

Form 3160-3
(April 2004)

OCD-ARTESIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007

1a Type of work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5 Lease Serial No. NMLC-028784A
1b Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other Injector <input 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 550 W. Texas Ave., Suite 100 Midland, TX 79701		8 Lease Name and Well No BURCH KEELY UNIT #854
3b Phone No. (include area code) 432-221-0336		9 API Well No. 40378
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 1620' FNL & 1260' FWL, Unit E At proposed prod zone BHL: 1980' FNL & 1310' FWL, Unit E		10 Field and Pool, or Exploratory Grayburg Jackson; SR-Q-G-SA
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 24 T17S R29E
15 Distance from proposed location to nearest property or lease line, ft (Also to nearest drg. unit line, if any) 1260'	16. No of acres in lease 640	17. Spacing Unit dedicated to this well 40
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 184'	19. Proposed Depth TVD: 4100' MD: 4123'	20 BLM/BIA Bond No on file NMB000740; NMB000215
21 Elevations (Show whether DF, KDB, RT, GL, etc) 3593' GL	22 Approximate date work will start* 05/31/2012	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 <i>Kacie Connally</i>	Name (Printed/Typed) Kacie Connally	Date 03/27/2012
Title Permitting Tech		
Approved by (Signature) <i>/s/ Don Peterson</i>	Name (Printed/Typed)	Date MAY 31 2012
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

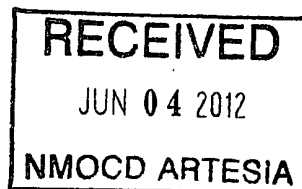
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

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 Attached

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

Surface Use Plan
COG Operating, LLC
Burch Keely Unit #854
SL: 1620' FNL & 1260' FWL UL E
BHL: 1980' FNL & 1320' FWL UL E
Section 24, T-17-S, R29-E
Eddy County, New Mexico

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 March, 2012.

Signed: _____



Printed Name: Carl Bird

Position: Drilling Engineer

Address: 550 W. Texas, Suite 1300, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

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- 40378	Pool Code 28509	Pool Name GRAYBURG JACKSON: SR-Q-G-SA
Property Code 308086	Property Name BURCH KEELY UNIT	Well Number 854
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3593'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	24	17-S	29-E		1620	NORTH	1260	WEST	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
E	24	17-S	29-E		1980	NORTH	1310	WEST	EDDY
Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No.						

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>GEODETIC COORDINATES NAD 27 NME</p> <p>SURFACE LOCATION Y=663148.2 N X=592492.1 E</p> <p>LAT.=32.822720° N LONG.=104.032248° W</p> <p>BOTTOM HOLE LOCATION Y=662788.5 N X=592542.7 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>[Signature]</i> 5/7/2012 Signature Date</p> <p>Robyn M. Odom Printed Name</p> <p>Rodom@concho.com E-mail Address</p>
	<p>DETAIL</p> <p>3593.4' 3590.8'</p> <p>600' 600'</p> <p>3593.5' 3596.2'</p> <p>CORNER COORDINATES TABLE</p> <p>(A) - Y=663445.6 N, X=591231.7 E</p> <p>(B) - Y=663448.8 N, X=592551.7 E</p> <p>(C) - Y=662126.3 N, X=591234.5 E</p> <p>(D) - Y=662129.6 N, X=592555.1 E</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>FEBRUARY 17, 2012</p> <p>Date of Survey</p> <p>Signature of Professional Surveyor:</p> <p><i>[Signature]</i> 04/23/2012</p> <p>Certificate Number: 3239</p> <p>AF JWSC W O 12.13.0848</p>

MASTER DRILLING PROGRAM

1. Geologic Name of Surface Formation

Quaternary

2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Rustler	220'
Salt	360'
Base of Salt	780'
Yates	950'
Seven Rivers	1235'
Queen	1845'
Grayburg	2220'
San Andres	2540'
Glorieta	4000'
Paddock	4075'

3. Estimated Depths of Anticipated Fresh Water, Oil and Gas

Water Sand	150'	Fresh Water
Grayburg	2220'	Oil/Gas
San Andres	2540'	Oil/Gas
Glorieta	4000'	Oil/Gas
Paddock	4075'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to ~~300'~~ and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 8 5/8" casing to ~~850'~~ and circulating cement, in a single or multi-stage job and/or with an ECP, back to the surface. 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, with a single or multi-stage job, the 5 1/2" production casing back 200' into the intermediate casing, (but calculated to surface) to be run at TD. 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

4. Casing Program

See
COA

Hole Size	Interval	OD Casing	Weight	Grade	Jt., Condition	Jt.	brst/clps/ten
17 1/2"	0-300' 265	13 3/8"	48#	H-40/J-55 Hybrid	ST&C/New	ST&C	9.22/3.943/15.8
11"	0-850' 480	8 5/8"	24or32#	J-55	ST&C/New	ST&C	3.03/2.029/7.82
7 7/8"	0-TD	5 1/2"	15.5or17#	J-55orL-80	LT&C/New	LT&C	1.88/1.731/2.42

5. Cement Program *See COA*

13 3/8" Surface Casing:

Class C w/ 2% CaCl₂ + 0.25 pps CF, 400 sx, yield 1.32, back to surface. 154% excess

8 5/8" Intermediate Casing:

11" Hole:

Single Stage: 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, 300 sx lead, yield-2.45 + Class C w/2% CaCl₂, 200 sx tail, yield-1.32, back to surface. 363% excess

Multi-Stage: Stage 1: Class C w/2% CaCl₂, 200 sx, yield - 1.32; 108% excess
Stage 2: 50:50:10 C:Poz:Gel w/ 5% Salt +0.25% CF, 300 sx, yield - 2.45, back to surface, 726% excess; assumption for tool is lost-circulation. Multi stage tool to be set at approximately, depending on hole conditions, 350' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

5 1/2" Production Casing:

Single Stage: LEAD 500 sx 35:65:6 C:Poz:Gel w/ 5% Salt + 5 pps LCM + 0.2% SMS + 0.3% FL-52A + 0.125 pps CF, yield-2.05; + TAIL 400 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield-1.37, to 200' minimum tie back to intermediate casing. 106% open hole excess, cement calculated back to surface.

