

OCD Artesia

FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT


APPLICATION FOR PERMIT TO DRILL OR REENTER

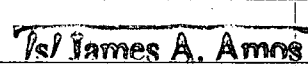
1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMLC028793A	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name N/A	
2. Name of Operator COG Operating LLC		7. If Unit or CA Agreement, Name and No. NMNM - 88525X; Burch Keely Unit	
3a. Address One Concho Center 600 W Illinois Ave Midland, TX 79701		8. Lease Name and Well No. Burch Keely Unit #965H <308086>	
3b. Phone No. (include area code) 432-685-4384		9. API Well No. 30-015- 40973	
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 2350' FNL & 493' FEL, Unit H At proposed prod. zone 2310' FNL & 330' FWL, Lot 2		10. Field and Pool, or Exploratory Burchh Keely; Glorieta-Upper Yeso	
14. Distance in miles and direction from nearest town or post office* 2 miles from Loco Hills, NM		11. Sec., T. R. M. or Blk. and Survey or Area Sec 19 T17S R30E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. unit line, if any) 330' 493'		12. County or Parish EDDY	
16. No. of acres in lease 629.65		13. State NM	
17. Spacing Unit dedicated to this well 157.43		18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 130' 240'	
19. Proposed Depth TVD: 4883' MD: 9122'		20. BLM/BIA Bond No. on file NMB000740; NMB000215	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3622' GL		22. Approximate date work will start* 12/31/2012	
23. Estimated duration 15 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 	Name (Printed/Typed) Kelly J. Holly	Date 10/23/2012
Title Permitting Tech		

Approved by (Signature) 	Name (Printed/Typed) James A. Amos	Date JAN 8 2013
Title FIELD MANAGER		Office CARLSBAD FIELD OFFICE

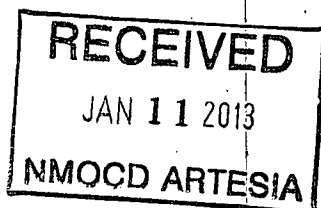
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

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.

*(Instructions on page 2)

Roswell Controlled Water Basin

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

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 40973	Pool Code 97918	Pool Name Burch Keely; Glorieta-Upper Yeso
Property Code 308086	Property Name BURCH KEELY UNIT	Well Number 965H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3622'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	19	17-S	30-E		2350	NORTH	493	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
2	19	17-S	30-E		2310	NORTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
157.43			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>CORNER COORDINATES TABLE</p> <p>A - Y=663458.1 N, X=596514.0 E</p> <p>B - Y=663476.6 N, X=601710.1 E</p> <p>C - Y=662139.4 N, X=596521.1 E</p> <p>D - Y=662156.9 N, X=601714.7 E</p> <p>37.41 AC.</p> <p>Estimated Completed Interval: 2312 FNL 672 FEL</p> <p>GEODETIC COORDINATES NAD 27 NME</p> <p>SURFACE LOCATION Y=662445.1 N X=601220.7 E</p> <p>LAT.=32.820715° N LONG.=104.003841° W</p> <p>BOTTOM HOLE LOCATION Y=662468.7 N X=596849.2 E</p>	<p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Kacie Connally</i> 10/1/12 Signature Date</p> <p>Kacie Connally Printed Name</p> <p>kconnally@concho.com E-mail Address</p> <p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>MARCH 9, 2012</p> <p>Date of Survey</p> <p>Signature & Seal of Professional Surveyor:</p> <p> Ronald J. Eidson 3239 Gary Eidson 12641 Ken Eidson 3239</p> <p>AF WSC W.O.: 12.13.1645</p>
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ATTACHMENT TO FORM 3160-3
COG Operating, LLC
BURCH KEELY UNIT # 965H
SHL: 2350' FNL & 493' FEL, UNIT H
BHL: 2310' FNL & 330' FWL, Lot 2
Sec 19, T17S, R30E
Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3622'
3. Proposed Depths: Horizontal: EOC (end of curve) TVD=4950' MD= 5264'
Toe (end of lateral) TVD=4883' MD 9123'
4. Estimated tops of geological markers:

Rustler	284'
Top of Salt	500'
Base of Salt	950'
Yates	1100'
Seven Rivers	1394'
Queen	2016'
Grayburg	2399'
San Andres	2738'
Glorieta	4184'
Paddock	4253'
Blaine	4780'
Tubb	5743'

5. Possible mineral bearing formations:

Water Sand	110'
Grayburg	2399'
San Andres	2738'
Glorieta	4184'
Paddock	4253'
Blaine	4780'
Tubb	5743'

Fresh Water

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 309' (25' into Rustler) and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 9 5/8" casing to 1120' and circulating cement back to surface in a single or multi-stage job and/or with an ECP. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing 7" x 5 1/2" tapered production casing from the TD to surface in two stages with DV Tool and ECP set at KOP. At KOP the production casing string will crossover from 7" to 5 1/2". First stage will be from TD to KOP and second stage will be from KOP to surface. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or environment.

See
COA

6. Proposed Mud System

The well will be drilled to TD with a combination of fresh water, brine, cut brine and polymer mud systems. The applicable depths and properties of these systems are as follows:

DEPTH (MD)	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-309'	Fresh Water	8.5	28	N.C.
309'- 1120' ^{950'}	Brine	10	30	N.C.
^{950'} 1120' -4468'	Cut Brine	8.7-9.2	30	N.C.
4468'-5264'	Cut Brine/polymer mud	8.7-9.2	30	N.C.
5264'-9122'	Cut Brine/polymer mud	8.7-9.2	30	N.C.

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

6. Proposed Casing Program

Hole Size	Interval MD	OD Casing	Weight	Grade	Condition	Jt.	brst/clps/ten
17 1/2"	0-309'	13 3/8"	48#	H-40/J-55 Hybrid	New	ST&C	6.52/6.58/29.1
12 1/4"	⁰ 309'- 1120' ^{950'}	9 5/8"	40#	J/K-55	New	ST&C	3.59/4.49/13.90
8 3/4" 0	1120' 4468'	7"	26#	L-80	New	LT&C	1.45/2.59/5.23
8 3/4"	4468'- 5264'	5 1/2"	17#	L-80	New	LT&C	1.55/2.64/4.65
7 7/8"	5264'- 9122'	5 1/2"	17#	L-80	New	LT&C	1.55/2.64/4.65

Production string will be a tapered string with 7" 26# L-80 LTC run from surface to kick off point (4468') and then crossed over to 5 1/2" 17# L-80 LTC.

