Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

Carlsbad Field Office
OCD Hobbs
HOBBS OCD
MAY 01 2017
RECEIVED

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM114981

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
RINGO 32 FEDERAL COM 1H

2. Name of Operator
COG OPERATING LLC
Contact: MAYTE X REYES
E-Mail: mreyes1@concho.com

9. API Well No.
30-025-41411

3a. Address
2208 WEST MAIN STREET
ARTESIA, NM 88210

3b. Phone No. (include area code)
Ph: 575-748-6945

10. Field and Pool or Exploratory Area
LUSK; BONE SPRING, SOUTH

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 32 T19S R32E SESE 330FSL 490FEL

11. County or Parish, State
LEA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

COG Operating LLC, respectfully requests approval for the following changes to the original approved APD.

BHL
From: 1652' FSL and 660' FEL Section 5. T20S. R32E.
To: 200' FSL & 330' FEL Section 8. T20S. R32E.
C102 attached.

Drilling Changes
Drilling program, directional plan and plot attached.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #371521 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by DEBORAH MCKINNEY on 04/11/2017 ()

Name *(Printed/Typed)* MAYTE X REYES — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 03/29/2017

APPROVED
APR 25 2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Mustafa Hague — Title PETROLEUM ENGINEER — Date 4/25/2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office BUREAU OF LAND MANAGEMENT CFO CARLSBAD

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED **

COG Operating, LLC - RINGO 32 FEDERAL COM 1H

1. Geologic Formations

TVD of target	9,620' EOL	Pilot hole depth	NA
MD at TD:	19,988'	Deepest expected fresh water:	250'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	941	Water	
Top of Salt	1031	Salt	
Base of Salt	2390	Salt	
Yates	2539	Salt Water	
Capitan Reef	2859	Salt Water	
Base of Reef/ CYCN	4163	Oil/Gas	
Delaware	4643	Oil/Gas	
Bone Spring Lime	7371	Oil/Gas	
1st Bone Spring Sand	8495	Oil/Gas	
2nd Bone Spring Sand	9344	Target Oil/Gas	
3rd Bone Spring Sand	10112	Not Penetrated	
Wolfcamp	x	Not Penetrated	
0	0	Not Penetrated	
0	0	Not Penetrated	

2. Casing Program

Hole Size	Casing Interval From	To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
26"	0	970	20"	94	H-40	STC	1.17	3.66	6.37
17.5"	0	2660	13.375"	54.5	J55	STC	0.93	2.92	3.55
12.25"	0	4190	9.625"	40	J55	LTC	1.36	1.06	3.10
8.75"	0	19,988	5.5"	17	P110	LTC	1.59	2.84	2.72
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

COG Operating, LLC - RINGO 32 FEDERAL COM 1H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	Y
If yes, does production casing cement tie back a minimum of 50' above the Reef?	Y
Is well within the designated 4 string boundary?	Y
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	1070	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl2
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter. 1	1220	12.7	2.0	9.6	16	Lead: 35:65:6 C Blend
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl
Inter. 2, Stage 1	210	12.7	1.98	10.6	16	Lead: 35:65:6 C Blend
	200	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl
DV/ECP @ 2740						
Inter. 2, Stage 2	380	12.7	2.0	10.6	16	Lead: Class C + 4% Gel + 1% CaCl2
	200	14.8	1.35	6.34	8	Tail: Class C + 2% CaCl
5.5 Prod	850	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	2990	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Low Cement - See COA

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1st Intermediate	0'	50%
2nd Intermediate	0'	50%
Production	2,759'	35% OH in Lateral (KOP to EOL) – 40% OH in Vertical

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
~~12-1/4~~ 17 1/2"	13-5/8"	2M	Annular	x	2000 psi
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram	x	3M
			Pipe Ram	x	
			Double Ram		
			Other*		

SEE COA

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	N Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Haque, Mustafa <mhaque@blm.gov>

FW: [External] EC Document Submitted - Ringo Fed Com 1H

Mayte Reyes <MReyes1@concho.com> Fri, Apr 21, 2017 at 7:59 AM
To: "Haque, Mustafa (mhaque@blm.gov)" <mhaque@blm.gov>

Hi Haque,

Please see below response from Tim Smith. Let me know if you need anything else.

Thank you so much Haque!
Mayte

From: Timothy Smith
Sent: Friday, April 21, 2017 7:58 AM
To: Mayte Reyes
Cc: Rand French
Subject: RE: FW: [External] EC Document Submitted - Ringo Fed Com 1H

Sorry.

Surf Mud will be fresh water (8.6-8.8)

1st intermediate will be brine (10-10.2)

2nd intermediate will be fresh water (8.4 – 8.8)

Production will be cut brine (8.6 – 9.4).

