November 15, 2019

Mike Bratcher
Oil Conservation Division, District 2
811 S First St.
Artesia, NM 88210

Jim Amos
Bureau of Land Management, CFO
620 E. Green Street
Carlsbad, NM 88220

Closure Report

Copperhead 31 Federal Com #001H
API#: 30-015-38532
RP#: 2RP-4763
DOR: May 20, 2018
GPS: 32.000366 -104.016256
Unit Letter H, Section 31, Township 26 South, Range 29 East
Eddy County, New Mexico

Mr. Bratcher/Mr. Amos,

COG Operating, LLC (COG) is pleased to submit the following closure report a release that occurred on a flowline associated with the Copperhead 31 Federal Com #001H. The release was located in Unit Letter H, Section 31, Township 26 South and Range 29 East in Eddy County, New Mexico. More specifically the latitude and longitude for the release are 32.000366 North and -104.016256 West.

BACKGROUND

The release was discovered on May 20, 2018. A C-141 initial report was submitted to the New Mexico Oil Conservation Division (NMOCD) and the Bureau of Land Management (BLM). A flowline failed resulting in a release of approximately two-hundred and forty (240) barrels (bbls) of produced water. A vacuum truck was utilized to recover all freestanding fluids. Following the release COG had the impacted area evaluated and a remediation work plan was submitted to and subsequently approved by NMOCD and BLM. A copy of the approved work plan is attached in Appendix B.

GROUNDWATER AND REGULATORY FRAMEWORK

In order to determine groundwater depth in this area a soil boring was drilled to a depth of fifty (50) feet below ground surface (BGS). This information was included in the remediation work plan submitted to and subsequently approved by NMOCD and BLM. A copy of the approved work plan is included in Appendix B.

A risk based evaluation and site determinations were performed in accordance to the New Mexico Oil Conservation Division (NMOCD) Rule (Title 19 Chapter 15 Part 29) for releases on oil and gas development and production in New Mexico (effective August 14, 2018). According to the site characterization evaluation, the affected area has medium potential for cave karst no other receptors (water wells, playas, water course, lake beds or ordinance boundaries) were located within each specific boundaries or distance from the site. The groundwater data and the site characterization evaluation data is summarized in Appendix B. The delineation and closure criteria are listed below:

General Site Characterization and Groundwater:

Site Characterization	Average Groundwater Depth (ft.)
Medium Karst	>50

Delineation and Closure Criteria:

Recommended Remedial Action Levels (RRALs)	
Chlorides	600 mg/kg
TPH (GRO and DRO and MRO)	100 mg/kg
Benzene	10 mg/kg
Total BTEX	50 mg/kg

REMEDIAL ACTIONS

- The impacted area was excavated to a depth of four (4) feet BGS.
- All of the excavated material was hauled to an NMOCD approved solid waste disposal facility.
- Confirmation soil samples were taken from the sidewalls of the excavation per the approved sampling plan.
- A 20-mil poly liner was installed in the bottom of the four (4) foot excavation in order to encapsulate the remaining chloride impacts at depth.

- The site was backfilled with clean “like” material and contoured to match the surrounding location.

SITE RECLAMATION AND RESTORATION

Per NMED 19.15.29.13 reclamation of the pasture area has been performed by removing the impacted soil containing chloride concentrations greater than 600 mg/kg within the first four (4) feet BGS. Approximately one-thousand four-hundred and thirty (1430) cubic yards of material was removed and hauled to an NMOCD approved solid waste disposal facility. Once excavated, soil samples were collected from the sidewalls to confirm the removal of impacted soil greater than 600 mg/kg of chlorides. A 20-mil poly liner was installed at the bottom of the excavation in order to encapsulate the remaining chloride impacts at depth. The backfill material was non-contaminated with concentrations below 600 mg/kg of chlorides. The surface was left in a rough condition to approximate natural surface deviations. The site will be mechanically seeded with the BLM #3 seed mixture once proper seasonal conditions exist.

CLOSURE REQUEST

COG Operating, LLC respectfully requests that the New Mexico Oil Conservation Division and the Bureau of Land Management grant closure approval for the Copperhead 31 Federal Com #001H incident that occurred on May 20, 2018 (2RP-4763).

Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

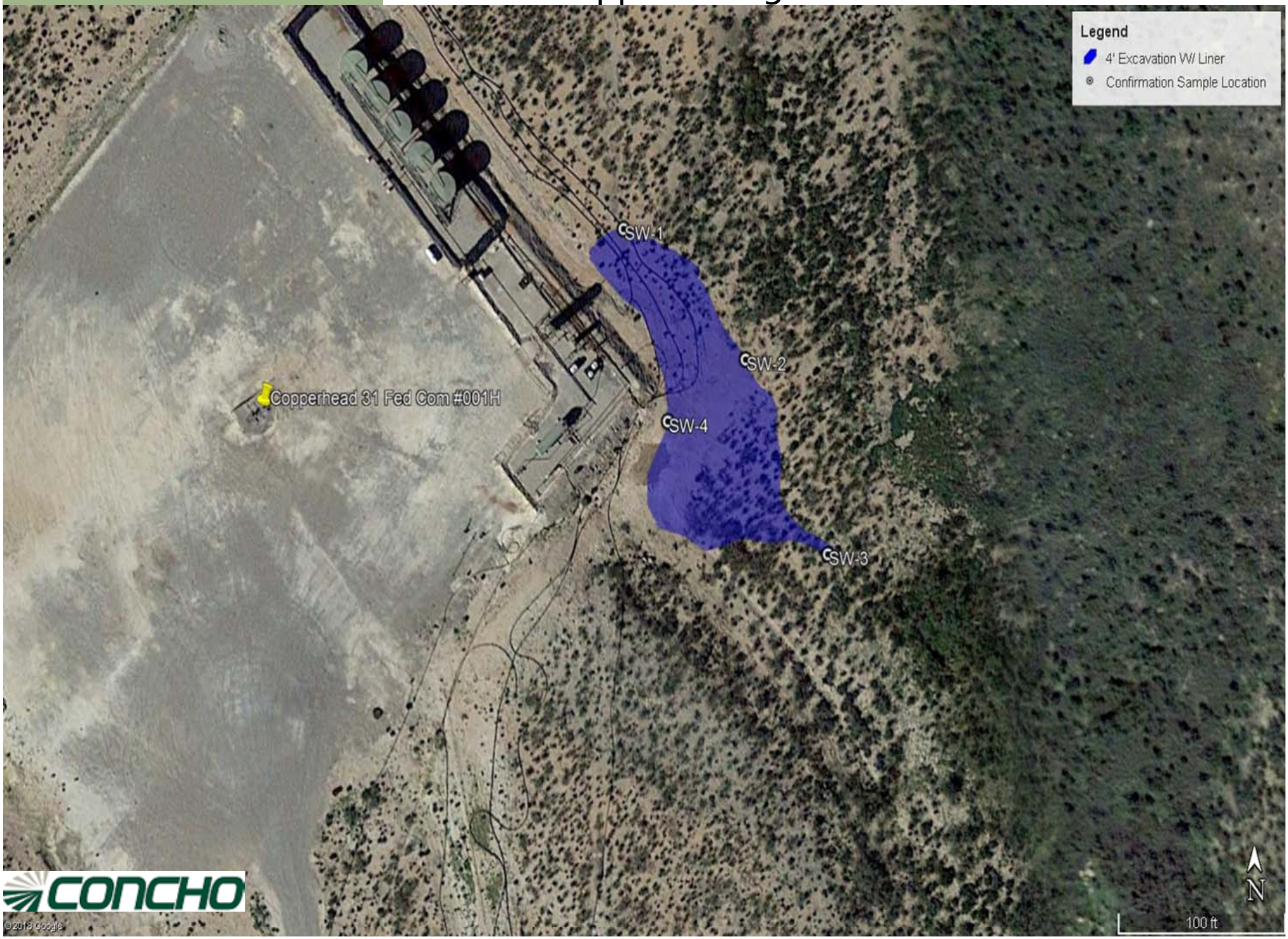
Sheldon Hitchcock

Sheldon L. Hitchcock
HSE Coordinator
slhitchcock@concho.com

FIGURES

May 20, 2018

Copperhead 31 Federal Com #001



TABLES

Table 1
COG Operating LLC.
Copperhead 31 Federal Com #001H
Eddy County, New Mexico

Sample ID	Sample Depth (ft)	Sample Date	Soil Status		TPH (mg/kg)							Benzene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	MRO	*Total*	GRO	DRO	*Total*			
NMOCD RRAL Limits (mg/kg)					**-**	**-**	**-**	**2,500**	**-**	**-**	**1,000**	**10**	**50**	**20,000**
SW-1	N/A	10/24/2019		X	<50.0	<50.0	<50.0	0.0	<50.0	<50.0	0.0	<0.002	<0.002	3,580
SW-2	N/A	10/24/2019	X		<50.0	<50.0	<50.0	0.0	<50.0	<50.0	0.0	<0.002	<0.002	151
SW-3	N/A	10/24/2019	X		<50.0	<50.0	<50.0	0.0	<50.0	<50.0	0.0	<0.002	<0.002	197
SW-4	N/A	10/24/2019	X		<50.0	<50.0	<50.0	0.0	<50.0	<50.0	0.0	<0.002	<0.002	367
SW-1	N/A	10/29/2019	X		#	#	#	#	#	#	#	#	#	149

(#) Not Analyzed

APPENDIX A

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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	COG Operating, LLC	OGRID	229137
Contact Name	Jennifer Knowlton	Contact Telephone	(432) 683-7443
Contact email	jknowlton@concho.com	Incident # *(assigned by OCD)*	
Contact mailing address	600 West Illinois Avenue, Midland, Texas 79701		

