

OCD Hobbs

FORM 3160-3
OMB No. 1004-0137
Expires October 31, 2014UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTUNORTHODOX
LOCATION

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM086	
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator COG Operating LLC. <229137>		7. If Unit or CA Agreement, Name and No.	
3a. Address 2208 West Main Street Artesia, NM 88210		8. Lease Name and Well No. <38664> Tusk Federal #3H	
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-025-41573	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 170' FSL & 1820' FWL Unit Letter N (SESW) SHL Sec 25-T19S-R34E At proposed prod. Zone 330' FNL & 1980' FWL Unit Letter C (NENW) BHL Sec 25-T19S-R34E		10. Field and Pool, or Exploratory Lea; Bone Spring <37570>	
14. Distance in miles and direction from nearest town or post office* Approximately 11 miles from Monument		11. Sec., T.R.M. or Blk and Survey or Area Sec. 25 - T19S - R34E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 170'		12. County or Parish Lea County	
16. No. of acres in lease 640		13. State NM	
17. Spacing Unit dedicated to this well 160		18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 444' BHL: 330'	
19. Proposed Depth TVD: 10,825' MD: 15,494'		20. BLM/BIA Bond No. on file NMB000740 & NMB000215	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3732.5' GL		22. Approximate date work will start* 2/1/2014	
23. Estimated duration 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. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 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). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 10/29/2013
Title Regulatory Analyst		

Approved by (Signature) <i>/s/ STEPHEN J. CARLEY</i>	Name (Printed/Typed) STEPHEN J. CARLEY	Date DEC 19 2013
Title FIELD MANAGER		
Office 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 thereon.

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)

Capitan Controlled Water Basin (Instructions on page 2)

Approval Subject to General Requirements
& Special Stipulations AttachedSEE ATTACHED FOR
CONDITIONS OF APPROVAL

DEC 30 2013

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM

Tusk Federal 3H
SHL: 170' FSL & 1820' FWL
BHL: 330' FNL & 1980' FWL
Section 25, T19S R34E
Lea 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	157'	
Rustler	1,834'	
Top of Salt	1,923'	
Base of Salt	3,353'	
Yates	3,641'	
Seven Rivers	4,054'	
Queen	4,672'	
Cherry Canyon	5,754'	Oil
Brushy Canyon	6,464'	Oil
Bone Spring	8,165'	Oil
1 st BS Sand	9,553'	Oil
2 nd BS Sand	10,097'	Oil
3 rd BS Sand	10,725'	Oil
Wolfcamp	10,950'	Will not penetrate
TD MD	15,494'	
TD TVD	10,825'	

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 1,880' and circulating cement back to surface.

The salt sections will be isolated by setting 9-5/8" casing at 3,750' and circulating cement back to surface.

Other intervals will be isolated by setting 5 1/2" casing to total depth and circulating cement to ~ 3,250' (500' overlap).

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

Hole Size	Depths	Section	OD Casing	New/ Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 ½"	0' – 1,880'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 ¼"	0' – 3,750'	Intrmd	9 5/8"	New	36#	LTC	J-55	1.125	1.125	1.6
7 7/8"	0' – 15,494'	Production Curve & Lateral	5 1/2"	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.
- Will run one centralizer per joint in lateral section of well.

4. Proposed Cement Program

- a. 13-3/8" Surface
- Lead: 860 sx Class C + 4% Gel + 2% CaCl₂
(13.5 ppg / 9.2 gal/sk / 1.75 cuft/sk)
- Tail: 220 sx Class C + 2% CaCl₂
(14.8 ppg / 6.35 gal/sk / 1.34 cuft/sk)
- **Calculated w/35% excess on OH volumes based on offset wells
- b. 9 5/8" Intermediate:
- Lead: 865 sx Class C + 4% Gel + 1% CaCl₂
(13.5 ppg / 9.2 gal/sk / 1.75 cuft/sk)
- Tail: 200 sx Class C + 2% CaCl₂
(14.8 ppg / 6.35 gal/sk / 1.34 cuft/sk)
- **Calculated w/85% excess on OH volumes
- c. 5 1/2" Production
- Lead: 930 sx 50:50:10 H w/ 8# salt, 5# kolseal, 0.5% Halad-322, 0.3% HR-601 & 1/4# D-Air 5000 (11.9 ppg / 14.07 gal/sk / 2.51 cuft/sk)
- Tail: 1180 sx 50:50:2 H w/ 1% salt, 0.4% GasStop, 0.3% CFR-3 & 0.1% HR601, & CFR-3 (14.4 ppg / 5.66 gal/sk 1.25 cuft/sk)
- **Calculated w/80% excess on OH volumes
- The above cement volumes could be revised pending caliper measurements.
 - Surface and intermediate strings are designed to circulate to surface. The production string will be cemented 500' into the intermediate casing.

5. Minimum Specifications for Pressure Control:

Nipple up on 13 3/8" with minimum 2M annular preventer. Annular will be tested to 50% of WP and remainder of system tested to 2000 psi by independent tester.

Nipple up on 9 5/8" with minimum 3M annular and double ram preventers. Annular will be tested to 50% of WP and remainder of 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.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string depth or 1500 psig, whichever is greater, but not to exceed 70 percent of casing's minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken.

See COA While drilling the intermediate section, if a reading of H₂S is greater than 100 ppm, well will be shut-in and a remote operated choke will be installed.

6. Estimated BHP & BHT:

Lateral TD = 4728 psi

Lateral TD = 157° F

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

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' - 1,880'	Fresh Water	8.4	29	N.C.
1,880' - 3,750'	Brine	10.0	29	N.C.
3,750' - 15,494' (Lateral)	Cut Brine	8.5 – 8.7	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 totalizer, 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. *See COA* Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

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 cores are planned.
 - iv. Additional testing will be initiated subsequent to setting the 5 1/2" 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:

- a. 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 30 days.



COG Operating LLC

Lea County, NM (NAD27 NME)

Tusk Federal

3H

OH

Plan: Design #1

Standard Planning Report - Geographic

17 October, 2013

NEXUS
DIRECTIONAL SOLUTIONS, L.P.



