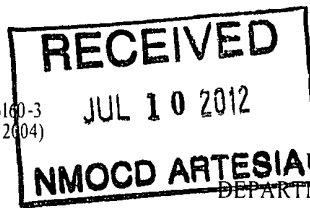


Form 3160-3
(April 2004)



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 NMNM-118109
1b Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <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 N/A
3a Address 550 W. Texas Ave., Suite 1300 Midland, TX 79701	3b Phone No (include area code) 432-685-4384	8 Lease Name and Well No TUMAK FEDERAL #4 <i><393267</i>
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 455' FSL & 1275' FWL, Unit M At proposed prod zone BHL: 330' FSL & 990' FWL, Unit M		9 API Well No 30-015- 40460 <i>7/11/2012</i>
14 Distance in miles and direction from nearest town or post office* 2 miles from Loco Hills, NM		10 Field and Pool, or Exploratory Empire; Glorieta-Yeso <i>496210 > 86210</i>
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drg unit line, if any) 455'		11 Sec, T R M or Blk and Survey or Area Sec 14 T17S R28E
16 No of acres in lease 40	17 Spacing Unit dedicated to this well 40	12 County or Parish EDDY
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 375'	19 Proposed Depth TVD: 5400' MD: 5414'	13 State NM
20 BLM/BIA Bond No on file NMB000740, NMB000215	21 Elevations (Show whether DF, KDB, RT, GL, etc) 3647' GL	22 Approximate date work will start* 02/28/2012
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 01/03/2012
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Title **Permitting Tech**

Approved by (Signature) 	Name (Printed/Typed) James A. Ames	Date JUL 6 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 USC Section 1001 and Title 43 USC 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

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

**APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED**

Surface Use Plan
COG Operating, LLC
Tumak Federal #4
SL: 455' FSL & 1275' FWL UL M
BHL: 330' FSL & 990' FWL UL M
Section 14, T-17-S, R-28-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 10th day of April, 2012.

Signed: Carl Bird

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 - 40460	Pool Code 96210	Pool Name Empire; glorieta-Yeso
Property Code 37882 39326	Property Name TUMAK FEDERAL	Well Number 4
OGRID No 229137	Operator Name COG OPERATING, LLC	Elevation 3647'

Surface Location

UL or lot No	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	14	17-S	28-E		455	SOUTH	1275	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
M	14	17-S	28-E		330	SOUTH	990	WEST	EDDY

Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No 5414 7/6
-----------------------	-----------------	--------------------	-----------------------------

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

DETAILED

3676.9' 3637.9'

3662.8' 3634.8'

600' 600'

1275' 990'

330' 455'

GEODETIC COORDINATES
NAD 27 NME
SURFACE LOCATION
Y=665227.8 N
X=556142.3 E
LAT=32 828664' N
LONG=104 150564' W
BOTTOM HOLE LOCATION
Y=665075.8 N
X=555861.4 E

GRID AZ=241°34'45"
HORZ DIST=319.4'

Penetration Point
391 FSL & 1077 FWL

SECTION, QUARTER & SIXTEENTH CORNER COORDINATES

- (A) - Y=665980.2 N, X=554845.5 E
- (B) - Y=666102.5 N, X=556140.5 E
- (C) - Y=664774.1 N, X=556176.8 E
- (D) - Y=664652.5 N, X=554883.3 E

OPERATOR CERTIFICATION

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

[Signature] 11-9-11
Signature Date

Kelly J. Holly
Printed Name

kholly@concho.com
E-mail Address

SURVEYOR CERTIFICATION

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

SEPTEMBER 28, 2011
Date of Survey

Signature & Seal of Professional Surveyor

[Signature]
GARY G. EIDSON
NEW MEXICO
12641
REGISTERED PROFESSIONAL SURVEYOR
9/25/11

Certificate Number Gary G. Eidson 12641
Ronald L. Eidson 3239

AF

MASTER DRILLING PROGRAM

1. Geologic Name of Surface Formation

Quaternary

2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Rustler	220'
Salt	400'
Base of Salt	800'
Yates	740'
Seven Rivers	1001'
Queen	1590'
Grayburg	1980'
San Andres	2280'
Glorieta	3680'
Paddock	3780'
Blinbry	4220'
Tubb	5300'

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

Water Sand	150'	Fresh Water
Grayburg	1980'	Oil/Gas
San Andres	2280'	Oil/Gas
Glorieta	3680'	Oil/Gas
Paddock	3780'	Oil/Gas
Blinbry	4220'	Oil/Gas
Tubb	5300'	Oil/Gas

See COA
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

Hole Size	Interval	OD Casing	Weight	Grade	Jt., Condition	Jt.	brst/clps/ten
17 1/2"	0-300.25	13 3/8"	48#	H-40/J-55 hybrid	ST&C/New	ST&C	9.22/3.943/15.8
11"	0-850.92	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. 76.8% open hole excess, cement calculated back to surface.

Multi-Stage: Stage 1: (Assumed TD of 5450') 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, 34% 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" *See COG* 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.

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' <i>215</i>	Fresh Water	8.5	28	N.C.
300-850' <i>900</i>	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 ½" 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 2300 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.