Thanks,

Tim

From: Haque, Mustafa [mailto:mhaque@blm.gov]
Sent: Thursday, April 20, 2017 9:19 AM
To: Mayte Reyes
Subject: Re: FW: [External] EC Document Submitted - Ringo Fed Com 1H

[Quoted text hidden]

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.6 - 8.8	28-34	N/C
Surf csg	9-5/8" Int shoe	Saturated Brine	8.3 - 8.7	28-34	N/C
9-5/8" Int shoe	Lateral TD	Cut Brine	8.6 - 9.4	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
Y	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4705 psi at 9620' TVD
Abnormal Temperature	NO 155 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

N	Is it a walking operation?
N	Is casing pre-set?

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

CONCHO

COG OPERATING LLC

EDDY COUNTY, NM
ZEUS
RINGO 32 FED COM #1H

OWB

Plan: PWP0

Survey Report - Geographic

24 January, 2017

COG Operating LLC

Survey Report - Geographic

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well RINGO 32 FED COM #1H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Site:	ZEUS	**MD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Well:	RINGO 32 FED COM #1H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Project	EDDY COUNTY, NM		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	ZEUS				
Site Position:		**Northing:**	633,821.32 usft	**Latitude:**	32° 44' 30.186 N
From:	Map	**Easting:**	633,410.14 usft	**Longitude:**	103° 53' 57.996 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.23 °

Well	RINGO 32 FED COM #1H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	586,219.50 usf	**Latitude:**	32° 36' 37.464 N
	+E/-W	0.0 usft	**Easting:**	670,115.80 usf	**Longitude:**	103° 46' 51.153 W
Position Uncertainty		3.0 usft	**Wellhead Elevation:**	usf	**Ground Level:**	3,535.0 usf

Wellbore	OWB			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	WMM2015	1/23/2017	7.14	60.38	48,175.65762085

Design	PWP0				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	178.97	

Survey Tool Program	**Date** 1/24/2017			
From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	19,987.4	PWP0 (OWB)	MWD	OWSG MWD - Standard