Multi-Stage: Stage 1: (Assumed TD of 4100') 500 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37, 89% excess; Stage 2: LEAD

450 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37, + TAIL 250 sx Class C w/ 0.3% R-3 + 1.5% CD-32, yield - 1.02 148% open hole excess, cement calculated back to surface. Multi stage tool to be set at approximately, depending on hole conditions, 2500'. Cement volumes will be adjusted proportionately for depth changes of multi stage tool, assumption for tool is water flow.

6. Minimum Specifications for Pressure Control

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 of 4 1/2" drill pipe rams on the bottom. A 13-5/8" or 11" BOP will be used, depending on the rig selected, during the drilling of the well. The BOP will be nipped up on the 13 3/8" surface casing with BOP equipment and tested to 2000 psi. When 11" BOP is used the special drilling flange will be utilized on the 13-3/8" head to allow testing the BOP with a retrievable test plug. After setting 8-5/8" the BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a third party to 2000 psi 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 (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) with a 2000 psi WP rating.

The majority of the rigs currently in use have a 13-5/8" BOP, so no special provision is needed for most wells in the area for conventionally testing the BOP with a test plug. However, due to the vagaries of rig scheduling, it might be that one of the few rigs with 11" BOP's might be called upon to drill any specific well in the area. Note that intermediate hole size is always 11". Therefore, COG Operating LLC respectfully requests a variance to the requirement of 13-5/8" BOP on 13-3/8" casing. When that circumstance is encountered the special flange will be utilized to allow testing the entire BOP with a test plug, without subjecting the casing to test pressure. The special flange also allows the return to full-open capability if desired.

See
COA

7. Types and Characteristics of the Proposed Mud System

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

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-300' 265	Fresh Water	8.5	28	N.C.
300-850' 180	Brine	10	30	N.C.
850'-TD'	Cut Brine	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.

8. 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.

9. Logging, Testing and Coring Program *See COA*

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be run from TD to Surface.
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production casing has been cemented at TD, based on drill shows and log evaluation.

10. Abnormal Conditions, Pressure, Temperatures and Potential Hazards

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 110 degrees and the estimated maximum bottom hole pressure is 1760 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, although a Hydrogen Sulfide Drilling Operation Plan is attached to this program. No major loss of circulation zones has been reported in offsetting wells.

11. Anticipated Starting Date and Duration of Operations

Road and location work will not begin until approval has been received from the BLM. As this is a Master Drilling plan, please refer to the Form 3160-3 for the anticipated start date. Once commenced, drilling operations should be finished in approximately 10 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities. Completion is planned in the San Andres formation.



COG Operating LLC

Eddy County, NM (NAN27 NME)

Burch Keely Unit #854

OH

Plan: Plan #3 - 7-7/8" Hole

SHL = 1620' FNL & 1260' FWL

BHL = 1980' FNL & 1310' FWL

Top of Paddock = 347' South of Surface & 49' East of Surface @ 4000' TVD

Standard Planning Report

09 May, 2012



Scientific Drilling



Database:	EDM 5000 1 Single-User Db	Local Co-ordinate Reference:	Site Burch Keely Unit #854
Company:	COG Operating LLC	TVD Reference:	GL @ 3593.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3593.00usft
Site:	Burch Keely Unit #854	North Reference:	Grid
Well:	Burch Keely Unit #854	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 - 7-7/8" Hole		

Project	Eddy County, NM (NAN27 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	Burch Keely Unit #854		
Site Position:		Northing:	663,148.20 usft
From:	Map	Easting:	592,492.10 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 49' 21.790 N
		Longitude:	104° 1' 56.092 W
		Grid Convergence:	0.16°

Well	Burch Keely Unit #854		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,593.00 usft

Wellbore	OH		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	05/09/12	7.73	60.64	48,834

Design	Plan #3 - 7-7/8" Hole		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			171.99

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,150.00	0.00	0.00	1,150.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,524.55	7.49	171.99	1,523.48	-24.21	3.41	2.00	2.00	45.92	171.99	
4,123.25	7.49	171.99	4,100.00	-359.70	50.60	0.00	0.00	0.00	0.00	PBHL-BKU #854



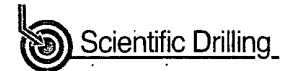
Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Burch Keely Unit #854
Company:	COG Operating LLC	TVD Reference:	GL @ 3593 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3593 00usft
Site:	Burch Keely Unit #854	North Reference:	Grid
Well:	Burch Keely Unit #854	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 - 7-7/8" Hole		