Nexus Directional Solutions L.P.
Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 3H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3749.5usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3749.5usft (Original Well Elev)
Site:	Tusk Federal	North Reference:	Grid
Well:	3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Project:	Lea County, NM (NAD27 NME)		
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:	Tusk Federal		
Site Position:		Northing:	0.00 usft
From:	Map	Easting:	0.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	30° 59' 24.512 N
		Longitude:	105° 55' 44.137 W
		Grid Convergence:	-0.82 °

Well:	3H		
Well Position	+N-S	0.0 usft	Northing:
	+E-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	Ground Level:
			3,732.5 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/17/13	7.30
			Dip Angle
			(°)
			60.51
			Field Strength
			(nT)
			48,627

Design:	Design #1		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			1.41

Plan Sections:										
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,433.2	0.00	0.00	10,433.2	0.0	0.0	0.00	0.00	0.00	0.00	
11,192.7	91.14	1.41	10,910.6	486.8	12.0	12.00	12.00	0.00	1.41	
15,494.1	91.14	1.41	10,825.0	4,786.1	117.9	0.00	0.00	0.00	0.00	PBHL Tusk Fed #3H



Nexus Directional Solutions L.P.
Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local: Co-ordinate Reference:	Well 3H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3749.5usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3749.5usft (Original Well Elev)
Site:	Tusk Federal	North Reference:	Grid
Well:	3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

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	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
100.0	0.00	0.00	100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
200.0	0.00	0.00	200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
300.0	0.00	0.00	300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
400.0	0.00	0.00	400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
500.0	0.00	0.00	500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
600.0	0.00	0.00	600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
700.0	0.00	0.00	700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
800.0	0.00	0.00	800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
900.0	0.00	0.00	900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,400.0	0.00	0.00	4,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,800.0	0.00	0.00	4,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
5,300.0	0.00	0.00	5,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W



Nexus Directional Solutions L.P.
Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 3H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3749.5usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3749.5usft (Original Well Elev)
Site:	Tusk Federal	North Reference:	Grid
Well:	3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
5,800.0	0.00	0.00	5,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,000.0	0.00	0.00	6,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,200.0	0.00	0.00	6,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,400.0	0.00	0.00	6,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,600.0	0.00	0.00	6,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,800.0	0.00	0.00	6,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,000.0	0.00	0.00	7,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,200.0	0.00	0.00	7,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,400.0	0.00	0.00	7,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,800.0	0.00	0.00	7,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,000.0	0.00	0.00	8,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,400.0	0.00	0.00	8,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,600.0	0.00	0.00	8,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,800.0	0.00	0.00	8,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,000.0	0.00	0.00	9,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,100.0	0.00	0.00	9,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,200.0	0.00	0.00	9,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,300.0	0.00	0.00	9,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,400.0	0.00	0.00	9,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,500.0	0.00	0.00	9,500.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,600.0	0.00	0.00	9,600.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,700.0	0.00	0.00	9,700.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,800.0	0.00	0.00	9,800.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
9,900.0	0.00	0.00	9,900.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,000.0	0.00	0.00	10,000.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,100.0	0.00	0.00	10,100.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,200.0	0.00	0.00	10,200.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,300.0	0.00	0.00	10,300.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,400.0	0.00	0.00	10,400.0	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
10,433.2	0.00	0.00	10,433.2	0.0	0.0	591,834.00	751,663.90	32° 37' 27.820 N	103° 30' 57.328 W	
Start Build 12.00										
10,450.0	2.01	1.41	10,450.0	0.3	0.0	591,834.30	751,663.90	32° 37' 27.823 N	103° 30' 57.328 W	
10,475.0	5.01	1.41	10,474.9	1.8	0.0	591,835.83	751,663.94	32° 37' 27.838 N	103° 30' 57.327 W	



