556-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	937	94	1000	877	88	7	70-135	35	
Diesel Range Organics (DRO)	<15.0	1000	1010	101	1000	949	95	6	70-135	35	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Michalada Fed #3D

Work Order # : 576852

Project ID: 212C-MD-00863

Lab Batch ID: 3041950

QC- Sample ID: 576848-004 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/22/2018

Date Prepared: 02/22/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0543	54	0.0996	0.0637	64	16	70-130	35	X
Toluene	0.00219	0.100	0.0777	76	0.0996	0.0831	81	7	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0836	84	0.0996	0.0935	94	11	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.165	83	0.199	0.186	93	12	70-135	35	
o-Xylene	<0.00200	0.100	0.0812	81	0.0996	0.0931	93	14	71-133	35	

Lab Batch ID: 3041960

QC- Sample ID: 576402-004 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/22/2018

Date Prepared: 02/22/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.100	0.0805	81	0.0998	0.0808	81	0	70-130	35	
Toluene	<0.00201	0.100	0.0842	84	0.0998	0.0849	85	1	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0889	89	0.0998	0.0930	93	5	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.175	87	0.200	0.184	92	5	70-135	35	
o-Xylene	<0.00201	0.100	0.0860	86	0.0998	0.0908	91	5	71-133	35	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: Michalada Fed #3D

Work Order # : 576852

Project ID: 212C-MD-00863

Lab Batch ID: 3041964

QC- Sample ID: 576848-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/21/2018

Date Prepared: 02/20/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0730	72	0.0994	0.0738	74	1	70-130	35	
Toluene	0.00225	0.101	0.0781	75	0.0994	0.0777	76	1	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0875	87	0.0994	0.0848	85	3	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.171	85	0.199	0.166	83	3	70-135	35	
o-Xylene	<0.00202	0.101	0.0859	85	0.0994	0.0823	83	4	71-133	35	

Lab Batch ID: 3041987

QC- Sample ID: 576848-010 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/23/2018

Date Prepared: 02/23/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.100	0.0771	77	0.0998	0.0724	73	6	70-130	35	
Toluene	<0.00201	0.100	0.0818	82	0.0998	0.0761	76	7	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0923	92	0.0998	0.0856	86	8	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.182	91	0.200	0.170	85	7	70-135	35	
o-Xylene	<0.00201	0.100	0.0899	90	0.0998	0.0849	85	6	71-133	35	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: Michalada Fed #3D

Work Order # : 576852

Project ID: 212C-MD-00863

Lab Batch ID: 3041974

QC- Sample ID: 576793-006 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/23/2018

Date Prepared: 02/23/2018

Analyst: OJS

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	369	244	639	111	244	649	115	2	90-110	20	X

Lab Batch ID: 3041974

QC- Sample ID: 576793-016 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/23/2018

Date Prepared: 02/23/2018

Analyst: OJS

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	23.9	253	285	103	253	278	100	2	90-110	20	

Lab Batch ID: 3042082

QC- Sample ID: 576852-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/23/2018

Date Prepared: 02/23/2018

Analyst: OJS

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	295	247	525	93	247	533	96	2	90-110	20	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: Michalada Fed #3D

Work Order # : 576852

Project ID: 212C-MD-00863

Lab Batch ID: 3042082

QC- Sample ID: 576852-013 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/23/2018

Date Prepared: 02/23/2018

Analyst: OJS

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	36.1	249	309	110	249	299	106	3	90-110	20	

Lab Batch ID: 3041816

QC- Sample ID: 576780-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/20/2018

Date Prepared: 02/20/2018

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	987	99	1000	1020	102	3	70-135	35	
Diesel Range Organics (DRO)	<15.0	999	1070	107	1000	1100	110	3	70-135	35	

Lab Batch ID: 3041818

QC- Sample ID: 576847-007 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 02/21/2018

Date Prepared: 02/21/2018

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	886	89	998	1010	101	13	70-135	35	
Diesel Range Organics (DRO)	47.1	997	1070	103	998	1100	106	3	70-135	35	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Tetra Tech, Inc.