7. Proposed Cement Program

13 3/8" SURFACE: (Circulate to Surface)

Lead: 0'-309'	400 sks	Class "C" w/2% CaCl ₂ +	1.32 cf/sk	14.8 ppg
Excess 141%		0.25 pps CF		

9 5/8" INTERMEDIATE:

Option #1: Single Stage (Circulate to Surface)

Lead:	200 sks	50:50:10 C:Poz:Gel	2.45 cf/sk	11.8 ppg
0'-800'		w/ 5% Salt+ 0.25% CF		
Excess 83%		+5 pps LCM		

Tail:	200 sks	Class C w/2% CaCl ₂	1.32 cf/sk	14.8 ppg
800'-1120'				
Excess 164%				

Option #2: Multi-stage w/ DV Tool @ +/-359' (DV Tool 50' below 13 3/8" csg. Shoe) (Circulate to Surface)

Stage #1:

Lead:				
359'-800'	200 sks	50:50:10 C:Poz:Gel w/5%	2.45 cf/sk	11.8 ppg
Excess 222%		Salt +5 pps LCM +		
		0.25 pps CF		

Tail:				
800'-1120'	200 sks	Class "C" w/2% CaCl ₂	1.32 cf/sk	14.8 ppg
Excess 180%				

Stage #2

0'-359'	200 sks	50:50:10 C:Poz:Gel w/5%	2.45 cf/sk	11.8 ppg
Excess 322%		salt+ 5 pps LCM +		
		0.25 pps CF		

Note: Multi-stage tool to be set depending on hole conditions at approximately 359' (50' below the surface casing shoe). Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

7" X 5 1/2" TAPERED PRODUCTION CASING:**Option #1: Single Stage (Cement cal to surface)**

1st Lead:	400 sks	35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF	2.05 cf/sk	12.5 ppg
0'-2900'				
Excess 81%				
2 nd Lead:	400 sks	50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+ 0.125 pps CF+1% FL-25+ 1% BA-58	1.37 cf/sk	14.0 ppg
2900'-4468'				
Excess 143%				
Tail:	725 sks	Class "H" SOLUCEM-H w/0.7% HR-601	2.62 cf/sk	15.0 ppg
4468'-9122'				
Excess 27%				

Option #2: Multi-stage (2 Stages) w/DV Tool & ECP@ +/-4468'
(Cement calculated to surface)**Stage #1:**

Tail:	725 sks	Class "H" SOLUCEM-H w/0.7% HR-601	2.62 cf/sk	15.0 ppg
4468'-9122'				
Excess 27%				

Stage #2: 2nd DV Tool & ECP @ +/-4468'

Lead:	525 sks	35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF	2.05 cf/sk	12.5 ppg
0'-2000'				
Excess 248%				
Tail:	400 sks	50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+ 0.125 pps CF+1% FL-25+ 1% BA-58	1.37 cf/sk	14.0 ppg
2000'-4468'				
Excess 33%				

ATTACHMENT TO FORM 3160-3

COG Operating, LLC
Burch Keely Unit #965H

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Note: 5 1/2" casing will be run from KOP at 4468' thru curve and lateral to TD of 9122' MD. Productive intervals will be isolated by cement as described above..

Note: FL-52A is fluid loss additive, R-3 is retarder.

Note: Multi-stage tool & ECP to be set depending on hole conditions at approximately 4373.' Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

8. Pressure Control Equipment:

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4 1/2" drill pipe rams on the bottom. A 13-5/8" BOP will be used during the drilling of the well. A 13 5/8" permanent casing head will be installed on the 13 3/8" casing. The BOP will be nipped up on the 13 5/8" permanent casing head and tested to 2000 psig. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent BOP and well head will be tested by a third party to 2000 psig and used continuously until total depth is reached. 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, choke lines and a choke manifold with a 2000 psi WP rating all of which will also be tested to working pressure by independent tester also.

9. Production Hole Drilling Summary:

Drill 8 3/4" hole to 4468'. Kick off at +/- 4468', building curve at 12°/100' over +/- 758' to horizontal at 5264' MD/4950'TVD. Reduce hole size and drill 7 7/8" lateral section in a easterly direction for +/-3974' lateral to TD at +/-9122' MD, 4883' TVD. Run 7" x 5-1/2" production casing. 7" to be run from surface to kickoff point and then changed over to 5 1/2". 5 1/2" casing will be run from kickoff point to td and both strings will be isolated by either a single stage or multi-stage cement jobs. Cement will be circulated to surface.

10. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Burch Keely Unit #965H
Page 6 of 6

11. Logging, Testing and Coring Program: *See CoA*

- A. The following logs will be run in the vertical portion of the hole to KOP: SLB-PEX/HRLA, HNGS.
- B. The mud logging program will consist of lagged 10' samples from KOP to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 7" x 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

12. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD is 90° Fahrenheit and estimated maximum bottom hole pressure is 2134 psi. Wells in the Empire area will penetrate formations that are known or could reasonably be expected to contain Hydrogen Sulfide. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area. However as per Onshore order No. 6 a H2S drilling operations plan is included with this APD. No major loss circulation zones have been reported in offsetting wells.

13. Anticipated Starting Date

Drilling operations will commence approximately on approximately December 15, 2012 with drilling and completion operations lasting approximately 90 days.



COG Operating LLC

Eddy County, NM

Burch Keely Unit #965H

#965H

OH

Plan: Plan #3

Standard Planning Report

19 October, 2012

Surface: 2350' FNL, 493' FEL, Sec 19, T17S, R30E, Unit H (Lot #2)

BHL: 2310' FNL, 330' FWL, Sec 19, T17S, R30E, Unit E (Lot #2)

PP: 2312' FNL, 672' FEL, Sec 19, T17S, R30E, Unit H (Lot #2)



Database:	Houston R5000 Database	Local Co-ordinate Reference:	Well #965H
Company:	COG Operating LLC	TVD Reference:	Well @ 3636.0usft (UDI #40 -14' KB)
Project:	Eddy County, NM	MD Reference:	Well @ 3636.0usft (UDI #40 -14' KB)
Site:	Burch Keely Unit #965H	North Reference:	Grid
Well:	#965H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

