14-780

Form 3160-3
(March 2012)

HOBBS OCD

OCT 27 2014 Hobbs

RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMLC065710A

6. If Indian, Allotee or Tribe Name:

1a. Type of Work: [✓] DRILL [ ] REENTER

7. If Unit or CA Agreement, Name and No.: Lusk Deep Unit - NMNM 070982X

1b. Type of Well: [✓] Oil Well [ ] Gas Well [ ] Other [✓] Single Zone [ ] Multiple Zone

8. Lease Name and Well No.: (308161) Lusk Deep Unit A #35H

2. Name of Operator: COG Operating LLC. (229137)

9. API Well No.: 30-025-42211

3a. Address: 2208 West Main Street, Artesia, NM 88210

3b. Phone No. (include area code): 575-748-6940

10. Field and Pool, or Exploratory: Lusk; Bone Spring (41480)

4. Location of Well (Report location clearly and in accordance with any State requirements.*)

At surface: 1980' FNL & 190' FEL Unit Letter H (SENE) SHL Sec 20-T19S-R32E (H)

At proposed prod. Zone: 1980' FNL & 330' FWL Unit Letter E (SWNW) BHL Sec 20-T19S-R32E (E)

11. Sec., T.R.M. or Blk and Survey or Area: Section 20 - T19S - R32E

14. Distance in miles and direction from nearest town or post office*: Approximately 12 miles from Maljamar

12. County or Parish: Lea County

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any)	16. No. of acres in lease	17. Spacing Unit dedicated to this well
190'	640	160
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No. on file**
SHL: 358' BHL: 180'	TVD: 8,470' MD: 13,125'	NMB000740 &NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	**22. Approximate date work will start***	**23. Estimated duration**
3590.9' GL	8/1/2014	30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature	Name (Printed/Typed)	Date
Mayte Reyes	Mayte Reyes	5-19-14
Title		
Regulatory Analyst		
Approved by (Signature)	**Name (Printed/Typed)**	**Date**
Steve Caffey		OCT 17 2014
Title	**Office**	
FIELD MANAGER	CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legan or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations theron.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

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.

(Continued on page 2)

*(Instructions on page 2)

Capitan Controlled Water Basin

KZ 10/22/14

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

OCT 28 2014

OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 19th day of May, 2014.

Signed: Melanie Parker

Printed Name: Melanie J. Parker
Position: Regulatory Coordinator
Address: 2208 W. Main Street, Artesia, NM 88210
Telephone: (575) 748-6940
Field Representative (if not above signatory): Rand French
E-mail: mparker@concho.com

HOBBS OCD

OCT 27 2014

RECEIVED

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Lusk Deep Unit A 35H
SHL: 1980' FNL & 190' FEL of Section 20
BHL: 1980' FNL & 330' FWL of Section 20
Section 20 T19S R32E
Eddy County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

Fresh Water	223'	
Rustler	819'	
Salt	894'	
Tansill	2,459'	
Yates	2,617'	
Seven Rivers	2,801'	
Capitan Reef	2,901'	
Queen	3,871'	
Delaware	4,677'	Oil
Bone Springs	7,179'	Oil
FBSG	8,425'	
SBSG	9,166'	
TD TVD	8,470'	
TD MD	13,125'	

No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at ~~850'~~ 900' and circulating cement back to surface. All intervals will be isolated by setting 5 ½" casing to total depth and tying back cement to a minimum of 50' above the Capitan Reef.

3. Proposed Casing Program: All casing is new and API approved

See COA

Hole Size	Depths	Section	OD Casing	New/ Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 ½"	0' – ~~850'~~ 900'	Surface	13 3/8"	New	48#	STC	H-40	1.125	1.125	1.6
12 ¼"	0' – 3,500'	Intrmd	9 5/8"	New	36#	BTC	J-55	1.125	1.125	1.6
12 ¼"	3,500' – 4,500'	Intrmd	9 5/8"	New	40#	BTC	J-55	1.125	1.125	1.6
8 3/4"	0' – 13,125'	Production Curve & Lateral	5 ½"	New	17#	LTC	P-110	1.125	1.125	1.6

While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

4. Proposed Cement Program

a. 13-3/8" Surface

Lead: 400 sx Class C + 4% Gel
(13.5 ppg /1.75 cuft/sx / 9.2 gal/sk)
Tail: 250 sx Class C + 2% $CaCl_2$
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)
**Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate:

1st Stage:
Lead: 300 sx 35:65:6 C + 5% Salt + 5 pps Gilsonite
(12.7 ppg /2 cuft/sx / 11.5 gal/sk)
Tail: 250 sx Class C
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)

See COA

2nd Stage: DVT @ 2800'
Lead: 700 sx Class C + 4% Gel
(13.5 ppg /1.75 cuft/sx / 9.2 gal/sk)
Tail: 100 sx Class C + 1% $CaCl_2$
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)
**Calculated w/35% excess on OH volumes

c. 5 ½" Production:

Lead: 875 sx 35:65:6 H Blend
(12.7 ppg / 2 cuft/sx / 11.5 gal/sk)
Tail: 1400 sx 50:50:2 H Blend
(14.4 ppg /1.24 cuft/sx / 6.4 gal/sk)
**Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement.
- The 9-5/8" intermediate string is designed to circulate cement to surface.
- The production string will tie back a minimum of 50' above the Capitan Reef.

5. Pressure Control:

Nipple up on 13 3/8 with annular preventer tested to 2000 psi by independent tester and the rest of the 2M system tested to 2000 psi.
Nipple up on 9 5/8 with 3M system tested to 3000 psi by independent tester.
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. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating. A remotely operated choke will be installed before drilling out intermediate shoe. If H2S is monitored with 100 ppm in the gas stream while drilling intermediate, we will shut in and install a remote operated choke.

6. Estimated BHP & BHT:

Lateral TD = 4,000 psi
Lateral TD= 141° F

7. **Mud Program:** The applicable depths and properties of this system are as follows:

See COA

Depth ~~850'~~ 900'	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – ~~850'~~	Fresh Water	8.4 – 8.6	29	N.C.
~~850'~~ – 4,500'	Brine	10-10.2	29	N.C.
4,500' – 13,125'	Cut Brine	8.8 – 9.2	29	N.C.

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. **Auxiliary Well Control and Monitoring Equipment:**
   a. A Kelly cock will be in the drill string at all times.
   b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
   c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 ½" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

See COA

9. **Testing, Logging and Coring Program:**
   a. Drill stem tests will be based on geological sample shows.
   b. If open hole electrical logging is performed, the program will be:
      i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
      ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
      iii. No coring program is planned
      iv. Additional testing will be initiated subsequent to setting the 5 ½" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. **Potential Hazards:**
    a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

See COA

11. **Anticipated starting date and Duration of Operations:**
    Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days.

COG Operating LLC

Lea County New Mexico
Lusk Deep Unit A
Lusk Deep Unit A Well No. 35H
Original Hole

SHL: 1980 FNL 190 FEL
BHL: 1980 FNL 330 FWL

Plan: rev0

Standard_report

21 March, 2014

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	TVD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Project Lea County New Mexico

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 Lusk Deep Unit A

Site Position:		Northing:	599,764.20 usft	Latitude:	32.64763363
From:	Map	Easting:	670,347.80 usft	Longitude:	-103.77989322
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well Lusk Deep Unit A Well No. 35H

Well Position	+N/-S	0.00 usft	Northing:	599,764.20 usft	Latitude:	32.64763363
	+E/-W	0.00 usft	Easting:	670,347.80 usft	Longitude:	-103.77989322
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,590.90 usft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/21/2014	7.37	60.47	48,571

Design rev0

Audit Notes:

Version:	Phase:	PROTOTYPE	Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	269.79

Survey Tool Program Date 3/21/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,125.55	rev0 (Original Hole)	MWD	MWD - Standard

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	TVD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	TVD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	599,764.20	670,347.80

