

OCD-ARTESIA

Form 3160-3
(April 2004)

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 ☒ DRILL ☐ REENTER		5 Lease Serial No. NMNM-127445
1b Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ 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, Suite 100 Midland TX 79701		8 Lease Name and Well No Blue Duck Federal #1H
3b Phone No. (include area code) (432) 685-4384		9 API Well No. 30-015-40448
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 380' FSL & 330' FWL, UL M At proposed prod. zone BHL: 380' FSL & 330' FEL, UL P		10 Field and Pool, or Exploratory Wildcat, Yeso WC-0056-01
11 Sec, T R M or Blk and Survey or Area Sec 30, T16S, R30E		12 County or Parish Eddy
13 State NM		14 Distance in miles and direction from nearest town or post office* 2.5 miles north of Loco Hills, NM
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any) 330'	16 No of acres in lease 393.15	17 Spacing Unit dedicated to this well 156.59
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 496'	19 Proposed Depth TVD: 4260' MD: 8526' PH: 4130'	20 BLM/BIA Bond No on file NMB000740; NMB000215
21 Elevations (Show whether DF, KDB, RT, GL, etc) 3711' 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.
2 A Drilling Plan
3 A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 4 Bond to cover the operations unless covered by an existing bond on file (see Item 20 above)
5 Operator certification
6 Such other site specific information and/or plans as may be required by the authorized officer |
|--|---|

25 Signature <i>Kacie Connolly</i>	Name (Printed/Typed) Kacie Connolly	Date 03/14/2012
Title Permitting Tech		

Approved by (Signature) James A. Amos	Name (Printed/Typed)	Date JUL 3 2012
Title FIELD MANAGER		
Office CARLSBAD FIELD OFFICE		

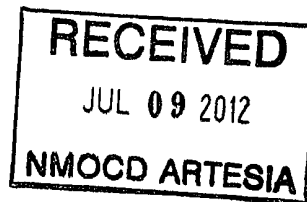
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon
Conditions of approval, if any, are attached.

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



**ATTACHED FOR
CONDITIONS OF APPROVAL**

**Approval Subject to General Requirements
& Special Stipulations Attached**

Surface Use Plan
COG Operating, LLC
Blue Duck Federal IH
SL: 380' FSL & 330' FWL *UN 4*
BHL: 380' FSL & 330' FEL *UL P*
Section 30, T-16-S, R-30-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 9th day of February, 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@conchoresources.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, 201

Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 40448	Pool Code 97960	Pool Name WC-005 G-01 SL 3030m; GL-YESO Wildcat; YESO
Property Code 39323	Property Name BLUE DUCK FEDERAL	Well Number 1H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3711'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	30	16-S	30-E		380	SOUTH	330	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
P	30	16-S	30-E		380	SOUTH	330	EAST	EDDY
Dedicated Acres 156.59	Joint or Infill	Consolidation Code	Order No.						
							8526	7/3	

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

LOT 1 36 51 AC LOT 2 36 54 AC LOT 3 36 56 AC LOT 4 36 59 AC Project Area Producing Area GRID AZ = 89°50'04" HORIZ DIST. = 4512.4' SEE DETAIL	CORNER COORDINATES TABLE (A) - Y=687204.3 N, X=596456.2 E (B) - Y=687220.0 N, X=601626.1 E (C) - Y=685884.0 N, X=596459.9 E (D) - Y=658898.9 N, X=601631.4 E DETAIL 3712.8' 3714.4' 600' 3711.6' 3715.7' GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=686264.8 N X=596788.8 E LAT = 32.886225° N LONG = 104.018037° W BOTTOM HOLE LOCATION Y=686277.9 N X=601300.0 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. <i>Robyn Odom</i> 4/11/2011 Signature Date Robyn Odom Printed Name Rodom@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. JANUARY 23, 2012 Date of Survey Signature of Professional Surveyor: RONALD J. EIDSON NEW MEXICO 3239 OFFICIAL SEAL Certification Number: 3239 AF JWSC W.O. 12.11.0101
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ATTACHMENT TO FORM 3160-3
COG Operating, LLC
BLUE DUCK FEDERAL #1H
SHL: 380' FSL & 330' FWL, Lot 4
BHL: 380' FSL & 330' FEL, Unit P
Sec 30, T16S, R30E
Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3711'
3. Proposed Depths: Pilot Hole TD 4630', Horizontal TVD = 4220', MD = 8527'
4. Estimated tops of geological markers:

Quaternary	Surface
Rustler	260'
Top of Salt	410'
Base of Salt	1090'
Yates	1100'
Seven Rivers	1350'
Queen	1890'
Grayburg	2300'
San Andres	2660'
Glorieta	4060'
Paddock	4210'
Blinbry	4490'
Tubb	5350'

5. Possible mineral bearing formations:

Water Sand	150'	Fresh Water
Yates	1100'	Oil/Gas
Queen	1890'	Oil/Gas
San Andres	2660'	Oil/Gas
Paddock	4210'	Oil/Gas
Blinebry	4490'	Oil/Gas
Tubb	5350'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 400' 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 2700' 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 7" x 5 1/2" production casing back 200' into the intermediate casing (although cement volume is actually 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
10/17

**ATTACHMENT TO FORM 3160-3
COG Operating, LLC
BLUE DUCK FEDERAL #1H
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6. Casing Program - Proposed

<u>Hole size</u>	<u>Interval</u>	<u>OD of Casing</u>	<u>Weight</u>	<u>Cond.</u>	<u>Collar</u>	<u>Grade</u>
17-1/2"	0' - +/-400'	13-3/8"	48#	New	STC	H-40 or J-55 Hybrid
Collapse sf - 3.87, Burst sf - 8.70, Tension sf - 14.91						
12-1/4"	0' - +/-2700'	9-5/8"	40#	New	STC	J/K-55
Collapse sf - 2.88, Burst sf - 5.01, Tension sf - 8.11						
8-3/4" x 7 7/8" 0' - +/-8527'	7" x 5-1/2"	26#/17#	New	LTC	L-80	
7" Csg - Collapse sf - 2.20, Burst sf - 1.83, Tension sf - 3.84						
5 1/2" Csg - Collapse sf - 2.55, Burst sf - 1.95, Tension sf - 3.94						

Production string will be a tapered string with 7" 26# L-80 LTC ran from surface to kick off point (at 3742' MD) and then crossed over to 5 1/2" 17# L-80 LTC from there to TD.