Location of Release Source

Latitude 32.0014305 Longitude -104.0168457
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Copperhead 31 Fed Com #001H	Site Type	Tank Battery
Date Release Discovered	5/20/2018	API# *(if applicable)*	30-015-38532

Unit Letter	Section	Township	Range	County
H	31	26S	29E	Eddy

Surface Owner: ☐ State ■ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
■ Produced Water	Volume Released (bbls) 240	Volume Recovered (bbls) 9
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	■ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A 4-inch poly line ruptured due to overpressure. The damage section of the line was replaced.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? >25bbls released

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Sheldon Hitchcock to Mike Bratcher-NMOCD & Shelly Tucker-BLM via Email

Initial Response

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

- ☒ The source of the release has been stopped.
- ☒ The impacted area has been secured to protect human health and the environment.
- ☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
- ☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

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

Printed Name: Sheldon L. Hitchcock Title: HSE Coordinator

Signature: Sheldon Hitchcock Date: 11/15/2019

email: slhitchcock@concho.com Telephone: 575-746-2010

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	>50 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ■ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ■ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ■ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ■ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ■ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ■ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ■ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ■ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ■ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	■ Yes ☐ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ■ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	■ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ■ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ■ Field data
- ■ Data table of soil contaminant concentration data
- ■ Depth to water determination
- ■ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ■ Boring or excavation logs
- ■ Photographs including date and GIS information
- ■ Topographic/Aerial maps
- ■ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: Sheldon L. Hitchcock Title: HSE Coordinator

Signature: Sheldon Hitch Date: 11/15/2019

email: slhitchcock@concho.com Telephone: 575-746-2010

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ■ Detailed description of proposed remediation technique
- ■ Scaled sitemap with GPS coordinates showing delineation points
- ■ Estimated volume of material to be remediated
- ■ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ■ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☐ Extents of contamination must be fully delineated.

☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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

Printed Name: Sheldon L. Hitchcock Title: HSE Coordinator

Signature: Sheldon Hitchcock Date: 11/15/2019

email: slhitchcock@concho.com Telephone: 575-746-2010

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

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

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

■ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

■ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

■ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

■ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Sheldon L. Hitchcock Title: HSE Coordinator

Signature: Sheldon Hitchcock Date: 11/15/2019

email: slhitchcock@concho.com Telephone: 575-746-2010

OCD Only

Received by: _____ Date: _____

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

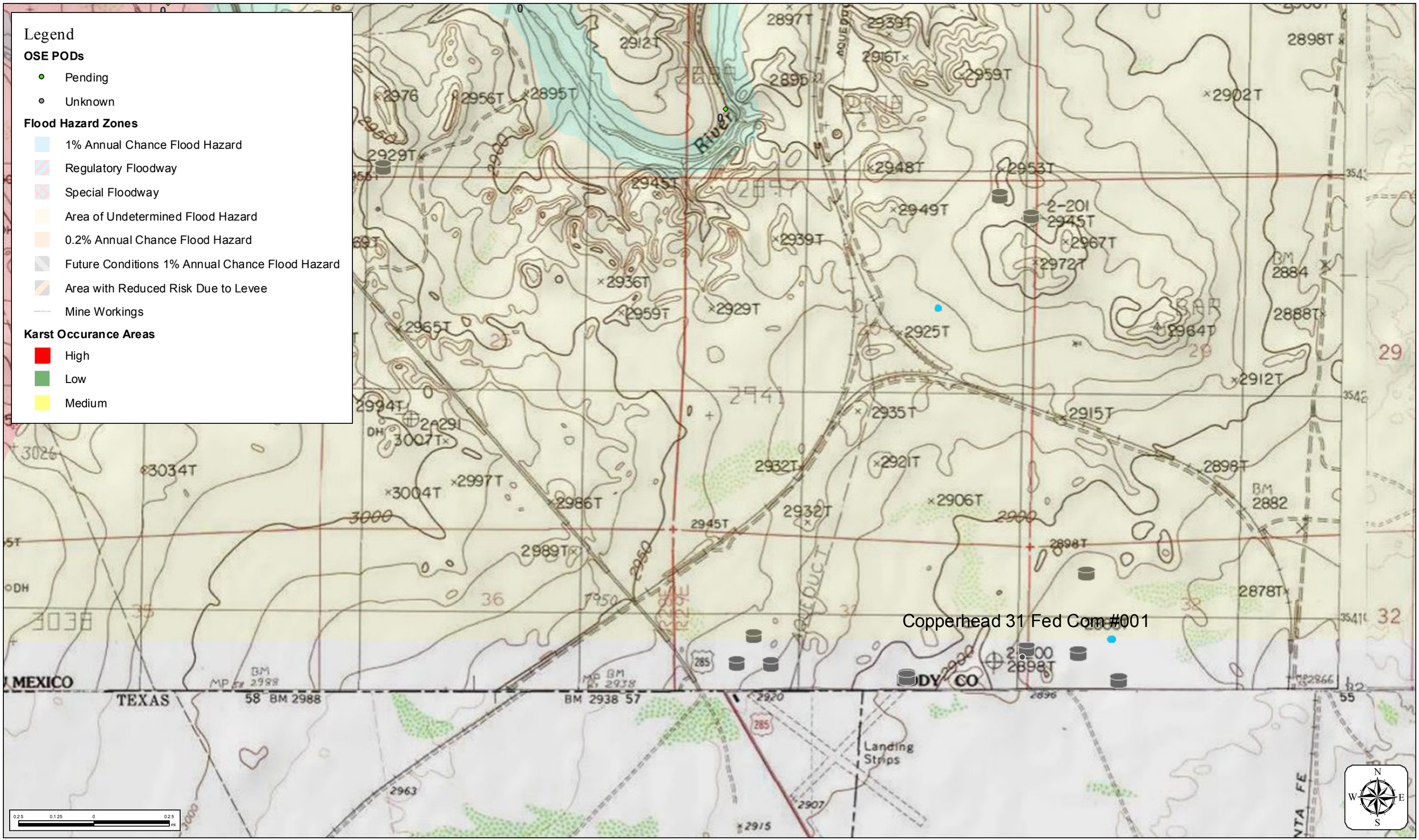
Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

APPENDIX B

CONCHO

ArcGIS Web Map



SITE INFORMATION

Report Type: Addendum

General Site Information:						
Site & Lease No:	**Copperhead 31 Federal Com #001H**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit H**	**Sec. 31**	**T 26S**	**R 29E**		
Lease Number:	**API No. 30-015-38532**					
County:	**Eddy County**					
GPS:	**32.0014305**			**-104.0168457**		
Surface Owner:	**BLM**					
Directions:	From the intersection of Hwy 285 and Catfish Rd. head east on Catfish Rd. for 0.85 miles, turn left (north) and go 400 feet and arrive at location.					

Release Data:		
RP Number	**2RP- 4763**	
Date Released:	5/20/2018	
Type Release:	*Produced Water*	
Source of Contamination:	*Flowline Rupture*	
Fluid Released:	*249 bbl*	
Fluids Recovered:	*9 bbls*	

Official Communication:			
Name:	Ike Tavarez		Clair Gonzales
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		901 West Wall Street
	600 W. Illinois Ave.		Suite 100
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	itavarez@concho.com		Clair.Gonzales@tetratech.com

Site Characterization	
Depth to Groundwater:	*50' +*
Karst Potential:	*Medium*

Recommended Remedial Action Levels (RRALs)			
Benzene	***Total BTEX***	***TPH (GRO+DRO+MRO)***	***Chlorides***
10 mg/kg	*50 mg/kg*	*100 mg/kg*	*600 mg/kg*

TETRA TECH

June 18, 2019

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

Re: Work Plan for the COG Operating, LLC, Copperhead 31 Federal Com #001H, Unit H, Section 31, Township 26 South, Range 29 East, Eddy County, New Mexico. 2RP-4763

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating, LLC (COG) to evaluate a release that occurred at the Copperhead 31 Federal #001H, Unit H, Section 31, Township 26 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are 32.00143°, -104.01684°. 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 May 20, 2018, and released approximately 240 barrels of produced water due to a flowline rupture. The release impacted an overall area measuring approximately 220' x 110'. The C-141 Form is included in Appendix A.

BBC International (BBC) previously submitted a workplan which was denied by the NMOCD. The BBC work plan is shown in Appendix C.

Site Characterization

A site characterization was performed for the site and no watercourses, lakebeds, sinkholes, playa lakes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, springs, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the specified distances.

However, the site is located in a medium karst potential area. No water wells were listed within Section 31 on the New Mexico Office of the State Engineer's (NMOSE) database, the Geology and Groundwater Resources of Eddy County (Report 3), or the USGS National Water Information database. The nearest well is listed in Section 26 on the USGS database, approximately 3.35 miles northeast of the site, and has a reported depth to groundwater of 54.30' below surface.

Tetra Tech personnel were onsite on February 14-15 2019, to re-assess overlapping releases (2RP-4796 and 2RP-5034) that occurred adjacent to the site. A total of four (4) boreholes (BH-1, BH-2, BH-3, and BH-4) were installed in the area to total depths ranging from 19'-20- to 49'-50' below surface in order to vertically define the chloride concentrations. Also, the boreholes (BH-1 through BH-4) showed no moisture or groundwater at any of the borehole locations with the

Tetra Tech
901 West Wall, Suite 100, Midland, TX 79701
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

deepest depth at (BH-1) 49'-50' below surface. The groundwater data and borehole logs are 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, updated August 14, 2018. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the site characterization the proposed RRAL for TPH is 100 mg/kg (GRO+DRO+MRO). Additionally, the proposed RRAL for chlorides is 600 mg/kg.

Work Plan

Based on the laboratory results, as presented by BBC, and the boreholes installed by Tetra Tech at the adjacent site which indicate depth to ground water is greater than 50', COG proposes to remove the chloride impacted soils as shown on BBC's Figure 1 in Appendix C. Due to access issues and safely concerns, the proposed excavation will be performed to remove the impacted soil to the maximum extent practicable. The areas of sample points (SP-1, SP-2, SP-3, SP-4, SP-5, SP-6, SP-7, SP-8, and SP-9) will be excavated to approximately 4.0' below surface.