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
100.0	0.00	0.00	100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
200.0	0.00	0.00	200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
300.0	0.00	0.00	300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
400.0	0.00	0.00	400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
500.0	0.00	0.00	500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
600.0	0.00	0.00	600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
700.0	0.00	0.00	700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
800.0	0.00	0.00	800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
900.0	0.00	0.00	900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well RINGO 32 FED COM #1H
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Well:	RINGO 32 FED COM #1H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,000.0	0.00	0.00	1,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,400.0	0.00	0.00	4,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,800.0	0.00	0.00	4,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,300.0	0.00	0.00	5,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,500.0	0.00	0.00	5,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,600.0	0.00	0.00	5,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,700.0	0.00	0.00	5,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,800.0	0.00	0.00	5,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
5,900.0	0.00	0.00	5,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,000.0	0.00	0.00	6,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,100.0	0.00	0.00	6,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,200.0	0.00	0.00	6,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well RINGO 32 FED COM #1H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Site:	ZEUS	**MD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Well:	RINGO 32 FED COM #1H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,300.0	0.00	0.00	6,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,400.0	0.00	0.00	6,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,500.0	0.00	0.00	6,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,600.0	0.00	0.00	6,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,700.0	0.00	0.00	6,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,800.0	0.00	0.00	6,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
6,900.0	0.00	0.00	6,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,000.0	0.00	0.00	7,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,100.0	0.00	0.00	7,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,200.0	0.00	0.00	7,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,300.0	0.00	0.00	7,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,400.0	0.00	0.00	7,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,500.0	0.00	0.00	7,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,600.0	0.00	0.00	7,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,700.0	0.00	0.00	7,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,800.0	0.00	0.00	7,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
7,900.0	0.00	0.00	7,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,000.0	0.00	0.00	8,000.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,100.0	0.00	0.00	8,100.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,200.0	0.00	0.00	8,200.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,300.0	0.00	0.00	8,300.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,400.0	0.00	0.00	8,400.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,500.0	0.00	0.00	8,500.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,600.0	0.00	0.00	8,600.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,700.0	0.00	0.00	8,700.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,800.0	0.00	0.00	8,800.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,900.0	0.00	0.00	8,900.0	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
8,982.5	0.00	0.00	8,982.5	0.0	0.0	586,219.50	670,115.80	32° 36' 37.464 N	103° 46' 51.153 W
9,000.0	2.10	165.80	9,000.0	-0.3	0.1	586,219.19	670,115.88	32° 36' 37.461 N	103° 46' 51.152 W
9,100.0	14.10	165.80	9,098.8	-13.9	3.5	586,205.56	670,119.33	32° 36' 37.326 N	103° 46' 51.112 W
9,200.0	26.09	165.80	9,192.6	-47.2	11.9	586,172.31	670,127.75	32° 36' 36.997 N	103° 46' 51.016 W
9,300.0	38.09	165.80	9,277.1	-98.6	25.0	586,120.90	670,140.76	32° 36' 36.487 N	103° 46' 50.867 W
9,400.0	50.09	165.80	9,348.8	-165.9	42.0	586,053.57	670,157.79	32° 36' 35.820 N	103° 46' 50.672 W
9,500.0	62.09	165.80	9,404.5	-246.2	62.3	585,973.26	670,178.11	32° 36' 35.025 N	103° 46' 50.439 W
9,600.0	74.09	165.80	9,441.8	-336.0	85.0	585,883.48	670,200.83	32° 36' 34.135 N	103° 46' 50.179 W
9,700.0	86.08	165.80	9,458.9	-431.3	109.1	585,788.16	670,224.95	32° 36' 33.191 N	103° 46' 49.903 W
9,725.2	89.11	165.80	9,460.0	-455.8	115.3	585,763.73	670,231.13	32° 36' 32.948 N	103° 46' 49.832 W
9,800.0	89.10	168.79	9,461.2	-528.7	131.8	585,690.80	670,247.57	32° 36' 32.226 N	103° 46' 49.644 W
9,900.0	89.10	172.79	9,462.7	-627.4	147.8	585,592.12	670,263.57	32° 36' 31.249 N	103° 46' 49.463 W
10,000.0	89.10	176.79	9,464.3	-726.9	156.8	585,492.57	670,272.65	32° 36' 30.263 N	103° 46' 49.363 W
10,075.5	89.11	179.81	9,465.5	-802.4	159.1	585,417.15	670,274.88	32° 36' 29.517 N	103° 46' 49.342 W
10,100.0	89.11	179.81	9,465.9	-826.9	159.2	585,392.62	670,274.96	32° 36' 29.274 N	103° 46' 49.342 W
10,200.0	89.11	179.81	9,467.4	-926.9	159.5	585,292.64	670,275.29	32° 36' 28.285 N	103° 46' 49.344 W
10,300.0	89.11	179.81	9,469.0	-1,026.9	159.8	585,192.65	670,275.62	32° 36' 27.295 N	103° 46' 49.347 W
10,400.0	89.11	179.81	9,470.5	-1,126.8	160.1	585,092.66	670,275.95	32° 36' 26.306 N	103° 46' 49.349 W
10,500.0	89.11	179.81	9,472.1	-1,226.8	160.5	584,992.67	670,276.28	32° 36' 25.316 N	103° 46' 49.351 W
10,600.0	89.11	179.81	9,473.7	-1,326.8	160.8	584,892.69	670,276.61	32° 36' 24.327 N	103° 46' 49.353 W
10,700.0	89.11	179.81	9,475.2	-1,426.8	161.1	584,792.70	670,276.94	32° 36' 23.338 N	103° 46' 49.356 W
10,800.0	89.11	179.81	9,476.8	-1,526.8	161.5	584,692.71	670,277.27	32° 36' 22.348 N	103° 46' 49.358 W
10,900.0	89.11	179.81	9,478.3	-1,626.8	161.8	584,592.73	670,277.60	32° 36' 21.359 N	103° 46' 49.360 W
11,000.0	89.11	179.81	9,479.9	-1,726.8	162.1	584,492.74	670,277.92	32° 36' 20.369 N	103° 46' 49.362 W
11,100.0	89.11	179.81	9,481.4	-1,826.8	162.4	584,392.75	670,278.25	32° 36' 19.380 N	103° 46' 49.365 W
11,200.0	89.11	179.81	9,483.0	-1,926.7	162.8	584,292.76	670,278.58	32° 36' 18.390 N	103° 46' 49.367 W