7. Cement Program

13 3/8" Surface Csg: Set at +/- 400' MD. Lead Slurry: 450sx Class "C" w/ 2% CaCl₂ & .25 pps CF, 1.32 yield. 45% excess, calculated to surface.

9 5/8" Intrmd. Csg: Set at +/- 2700' MD. **Single Stage:** Lead Slurry: 500 sx Class C w/ 4% gel, 13.5 ppg and 1.75 yield. Tail Slurry: 200 sx Class "C", 1.32 yield. 194% excess, calculated to surface.

Multi Stage: **Stage 1:** 400 sx Class "C" w/ 2% CaCl₂, 1.32 yield. 43% excess. **Stage 2:** 500 sx 50:50:10:C:Poz:Gel w/ 5% salt, 5 pps LCM-1 .25 pps CF, 2.45 yield, back to surface, 176% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 450' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

7 x 5 1/2" Production Csg: Set at +/- 8527' MD. **Single Stage:** Lead Slurry: 400 sx 35:65:6:C:Poz:Gel w/ 5% salt, 5 pps LCM, 2% SMS, 3% FL-52A, .125 pps CF, 2.01 yd. Tail Slurry: 300 sx 50:50:2:C:Poz:Gel w/ 5% salt, 3 pps LCM, .6% SMS, 1% FL-25, 1% BA-58, .125 pps CF, .3% FL-52A; 1.37 yield. DV Tool and ECP to be set in the curve at approx 4210' TVD point with 7" cemented to surface and 5 1/2" run with +/- 18 isolation packers and sliding sleeves in uncemented lateral. 90% excess in open hole, from landing point, calculated to surface. **This is a minimum volume and will be adjusted up after caliper is run.** = 4400 M

Pilot Hole : 7 7/8" pilot hole from 3743' to 4630' plugged back to 3743' with 330 sks Class "C" with 0.3% R-3, 1.5% CD-32, yield 0.99 cf/sk. wt. 16.8 ppg 30% excess.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
BLUE DUCK FEDERAL #1H
Page 3 of 4

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 of 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 psi. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent B section well head 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.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 450' 320'	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
450' - 2700'	10	30	NC	Brine mud, lime for PH and paper for seepage and sweeps.
2700' - 8527'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.

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

10. Production Hole Drilling Summary:

Drill 8 3/4" hole to 3743' and reduce hole size to 7-7/8" Continue drilling to pilot hole depth of 4630' After logging pilot hole, plug it back to KOP with 330 sacks of cement. and kick off with 8-3/4" bit at +/- 3743', building curve over +/- 750' to horizontal at 4220' TVD. Drill 7 7/8" lateral section in a easterly direction for +/- 4511' lateral to TD at +/- 8527' MD, 4260' TVD. Run 7" x 5-1/2" production casing. 7" to be run from surface to kickoff point and changed over to 5 1/2" with DV Tool and ECP at approximately just above landing point. 5 1/2" casing will be run from kickoff point to td and isolation packers set throughout lateral. 7" to be cemented from kickoff point to surface.

11. 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
BLUE DUCK FEDERAL #1H
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12. Logging, Testing and Coring Program:

- A. No electric logs to be run. *See COA*
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point 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.

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

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD of pilot hole is 90 degrees and estimated maximum bottom hole pressure is 1800 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, however an H2S plan is attached to the Drilling Program. No major loss of circulation zones *have* been reported in offsetting wells.

14. Anticipated Starting Date

Drilling operations will commence approximately on May 30, 2012 with drilling and completion operations lasting approximately 90 days.



COG Operating LLC

Eddy County, NM (NAN27 NME)

Blue Duck Federal #1H

Blue Duck Federal #1H

OH

Plan: Plan #2 8-3/4" Hole

SHL = 380' FSL & 330' FWL

BHL = 380' FSL & 330' FEL

Standard Planning Report

14 February, 2012



Scientific Drilling
Directional Drilling Operations



SDI
Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Blue Duck Federal #1H
Company:	COG Operating LLC	TVD Reference:	GL @ 3711.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3711.00usft
Site:	Blue Duck Federal #1H	North Reference:	Grid
Well:	Blue Duck Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 - 8-3/4" 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:	Blue Duck Federal #1H		
Site Position:		Northing:	686,264.80 usft
From:	Map	Easting:	596,788.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 53' 10.411 N
		Longitude:	104° 1' 4.931 W
		Grid Convergence:	0.17°

Well:	Blue Duck Federal #1H					
Well Position	+N/-S	0 00 usft	Northing:	686,264 80 usft	Latitude:	32° 53' 10 411 N
	+E/-W	0 00 usft	Easting:	596,788 80 usft	Longitude:	104° 1' 4 931 W
Position Uncertainty		0 00 usft	Wellhead Elevation:		Ground Level:	3,711 00 usft

Wellbore:	OH
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Magnetics:	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	02/14/12	7.76	60.71	48,897

Design		Plan #2 - 8-3/4" 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	89 83

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	
3,742.50	0.00	0.00	3,742.50	0.00	0.00	0.00	0.00	0.00	0.00	
4,487.86	89.43	89.83	4,220.00	1.37	472.79	12.00	12.00	0.00	89.83	
8,526.49	89.43	89.83	4,260.00	13.10	4,511.20	0.00	0.00	0.00	0.00	PBHL-Blue Duck Fed



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Blue Duck Federal #1H
Company:	COG Operating LLC	TVD Reference:	GL @ 3711' 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3711' 00usft
Site:	Blue Duck Federal #1H	North Reference:	Grid
Well:	Blue Duck Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2' 8-3/4" Hole		