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

576852

Client Name: COG

Site Manager: Ike Tavarez

Project Name: Michalada Fed #3D

Project Location: Eddy Co, NM

Project #:

212C-MD-00863

Invoice to:

Receiving Laboratory: Xenco

Sampler Signature: Clint Merritt

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		DATE	TIME	MATRIX	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)
		YEAR	DATE						
NSW-1				2/13/2018	10:00	X		1	
SSW-1				2/13/2018	10:05	X		1	
WSW-1				2/13/2018	10:10	X		1	
BH-1				2/13/2018	10:15	X		1	
NSW-2				2/13/2018	15:00	X		1	
SSW-2				2/13/2018	15:05	X		1	
BH-2				2/13/2018	15:10	X		1	
NSW-3				2/14/2018	13:00	X		1	
SSW-3				2/14/2018	13:05	X		1	
ESW-1				2/14/2018	13:10	X		1	

Relinquished by: *[Signature]* Date: 2/16/18 Time: 15:30

Received by: *[Signature]* Date: 2/16/18 Time: 15:30

Temp: 0.10 IR ID: R-8
CF: (0.6: -0.2°C) (6-23: +0.2°C)
Corrected Temp: 0.4

Received by: _____ Date: _____ Time: _____

Temp: _____ IR ID: R-8

CF: (0.6: -0.2°C) (6-23: +0.2°C)

Corrected Temp: _____

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

REMARKS:

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Special Report Limits or TRRP Report

DELIVERED FEDEX UPS Tracking #: _____

(Circle or Specify Method No.)

ANALYSIS REQUEST



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 02/16/2018 03:30:00 PM

Work Order #: 576852

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.4
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6* Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	Yes
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	Yes
#18 Water VOC samples have zero headspace?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by: 
Katie Lowe

Date: 02/19/2018

Checklist reviewed by: 
Kelsey Brooks

Date: 02/19/2018

Analytical Report 579802

for
COG Operating, LLC

Project Manager: Becky Haskell

Michalada Federal #3D

212C-MD-00863

21-MAR-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-18-24), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-16), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-18-14)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)



21-MAR-18

Project Manager: **Becky Haskell**
COG Operating, LLC
600 W Illinois
Midland, TX 79701

Reference: XENCO Report No(s): **579802**
Michalada Federal #3D
Project Address: Eddy Co NM

Becky Haskell:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 579802. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 579802 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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

Certified and approved by numerous States and Agencies.

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

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 579802



COG Operating, LLC, Midland, TX

Michalada Federal #3D

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SSW-2 (2')	S	03-09-18 11:00		579802-001
NSW-2 (2')	S	03-09-18 11:00		579802-002



CASE NARRATIVE

Client Name: COG Operating, LLC

Project Name: Michalada Federal #3D

Project ID: 212C-MD-00863
Work Order Number(s): 579802

Report Date: 21-MAR-18
Date Received: 03/20/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3044365 BTEX by EPA 8021B

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



Certificate of Analysis Summary 579802

COG Operating, LLC, Midland, TX

Project Name: Michalada Federal #3D



Project Id: 212C-MD-00863
Contact: Becky Haskell
Project Location: Eddy Co NM

Date Received in Lab: Tue Mar-20-18 04:49 pm
Report Date: 21-MAR-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	579802-001	579802-002				
	<i>Field Id:</i>	SSW-2 (2')	NSW-2 (2')				
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL				
	<i>Sampled:</i>	Mar-09-18 11:00	Mar-09-18 11:00				
BTEX by EPA 8021B	<i>Extracted:</i>	Mar-20-18 17:00					
	<i>Analyzed:</i>	Mar-21-18 04:46					
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00200 0.00200					
Toluene		<0.00200 0.00200					
Ethylbenzene		<0.00200 0.00200					
m,p-Xylenes		<0.00401 0.00401					
o-Xylene		<0.00200 0.00200					
Total Xylenes		<0.00200 0.00200					
Total BTEX		<0.00200 0.00200					
TPH by SW8015 Mod	<i>Extracted:</i>	Mar-20-18 17:00	Mar-20-18 17:00				
	<i>Analyzed:</i>	Mar-20-18 20:47	Mar-20-18 21:15				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons		<15.0 15.0	<15.0 15.0				
Diesel Range Organics		<15.0 15.0	<15.0 15.0				
Oil Range Hydrocarbons		<15.0 15.0	<15.0 15.0				

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

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

Version: 1.9%

Kelsey Brooks
Project Manager



Form 2 - Surrogate Recoveries

Project Name: Michalada Federal #3D

Work Orders : 579802,

Project ID: 212C-MD-00863

Lab Batch #: 3044346

Sample: 579802-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 20:47

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.9	99.7	94	70-135	
o-Terphenyl	47.0	49.9	94	70-135	

Lab Batch #: 3044346

Sample: 579802-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 21:15

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.3	99.7	97	70-135	
o-Terphenyl	48.7	49.9	98	70-135	

Lab Batch #: 3044365

Sample: 579802-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/21/18 04:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0218	0.0300	73	70-130	
4-Bromofluorobenzene	0.0386	0.0300	129	70-130	

Lab Batch #: 3044346

Sample: 7641204-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 18:08

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	97.0	100	97	70-135	
o-Terphenyl	49.9	50.0	100	70-135	

Lab Batch #: 3044365

Sample: 7641218-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 19:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	70-130	
4-Bromofluorobenzene	0.0383	0.0300	128	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Federal #3D