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well RINGO 32 FED COM #1H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Site:	ZEUS	**MD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Well:	RINGO 32 FED COM #1H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,300.0	89.11	179.81	9,484.6	-2,026.7	163.1	584,192.78	670,278.91	32° 36' 17.401 N	103° 46' 49.369 W
11,400.0	89.11	179.81	9,486.1	-2,126.7	163.4	584,092.79	670,279.24	32° 36' 16.412 N	103° 46' 49.371 W
11,500.0	89.11	179.81	9,487.7	-2,226.7	163.8	583,992.80	670,279.57	32° 36' 15.422 N	103° 46' 49.373 W
11,600.0	89.11	179.81	9,489.2	-2,326.7	164.1	583,892.81	670,279.90	32° 36' 14.433 N	103° 46' 49.376 W
11,700.0	89.11	179.81	9,490.8	-2,426.7	164.4	583,792.83	670,280.23	32° 36' 13.443 N	103° 46' 49.378 W
11,800.0	89.11	179.81	9,492.4	-2,526.7	164.8	583,692.84	670,280.56	32° 36' 12.454 N	103° 46' 49.380 W
11,900.0	89.11	179.81	9,493.9	-2,626.7	165.1	583,592.85	670,280.89	32° 36' 11.464 N	103° 46' 49.382 W
12,000.0	89.11	179.81	9,495.5	-2,726.6	165.4	583,492.87	670,281.22	32° 36' 10.475 N	103° 46' 49.385 W
12,100.0	89.11	179.81	9,497.0	-2,826.6	165.7	583,392.88	670,281.54	32° 36' 9.486 N	103° 46' 49.387 W
12,200.0	89.11	179.81	9,498.6	-2,926.6	166.1	583,292.89	670,281.87	32° 36' 8.496 N	103° 46' 49.389 W
12,300.0	89.11	179.81	9,500.2	-3,026.6	166.4	583,192.90	670,282.20	32° 36' 7.507 N	103° 46' 49.391 W
12,400.0	89.11	179.81	9,501.7	-3,126.6	166.7	583,092.92	670,282.53	32° 36' 6.517 N	103° 46' 49.394 W
12,500.0	89.11	179.81	9,503.3	-3,226.6	167.1	582,992.93	670,282.86	32° 36' 5.528 N	103° 46' 49.396 W
12,600.0	89.11	179.81	9,504.8	-3,326.6	167.4	582,892.94	670,283.19	32° 36' 4.538 N	103° 46' 49.398 W
12,700.0	89.11	179.81	9,506.4	-3,426.5	167.7	582,792.95	670,283.52	32° 36' 3.549 N	103° 46' 49.400 W
12,800.0	89.11	179.81	9,507.9	-3,526.5	168.0	582,692.97	670,283.85	32° 36' 2.560 N	103° 46' 49.402 W
12,900.0	89.11	179.81	9,509.5	-3,626.5	168.4	582,592.98	670,284.18	32° 36' 1.570 N	103° 46' 49.405 W
13,000.0	89.11	179.81	9,511.1	-3,726.5	168.7	582,492.99	670,284.51	32° 36' 0.581 N	103° 46' 49.407 W
13,100.0	89.11	179.81	9,512.6	-3,826.5	169.0	582,393.00	670,284.84	32° 35' 59.591 N	103° 46' 49.409 W
13,200.0	89.11	179.81	9,514.2	-3,926.5	169.4	582,293.02	670,285.16	32° 35' 58.602 N	103° 46' 49.411 W
13,300.0	89.11	179.81	9,515.7	-4,026.5	169.7	582,193.03	670,285.49	32° 35' 57.612 N	103° 46' 49.414 W
13,400.0	89.11	179.81	9,517.3	-4,126.5	170.0	582,093.04	670,285.82	32° 35' 56.623 N	103° 46' 49.416 W
13,500.0	89.11	179.81	9,518.9	-4,226.4	170.3	581,993.06	670,286.15	32° 35' 55.634 N	103° 46' 49.418 W
13,600.0	89.11	179.81	9,520.4	-4,326.4	170.7	581,893.07	670,286.48	32° 35' 54.644 N	103° 46' 49.420 W
13,700.0	89.11	179.81	9,522.0	-4,426.4	171.0	581,793.08	670,286.81	32° 35' 53.655 N	103° 46' 49.423 W