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
3,742 50	0 00	0 00	3,742 50	0 00	0 00	0 00	0 00	0 00	0 00
KOP Start Build 12.00°/100'									
3,800 00	6 90	89 83	3,799 86	0 01	3 46	3 46	12 00	12 00	0 00
3,900 00	18 90	89 83	3,897 16	0 07	25 74	25 74	12 00	12 00	0 00
4,000 00	30 90	89 83	3,987 70	0 20	67 76	67 76	12 00	12 00	0 00
4,100 00	42 89	89 83	4,067 53	0 37	127 69	127 69	12 00	12 00	0 00
4,200 00	54 89	89 83	4,133 15	0 59	202 90	202 90	12 00	12 00	0 00
4,300 00	66 89	89 83	4,181 71	0 84	290 11	290 11	12 00	12 00	0 00
4,400 00	78 89	89 83	4,211 07	1 12	385 51	385 51	12 00	12 00	0 00
4,487 86	89 43	89 83	4,220 00	1 37	472 79	472 79	12 00	12 00	0 00
EOC hold 89.43°									
4,500 00	89 43	89 83	4,220 12	1 41	484 93	484 93	0 00	0 00	0 00
4,600 00	89 43	89 83	4,221 11	1 70	584 92	584 93	0 00	0 00	0 00
4,700 00	89 43	89 83	4,222 10	1 99	684 92	684 92	0 00	0 00	0 00
4,800 00	89 43	89 83	4,223 09	2 28	784 91	784 92	0 00	0 00	0 00
4,900 00	89 43	89 83	4,224 08	2 57	884 91	884 91	0 00	0 00	0 00
5,000 00	89 43	89 83	4,225 07	2 86	984 90	984 91	0 00	0 00	0 00
5,100 00	89 43	89 83	4,226 06	3 15	1,084 90	1,084 90	0 00	0 00	0 00
5,200 00	89 43	89 83	4,227 05	3 44	1,184 89	1,184 90	0 00	0 00	0 00
5,300 00	89 43	89 83	4,228 04	3 73	1,284 89	1,284 89	0 00	0 00	0 00
5,400 00	89 43	89 83	4,229 03	4 02	1,384 88	1,384 89	0 00	0 00	0 00
5,500 00	89 43	89 83	4,230 02	4 31	1,484 88	1,484 88	0 00	0 00	0 00
5,600 00	89 43	89 83	4,231 01	4 60	1,584 87	1,584 88	0 00	0 00	0 00
5,700 00	89 43	89 83	4,232 01	4 89	1,684 86	1,684 87	0 00	0 00	0 00
5,800 00	89 43	89 83	4,233 00	5 18	1,784 86	1,784 87	0 00	0 00	0 00
5,900 00	89 43	89 83	4,233 99	5 47	1,884 85	1,884 86	0 00	0 00	0 00
6,000 00	89 43	89 83	4,234 98	5 76	1,984 85	1,984 86	0 00	0 00	0 00
6,100 00	89 43	89 83	4,235 97	6 05	2,084 84	2,084 85	0 00	0 00	0 00
6,200 00	89 43	89 83	4,236 96	6 34	2,184 84	2,184 85	0 00	0 00	0 00
6,300 00	89 43	89 83	4,237 95	6 63	2,284 83	2,284 84	0 00	0 00	0 00
6,400 00	89 43	89 83	4,238 94	6 93	2,384 83	2,384 84	0 00	0 00	0 00
6,500 00	89 43	89 83	4,239 93	7 22	2,484 82	2,484 83	0 00	0 00	0 00
6,600 00	89 43	89 83	4,240 92	7 51	2,584 82	2,584 83	0 00	0 00	0 00
6,700 00	89 43	89 83	4,241 91	7 80	2,684 81	2,684 82	0 00	0 00	0 00
6,800 00	89 43	89 83	4,242 90	8 09	2,784 81	2,784 82	0 00	0 00	0 00
6,900 00	89 43	89 83	4,243 89	8 38	2,884 80	2,884 81	0 00	0 00	0 00
7,000 00	89 43	89 83	4,244 88	8 67	2,984 80	2,984 81	0 00	0 00	0 00
7,100 00	89 43	89 83	4,245 87	8 96	3,084 79	3,084 80	0 00	0 00	0 00
7,200 00	89 43	89 83	4,246 86	9 25	3,184 79	3,184 80	0 00	0 00	0 00
7,300 00	89 43	89 83	4,247 85	9 54	3,284 78	3,284 79	0 00	0 00	0 00
7,400 00	89 43	89 83	4,248 84	9 83	3,384 77	3,384 79	0 00	0 00	0 00
7,500 00	89 43	89 83	4,249 83	10 12	3,484 77	3,484 78	0 00	0 00	0 00
7,600 00	89 43	89 83	4,250 82	10 41	3,584 76	3,584 78	0 00	0 00	0 00
7,700 00	89 43	89 83	4,251 81	10 70	3,684 76	3,684 77	0 00	0 00	0 00
7,800 00	89 43	89 83	4,252 80	10 99	3,784 75	3,784 77	0 00	0 00	0 00
7,900 00	89 43	89 83	4,253 80	11 28	3,884 75	3,884 76	0 00	0 00	0 00
8,000 00	89 43	89 83	4,254 79	11 57	3,984 74	3,984 76	0 00	0 00	0 00
8,100 00	89 43	89 83	4,255 78	11 86	4,084 74	4,084 75	0 00	0 00	0 00
8,200 00	89 43	89 83	4,256 77	12 15	4,184 73	4,184 75	0 00	0 00	0 00
8,300 00	89 43	89 83	4,257 76	12 44	4,284 73	4,284 74	0 00	0 00	0 00
8,400 00	89 43	89 83	4,258 75	12 73	4,384 72	4,384 74	0 00	0 00	0 00
8,500 00	89 43	89 83	4,259 74	13 02	4,484 72	4,484 73	0 00	0 00	0 00
8,526 49	89 43	89 83	4,260 00	13 10	4,511 20	4,511 22	0 00	0 00	0 00



Database:	EDM 5000 1: Single User Db	Local Co-ordinate Reference:	Site Blue Duck Federal #1H
Company:	COG Operating LLC	TVD Reference:	GL @ 3711 00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GL @ 3711 00usft
Site:	Blue Duck Federal #1H	North Reference:	Grid
Well:	Blue Duck Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 8-3/4" 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)
PBHL-Blue Duck Fed #1H									

Design Targets

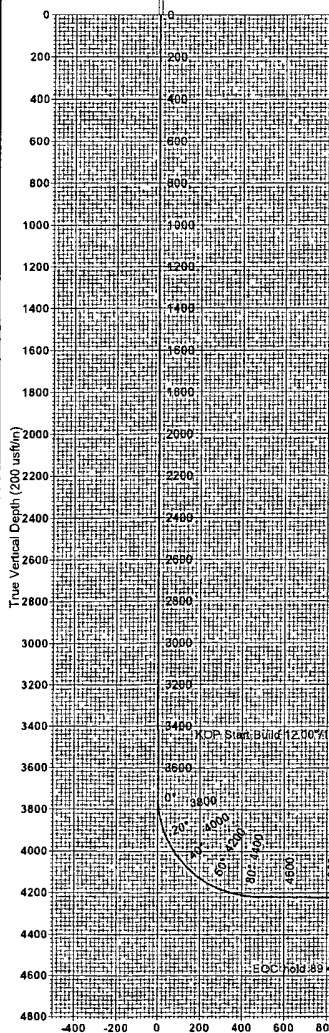
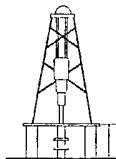
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Blue Duck Fed #1	- plan hits target center	0 00	0 00	4,260 00	13 10	4,511 20	686,277 90	601,300 00	32° 53' 10 404 N	104° 0' 12 028 W
	- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,742 50	3,742 50	0 00	0 00	KOP Start Build 12 00°/100'
4,487 86	4,220 00	1 37	472 79	EOC hold 89 43°