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 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
1,050 00	0 00	0 00	1,050 00	0 00	0 00	0 00	0 00	0 00	0 00
8-5/8" Casing									
1,150 00	0 00	0 00	1,150 00	0 00	0 00	0 00	0 00	0 00	0 00
Start Build 2.00°/100'									
1,200 00	1 00	171 99	1,200 00	-0 43	0 06	0 44	2 00	2 00	0 00
1,300 00	3 00	171 99	1,299 93	-3 89	0 55	3 93	2 00	2 00	0 00
1,400 00	5 00	171 99	1,399 68	-10 80	1 52	10 90	2 00	2 00	0 00
1,500 00	7 00	171 99	1,499 13	-21 15	2 97	21 35	2 00	2 00	0 00
1,524 55	7 49	171 99	1,523 48	-24 21	3 41	24 45	2 00	2 00	0 00
Hold 7.49°									
1,600 00	7 49	171 99	1,598 29	-33 95	4 78	34 29	0 00	0 00	0 00
1,700 00	7 49	171 99	1,697 44	-46 86	6 59	47 32	0 00	0 00	0 00
1,800 00	7 49	171 99	1,796 58	-59 77	8 41	60 36	0 00	0 00	0 00
1,900 00	7 49	171 99	1,895 73	-72 68	10 22	73 40	0 00	0 00	0 00
2,000 00	7 49	171 99	1,994 88	-85 59	12 04	86 43	0 00	0 00	0 00
2,100 00	7 49	171 99	2,094 02	-98 50	13 86	99 47	0 00	0 00	0 00
2,200 00	7 49	171 99	2,193 17	-111 41	15 67	112 51	0 00	0 00	0 00
2,300 00	7 49	171 99	2,292 32	-124 32	17 49	125 55	0 00	0 00	0 00
2,400 00	7 49	171 99	2,391 46	-137 23	19 30	138 58	0 00	0 00	0 00
2,500 00	7 49	171 99	2,490 61	-150 14	21 12	151 62	0 00	0 00	0 00
2,600 00	7 49	171 99	2,589 76	-163 05	22 94	164 66	0 00	0 00	0 00
2,700 00	7 49	171 99	2,688 90	-175 96	24 75	177 69	0 00	0 00	0 00
2,800 00	7 49	171 99	2,788 05	-188 87	26 57	190 73	0 00	0 00	0 00
2,900 00	7 49	171 99	2,887 20	-201 78	28 39	203 77	0 00	0 00	0 00
3,000 00	7 49	171 99	2,986 34	-214 69	30 20	216 80	0 00	0 00	0 00
3,100 00	7 49	171 99	3,085 49	-227 60	32 02	229 84	0 00	0 00	0 00
3,200 00	7 49	171 99	3,184 63	-240 51	33 83	242 88	0 00	0 00	0 00
3,300 00	7 49	171 99	3,283 78	-253 42	35 65	255 92	0 00	0 00	0 00
3,400 00	7 49	171 99	3,382 93	-266 33	37 47	268 95	0 00	0 00	0 00
3,500 00	7 49	171 99	3,482 07	-279 24	39 28	281 99	0 00	0 00	0 00
3,600 00	7 49	171 99	3,581 22	-292 15	41 10	295 03	0 00	0 00	0 00
3,700 00	7 49	171 99	3,680 37	-305 06	42 91	308 06	0 00	0 00	0 00
3,800 00	7 49	171 99	3,779 51	-317 97	44 73	321 10	0 00	0 00	0 00
3,900 00	7 49	171 99	3,878 66	-330 88	46 55	334 14	0 00	0 00	0 00
4,000 00	7 49	171 99	3,977 81	-343 79	48 36	347 17	0 00	0 00	0 00
4,022 38	7 49	171 99	4,000 00	-346 68	48 77	350 09	0 00	0 00	0 00
Top of Paddock									
4,100 00	7 49	171 99	4,076 95	-356 70	50 18	360 21	0 00	0 00	0 00
4,123 25	7 49	171 99	4,100 00	-359 70	50 60	363 24	0 00	0 00	0 00
PBHL-BKU #854									

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 #854	0 00	0 00	4,100 00	-359 70	50 60	662,788 50	592,542 70	32° 49' 18 230 N	104° 1' 55 511 W
- plan hits target center									
- Circle (radius 10.00)									



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Burch Keely Unit #854
Company:	COG Operating LLC	TVD Reference:	GL @ 3593 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3593 00usft
Site:	Burch Keely Unit #854	North Reference:	Grid
Well:	Burch Keely Unit #854	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3 - 7-7/8" Hole		

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,050 00	1,050 00	8-5/8" Casing	8-5/8	12-1/4

Formations				
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip Direction (°)
4,022 38	4,000 00	Top of Paddock		0 00

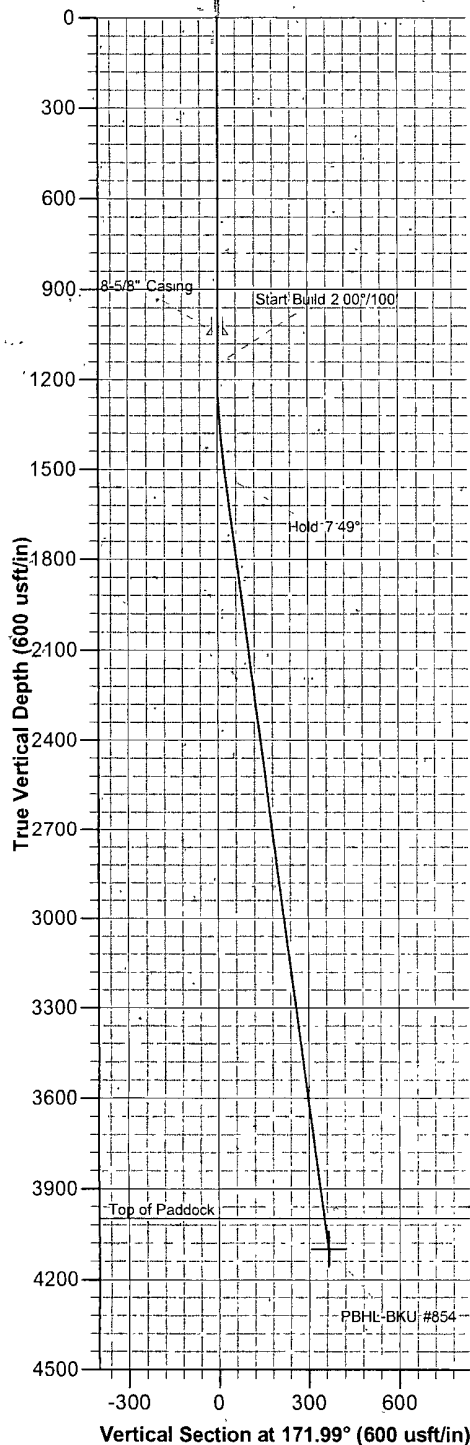
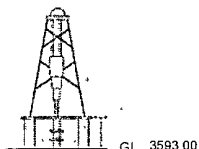
Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,150 00	1,150 00	0 00	0 00	Start Build 2 00"/100'
1,524 55	1,523 48	-24 21	3 41	Hold 7 49°



