

OCD-HOBBS

HOBBS OCD
JUL 28 2011

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FORM APPROVED
OMB No. 1004-013
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM114987
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator COG Operating LLC.		7. If Unit or CA Agreement, Name and No.
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	8. Lease Name and Well No. <38728> Dominator 25 Federal #1H
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 330' FNL & 380' FEL Unit Letter A (NENE) SHL At proposed prod. Zone 330' FSL & 330' FEL Unit Letter P (SESE) BHL		9. API Well No. 30-025-40211
14. Distance in miles and direction from nearest town or post office* About 18 miles from Jal		10. Field and Pool, or Exploratory Red Hills <51020> Wildcat, Bone Springs
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drg. Unit line, if any) 380'		11. Sec., T.R.M. or Blk and Survey or Area Sec. 25 - T25S - R33E
16. No. of acres in lease 280		12. County or Parish Lea County
17. Spacing Unit dedicated to this well 160		13. State NM
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. 280'		20. BLM/BIA Bond No. on file NMB00215
19. Proposed Depth PHTD:12545 TVD: 9475 MD: 13885		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3324
22. Approximate date work will start* ASAP		23. Estimated duration 30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 4/13/2011
Title Regulatory Analyst		
Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed)	Date JUL 22 2011
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legan or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

Carlsbad Controlled Water Basin

Ka 08/02/11

*(Instructions on page 2)
Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

AUG 03 2011

STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS

JUL 28 2011

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The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Date: April 13, 2011

Lease #: NMNM114987
Dominator 25 Federal #1H

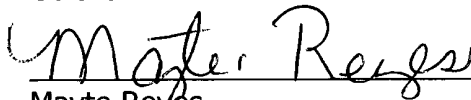
Legal Description: Sec. 25 – T25S – R33E
Lea County, New Mexico

Formation(s): Bone Springs

Bond Coverage: Statewide

BLM Bond File #: NMB00215

COG OPERATING LLC



Mayte Reyes
Regulatory Analyst

**COG Operating LLC
DRILLING AND OPERATIONS PROGRAM**

HOBBS OCD

JUL 28 2011

**Dominator 25 State #1H
SHL: 330' FNL & 380' FEL
BHL: 330' FSL & 330' FEL
Section 25 T25S R33E
Lea County, New Mexico**

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In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC the following ten items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

Rustler	1115'	
Top of Salt	1510'	
Base of Salt	4925'	
Delaware	5170'	Oil
Bone Spring	9290'	
Avalon Shale	9345'	Oil/Gas
1 st BSS	10,075'	Oil
2 nd BSS	10,790'	Oil
3 rd BSS	11,780'	Oil
TD(Pilot)	12,545'	
TVD	9475'	
TMD	13,885'	

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at 1130' and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement to 200' into 9-5/8" casing.

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

Hole Size	Depths	Section	OD Casing	New/Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
	<i>See COA</i>									
17 1/2"	0' - 1130' ^{1100'}	Surface	13 3/8"	New	54.5 #	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 3500'	Intrmd	9 5/8"	New	36#	STC	J-55	1.125	1.125	1.6
12 1/4"	3500' - 5050'	(<i>see con</i>) Intrmd	9 5/8"	New	40#	STC	J-55	1.125	1.125	1.6
8 3/4"	0' - 12,545'	Pilot Hole								
7 7/8"	9700' - 13,885'	Production, Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.125	1.125	1.6

4. Proposed Cement Program

- a. 13-3/8" Surface
- Lead: 500 sx Class C + Gilsonite + HR-800
(12.7 ppg / 1.88 cuft/sx)
- Tail: 250 sx Class C + 2% CaCl₂
(14.8 ppg / 1.35 cuft/sx)
- **Calculated w/50% excess on OH volumes
- b. 9 5/8" Intermediate
- Lead: 950 sx Class C + Gilsonite + HR-800
(12.7 ppg / 1.88 cuft/sx)
- Tail: 250 sx Class C + 1% CaCl₂
(14.8 ppg / 1.35 cuft/sx)
- **Calculated w/35% excess on OH volumes
- d. 5 1/2" Production
- 1st Stage:
- Lead: 500 sx Class H + Acid soluble
(15.0 ppg / 2.6 cuft/sx)
- 2nd Stage:
- Lead: 1000 sx Class H + Bentonite + HALAD-322
(12.7 ppg / 1.89 cuft/sx)
- Tail: 100 sx Class H
(15.6 ppg / 1.19 cuft/sx)
- DVT @ 8900' (approx depth)
- **Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement from the open hole logs.
- The intermediate string TOC is designed to circulate cement to surface.
- The production string TOC is designed to reach approximately 200' into 9-5/8" casing shoe.
- After logging the PH, will plug back to kick off point by setting the following plugs:

TD Plug f/PH TD - 12,350'
100 sx Class H @ 15.6 ppg/1.18 ft3/sx + HR-800
PH Plug f/11,200 - 11,000'
100 sx Class H @ 15.6 ppg/1.18 ft3/sx + HR-800
Kick Off Plug f/9000' - 9500'
300 sx Class H @ 17.2 ppg / 0.98 ft3/sx + CFR3 + HR-800

5. Minimum Specifications for Pressure Control:

Nipple up on 13 3/8 with 2M system (Hydril) tested to 2000# by independent tester, nipple up on 9 5/8 with 3m system tested to 3000# by independent tester. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and a 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a

See
COA
SM
required

Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating.