Variance

Per rule 19.15.29.14, COG requests a variance to install a 20-mil liner at 4.0' below surface in the areas of sample points (SP-1, SP-2, SP-3, SP-4, SP-5, SP-6, SP-7, SP-8, and SP-9), to prevent vertical migration of the deeper chloride concentrations detected. Prior to the liner installation, composite sidewall samples will be collected every 600 square feet, to be representative of the release area, for documentation purposes.

All the excavated material will be transported offsite for proper disposal. COG estimates approximately 1,265 cubic yards will be excavated and will be implemented within ninety (90) days of the work plan being approved.

Sampling Plan

Five-point composite sidewall confirmation samples will be collected every 600 square feet in order to ensure proper removal of the impacted areas. The proposed excavation depths may not be reached due to wall cave-ins and safety concerns for onsite personnel. Also, impacted soil around oil and gas equipment, structures or lines may not be viable or practicable to be removed due to safely concerns for on-site personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.

Conclusion

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 at (432) 682-4559.

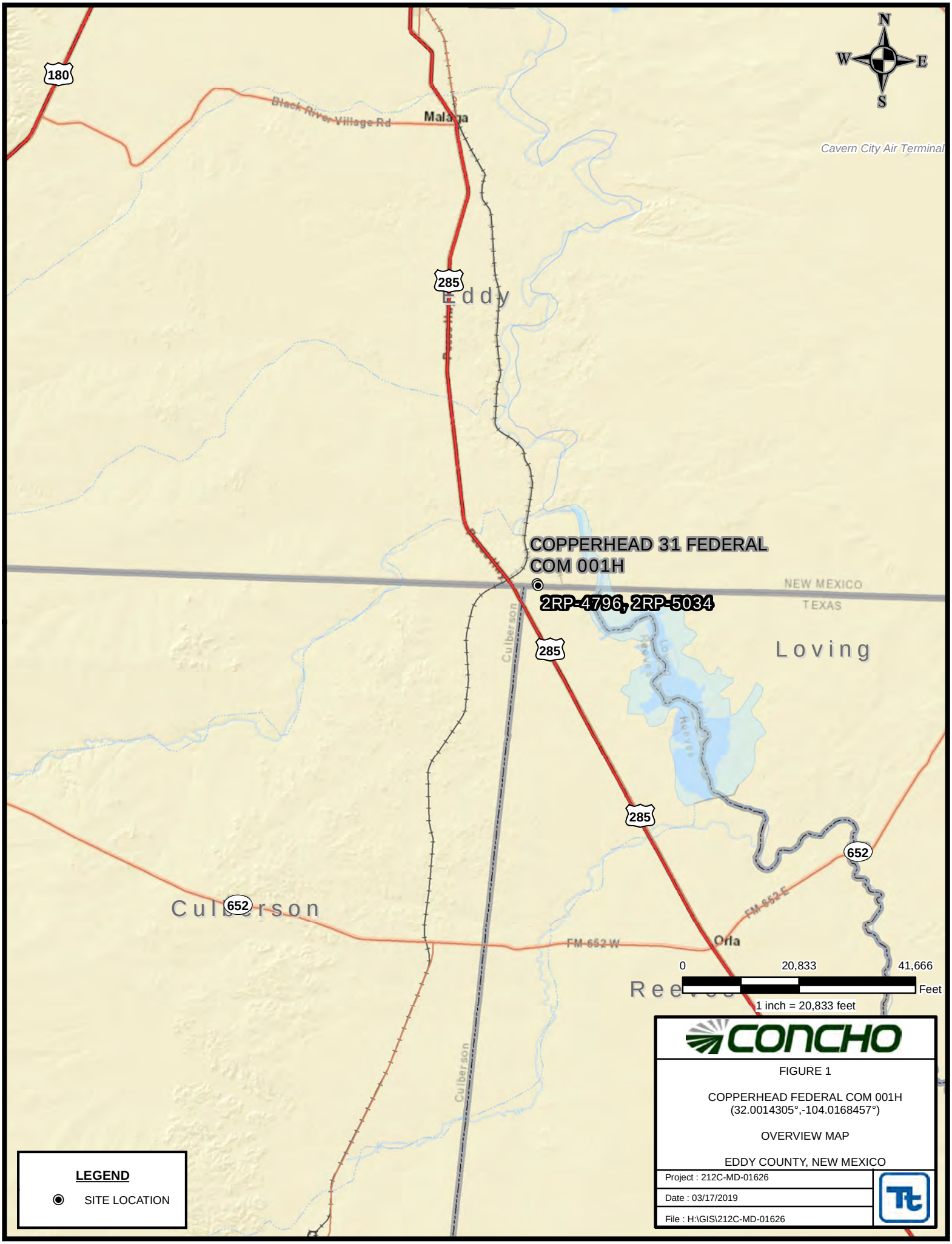
Respectfully submitted,
TETRA TECH

Clair Gonzales, PG
Project Manager

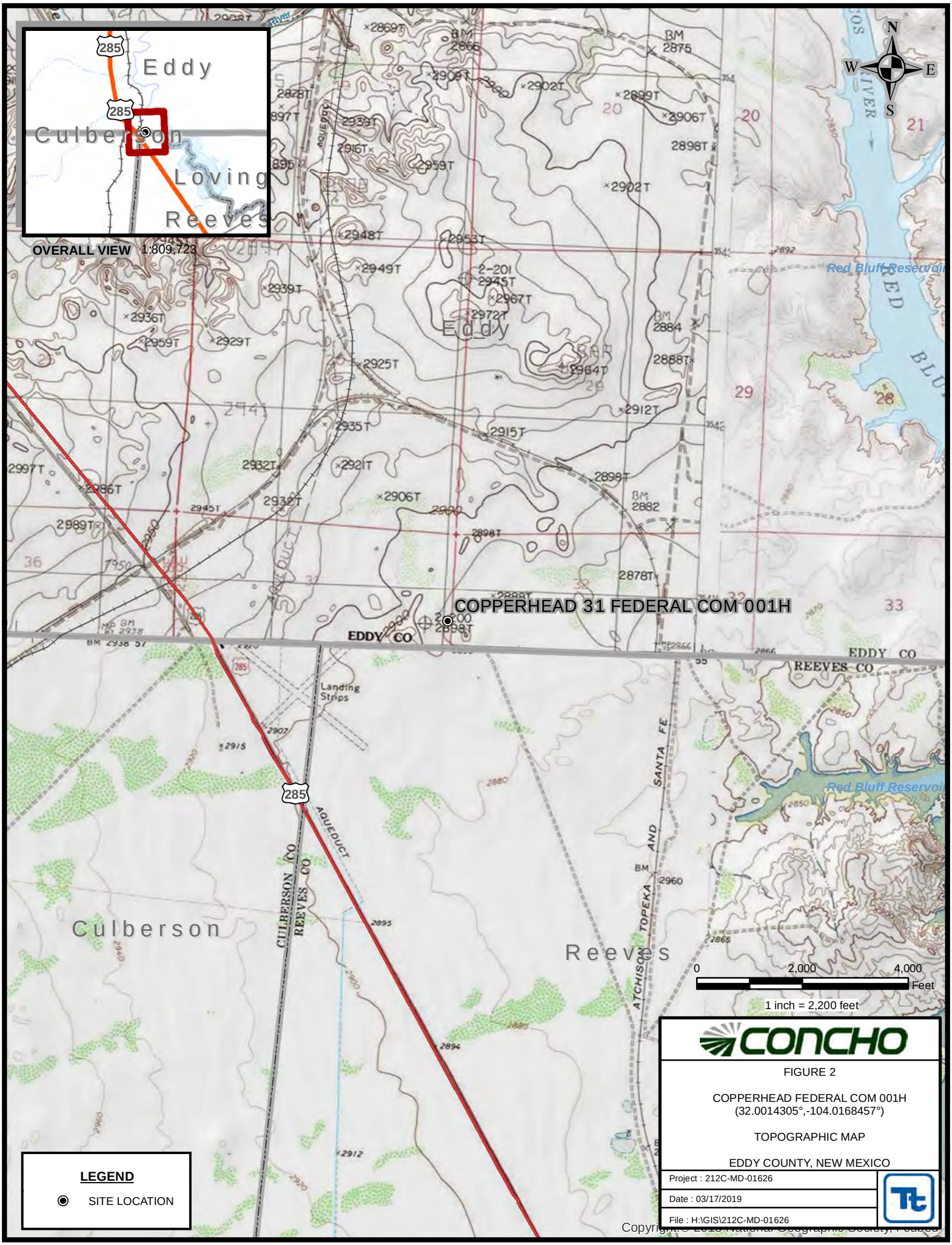
Johnathon Kell,
Geologist

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

Figures



MAPPED BY: MISTI MORGAN



MAPPED BY: MISTI MORGAN

Appendix A

RECEIVED

MAY 21 2018

DISTRICT II-ARTESIA O.C.D.

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 April 3, 2017

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

Release Notification and Corrective Action

nAB1814258390

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: **COG Production, LLC** (OGRID 217955)	Contact: **Robert McNeill**
Address: **600 West Illinois Avenue, Midland TX 79701**	Telephone No.: **432-683-7443**
Facility Name: **Copperhead 31 Federal Com #001H**	Facility Type: **Tank Battery**

Surface Owner: BLM	Mineral Owner: Federal	API No.: 30-015-38532

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
H	31	26S	29E	480	South	480	East	Eddy

Latitude: 32.0014305 **Longitude**: -104.0168457 NAD83

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 240bbls	Volume Recovered: 9bbls
Source of Release: Flowline	Date and Hour of Occurrence: 5/20/2018	Date and Hour of Discovery: 5/20/2018 9:15am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher-NMOCD Shelly Tucker-BLM	
By Whom? Sheldon Hitchcock	Date and Hour: 5/20/2018 6:15pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

A 4-inch poly line ruptured due to a suspected high line pressure. The damaged section of line will be replaced.