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						Burch Keely Unit #965H					
Site Position:		Northing:		662,445.10 usft		Latitude:		32° 49' 14.575 N			
From:		Map		Easting:		601,220.70 usft		Longitude:		104° 0' 13.830 W	
Position Uncertainty:		0.0 usft		Slot Radius:		13-3/16 "		Grid Convergence:		0.18 °	

Well	#965H					
Well Position	+N/-S	0.0 usft	Northing:	662,445.10 usft	Latitude:	32° 49' 14.575 N
	+E/-W	0.0 usft	Easting:	601,220.70 usft	Longitude:	104° 0' 13.830 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	3,622.0 usft

Wellbore:	OH
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/3/2012	7.73	60.64	48,846

Design	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	-4.0	0.0	0.0	270.31

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,467.9	0.00	0.00	4,467.9	0.0	0.0	0.00	0.00	0.00	0.00	
5,092.9	75.00	282.07	4,929.1	74.0	-346.1	12.00	12.00	0.00	282.07	
5,264.2	91.00	269.01	4,950.0	90.0	-514.4	12.00	9.34	-7.62	-40.03	
9,122.5	91.00	269.01	4,883.0	23.6	-4,371.5	0.00	0.00	0.00	0.00	PBHL (BKU#965H)

Database: Houston R5000 Database
Company: COG Operating LLC
Project: Eddy County, NM
Site: Burch Keely Unit #965H
Well: #965H
Wellbore: OH
Design: Plan #3.

Local Co-ordinate Reference: Well #965H
TVD Reference: Well @ 3636.0usft (UDI #40 - 14' KB)
MD Reference: Well @ 3636.0usft (UDI #40 - 14' KB)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,467.9	0.00	0.00	4,467.9	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build @ 12.00°/100'									
4,475.0	0.85	282.07	4,475.0	0.0	-0.1	0.1	12.00	12.00	0.00
4,500.0	3.85	282.07	4,500.0	0.2	-1.1	1.1	12.00	12.00	0.00
4,525.0	6.85	282.07	4,524.9	0.7	-3.3	3.3	12.00	12.00	0.00
4,550.0	9.85	282.07	4,549.6	1.5	-6.9	6.9	12.00	12.00	0.00
4,575.0	12.85	282.07	4,574.1	2.5	-11.7	11.7	12.00	12.00	0.00
4,600.0	15.85	282.07	4,598.3	3.8	-17.8	17.8	12.00	12.00	0.00
4,625.0	18.85	282.07	4,622.2	5.4	-25.0	25.1	12.00	12.00	0.00

Database:	Houston R5000 Database	Local Co-ordinate Reference:	Well #965H
Company:	COG Operating LLC	TVD Reference:	Well @ 3636 0usft (UDI #40 - 14 KB)
Project:	Eddy County NM	MD Reference:	Well @ 3636 0usft (UDI #40 - 14 KB)
Site:	Burch Keely Unit #965H	North Reference:	Grid
Well:	#965H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,650.0	21.85	282.07	4,645.6	7.2	-33.5	33.6	12.00	12.00	0.00	
4,675.0	24.85	282.07	4,668.6	9.2	-43.2	43.3	12.00	12.00	0.00	
4,700.0	27.85	282.07	4,691.0	11.6	-54.1	54.1	12.00	12.00	0.00	
4,725.0	30.85	282.07	4,712.8	14.1	-66.1	66.1	12.00	12.00	0.00	
4,750.0	33.85	282.07	4,733.9	16.9	-79.2	79.2	12.00	12.00	0.00	
4,775.0	36.85	282.07	4,754.3	19.9	-93.3	93.4	12.00	12.00	0.00	
4,800.0	39.85	282.07	4,773.9	23.2	-108.5	108.6	12.00	12.00	0.00	
4,825.0	42.85	282.07	4,792.6	26.6	-124.6	124.8	12.00	12.00	0.00	
4,850.0	45.85	282.07	4,810.5	30.3	-141.7	141.9	12.00	12.00	0.00	
4,875.0	48.85	282.07	4,827.4	34.1	-159.7	159.9	12.00	12.00	0.00	
4,900.0	51.85	282.07	4,843.4	38.2	-178.5	178.7	12.00	12.00	0.00	
4,900.3	51.89	282.07	4,843.6	38.2	-178.7	178.9	12.00	12.00	0.00	
PP - 4900.3' MD, 4843.6' TVD, 51.89° INC, 178.9° VS										
4,925.0	54.85	282.07	4,858.3	42.4	-198.1	198.3	12.00	12.00	0.00	
4,950.0	57.85	282.07	4,872.2	46.7	-218.5	218.7	12.00	12.00	0.00	
4,975.0	60.85	282.07	4,884.9	51.2	-239.5	239.8	12.00	12.00	0.00	
5,000.0	63.85	282.07	4,896.5	55.8	-261.1	261.4	12.00	12.00	0.00	
5,025.0	66.85	282.07	4,906.9	60.6	-283.4	283.7	12.00	12.00	0.00	
5,050.0	69.85	282.07	4,916.1	65.5	-306.1	306.4	12.00	12.00	0.00	
5,075.0	72.85	282.07	4,924.1	70.4	-329.2	329.6	12.00	12.00	0.00	
5,092.9	75.00	282.07	4,929.1	74.0	-346.1	346.5	12.00	12.00	0.00	
Continue Build & Turn @ 12.00°/100'										
5,100.0	75.65	281.50	4,930.9	75.4	-352.8	353.2	12.00	9.20	-7.97	
5,125.0	77.96	279.54	4,936.6	79.8	-376.7	377.1	12.00	9.24	-7.87	
5,150.0	80.29	277.60	4,941.3	83.5	-401.0	401.4	12.00	9.29	-7.73	
5,175.0	82.62	275.70	4,945.0	86.4	-425.5	426.0	12.00	9.34	-7.63	
5,200.0	84.96	273.81	4,947.7	88.4	-450.3	450.8	12.00	9.37	-7.55	
5,225.0	87.31	271.94	4,949.4	89.7	-475.2	475.7	12.00	9.39	-7.49	
5,250.0	89.66	270.07	4,950.1	90.1	-500.2	500.7	12.00	9.40	-7.46	
5,264.2	90.99	269.01	4,950.0	90.0	-514.4	514.9	12.00	9.40	-7.46	
EOC - 5264.2' MD, 4950.0' TVD, 90.99° INC, 269.01° AZI, 514.9° VS										
5,300.0	91.00	269.01	4,949.4	89.4	-550.2	550.7	0.00	0.00	0.00	
5,400.0	91.00	269.01	4,947.6	87.7	-650.2	650.6	0.00	0.00	0.00	
5,500.0	91.00	269.01	4,945.9	85.9	-750.1	750.6	0.00	0.00	0.00	
5,600.0	91.00	269.01	4,944.2	84.2	-850.1	850.5	0.00	0.00	0.00	
5,700.0	91.00	269.01	4,942.4	82.5	-950.1	950.5	0.00	0.00	0.00	
5,800.0	91.00	269.01	4,940.7	80.8	-1,050.0	1,050.5	0.00	0.00	0.00	
5,900.0	91.00	269.01	4,939.0	79.1	-1,150.0	1,150.4	0.00	0.00	0.00	
6,000.0	91.00	269.01	4,937.2	77.3	-1,250.0	1,250.4	0.00	0.00	0.00	
6,100.0	91.00	269.01	4,935.5	75.6	-1,350.0	1,350.3	0.00	0.00	0.00	
6,200.0	91.00	269.01	4,933.8	73.9	-1,449.9	1,450.3	0.00	0.00	0.00	
6,300.0	91.00	269.01	4,932.0	72.2	-1,549.9	1,550.3	0.00	0.00	0.00	
6,400.0	91.00	269.01	4,930.3	70.5	-1,649.9	1,650.2	0.00	0.00	0.00	
6,500.0	91.00	269.01	4,928.5	68.7	-1,749.8	1,750.2	0.00	0.00	0.00	
6,600.0	91.00	269.01	4,926.8	67.0	-1,849.8	1,850.1	0.00	0.00	0.00	
6,700.0	91.00	269.01	4,925.1	65.3	-1,949.8	1,950.1	0.00	0.00	0.00	
6,800.0	91.00	269.01	4,923.3	63.6	-2,049.7	2,050.1	0.00	0.00	0.00	
6,900.0	91.00	269.01	4,921.6	61.8	-2,149.7	2,150.0	0.00	0.00	0.00	
7,000.0	91.00	269.01	4,919.9	60.1	-2,249.7	2,250.0	0.00	0.00	0.00	
7,100.0	91.00	269.01	4,918.1	58.4	-2,349.7	2,349.9	0.00	0.00	0.00	
7,200.0	91.00	269.01	4,916.4	56.7	-2,449.6	2,449.9	0.00	0.00	0.00	
7,300.0	91.00	269.01	4,914.6	55.0	-2,549.6	2,549.9	0.00	0.00	0.00	
7,400.0	91.00	269.01	4,912.9	53.2	-2,649.6	2,649.8	0.00	0.00	0.00	