6. Estimated BHP:

- a. PH TD = 5440 psi
- b. Lateral TD = 4110 psi

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

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' - 1130' 1160'	Fresh Water	8.4	29	N.C.
1130' - 5050'	Brine	10	29	N.C.
5050' - 12,545' (PH)	Cut Brine	9.0-9.4	29	N.C.
9000' - 13,885' (Lateral)	Cut Brine	9.0-9.4	29	N.C.

The necessary mud products for weight addition and fluid loss control will be on location at all times.

8. Auxiliary Well Control and Monitoring Equipment:

- a. A Kelly cock will be in the drill string at all times.
- b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

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

- a. Drill stem tests will be based on geological sample shows.
- b. The open hole electrical logging program will be:
 - i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron - Z Density log with Gamma Ray and Caliper.
 - ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
 - iii. No coring program is planned
 - iv. Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. Potential Hazards:

- a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. No lost circulation is expected to occur. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

11. Anticipated starting date and Duration of Operations:

a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.



New Mexico Office of the State Engineer **Water Column/Average Depth to Water**

No records found.

PLSS Search:

Section(s): 25

Township: 25S

Range: 33E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



Cog Operating, LLC

Eddy County (NAD83)

Dominator "25" State

#1H

OH

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Plan: Design #1

Pathfinder X & Y Planning Report

14 December, 2010

PATHFINDER

A Schlumberger Company



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating, LLC
Project: Eddy County (NAD83)
Site: Dominator "25" State
Well: #1H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 9345.00usft (Original Well Elev)
MD Reference: WELL @ 9345.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project: Eddy County (NAD83)

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site: Dominator "25" State

Site Position:	From: Map	Northing:	403,865.630 usft	Latitude:	32° 6' 27.668 N
		Easting:	793,580.120 usft	Longitude:	103° 31' 7.228 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.43 °

Well: #1H

Well Position	+N/-S	0.00 usft	Northing:	403,865.630 usft	Latitude:	32° 6' 27.668 N
	+E/-W	0.00 usft	Easting:	793,580.120 usft	Longitude:	103° 31' 7.228 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	3,324.00 usft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/06/10	7.62	60.10	48,605

Design: Design #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.58

Survey Tool Program Date 12/14/10

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,885.43	Design #1 (OH)		



Pathfinder
Pathfinder X & Y Planning Report



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Survey Calculation Method: Minimum Curvature
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Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	9,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
100.00	0.00	0.00	100.00	9,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
200.00	0.00	0.00	200.00	9,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
300.00	0.00	0.00	300.00	9,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
400.00	0.00	0.00	400.00	8,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
500.00	0.00	0.00	500.00	8,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
600.00	0.00	0.00	600.00	8,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
700.00	0.00	0.00	700.00	8,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
800.00	0.00	0.00	800.00	8,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
900.00	0.00	0.00	900.00	8,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,000.00	0.00	0.00	1,000.00	8,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,100.00	0.00	0.00	1,100.00	8,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,200.00	0.00	0.00	1,200.00	8,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,300.00	0.00	0.00	1,300.00	8,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,400.00	0.00	0.00	1,400.00	7,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,500.00	0.00	0.00	1,500.00	7,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,600.00	0.00	0.00	1,600.00	7,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,700.00	0.00	0.00	1,700.00	7,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,800.00	0.00	0.00	1,800.00	7,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
1,900.00	0.00	0.00	1,900.00	7,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,000.00	0.00	0.00	2,000.00	7,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,100.00	0.00	0.00	2,100.00	7,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,200.00	0.00	0.00	2,200.00	7,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,300.00	0.00	0.00	2,300.00	7,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,400.00	0.00	0.00	2,400.00	6,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,500.00	0.00	0.00	2,500.00	6,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,600.00	0.00	0.00	2,600.00	6,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12



