

SITE INFORMATION

Report Type: Work Plan

General Site Information:

Site:	Prohibition 12 Federal #008					
Company:	COG Operating LLC					
Section, Township and Range	Unit L	Sec. 12	T 22S	R 32E		
Lease Number:	API No. 30-025-37227					
County:	Lea County					
GPS:	32.40447° N			103.63496° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From intersection of HWY 128 & Delaware Basin Rd, travel west on HWY 128 for 3.3 mi, turn north onto CR 2-From HWY 176 & Co Rd 27A in Lea County, travel EAST on HWY 176 for 2.20 mi, turn SOUTH onto lease road for 3.70 mi to T in road, go right (SW) for 7.70 mi, turn SOUTH for 1.70 mi, turn WEST for 0.80 mi, turn SOUTH for 0.20 mi to location on west side of the road.					

Release Data:

Date Released:	10/21/2016	10/29/2016
Type Release:	Oil & Produced Water	Oil & Produced Water
Source of Contamination:	Wellhead	Wellhead
Fluid Released:	2 bbls oil & 3 bbls water	2.5 bbls oil & 8 bbls water
Fluids Recovered:	0 bbls	0 bbls

Official Communication:

Name:	Robert McNeil	Ike Tavaréz
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.Tavaréz@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	300'+
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:	0	

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



TETRA TECH

APPROVED

By Olivia Yu at 9:19 am, Sep 15, 2017

February 7, 2017

Ms. Kristen Lynch
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

NMOCD will consider delineation completed for 1RP-4491 and 1RP-4619. For remediation, confirmatory laboratory analyses (BTEX, TPH extended, and chlorides) of bottom and sidewall samples < 50 ft apart are required. Provide confirmation sample locations on a scaled map.

Re: Work Plan for the COG Operating LLC., Prohibition 12 Federal #008, Unit L, Section 12, Township 22 South, Range 32 East, Lea County, New Mexico.

Ms. Lynch:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess two spills from the Prohibition 12 Federal #008, Unit L, Section 12, Township 22 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.40447°, W 103.63496°. The site location is shown on Figures 1 and 2.

Background

Two reportable releases occurred at the site in October 2016. The first release occurred on October 21, 2016, and according to the State of New Mexico C-141 Initial Report, approximately two (2) barrels of oil and three (3) barrels of produced water were released due to a failed tubing gauge. The gauge was removed and replaced.

On October 29, 2016, the second release occurred and migrated on top of the first release footprint. According to the State of New Mexico C-141 Initial Report, approximately two and a half (2.5) barrels of oil and eight (8) barrels of produced water were released due to a failed packing in the well head stuffing box. None of the fluids were recovered from either release. The spills remained on the pad and measured approximately 60' x 75'. The initial C-141 forms are included in Appendix A.

Groundwater

No water wells were listed within Section 12 on the New Mexico Office of the State Engineer's database. The nearest well is located in Section 14 with a reported depth of approximately 360' below surface. According to the Chevron Texaco

Tetra Tech

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

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



Groundwater Trend map, the average depth to groundwater in this area is greater than 300' below surface. The groundwater data is shown in Appendix B.

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 November 30, 2016, Tetra Tech personnel were onsite to evaluate and sample the release area. Using a backhoe, two (2) sample trenches (T-1 and T-2) were installed to a total depth of 8.0' below surface. 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 results of the sampling are summarized in Table 1. The trench locations are shown on Figure 3.

Referring to Table 1, none of the samples showed total TPH, benzene, or total BTEX concentrations above the RRAL's. The area of trench (T-1) showed a total TPH concentration of 2,346 mg/kg and a total BTEX concentration of 12.7 mg/kg at 0-1' below surface. The area of trench (T-2) showed a total TPH concentration of 177.3 mg/kg and a total BTEX concentration of 12.5 mg/kg at 0-1' below surface.