Database:	Houston R5000 Database	Local Co-ordinate Reference:	Well #965H
Company:	COG Operating LLC	TVD Reference:	Well @ 3636.0usft (UDI #40 - 14' KB)
Project:	Eddy County, NM	MD Reference:	Well @ 3636.0usft (UDI #40 - 14' KB)
Site:	Burch Keely Unit #965H	North Reference:	Grid
Well:	#965H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,500.0	91.00	269.01	4,911.2	51.5	-2,749.5	2,749.8	0.00	0.00	0.00	
7,600.0	91.00	269.01	4,909.4	49.8	-2,849.5	2,849.7	0.00	0.00	0.00	
7,700.0	91.00	269.01	4,907.7	48.1	-2,949.5	2,949.7	0.00	0.00	0.00	
7,800.0	91.00	269.01	4,906.0	46.4	-3,049.4	3,049.6	0.00	0.00	0.00	
7,900.0	91.00	269.01	4,904.2	44.6	-3,149.4	3,149.6	0.00	0.00	0.00	
8,000.0	91.00	269.01	4,902.5	42.9	-3,249.4	3,249.6	0.00	0.00	0.00	
8,100.0	91.00	269.01	4,900.8	41.2	-3,349.4	3,349.5	0.00	0.00	0.00	
8,200.0	91.00	269.01	4,899.0	39.5	-3,449.3	3,449.5	0.00	0.00	0.00	
8,300.0	91.00	269.01	4,897.3	37.8	-3,549.3	3,549.4	0.00	0.00	0.00	
8,400.0	91.00	269.01	4,895.5	36.0	-3,649.3	3,649.4	0.00	0.00	0.00	
8,500.0	91.00	269.01	4,893.8	34.3	-3,749.2	3,749.4	0.00	0.00	0.00	
8,600.0	91.00	269.01	4,892.1	32.6	-3,849.2	3,849.3	0.00	0.00	0.00	
8,700.0	91.00	269.01	4,890.3	30.9	-3,949.2	3,949.3	0.00	0.00	0.00	
8,800.0	91.00	269.01	4,888.6	29.1	-4,049.1	4,049.2	0.00	0.00	0.00	
8,900.0	91.00	269.01	4,886.9	27.4	-4,149.1	4,149.2	0.00	0.00	0.00	
9,000.0	91.00	269.01	4,885.1	25.7	-4,249.1	4,249.2	0.00	0.00	0.00	
9,100.0	91.00	269.01	4,883.4	24.0	-4,349.1	4,349.1	0.00	0.00	0.00	
9,122.5	91.00	269.01	4,883.0	23.6	-4,371.5	4,371.6	0.00	0.00	0.00	
TD @ 9122.5' MD, 4883.0' TVD										

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 (BKU#965H)	0.00	0.01	4,883.0	23.6	-4,371.5	662,468.70	596,849.20	32° 49' 14.941 N	104° 1' 5.056 W	
- plan hits target center										
- Point										

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	+N/-S (usft)	+E/-W (usft)	Comment
4,467.9	4,467.9		0.0	0.0	KOP - Start Build @ 12.00°/100'
4,900.3	4,843.6		38.2	-178.7	PP - 4900.3' MD, 4843.6' TVD, 51.89° INC, 178.9° VS
5,092.9	4,929.1		74.0	-346.1	Continue Build & Turn @ 12.00°/100'
5,264.2	4,950.0		90.0	-514.4	EOC - 5264.2' MD, 4950.0' TVD, 90.99° INC, 269.01° AZI, 514.9° VS
9,122.5	4,883.0		23.6	-4,371.5	TD @ 9122.5' MD, 4883.0' TVD