Pathfinder
Pathfinder X & Y Planning Report



Company: Cog Operating, LLC
Project: Eddy County (NAD83)
Site: Dominator "25" State
Well: #1H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #1H
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Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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2,700.00	0.00	0.00	2,700.00	6,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,800.00	0.00	0.00	2,800.00	6,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
2,900.00	0.00	0.00	2,900.00	6,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,000.00	0.00	0.00	3,000.00	6,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,100.00	0.00	0.00	3,100.00	6,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,200.00	0.00	0.00	3,200.00	6,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,300.00	0.00	0.00	3,300.00	6,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,400.00	0.00	0.00	3,400.00	5,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,500.00	0.00	0.00	3,500.00	5,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,600.00	0.00	0.00	3,600.00	5,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,700.00	0.00	0.00	3,700.00	5,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,800.00	0.00	0.00	3,800.00	5,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
3,900.00	0.00	0.00	3,900.00	5,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,000.00	0.00	0.00	4,000.00	5,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,100.00	0.00	0.00	4,100.00	5,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,200.00	0.00	0.00	4,200.00	5,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,300.00	0.00	0.00	4,300.00	5,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,400.00	0.00	0.00	4,400.00	4,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,500.00	0.00	0.00	4,500.00	4,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,600.00	0.00	0.00	4,600.00	4,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,700.00	0.00	0.00	4,700.00	4,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,800.00	0.00	0.00	4,800.00	4,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
4,900.00	0.00	0.00	4,900.00	4,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
5,000.00	0.00	0.00	5,000.00	4,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
5,100.00	0.00	0.00	5,100.00	4,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
5,200.00	0.00	0.00	5,200.00	4,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
5,300.00	0.00	0.00	5,300.00	4,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating, LLC
Project: Eddy County (NAD83)
Site: Dominator "25" State
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Wellbore: OH
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North Reference: Grd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey											
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5,400.00	0.00	0.00	5,400.00	3,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
5,500.00	0.00	0.00	5,500.00	3,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
5,600.00	0.00	0.00	5,600.00	3,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
5,700.00	0.00	0.00	5,700.00	3,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
5,800.00	0.00	0.00	5,800.00	3,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
5,900.00	0.00	0.00	5,900.00	3,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,000.00	0.00	0.00	6,000.00	3,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,100.00	0.00	0.00	6,100.00	3,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,200.00	0.00	0.00	6,200.00	3,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,300.00	0.00	0.00	6,300.00	3,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,400.00	0.00	0.00	6,400.00	2,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,500.00	0.00	0.00	6,500.00	2,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,600.00	0.00	0.00	6,600.00	2,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,700.00	0.00	0.00	6,700.00	2,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,800.00	0.00	0.00	6,800.00	2,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
6,900.00	0.00	0.00	6,900.00	2,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,000.00	0.00	0.00	7,000.00	2,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,100.00	0.00	0.00	7,100.00	2,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,200.00	0.00	0.00	7,200.00	2,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,300.00	0.00	0.00	7,300.00	2,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,400.00	0.00	0.00	7,400.00	1,945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,500.00	0.00	0.00	7,500.00	1,845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,600.00	0.00	0.00	7,600.00	1,745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,700.00	0.00	0.00	7,700.00	1,645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,800.00	0.00	0.00	7,800.00	1,545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
7,900.00	0.00	0.00	7,900.00	1,445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	
8,000.00	0.00	0.00	8,000.00	1,345.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12	



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Pathfinder X & Y Planning Report



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Wellbore: OH
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MD Reference: WELL @ 9345.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
8,100.00	0.00	0.00	8,100.00	1,245.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,200.00	0.00	0.00	8,200.00	1,145.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,300.00	0.00	0.00	8,300.00	1,045.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,400.00	0.00	0.00	8,400.00	945.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,500.00	0.00	0.00	8,500.00	845.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,600.00	0.00	0.00	8,600.00	745.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,700.00	0.00	0.00	8,700.00	645.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,800.00	0.00	0.00	8,800.00	545.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,900.00	0.00	0.00	8,900.00	445.00	0.00	0.00	0.00	0.00	403,865.63	793,580.12
8,997.50	0.00	0.00	8,997.50	347.50	0.00	0.00	0.00	0.00	403,865.63	793,580.12
9,000.00	0.30	179.58	9,000.00	345.00	-0.01	0.00	0.01	12.00	403,865.62	793,580.12
9,025.00	3.30	179.58	9,024.98	320.02	-0.79	0.01	0.79	12.00	403,864.84	793,580.13
9,050.00	6.30	179.58	9,049.89	295.11	-2.88	0.02	2.88	12.00	403,862.75	793,580.14
9,075.00	9.30	179.58	9,074.66	270.34	-6.28	0.05	6.28	12.00	403,859.35	793,580.17
9,100.00	12.30	179.58	9,099.21	245.79	-10.96	0.08	10.96	12.00	403,854.67	793,580.20
9,125.00	15.30	179.58	9,123.49	221.51	-16.92	0.12	16.92	12.00	403,848.71	793,580.24
9,150.00	18.30	179.58	9,147.42	197.58	-24.15	0.18	24.15	12.00	403,841.48	793,580.30
9,175.00	21.30	179.58	9,170.94	174.06	-32.61	0.24	32.61	12.00	403,833.02	793,580.36
9,200.00	24.30	179.58	9,193.98	151.02	-42.30	0.31	42.30	12.00	403,823.33	793,580.43
9,225.00	27.30	179.58	9,216.49	128.51	-53.18	0.39	53.18	12.00	403,812.45	793,580.51
9,250.00	30.30	179.58	9,238.40	106.60	-65.22	0.48	65.22	12.00	403,800.41	793,580.60
9,275.00	33.30	179.58	9,259.64	85.36	-78.39	0.57	78.39	12.00	403,787.24	793,580.69
9,300.00	36.30	179.58	9,280.17	64.83	-92.65	0.68	92.66	12.00	403,772.98	793,580.80
9,325.00	39.30	179.58	9,299.92	45.08	-107.97	0.79	107.98	12.00	403,757.66	793,580.91
9,350.00	42.30	179.58	9,318.84	26.16	-124.31	0.91	124.31	12.00	403,741.32	793,581.03
9,375.00	45.30	179.58	9,336.89	8.11	-141.61	1.04	141.61	12.00	403,724.02	793,581.16
9,400.00	48.30	179.58	9,354.00	-9.00	-159.83	1.17	159.83	12.00	403,705.80	793,581.29