Azimuths to Grid North
True North -0 16°
Magnetic North 7 57°

Magnetic Field
Strength 48834.4nT
Dip Angle 60 64°
Date 05/09/2012
Model IGRF2010.

Burch Keely Unit #854
Eddy County, NM (NAN27 NME)
Northing: (Y) 663148.20
Easting: (X) 592492.10
Plan #3 - 7-7/8" Hole



WELL DETAILS: Burch Keely Unit #854

+N/-S	+E/-W	Northing	Ground Level Easting	3593.00 Latitude	Longitude
0 00	0 00	663148.20	592492.10	21 790 N	104° 1' 56.092 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
2	1150 00	0 00	0 00	1150 00	0 00	0 00	0 00	0 00	0 00	
3	1524 55	7 49	171 99	1523 48	-24 21	3 41	2 00	171 99	24 45	
4	4123 24	7 49	171 99	4100 00	-359 70	50 60	0 00	0 00	363 24	PBHL-BKU #854

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL-BKU #854	4100'00	-359 70	50 60	662788.50	592542.782° 49'	18 230 N	104° 1' 55.511 W
plan hits target center							

SITE DETAILS: Burch Keely Unit #854

Site Centre Northing: 663148.20
Easting: 592492.10
Positional Uncertainty: 0 00
Convergence: 0 16
Local North: Grid

PROJECT DETAILS: Eddy County, NM (NAN27 NME)

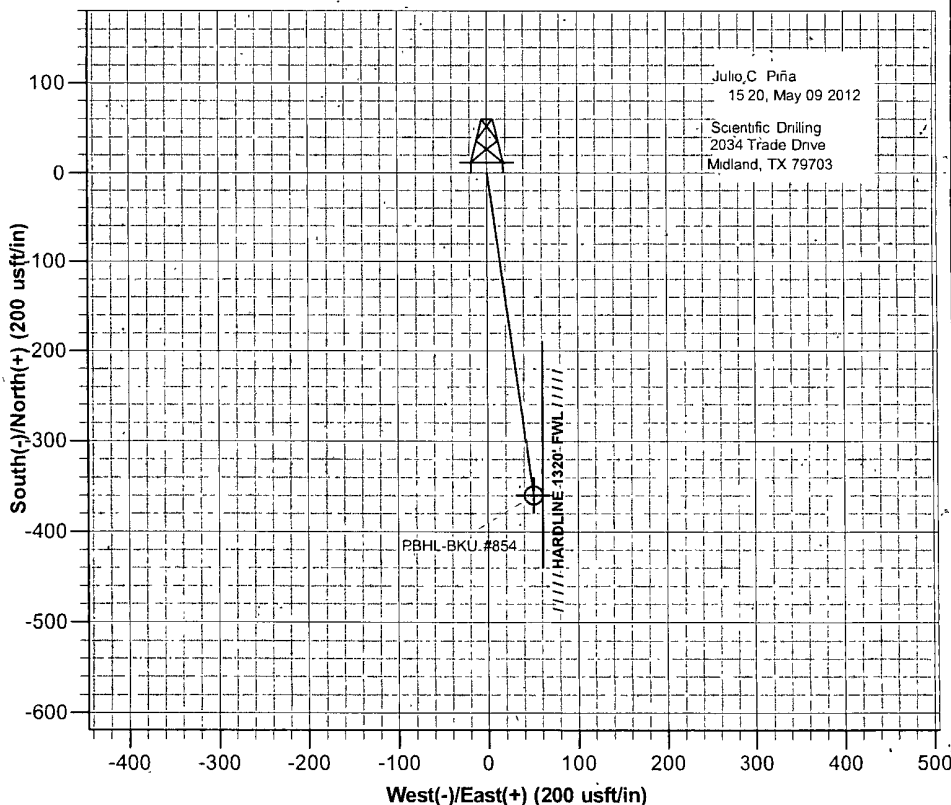
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke, 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
4000 00	4022 38	Top of Paddock	0 00	