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
8,082.64	0.00	0.00	8,082.64	0.00	0.00	0.00	0.00	599,764.20	670,347.80
KOP Begin 12°/100' build									
8,100.00	2.08	269.79	8,100.00	0.00	-0.32	12.00	0.32	599,764.20	670,347.48
8,200.00	14.08	269.79	8,198.82	-0.05	-14.35	12.00	14.35	599,764.15	670,333.45
8,300.00	26.08	269.79	8,292.57	-0.17	-48.63	12.00	48.63	599,764.03	670,299.17
8,400.00	38.08	269.79	8,377.14	-0.36	-101.64	12.00	101.64	599,763.84	670,246.16
8,500.00	50.08	269.79	8,448.84	-0.61	-171.09	12.00	171.09	599,763.59	670,176.71
8,600.00	62.08	269.79	8,504.54	-0.91	-253.92	12.00	253.92	599,763.29	670,093.88
8,700.00	74.08	269.79	8,541.80	-1.24	-346.52	12.00	346.52	599,762.96	670,001.28
8,800.00	86.08	269.79	8,558.99	-1.59	-444.85	12.00	444.85	599,762.61	669,902.95
8,842.67	91.20	269.79	8,560.00	-1.75	-487.49	12.00	487.50	599,762.45	669,860.31
Begin 91.20° lateral									
8,900.00	91.20	269.79	8,558.79	-1.95	-544.81	0.00	544.81	599,762.25	669,802.99
9,000.00	91.20	269.79	8,556.69	-2.31	-644.79	0.00	644.79	599,761.89	669,703.01
9,100.00	91.20	269.79	8,554.59	-2.67	-744.76	0.00	744.77	599,761.53	669,603.04
9,200.00	91.20	269.79	8,552.49	-3.03	-844.74	0.00	844.75	599,761.17	669,503.06
9,300.00	91.20	269.79	8,550.39	-3.39	-944.72	0.00	944.72	599,760.81	669,403.08
9,400.00	91.20	269.79	8,548.29	-3.75	-1,044.69	0.00	1,044.70	599,760.45	669,303.11
9,500.00	91.20	269.79	8,546.19	-4.10	-1,144.67	0.00	1,144.68	599,760.10	669,203.13
9,600.00	91.20	269.79	8,544.08	-4.46	-1,244.65	0.00	1,244.66	599,759.74	669,103.15
9,700.00	91.20	269.79	8,541.98	-4.82	-1,344.63	0.00	1,344.64	599,759.38	669,003.17
9,800.00	91.20	269.79	8,539.88	-5.18	-1,444.60	0.00	1,444.61	599,759.02	668,903.20
9,900.00	91.20	269.79	8,537.78	-5.54	-1,544.58	0.00	1,544.59	599,758.66	668,803.22
10,000.00	91.20	269.79	8,535.68	-5.90	-1,644.56	0.00	1,644.57	599,758.30	668,703.24
10,100.00	91.20	269.79	8,533.58	-6.25	-1,744.54	0.00	1,744.55	599,757.95	668,603.26
10,200.00	91.20	269.79	8,531.48	-6.61	-1,844.51	0.00	1,844.52	599,757.59	668,503.29
10,300.00	91.20	269.79	8,529.37	-6.97	-1,944.49	0.00	1,944.50	599,757.23	668,403.31

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	TVD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
10,400.00	91.20	269.79	8,527.27	-7.33	-2,044.47	0.00	2,044.48	599,756.87	668,303.33
10,500.00	91.20	269.79	8,525.17	-7.69	-2,144.44	0.00	2,144.46	599,756.51	668,203.36
10,600.00	91.20	269.79	8,523.07	-8.05	-2,244.42	0.00	2,244.44	599,756.15	668,103.38
10,700.00	91.20	269.79	8,520.97	-8.41	-2,344.40	0.00	2,344.41	599,755.79	668,003.40
10,800.00	91.20	269.79	8,518.87	-8.76	-2,444.38	0.00	2,444.39	599,755.44	667,903.42
10,900.00	91.20	269.79	8,516.77	-9.12	-2,544.35	0.00	2,544.37	599,755.08	667,803.45
11,000.00	91.20	269.79	8,514.67	-9.48	-2,644.33	0.00	2,644.35	599,754.72	667,703.47
11,100.00	91.20	269.79	8,512.56	-9.84	-2,744.31	0.00	2,744.33	599,754.36	667,603.49
11,200.00	91.20	269.79	8,510.46	-10.20	-2,844.29	0.00	2,844.30	599,754.00	667,503.51
11,300.00	91.20	269.79	8,508.36	-10.56	-2,944.26	0.00	2,944.28	599,753.64	667,403.54
11,400.00	91.20	269.79	8,506.26	-10.91	-3,044.24	0.00	3,044.26	599,753.29	667,303.56
11,500.00	91.20	269.79	8,504.16	-11.27	-3,144.22	0.00	3,144.24	599,752.93	667,203.58
11,600.00	91.20	269.79	8,502.06	-11.63	-3,244.19	0.00	3,244.22	599,752.57	667,103.61
11,700.00	91.20	269.79	8,499.96	-11.99	-3,344.17	0.00	3,344.19	599,752.21	667,003.63
11,800.00	91.20	269.79	8,497.85	-12.35	-3,444.15	0.00	3,444.17	599,751.85	666,903.65
11,900.00	91.20	269.79	8,495.75	-12.71	-3,544.13	0.00	3,544.15	599,751.49	666,803.67
12,000.00	91.20	269.79	8,493.65	-13.07	-3,644.10	0.00	3,644.13	599,751.13	666,703.70
12,100.00	91.20	269.79	8,491.55	-13.42	-3,744.08	0.00	3,744.11	599,750.78	666,603.72
12,200.00	91.20	269.79	8,489.45	-13.78	-3,844.06	0.00	3,844.08	599,750.42	666,503.74
12,300.00	91.20	269.79	8,487.35	-14.14	-3,944.04	0.00	3,944.06	599,750.06	666,403.76
12,400.00	91.20	269.79	8,485.25	-14.50	-4,044.01	0.00	4,044.04	599,749.70	666,303.79
12,500.00	91.20	269.79	8,483.15	-14.86	-4,143.99	0.00	4,144.02	599,749.34	666,203.81
12,600.00	91.20	269.79	8,481.04	-15.22	-4,243.97	0.00	4,243.99	599,748.98	666,103.83
12,700.00	91.20	269.79	8,478.94	-15.57	-4,343.94	0.00	4,343.97	599,748.63	666,003.86
12,800.00	91.20	269.79	8,476.84	-15.93	-4,443.92	0.00	4,443.95	599,748.27	665,903.88
12,900.00	91.20	269.79	8,474.74	-16.29	-4,543.90	0.00	4,543.93	599,747.91	665,803.90
13,000.00	91.20	269.79	8,472.64	-16.65	-4,643.88	0.00	4,643.91	599,747.55	665,703.92

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	TVD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site:	Lusk Deep Unit A	MD Reference:	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Well:	Lusk Deep Unit A Well No. 35H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	EDM 5000.1 Ddatabase

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100ft)	V. Sec (usft)	Northing (usft)	Easting (usft)
13,100.00	91.20	269.79	8,470.54	-17.01	-4,743.85	0.00	4,743.88	599,747.19	665,603.95
13,125.55	91.20	269.79	8,470.00	-17.10	-4,769.40	0.00	4,769.43	599,747.10	665,578.40
PBHL/TD									

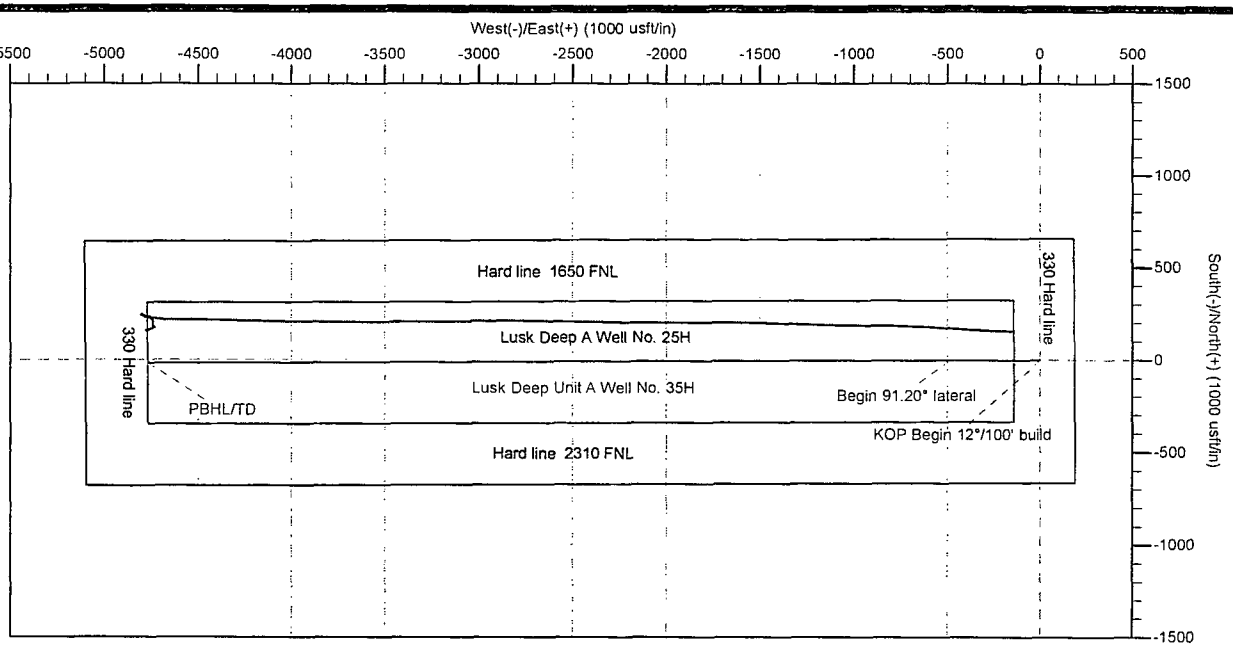
Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,082.64	8,082.64	0.00	0.00	KOP Begin 12°/100' build
8,842.67	8,560.00	-1.75	-487.49	Begin 91.20° lateral
13,125.55	8,470.00	-17.10	-4,769.40	PBHL/TD