Pathfinder
Pathfinder X & Y Planning Report



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Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 9345.00usft (Original Well Elev)
MD Reference: WELL @ 9345.00usft (Original Well Elev)
North Reference: Gnd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
9,425.00	51.30	179.58	9,370.14	-25.14	-178.92	1.31	178.92	12.00	403,686.71	793,581.43
9,450.00	54.30	179.58	9,385.25	-40.25	-198.83	1.46	198.83	12.00	403,666.80	793,581.58
9,475.00	57.30	179.58	9,399.30	-54.30	-219.50	1.61	219.51	12.00	403,646.13	793,581.73
9,500.00	60.30	179.58	9,412.25	-67.25	-240.88	1.77	240.89	12.00	403,624.75	793,581.89
9,525.00	63.30	179.58	9,424.07	-79.07	-262.91	1.93	262.92	12.00	403,602.72	793,582.05
9,550.00	66.30	179.58	9,434.71	-89.71	-285.53	2.09	285.53	12.00	403,580.10	793,582.21
9,575.00	69.29	179.58	9,444.16	-99.16	-308.67	2.26	308.68	12.00	403,556.96	793,582.38
9,600.00	72.29	179.58	9,452.38	-107.38	-332.27	2.44	332.28	12.00	403,533.36	793,582.56
9,625.00	75.29	179.58	9,459.36	-114.36	-356.28	2.61	356.29	12.00	403,509.35	793,582.73
9,650.00	78.29	179.58	9,465.07	-120.07	-380.61	2.79	380.62	12.00	403,485.02	793,582.91
9,675.00	81.29	179.58	9,469.50	-124.50	-405.21	2.97	405.22	12.00	403,460.42	793,583.09
9,700.00	84.29	179.58	9,472.63	-127.63	-430.01	3.15	430.02	12.00	403,435.62	793,583.27
9,725.00	87.29	179.58	9,474.47	-129.47	-454.94	3.33	454.95	12.00	403,410.69	793,583.45
9,747.56	90.00	179.58	9,475.00	-130.00	-477.49	3.50	477.50	12.00	403,388.14	793,583.62
9,800.00	90.00	179.58	9,475.00	-130.00	-529.93	3.88	529.94	0.00	403,335.70	793,584.00
9,900.00	90.00	179.58	9,475.00	-130.00	-629.93	4.62	629.94	0.00	403,235.70	793,584.74
10,000.00	90.00	179.58	9,475.00	-130.00	-729.93	5.35	729.94	0.00	403,135.70	793,585.47
10,100.00	90.00	179.58	9,475.00	-130.00	-829.92	6.08	829.94	0.00	403,035.71	793,586.20
10,200.00	90.00	179.58	9,475.00	-130.00	-929.92	6.82	929.94	0.00	402,935.71	793,586.94
10,300.00	90.00	179.58	9,475.00	-130.00	-1,029.92	7.55	1,029.94	0.00	402,835.71	793,587.67
10,400.00	90.00	179.58	9,475.00	-130.00	-1,129.91	8.28	1,129.94	0.00	402,735.72	793,588.40
10,500.00	90.00	179.58	9,475.00	-130.00	-1,229.91	9.02	1,229.94	0.00	402,635.72	793,589.14
10,600.00	90.00	179.58	9,475.00	-130.00	-1,329.91	9.75	1,329.94	0.00	402,535.72	793,589.87
10,700.00	90.00	179.58	9,475.00	-130.00	-1,429.91	10.48	1,429.94	0.00	402,435.72	793,590.60
10,800.00	90.00	179.58	9,475.00	-130.00	-1,529.90	11.21	1,529.94	0.00	402,335.73	793,591.33
10,900.00	90.00	179.58	9,475.00	-130.00	-1,629.90	11.95	1,629.94	0.00	402,235.73	793,592.07
11,000.00	90.00	179.58	9,475.00	-130.00	-1,729.90	12.68	1,729.94	0.00	402,135.73	793,592.80



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating, LLC