Blue Duck Federal #1H
Eddy County, NM (NAN27 NME)
Northing (Y) 686264.80
Easting (X) 596788.80
Plan #2 8-3/4" Hole



WELL DETAILS Blue Duck Federal #1H									
	Ground Level	3711.00							
	North	East	Lat	Long	Slat				
+N-S	0.00	0.00	686264.80	596788.80	32° 53' 10.411 N	104° 1' 4.931 W			

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Deg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3742.50	0.00	0.00	3742.50	0.00	0.00	0.00	0.00	0.00
3	4467.85	89.43	89.83	4220.00	1.37	472.79	12.00	89.83	472.79
4	8526.49	89.43	89.83	4260.00	13.10	4511.20	0.00	0.00	4511.22
PBHL-Blue Duck Fed #1H									

DESIGN TARGET DETAILS									
Name	TVD	+N-S	+E-W	North	East	Lat	Long	Shape	
PBHL-Blue Duck Fed #1H	4260.00	13.10	4511.20	686277.90	601300.0032	53° 10.404 N	104° 0' 12.028 W	Poni	
plan 1H's target center									



Azimuth to Grid North
True North -0.17°
Magnetic North 7.58°
Magnetic Field
Strength 48596 StatT
Dip Angle 60.71°
Date 02/14/2012
To convert a Magnetic Direction to a Grid Direction, Add 7.59°
To convert a True Direction to a Grid Direction, Subtract 0.17° Model IGRF2010

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

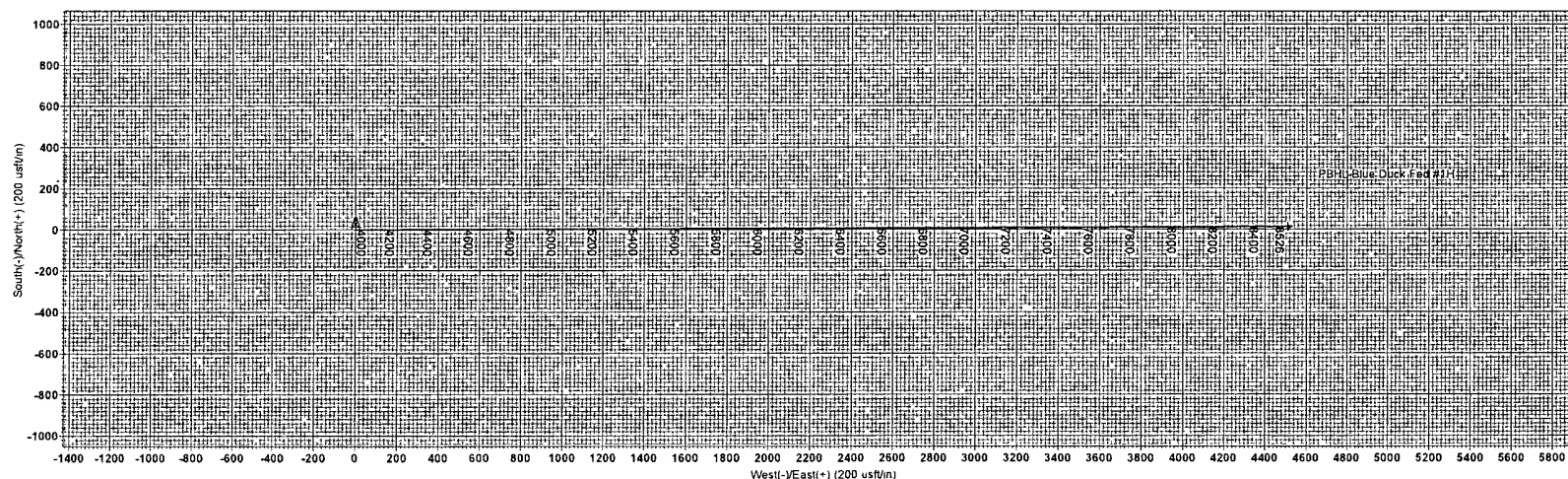
SITE DETAILS Blue Duck Federal #1H
Site Centre Northing 686264.80
Easting 596788.80
Positional Uncertainty 0.00
Convergence 0.17
Local North Grid

Map System US State Plane 1927 (Exact solution)
Datum NAD 1927 (NADCON CONUS)
Ellipsoid Clarke 1866
Zone Name New Mexico East 3001
Local Origin See Blue Duck Federal #1H, Grid North
Latitude 32° 53' 10.411 N
Longitude 104° 1' 4.931 W
Grid East 596788.80
Grid North 686264.80
Scale Factor 1.000

Geomagnetic Model IGRF2010
Sample Date 14-Feb-12
Magnetic Declination 7.76°
Dip Angle from Horizontal 60.71°
Magnetic Field Strength 48597
To convert a Magnetic Direction to a Grid Direction, Add 7.59°
To convert a Magnetic Direction to a True Direction, Add 7.76° East
To convert a True Direction to a Grid Direction, Subtract 0.17°