CONCHO

COG Operating LLC

Well: Lusk Deep Unit A Well No. 35H
Site: Lusk Deep Unit A
Project: Lea County New Mexico
Design: rev0
Rig: Patriot 6



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8082.64	0.00	0.00	8082.64	0.00	0.00	0.00	0.00	0.00	KOP Begin 12°/100' build
3	8842.67	91.20	269.79	8560.00	-1.75	-487.49	12.00	269.79	487.50	Begin 91.20° lateral
4	13125.55	91.20	269.79	8470.00	-17.10	-4769.40	0.00	0.00	4769.43	PBHL/TD

Surface Location: RKB=3590.9+18 @ 3608.90usft (Patriot 6)
US State Plane 1927 (Exact solution)
New Mexico East 3001

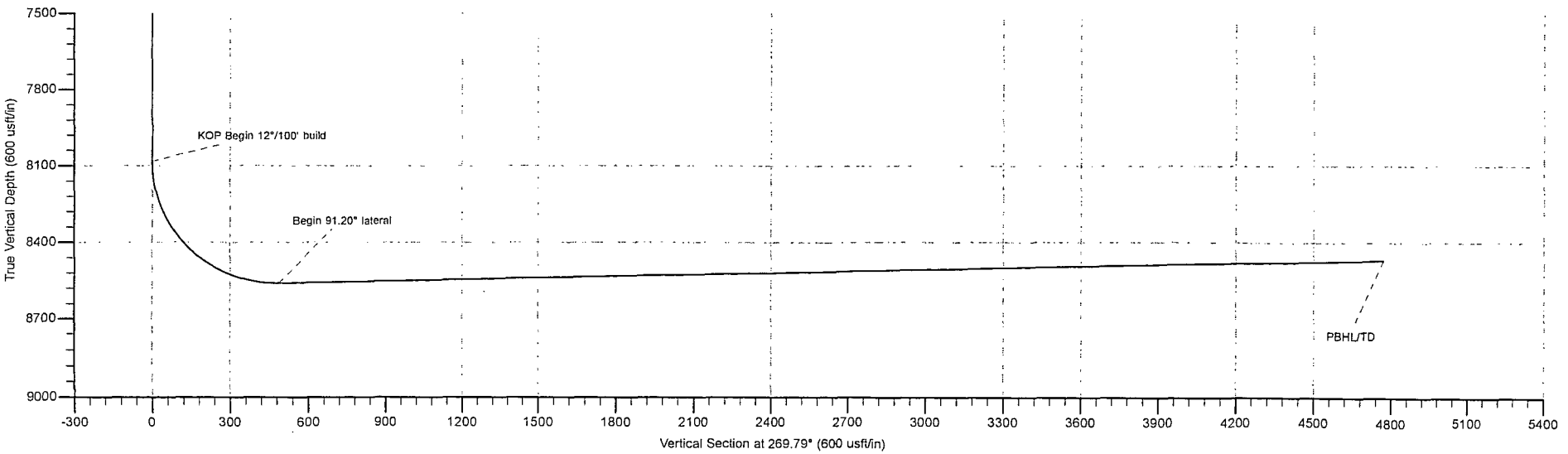
Northing	Easting	Latitude	Longitude
599764.20	670347.80	32.64763363	-103.77989322

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 7.07°

Azimuths to Grid North
True North: -0.30°
Magnetic North: 7.07°

Magnetic Field
Strength: 48570.5snT
Dip Angle: 60.47°
Date: 3/21/2014
Model: IGRF2010

N-ZONE



13:58, April 24 2014

CONCHO

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference rev0

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.96 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program **Date** 4/24/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,125.55	rev0 (Original Hole)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Lusk Deep Unit A						
Lusk Deep A Well No. 25H - Original hole - Surveys Orig	13,125.55	8,455.36	267.23	120.18	1.817	Level 3<=2.00, CC, ES, SF