The areas of trenches (T-1 and T-2) showed elevated chloride concentrations of 4,900 mg/kg and 3,040 mg/kg at 0-1' below surface. The chloride concentrations in both areas significantly declined at 2.0' below surface to 128 mg/kg and 464 mg/kg, respectively. The bottom trench samples at 8.0' below surface showed chloride concentrations of 128 mg/kg (T-1) and 48.0 mg/kg (T-2).

Work Plan

Based on the laboratory results, COG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. The areas of trenches (T-1 and T-2) will be excavated to a depth of approximately 1.0' below surface to remove the elevated chloride impact in the shallow soils. Once excavated to the appropriate depth, the excavated areas will be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.



TETRA TECH

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns for onsite personnel. As such, Tetra Tech will excavate the impacted soils to the maximum extent practicable.

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

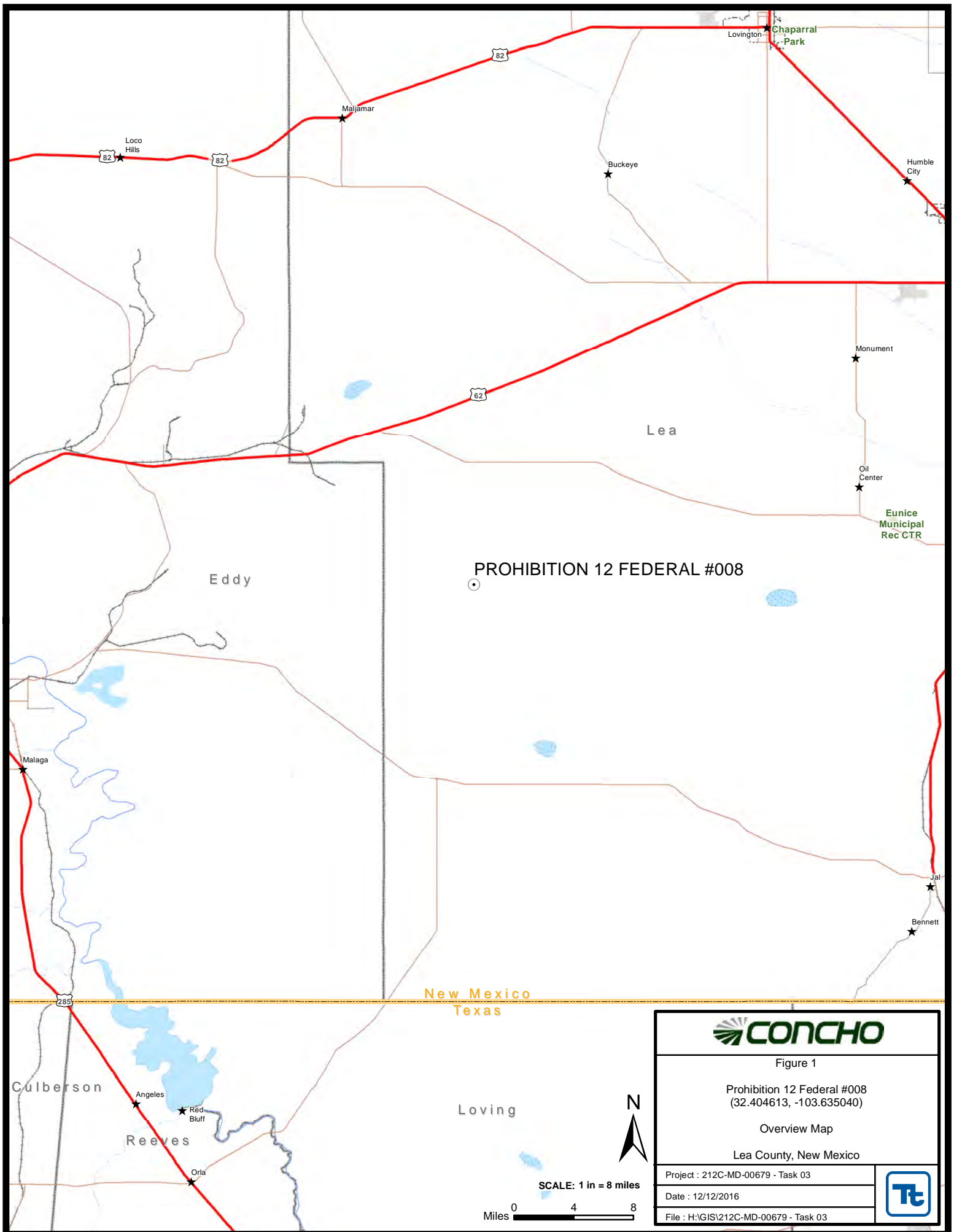
Respectfully submitted,
TETRA TECH



Clair Gonzales,
Geologist I

Ike Tavaréz,
Senior Project Manager, P.G.

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

Figures



	
Figure 1	
Prohibition 12 Federal #008 (32.404613, -103.635040)	
Overview Map	
Lea County, New Mexico	
Project : 212C-MD-00679 - Task 03	
Date : 12/12/2016	
File : H:\GIS\212C-MD-00679 - Task 03	