13,800.0	89.11	179.81	9,523.5	-4,526.4	171.3	581,693.09	670,287.14	32° 35' 52.665 N	103° 46' 49.425 W
13,900.0	89.11	179.81	9,525.1	-4,626.4	171.7	581,593.11	670,287.47	32° 35' 51.676 N	103° 46' 49.427 W
14,000.0	89.11	179.81	9,526.7	-4,726.4	172.0	581,493.12	670,287.80	32° 35' 50.687 N	103° 46' 49.429 W
14,100.0	89.11	179.81	9,528.2	-4,826.4	172.3	581,393.13	670,288.13	32° 35' 49.697 N	103° 46' 49.431 W
14,200.0	89.11	179.81	9,529.8	-4,926.4	172.7	581,293.14	670,288.46	32° 35' 48.708 N	103° 46' 49.434 W
14,300.0	89.11	179.81	9,531.3	-5,026.3	173.0	581,193.16	670,288.78	32° 35' 47.718 N	103° 46' 49.436 W
14,400.0	89.11	179.81	9,532.9	-5,126.3	173.3	581,093.17	670,289.11	32° 35' 46.729 N	103° 46' 49.438 W
14,500.0	89.11	179.81	9,534.4	-5,226.3	173.6	580,993.18	670,289.44	32° 35' 45.739 N	103° 46' 49.440 W
14,600.0	89.11	179.81	9,536.0	-5,326.3	174.0	580,893.20	670,289.77	32° 35' 44.750 N	103° 46' 49.443 W
14,700.0	89.11	179.81	9,537.6	-5,426.3	174.3	580,793.21	670,290.10	32° 35' 43.761 N	103° 46' 49.445 W
14,800.0	89.11	179.81	9,539.1	-5,526.3	174.6	580,693.22	670,290.43	32° 35' 42.771 N	103° 46' 49.447 W
14,900.0	89.11	179.81	9,540.7	-5,626.3	175.0	580,593.23	670,290.76	32° 35' 41.782 N	103° 46' 49.449 W
15,000.0	89.11	179.81	9,542.2	-5,726.3	175.3	580,493.25	670,291.09	32° 35' 40.792 N	103° 46' 49.451 W
15,100.0	89.11	179.81	9,543.8	-5,826.2	175.6	580,393.26	670,291.42	32° 35' 39.803 N	103° 46' 49.454 W
15,200.0	89.11	179.81	9,545.4	-5,926.2	175.9	580,293.27	670,291.75	32° 35' 38.813 N	103° 46' 49.456 W
15,300.0	89.11	179.81	9,546.9	-6,026.2	176.3	580,193.28	670,292.08	32° 35' 37.824 N	103° 46' 49.458 W
15,400.0	89.11	179.81	9,548.5	-6,126.2	176.6	580,093.30	670,292.41	32° 35' 36.835 N	103° 46' 49.460 W
15,500.0	89.11	179.81	9,550.0	-6,226.2	176.9	579,993.31	670,292.73	32° 35' 35.845 N	103° 46' 49.463 W
15,600.0	89.11	179.81	9,551.6	-6,326.2	177.3	579,893.32	670,293.06	32° 35' 34.856 N	103° 46' 49.465 W
15,700.0	89.11	179.81	9,553.2	-6,426.2	177.6	579,793.33	670,293.39	32° 35' 33.866 N	103° 46' 49.467 W
15,800.0	89.11	179.81	9,554.7	-6,526.2	177.9	579,693.35	670,293.72	32° 35' 32.877 N	103° 46' 49.469 W
15,900.0	89.11	179.81	9,556.3	-6,626.1	178.2	579,593.36	670,294.05	32° 35' 31.887 N	103° 46' 49.472 W
16,000.0	89.11	179.81	9,557.8	-6,726.1	178.6	579,493.37	670,294.38	32° 35' 30.898 N	103° 46' 49.474 W
16,100.0	89.11	179.81	9,559.4	-6,826.1	178.9	579,393.39	670,294.71	32° 35' 29.909 N	103° 46' 49.476 W
16,200.0	89.11	179.81	9,560.9	-6,926.1	179.2	579,293.40	670,295.04	32° 35' 28.919 N	103° 46' 49.478 W
16,300.0	89.11	179.81	9,562.5	-7,026.1	179.6	579,193.41	670,295.37	32° 35' 27.930 N	103° 46' 49.480 W
16,400.0	89.11	179.81	9,564.1	-7,126.1	179.9	579,093.42	670,295.70	32° 35' 26.940 N	103° 46' 49.483 W
16,500.0	89.11	179.81	9,565.6	-7,226.1	180.2	578,993.44	670,296.03	32° 35' 25.951 N	103° 46' 49.485 W