COG Operating LLC

Eddy County, NM (NAN27 NME)

Tumak Federal #4

Tumak Federal #4

OH

Plan: Plan #1 7-7/8" Hole

SHL = 455' FSL & 1275' FWL

BHL = 380' FSL & 940' FWL

Paddock Top = 64' S of Surface & 198' W of Surface @ 3650' TVD

Standard Planning Report

07 December, 2011





Scientific Drilling
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Site Tumak Federal #4
Company:	COG Operating, LLC	TVD Reference:	GL Elev @ 3647.00usft
Project:	Eddy County- NM (NAN27 NME)	MD Reference:	GL Elev @ 3647.00usft
Site:	Tumak Federal #4	North Reference:	Grid
Well:	Tumak Federal #4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 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: Tumak Federal #4						
Site Position		Northing:	665,227.80 usft	Latitude:	32° 49' 43.192 N	
From:	Map	Easting:	556,142.30 usft	Longitude:	104° 9' 2.028 W	
Position Uncertainty		0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Tumak Federal #4					
Well Position	+N/-S	0 00 usft	Northing	665,227 80 usft	Latitude:	32° 49' 43 192 N
	+E/-W	0 00 usft	Easting	556,142 30 usft	Longitude:	104° 9' 2 028 W
Position Uncertainty		0 00 usft	Wellhead Elevation.		Ground Level:	3,647 00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip/Angle (°)	Field Strength (nT)
	IGRF2010	2011/12/07	7.84	60.63	48,866

Design:		Plan #1 7-7/8" Hole		
Audit Notes				
Version:	Phase:	PLAN	Tie On Depth:	0 00
Vertical Section	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0 00	0 00	0 00	252 21

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,180.04	4.60	252.21	1,179.80	-2.82	-8.79	2.00	2.00	-46.86	252.21	
5,413.89	4.60	252.21	5,400.00	-106.60	-332.16	0.00	0.00	0.00	0.00	PBHL-Tumak Fed #4



Scientific Drilling
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Site: Tumak Federal #4
Company:	COG Operating LLC	TVD Reference:	GL Elev. @ 3647.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev. @ 3647.00usft
Site:	Tumak Federal #4	North Reference:	Grid
Well:	Tumak Federal #4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1-7-7/8 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
West HL-Tumak Fed #4 - South HL-Tumak Fed #4									
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing									
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2.00°/100'									
1,000.00	1.00	252.21	1,000.00	-0.13	-0.42	0.44	2.00	2.00	0.00
1,100.00	3.00	252.21	1,099.93	-1.20	-3.74	3.93	2.00	2.00	0.00
1,180.04	4.60	252.21	1,179.79	-2.82	-8.79	9.23	2.00	2.00	0.00
EOC hold 4.60°									
1,200.00	4.60	252.21	1,199.69	-3.31	-10.31	10.83	0.00	0.00	0.00
1,300.00	4.60	252.21	1,299.37	-5.76	-17.95	18.85	0.00	0.00	0.00
1,400.00	4.60	252.21	1,399.04	-8.21	-25.59	26.87	0.00	0.00	0.00
1,500.00	4.60	252.21	1,498.72	-10.66	-33.23	34.90	0.00	0.00	0.00
1,600.00	4.60	252.21	1,598.40	-13.11	-40.86	42.92	0.00	0.00	0.00
1,700.00	4.60	252.21	1,698.08	-15.57	-48.50	50.94	0.00	0.00	0.00
1,800.00	4.60	252.21	1,797.76	-18.02	-56.14	58.96	0.00	0.00	0.00
1,900.00	4.60	252.21	1,897.43	-20.47	-63.78	66.98	0.00	0.00	0.00
2,000.00	4.60	252.21	1,997.11	-22.92	-71.42	75.00	0.00	0.00	0.00
2,100.00	4.60	252.21	2,096.79	-25.37	-79.05	83.02	0.00	0.00	0.00
2,200.00	4.60	252.21	2,196.47	-27.82	-86.69	91.05	0.00	0.00	0.00
2,300.00	4.60	252.21	2,296.14	-30.27	-94.33	99.07	0.00	0.00	0.00
2,400.00	4.60	252.21	2,395.82	-32.72	-101.97	107.09	0.00	0.00	0.00
2,500.00	4.60	252.21	2,495.50	-35.17	-109.60	115.11	0.00	0.00	0.00
2,600.00	4.60	252.21	2,595.18	-37.63	-117.24	123.13	0.00	0.00	0.00
2,700.00	4.60	252.21	2,694.86	-40.08	-124.88	131.15	0.00	0.00	0.00
2,800.00	4.60	252.21	2,794.53	-42.53	-132.52	139.17	0.00	0.00	0.00
2,900.00	4.60	252.21	2,894.21	-44.98	-140.16	147.20	0.00	0.00	0.00
3,000.00	4.60	252.21	2,993.89	-47.43	-147.79	155.22	0.00	0.00	0.00
3,100.00	4.60	252.21	3,093.57	-49.88	-155.43	163.24	0.00	0.00	0.00
3,200.00	4.60	252.21	3,193.24	-52.33	-163.07	171.26	0.00	0.00	0.00
3,300.00	4.60	252.21	3,292.92	-54.78	-170.71	179.28	0.00	0.00	0.00
3,400.00	4.60	252.21	3,392.60	-57.24	-178.34	187.30	0.00	0.00	0.00
3,500.00	4.60	252.21	3,492.28	-59.69	-185.98	195.32	0.00	0.00	0.00
3,600.00	4.60	252.21	3,591.96	-62.14	-193.62	203.35	0.00	0.00	0.00
3,658.23	4.60	252.21	3,650.00	-63.56	-198.07	208.02	0.00	0.00	0.00
Top of Paddock									
3,700.00	4.60	252.21	3,691.63	-64.59	-201.26	211.37	0.00	0.00	0.00
3,800.00	4.60	252.21	3,791.31	-67.04	-208.89	219.39	0.00	0.00	0.00
3,900.00	4.60	252.21	3,890.99	-69.49	-216.53	227.41	0.00	0.00	0.00
4,000.00	4.60	252.21	3,990.67	-71.94	-224.17	235.43	0.00	0.00	0.00
4,100.00	4.60	252.21	4,090.34	-74.39	-231.81	243.45	0.00	0.00	0.00
4,200.00	4.60	252.21	4,190.02	-76.84	-239.45	251.47	0.00	0.00	0.00
4,300.00	4.60	252.21	4,289.70	-79.30	-247.08	259.50	0.00	0.00	0.00
4,400.00	4.60	252.21	4,389.38	-81.75	-254.72	267.52	0.00	0.00	0.00
4,500.00	4.60	252.21	4,489.05	-84.20	-262.36	275.54	0.00	0.00	0.00
4,600.00	4.60	252.21	4,588.73	-86.65	-270.00	283.56	0.00	0.00	0.00
4,700.00	4.60	252.21	4,688.41	-89.10	-277.63	291.58	0.00	0.00	0.00
4,800.00	4.60	252.21	4,788.09	-91.55	-285.27	299.60	0.00	0.00	0.00
4,900.00	4.60	252.21	4,887.77	-94.00	-292.91	307.62	0.00	0.00	0.00
5,000.00	4.60	252.21	4,987.44	-96.45	-300.55	315.65	0.00	0.00	0.00
5,100.00	4.60	252.21	5,087.12	-98.90	-308.19	323.67	0.00	0.00	0.00
5,200.00	4.60	252.21	5,186.80	-101.36	-315.82	331.69	0.00	0.00	0.00
5,300.00	4.60	252.21	5,286.48	-103.81	-323.46	339.71	0.00	0.00	0.00