Offset Design Lusk Deep Unit A - Lusk Deep A Well No. 25H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 8659-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	15.40	0.00	0.00	-88.04	163.20	-4,770.80	4,773.62				
100.00	100.00	82.96	98.36	0.09	0.09	-88.04	163.18	-4,770.82	4,773.61	4,773.42	0.18	N/A	
200.00	200.00	182.34	197.74	0.32	0.25	-88.04	163.22	-4,770.86	4,773.65	4,773.08	0.57	8,385.656	
300.00	300.00	277.22	292.62	0.54	0.44	-88.04	163.34	-4,770.94	4,773.74	4,772.76	0.98	4,868.900	
400.00	400.00	363.40	378.80	0.77	0.64	-88.04	163.29	-4,771.18	4,774.02	4,772.61	1.41	3,386.088	
500.00	500.00	450.17	465.57	0.99	0.87	-88.04	163.28	-4,771.70	4,774.62	4,772.76	1.86	2,571.927	
600.00	600.00	542.52	557.91	1.22	1.11	-88.04	163.14	-4,772.46	4,775.44	4,773.12	2.32	2,057.184	
700.00	700.00	644.89	660.28	1.44	1.37	-88.05	162.88	-4,773.39	4,776.33	4,773.52	2.81	1,697.450	
800.00	800.00	748.26	763.64	1.67	1.64	-88.05	162.68	-4,774.18	4,777.09	4,773.78	3.31	1,443.823	
900.00	900.00	872.54	887.92	1.89	1.93	-88.05	162.18	-4,774.99	4,777.76	4,773.93	3.83	1,249.023	
1,000.00	1,000.00	984.47	999.85	2.12	2.15	-88.06	161.71	-4,775.06	4,777.80	4,773.53	4.26	1,120.384	
1,100.00	1,100.00	1,082.18	1,097.56	2.34	2.34	-88.07	161.30	-4,775.10	4,777.82	4,773.14	4.68	1,020.048	
1,200.00	1,200.00	1,176.23	1,191.61	2.56	2.56	-88.07	160.95	-4,775.21	4,777.93	4,772.80	5.12	932.637	
1,300.00	1,300.00	1,290.67	1,306.04	2.79	2.81	-88.08	160.46	-4,775.31	4,778.01	4,772.41	5.60	853.741	
1,400.00	1,400.00	1,390.74	1,406.11	3.01	2.97	-88.08	160.13	-4,775.18	4,777.86	4,771.88	5.98	798.331	
1,500.00	1,500.00	1,497.76	1,513.14	3.24	3.10	-88.08	160.00	-4,774.97	4,777.67	4,771.33	6.34	753.282	
1,600.00	1,600.00	1,598.04	1,613.42	3.46	3.19	-88.08	159.98	-4,774.69	4,777.39	4,770.74	6.65	718.204	
1,700.00	1,700.00	1,872.89	1,888.14	3.69	3.41	-88.04	163.26	-4,767.93	4,774.43	4,767.33	7.10	672.151	
1,800.00	1,800.00	1,982.80	1,997.93	3.91	3.54	-88.01	165.46	-4,763.34	4,770.32	4,762.86	7.45	639.930	
1,900.00	1,900.00	2,096.51	2,111.51	4.14	3.69	-87.98	167.83	-4,758.39	4,766.04	4,758.21	7.83	608.692	
2,000.00	2,000.00	2,186.45	2,201.34	4.36	3.83	-87.96	169.61	-4,754.42	4,761.70	4,753.51	8.19	581.458	
2,100.00	2,100.00	2,284.95	2,299.74	4.59	3.99	-87.93	171.46	-4,750.22	4,757.50	4,748.93	8.57	554.984	
2,200.00	2,200.00	2,383.94	2,378.65	4.81	4.12	-87.91	172.85	-4,746.99	4,753.49	4,744.56	8.93	532.118	
2,300.00	2,300.00	2,438.93	2,453.59	5.04	4.26	-87.90	173.81	-4,744.33	4,749.99	4,740.70	9.29	511.136	
2,400.00	2,400.00	2,515.08	2,529.70	5.26	4.40	-87.89	174.63	-4,742.04	4,747.02	4,737.36	9.66	491.398	
2,500.00	2,500.00	2,600.00	2,614.59	5.49	4.56	-87.88	175.32	-4,739.85	4,744.48	4,734.43	10.05	472.082	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Lusk Deep Unit A - Lusk Deep A Well No. 25H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 8659-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,600.00	2,600.00	2,674.48	2,689.05	5.71	4.72	-87.88	175.75	-4,738.26	4,742.36	4,731.93	10.43	454.870	
2,700.00	2,700.00	2,754.15	2,768.71	5.94	4.88	-87.87	176.10	-4,736.93	4,740.70	4,729.89	10.82	438.320	
2,800.00	2,800.00	2,842.13	2,856.68	6.16	5.07	-87.87	176.34	-4,735.80	4,739.42	4,728.19	11.23	422.148	
2,900.00	2,900.00	2,937.62	2,952.16	6.39	5.27	-87.86	176.62	-4,734.68	4,738.26	4,726.61	11.66	406.483	
3,000.00	3,000.00	3,030.89	3,045.43	6.61	5.47	-87.86	177.04	-4,733.71	4,737.23	4,725.15	12.08	392.051	
3,100.00	3,100.00	3,126.22	3,140.75	6.84	5.69	-87.86	177.26	-4,732.85	4,736.34	4,723.82	12.52	378.300	
3,200.00	3,200.00	3,224.06	3,238.59	7.06	5.91	-87.85	177.26	-4,732.00	4,735.48	4,722.51	12.97	365.096	
3,300.00	3,300.00	3,313.81	3,328.34	7.28	6.12	-87.86	177.11	-4,731.37	4,734.77	4,721.37	13.40	353.211	
3,400.00	3,400.00	3,400.00	3,414.53	7.51	6.32	-87.86	176.91	-4,730.96	4,734.29	4,720.45	13.83	342.305	
3,500.00	3,500.00	3,488.44	3,502.96	7.73	6.51	-87.86	176.69	-4,730.77	4,734.07	4,719.83	14.24	332.482	
3,522.16	3,522.16	3,507.63	3,522.16	7.78	6.54	-87.86	176.65	-4,730.76	4,734.06	4,719.73	14.32	330.495	
3,600.00	3,600.00	3,576.78	3,591.31	7.96	6.65	-87.86	176.48	-4,730.83	4,734.13	4,719.52	14.61	324.109	
3,700.00	3,700.00	3,649.77	3,664.29	8.18	6.74	-87.87	176.35	-4,731.14	4,734.56	4,719.63	14.92	317.271	
3,800.00	3,800.00	3,723.04	3,737.56	8.41	6.82	-87.86	176.46	-4,731.94	4,735.64	4,720.41	15.23	311.009	
3,900.00	3,900.00	3,814.68	3,829.18	8.63	6.91	-87.85	177.54	-4,733.20	4,737.05	4,721.51	15.55	304.701	
4,000.00	4,000.00	3,900.00	3,914.48	8.86	7.01	-87.83	179.21	-4,734.43	4,738.59	4,722.72	15.87	298.595	
4,100.00	4,100.00	3,989.03	4,003.46	9.08	7.13	-87.80	181.77	-4,735.92	4,740.39	4,724.18	16.21	292.480	
4,200.00	4,200.00	4,071.57	4,085.92	9.31	7.24	-87.76	185.11	-4,737.63	4,742.62	4,726.07	16.54	286.662	
4,300.00	4,300.00	4,196.12	4,210.32	9.53	7.42	-87.70	190.50	-4,740.24	4,744.92	4,727.97	16.95	279.983	
4,400.00	4,400.00	4,383.96	4,398.07	9.76	7.74	-87.63	195.88	-4,741.02	4,745.06	4,727.57	17.49	271.320	
4,500.00	4,500.00	4,479.20	4,493.30	9.98	7.91	-87.61	197.75	-4,741.03	4,745.15	4,727.27	17.88	265.317	
4,600.00	4,600.00	13,706.00	9,335.82	10.21	127.61	-43.89	157.14	-151.17	4,740.84	4,640.00	100.83	47.016	
4,700.00	4,700.00	13,706.00	9,335.82	10.43	127.61	-43.89	157.14	-151.17	4,640.94	4,539.89	101.06	45.923	
4,800.00	4,800.00	13,706.00	9,335.82	10.66	127.61	-43.89	157.14	-151.17	4,541.06	4,439.77	101.28	44.835	
4,900.00	4,900.00	13,706.00	9,335.82	10.88	127.61	-43.89	157.14	-151.17	4,441.17	4,339.67	101.51	43.752	
5,000.00	5,000.00	13,706.00	9,335.82	11.11	127.61	-43.89	157.14	-151.17	4,341.30	4,239.56	101.73	42.674	
5,100.00	5,100.00	13,706.00	9,335.82	11.33	127.61	-43.89	157.14	-151.17	4,241.43	4,139.47	101.96	41.600	
5,200.00	5,200.00	13,706.00	9,335.82	11.56	127.61	-43.89	157.14	-151.17	4,141.56	4,039.38	102.18	40.531	
5,300.00	5,300.00	13,706.00	9,335.82	11.78	127.61	-43.89	157.14	-151.17	4,041.70	3,939.30	102.41	39.467	
5,400.00	5,400.00	13,706.00	9,335.82	12.00	127.61	-43.89	157.14	-151.17	3,941.85	3,839.22	102.63	38.408	
5,500.00	5,500.00	13,706.00	9,335.82	12.23	127.61	-43.89	157.14	-151.17	3,842.01	3,739.15	102.86	37.353	
5,600.00	5,600.00	13,706.00	9,335.82	12.45	127.61	-43.89	157.14	-151.17	3,742.18	3,639.09	103.08	36.303	
5,700.00	5,700.00	13,706.00	9,335.82	12.68	127.61	-43.89	157.14	-151.17	3,642.35	3,539.04	103.31	35.258	
5,800.00	5,800.00	13,706.00	9,335.82	12.90	127.61	-43.89	157.14	-151.17	3,542.54	3,439.00	103.53	34.217	
5,900.00	5,900.00	13,706.00	9,335.82	13.13	127.61	-43.89	157.14	-151.17	3,442.73	3,338.97	103.76	33.181	
6,000.00	6,000.00	13,706.00	9,335.82	13.35	127.61	-43.89	157.14	-151.17	3,342.94	3,238.96	103.98	32.150	
6,100.00	6,100.00	13,706.00	9,335.82	13.58	127.61	-43.89	157.14	-151.17	3,243.16	3,138.95	104.21	31.123	
6,200.00	6,200.00	13,706.00	9,335.82	13.80	127.61	-43.89	157.14	-151.17	3,143.39	3,038.96	104.43	30.101	
6,300.00	6,300.00	13,706.00	9,335.82	14.03	127.61	-43.89	157.14	-151.17	3,043.64	2,938.98	104.65	29.083	
6,400.00	6,400.00	13,706.00	9,335.82	14.25	127.61	-43.89	157.14	-151.17	2,943.90	2,839.03	104.88	28.069	
6,500.00	6,500.00	13,706.00	9,335.82	14.48	127.61	-43.89	157.14	-151.17	2,844.19	2,739.08	105.10	27.061	
6,600.00	6,600.00	13,706.00	9,335.82	14.70	127.61	-43.89	157.14	-151.17	2,744.49	2,639.16	105.33	26.056	
6,700.00	6,700.00	13,706.00	9,335.82	14.93	127.61	-43.89	157.14	-151.17	2,644.82	2,539.27	105.55	25.057	
6,800.00	6,800.00	13,706.00	9,335.82	15.15	127.61	-43.89	157.14	-151.17	2,545.18	2,439.40	105.78	24.061	
6,900.00	6,900.00	13,706.00	9,335.82	15.38	127.61	-43.89	157.14	-151.17	2,445.56	2,339.56	106.00	23.071	
7,000.00	7,000.00	13,706.00	9,335.82	15.60	127.61	-43.89	157.14	-151.17	2,345.97	2,239.75	106.23	22.084	
7,100.00	7,100.00	13,706.00	9,335.82	15.83	127.61	-43.89	157.14	-151.17	2,246.43	2,139.97	106.45	21.103	
7,200.00	7,200.00	13,706.00	9,335.82	16.05	127.61	-43.89	157.14	-151.17	2,146.92	2,040.24	106.68	20.125	
7,300.00	7,300.00	13,706.00	9,335.82	16.28	127.61	-43.89	157.14	-151.17	2,047.46	1,940.56	106.90	19.153	
7,400.00	7,400.00	13,706.00	9,335.82	16.50	127.61	-43.89	157.14	-151.17	1,948.06	1,840.93	107.13	18.185	
7,500.00	7,500.00	13,706.00	9,335.82	16.72	127.61	-43.89	157.14	-151.17	1,848.72	1,741.37	107.35	17.221	
7,600.00	7,600.00	13,706.00	9,335.82	16.95	127.61	-43.89	157.14	-151.17	1,749.46	1,641.88	107.58	16.262	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Lusk Deep Unit A - Lusk Deep A Well No. 25H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 8659-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,700.00	7,700.00	13,706.00	9,335.82	17.17	127.61	-43.89	157.14	-151.17	1,650.29	1,542.49	107.80	15.309	
7,800.00	7,800.00	13,706.00	9,335.82	17.40	127.61	-43.89	157.14	-151.17	1,551.22	1,443.19	108.03	14.360	
7,900.00	7,900.00	13,706.00	9,335.82	17.62	127.61	-43.89	157.14	-151.17	1,452.28	1,344.03	108.25	13.416	
8,000.00	8,000.00	13,706.00	9,335.82	17.85	127.61	-43.89	157.14	-151.17	1,353.50	1,245.02	108.48	12.477	
8,100.00	8,100.00	13,706.00	9,335.82	18.07	127.61	56.27	157.14	-151.17	1,254.87	1,131.69	123.18	10.187	
8,200.00	8,198.82	13,706.00	9,335.82	18.27	127.61	132.50	157.14	-151.17	1,155.94	1,041.20	114.74	10.075	
8,300.00	8,292.57	13,706.00	9,335.82	18.50	127.61	156.76	157.14	-151.17	1,060.01	986.28	73.73	14.376	
8,400.00	8,377.14	13,706.00	9,335.82	18.77	127.61	164.08	157.14	-151.17	972.79	911.96	60.83	15.991	
8,500.00	8,448.84	13,706.00	9,335.82	19.18	127.61	167.19	157.14	-151.17	901.11	844.82	56.29	16.009	
8,600.00	8,504.54	13,633.08	9,337.89	19.81	125.61	167.91	159.93	-224.01	849.26	794.31	54.94	15.457	
8,700.00	8,541.80	13,542.61	9,340.67	20.72	123.14	168.04	163.44	-314.37	816.31	762.32	53.99	15.120	
8,800.00	8,558.99	13,395.58	9,340.92	21.93	119.12	167.42	172.17	-461.08	801.17	747.83	53.34	15.019	
8,851.76	8,561.33	13,350.10	9,339.23	22.68	117.88	167.09	176.41	-506.32	798.11	744.68	53.43	14.937	
8,900.00	8,558.79	13,289.56	9,337.18	23.38	116.23	166.80	180.66	-566.67	799.82	746.48	53.34	14.996	
9,000.00	8,556.69	13,186.10	9,332.55	25.04	113.41	166.38	185.71	-669.90	798.71	745.39	53.32	14.980	
9,098.28	8,554.63	13,095.90	9,329.53	26.86	110.95	166.17	188.12	-760.02	798.22	745.02	53.20	15.003	
9,100.00	8,554.59	13,094.31	9,329.49	26.89	110.90	166.17	188.14	-761.61	798.22	745.02	53.20	15.004	
9,200.00	8,552.49	12,996.61	9,327.29	28.88	108.24	166.07	189.15	-859.28	798.41	745.48	52.93	15.083	
9,300.00	8,550.39	12,897.96	9,325.31	30.99	105.56	165.98	190.11	-957.91	798.83	746.13	52.70	15.158	
9,400.00	8,548.29	12,760.70	9,319.55	33.20	101.83	165.76	192.03	-1,095.02	797.31	744.99	52.32	15.238	
9,500.00	8,546.19	12,672.28	9,313.87	35.48	99.43	165.55	193.80	-1,183.23	793.72	741.29	52.43	15.138	
9,600.00	8,544.08	12,589.86	9,310.03	37.82	97.19	165.33	196.01	-1,265.53	792.02	739.38	52.64	15.046	
9,619.44	8,543.68	12,574.46	9,309.53	38.29	96.77	165.29	196.47	-1,280.91	791.97	739.28	52.69	15.031	
9,700.00	8,541.98	12,506.65	9,308.19	40.22	94.93	165.13	198.63	-1,348.68	792.77	739.90	52.86	14.996	
9,800.00	8,539.88	12,412.23	9,307.07	42.66	92.37	164.91	201.65	-1,443.04	794.58	741.55	53.03	14.983	
9,900.00	8,537.78	12,325.52	9,307.46	45.14	90.01	164.77	203.87	-1,529.72	797.79	744.61	53.19	15.000	
10,000.00	8,535.68	12,230.03	9,309.49	47.65	87.43	164.76	204.82	-1,625.18	802.22	749.10	53.12	15.102	
10,100.00	8,533.58	12,113.28	9,311.07	50.18	84.27	164.76	205.47	-1,741.92	805.81	752.96	52.85	15.246	
10,200.00	8,531.48	12,003.22	9,310.58	52.73	81.30	164.82	204.71	-1,851.98	807.29	754.70	52.59	15.349	
10,300.00	8,529.38	11,891.08	9,308.40	55.31	78.28	164.83	204.21	-1,964.09	807.37	754.97	52.40	15.408	
10,400.00	8,527.27	11,789.56	9,305.80	57.90	75.55	164.79	204.36	-2,065.57	807.07	754.67	52.40	15.403	
10,439.56	8,526.44	11,753.99	9,304.85	58.93	74.60	164.77	204.49	-2,101.13	806.93	754.48	52.45	15.385	
10,500.00	8,525.17	11,703.25	9,303.94	60.51	73.24	164.73	204.89	-2,151.86	807.30	754.73	52.57	15.357	
10,600.00	8,523.07	11,591.00	9,301.33	63.13	70.22	164.62	205.99	-2,264.07	807.39	754.81	52.59	15.353	
10,645.64	8,522.11	11,547.26	9,300.00	64.33	69.05	164.58	206.41	-2,307.79	807.15	754.48	52.67	15.325	
10,700.00	8,520.97	11,495.00	9,298.90	65.76	67.66	164.51	207.19	-2,360.03	807.41	754.63	52.78	15.298	
10,800.00	8,518.87	11,409.48	9,297.94	68.40	65.37	164.40	208.72	-2,445.53	808.86	755.79	53.08	15.240	
10,900.00	8,516.77	11,317.20	9,297.79	71.04	62.91	164.30	210.42	-2,537.79	811.32	758.00	53.32	15.216	
11,000.00	8,514.67	11,215.54	9,298.03	73.70	60.21	164.18	212.41	-2,639.43	814.20	760.69	53.51	15.216	
11,100.00	8,512.56	11,080.59	9,294.00	76.36	56.64	163.93	215.22	-2,774.28	813.75	760.15	53.61	15.181	
11,200.00	8,510.46	10,983.45	9,290.06	79.03	54.09	163.85	215.62	-2,871.34	812.09	758.26	53.83	15.085	
11,300.00	8,508.36	10,890.88	9,287.91	81.71	51.67	163.93	213.93	-2,963.87	811.46	757.58	53.88	15.061	
11,393.05	8,506.41	10,800.23	9,286.27	84.20	49.32	164.03	212.24	-3,054.49	811.34	757.47	53.88	15.060	
11,400.00	8,506.26	10,793.41	9,286.15	84.39	49.14	164.04	212.14	-3,061.30	811.34	757.46	53.88	15.059	
11,500.00	8,504.16	10,690.97	9,284.21	87.08	46.50	164.10	210.94	-3,163.72	811.32	757.40	53.92	15.047	
11,600.00	8,502.06	10,585.22	9,281.47	89.77	43.79	164.13	209.93	-3,269.43	810.68	756.69	53.99	15.015	
11,700.00	8,499.96	10,488.33	9,278.63	92.46	41.33	164.15	209.16	-3,366.27	809.77	755.59	54.19	14.944	
11,800.00	8,497.85	10,389.68	9,276.18	95.16	38.86	164.17	208.38	-3,464.89	809.29	754.90	54.38	14.881	
11,848.79	8,496.83	10,344.48	9,275.18	96.47	37.74	164.19	207.94	-3,510.08	809.16	754.65	54.50	14.846	
11,900.00	8,495.75	10,298.14	9,274.43	97.86	36.59	164.21	207.50	-3,556.41	809.31	754.67	54.64	14.812	
12,000.00	8,493.65	10,214.73	9,274.01	100.56	34.56	164.23	207.28	-3,639.81	810.88	755.87	55.01	14.741	
12,100.00	8,491.55	10,119.08	9,274.80	103.27	32.26	164.21	208.05	-3,735.46	814.01	758.63	55.38	14.699	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Lusk Deep Unit A - Lusk Deep A Well No. 25H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 8659-MWD — Offset Well Error: 0.00 usft