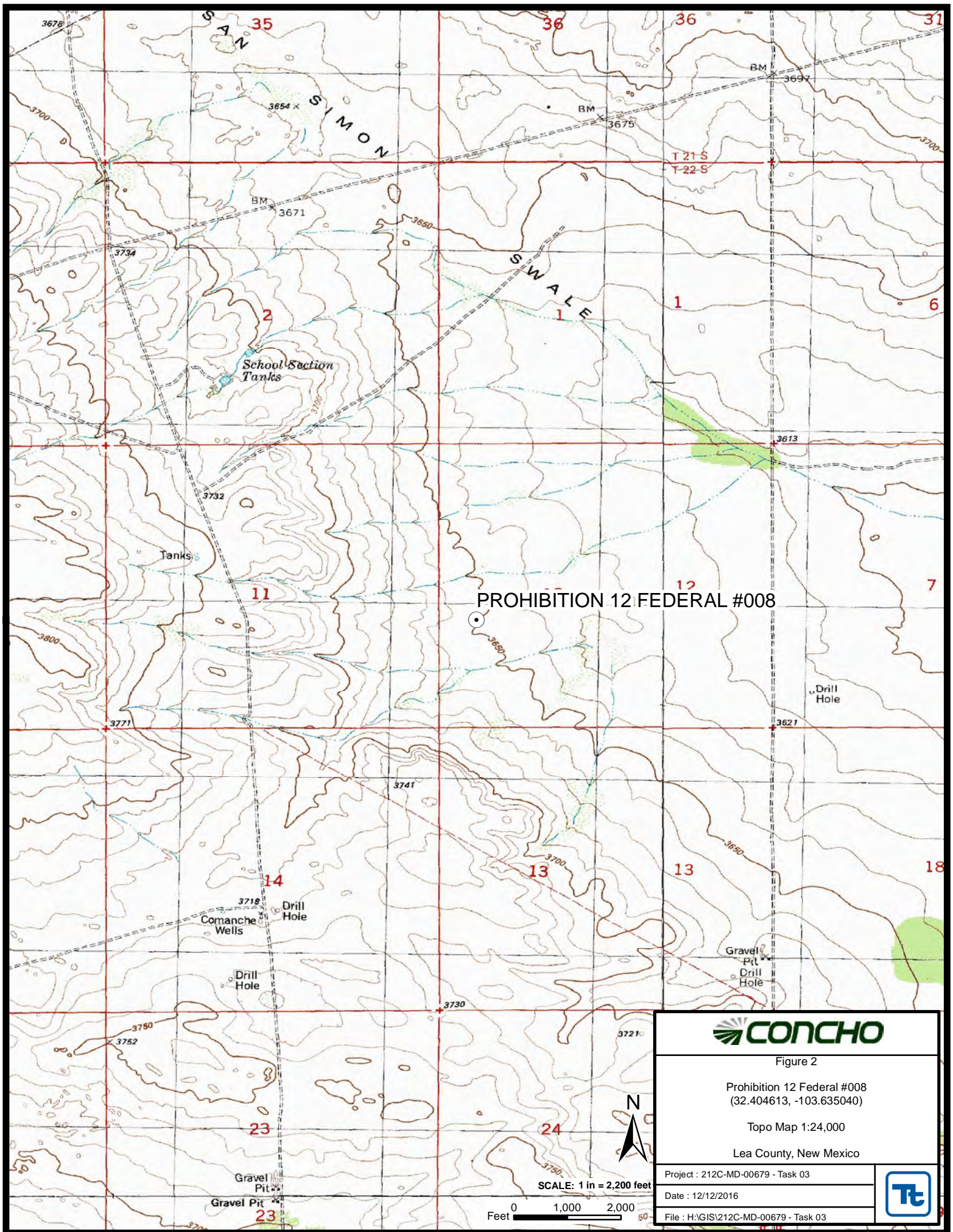


Figure 2

Prohibition 12 Federal #008
(32.404613, -103.635040)

Topo Map 1:24,000

Lea County, New Mexico

Project : 212C-MD-00679 - Task 03

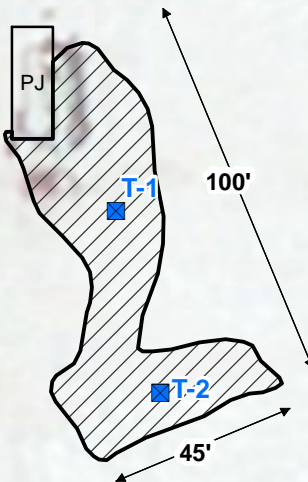
Date : 12/12/2016

File : H:\GIS\212C-MD-00679 - Task 03





PASTURE

PAD



LEASE ROAD

EXPLANATION

-  TRENCH SAMPLE LOCATIONS
-  SPILL AREA



Source: ESRI, DigitalGlobe, GeoEye, **SCALE: 1 IN = 50 FEET**
Feet 0 25 50 app



Figure 3

Prohibition 12 Federal #008
(32.404613, -103.635040)

Spill Assessment Map

Lea County, New Mexico

Project : 212C-MD-00679 - Task 03

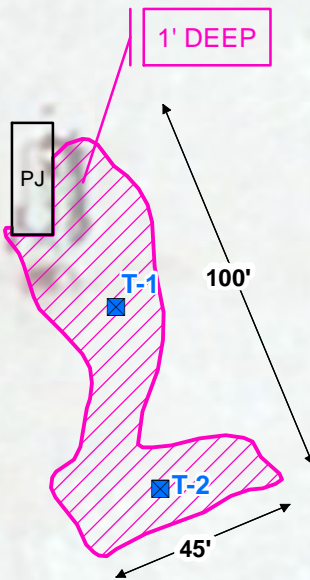
Date : 12/12/2016

File : H:\GIS\212C-MD-00679 - Task 03





PASTURE

PAD



LEASE ROAD

EXPLANATION

-  TRENCH SAMPLE LOCATIONS
-  PROPOSED EXCAVATION AREA