Scientific Drilling
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Site Tumak Federal #4
Company:	COG Operating LLC	TVD Reference:	GL Elev @ 3647 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL Elev @ 3647 00usft
Site:	Tumak Federal #4	North Reference:	Grid
Well:	Tumak Federal #4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 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)
5,400 00	4 60	252 21	5,386 15	-106 26	-331 10	347 73	0 00	0 00	0 00
5,413 89	4 60	252 21	5,400 00	-106 60	-332 16	348 85	0 00	0 00	0 00
PBHL-Tumak Fed #4									

Design Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude Longitude
West HL-Tumak Fed #4		0 00	0 00	0 00	-152 00	-280 90	665,075 80	555,861 40	32° 49' 41 693 N 104° 9' 5 323 W
- plan misses target center by 319 39usft at 0 00usft MD (0 00 TVD, 0 00 N, 0 00 E)									
- Rectangle (sides W0 00 H200 00 D0 00)									
South HL-Tumak Fed #4		0 00	0 00	0 00	-152 00	-280 90	665,075 80	555,861 40	32° 49' 41 693 N 104° 9' 5 323 W
- plan misses target center by 319 39usft at 0 00usft MD (0 00 TVD, 0 00 N, 0 00 E)									
- Rectangle (sides W200 00 H0 00 D0 00)									
PBHL-Tumak Fed #4		0 00	0 01	5,400 00	-106 60	-332 16	665,121 21	555,810 14	32° 49' 42 143 N 104° 9' 5 923 W
- plan hits target center									
- Circle (radius 50 00)									