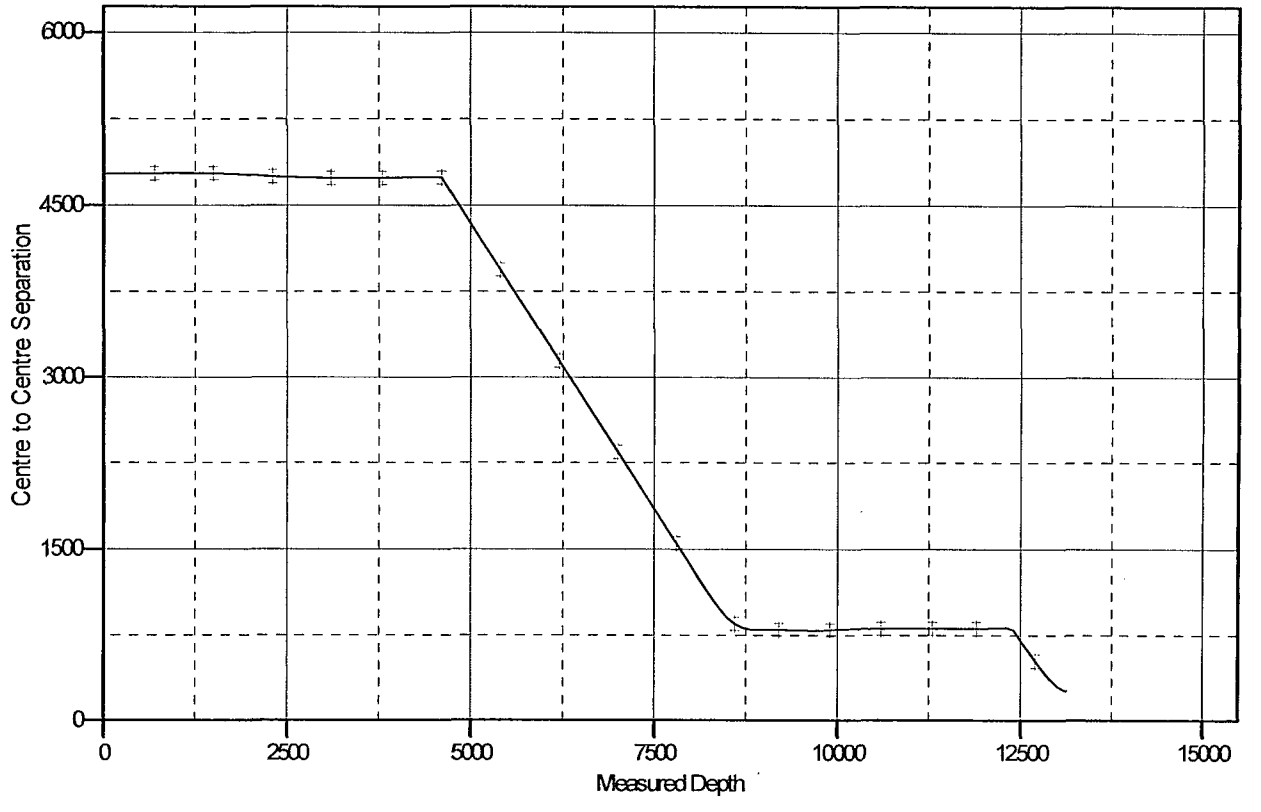
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,200.00	8,489.45	10,011.02	9,275.82	105.98	29.74	164.21	208.58	-3,843.51	817.20	761.52	55.68	14.676	
12,300.00	8,487.35	9,909.21	9,274.77	108.69	27.44	164.04	210.99	-3,945.29	818.97	762.66	56.31	14.545	
12,400.00	8,485.25	8,459.84	8,472.79	111.40	15.94	90.72	248.65	-4,797.69	798.39	671.08	127.31	6.271	
12,500.00	8,483.15	8,459.25	8,472.20	114.12	15.94	90.60	248.65	-4,797.68	704.89	574.86	130.03	5.421	
12,600.00	8,481.04	8,458.65	8,471.60	116.83	15.94	90.47	248.65	-4,797.67	613.43	480.68	132.75	4.621	
12,700.00	8,478.94	8,458.04	8,470.99	119.55	15.94	90.34	248.65	-4,797.66	525.10	389.63	135.47	3.876	
12,800.00	8,476.84	8,457.43	8,470.38	122.27	15.94	90.21	248.64	-4,797.65	441.78	303.59	138.19	3.197	
12,900.00	8,474.74	8,456.80	8,469.75	124.99	15.93	90.07	248.64	-4,797.64	366.88	225.96	140.92	2.604	
13,000.00	8,472.64	8,456.17	8,469.12	127.72	15.93	89.93	248.64	-4,797.63	306.65	163.01	143.64	2.135	
13,100.00	8,470.54	8,455.53	8,468.48	130.44	15.93	89.80	248.63	-4,797.62	271.04	124.68	146.36	1.852	Level 3<=2.00
13,125.55	8,470.00	8,455.36	8,468.32	131.14	15.93	89.76	248.63	-4,797.62	267.23	120.18	147.06	1.817	Level 3<=2.00, CC, ES, SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3590.9+18 @ 3608.90usft (Patr
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Lusk Deep Unit A Well No. 35H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