CONCHO

COG Operating LLC

Survey Report - Geographic

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well RINGO 32 FED COM #1H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Site:	ZEUS	**MD Reference:**	RKB=3535+27 @ 3562.0usft (SACNDRILL FREEDOM)
Well:	RINGO 32 FED COM #1H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,600.0	89.11	179.81	9,567.2	-7,326.1	180.5	578,893.45	670,296.35	32° 35' 24.961 N	103° 46' 49.487 W
16,700.0	89.11	179.81	9,568.7	-7,426.0	180.9	578,793.46	670,296.68	32° 35' 23.972 N	103° 46' 49.489 W
16,800.0	89.11	179.81	9,570.3	-7,526.0	181.2	578,693.47	670,297.01	32° 35' 22.983 N	103° 46' 49.492 W
16,900.0	89.11	179.81	9,571.9	-7,626.0	181.5	578,593.49	670,297.34	32° 35' 21.993 N	103° 46' 49.494 W
17,000.0	89.11	179.81	9,573.4	-7,726.0	181.9	578,493.50	670,297.67	32° 35' 21.004 N	103° 46' 49.496 W
17,100.0	89.11	179.81	9,575.0	-7,826.0	182.2	578,393.51	670,298.00	32° 35' 20.014 N	103° 46' 49.498 W
17,200.0	89.11	179.81	9,576.5	-7,926.0	182.5	578,293.52	670,298.33	32° 35' 19.025 N	103° 46' 49.501 W
17,300.0	89.11	179.81	9,578.1	-8,026.0	182.9	578,193.54	670,298.66	32° 35' 18.036 N	103° 46' 49.503 W
17,400.0	89.11	179.81	9,579.7	-8,126.0	183.2	578,093.55	670,298.99	32° 35' 17.046 N	103° 46' 49.505 W
17,500.0	89.11	179.81	9,581.2	-8,225.9	183.5	577,993.56	670,299.32	32° 35' 16.057 N	103° 46' 49.507 W
17,600.0	89.11	179.81	9,582.8	-8,325.9	183.8	577,893.58	670,299.65	32° 35' 15.067 N	103° 46' 49.509 W
17,700.0	89.11	179.81	9,584.3	-8,425.9	184.2	577,793.59	670,299.97	32° 35' 14.078 N	103° 46' 49.512 W
17,800.0	89.11	179.81	9,585.9	-8,525.9	184.5	577,693.60	670,300.30	32° 35' 13.088 N	103° 46' 49.514 W
17,900.0	89.11	179.81	9,587.4	-8,625.9	184.8	577,593.61	670,300.63	32° 35' 12.099 N	103° 46' 49.516 W
18,000.0	89.11	179.81	9,589.0	-8,725.9	185.2	577,493.63	670,300.96	32° 35' 11.110 N	103° 46' 49.518 W
18,100.0	89.11	179.81	9,590.6	-8,825.9	185.5	577,393.64	670,301.29	32° 35' 10.120 N	103° 46' 49.521 W
18,200.0	89.11	179.81	9,592.1	-8,925.9	185.8	577,293.65	670,301.62	32° 35' 9.131 N	103° 46' 49.523 W
18,300.0	89.11	179.81	9,593.7	-9,025.8	186.1	577,193.66	670,301.95	32° 35' 8.141 N	103° 46' 49.525 W
18,400.0	89.11	179.81	9,595.2	-9,125.8	186.5	577,093.68	670,302.28	32° 35' 7.152 N	103° 46' 49.527 W
18,500.0	89.11	179.81	9,596.8	-9,225.8	186.8	576,993.69	670,302.61	32° 35' 6.162 N	103° 46' 49.529 W
18,600.0	89.11	179.81	9,598.4	-9,325.8	187.1	576,893.70	670,302.94	32° 35' 5.173 N	103° 46' 49.532 W
18,700.0	89.11	179.81	9,599.9	-9,425.8	187.5	576,793.72	670,303.27	32° 35' 4.184 N	103° 46' 49.534 W
18,800.0	89.11	179.81	9,601.5	-9,525.8	187.8	576,693.73	670,303.59	32° 35' 3.194 N	103° 46' 49.536 W
18,900.0	89.11	179.81	9,603.0	-9,625.8	188.1	576,593.74	670,303.92	32° 35' 2.205 N	103° 46' 49.538 W
19,000.0	89.11	179.81	9,604.6	-9,725.7	188.4	576,493.75	670,304.25	32° 35' 1.215 N	103° 46' 49.541 W
19,100.0	89.11	179.81	9,606.2	-9,825.7	188.8	576,393.77	670,304.58	32° 35' 0.226 N	103° 46' 49.543 W
19,200.0	89.11	179.81	9,607.7	-9,925.7	189.1	576,293.78	670,304.91	32° 34' 59.236 N	103° 46' 49.545 W
19,300.0	89.11	179.81	9,609.3	-10,025.7	189.4	576,193.79	670,305.24	32° 34' 58.247 N	103° 46' 49.547 W
19,400.0	89.11	179.81	9,610.8	-10,125.7	189.8	576,093.80	670,305.57	32° 34' 57.258 N	103° 46' 49.550 W
19,500.0	89.11	179.81	9,612.4	-10,225.7	190.1	575,993.82	670,305.90	32° 34' 56.268 N	103° 46' 49.552 W
19,600.0	89.11	179.81	9,613.9	-10,325.7	190.4	575,893.83	670,306.23	32° 34' 55.279 N	103° 46' 49.554 W
19,700.0	89.11	179.81	9,615.5	-10,425.7	190.8	575,793.84	670,306.56	32° 34' 54.289 N	103° 46' 49.556 W
19,800.0	89.11	179.81	9,617.1	-10,525.6	191.1	575,693.85	670,306.89	32° 34' 53.300 N	103° 46' 49.558 W
19,900.0	89.11	179.81	9,618.6	-10,625.6	191.4	575,593.87	670,307.21	32° 34' 52.310 N	103° 46' 49.561 W
19,988.2	89.11	179.81	9,620.0	-10,713.8	191.7	575,505.70	670,307.50	32° 34' 51.438 N	103° 46' 49.563 W