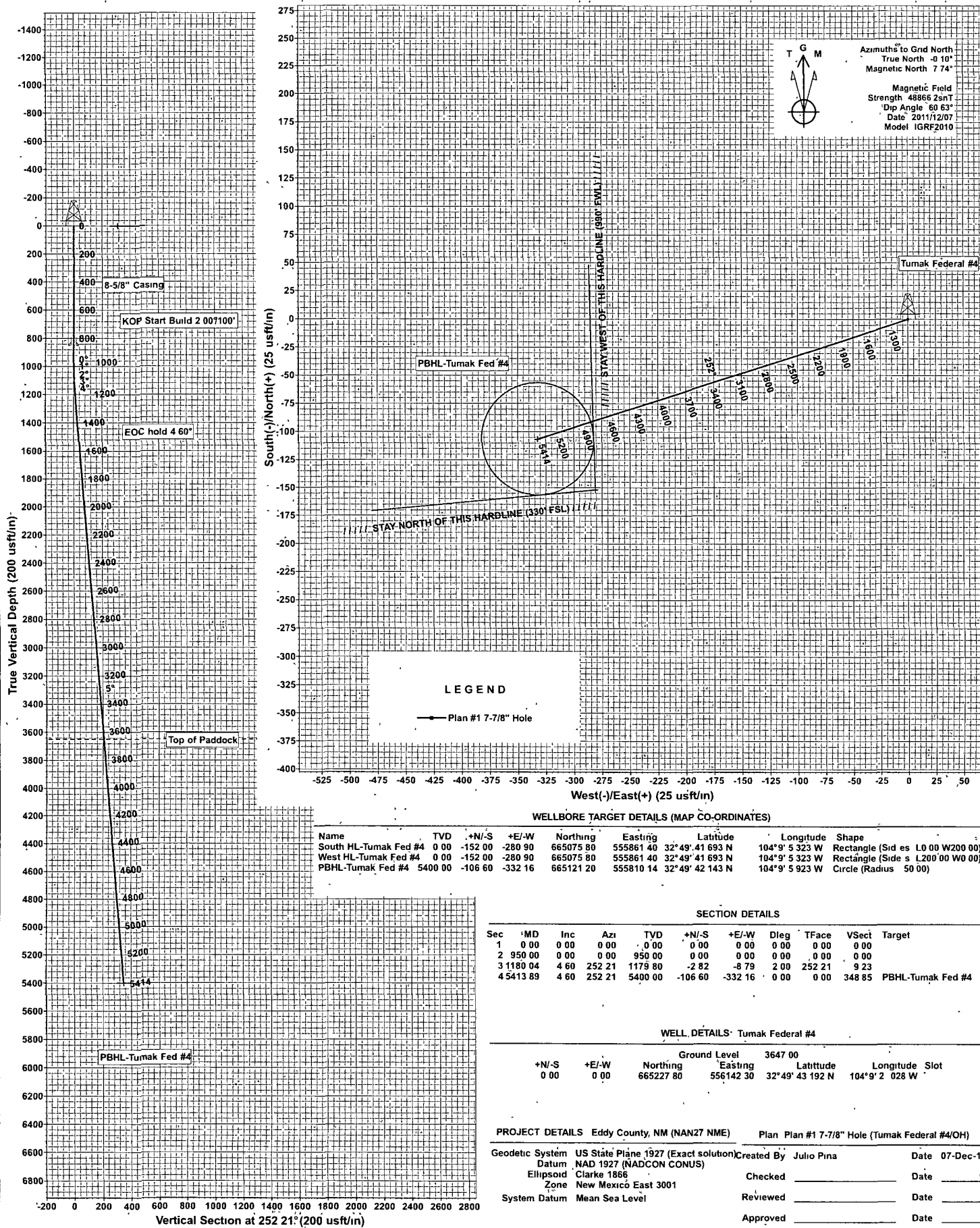
Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
850 00	850 00	8-5/8" Casing	8-5/8	12-1/4

Formations				
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°) Direction
3,658 23	3,650 00	Top of Paddock		0 00

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)		Comment
950 00	950 00	.0 00	0 00		KOP Start Build 2 00°/100'
1,180 04	1,179 79	-2 82	-8 79		EOC hold 4 60°



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Tumak Federal #4
Wellbore: OH
Design: Plan #1 7-7/8" Hole



Azimuths to Grid North
True North -0.10°
Magnetic North 7.74°

Magnetic Field
Strength 48866.2 nT
Dip Angle 60.63°
Date 2011/12/07
Model IGRF2010

LEGEND

Plan #1 7-7/8" Hole

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
South HL-Tumak Fed #4	0 00	-152 00	-280 90	665075 80	555861 40	32°49' 41 693 N	104°9' 5 323 W	Rectangle (Side s L0 00 W200 00)
West HL-Tumak Fed #4	0 00	-152 00	-280 90	665075 80	555861 40	32°49' 41 693 N	104°9' 5 323 W	Rectangle (Side s L200 00 W0 00)
PBHL-Tumak Fed #4	5400 00	-106 60	-332 16	665121 20	555810 14	32°49' 42 143 N	104°9' 5 923 W	Circle (Radius 50 00)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
2	950 00	0 00	0 00	950 00	0 00	0 00	0 00	0 00	0 00	
3	1180 04	4 60	252 21	1179 80	-2 82	-8 79	2 00	252 21	9 23	
4	5413 89	4 60	252 21	5400 00	-106 60	-332 16	0 00	0 00	348 85	PBHL-Tumak Fed #4

WELL DETAILS: Tumak Federal #4

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0 00	0 00	665227 80	556142 30	32°49' 43 192 N	104°9' 2 028 W	

PROJECT DETAILS Eddy County, NM (NAN27 NME) Plan Plan #1 7-7/8" Hole (Tumak Federal #4/OH)