LEGEND

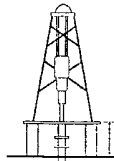
Plan #2 8-3/4" Hole



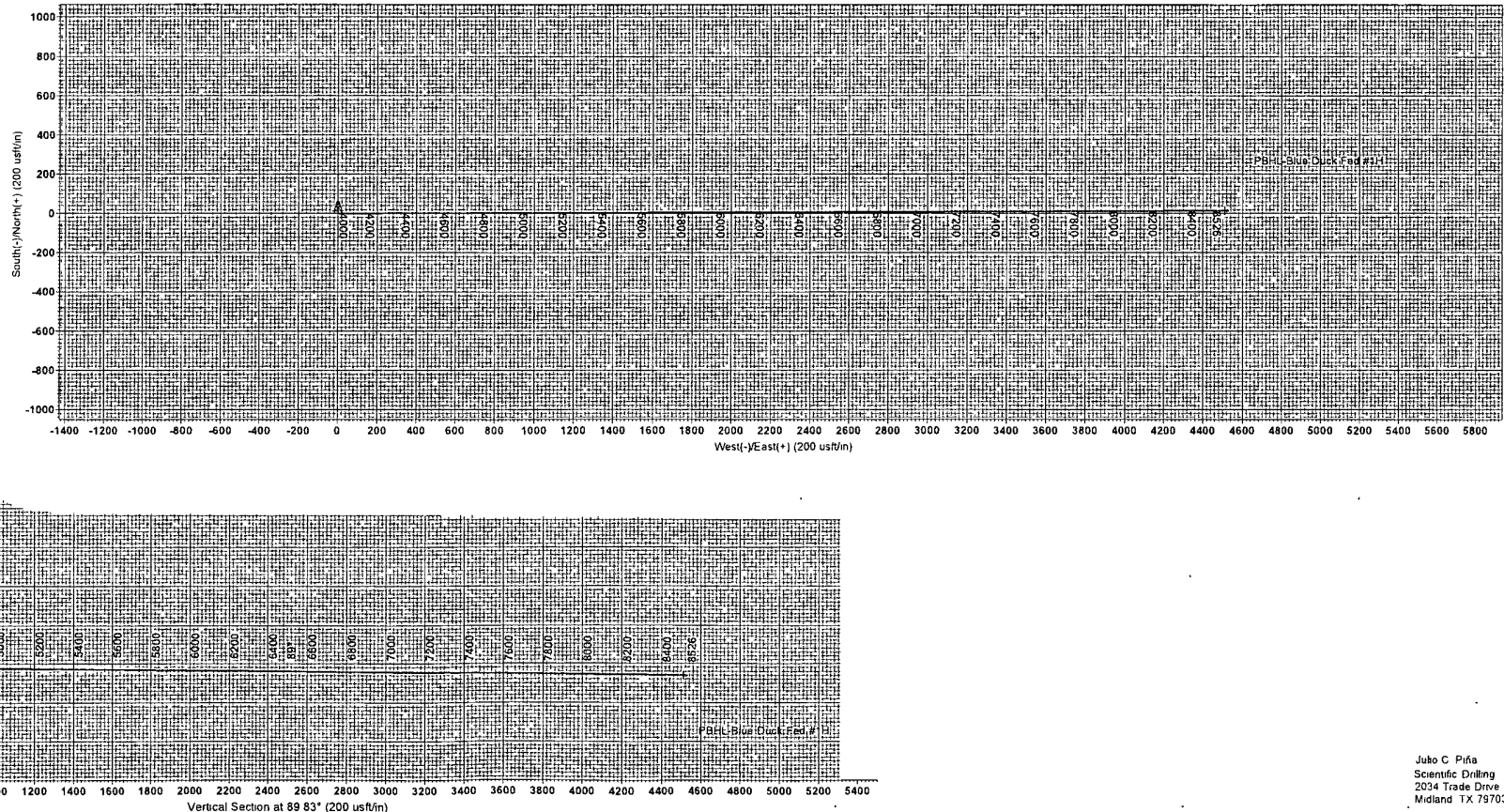
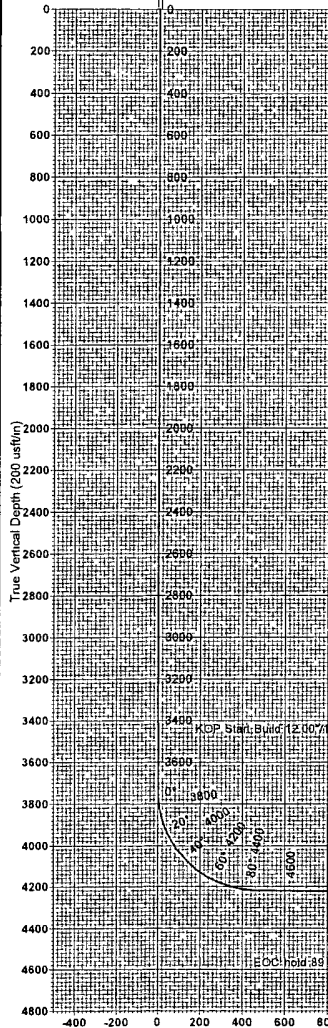
Vertical Section at 89.83° (200 usf/in)



Blue Duck Federal #1H
Eddy County, NM (NAN27 NME)
Northing (Y) 686264.80
Easting (X) 596788.80
Plan #2 8-3/4" Hole



GL 3711.00



WELL DETAILS Blue Duck Federal #1H

	+N/-S	+E/-W	Northing	Ground Level	3711.00	Latitude	Longitude	Spot
	0.00	0.00	686264.80	Easting	596788.80	32° 53' 10.411 N	104° 1' 4.931 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Deg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3742.50	0.00	0.50	3742.50	0.00	0.00	0.00	0.00	0.00	
3	4487.86	89.43	89.83	4220.00	1.37	472.79	12.00	89.83	472.79	
4	4526.49	89.43	89.83	4250.00	13.10	4511.20	0.00	0.00	4511.22	PBHL-Blue Duck Fed #1H

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL-Blue Duck Fed #1H	4250.00	1.37	4511.20	686277.90	601300.0032° 53'	104° 0' 12.028 W		Point
-plan hls target center								

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

SITE DETAILS Blue Duck Federal #1H

See Centre Northing 686264.80
Easting 596788.80

Positional Uncertainty: 0.00
Convergence: 0.17
Local North: Grid

LEGEND

Plan #2 8-3/4" Hole



Azimuths to Grid North
True North -0.17°
Magnetic North 7.59°

Magnetic Field
Strength 48896 SenT
Dip Angle 60.71°
Date 02/14/2012
To convert a Magnetic Direction to a Grid Direction: Subtract 0.17°
To convert a True Direction to a Grid Direction: Subtract 0.17°

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: See Blue Duck Federal #1H Grid North