Nexus Directional Solutions L.P.
Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 3H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3749.5usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3749.5usft (Original Well Elev)
Site:	Tusk Federal	North Reference:	Grid
Well:	3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,500.0	8.01	1.41	10,499.8	4.7	0.1	591,838.67	751,664.01	32° 37' 27.866 N	103° 30' 57.326 W
10,525.0	11.01	1.41	10,524.4	8.8	0.2	591,842.80	751,664.11	32° 37' 27.907 N	103° 30' 57.324 W
10,550.0	14.01	1.41	10,548.8	14.2	0.4	591,848.21	751,664.25	32° 37' 27.961 N	103° 30' 57.322 W
10,575.0	17.01	1.41	10,572.9	20.9	0.5	591,854.90	751,664.41	32° 37' 28.027 N	103° 30' 57.320 W
10,600.0	20.01	1.41	10,596.6	28.8	0.7	591,862.83	751,664.61	32° 37' 28.106 N	103° 30' 57.317 W
10,625.0	23.01	1.41	10,619.9	38.0	0.9	591,872.00	751,664.83	32° 37' 28.196 N	103° 30' 57.313 W
10,650.0	26.01	1.41	10,642.6	48.4	1.2	591,882.37	751,665.09	32° 37' 28.299 N	103° 30' 57.310 W
10,675.0	29.01	1.41	10,664.8	59.9	1.5	591,893.91	751,665.37	32° 37' 28.413 N	103° 30' 57.305 W
10,700.0	32.01	1.41	10,686.3	72.6	1.8	591,906.60	751,665.69	32° 37' 28.538 N	103° 30' 57.300 W
10,725.0	35.01	1.41	10,707.2	86.4	2.1	591,920.40	751,666.03	32° 37' 28.675 N	103° 30' 57.295 W
10,750.0	38.01	1.41	10,727.3	101.3	2.5	591,935.27	751,666.39	32° 37' 28.822 N	103° 30' 57.290 W
10,775.0	41.01	1.41	10,746.5	117.2	2.9	591,951.17	751,666.78	32° 37' 28.979 N	103° 30' 57.283 W
10,800.0	44.01	1.41	10,765.0	134.1	3.3	591,968.05	751,667.20	32° 37' 29.146 N	103° 30' 57.277 W
10,825.0	47.01	1.41	10,782.5	151.9	3.7	591,985.88	751,667.64	32° 37' 29.323 N	103° 30' 57.270 W
10,850.0	50.01	1.41	10,799.0	170.6	4.2	592,004.60	751,668.10	32° 37' 29.508 N	103° 30' 57.263 W
10,875.0	53.01	1.41	10,814.6	190.2	4.7	592,024.16	751,668.58	32° 37' 29.702 N	103° 30' 57.256 W
10,900.0	56.01	1.41	10,829.1	210.5	5.2	592,044.51	751,669.08	32° 37' 29.903 N	103° 30' 57.248 W
10,925.0	59.01	1.41	10,842.5	231.6	5.7	592,065.59	751,669.60	32° 37' 30.111 N	103° 30' 57.240 W
10,950.0	62.01	1.41	10,854.8	253.3	6.2	592,087.35	751,670.14	32° 37' 30.327 N	103° 30' 57.232 W
10,975.0	65.01	1.41	10,866.0	275.7	6.8	592,109.71	751,670.69	32° 37' 30.548 N	103° 30' 57.224 W
11,000.0	68.01	1.41	10,876.0	298.6	7.4	592,132.63	751,671.25	32° 37' 30.775 N	103° 30' 57.215 W
11,025.0	71.01	1.41	10,884.7	322.0	7.9	592,156.04	751,671.83	32° 37' 31.006 N	103° 30' 57.206 W
11,050.0	74.01	1.41	10,892.2	345.9	8.5	592,179.88	751,672.42	32° 37' 31.242 N	103° 30' 57.197 W
11,075.0	77.01	1.41	10,898.5	370.1	9.1	592,204.07	751,673.01	32° 37' 31.481 N	103° 30' 57.188 W
11,100.0	80.01	1.41	10,903.4	394.6	9.7	592,228.56	751,673.62	32° 37' 31.724 N	103° 30' 57.179 W
11,125.0	83.01	1.41	10,907.1	419.3	10.3	592,253.28	751,674.23	32° 37' 31.968 N	103° 30' 57.169 W
11,150.0	86.01	1.41	10,909.5	444.1	10.9	592,278.15	751,674.84	32° 37' 32.214 N	103° 30' 57.160 W
11,175.0	89.01	1.41	10,910.6	469.1	11.6	592,303.12	751,675.45	32° 37' 32.461 N	103° 30' 57.150 W
11,192.7	91.14	1.41	10,910.6	486.8	12.0	592,320.82	751,675.89	32° 37' 32.636 N	103° 30' 57.144 W
Start 4301.4 hold at 11192.7 MD									
11,200.0	91.14	1.41	10,910.4	494.1	12.2	592,328.11	751,676.07	32° 37' 32.708 N	103° 30' 57.141 W
11,300.0	91.14	1.41	10,908.4	594.1	14.6	592,428.06	751,678.53	32° 37' 33.697 N	103° 30' 57.103 W
11,400.0	91.14	1.41	10,906.5	694.0	17.1	592,528.01	751,680.99	32° 37' 34.686 N	103° 30' 57.065 W
11,500.0	91.14	1.41	10,904.5	794.0	19.6	592,627.96	751,683.45	32° 37' 35.675 N	103° 30' 57.028 W
11,600.0	91.14	1.41	10,902.5	893.9	22.0	592,727.91	751,685.92	32° 37' 36.664 N	103° 30' 56.990 W
11,700.0	91.14	1.41	10,900.5	993.9	24.5	592,827.86	751,688.38	32° 37' 37.652 N	103° 30' 56.952 W
11,800.0	91.14	1.41	10,898.5	1,093.8	26.9	592,927.81	751,690.84	32° 37' 38.641 N	103° 30' 56.914 W
11,900.0	91.14	1.41	10,896.5	1,193.8	29.4	593,027.76	751,693.30	32° 37' 39.630 N	103° 30' 56.877 W
12,000.0	91.14	1.41	10,894.5	1,293.7	31.9	593,127.71	751,695.77	32° 37' 40.619 N	103° 30' 56.839 W
12,100.0	91.14	1.41	10,892.5	1,393.7	34.3	593,227.66	751,698.23	32° 37' 41.608 N	103° 30' 56.801 W
12,200.0	91.14	1.41	10,890.5	1,493.6	36.8	593,327.61	751,700.69	32° 37' 42.596 N	103° 30' 56.763 W
12,300.0	91.14	1.41	10,888.5	1,593.6	39.3	593,427.56	751,703.15	32° 37' 43.585 N	103° 30' 56.725 W
12,400.0	91.14	1.41	10,886.6	1,693.5	41.7	593,527.51	751,705.61	32° 37' 44.574 N	103° 30' 56.688 W
12,500.0	91.14	1.41	10,884.6	1,793.5	44.2	593,627.46	751,708.08	32° 37' 45.563 N	103° 30' 56.650 W
12,600.0	91.14	1.41	10,882.6	1,893.4	46.6	593,727.41	751,710.54	32° 37' 46.551 N	103° 30' 56.612 W
12,700.0	91.14	1.41	10,880.6	1,993.4	49.1	593,827.36	751,713.00	32° 37' 47.540 N	103° 30' 56.574 W
12,800.0	91.14	1.41	10,878.6	2,093.3	51.6	593,927.31	751,715.46	32° 37' 48.529 N	103° 30' 56.537 W
12,900.0	91.14	1.41	10,876.6	2,193.3	54.0	594,027.26	751,717.93	32° 37' 49.518 N	103° 30' 56.499 W
13,000.0	91.14	1.41	10,874.6	2,293.2	56.5	594,127.21	751,720.39	32° 37' 50.507 N	103° 30' 56.461 W
13,100.0	91.14	1.41	10,872.6	2,393.2	59.0	594,227.16	751,722.85	32° 37' 51.495 N	103° 30' 56.423 W
13,200.0	91.14	1.41	10,870.6	2,493.1	61.4	594,327.11	751,725.31	32° 37' 52.484 N	103° 30' 56.385 W
13,300.0	91.14	1.41	10,868.7	2,593.1	63.9	594,427.06	751,727.77	32° 37' 53.473 N	103° 30' 56.348 W
13,400.0	91.14	1.41	10,866.7	2,693.0	66.3	594,527.00	751,730.24	32° 37' 54.462 N	103° 30' 56.310 W
13,500.0	91.14	1.41	10,864.7	2,793.0	68.8	594,626.95	751,732.70	32° 37' 55.451 N	103° 30' 56.272 W