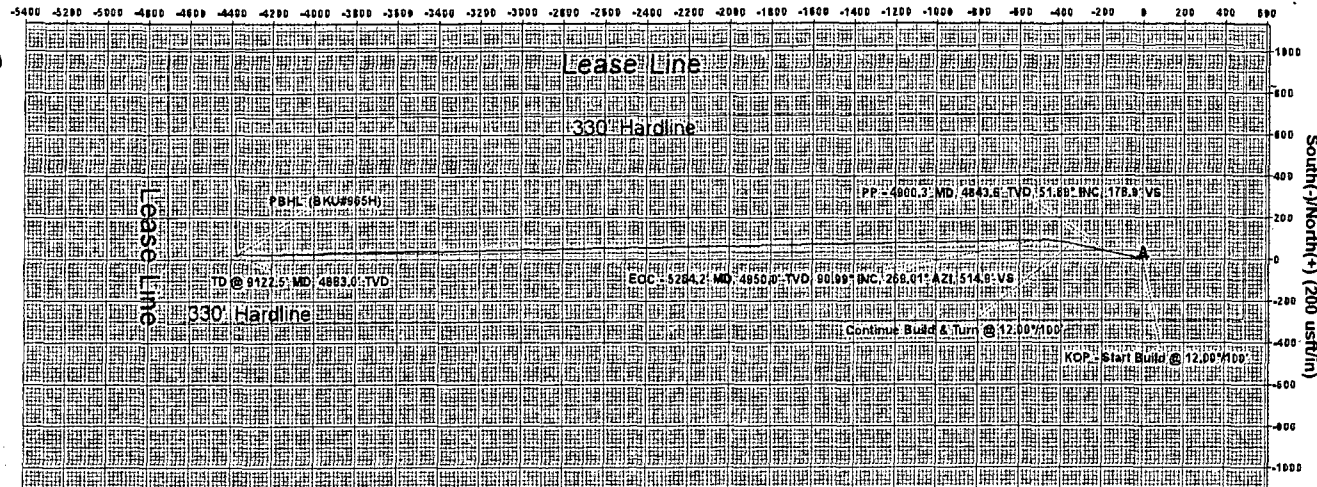
COG Operating LLC
Project: Eddy County, NM
Site: Burch Keely Unit #9651
Well: #965H
Wellbore: OH
Plan: Plan #3 (#965H/OH)



Azimuths to Grid North
True North: -0.18°
Magnetic North: 7.55°

Magnetic Field
Strength: 48846.CsnT
Dip Angle: 60.64°
Date: 4/3/2012
Model: IGRF2010

West(-)/East(+) (200 usft/in)



West(-)/East(+) (50 usft/in)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4467.9	0.00	0.00	4467.9	0.0	0.0	0.00	0.00	0.0	
3	5092.9	75.00	282.07	4929.1	74.0	-346.1	12.00	282.07	346.5	
4	5264.2	91.00	269.01	4950.0	90.0	-514.4	12.00	-40.03	514.9	
5	9122.5	91.00	269.01	4883.0	23.6	-4371.5	0.00	0.00	4371.6	PBHL (BKU#965H)

WELL DETAILS: #965H

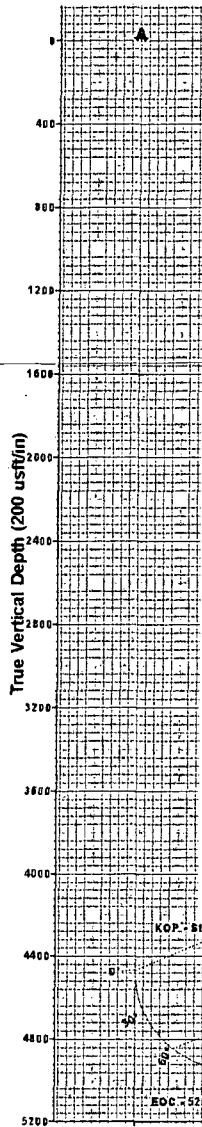
Ground Elevation: 3622.0
RKB Elevation: Well @ 3636.0usft (UDI #40 - 14' KB)
Rig Name: UDI #40 - 14' KB

Surface Hole Location		Latitude	Longitude
Northing	Easting		
662445.10	601220.70	32° 49' 14.575 N	104° 0' 13.830 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL (BKU#965H)	4883.0	23.6	-4371.5	662468.70	596849.20

PROJECT DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



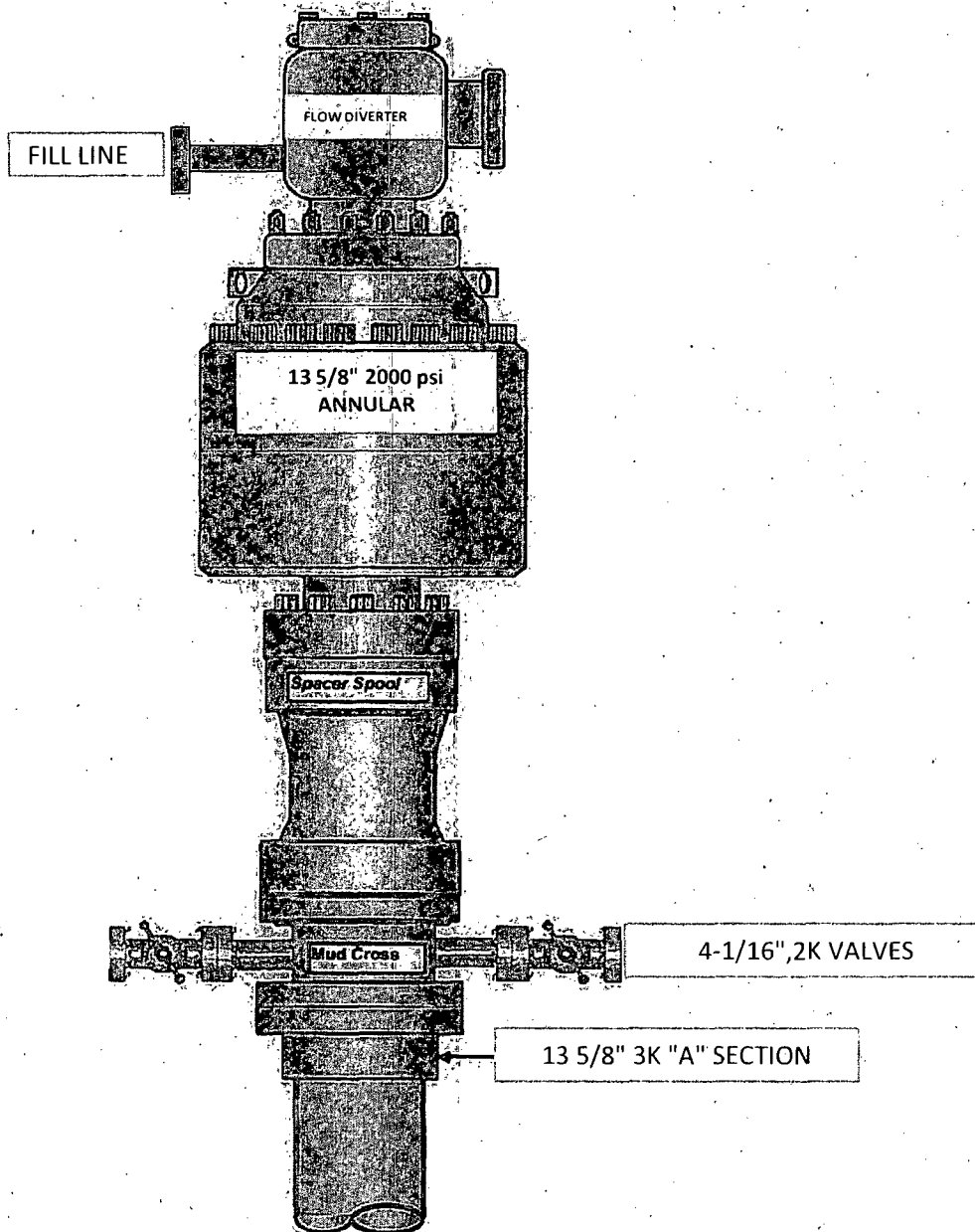
Vertical Section at 270.31° (200 usft/in)