Project: Eddy County (NAD83)
Site: Dominator "25" State
Well: #1H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 9345.00usft (Original Well Elev)
MD Reference: WELL @ 9345.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,100.00	90.00	179.58	9,475.00	-130.00	-1,829.90	13.41	1,829.94	0.00	402,035.73	793,593.53
11,200.00	90.00	179.58	9,475.00	-130.00	-1,929.89	14.15	1,929.94	0.00	401,935.74	793,594.27
11,300.00	90.00	179.58	9,475.00	-130.00	-2,029.89	14.88	2,029.94	0.00	401,835.74	793,595.00
11,400.00	90.00	179.58	9,475.00	-130.00	-2,129.89	15.61	2,129.94	0.00	401,735.74	793,595.73
11,500.00	90.00	179.58	9,475.00	-130.00	-2,229.88	16.35	2,229.94	0.00	401,635.75	793,596.47
11,600.00	90.00	179.58	9,475.00	-130.00	-2,329.88	17.08	2,329.94	0.00	401,535.75	793,597.20
11,700.00	90.00	179.58	9,475.00	-130.00	-2,429.88	17.81	2,429.94	0.00	401,435.75	793,597.93
11,800.00	90.00	179.58	9,475.00	-130.00	-2,529.88	18.55	2,529.94	0.00	401,335.75	793,598.67
11,900.00	90.00	179.58	9,475.00	-130.00	-2,629.87	19.28	2,629.94	0.00	401,235.76	793,599.40
12,000.00	90.00	179.58	9,475.00	-130.00	-2,729.87	20.01	2,729.94	0.00	401,135.76	793,600.13
12,100.00	90.00	179.58	9,475.00	-130.00	-2,829.87	20.74	2,829.94	0.00	401,035.76	793,600.86
12,200.00	90.00	179.58	9,475.00	-130.00	-2,929.87	21.48	2,929.94	0.00	400,935.76	793,601.60
12,300.00	90.00	179.58	9,475.00	-130.00	-3,029.86	22.21	3,029.94	0.00	400,835.77	793,602.33
12,400.00	90.00	179.58	9,475.00	-130.00	-3,129.86	22.94	3,129.94	0.00	400,735.77	793,603.06
12,500.00	90.00	179.58	9,475.00	-130.00	-3,229.86	23.68	3,229.94	0.00	400,635.77	793,603.80
12,600.00	90.00	179.58	9,475.00	-130.00	-3,329.86	24.41	3,329.94	0.00	400,535.77	793,604.53
12,700.00	90.00	179.58	9,475.00	-130.00	-3,429.85	25.14	3,429.94	0.00	400,435.78	793,605.26
12,800.00	90.00	179.58	9,475.00	-130.00	-3,529.85	25.88	3,529.94	0.00	400,335.78	793,606.00
12,900.00	90.00	179.58	9,475.00	-130.00	-3,629.85	26.61	3,629.94	0.00	400,235.78	793,606.73
13,000.00	90.00	179.58	9,475.00	-130.00	-3,729.84	27.34	3,729.94	0.00	400,135.79	793,607.46
13,100.00	90.00	179.58	9,475.00	-130.00	-3,829.84	28.07	3,829.94	0.00	400,035.79	793,608.19
13,200.00	90.00	179.58	9,475.00	-130.00	-3,929.84	28.81	3,929.94	0.00	399,935.79	793,608.93
13,300.00	90.00	179.58	9,475.00	-130.00	-4,029.84	29.54	4,029.94	0.00	399,835.79	793,609.66
13,400.00	90.00	179.58	9,475.00	-130.00	-4,129.83	30.27	4,129.94	0.00	399,735.80	793,610.39
13,500.00	90.00	179.58	9,475.00	-130.00	-4,229.83	31.01	4,229.94	0.00	399,635.80	793,611.13
13,600.00	90.00	179.58	9,475.00	-130.00	-4,329.83	31.74	4,329.94	0.00	399,535.80	793,611.86
13,700.00	90.00	179.58	9,475.00	-130.00	-4,429.83	32.47	4,429.94	0.00	399,435.80	793,612.59