Geodetic System	US State Plane 1927 (Exact solution)	Created By	Julio Pina	Date	07-Dec-11
Datum	NAD 1927 (NADCON CONUS)	Checked		Date	
Ellipsoid	Clarke 1866	Reviewed		Date	
Zone	New Mexico East 3001	Approved		Date	
System Datum	Mean Sea Level				

COG OPERATING LLC

550 West Texas, Suite 1300
Midland, TX 79701

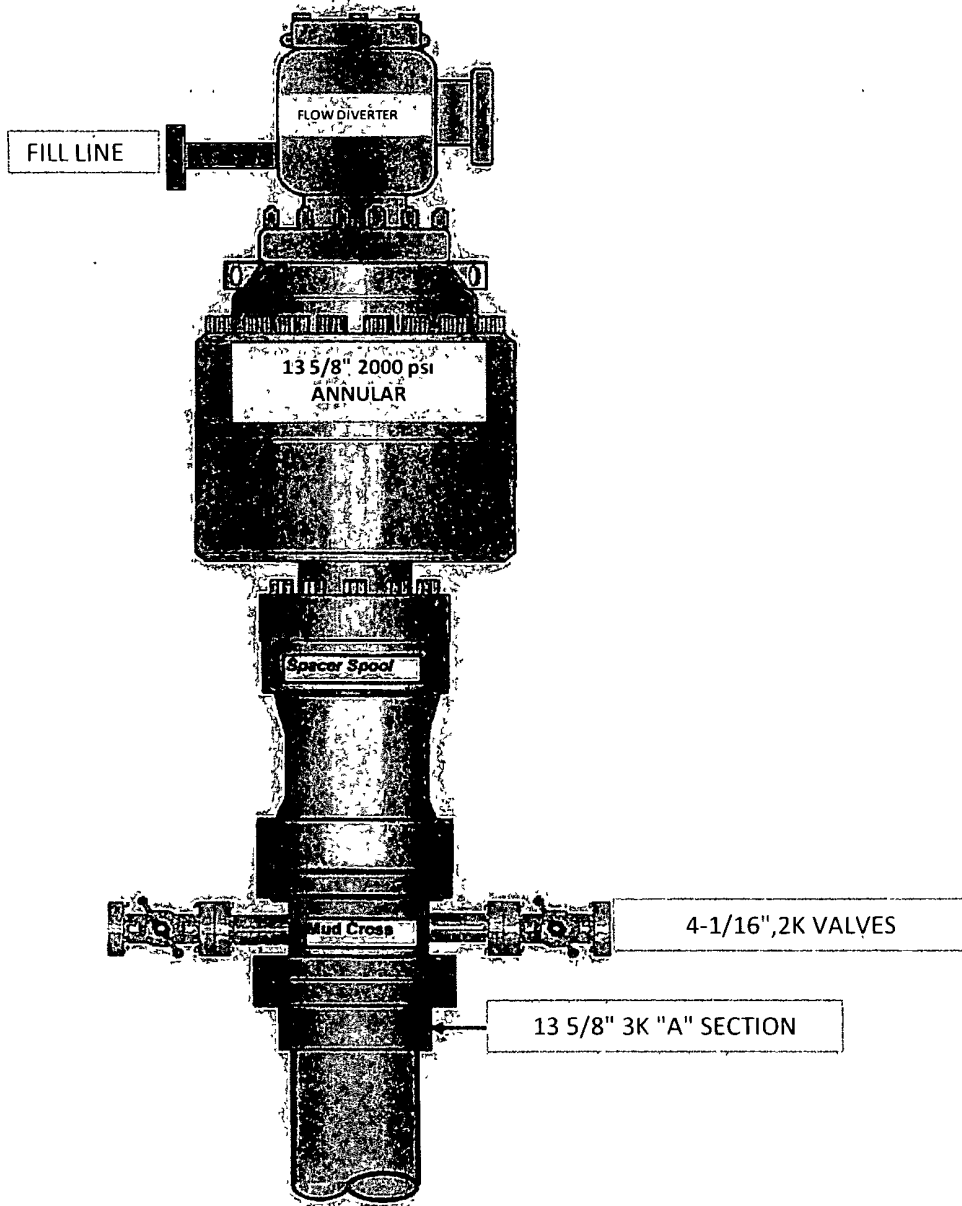
DIRECTIONAL PLAN VARIANCE REQUEST

**TUMAK FEDERAL #4
EDDY, NM**

SHL	455 FSL, 1275 FWL	Sec 14, T17S, R28E, Unit M
BHL	330 FSL, 990 FWL	Sec 14, T17S, R28E, Unit M

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.