Nexus Directional Solutions L.P.
Planning Report - Geographic



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well 3H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3749.5usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3749.5usft (Original Well Elev)
Site:	Tusk Federal	North Reference:	Grid
Well:	3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,600.0	91.14	1.41	10,862.7	2,892.9	71.3	594,726.90	751,735.16	32° 37' 56.439 N	103° 30' 56.234 W
13,700.0	91.14	1.41	10,860.7	2,992.9	73.7	594,826.85	751,737.62	32° 37' 57.428 N	103° 30' 56.197 W
13,800.0	91.14	1.41	10,858.7	3,092.8	76.2	594,926.80	751,740.08	32° 37' 58.417 N	103° 30' 56.159 W
13,900.0	91.14	1.41	10,856.7	3,192.8	78.6	595,026.75	751,742.55	32° 37' 59.406 N	103° 30' 56.121 W
14,000.0	91.14	1.41	10,854.7	3,292.7	81.1	595,126.70	751,745.01	32° 38' 0.395 N	103° 30' 56.083 W
14,100.0	91.14	1.41	10,852.7	3,392.7	83.6	595,226.65	751,747.47	32° 38' 1.383 N	103° 30' 56.045 W
14,200.0	91.14	1.41	10,850.7	3,492.6	86.0	595,326.60	751,749.93	32° 38' 2.372 N	103° 30' 56.008 W
14,300.0	91.14	1.41	10,848.8	3,592.6	88.5	595,426.55	751,752.40	32° 38' 3.361 N	103° 30' 55.970 W
14,400.0	91.14	1.41	10,846.8	3,692.5	91.0	595,526.50	751,754.86	32° 38' 4.350 N	103° 30' 55.932 W
14,500.0	91.14	1.41	10,844.8	3,792.5	93.4	595,626.45	751,757.32	32° 38' 5.338 N	103° 30' 55.894 W
14,600.0	91.14	1.41	10,842.8	3,892.4	95.9	595,726.40	751,759.78	32° 38' 6.327 N	103° 30' 55.856 W
14,700.0	91.14	1.41	10,840.8	3,992.4	98.3	595,826.35	751,762.24	32° 38' 7.316 N	103° 30' 55.819 W
14,800.0	91.14	1.41	10,838.8	4,092.3	100.8	595,926.30	751,764.71	32° 38' 8.305 N	103° 30' 55.781 W
14,900.0	91.14	1.41	10,836.8	4,192.2	103.3	596,026.25	751,767.17	32° 38' 9.294 N	103° 30' 55.743 W
15,000.0	91.14	1.41	10,834.8	4,292.2	105.7	596,126.20	751,769.63	32° 38' 10.282 N	103° 30' 55.705 W
15,100.0	91.14	1.41	10,832.8	4,392.1	108.2	596,226.15	751,772.09	32° 38' 11.271 N	103° 30' 55.667 W
15,200.0	91.14	1.41	10,830.9	4,492.1	110.7	596,326.10	751,774.55	32° 38' 12.260 N	103° 30' 55.630 W
15,300.0	91.14	1.41	10,828.9	4,592.0	113.1	596,426.05	751,777.02	32° 38' 13.249 N	103° 30' 55.592 W
15,400.0	91.14	1.41	10,826.9	4,692.0	115.6	596,526.00	751,779.48	32° 38' 14.238 N	103° 30' 55.554 W
15,494.1	91.14	1.41	10,825.0	4,786.1	117.9	596,620.10	751,781.80	32° 38' 15.168 N	103° 30' 55.519 W
TD at 15494.1									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL Tusk Fed #3H	0.00	0.00	10,825.0	4,786.1	117.9	596,620.10	751,781.80	32° 38' 15.168 N	103° 30' 55.519 W
- plan hits target center									
- Point									

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,433.2	10,433.2	0.0	0.0	Start Build 12.00
11,192.7	10,910.6	486.8	12.0	Start 4301.4 hold at 11192.7 MD
15,494.1	10,825.0	4,786.1	117.9	TD at 15494.1



NEXUS

DIRECTIONAL SOLUTIONS, L.P.