Pathfinder
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PATHFINDER
A Schlumberger Company

Company: Cog Operating, LLC
Project: Eddy County (NAD83)
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Wellbore: OH
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Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec. (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,800.00	90.00	179.58	9,475.00	-130.00	-4,529.82	33.21	4,529.94	0.00	399,335.81	793,613.33
13,885.97	90.00	179.58	9,475.00	-130.00	-4,615.79	33.84	4,615.92	0.00	399,249.84	793,613.96

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County (NAD83)
Site: Dominator "25" State
Well: #1H
Wellbore: OH
Plan: Design #1 (#1H/OH)



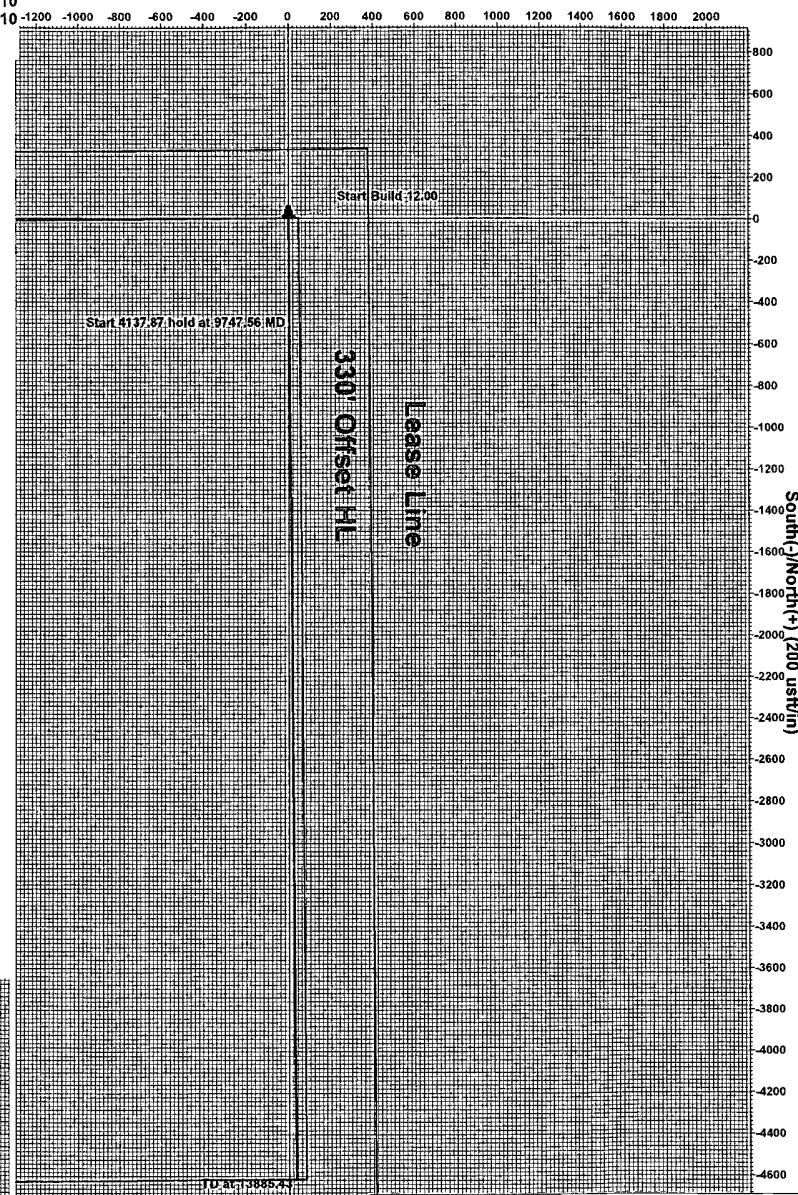
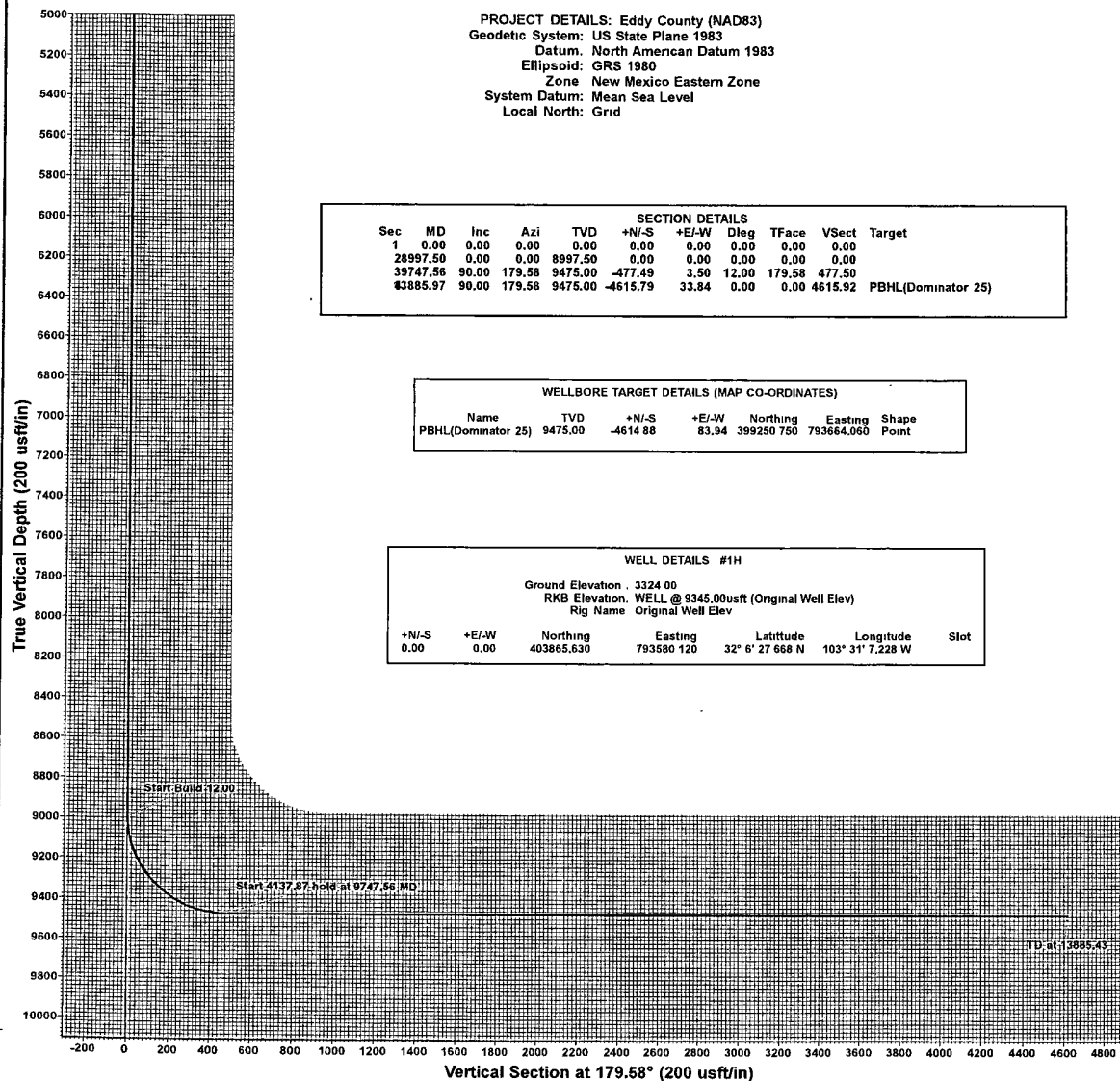
Azimuths to Grid North
True North: -0.43°
Magnetic North: 7.18°

Magnetic Field
Strength: 48605.3snT
Dip Angle: 60.10°
Date: 12/06/2010
Model: IGRF2010