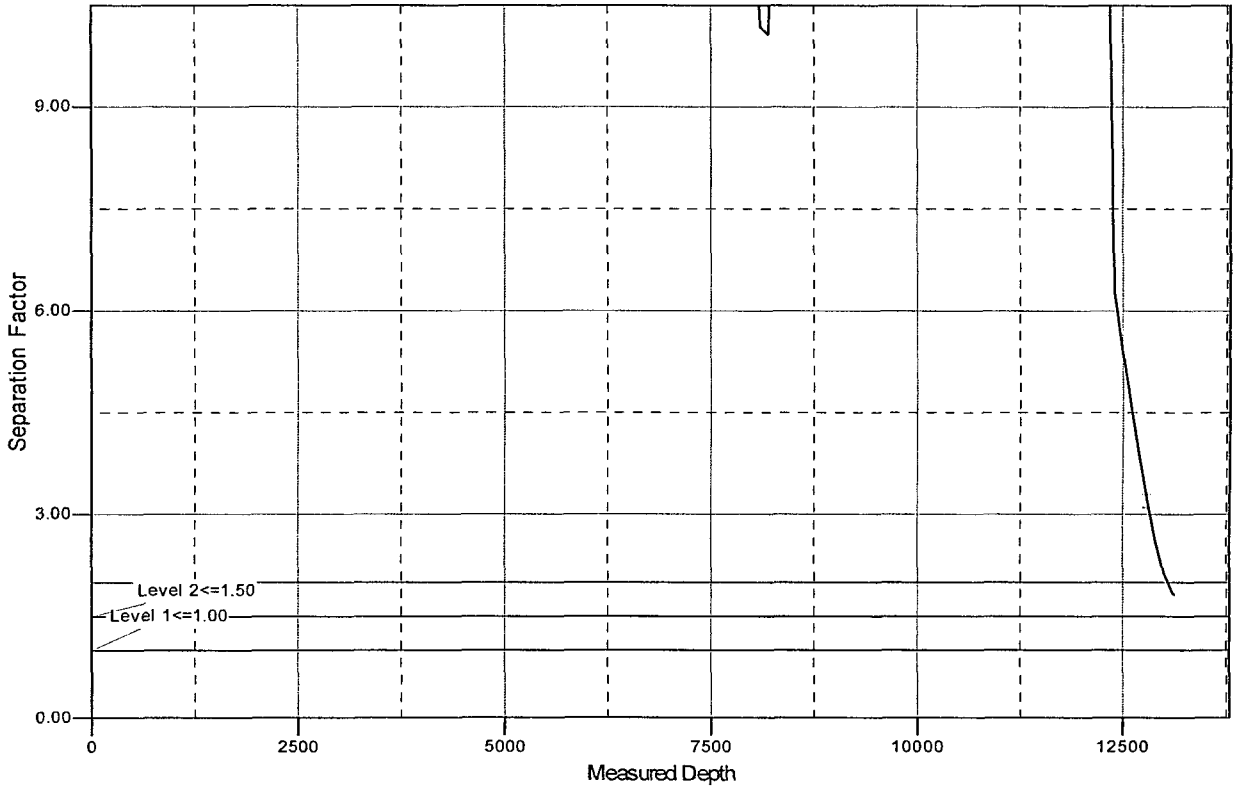
›.25H, Original hole, Surveys Original hole V0

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Lusk Deep Unit A Well No. 35H
Project:	Lea County New Mexico	**TVD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Reference Site:	Lusk Deep Unit A	**MD Reference:**	RKB=3590.9+18 @ 3608.90usft (Patriot 6)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Lusk Deep Unit A Well No. 35H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Original Hole	**Database:**	EDM 5000.1 Ddatabase
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3590.9+18 @ 3608.90usft (Patr
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Lusk Deep Unit A Well No. 35H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.30°

Separation Factor Plot



LEGEND

, 25H, Original hole, Surveys Original hole V0

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

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twws	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00639 EXPL		LE	3	1	20	19S	32E		613029	3612880*	350	345	5

Average Depth to Water: **345 feet**

Minimum Depth: **345 feet**

Maximum Depth: **345 feet**

Record Count: 1

PLSS Search:

Section(s): 20 **Township:** 19S **Range:** 32E

***UTM location was derived from PLSS - see Help**

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

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twsp	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00073		LE		2	4	34	19S	32E	617502	3609301*	575		
CP 00075		LE		2	4	34	19S	32E	617502	3609301*	575		
CP 00563		LE	1	1	2	19	19S	32E	612118	3613376*	300		
CP 00639 EXPL		LE		3	1	20	19S	32E	613029	3612880*	350	345	5
CP 00640 EXPL		LE		2	2	19	19S	32E	612621	3613280*	260	102	158