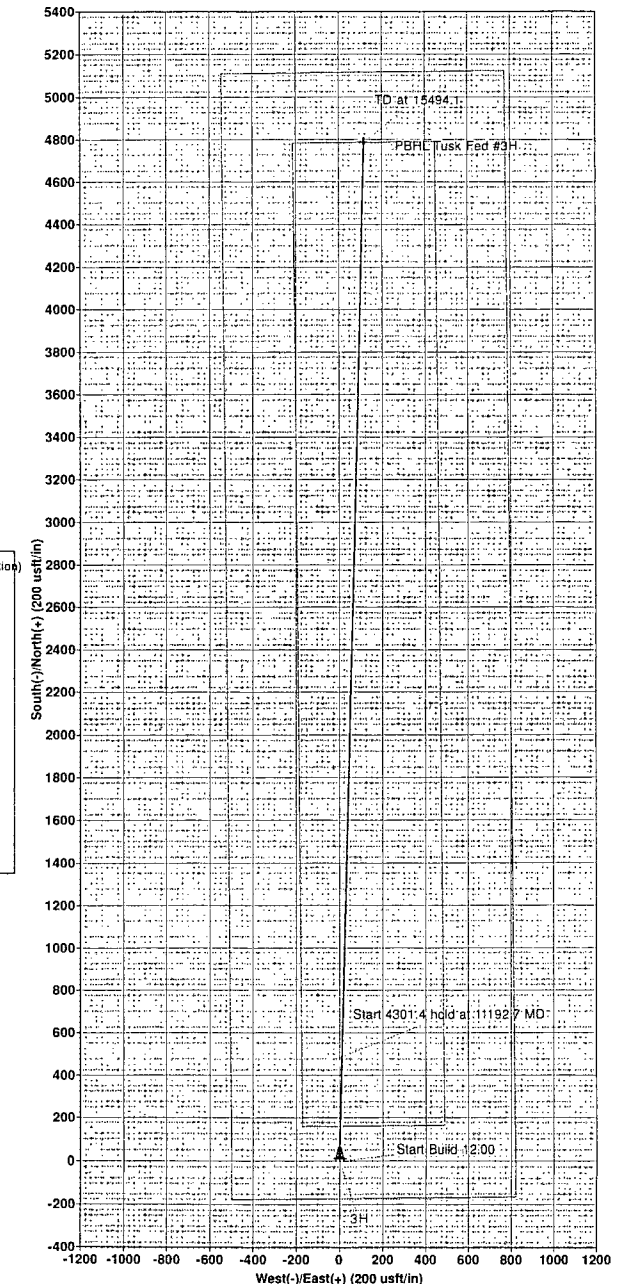
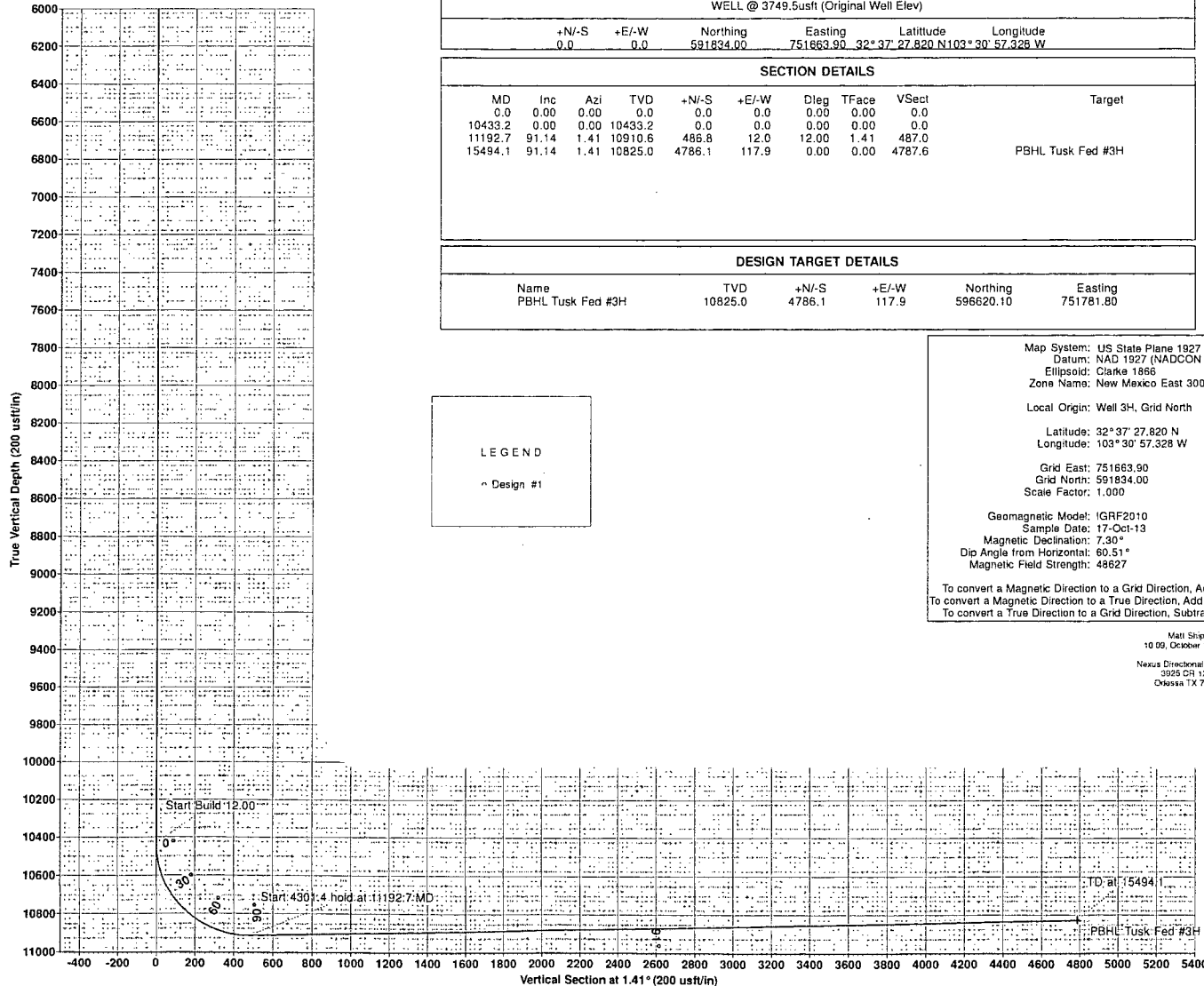
Tusk Federal 3H
Lea County, NM (NAD27 NME)
Northing: (Y) 591834.00
Easting: (X) 751663.90
Design #1