Crescent Directional Drilling
7715 West Industrial Ave. Midland, Tx 79706
Phone: 432-618-1135

Plan: Plan #3 (#965H/OH)
Created By: Matt Higgins Date: 15:31, October 19 2012

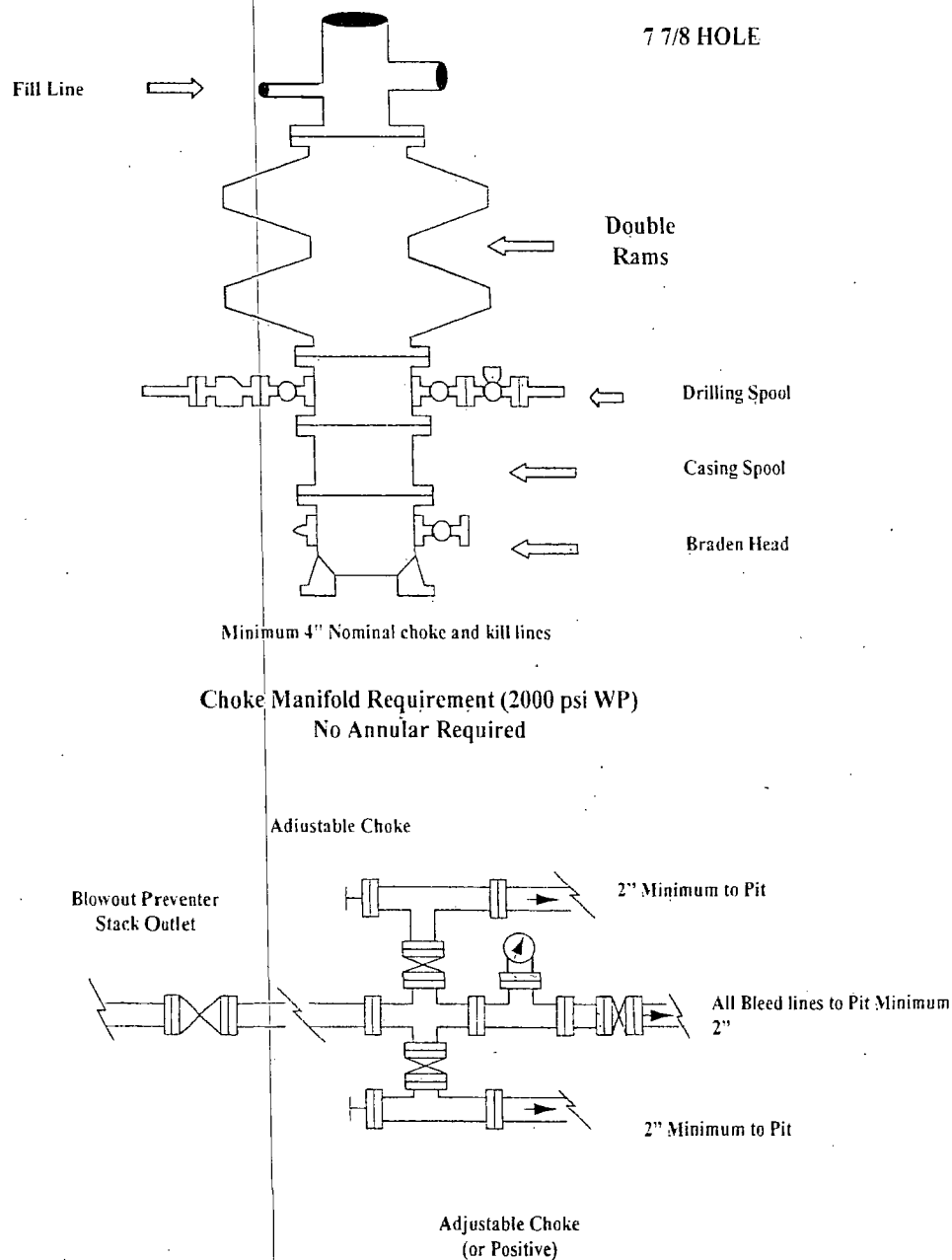
13 5/8" 2K ANNULAR



COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



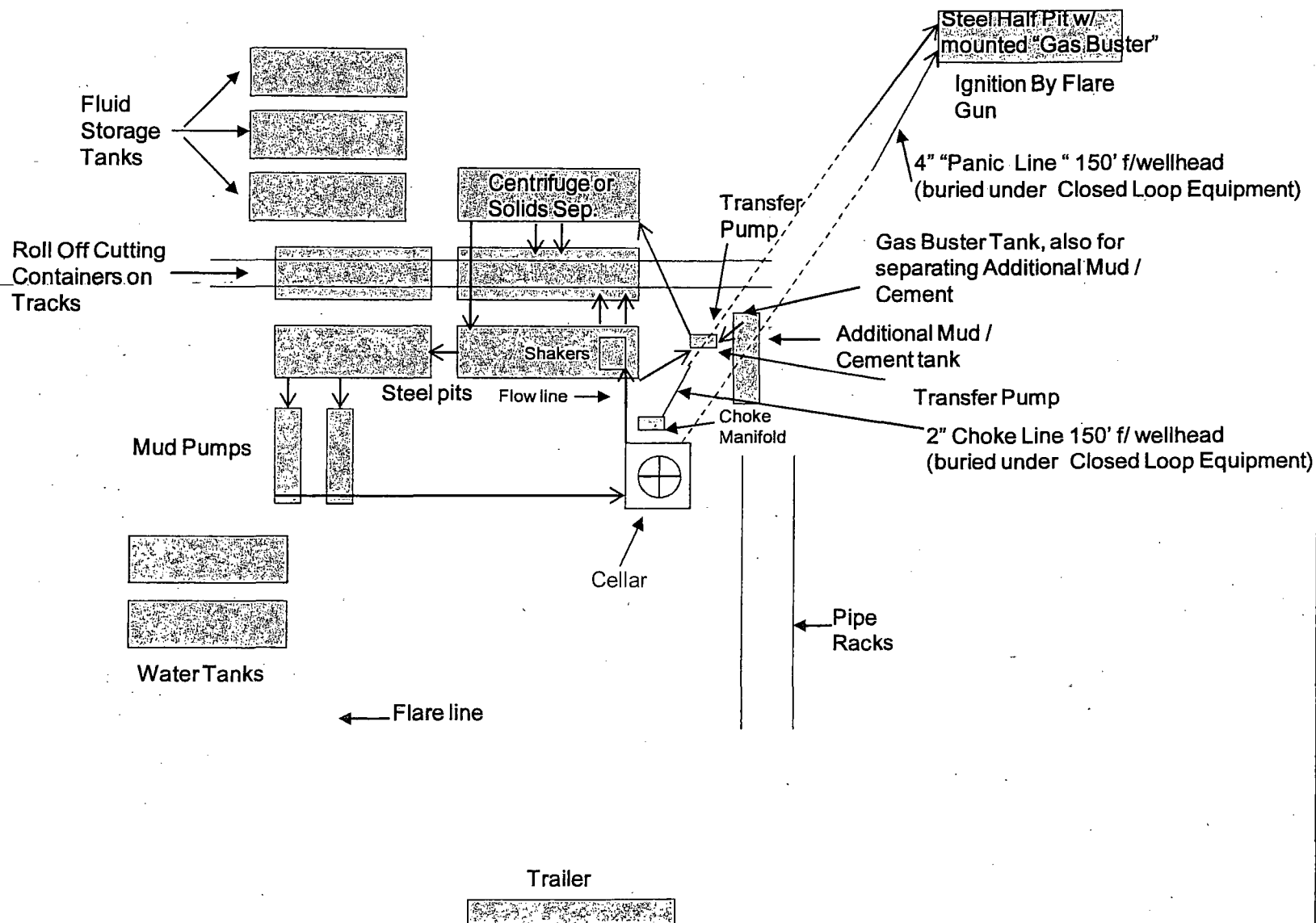
NOTES REGARDING THE BLOWOUT PREVENTERS

Master Drilling Plan
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

COG Operating LLC

Closed Loop Equipment Diagram



COG Operating LLC

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H₂S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H₂S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H₂S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H₂S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

1. Well Control Equipment:

- A. Flare line.
- B. Choke manifold.
- C. Closed Loop Blow Down Tank
- D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- E. Auxiliary equipment may include if applicable: annular preventer & rotating head.

2. Protective equipment for essential personnel:

- A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. H2S detection and monitoring equipment:

- A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. Visual warning systems:

- A. Wind direction indicators as shown on well site diagram.
- B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

5. Mud program:

- A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.
-

6. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H₂S service.
- B. All elastomers used for packing and seals shall be H₂S trim.

7. Communication:

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

8. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

EXHIBIT #7

WARNING
YOU ARE ENTERING AN H₂S
AUTHORIZED PERSONNEL ONLY

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED**
- 2. HARD HATS REQUIRED**
- 3. SMOKING IN DESIGNATED AREAS ONLY**
- 4. BE WIND CONSCIOUS AT ALL TIMES**
- 5. CHECK WITH COG OPERATING FOREMAN AT**