LEGEND

— Plan #3 - 7-7/8" Hole



COG OPERATING LLC

550 West Texas, Suite 1300
Midland, TX 79701

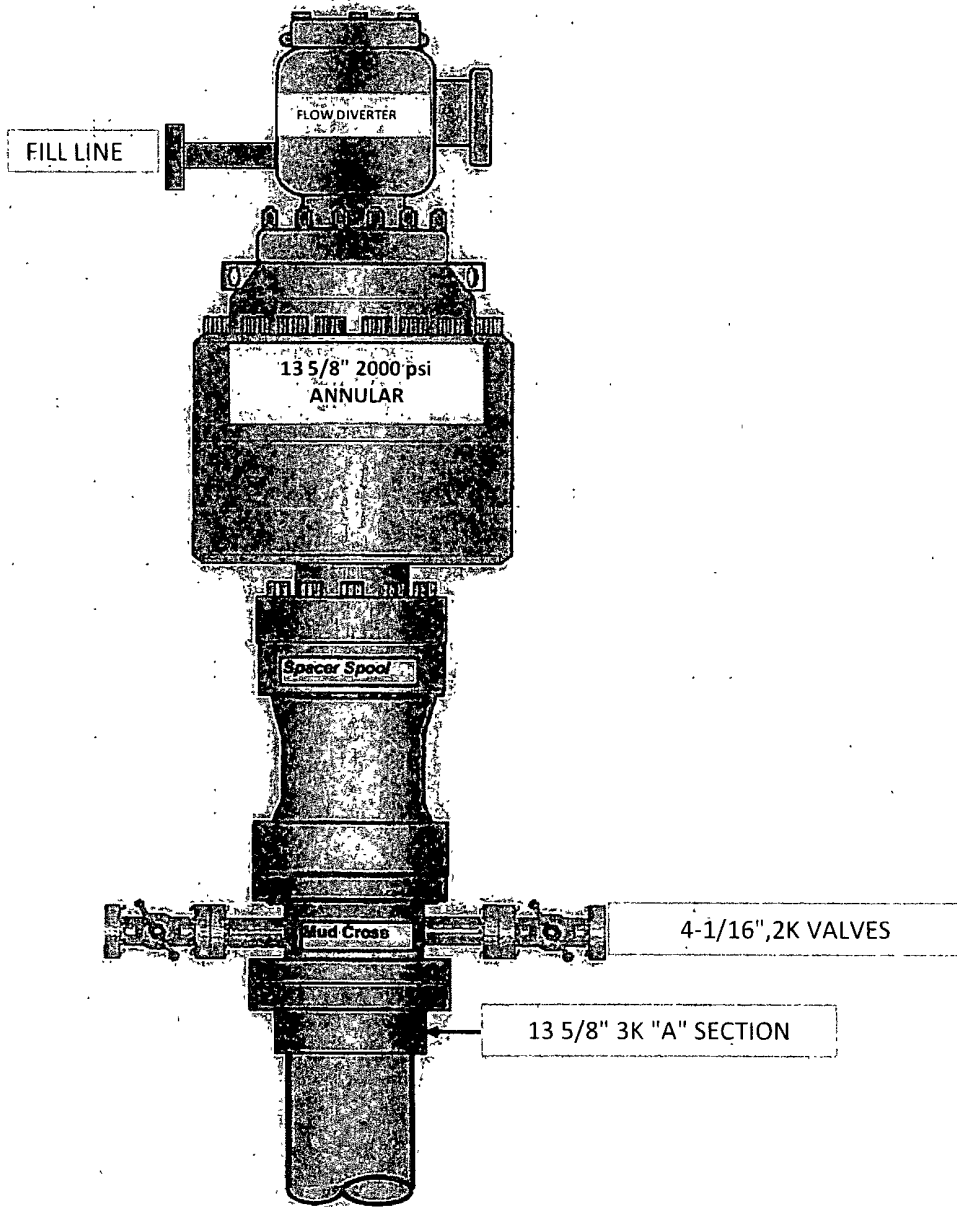
DIRECTIONAL PLAN VARIANCE REQUEST

**Burch Keely Unit #854
EDDY, NM**

SHL	1620 FNL, 1260 FWL	Sec 24, T17S, R29E, Unit E
BHL	1980 FNL, 1320 FWL	Sec 24, T17S, R29E, Unit E

COG Operating LLC, as Operator, desires that the APD reflect the footages as stated on the surveyor's plat. However, Operator also desires to avoid inadvertently drilling the well to a non-standard location. Therefore, due to the proximity of the plat bottom hole location to the pro-ration unit hard line(s), the attached directional plan is designed to avoid the hard lines by as much as fifty feet; said fifty feet being in either (or both) the north-south and/or east-west directions as applicable.

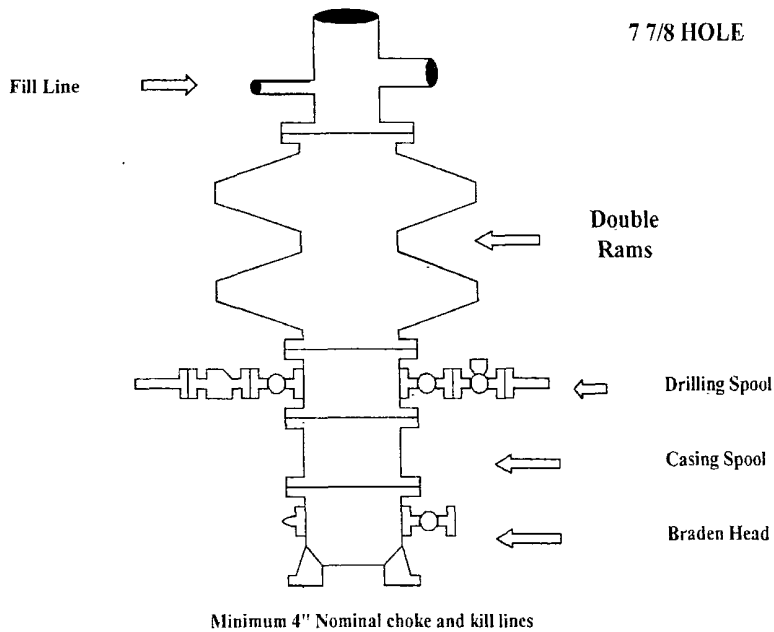
13 5/8" 2K ANNULAR



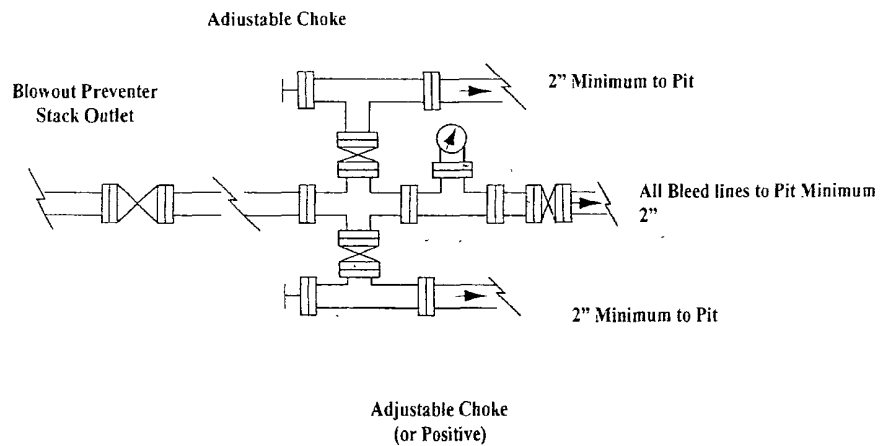
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