Describe Area Affected and Cleanup Action Taken.*

The release impacted the pasture east of the tank battery. Concho will have the area evaluated for 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: Sheldon Hitchcock

Printed Name: Sheldon L. Hitchcock

Title: HSE Coordinator

E-mail Address: slhitchcock@concho.com

Date: 5/21/2018 Phone: 575-746-2010

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: Signed By Mike Bratcher

Approval Date: 5/22/18 Expiration Date: N/A

Conditions of Approval: See attached Attached ☐ 2RP-4763

* Attach Additional Sheets If Necessary

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 5/21/2018 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 2RP-4763 has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District 2 office in ARTESIA on or before 6/21/2018. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

- Nominal detection limits for field and laboratory analyses must be provided.

- Composite sampling is not generally allowed.

- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

•Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

• If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

• Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

Bratcher, Mike, EMNRD

From: Sheldon Hitchcock <SLHitchcock@concho.com>
Sent: Monday, May 21, 2018 10:27 AM
To: Bratcher, Mike, EMNRD; Weaver, Crystal, EMNRD; stucker@blm.gov
Cc: Robert McNeill; Rebecca Haskell; Dakota Neel; Christopher Gray; DeAnn Grant
Subject: (C-141 Initial) Copperhead 31 Federal Com #001H (30-015-38532) 5/20/2018
Attachments: (C-141 Initial) Copperhead 31 Federal Com #001H (30-015-38532) 5-20-2018.pdf

Mr. Bratcher/Ms. Tucker,

Please find the attached C-141 for your consideration. If you have any questions or concerns please let me know.

Thank you,

Sheldon L. Hitchcock
HSE Coordinator
COG Operating LLC
2407 Pecos Avenue | Artesia, NM 88210
Cell: 575-703-6475 | Office: 575-746-2010
slhitchcock@concho.com

CONCHO

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG Copperhead 31 Fed Com #1H
Eddy County, New Mexico

25 South 28 East

6	5 59	4 35	3 32	2	1 Site
7	8	9	10	11	12
18 67	17	16	15 48 49	14	13
19	20 96	21	22	23	24
30	29 15	28 90	27	26 40	25
31	32	33	34	35	36 40

25 South 29 East

6 40	5	4	3	2	1
7	8	9	10 40	11	12
18	17	16	15 60	14	13
19	20	21	22	23	24
30 30	29	28	27	26	25
31	32 115	33	34	35	36

25 South 30 East

6	5	4	3	2 295	1
7 264	8	9 295	10	11	12 390
18	17	16	15	14	13
19	20	21 265 268	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South 28 East

6	5	4	3	2 120 21	1
7	8	9	10	11	12 100
18	17	16	15	14 120	13 56
19	20	21	22 120	23	24
30	29	28	27	26	25
31	32	33	34	35	36

26 South 29 East

6	5 78	4	3	2	1
7	8	9	10	11	12
18	17	16 125	15	14	13
19	20	21	22 57 57 69	23	24
30	29	28	27	26 54.30	25
31 Site	32	33	34	35	36

26 South 30 East

6	5 179 180	4	3	2	1
7	8 172	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24 180
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

National Water Information System: Web Interface

Click to hideNews Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

site_no list =

- 320106103555301

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

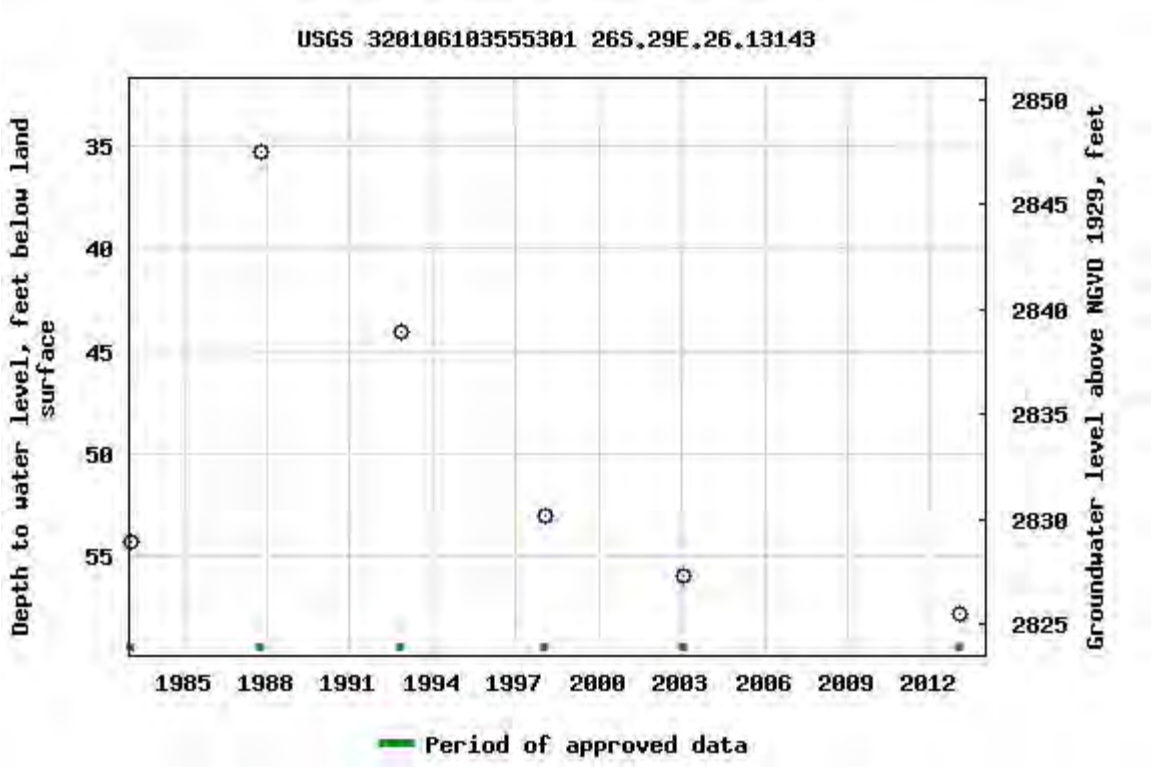
USGS 320106103555301 26S.29E.26.13143

Available data for this site Groundwater: Field measurements GO

Eddy County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°00'51.3", Longitude 103°57'42.0" NAD83
Land-surface elevation 2,883.00 feet above NGVD29
The depth of the well is 140 feet below land surface.
This well is completed in the Rustler Formation (312RSLR) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Accessibility Plug-Ins FOIA Privacy Policies and Notices

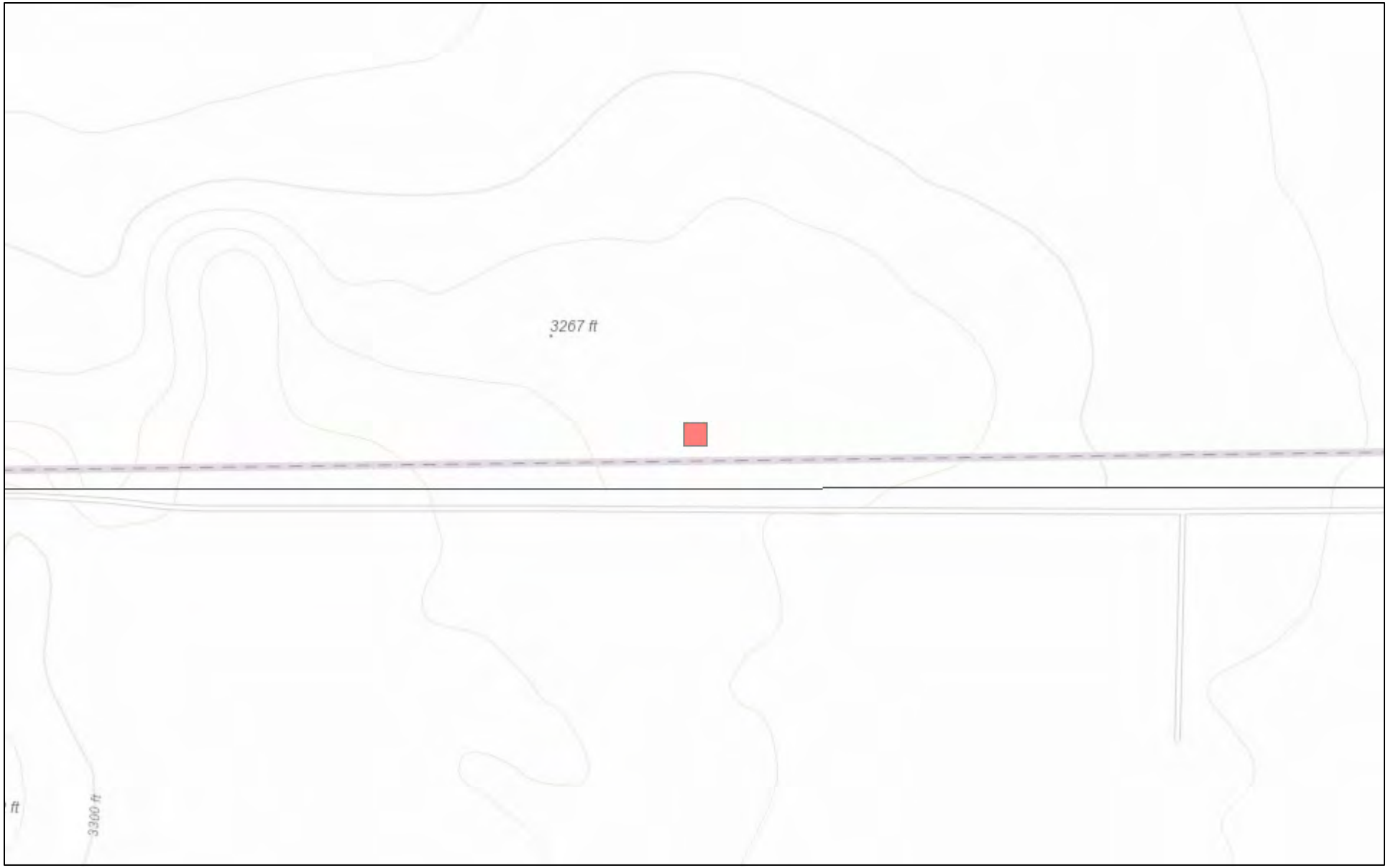
U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for New Mexico: Water Levels
URL: https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?