Source: ESRI, DigitalGlobe, GeoEye, **SCALE: 1 IN = 50 FEET**
Feet 0 25 50 app



Figure 4

Prohibition 12 Federal #008
(32.404613, -103.635040)

Proposed Excavation Area & Depth Map

Lea County, New Mexico

Project : 212C-MD-00679 - Task 03

Date : 12/12/2016

File : H:\GIS\212C-MD-00679 - Task 03



Tables

Table 1
COG Operating LLC.
Prohibition 12 Federal #8
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
T-1	11/30/2016	0-1	X		116	2,230	2,350	0.300	3.68	1.80	6.90	12.7	4,900
	"	2	X		-	-	-	-	-	-	-	-	128
	"	3	X		-	-	-	-	-	-	-	-	720
	"	4	X		-	-	-	-	-	-	-	-	736
	"	6	X		-	-	-	-	-	-	-	-	240
	"	8	X		-	-	-	-	-	-	-	-	128
T-2	11/30/2016	0-1	X		33.3	144	177	<0.050	1.56	1.97	8.95	12.5	3,040
	"	2	X		-	-	-	-	-	-	-	-	464
	"	3	X		-	-	-	-	-	-	-	-	272
	"	4	X		-	-	-	-	-	-	-	-	640
	"	6	X		-	-	-	-	-	-	-	-	352
	"	8	X		-	-	-	-	-	-	-	-	48.0