Choke Manifold Requirement (2000 psi WP)
No Annular Required



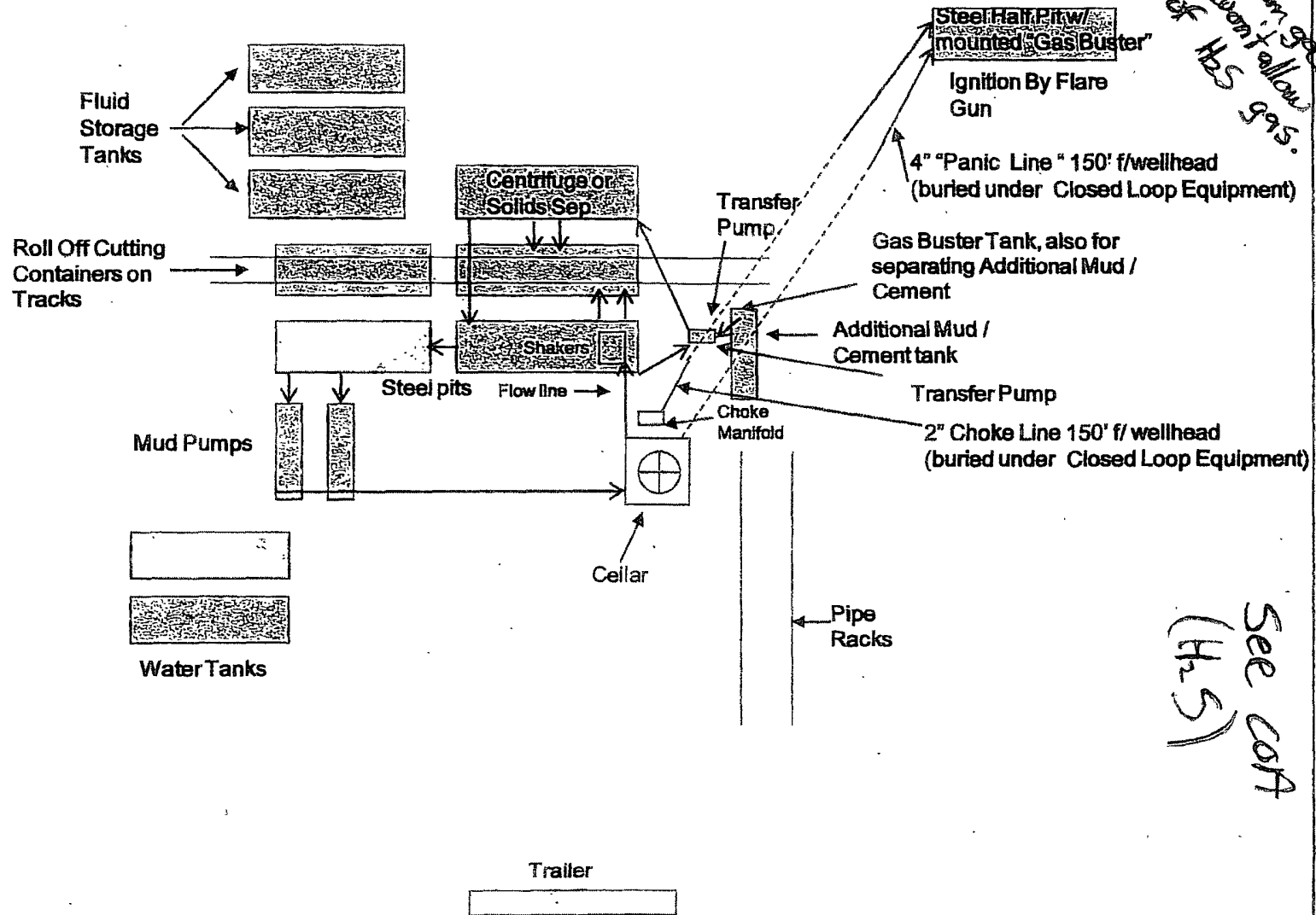
NOTES REGARDING THE BLOWOUT PREVENTERS

**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



All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

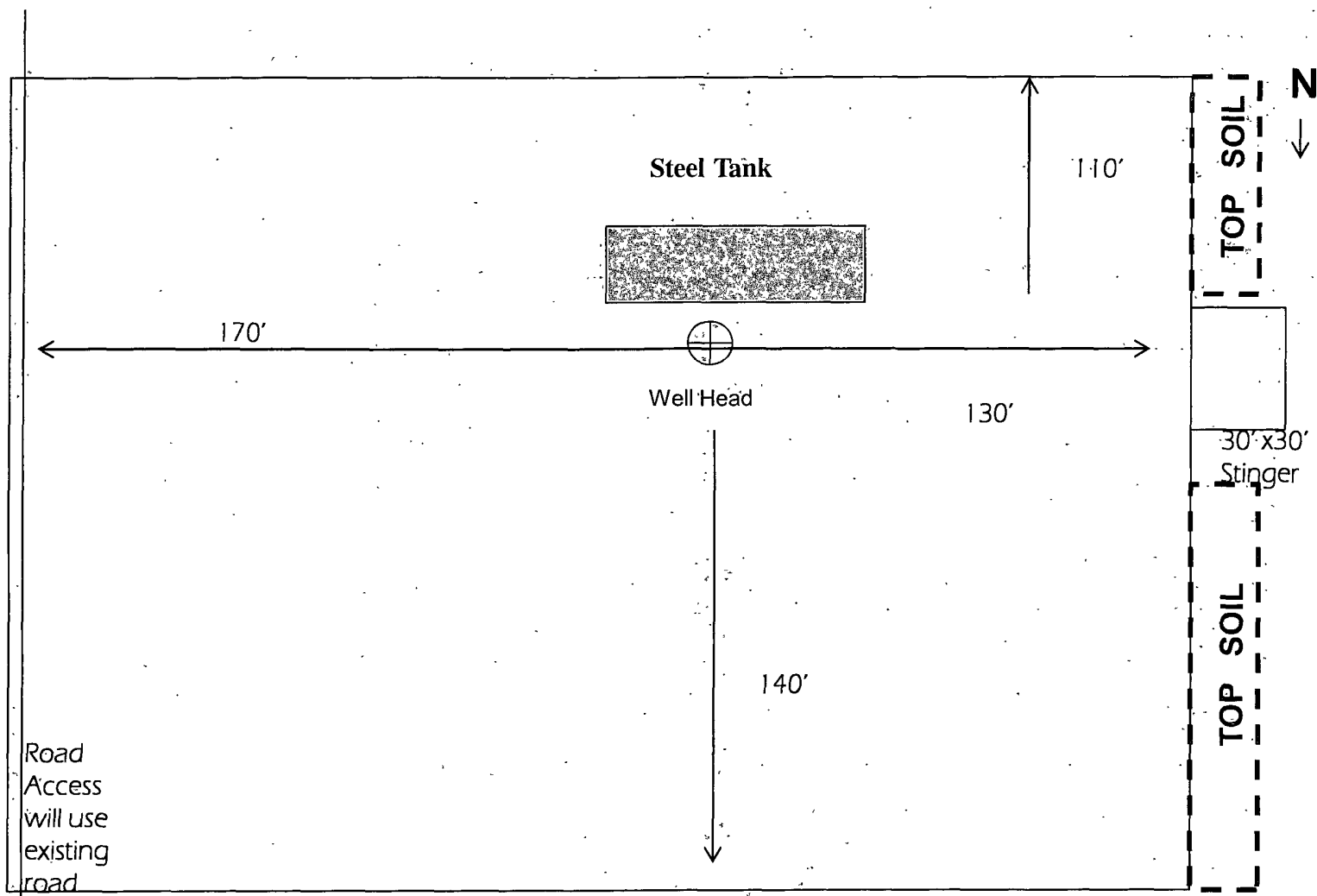
Cuttings will be hauled to either:

CRI (permit number R9166)

or

GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.



Not To Scale

COG OPERATING, LLC
Rig Layout-Closed Loop
System: BKU 854

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. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

2. Protective equipment for essential personnel:

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. H2S detection and monitoring equipment:

- A. 1 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 (Exhibit #8).
- 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