Page Contact Information: New Mexico Water Data Maintainer
Page Last Modified: 2019-06-18 12:30:03 EDT
0.96 0.87 nadww02


Copperhead 31Fed Com #001H
Legend
High
Low
Medium
285
Google Earth
32.00035 -104.01626
N
1 mi

New Mexico NFHL Data



March 18, 2019

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

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

Client:	**COG**			
Site Name	**Copperhead 31 Fed Com #001H**			
Boring/Well:	**BH-1**			
GPS	**32.000342° -104.016309°**			
Project #:	**212C-MD-01589**			
Total Depth	**50'**			
Date Installed:	**2/15/2019**			
DEPTH (Ft)	**Lithology/Sample Description**	**NOTES**	**Chloride(PPM)**	**Titration (ppm)**
0-1	***Red Silty Sand***	***No odor or Odor***	**4.48 PPT**	**-**
2-3	***Red Silty Sand***	***No Stain or odor***	***6.39 PPT***	**-**
4-5	***Red Silty Sand***	***No Stain or odor***	***5.52 PPT***	**-**
6-7	***Red Silty Sand***	***No Stain or odor***	***3.50 PPT***	**-**
9-10	***Red Silty Sand w/minor rock fragments, Dry***	***No Stain or odor***	***1.64 PPT***	**-**
14-15	***Red Clayey Sand , Dry***	***No Stain or odor***	***2.46 PPT***	**-**
19-20	***Red Silt Sand Clay w/gypsum fragments, Dry***	***No Stain or odor***	***1.93 PPT***	***1,040***
24-25	***Red Silt Sand Clay w/gypsum fragments, Dry***	***No Stain or odor***	***1.67 PPT***	***1,120***
29-30	***Red Silt Sand Clay w/gypsum fragments, Dry***	***No Stain or odor***	***1.51 PPT***	***960***
34-35	***Red Silt Sand Clay w/gypsum fragments, Dry***	***No Stain or odor***	***969 PPT***	***920***
39-40	***Red Silt Sand Clay w/gypsum fragments, Dry***	***No Stain or odor***	***1.12 PPT***	***800***
44-45	***Red Silt Sand Clay w/gypsum fragments,Dry***	***No Stain or odor***	***1.34 PPT***	***600***
49-50	***Red Silt Sand Clay w/gypsum fragments/Dry***	***No Stain or odor***	***1.29 PPT***	***520***

Client:	**COG**			
Site Name	**Copperhead 31 Fed Com #001H**			
Boring/Well:	**BH-2**			
GPS	**32.000500° -104.016200°**			
Project #:	**212C-MD-01589**			
Total Depth	**20'**			
Date Installed:	**2/15/2019**			

DEPTH (Ft)	Lithology/Sample Description	NOTES	Chloride(PPM)	Titration (ppm)
0-1	***Brown Silty Sandy Clay/Dry***	***No odor or Odor***	**1.92 PPT**	**-**
2-3	***Brown Silty Sandy Clay/Dry***	***No Stain or odor***	***942 PPM***	**-**
4-5	***Red Silty Sandy Clay/Dry***	***No Stain or odor***	***2.81 PPT***	**-**
6-7	***Red Silty Sandy Clay/Dry***	***No Stain or odor***	***3.14 PPT***	**-**
9-10	***Red Silty Sandy Clay/Dry***	***No Stain or odor***	***3.44 PPT***	**-**
14-15	***Red Silty Sandy Clay/Dry***	***No Stain or odor***	***595 PPM***	**360**
19-20	***Red Silty Sandy Clay/Dry***	***No Stain or odor***	***598 PPM***	***320***

Client:	**COG**			
Site Name	**Copperhead 31 Fed Com #001H**			
Boring/Well:	**BH-3**			
GPS	**32.000320° -104.015900°**			
Project #:	**212C-MD-01589**			
Total Depth	**20'**			
Date Installed:	**2/15/2019**			

DEPTH (Ft)	Lithology/Sample Description	NOTES	Chloride(PPM)	Titration (ppm)
0-1	*Brown Sandy Silt w/gravel fragments/Dry*	*No odor or Odor*	1.70 PPT	-
2-3	*Red Sand Clayey Silt/Dry*	*No Stain or odor*	*1.39 PPT*	-
4-5	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*2.24 PPT*	-
6-7	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*3.10 PPT*	-
9-10	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*3.95 PPT*	-
14-15	*White Chalkey Gypsum/Dry*	*No Stain or odor*	*1.23 PPT*	480
19-20	*White Chalkey Gypsum/Dry*	*No Stain or odor*	*1.11 PPT*	*320*

Client:	COG			
Site Name	Copperhead 31 Fed Com #001H			
Boring/Well:	BH-4			
GPS	32.000330° -104.016100°			
Project #:	212C-MD-01589			
Total Depth	20'			
Date Installed:	2/15/2019			

DEPTH (Ft)	Lithology/Sample Description	NOTES	Chloride(PPM)	Titration (ppm)
0-1	*Brown Sandy Silt w/gravel fragments/Dry*	*No odor or Odor*	1.92 PPT	-
2-3	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*2.04 PPT*	-
4-5	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*2.25 PPT*	-
6-7	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*4.22 PPT*	-
9-10	*Red Sandy Silty Clay/Dry*	*No Stain or odor*	*4.38 PPT*	-
14-15	*Red Sandy Silty Clay w/gypsum/Dry*	*No Stain or odor*	*1.35 PPT*	520
19-20	*Red Sandy Silty Clay w/gypsum/Dry*	*No Stain or odor*	*1.29 PPT*	*520*

Appendix C

WORLD-WIDE ENVIRONMENTAL SPECIALISTS

BBC INTERNATIONAL INCORPORATED

PHONE (575) 397-6388 • FAX (575) 397- 0397 • 1324 W. MARLAND • P.O. BOX 805 • HOBBS, NM 88241-0805
E-MAIL: cbrunson@bbcinternational.com

DELINEATION WORKPLAN

COG – COPPERHEAD 31 FED COM #001H
(Leak Date: 5/20/18)

RP # 2RP-4763

This delineation workplan and remediation proposal addresses the release associated with RP # 2RP-4763.

The following information includes:

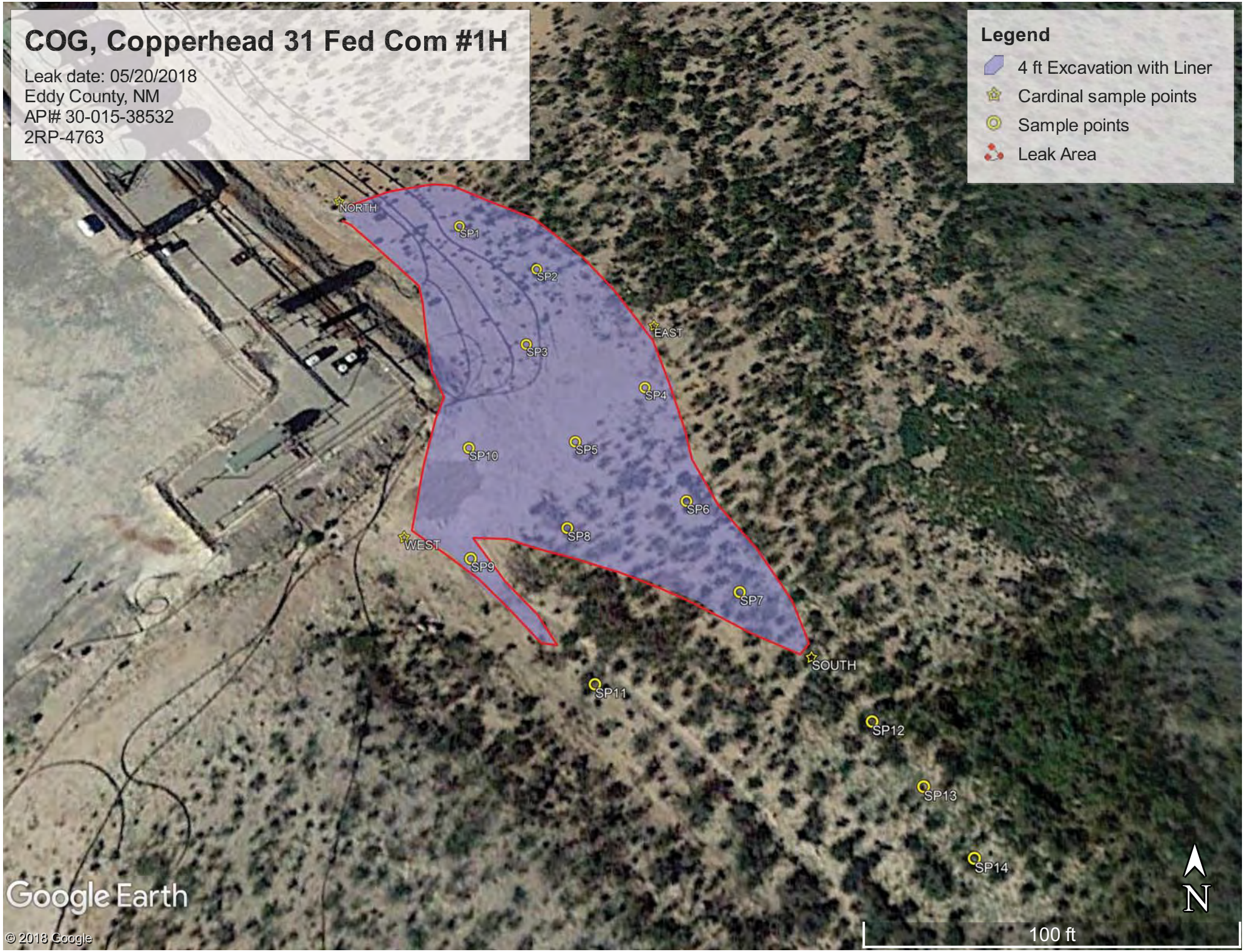
1. Scaled digital site map with spill area demarcated and leak point identified along with sample point locations and areas of remediation at appropriate depths.
2. GPS information for sample points and sample methodology
3. Depth to groundwater information (i.e., pdf of OSE search results and/or copy of Chevron groundwater trend map).
4. Laboratory analysis results summary table and original laboratory analysis reports
5. A copy of the initial C-141
6. Potentially other pertinent information as necessary for site specific purposes.