PATHFINDER

A Schlumberger Company

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

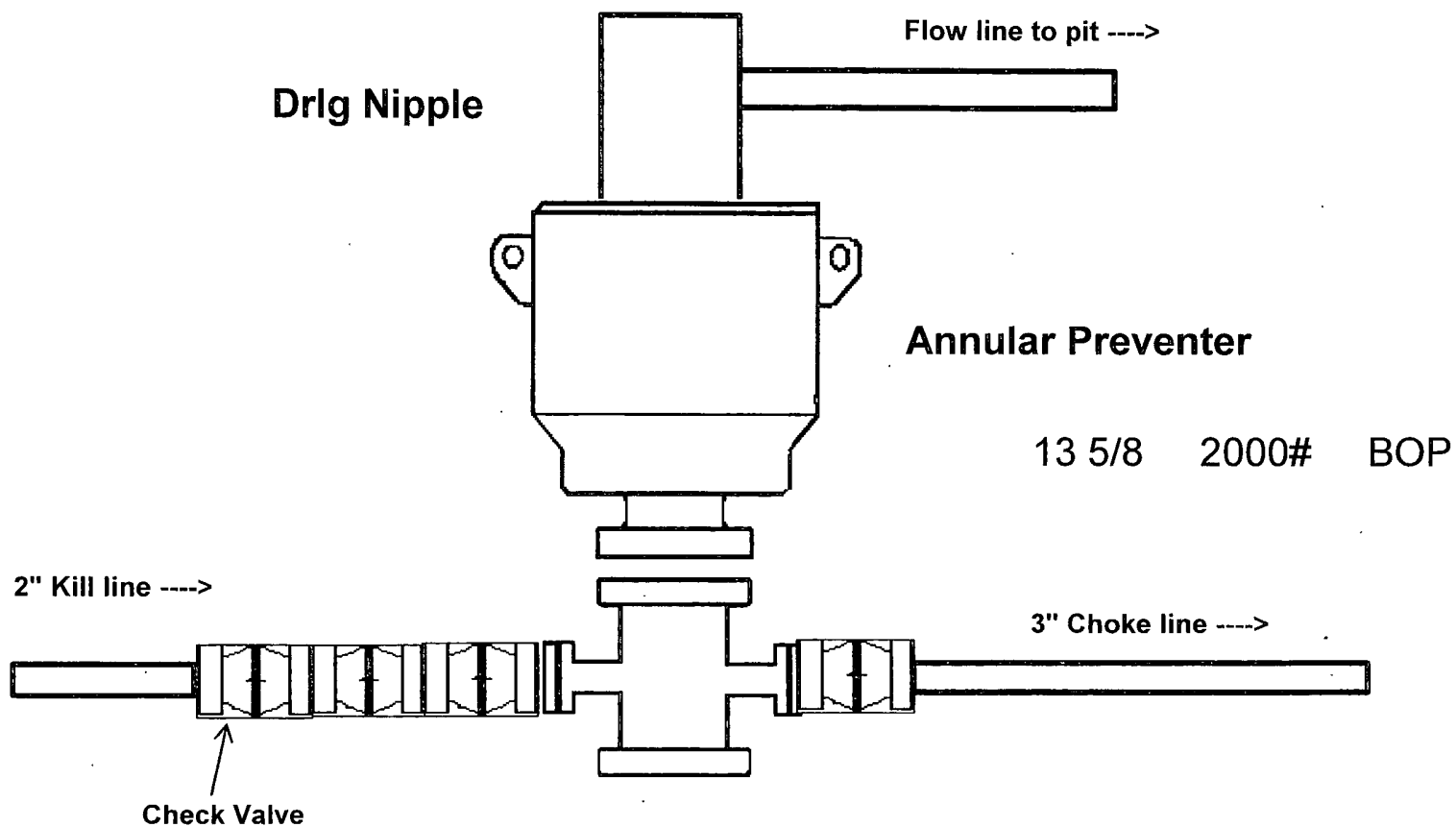


Plan Design #1 (#1H/OH)

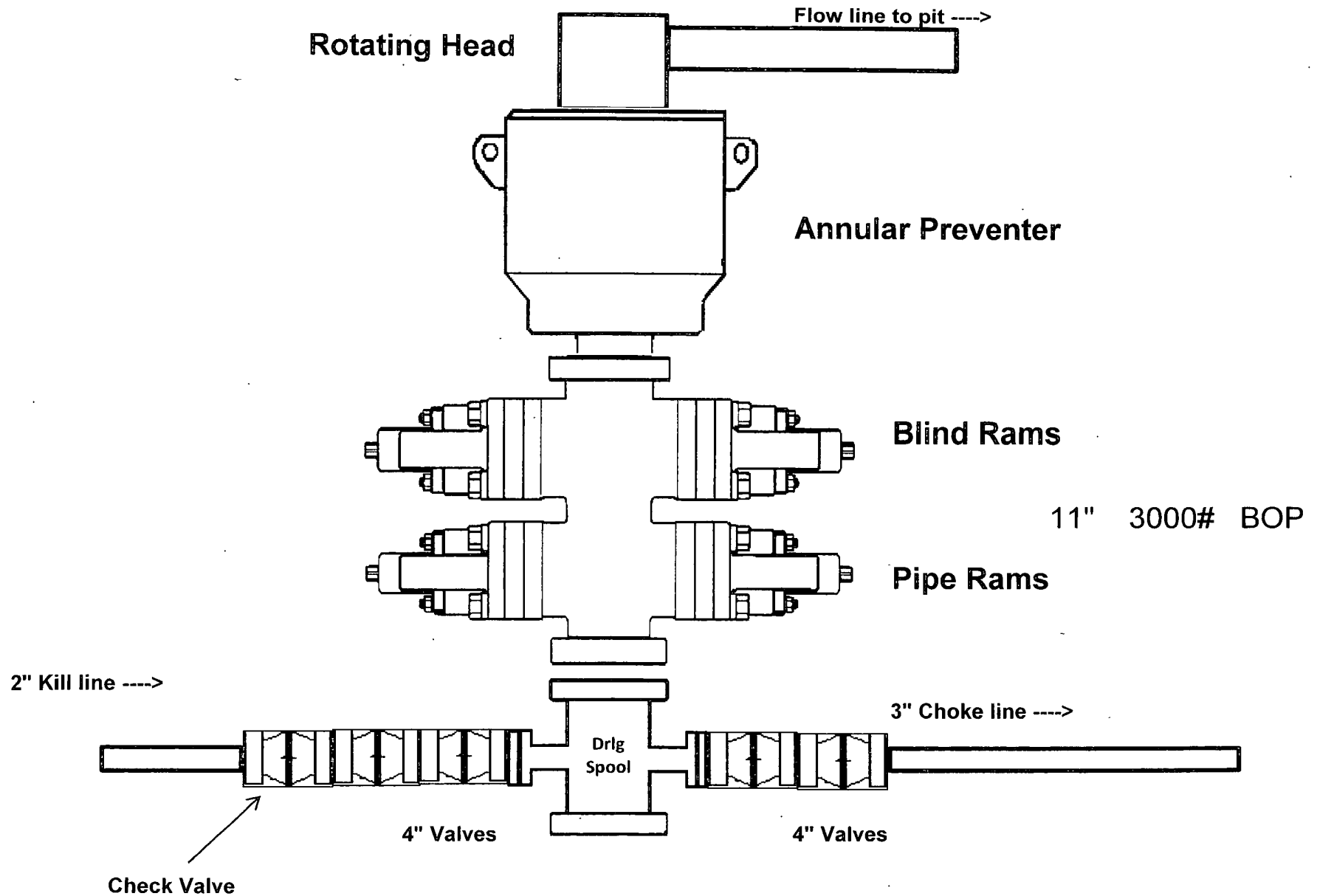
Created By: Nate Bingham Date: 9-24, December 14 2010