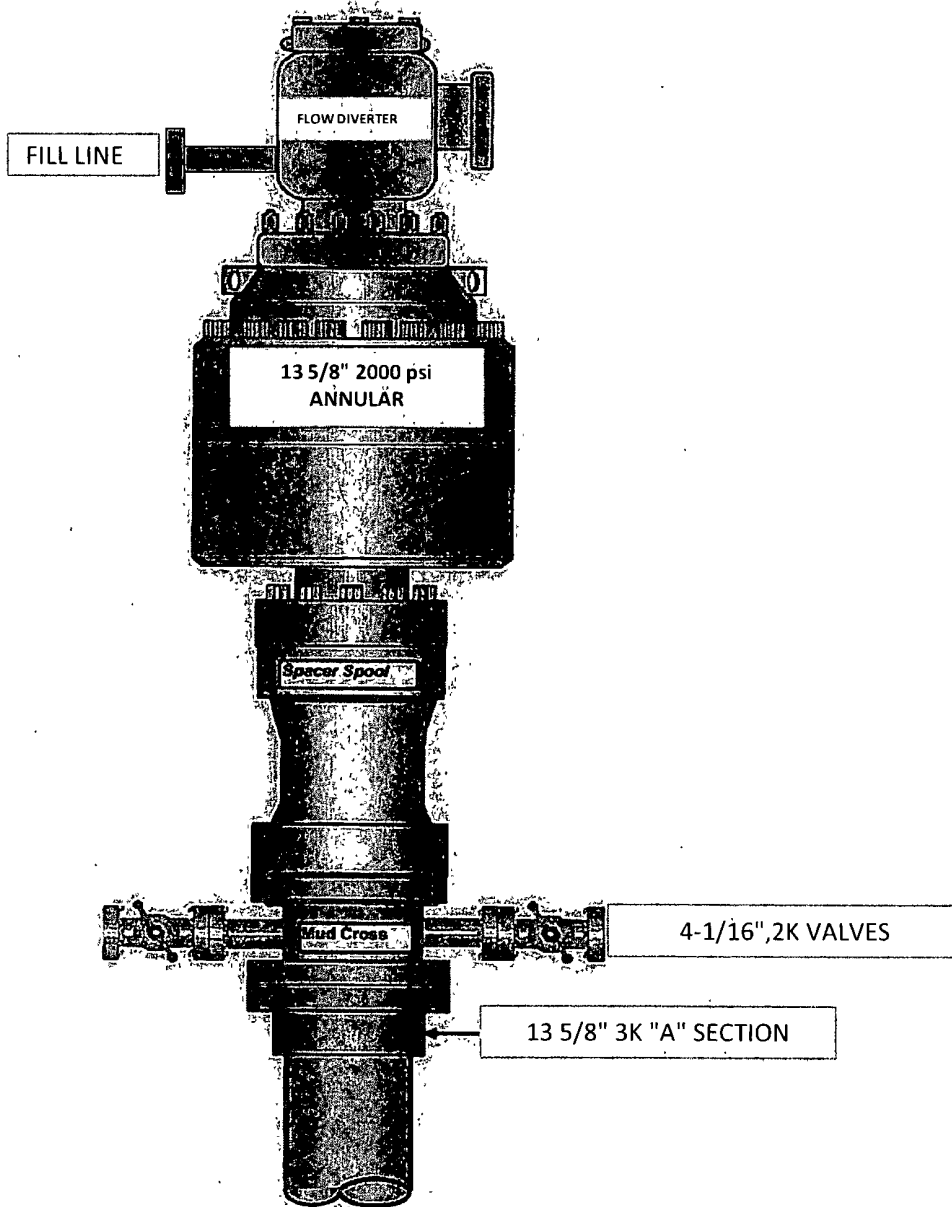
Latitude: 32° 53' 10.411 N
Longitude: 104° 1' 4.931 W

Grid East: 596788.80
Grid North: 686264.80
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 14-Feb-12
Magnetic Declination: 7.76°
Dip Angle from Horizontal: 60.71°
Magnetic Field Strength: 48897

To convert a Magnetic Direction to a Grid Direction: Add 7.76°
To convert a Magnetic Direction to a True Direction: Add 7.76° East
To convert a True Direction to a Grid Direction: Subtract 0.17°

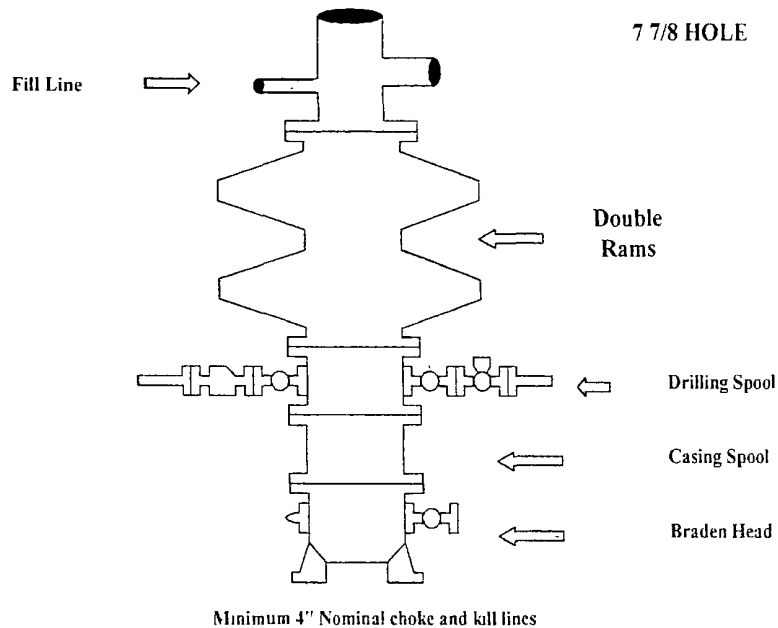
13 5/8" 2K ANNULAR



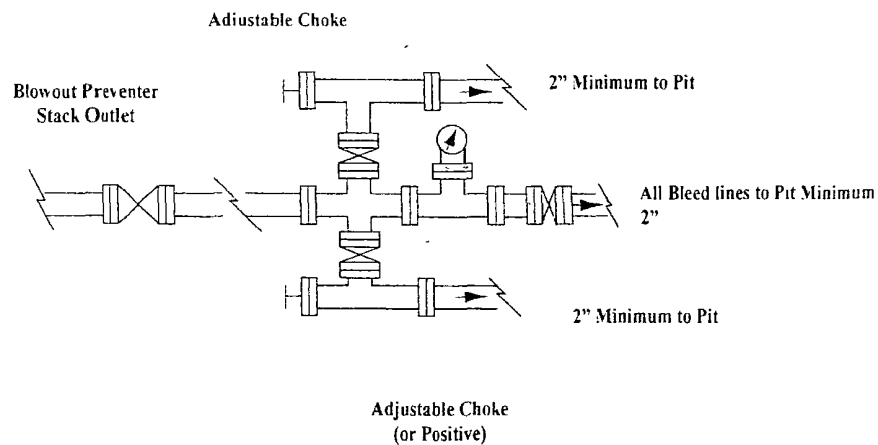
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