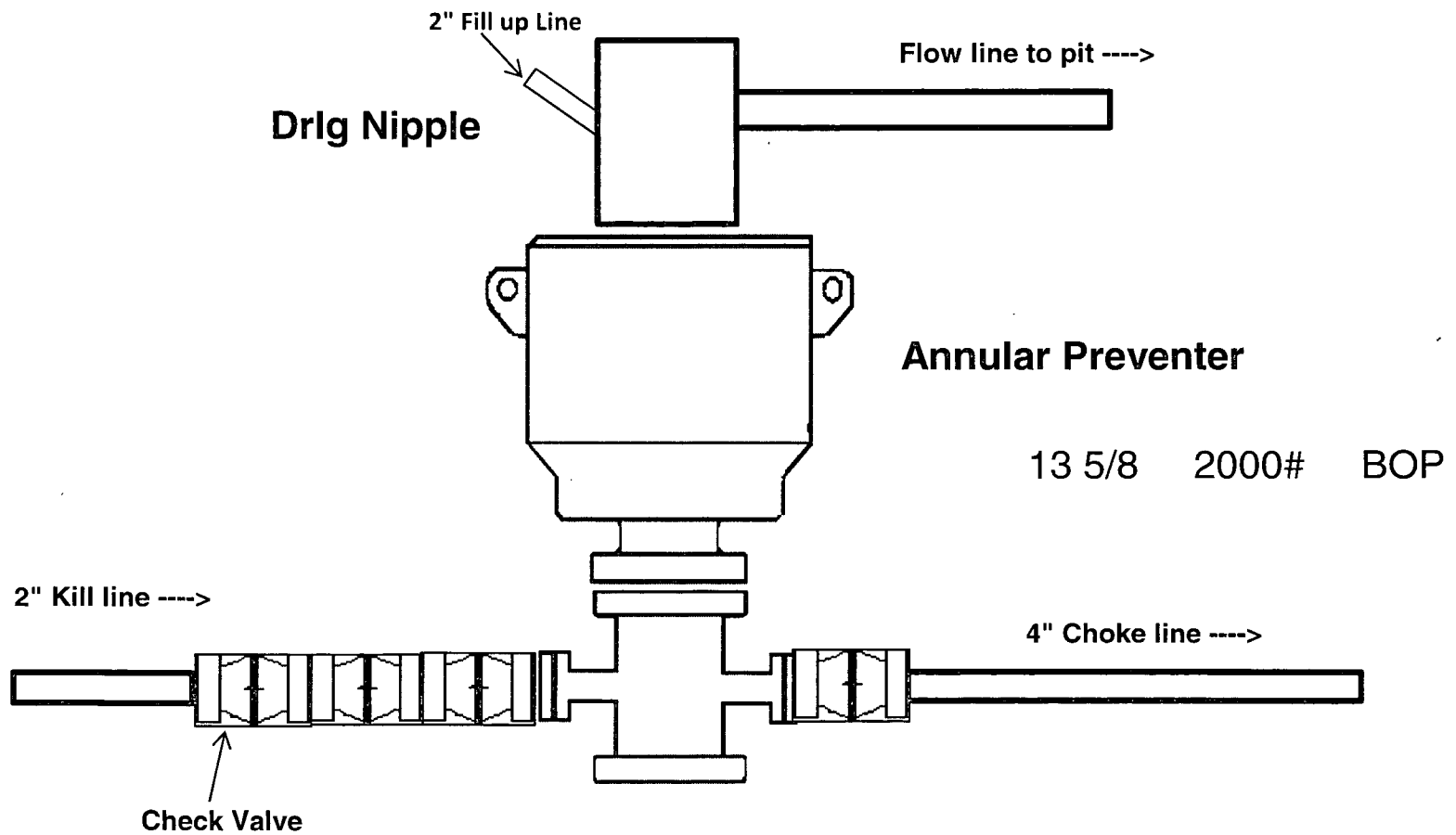
Azinuths to Grid North
True North: -0.44°
Magnetic North: 6.86°

Magnetic Field
Strength: 48626.6nT
Dip Angle: 60.51°
Date: 10/17/2013
Model: IGRF2010

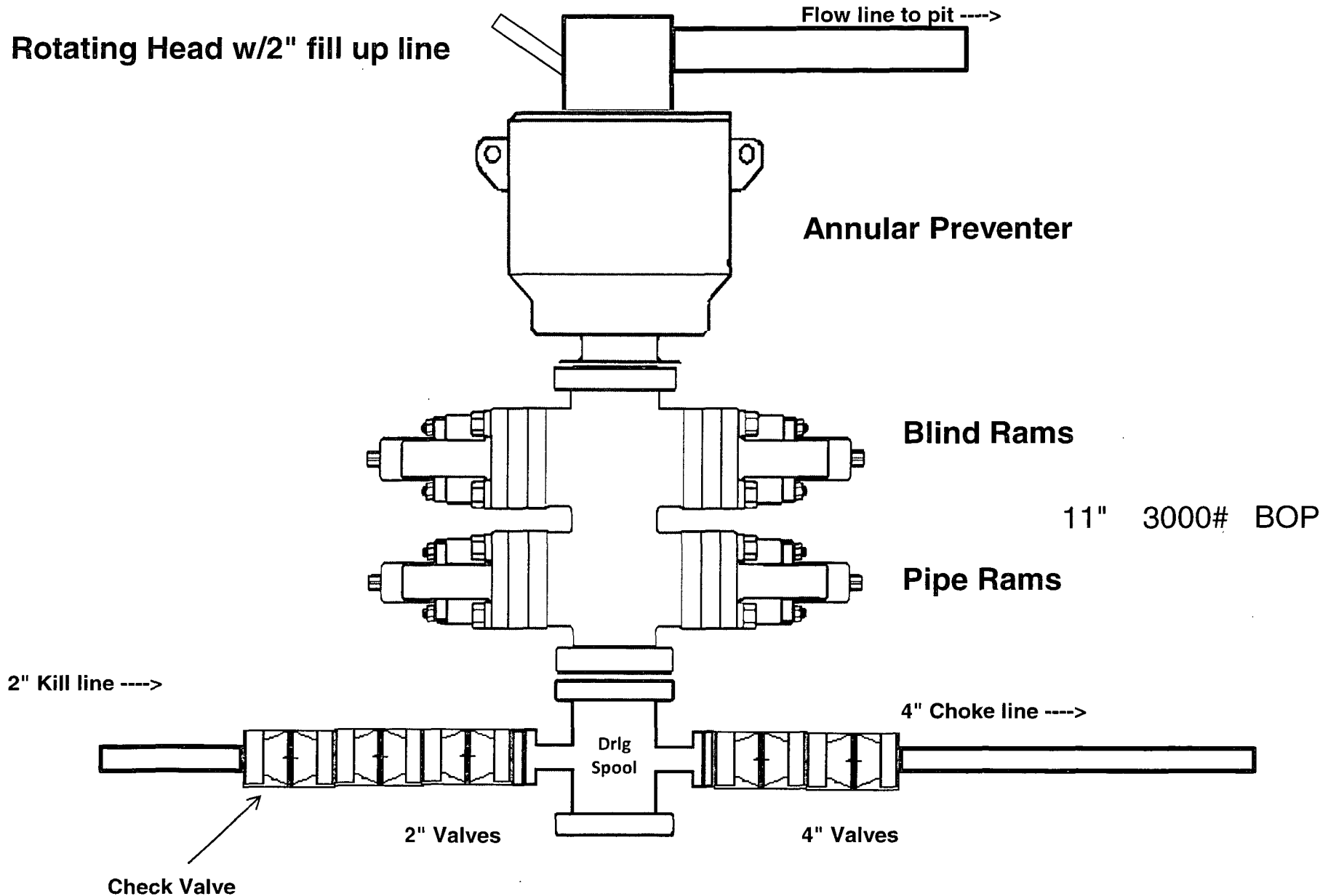
To convert a Magnetic Direction to a Grid Direction, Add 6.86°
To convert a True Direction to a Grid Direction, Subtract 0.44°