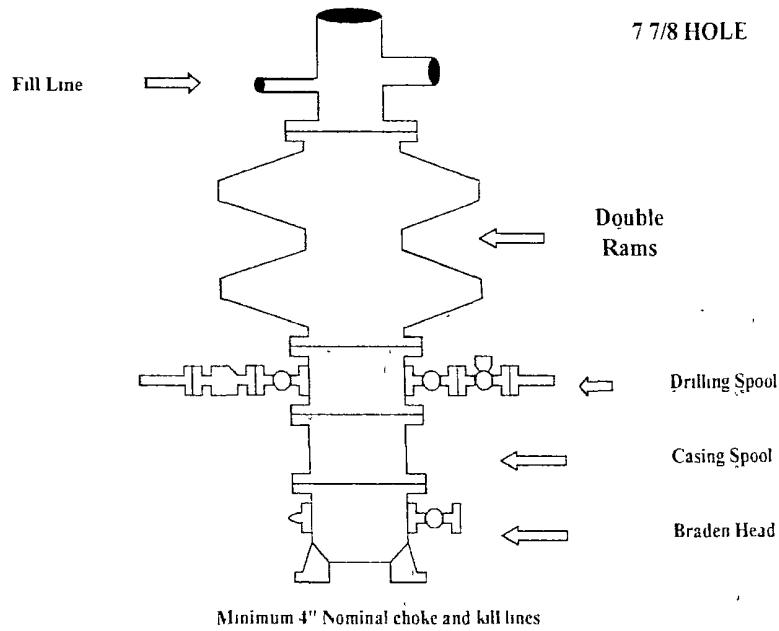
13 5/8" 2K ANNULAR



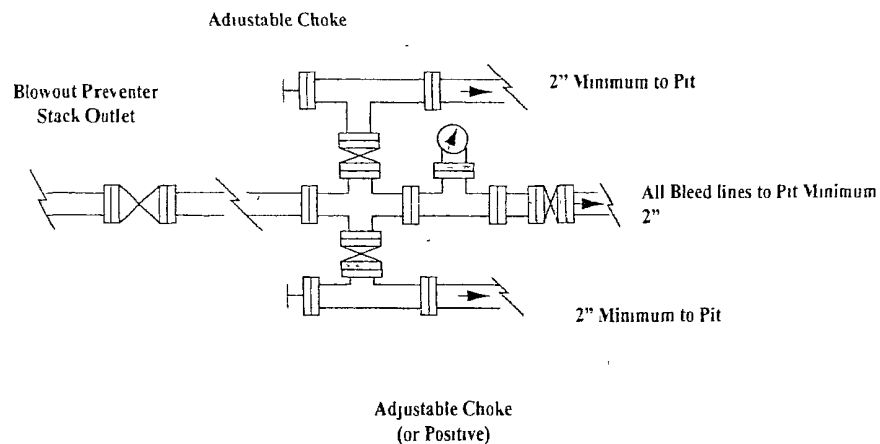
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