Based on the information included in this package and the NMOCD guidelines, the following remediation is proposed:

COG will excavate the spill area as depicted on the following site diagram. The entire leak area will be excavated to a depth of 4 feet with an impermeable liner placed in the bottom of the excavation.

The entire site will then be backfilled with clean soil and revegetated (if warranted) to the standards of the appropriate regulatory agency or private surface owner.

All excavated materials will be disposed of at an NMOCD-approved disposal facility.


COG, Copperhead 31 Fed Com #1H
Leak date: 05/20/2018
Eddy County, NM
API# 30-015-38532
2RP-4763
Legend
4 ft Excavation with Liner
Cardinal sample points
Sample points
Leak Area
NORTH
EAST
SOUTH
WEST
SP1
SP2
SP3
SP4
SP5
SP6
SP7
SP8
SP9
SP10
SP11
SP12
SP13
SP14
Google Earth
© 2018 Google
N
100 ft

COG, Copperhead 31 Fed Com #1H

Sample points

SP1, N 32.00163 W-104.01612

SP2, N 32.00158 W-104.01603

SP3, N 32.00149 W-104.01604

SP4, N 32.00145 W-104.01591

SP5, N 32.00139 W-104.01598

SP6, N 32.00133 W-104.01587

SP7, N 32.00125 W-104.01582

SP8, N 32.00131 W-104.01599

SP9, N 32.00128 W-104.01608

SP10, N 32.00138 W-104.01609

SP11, N 32.00117 W-104.01596

SP12, N 32.00114 W-104.01571

SP13, N 32.00109 W-104.01567

SP14, N 32.00103 W-104.01563

NORTH, N 32.00166 W-104.01626

SOUTH, N 32.00119 W-104.01576

EAST, N 32.00152 W-104.01590

WEST, N 32.00130 W-104.01615

COG, Copperhead 31 Fed Com #001H

U/L H, Section 31, T26S, R29E

Groundwater: <50’

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

UTMNAD83 Radius Search (in meters):

Easting (X): 592205 **Northing (Y):** 3541658 **Radius:** 1700

Public Land Survey System (PLSS)

Q64: Q16: Q4: Sec: 31 Tws: 26S Rng: 29E

State Plane Coordinate System - NAD27

X: 0 ft Y: 0 ft Zone:

State Plane Coordinate System - NAD83

X: 0 ft Y: 0 ft Zone:

Degrees/Minutes/Seconds

Longitude (X): Degrees: 0 ° Minutes: 0 ' Seconds: 0 "

Latitude (Y): Degrees: 0 ° Minutes: 0 ' Seconds: 0 "

UTM - NAD27

Easting (X): 0 mtrs Northing (Y): 0 mtrs Zone:

SUBMIT

All Conversion Results are displayed as NAD 1983 UTM Zone 13

Easting (X): 592205.0 mtrs Northing (Y): 3541658.0 mtrs

~~ Please keep screen open to copy UTM values for Reports. ~~

Laboratory Analytical Results Summary
Copperhead 31 Fed Com #001H (5/22/18)

		Sample ID	SP1 @ SURFACE	SP1 @ 1'	SP1 @ 2'	SP1 @ 4'	SP1 @ 6'	SP1 @ 8'	SP1 @ 9'
Analyte	**Method**	**Date**	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**32400**	**7860**	**8000**	**5040**	**5600**	**2400**	**544**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP2 @ SURFACE	SP2 @ 1'	SP2 @ 2'	SP2 @ 4'	SP2 @ 6'	SP2 @ 8'	SP2 @ 9'
Analyte	**Method**	**Date**	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**44800**	**8130**	**8660**	**5730**	**3440**	**2400**	**448**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		**14.4**	<10.0	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP3 @ SURFACE	SP3 @ 1'	SP3 @ 2'	SP3 @ 4'	SP3 @ 6'	SP3 @ 8'	SP3 @ 9'
Analyte	**Method**	**Date**	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18	7/12/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**30400**	**7730**	**7860**	**6260**	**3280**	**2600**	**496**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP4 @ SURFACE	SP4 @ 1'	SP4 @ 2'	SP4 @ 4'	SP4 @ 6'	SP4 @ 8'	SP4 @ 9'
Analyte	**Method**	**Date**	7/12/18	7/12/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**34800**	**28400**	**7330**	**3240**	**1560**	**608**	**608**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a

Laboratory Analytical Results Summary
Copperhead 31 Fed Com #001H (5/22/18)

		Sample ID	SP5 @ SURFACE	SP5 @ 1'	SP5 @ 2'	SP5 @ 4'	SP5 @ 6'	SP5 @ 8'	SP5 @ 9'	SP5 @ 10'
Analyte	**Method**	**Date**	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**33600**	**19400**	**6880**	**6720**	**3520**	**720**	**688**	**720**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		**16.5**	**25.7**	n/a	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	**10.2**	n/a	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP6 @ SURFACE	SP6 @ 1'	SP6 @ 2'	SP6 @ 4'	SP6 @ 6'	SP6 @ 8'	SP6 @ 10'	SP6 @ 12'	SP6 @ 13'
Analyte	**Method**	**Date**	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18	7/13/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**26800**	**3920**	**1170**	**2440**	**5280**	**6800**	**1040**	**608**	**480**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		**14.3**	<10.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP7 @ SURFACE	SP7 @ 1'	SP7 @ 2'	SP7 @ 4'	SP7 @ 5'	SP7 @ 6'
Analyte	**Method**	**Date**	7/16/18	7/16/18	7/16/18	7/16/18	7/16/18	7/16/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**2480**	**352**	**3800**	**720**	**848**	**368**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a

		Sample ID	SP8 @ SURFACE	SP8 @ 1'	SP8 @ 2'	SP8 @ 4'	SP8 @ 5'	SP8 @ 6'
Analyte	**Method**	**Date**	7/16/18	7/16/18	7/16/18	7/16/18	7/16/18	7/16/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**4560**	**5200**	**1800**	**1580**	**816**	**336**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a

Laboratory Analytical Results Summary
Copperhead 31 Fed Com #001H (5/22/18)

		Sample ID	SP9 @ SURFACE	SP9 @ 1'	SP9 @ 2'	SP9 @ 4'	SP9 @ 5'
Analyte	**Method**	**Date**	7/16/18	7/16/18	7/16/18	7/16/18	7/16/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a
Chloride	SM4500Cl-B		**11400**	**4480**	**5440**	**1840**	**272**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a

		Sample ID	SP10 @ SURFACE	SP10 @ 1'	SP10 @ 2'	SP10 @ 4'	SP10 @ 6'	SP10 @ 7'	SP10 @ 8'
Analyte	**Method**	**Date**	7/16/18	7/16/18	7/17/18	7/17/18	7/17/18	7/17/18	7/17/18
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Toluene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	BTEX 8021B		<0.050	<0.050	n/a	n/a	n/a	n/a	n/a
Total Xylenes	BTEX 8021B		<0.150	<0.150	n/a	n/a	n/a	n/a	n/a
Total BTEX	BTEX 8021B		<0.300	<0.300	n/a	n/a	n/a	n/a	n/a
Chloride	SM4500Cl-B		**7000**	**6300**	**6500**	**6100**	**544**	**512**	**368**
GRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a
EXT DRO	TPH 8015M		<10.0	<10.0	n/a	n/a	n/a	n/a	n/a

		Sample ID	SP11 @ SURFACE
Analyte	**Method**	**Date**	7/17/18
			mg/kg
Chloride	SM4500Cl-B		<16.0

		Sample ID	SP12 @ SURFACE	SP12 @ 1'
Analyte	**Method**	**Date**	7/18/18	7/18/18
			mg/kg	mg/kg
Chloride	SM4500Cl-B		<16.0	<16.0

		Sample ID	SP13 @ SURFACE	SP13 @ 1'
Analyte	**Method**	**Date**	7/18/18	7/18/18
			mg/kg	mg/kg
Chloride	SM4500Cl-B		<16.0	<16.0

		Sample ID	SP14 @ SURFACE	SP14 @ 1'
Analyte	**Method**	**Date**	7/18/18	7/18/18
			mg/kg	mg/kg
Chloride	SM4500Cl-B		<16.0	**32**