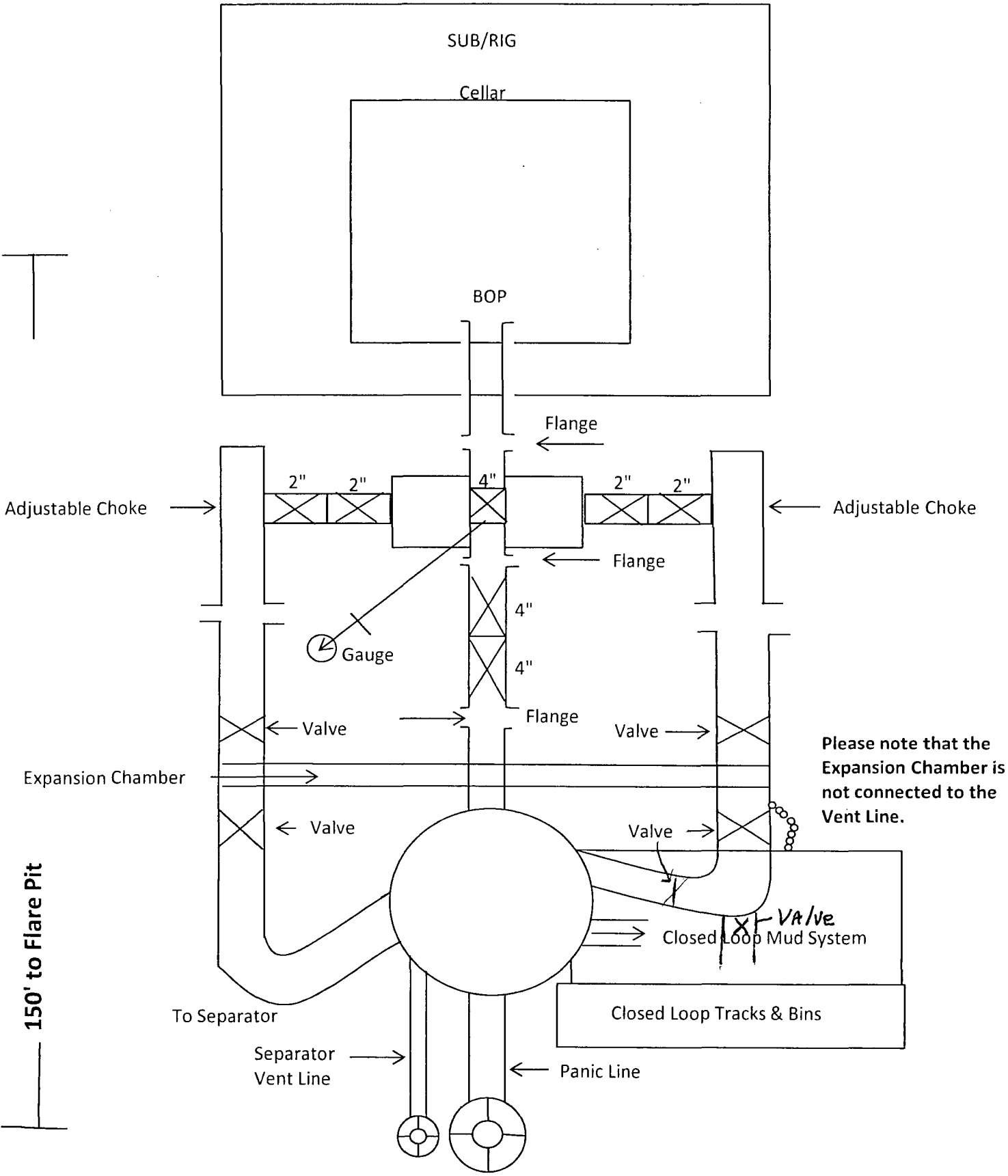
2,000 psi BOP Schematic



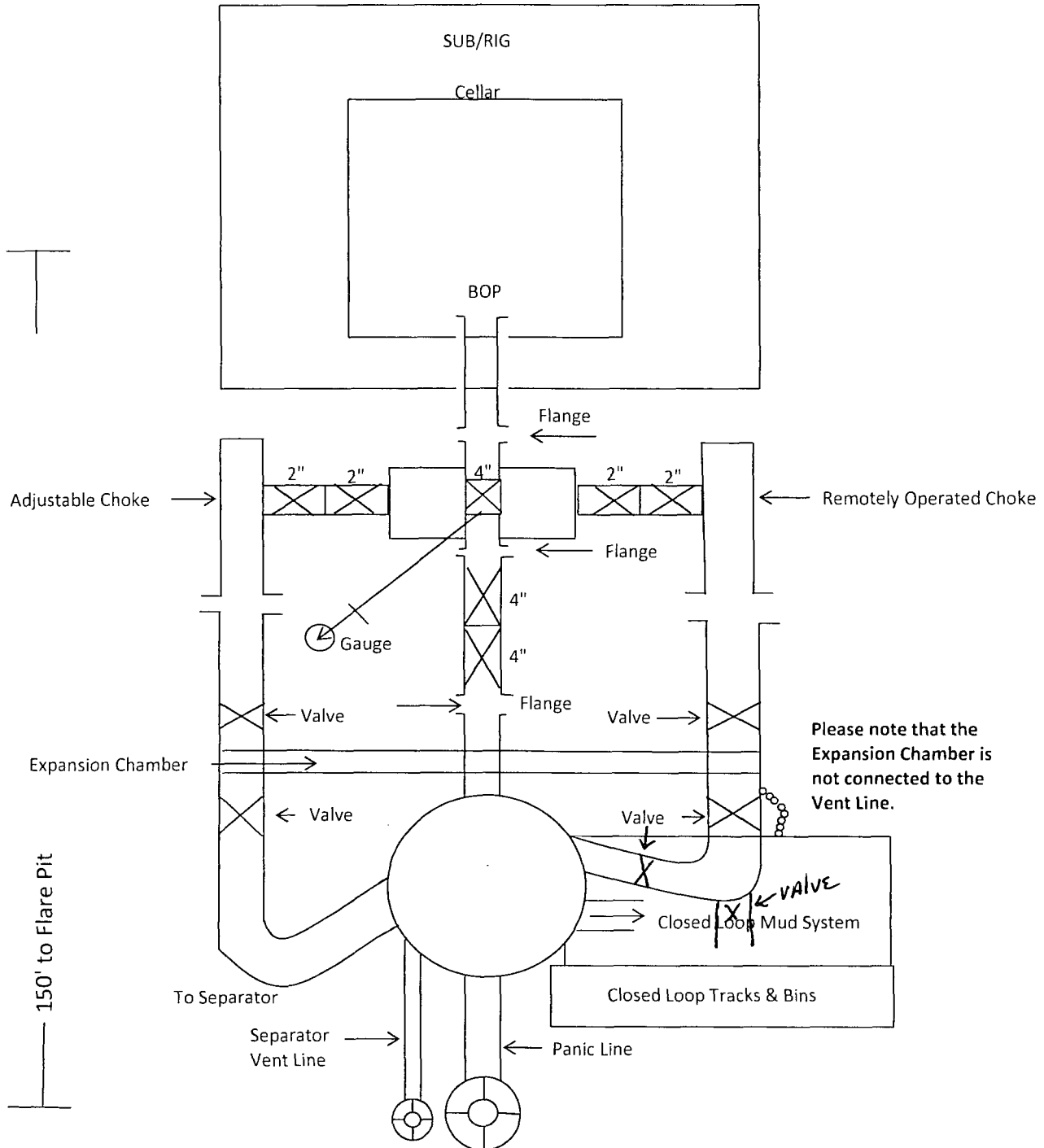
3,000 psi BOP Schematic