Choke Manifold Requirement (2000 psi WP)
No Annular Required

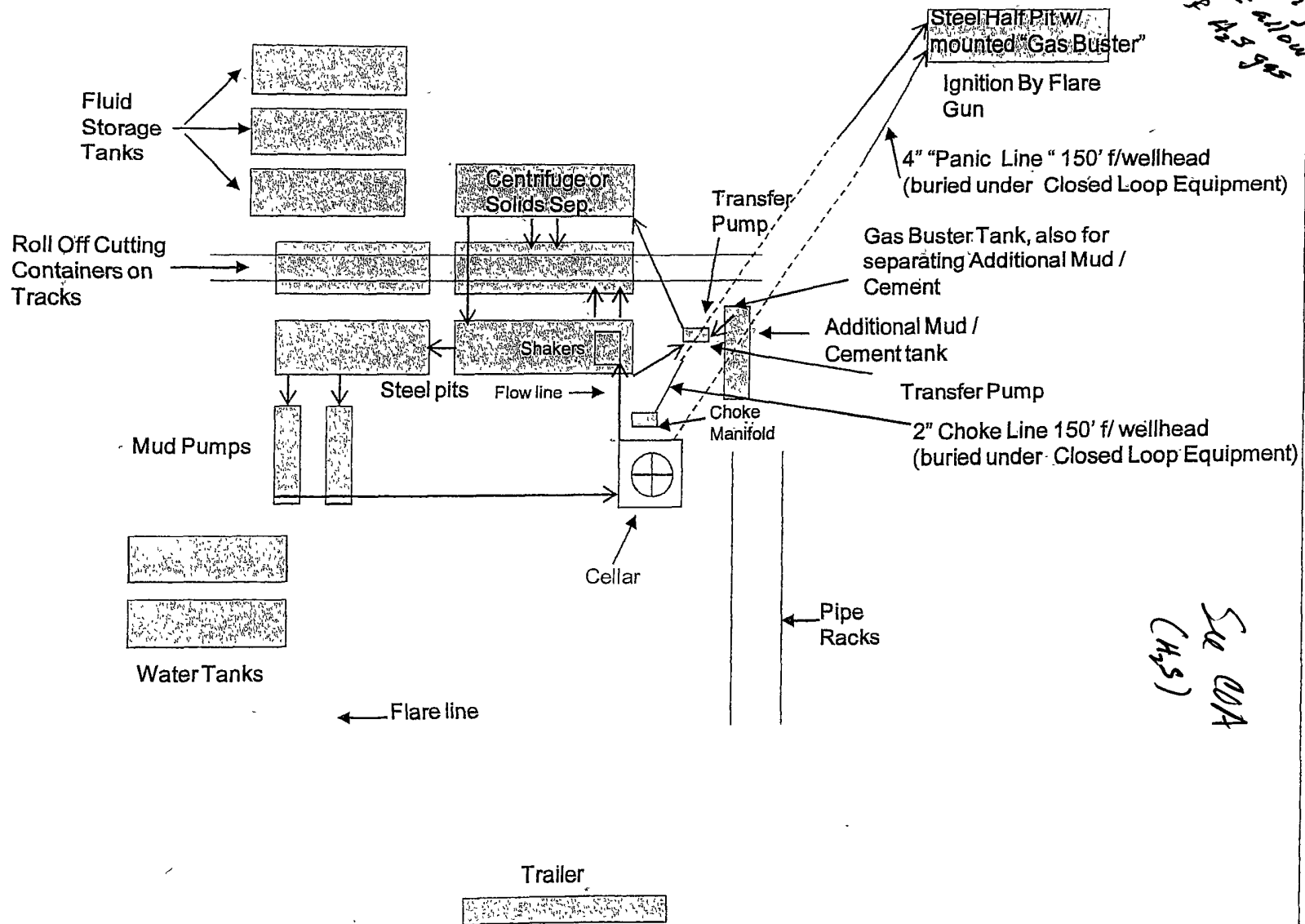


NOTES REGARDING THE BLOWOUT PREVENTERS**Master Drilling Plan
Eddy County, New Mexico**

- 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



Closed Loop Operation & Maintenance Procedure

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.