(-) Not Analyzed

Proposed Excavation Depth

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: PROHIBITION 12 FEDERAL #008	Facility Type: Battery

Surface Owner: Federal	Mineral Owner: Federal	API No. 30-025-37227
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LOCATION OF RELEASE

Unit Letter L	Section 12	Township 22S	Range 32E	Feet from the 2030	North/South Line South	Feet from the 610	East/West Line West	County Lea
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32.4046135,-103.6350403

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 2bbls of Oil ; 3 bbls of PW	Volume Recovered: 0 bbls of Oil ; 0 bbls of PW
Source of Release: Wellhead	Date and Hour of Occurrence: 10/21/2016 unknown	Date and Hour of Discovery: 10/21/2016 8:00 AM
Was Immediate Notice Given? <input type="checkbox"/> Yes <input 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 caused by a failed tubing gauge. The gauge was removed and replaced with a new one. The surface of the contaminated soil was removed.

Describe Area Affected and Cleanup Action Taken.*

This release occurred on the well pad location. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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

OIL CONSERVATION DIVISION

Signature:



Printed Name: Dakota Neel

Approved by Environmental Specialist:

Title: Environmental Coordinator

Approval Date:

Expiration Date:

E-mail Address: dneel2@concho.com

Conditions of Approval:

Attached ☐

Date: 10/28/2016

Phone: 575-748-6933

* Attach Additional Sheets If Necessary

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: COG Operating LLC	Contact: Robert McNeill	
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077	
Facility Name: PROHIBITION 12 FEDERAL #008	Facility Type: Battery	
Surface Owner: Federal	Mineral Owner: Federal	API No. 30-025-37227

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
L	12	22S	32E	2030	South	610	West	Lea

32.4046135,-103.6350403

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 2.5 bbls of Oil ; 8 bbls of PW	Volume Recovered: 0 bbls of Oil ; 0 bbls of PW
Source of Release: Wellhead	Date and Hour of Occurrence: 10/29/2016 unknown	Date and Hour of Discovery: 10/29/2016 2:00 PM
Was Immediate Notice Given? <input type="checkbox"/> Yes <input 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 caused by a failed packing in the stuffing box. The packing was removed and a new packing installed. The surface layer of the contaminated soil was scraped up and removed.

Describe Area Affected and Cleanup Action Taken.*

This release occurred on the well pad location surrounding the well. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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

Signature: 	OIL CONSERVATION DIVISION		
Printed Name: Dakota Neel	Approved by Environmental Specialist:		
Title: Environmental Coordinator	Approval Date:	Expiration Date:	
E-mail Address: dneel2@concho.com	Conditions of Approval:		Attached <input type="checkbox"/>
Date: 11/3/2016 Phone: 575-748-6933			

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Prohibition 12 Federal #008
Lea County, New Mexico

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

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

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

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

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

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

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

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

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

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 Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02096		ED		2	3	14	22S	32E		627204	3584464*	435	360	75
C 02821	C	LE		2	2	3	14	22S	32E	627303	3584563*	540	340	200
C 02939	C	LE		3	3	1	19	22S	32E	620234	3583042*	280		
C 03717 POD1	C	LE		4	4	1	09	22S	32E	624094	3586365	650		

Average Depth to Water: **350 feet**

Minimum Depth: **340 feet**

Maximum Depth: **360 feet**

Record Count: 4

PLSS Search:

Township: 22S

Range: 32E

*UTM location was derived from PLSS - see Help

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

Appendix C

December 07, 2016

IKE TAVAREZ

TETRA TECH

1910 N. BIG SPRING STREET

MIDLAND, TX 79705

RE: PROHIBITION 12 FEDERAL #8

Enclosed are the results of analyses for samples received by the laboratory on 12/01/16 14:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