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Ringo 32 Fed - plan hits target center - Point	0.00	0.00	9,620.0	-10,713.8	191.7	575,505.70	670,307.50	32° 34' 51.438 N	103° 46' 49.563 W

Checked By: _____ Approved By: _____ Date: _____

CONCHO

WELL DETAILS:RINGO 32 FED COM #1H
3535.0

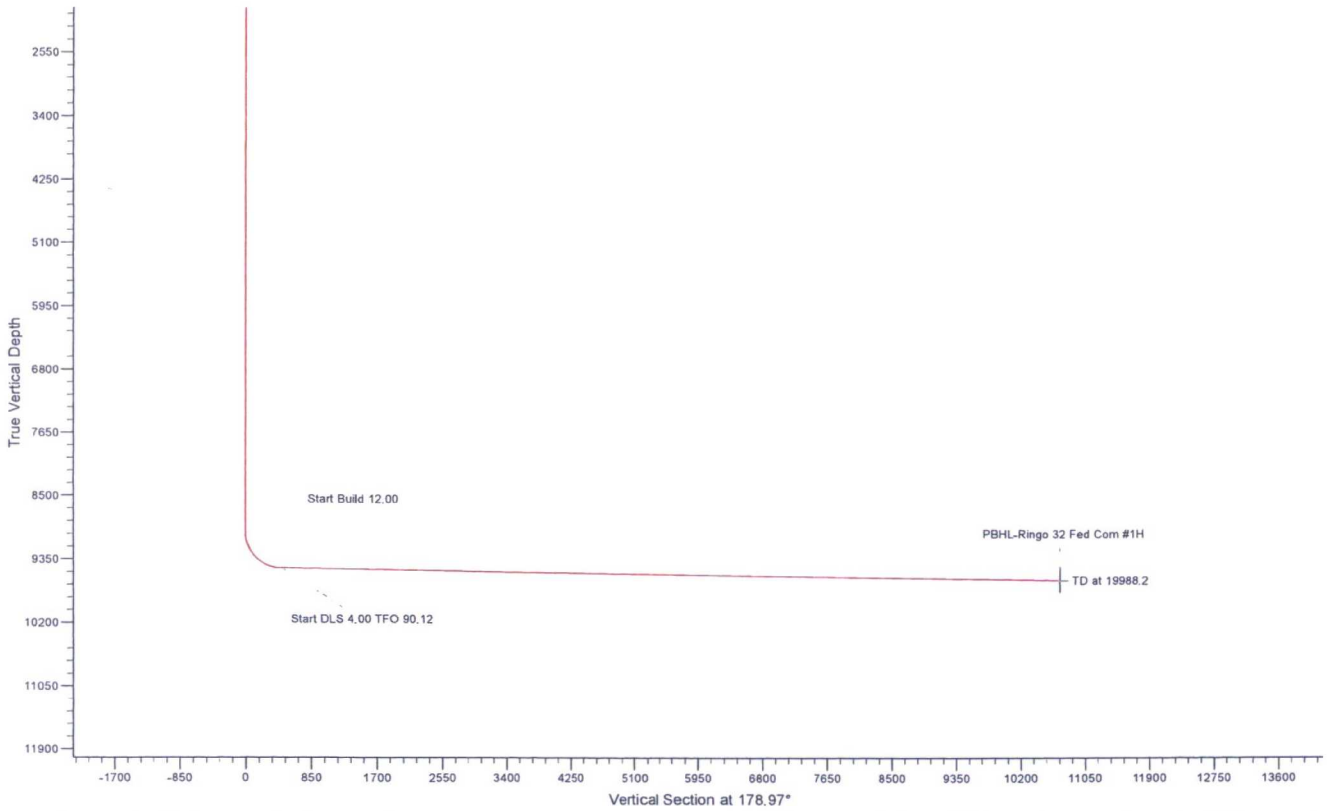
Northing	Easting	Latitude	Longitude
586219.50	670115.80	32° 36' 37.464 N	103° 46' 51.153 W