Work Orders : 579802,

Project ID: 212C-MD-00863

Lab Batch #: 3044365

Sample: 7641218-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 17:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	70-130	
4-Bromofluorobenzene	0.0367	0.0300	122	70-130	

Lab Batch #: 3044365

Sample: 7641204-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 18:34

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	53.6	50.0	107	70-135	

Lab Batch #: 3044365

Sample: 7641218-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 17:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0311	0.0300	104	70-130	
4-Bromofluorobenzene	0.0376	0.0300	125	70-130	

Lab Batch #: 3044365

Sample: 7641204-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 03/20/18 19:00

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	55.4	50.0	111	70-135	

Lab Batch #: 3044365

Sample: 579755-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 18:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0218	0.0300	73	70-130	
4-Bromofluorobenzene	0.0255	0.0300	85	70-130	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Michalada Federal #3D

Work Orders : 579802,

Project ID: 212C-MD-00863

Lab Batch #: 3044346

Sample: 579569-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 19:54

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.9	106	70-135	
o-Terphenyl	51.2	50.0	102	70-135	

Lab Batch #: 3044365

Sample: 579755-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 18:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0221	0.0300	74	70-130	
4-Bromofluorobenzene	0.0211	0.0300	70	70-130	

Lab Batch #: 3044346

Sample: 579569-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 03/20/18 20:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.8	109	70-135	
o-Terphenyl	51.6	49.9	103	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



BS / BSD Recoveries



Project Name: Michalada Federal #3D

Work Order #: 579802

Project ID: 212C-MD-00863

Analyst: ALJ

Date Prepared: 03/20/2018

Date Analyzed: 03/20/2018

Lab Batch ID: 3044365

Sample: 7641218-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00199	0.0994	0.0944	95	0.0998	0.103	103	9	70-130	35	
Toluene	<0.00199	0.0994	0.0948	95	0.0998	0.103	103	8	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.101	102	0.0998	0.109	109	8	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.197	99	0.200	0.212	106	7	70-130	35	
o-Xylene	<0.00199	0.0994	0.0997	100	0.0998	0.107	107	7	70-130	35	

Analyst: ARM

Date Prepared: 03/20/2018

Date Analyzed: 03/20/2018

Lab Batch ID: 3044346

Sample: 7641204-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons	<15.0	1000	1030	103	1000	1060	106	3	70-135	35	
Diesel Range Organics	<15.0	1000	1060	106	1000	1100	110	4	70-135	35	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Michalada Federal #3D

Work Order # : 579802

Project ID: 212C-MD-00863

Lab Batch ID: 3044365

QC- Sample ID: 579755-002 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 03/20/2018

Date Prepared: 03/20/2018

Analyst: ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.0227	22	0.100	0.0378	38	50	70-130	35	XF
Toluene	0.00254	0.101	0.0188	16	0.100	0.0343	32	58	70-130	35	XF
Ethylbenzene	<0.00202	0.101	0.0138	14	0.100	0.0314	31	78	70-130	35	XF
m,p-Xylenes	0.00455	0.202	0.0279	12	0.200	0.0624	29	76	70-130	35	XF
o-Xylene	0.00249	0.101	0.0144	12	0.100	0.0320	30	76	70-130	35	XF

Lab Batch ID: 3044346

QC- Sample ID: 579569-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 03/20/2018

Date Prepared: 03/20/2018

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons	<15.0	999	946	95	998	951	95	1	70-135	35	
Diesel Range Organics	<15.0	999	979	98	998	988	99	1	70-135	35	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste 401
Midland, Texas 79705
Tel (432) 682-4539
Fax (432) 682-3946

5708002

Client Name: COG		Site Manager: Ike Tavarez	
Project Name: <i>Michalada Federal #370</i>		Project #: 212C-MD-00863	
Project Location: (county, state) <i>Eddy Co NM</i>		Project #: 212C-MD-00863	
Invoice to: <i>Betsy Haskell (COG)</i>		Sampler Signature: Clint Merrit	
Receiving Laboratory: Xenco		Sampler Signature: Clint Merrit	
Comments: <i>RUSH Clear by March 22 2018</i>			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD			# CONTAINERS	FILTERED (Y/N)	ANALYSIS REQUEST (Circle or Specify Method No.)
		YEAR	DATE	TIME	WATER	SOIL	HCL	HNO ₃			
SSW-2(2)			3/9/2018	11:00	X			X	1	X	BTEX 8021B BTEX 8260B
NSW-1(2)			3/9/2018	11:00	X			X	1	X	TPH TX1005 (Ext to C35)
											TPH 8015M (GRO - DRO - ORO - MRO)
											PAH 8270C
											Total Metals Ag As Ba Cd Cr Pb Se Hg
											TCLP Metals Ag As Ba Cd Cr Pb Se Hg
											TCLP Volatiles
											TCLP Semi Volatiles
											RCI
											GC/MS Vol. 8260B / 624
											GC/MS Semi. Vol. 8270C/625
											PCB's 8082 / 608
											NORM
											PLM (Asbestos)
											Chloride
											Chloride Sulfate TDS
											General Water Chemistry (see attached list)
											Anion/Cation Balance