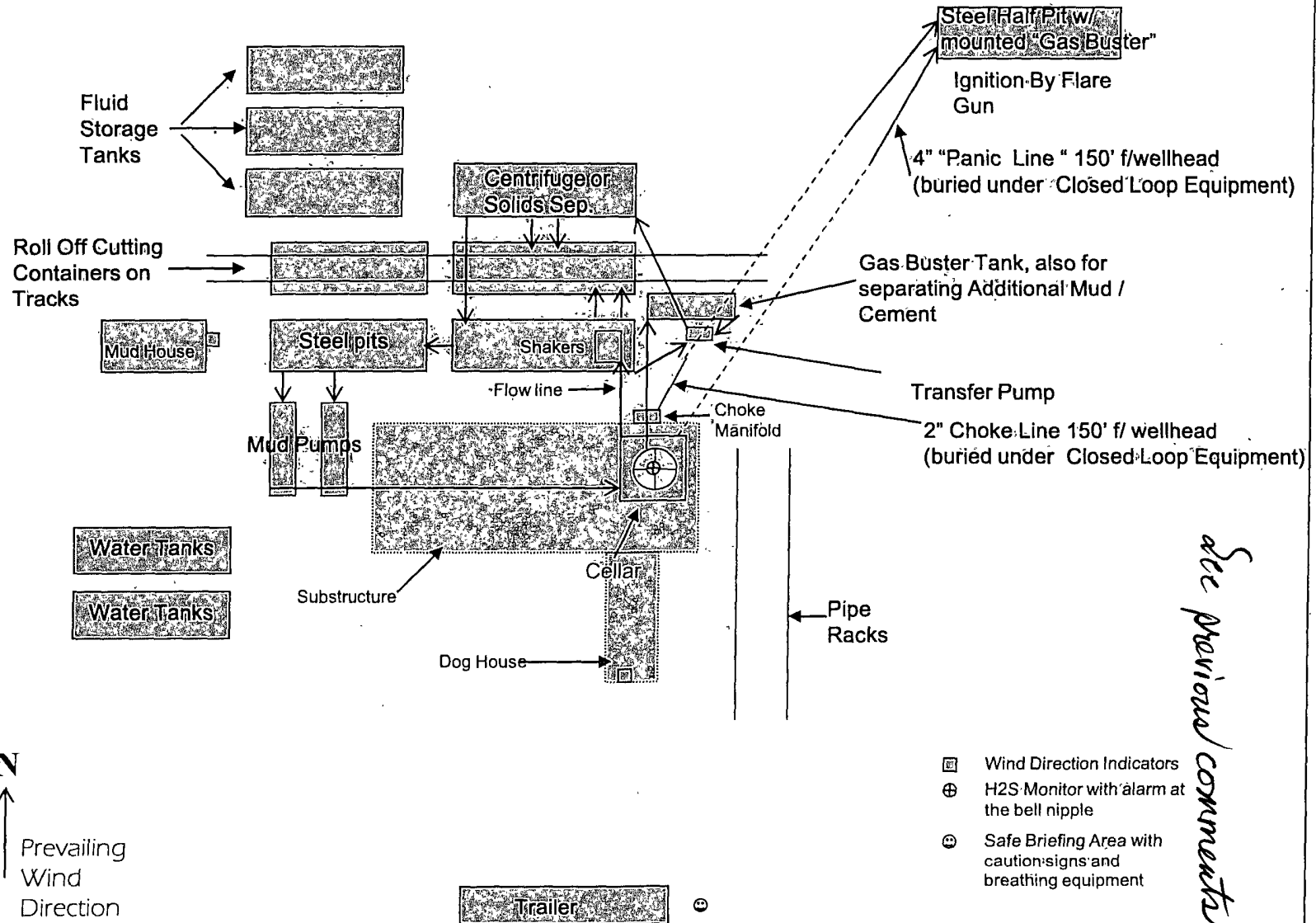
LEA COUNTY EMERGENCY NUMBERS

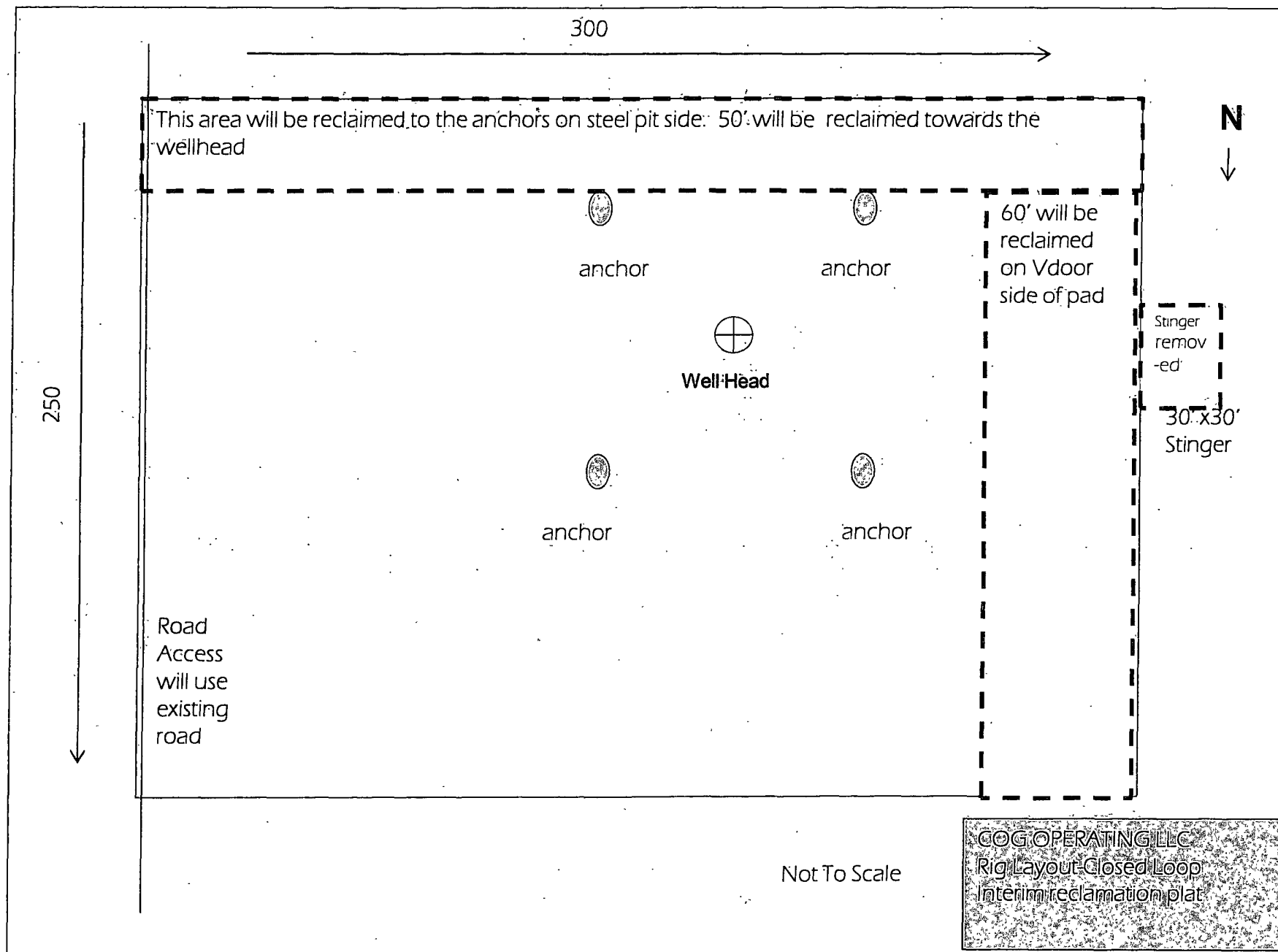
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram





PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING, LLC
LEASE NO.:	NMLC028784A
WELL NAME & NO.:	854 BURCH KEELY UNIT
SURFACE HOLE FOOTAGE:	1620' FNL & 1260' FWL
BOTTOM HOLE FOOTAGE:	1980' FNL & 1320' FWL
LOCATION:	Section 24, T.17 S., R.29 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
- ☐ **Interim Reclamation**
- ☒ **Final Abandonment & Reclamation**