Cardinal		Sample ID	NORTH @ SURFACE	EAST @ SURFACE	WEST @ SURFACE	SOUTH @ SURFACE
Analyte	**Method**	**Date**	7/18/18	7/18/18	7/18/18	7/18/18
			mg/kg	mg/kg	mg/kg	mg/kg
Chloride	SM4500Cl-B		**368**	**304**	**384**	**368**

APPENDIX C

Certificate of Analysis Summary 641096

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed 5-20-18

Project Id: 5-20-18
Contact: Sheldon Hitchcock
Project Location:

Date Received in Lab: Fri Oct-25-19 10:24 am
Report Date: 28-OCT-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	641096-001		641096-002		641096-003		641096-004					
	Field Id:	SW-1		SW-2		SW-3		SW-4					
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Oct-24-19 08:00		Oct-24-19 08:05		Oct-24-19 08:10		Oct-24-19 08:15					
BTEX by EPA 8021B	***Extracted:***	Oct-25-19 11:15		Oct-25-19 11:15		Oct-25-19 11:15		Oct-25-19 11:15					
SUB: T104704400-19-19	***Analyzed:***	Oct-26-19 11:18		Oct-26-19 11:38		Oct-26-19 11:58		Oct-26-19 12:18					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Benzene		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
Toluene		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
Ethylbenzene		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
m,p-Xylenes		<0.00398	0.00398	<0.00404	0.00404	<0.00402	0.00402	<0.00397	0.00397				
o-Xylene		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
Total Xylenes		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
Total BTEX		<0.00199	0.00199	<0.00202	0.00202	<0.00201	0.00201	<0.00198	0.00198				
Chloride by EPA 300	***Extracted:***	Oct-25-19 17:00		Oct-25-19 17:00		Oct-25-19 17:00		Oct-25-19 17:00					
SUB: T104704400-19-19	***Analyzed:***	Oct-25-19 18:50		Oct-25-19 19:05		Oct-25-19 19:10		Oct-25-19 19:15					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		3580	25.0	151	4.99	197	5.02	367	4.97				
TPH By SW8015 Mod	***Extracted:***	Oct-26-19 15:00		Oct-26-19 15:00		Oct-26-19 15:00		Oct-26-19 15:00					
SUB: T104704400-19-19	***Analyzed:***	Oct-27-19 04:32		Oct-27-19 04:53		Oct-27-19 05:14		Oct-27-19 05:35					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Gasoline Range Hydrocarbons		<49.9	49.9	<50.0	50.0	<49.8	49.8	<49.9	49.9				
Diesel Range Organics		<49.9	49.9	<50.0	50.0	<49.8	49.8	<49.9	49.9				
Motor Oil Range Hydrocarbons (MRO)		<49.9	49.9	<50.0	50.0	<49.8	49.8	<49.9	49.9				
Total TPH		<49.9	49.9	<50.0	50.0	<49.8	49.8	<49.9	49.9				

Jessica Kramer
Project Assistant

Analytical Report 641096

for

COG Operating LLC

Project Manager: Sheldon Hitchcock

Copperhead 31 Fed 5-20-18

5-20-18

28-OCT-19

Collected By: Client

1089 N Canal Street
Carlsbad, NM 88220

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

28-OCT-19

Project Manager: **Sheldon Hitchcock**
COG Operating LLC
2407 Pecos Avenue
Artesia, NM 88210

Reference: XENCO Report No(s): **641096**
Copperhead 31 Fed 5-20-18
Project Address:

Sheldon Hitchcock:

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) 641096. 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. 641096 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,

Jessica Kramer

Jessica Kramer
Project Assistant

Sample Cross Reference 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SW-1	S	10-24-19 08:00		641096-001
SW-2	S	10-24-19 08:05		641096-002
SW-3	S	10-24-19 08:10		641096-003
SW-4	S	10-24-19 08:15		641096-004

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3105496 BTEX by EPA 8021B

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

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-1**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-001	Date Collected:	10.24.19 08.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.25.19 17.00	Basis:	Wet Weight
Seq Number:	3105527			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**3580**	25.0	mg/kg	10.25.19 18.50		5

Analytical Method:	TPH By SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.26.19 15.00	Basis:	Wet Weight
Seq Number:	3105557			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<49.9	49.9	mg/kg	10.27.19 04.32	U	1
Diesel Range Organics	C10C28DRO	<49.9	49.9	mg/kg	10.27.19 04.32	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.27.19 04.32	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.27.19 04.32	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	84	%	70-135	10.27.19 04.32	
o-Terphenyl	84-15-1	90	%	70-135	10.27.19 04.32	

Final 1.000

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-1**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-001	Date Collected:	10.24.19 08.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.25.19 11.15	Basis:	Wet Weight
Seq Number:	3105496			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	10.26.19 11.18	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1
Total BTEX		<0.00199	0.00199	mg/kg	10.26.19 11.18	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.26.19 11.18	
4-Bromofluorobenzene	460-00-4	111	%	70-130	10.26.19 11.18	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-2**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-002	Date Collected:	10.24.19 08.05		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.25.19 17.00	Basis:	Wet Weight
Seq Number:	3105527			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**151**	4.99	mg/kg	10.25.19 19.05		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.26.19 15.00	Basis:	Wet Weight
Seq Number:	3105557			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<50.0	50.0	mg/kg	10.27.19 04.53	U	1
Diesel Range Organics	C10C28DRO	<50.0	50.0	mg/kg	10.27.19 04.53	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	10.27.19 04.53	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	10.27.19 04.53	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	87	%	70-135	10.27.19 04.53	
o-Terphenyl	84-15-1	87	%	70-135	10.27.19 04.53	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-2**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-002	Date Collected:	10.24.19 08.05		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.25.19 11.15	Basis:	Wet Weight
Seq Number:	3105496			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1
Toluene	108-88-3	<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1
Ethylbenzene	100-41-4	<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1
m,p-Xylenes	179601-23-1	<0.00404	0.00404	mg/kg	10.26.19 11.38	U	1
o-Xylene	95-47-6	<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1
Total Xylenes	1330-20-7	<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1
Total BTEX		<0.00202	0.00202	mg/kg	10.26.19 11.38	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.26.19 11.38	
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.26.19 11.38	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-3**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-003	Date Collected:	10.24.19 08.10		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.25.19 17.00	Basis:	Wet Weight
Seq Number:	3105527			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**197**	5.02	mg/kg	10.25.19 19.10		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.26.19 15.00	Basis:	Wet Weight
Seq Number:	3105557			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<49.8	49.8	mg/kg	10.27.19 05.14	U	1
Diesel Range Organics	C10C28DRO	<49.8	49.8	mg/kg	10.27.19 05.14	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	10.27.19 05.14	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	10.27.19 05.14	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	83	%	70-135	10.27.19 05.14	
o-Terphenyl	84-15-1	88	%	70-135	10.27.19 05.14	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-3**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-003	Date Collected:	10.24.19 08.10		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.25.19 11.15	Basis:	Wet Weight
Seq Number:	3105496			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	10.26.19 11.58	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1
Total BTEX		<0.00201	0.00201	mg/kg	10.26.19 11.58	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	93	%	70-130	10.26.19 11.58	
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.26.19 11.58	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-4**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-004	Date Collected:	10.24.19 08.15		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.25.19 17.00	Basis:	Wet Weight
Seq Number:	3105527			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**367**	4.97	mg/kg	10.25.19 19.15		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	SW8015P
Tech:	DVM			% Moisture:	
Analyst:	ARM	Date Prep:	10.26.19 15.00	Basis:	Wet Weight
Seq Number:	3105557			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<49.9	49.9	mg/kg	10.27.19 05.35	U	1
Diesel Range Organics	C10C28DRO	<49.9	49.9	mg/kg	10.27.19 05.35	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	10.27.19 05.35	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	10.27.19 05.35	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	88	%	70-135	10.27.19 05.35	
o-Terphenyl	84-15-1	89	%	70-135	10.27.19 05.35	

Certificate of Analytical Results 641096

COG Operating LLC, Artesia, NM

Copperhead 31 Fed 5-20-18

Sample Id:	**SW-4**	Matrix:	Soil	Date Received:	10.25.19 10.24
Lab Sample Id:	641096-004	Date Collected:	10.24.19 08.15		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	KTL			% Moisture:	
Analyst:	KTL	Date Prep:	10.25.19 11.15	Basis:	Wet Weight
Seq Number:	3105496			SUB:	T104704400-19-19

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	10.26.19 12.18	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1
Total BTEX		<0.00198	0.00198	mg/kg	10.26.19 12.18	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	107	%	70-130	10.26.19 12.18	
1,4-Difluorobenzene	540-36-3	98	%	70-130	10.26.19 12.18	

Flagging Criteria

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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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

QC Summary 641096

COG Operating LLC

Copperhead 31 Fed 5-20-18

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3105527 — Matrix: Solid — Date Prep: 10.25.19
MB Sample Id: 7688957-1-BLK — LCS Sample Id: 7688957-1-BKS — LCSD Sample Id: 7688957-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.858	250	261	104	263	105	90-110	1	20	mg/kg	10.25.19 18:09	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3105527 — Matrix: Soil — Date Prep: 10.25.19
Parent Sample Id: 641073-003 — MS Sample Id: 641073-003 S — MSD Sample Id: 641073-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1200	202	1410	104	1410	104	90-110	0	20	mg/kg	10.25.19 19:36	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3105527 — Matrix: Soil — Date Prep: 10.25.19
Parent Sample Id: 641083-001 — MS Sample Id: 641083-001 S — MSD Sample Id: 641083-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	17.7	248	285	108	286	108	90-110	0	20	mg/kg	10.25.19 18:24	

Analytical Method: TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3105557 — Matrix: Solid — Date Prep: 10.26.19
MB Sample Id: 7688979-1-BLK — LCS Sample Id: 7688979-1-BKS — LCSD Sample Id: 7688979-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons	<50.0	1000	890	89	872	87	70-135	2	20	mg/kg	10.26.19 22:14	
Diesel Range Organics	<15.0	1000	888	89	838	84	70-135	6	20	mg/kg	10.26.19 22:14	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	88		97		103		70-135	%	10.26.19 22:14
o-Terphenyl	94		92		90		70-135	%	10.26.19 22:14