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

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

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

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

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
T-1 0-1	H602694-01	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-1 2	H602694-02	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-1 3	H602694-03	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-1 4	H602694-04	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-1 6	H602694-05	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-1 8	H602694-06	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 0-1	H602694-07	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 2	H602694-08	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 3	H602694-09	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 4	H602694-10	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 6	H602694-11	Soil	30-Nov-16 00:00	01-Dec-16 14:15
T-2 8	H602694-12	Soil	30-Nov-16 00:00	01-Dec-16 14:15

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
07-Dec-16 14:17

T-1 0-1
H602694-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Inorganic Compounds

Chloride	4900		16.0	mg/kg	4	6120504	AC	05-Dec-16	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	0.300		0.100	mg/kg	100	6120606	MS	06-Dec-16	8021B	
Toluene*	3.68		0.100	mg/kg	100	6120606	MS	06-Dec-16	8021B	QM-07
Ethylbenzene*	1.80		0.100	mg/kg	100	6120606	MS	06-Dec-16	8021B	
Total Xylenes*	6.90		0.300	mg/kg	100	6120606	MS	06-Dec-16	8021B	
Total BTEX	12.7		0.600	mg/kg	100	6120606	MS	06-Dec-16	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 129 % 73.6-140 6120606 MS 06-Dec-16 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10	116		50.0	mg/kg	5	6120204	MS	03-Dec-16	8015B	
DRO >C10-C28	2230		50.0	mg/kg	5	6120204	MS	03-Dec-16	8015B	

Surrogate: 1-Chlorooctane 86.6 % 35-147 6120204 MS 03-Dec-16 8015B

Surrogate: 1-Chlorooctadecane 86.7 % 28-171 6120204 MS 03-Dec-16 8015B

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-1 2****H602694-02 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	128		16.0	mg/kg	4	6120504	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-1 3**
H602694-03 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	720		16.0	mg/kg	4	6120504	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-1 4****H602694-04 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	736		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-1 6**
H602694-05 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	240		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-1 8**
H602694-06 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	128		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
07-Dec-16 14:17

T-2 0-1
H602694-07 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories

Inorganic Compounds

Chloride	3040		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

S-04

Benzene*	<0.050		0.050	mg/kg	50	6120606	MS	06-Dec-16	8021B	
Toluene*	1.56		0.050	mg/kg	50	6120606	MS	06-Dec-16	8021B	
Ethylbenzene*	1.97		0.050	mg/kg	50	6120606	MS	06-Dec-16	8021B	
Total Xylenes*	8.95		0.150	mg/kg	50	6120606	MS	06-Dec-16	8021B	
Total BTEX	12.5		0.300	mg/kg	50	6120606	MS	06-Dec-16	8021B	

Surrogate: 4-Bromofluorobenzene (PID)		161 %		73.6-140		6120606	MS	06-Dec-16	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10	33.3		10.0	mg/kg	1	6120204	MS	03-Dec-16	8015B	
DRO >C10-C28	144		10.0	mg/kg	1	6120204	MS	03-Dec-16	8015B	

Surrogate: 1-Chlorooctane		61.5 %		35-147		6120204	MS	03-Dec-16	8015B	
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Surrogate: 1-Chlorooctadecane		47.2 %		28-171		6120204	MS	03-Dec-16	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-2 2****H602694-08 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	464		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-2 3**
H602694-09 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	272		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-2 4****H602694-10 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	640		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-2 6**
H602694-11 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	352		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946Reported:
07-Dec-16 14:17**T-2 8**
H602694-12 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	48.0		16.0	mg/kg	4	6120601	AC	06-Dec-16	4500-Cl-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
07-Dec-16 14:17

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 6120504 - 1:4 DI Water

Blank (6120504-BLK1)

Prepared & Analyzed: 05-Dec-16

Chloride	ND	16.0	mg/kg
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LCS (6120504-BS1)

Prepared & Analyzed: 05-Dec-16

Chloride	416	16.0	mg/kg	400	104	80-120
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LCS Dup (6120504-BSD1)