COG OPERATING LLC
1-432-683-7443
1-575-746-2010

EDDY COUNTY EMERGENCY NUMBERS

ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

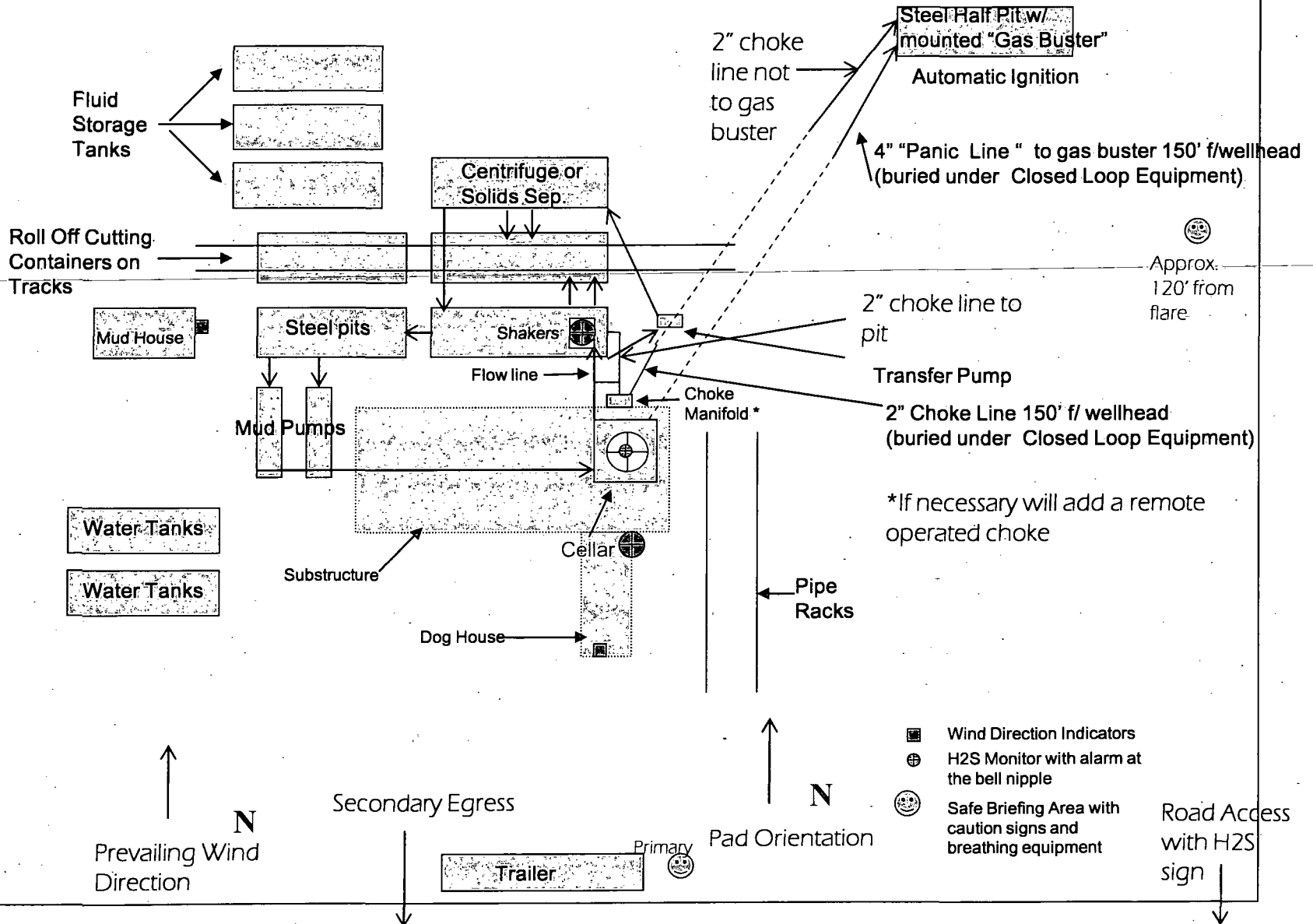
LEA COUNTY EMERGENCY NUMBERS

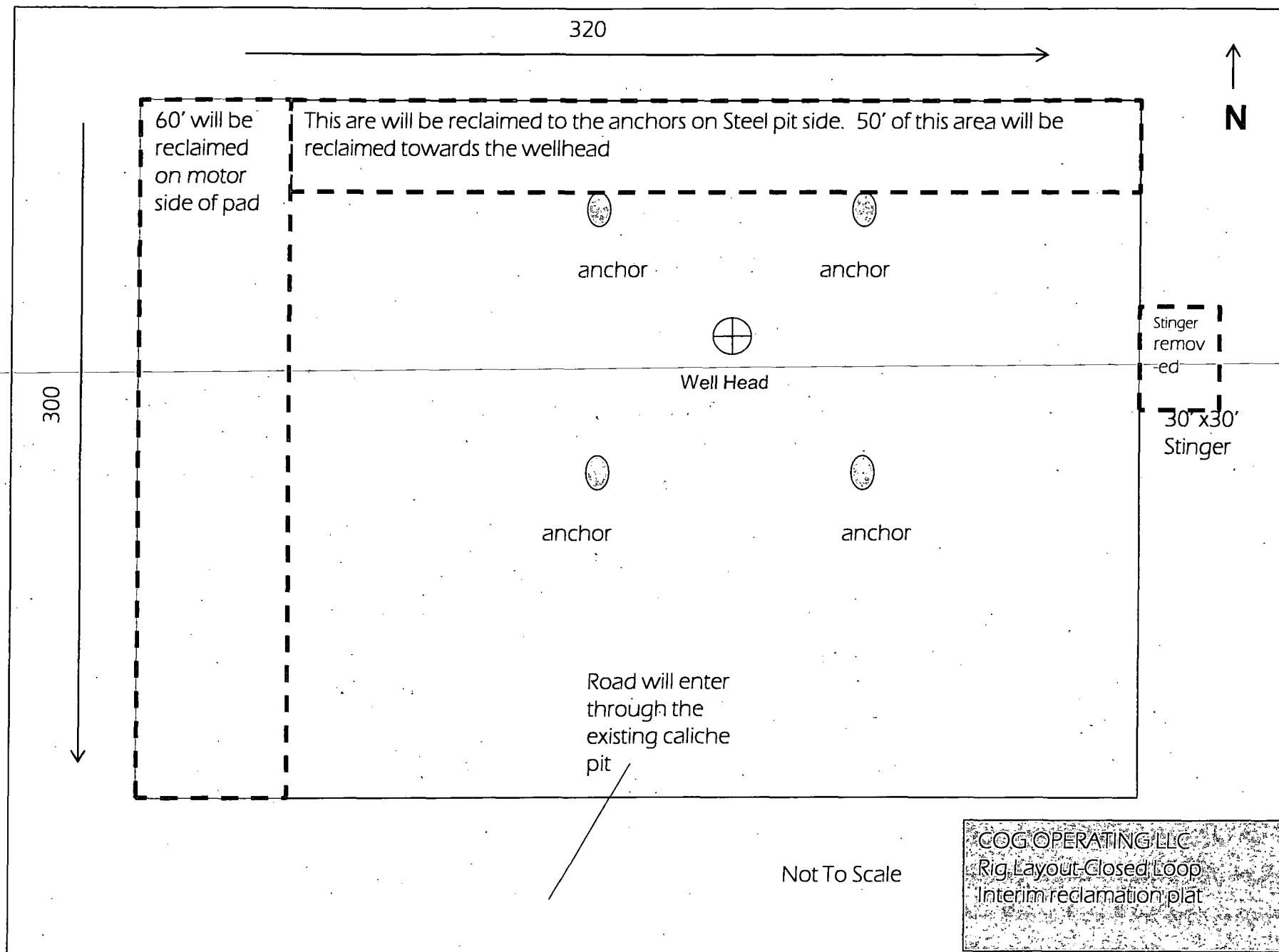
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8-

Drilling Location - H2S Safety Equipment Diagram





PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating
LEASE NO.:	LC028793A
WELL NAME & NO.:	965H Burch Keely Unit
SURFACE HOLE FOOTAGE:	2350' / FNL & 493' / FEL
BOTTOM HOLE FOOTAGE:	2310' / FNL & 330' / FWL
LOCATION:	Section 19, T.17 S., R.30 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - H2S requirement
 - Logging requirement
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**