Relinquished by: <i>Mike C...</i>	Date: <i>3/20/18</i>	Time: <i>4:49</i>	Received by: <i>[Signature]</i>	Date: <i>3/20/18</i>	Time: <i>4:49</i>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

ORIGINAL COPY

Temp: *5.6*
CF: (0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: *5.4*

IR ID: R-8

DELIVERED FEDEX UPS Tracking # _____

REMARKS:

RUSH: Same Day *24* hr 48 hr 72 hr

Rush Charges Authorized

Special Report Limits or TRRP Report

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Michalada Federal #3D
Eddy County, New Mexico

21 South			24 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

21 South			25 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
80	220				
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

21 South			26 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

22 South			24 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

22 South			25 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

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

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

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

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

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



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 00959	C	ED		1	1	1	27	22S	25E	557349	3581495*			
C 00960	C	ED		3	1	2	28	22S	25E	556534	3581303*	69	52	17
C 00961	C	ED		4	1	2	19	22S	25E	553461	3582890*	80	60	20
C 00988	C	ED				4	01	22S	25E	561503	3586854*	55	20	35
C 01288	C	ED		1	4	20		22S	25E	554996	3582193*	800		
C 01492	C	ED		1	2	4	30	22S	25E	553689	3580659*			
C 01738	C	ED		4	2	3	16	22S	25E	556273	3583728*	204		
C 01758	C	ED		4	2	3	16	22S	25E	556273	3583728*			
C 01856	C	ED				4	09	22S	25E	556774	3585236*	460		
C 02362		ED		1	3	3	29	22S	25E	554108	3580247*	83	60	23
C 02874	C	ED		4	3	2	11	22S	25E	559796	3585738*	740	385	355
C 03552 POD1	C	ED		4	4	2	15	22S	25E	558548	3584192	250	150	100

Average Depth to Water: **121 feet**
 Minimum Depth: **20 feet**
 Maximum Depth: **385 feet**

Record Count: 12

PLSS Search:

Township: 22S **Range:** 25E

*UTM location was derived from PLSS - see Help

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

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WATER COLUMN/ AVERAGE DEPTH TO WATER



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec 09	Tws 21S	Rng 25E	X	Y	DepthWell	DepthWater	Water Column
C 00107		CUB	ED	4	3	3	09	21S	25E	555822	3594647*	300		
C 00384		C	ED	1	4	1	17	21S	25E	554431	3593935	994	220	774
C 00384 CLW201180	O		ED	3	2	1	17	21S	25E	554411	3594236*	994	220	774
C 00384 CLW201207	O		ED	3	2	1	17	21S	25E	554411	3594236*	994	220	774
C 00550		C	ED	1	1	2	11	21S	25E	559689	3596136*	97		
C 00885		C	ED	3	4	2	05	21S	25E	555204	3597091*	348		
C 00885 POD2		C	ED	3	4	2	05	21S	25E	555204	3597091*	379	348	31
C 01041		C	ED	3	3	3	03	21S	25E	557260	3596343*	85	65	20
C 01166		C	ED		1	3	11	21S	25E	558976	3595176*	550		
C 01399		C	LE	3	3	2	15	21S	25E	558068	3593839*	200		
C 01451		C	ED		3	3	22	21S	25E	557373	3591507*	290	260	30
C 01455		C	ED		3	2	26	21S	25E	559780	3590713*	125	90	35
C 01456	R	C	ED		2	2	33	21S	25E	557012	3589339	60	17	43
C 01456 POD2		C	ED	4	2	2	33	21S	25E	557012	3589339	80	60	20
C 01470		C	ED		2	4	06	21S	25E	553698	3596774*	284	264	20
C 02066		C	ED	3	3	3	04	21S	25E	555616	3596280*	120	97	23
C 02268			ED	1	4	3	11	21S	25E	559277	3594853*	30	25	5
C 02643		C	ED		3	3	03	21S	25E	557361	3596444*	145	33	112
C 02731		C	ED	1	3	4	18	21S	25E	553218	3593208*	233	60	173
C 03618 POD1		C	ED	2	2	1	03	21S	25E	557943	3597754	160	80	80

Average Depth to Water: **137 feet**
 Minimum Depth: **17 feet**
 Maximum Depth: **348 feet**

Record Count: 20

PLSS Search:

Township: 21S **Range:** 25E

*UTM location was derived from PLSS - see Help

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WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C