Prepared & Analyzed: 05-Dec-16

Chloride	400	16.0	mg/kg	400	100	80-120	3.92	20
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Batch 6120601 - 1:4 DI Water

Blank (6120601-BLK1)

Prepared & Analyzed: 06-Dec-16

Chloride	ND	16.0	mg/kg
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LCS (6120601-BS1)

Prepared & Analyzed: 06-Dec-16

Chloride	416	16.0	mg/kg	400	104	80-120
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LCS Dup (6120601-BSD1)

Prepared & Analyzed: 06-Dec-16

Chloride	416	16.0	mg/kg	400	104	80-120	0.00	20
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
07-Dec-16 14:17

Volatile Organic Compounds by EPA Method 8021 - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 6120606 - Volatiles

Blank (6120606-BLK1)

Prepared & Analyzed: 06-Dec-16

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0590		mg/kg	0.0500		118	73.6-140			

LCS (6120606-BS1)

Prepared & Analyzed: 06-Dec-16

Benzene	2.16	0.050	mg/kg	2.00		108	82.6-122			
Toluene	2.23	0.050	mg/kg	2.00		112	72.9-122			
Ethylbenzene	2.17	0.050	mg/kg	2.00		108	65.4-131			
Total Xylenes	6.58	0.150	mg/kg	6.00		110	73.8-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.0587		mg/kg	0.0500		117	73.6-140			

LCS Dup (6120606-BSD1)

Prepared & Analyzed: 06-Dec-16

Benzene	2.11	0.050	mg/kg	2.00		106	82.6-122	2.15	8.23	
Toluene	2.19	0.050	mg/kg	2.00		110	72.9-122	1.86	8.71	
Ethylbenzene	2.13	0.050	mg/kg	2.00		107	65.4-131	1.62	9.46	
Total Xylenes	6.46	0.150	mg/kg	6.00		108	73.8-125	1.84	8.66	
Surrogate: 4-Bromofluorobenzene (PID)	0.0597		mg/kg	0.0500		119	73.6-140			

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TETRA TECH
1910 N. BIG SPRING STREET
MIDLAND TX, 79705

Project: PROHIBITION 12 FEDERAL #8
Project Number: 212C-MD-00679.03
Project Manager: IKE TAVAREZ
Fax To: (432) 682-3946

Reported:
07-Dec-16 14:17

Petroleum Hydrocarbons by GC FID - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 6120204 - General Prep - Organics

Blank (6120204-BLK1)

Prepared & Analyzed: 02-Dec-16

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	39.0		mg/kg	50.0		78.1	35-147			
Surrogate: 1-Chlorooctadecane	39.4		mg/kg	50.0		78.7	28-171			

LCS (6120204-BS1)

Prepared & Analyzed: 02-Dec-16

GRO C6-C10	182	10.0	mg/kg	200		90.9	76.7-115			
DRO >C10-C28	192	10.0	mg/kg	200		96.0	78.3-122			
Total TPH C6-C28	374	10.0	mg/kg	400		93.5	79.8-117			
Surrogate: 1-Chlorooctane	39.1		mg/kg	50.0		78.3	35-147			
Surrogate: 1-Chlorooctadecane	39.8		mg/kg	50.0		79.7	28-171			

LCS Dup (6120204-BSD1)

Prepared & Analyzed: 02-Dec-16

GRO C6-C10	185	10.0	mg/kg	200		92.6	76.7-115	1.79	9.42	
DRO >C10-C28	197	10.0	mg/kg	200		98.4	78.3-122	2.43	13.2	
Total TPH C6-C28	382	10.0	mg/kg	400		95.5	79.8-117	2.12	10.7	
Surrogate: 1-Chlorooctane	40.0		mg/kg	50.0		80.0	35-147			
Surrogate: 1-Chlorooctadecane	40.8		mg/kg	50.0		81.6	28-171			

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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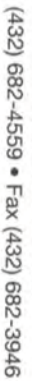
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Celey D. Keene, Lab Director/Quality Manager

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SITE MANAGER:

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Major Anions/Cations, pH, TDS

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