Choke Manifold Requirement (2000 psi WP)
No Annular Required

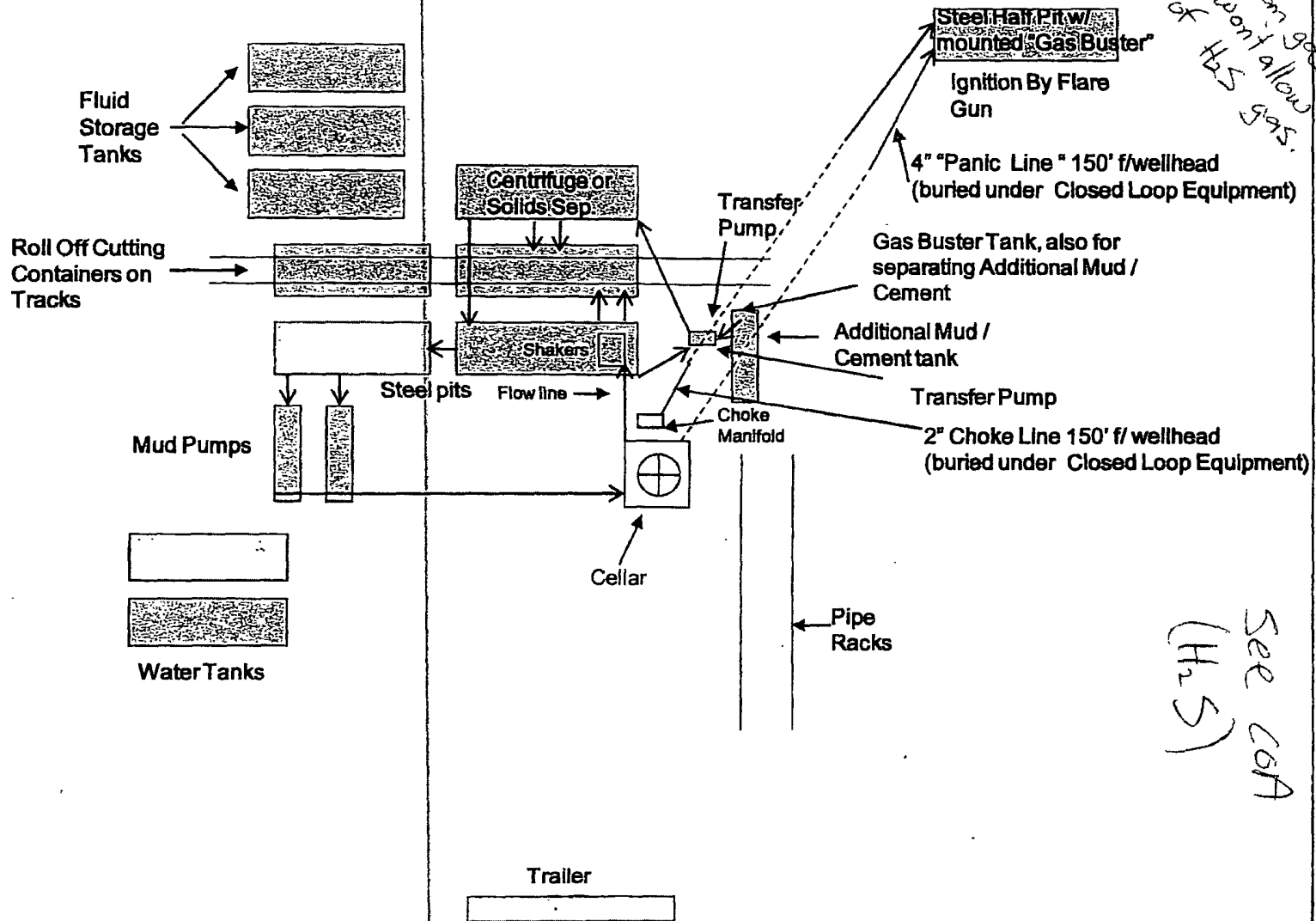


NOTES REGARDING THE BLOWOUT PREVENTERS

**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

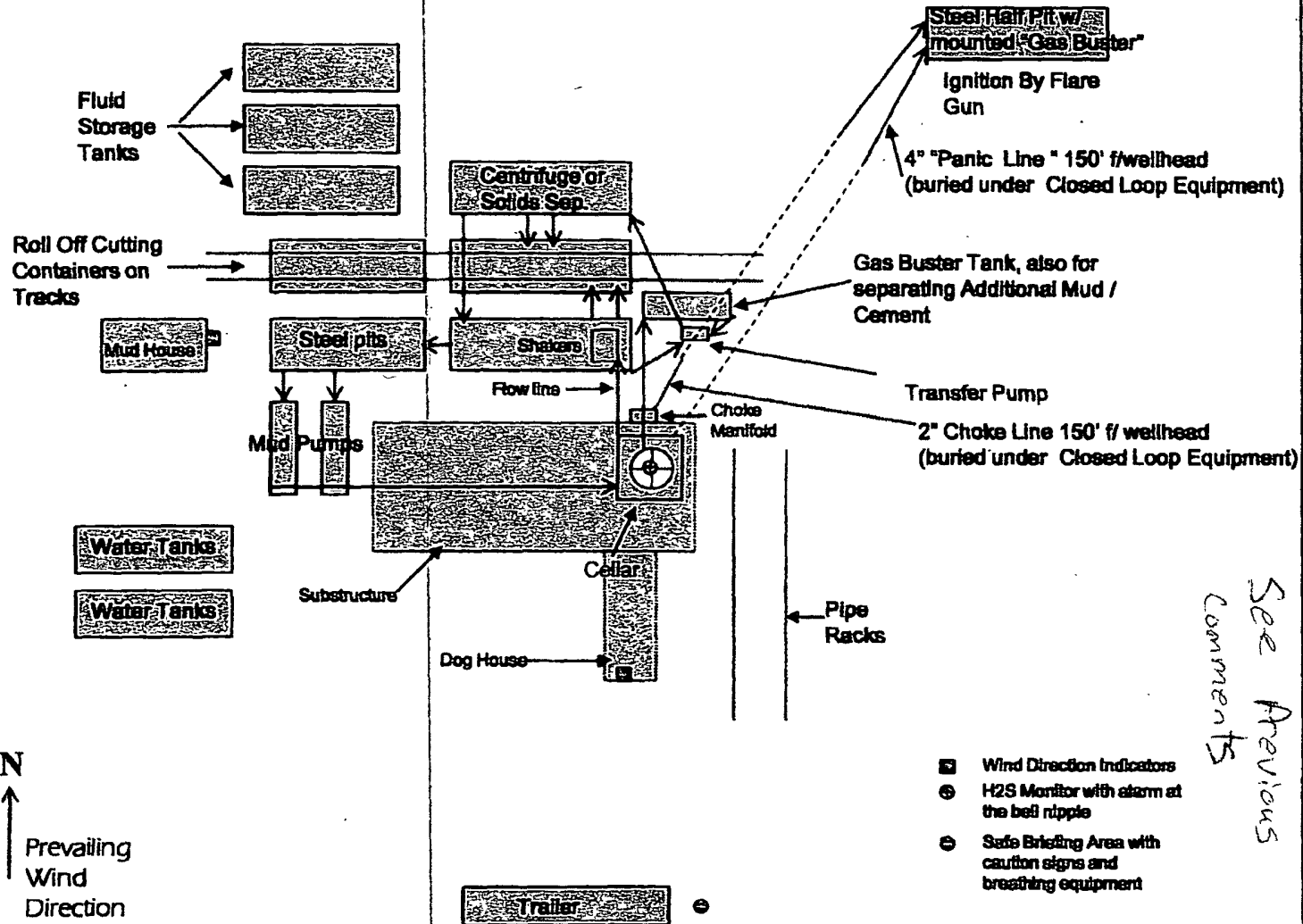
LEA COUNTY EMERGENCY NUMBERS

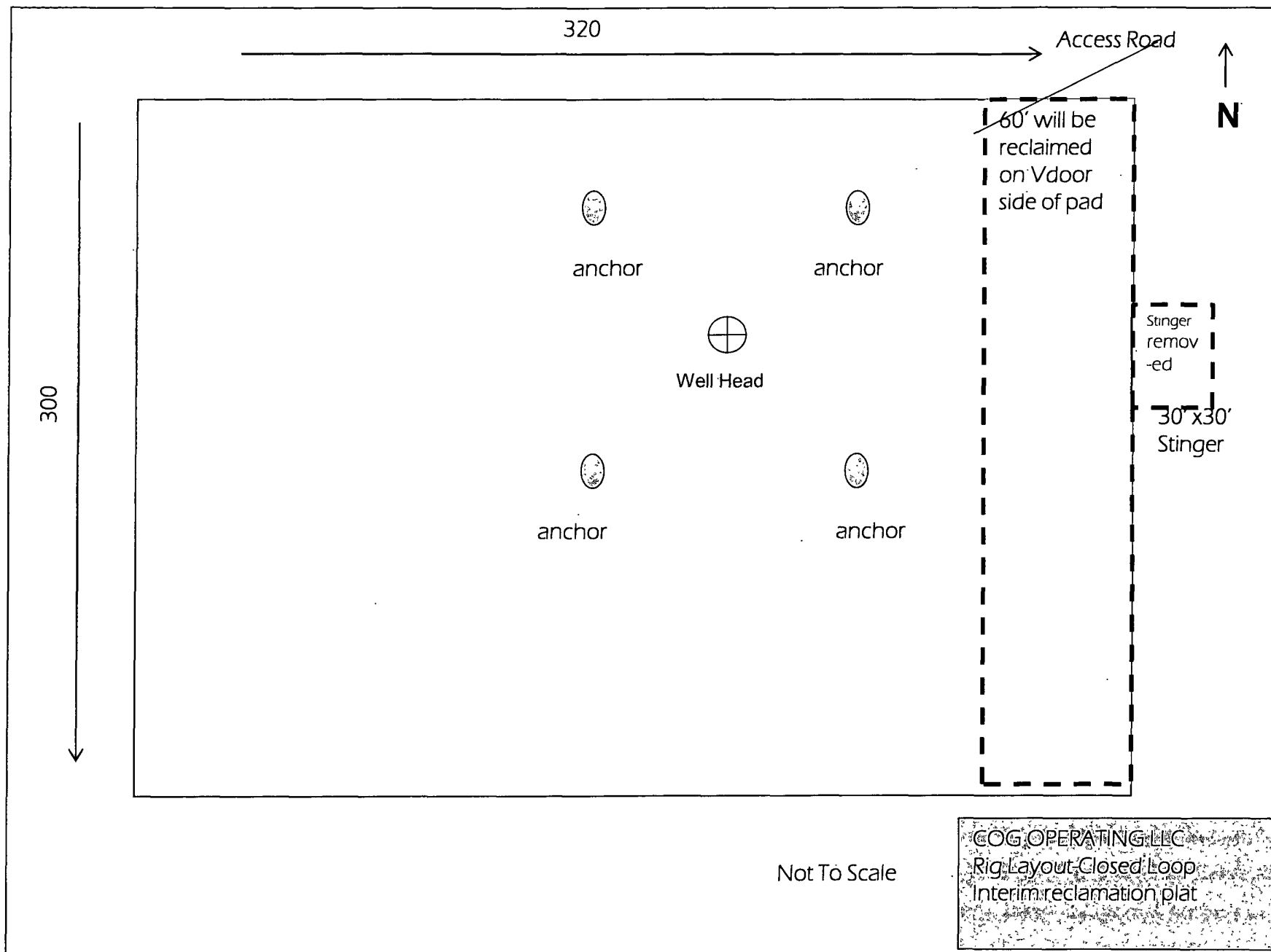
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

Drilling Location - H2S Safety Equipment Diagram

EXHIBIT 8





PECOS DISTRICT

CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING LLC
LEASE NO.:	NM127445
WELL NAME & NO.:	1H BLUE DUCK FEDERAL
SURFACE HOLE FOOTAGE:	380' FSL & 330' FWL
BOTTOM HOLE FOOTAGE:	380' FSL & 330' FEL
LOCATION:	Section 30, T.16 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**

Berming

- 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**

- Waste Material and Fluids
- Logging Requirements

☐ **Production (Post Drilling)**

- Well Structures & Facilities
- Pipelines
- Electric Lines

☐ **Interim Reclamation**

☐ **Final Abandonment & Reclamation**