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

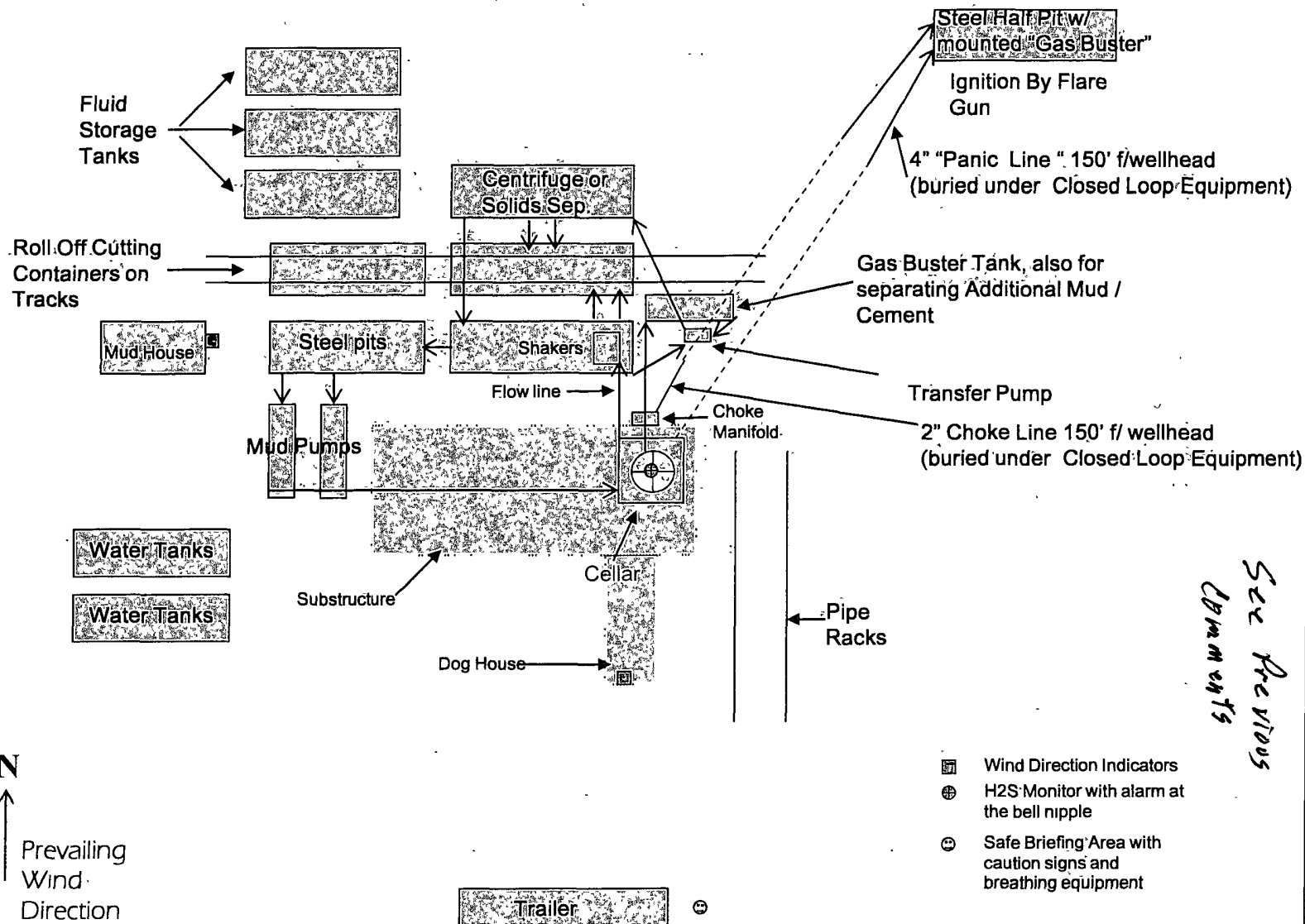
LEA COUNTY EMERGENCY NUMBERS

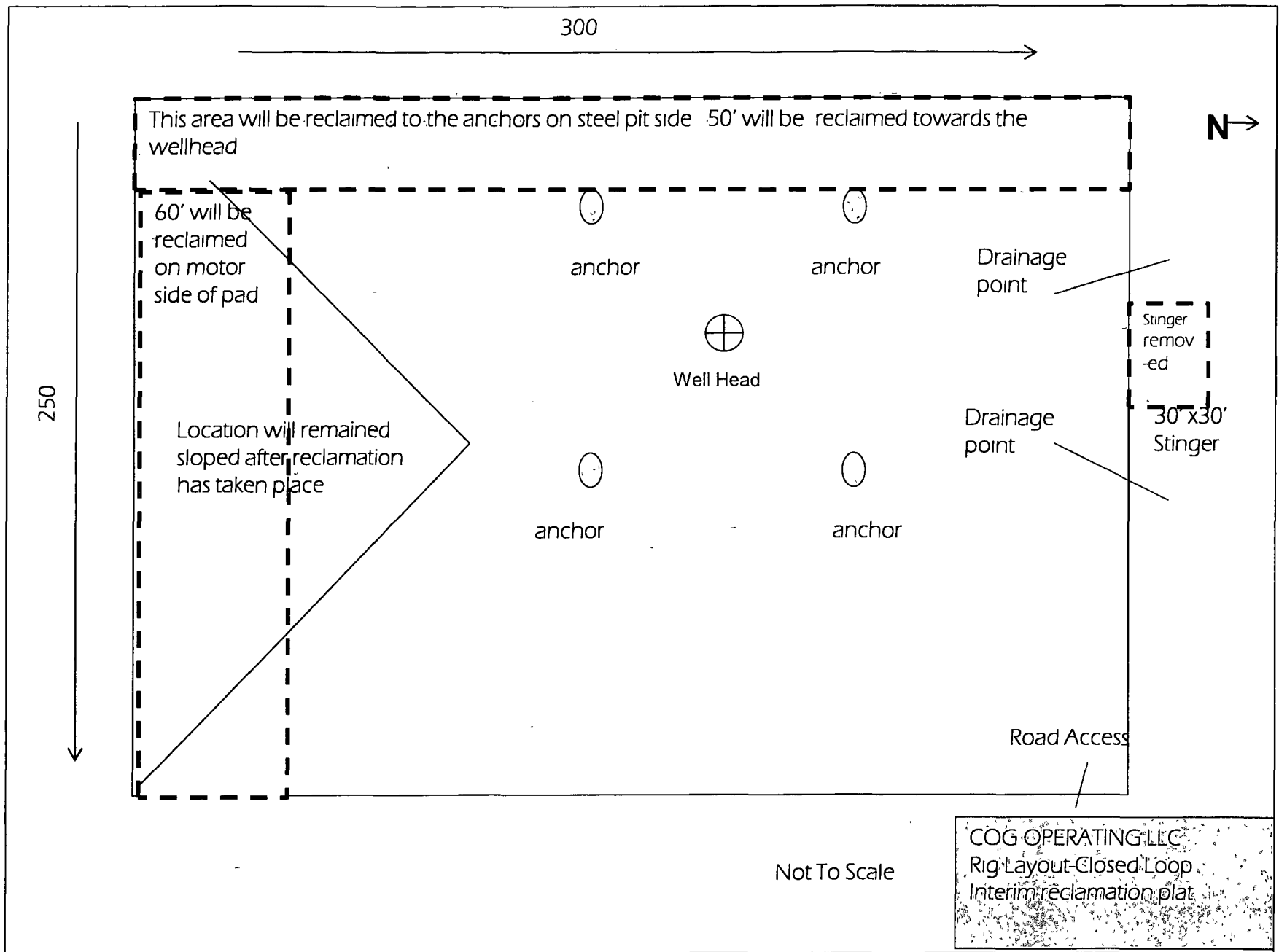
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8

Drilling Location - H2S Safety Equipment Diagram





Surface Use & Operating Plan

Tumak Federal #4

- Surface Tenant: Bogle Farms, Lewis Derrick, P O Box 441, Artesia, NM 88211.
- New Road: approx. 106'
- Flow Line: approx. 1.1 mile
- Facilities: Tumak Federal #3 Battery

Well Site Information

V Door: North

Topsoil: West

Interim Reclamation: South/West

Notes

-elevation change caused 320' move per BLM

Onsite: 8/4/2011

John Fast (BLM), Caden Jameson (COG), Gary Box (J.W.S)

**PECOS DISTRICT
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	COG Operating
LEASE NO.:	NM-118109
WELL NAME & NO.:	Tumak Federal #4
SURFACE HOLE FOOTAGE:	455' FSL & 1275' FWL
BOTTOM HOLE FOOTAGE:	330' FSL & 990' FWL
LOCATION:	Section 14, T.17 S., R.28 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**
- ☐ **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**