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

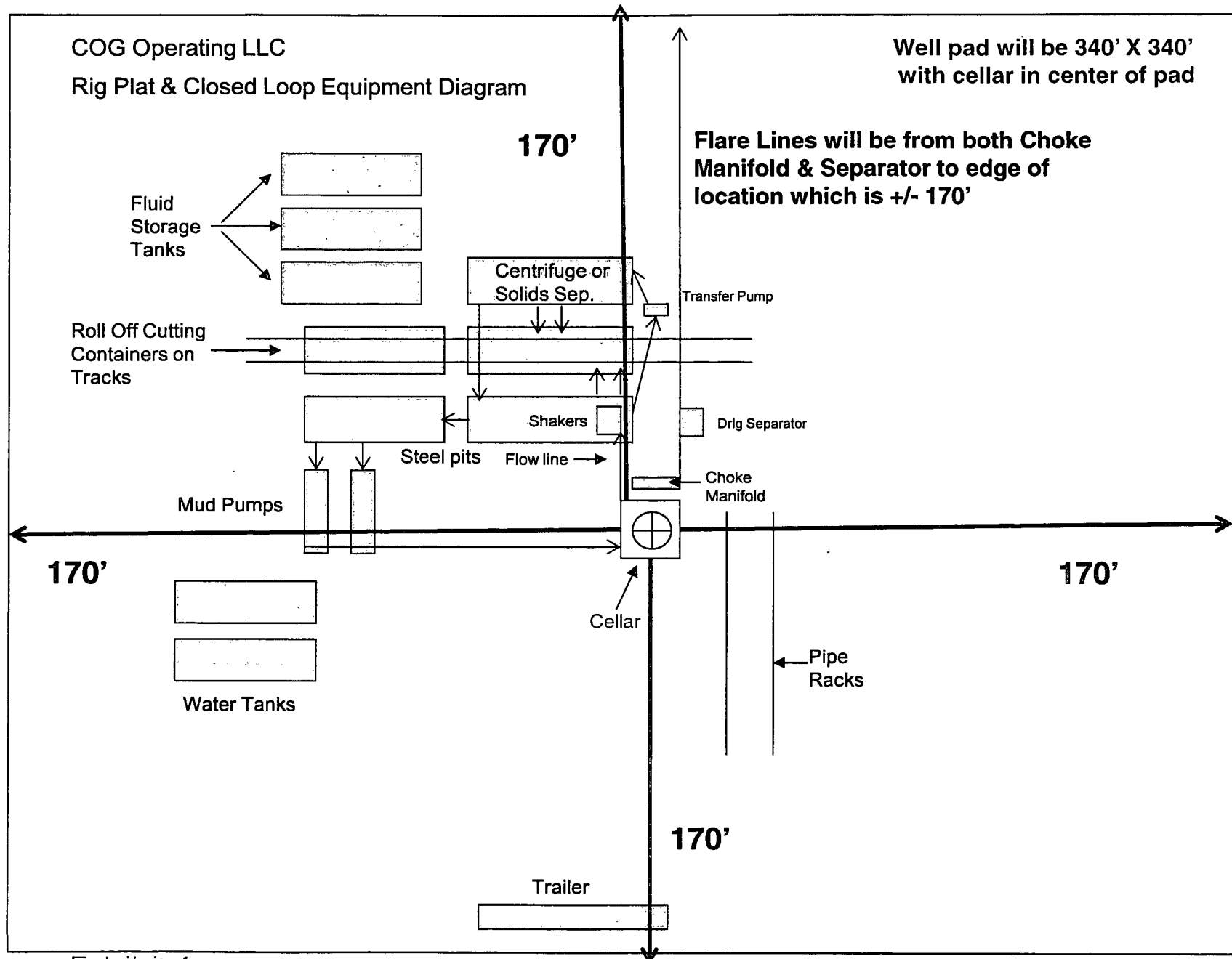


Exhibit 1

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