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

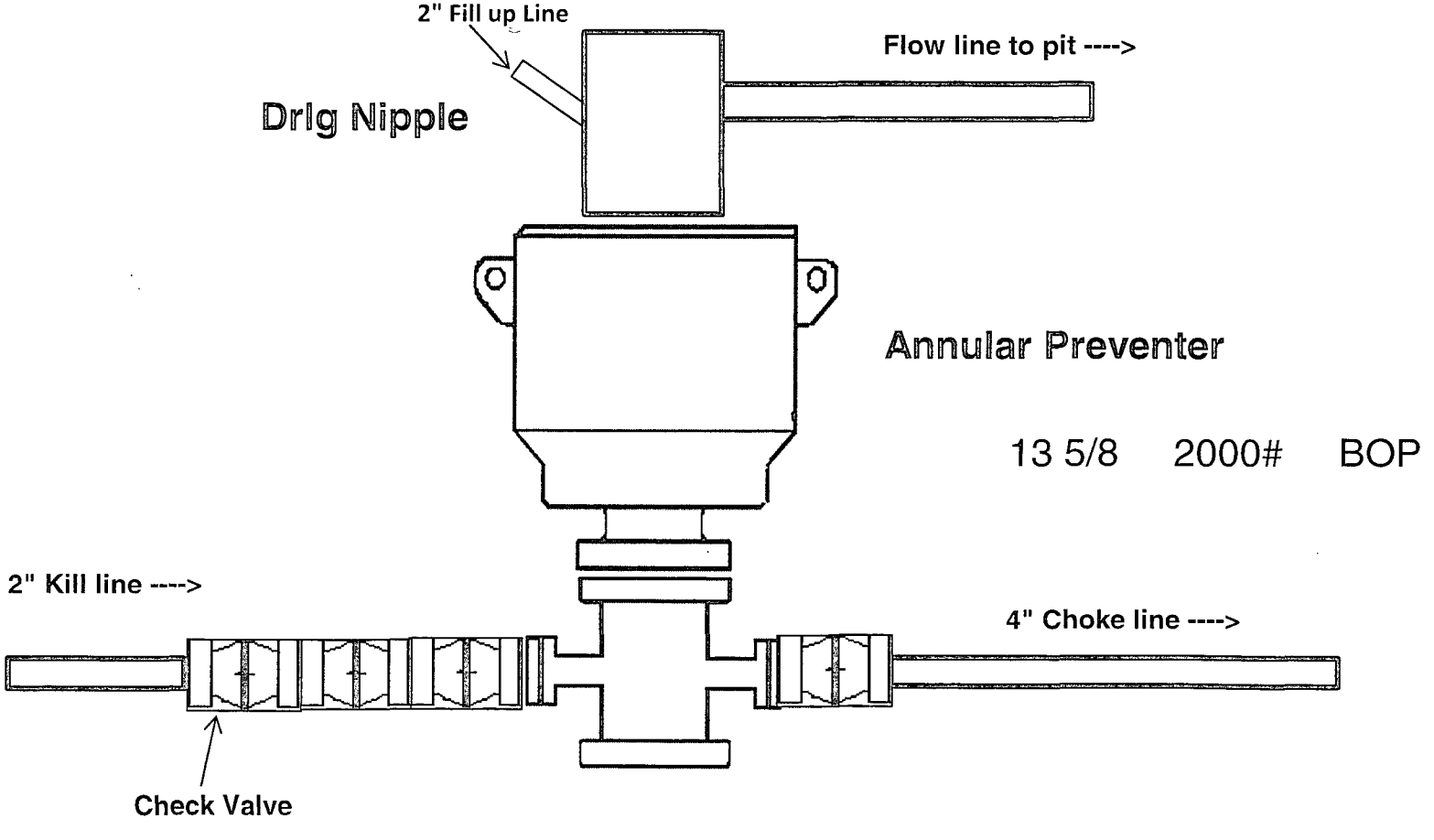
Record Count: 5

PLSS Search:

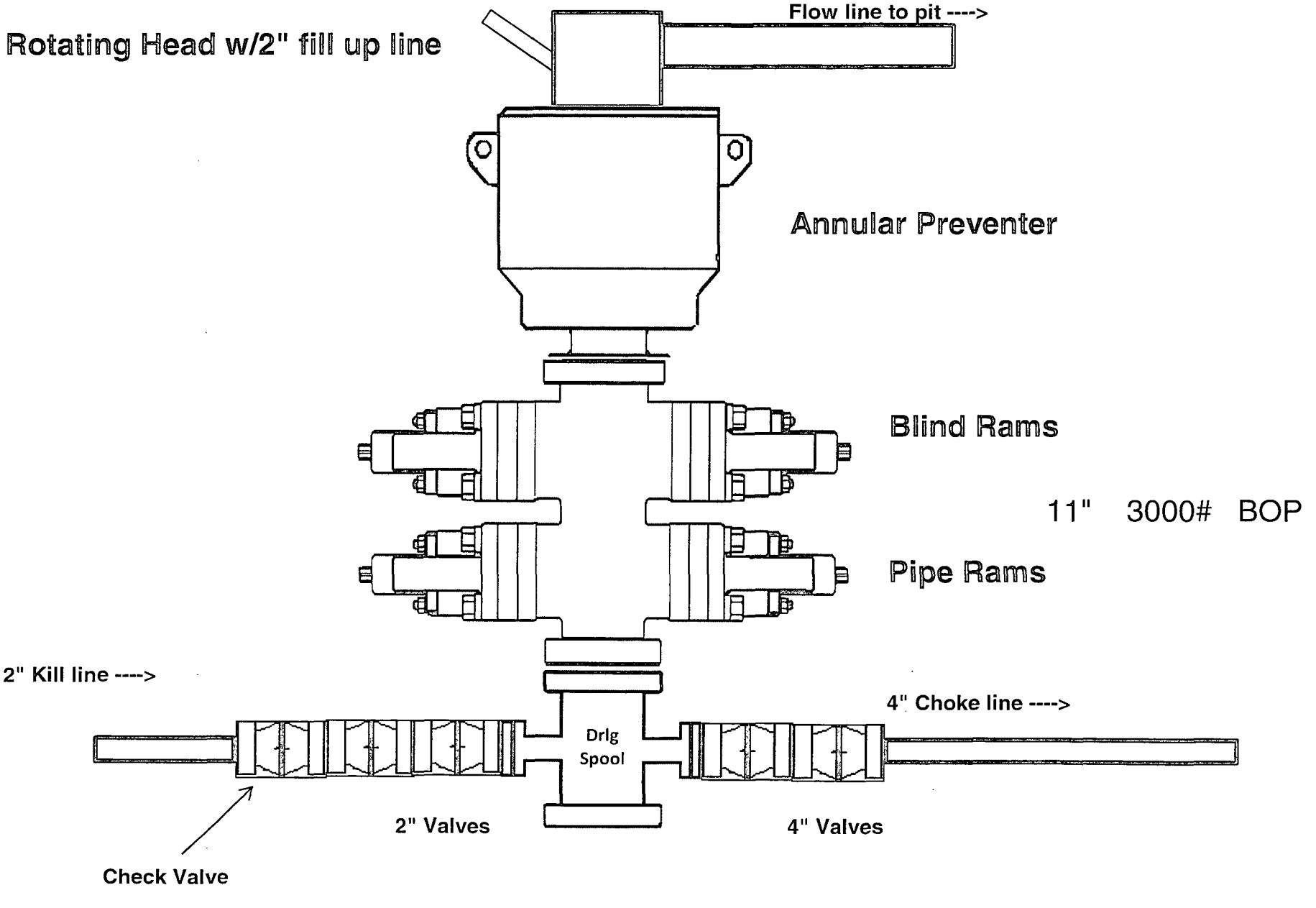
Township: 19S **Range:** 32E

***UTM location was derived from PLSS - see Help**

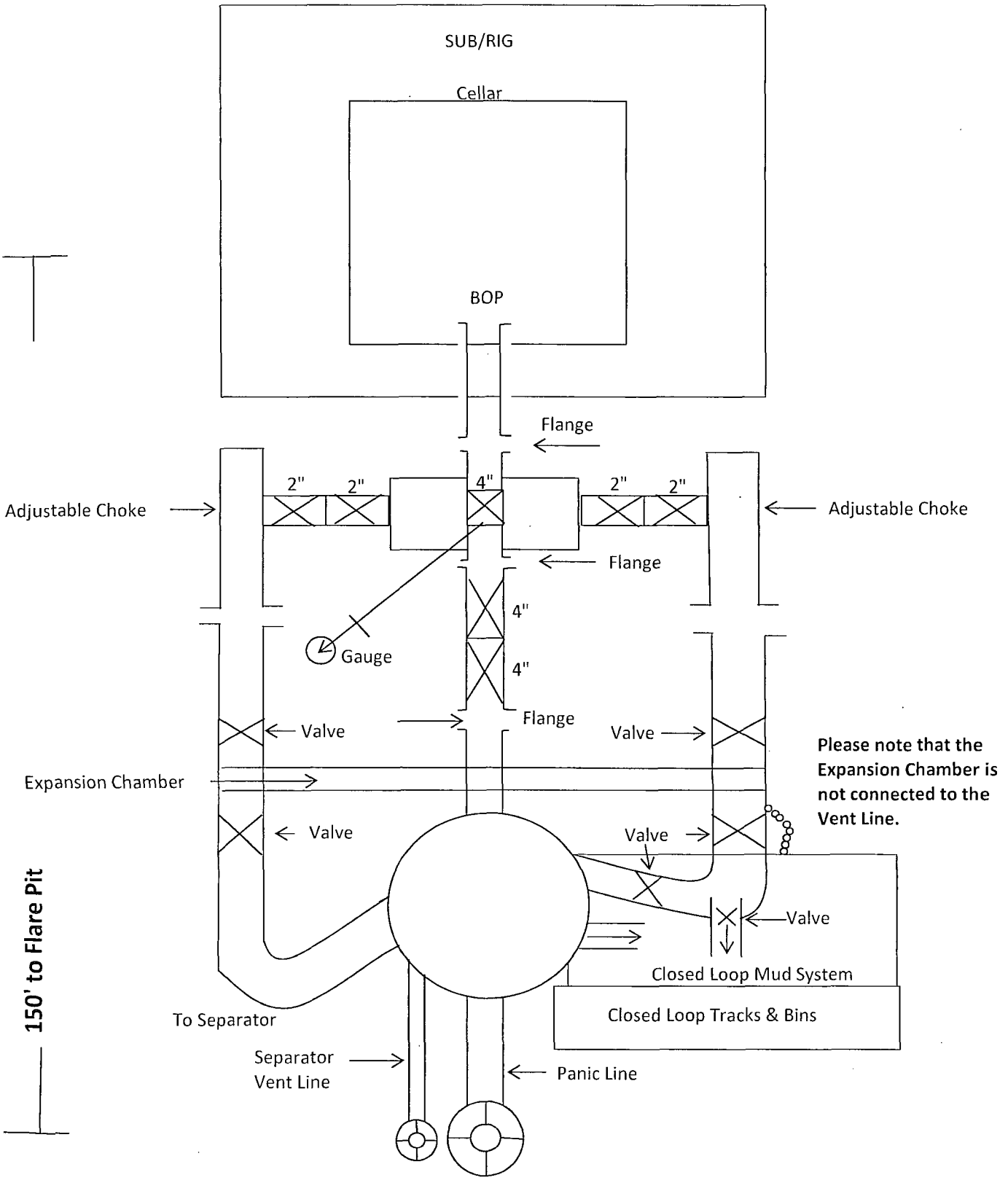
2,000 psi BOP Schematic



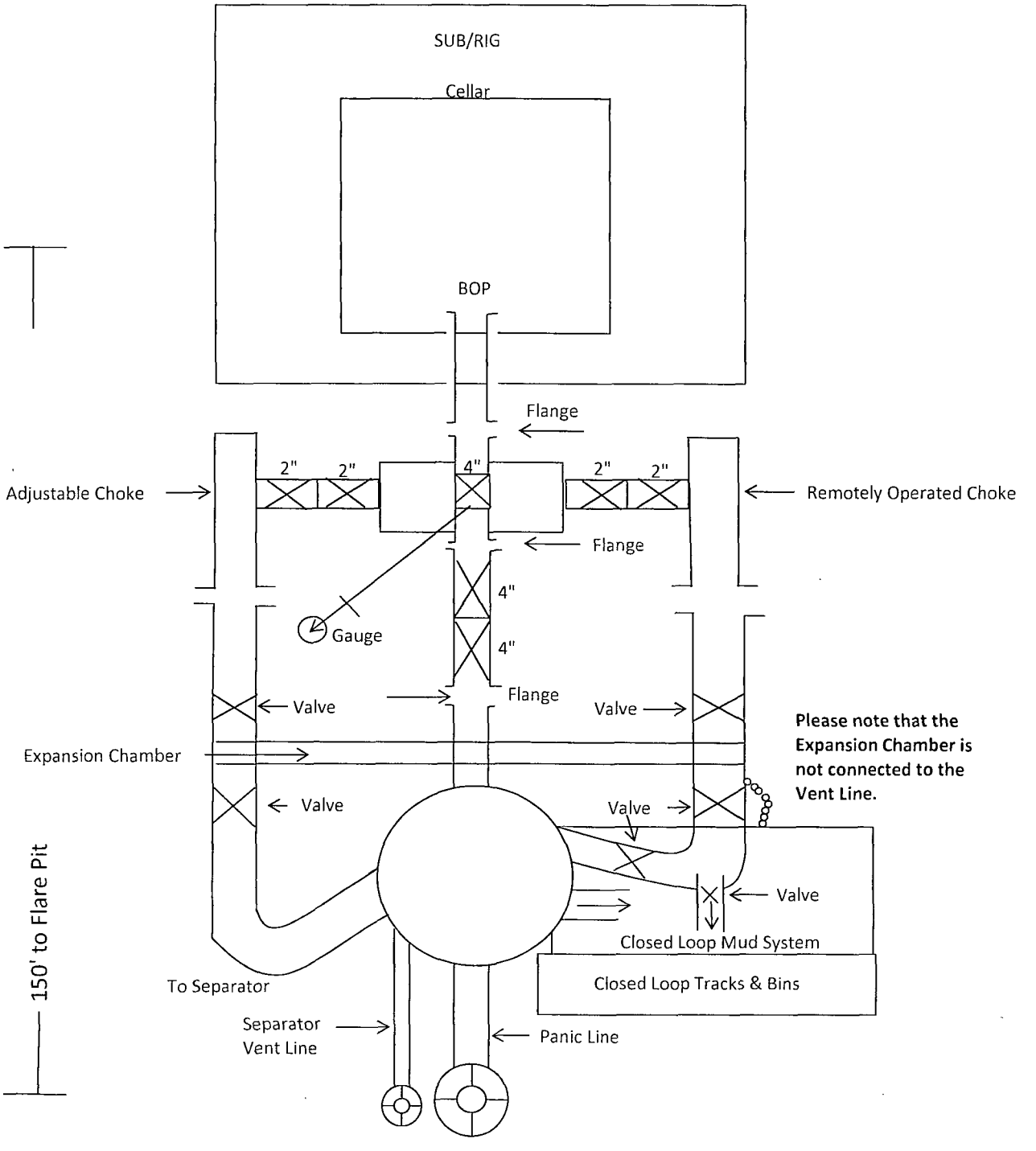
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

Well pad will be 340' X 340' with cellar in center of pad

Flare Lines will be from both Choke Manifold & Separator to edge of location which is +/- 170'

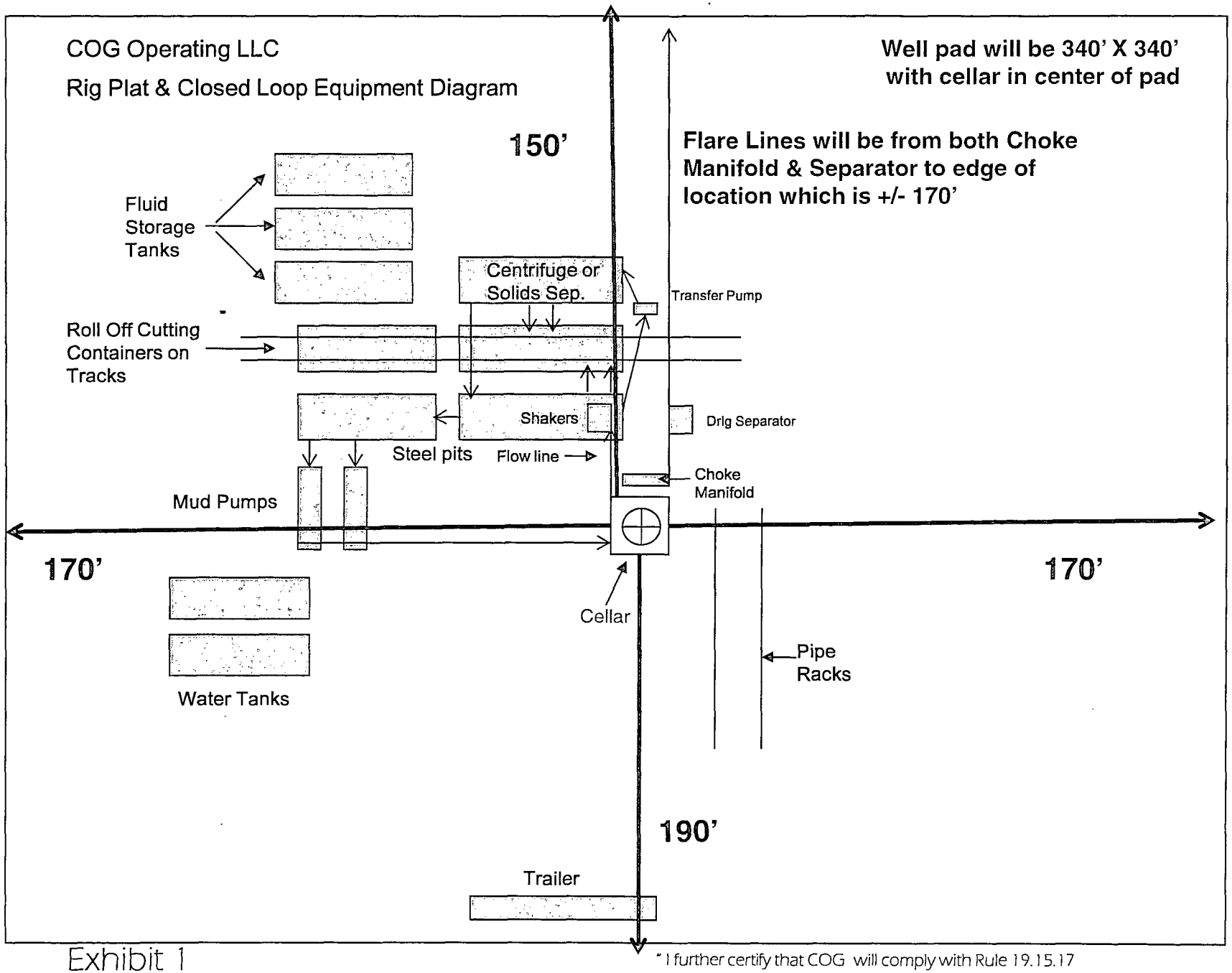


Exhibit 1

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

Well pad will be 340' X 340' with cellar in center of pad

COG Operating LLC
H_2S Equipment Schematic
Terrain: Shinnery sand hills.

Location Entry Condition Sign ☐