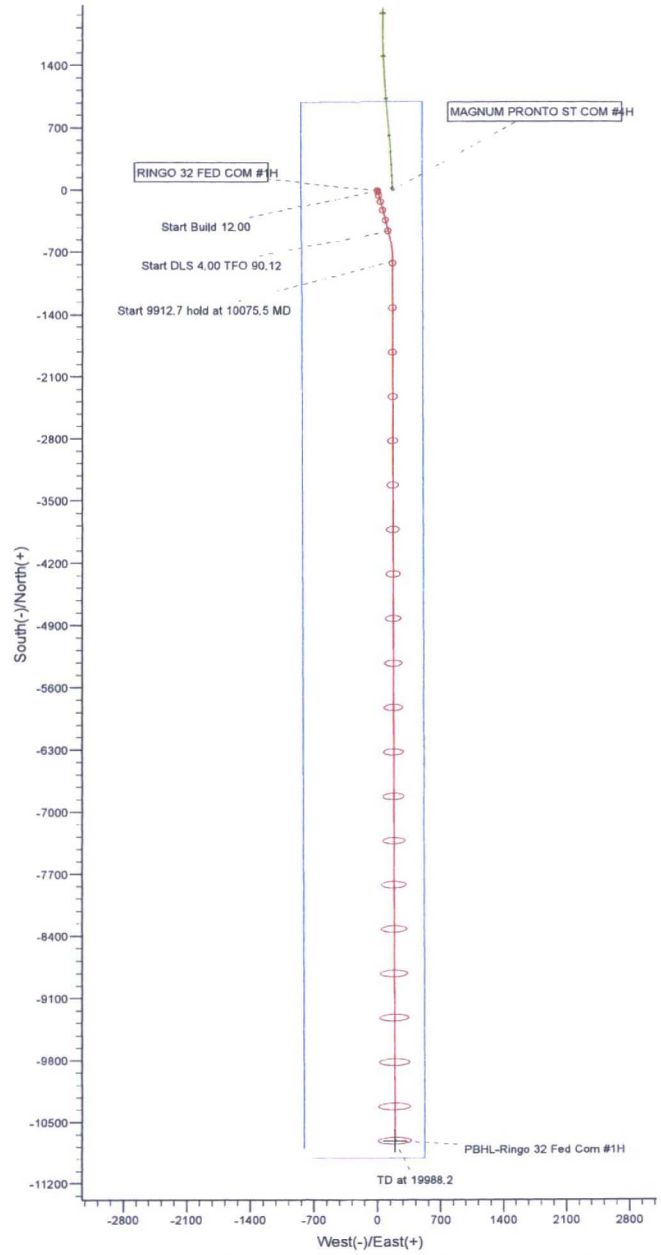
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	8982.5	0.00	0.00	8982.5	0.0	0.0	0.00	0.00	0.0	
3	9725.2	89.11	165.80	9460.0	-455.8	115.3	12.00	165.80	457.8	
4	10075.5	89.11	179.81	9465.5	-802.4	159.1	4.00	90.12	805.1	
5	19988.2	89.11	179.81	9620.0	-10713.8	191.7	0.00	0.00	10715.5	

Project: EDDY COUNTY, NM
Site: ZEUS
Well: *RINGO 32 FED COM #1H*
Wellbore: OWB
Design: *PWP0*

MAGNUM PRONTO ST COM #4H, OWB, ACTUAL WELLPATH V0
PWP0
LEGEND





Ringo 32 Fed Com 1H
30-025-41411
EOG Resources, Inc
Surface Location: Sec. 32, T. 19S, R. 32E
Conditions of Approval

All previous COAs still apply except for the following:

A. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Potash Areas:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.

Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Risks:
1. **Secretary's Potash**
2. **Capitan Reef**
3. **Possibility of water flows in the Delaware, Capitan Reef, Salado, and Artesia Group**
4. **Possibility of lost circulation in the Rustler, Capitan Reef, Delaware, and Red Beds.**

1. The **20** inch surface casing shall be set at approximately **970** feet and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **13-3/8** inch 1st intermediate casing is:

    ☒ Cement to surface. If cement does not circulate see A.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

3. The minimum required fill of cement behind the **9-5/8** inch 2nd intermediate casing is:

    Operator has proposed DV tool at depth of 2740', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

    a. First stage to DV tool:

    ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see A.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef and potash. Excess calculates to 4% - Additional cement may be required**

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement should tie-back at least **50 feet above the Capitan Reef, which is 2809 feet** (Top of Capitan Reef estimated at 2859 feet). Operator shall provide method of verification.

5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.

2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

3. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **20** inch surface casing shoe shall be **2000 (2M)** annular

5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch 2nd intermediate casing shoe shall be **3000 (3M)** psi.

6. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

    b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

    c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

    d. The results of the test shall be reported to the appropriate BLM office.

    e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**

    f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

MHH 04252017