Analytical Method: TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3105557 — Matrix: Solid — Date Prep: 10.26.19
MB Sample Id: 7688979-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	10.26.19 21:54	

MS/MSD Percent Recovery — [D] = 100*(C-A) / B — LCS = Laboratory Control Sample — MS = Matrix Spike
Relative Percent Difference — RPD = 200* | (C-E) / (C+E) | — A = Parent Result — B = Spike Added
LCS/LCSD Recovery — [D] = 100 * (C) / [B] — C = MS/LCS Result — D = MSD/LCSD % Rec
Log Difference — Log Diff. = Log(Sample Duplicate) - Log(Original Sample) — E = MSD/LCSD Result

QC Summary 641096

COG Operating LLC

Copperhead 31 Fed 5-20-18

Analytical Method: **TPH By SW8015 Mod** Prep Method: SW8015P
Seq Number: 3105557 Matrix: Soil Date Prep: 10.26.19
Parent Sample Id: 641040-021 MS Sample Id: 641040-021 S MSD Sample Id: 641040-021 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons	<15.0	997	874	88	882	88	70-135	1	20	mg/kg	10.26.19 23:17	
Diesel Range Organics	<15.0	997	875	88	922	92	70-135	5	20	mg/kg	10.26.19 23:17	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	93		115		70-135	%	10.26.19 23:17
o-Terphenyl	94		98		70-135	%	10.26.19 23:17

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3105496 Matrix: Solid Date Prep: 10.25.19
MB Sample Id: 7688897-1-BLK LCS Sample Id: 7688897-1-BKS LCSD Sample Id: 7688897-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.118	118	0.111	111	70-130	6	35	mg/kg	10.26.19 03:38	
Toluene	<0.00200	0.100	0.105	105	0.106	106	70-130	1	35	mg/kg	10.26.19 03:38	
Ethylbenzene	<0.00200	0.100	0.103	103	0.108	108	70-130	5	35	mg/kg	10.26.19 03:38	
m,p-Xylenes	<0.00400	0.200	0.205	103	0.219	110	70-130	7	35	mg/kg	10.26.19 03:38	
o-Xylene	<0.00200	0.100	0.103	103	0.110	110	70-130	7	35	mg/kg	10.26.19 03:38	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		101		97		70-130	%	10.26.19 03:38
4-Bromofluorobenzene	94		99		106		70-130	%	10.26.19 03:38

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3105496 Matrix: Soil Date Prep: 10.25.19
Parent Sample Id: 641040-021 MS Sample Id: 641040-021 S MSD Sample Id: 641040-021 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.0850	85	0.0710	71	70-130	18	35	mg/kg	10.26.19 04:19	
Toluene	<0.00200	0.0998	0.0814	82	0.0640	64	70-130	24	35	mg/kg	10.26.19 04:19	X
Ethylbenzene	<0.00200	0.0998	0.0821	82	0.0623	62	70-130	27	35	mg/kg	10.26.19 04:19	X
m,p-Xylenes	<0.00399	0.200	0.166	83	0.123	62	70-130	30	35	mg/kg	10.26.19 04:19	X
o-Xylene	<0.00200	0.0998	0.0829	83	0.0589	59	70-130	34	35	mg/kg	10.26.19 04:19	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	101		102		70-130	%	10.26.19 04:19
4-Bromofluorobenzene	109		95		70-130	%	10.26.19 04:19

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

Analysis Request of Chain of Custody Record

CONCHO

One Concho Center/600/Illinois Avenue/Midland, Texas
Tel (432) 683-7443

641094

Client Name: COG-Artesia

Site Manager: Sheldon Hitchcock

Project Name: Copperhead 31 Fed 5-20-18

Project Location: (county, state) Eddy, NM

Project #:

Invoice to: Sheldon Hitchcock

Receiving Laboratory: Xenco

Sampler Name: Sheldon Hitchcock

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2019 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	# CONTAINERS	(G)rab/(C)omposit	TPH 8015M (GRO - DRO - MRO)	BTEX 8021B	Chloride	Hold
	SV-1	10/24	8:00		X			X	1	C	X	X	X	
	SV-2	"	8:05		X			X	1	C	X	X	X	
	SV-3	"	8:10		X			X	1	C	X	X	X	
	SV-4	"	8:15		X			X	1	C	X	X	X	

ANALYSIS REQUEST (Circle or Specify Method No.)

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Sheldon Hitchcock	10/25/19	10:24		10/25/19	10:24
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY

Sample Temperature 4.8

REMARKS:

RUSH: Same Day 24 hr (48 hr) 72 hr

Rush Charges Authorized

Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

Certificate of Analysis Summary 641428

COG Operating LLC, Artesia, NM

Project Name: Copperhead 31 Fed #1

Project Id:

Contact: Sheldon Hitchcock

Project Location: Eddy, NM

Date Received in Lab: Tue Oct-29-19 03:13 pm

Report Date: 30-OCT-19

Project Manager: Jessica Kramer

Analysis Requested								
	Lab Id:	641428-001						
	Field Id:	SW-1						
	Depth:							
	Matrix:	SOIL						
	Sampled:	Oct-29-19 08:30						
Chloride by EPA 300	***Extracted:***	Oct-29-19 16:00						
	Analyzed:	Oct-29-19 19:51						
	Units/RL:	mg/kg	RL					
Chloride		149	9.94					

Jessica Kramer
Project Assistant

Analytical Report 641428

for

COG Operating LLC

Project Manager: Sheldon Hitchcock

Copperhead 31 Fed #1

30-OCT-19

Collected By: Client

1089 N Canal Street
Carlsbad, NM 88220

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)

30-OCT-19

Project Manager: **Sheldon Hitchcock**
COG Operating LLC
2407 Pecos Avenue
Artesia, NM 88210

Reference: XENCO Report No(s): **641428**
Copperhead 31 Fed #1
Project Address: Eddy, NM

Sheldon Hitchcock:

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) 641428. 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. 641428 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,

Jessica Kramer

Jessica Kramer
Project Assistant

Sample Cross Reference 641428

COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SW-1	S	10-29-19 08:30		641428-001

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 641428

COG Operating LLC, Artesia, NM

Copperhead 31 Fed #1

Sample Id:	**SW-1**	Matrix:	Soil	Date Received:	10.29.19 15.13
Lab Sample Id:	641428-001	Date Collected:	10.29.19 08.30		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MAB			% Moisture:	
Analyst:	MAB	Date Prep:	10.29.19 16.00	Basis:	Wet Weight
Seq Number:	3105795				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**149**	9.94	mg/kg	10.29.19 19.51		1

Final 1.000

Flagging Criteria

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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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

QC Summary 641428

COG Operating LLC

Copperhead 31 Fed #1

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3105795 Matrix: Solid Date Prep: 10.29.19
MB Sample Id: 7689124-1-BLK LCS Sample Id: 7689124-1-BKS LCSD Sample Id: 7689124-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	300	305	102	306	102	90-110	0	20	mg/kg	10.29.19 18:17	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3105795 Matrix: Soil Date Prep: 10.29.19
Parent Sample Id: 641345-007 MS Sample Id: 641345-007 S MSD Sample Id: 641345-007 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	3.83	247	236	94	240	94	90-110	2	20	mg/kg	10.29.19 18:36	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3105795 Matrix: Solid Date Prep: 10.29.19
Parent Sample Id: 641443-005 MS Sample Id: 641443-005 S MSD Sample Id: 641443-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	205	252	484	111	482	110	90-110	0	20	mg/kg	10.29.19 22:09	X

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

Final 1.000

641428

Analysis Request of Chain of Custody Record

Page 1 of 1

CONCHO

One Concho Center/600/Illinois Avenue/Midland, Texas
Tel (432) 683-7443

Client Name: COG-Artesia	**Site Manager:** Sheldon Hitchcock
Project Name: Copperhead 31 Fed #1	
Project Location: (county, state) Eddy, NM	**Project #:**
Invoice to: Sheldon Hitchcock	
Receiving Laboratory: Xenco	**Sampler Name:** Sheldon Hitchcock
Comments:	

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2019 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	# CONTAINERS	(C)omposite/(G)rab
	SW-1	10/29	8:30		X			X	1	C

ANALYSIS REQUEST
(Circle or Specify Method No.)

TPH 8015M (GRO - DRO - MRO)	BTEX 8021B	Chloride	Hold
		X	

Relinquished by:	Date: 10/29/19	Time: 15:13	Received by:
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

LAB USE ONLY

Sample Temperature 3.6

REMARKS:

- [x] RUSH: Same Day (24 hr) 48 hr 72 hr
- [ ] Rush Charges Authorized
- [ ] Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: COG Operating LLC

Date/ Time Received: 10/29/2019 03:13:00 PM

Work Order #: 641428

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : T-NM-007

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.6
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6*Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#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)?	**No**
#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: Elizabeth McClellan Date: 10/29/2019

Checklist reviewed by: Jessica Kramer Date: 10/30/2019

APPENDIX D

SE S SW

120 150 180 210

165°S (T) 32°0.103', -104°0.999' ±32ft ▲ 2894ft

COG OPERATING LLC

COPPERHEAD 31 FED COM #1H

UNIT L, H LOT 7 SEC.31-T26S-R29E

480' FSL & 480' FEL

EDDY COUNTY, NM

API #30-015-38532

NMNM121474

24 Oct 2019, 08:23:16

S SW W

150 180 210 240 270

213°SW (T) 32.001416°, -104.015871° ±16ft ▲ 2892ft

04 Nov 2019, 10:42:07