Checked _____ Date: _____

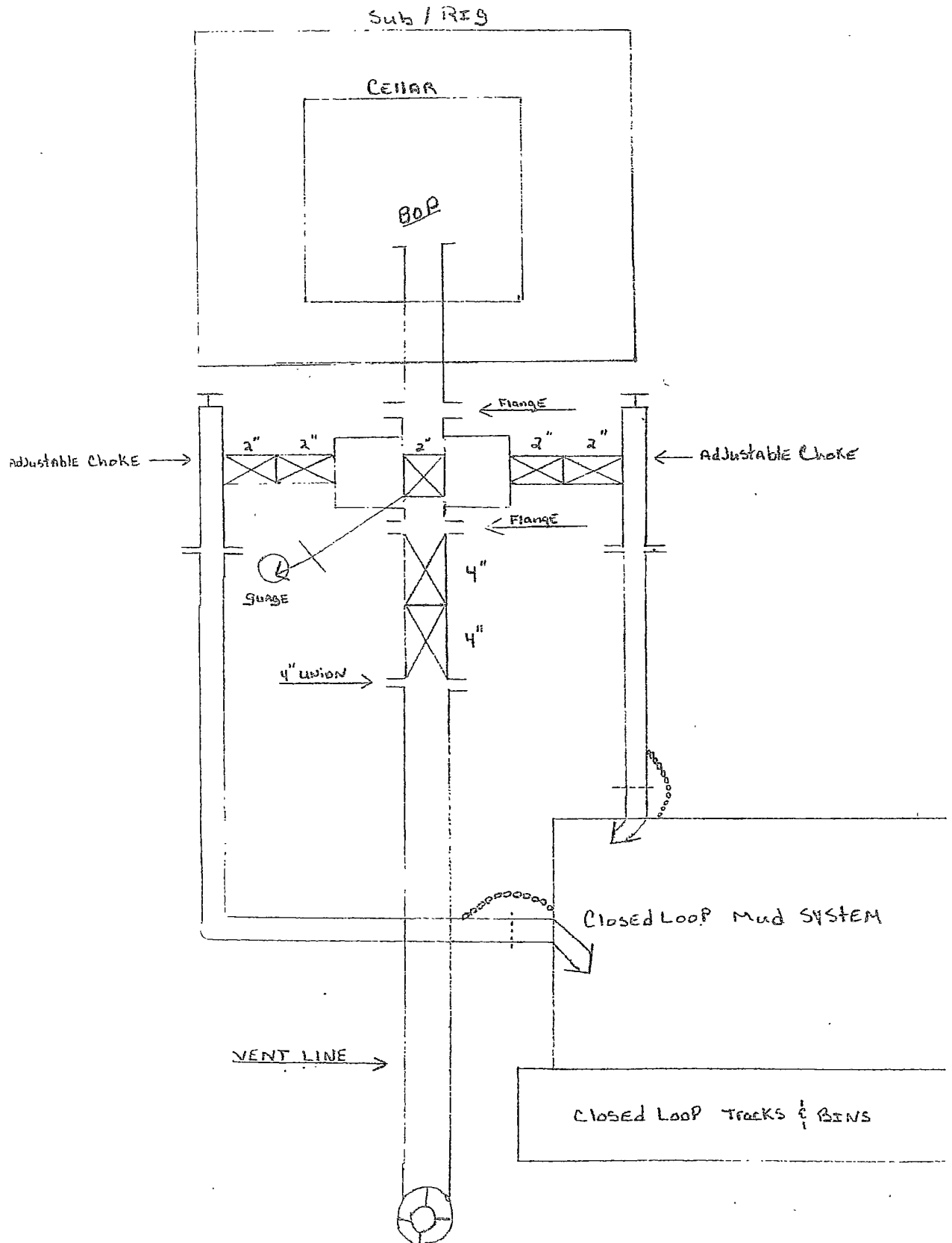
2,000 psi BOP Schematic



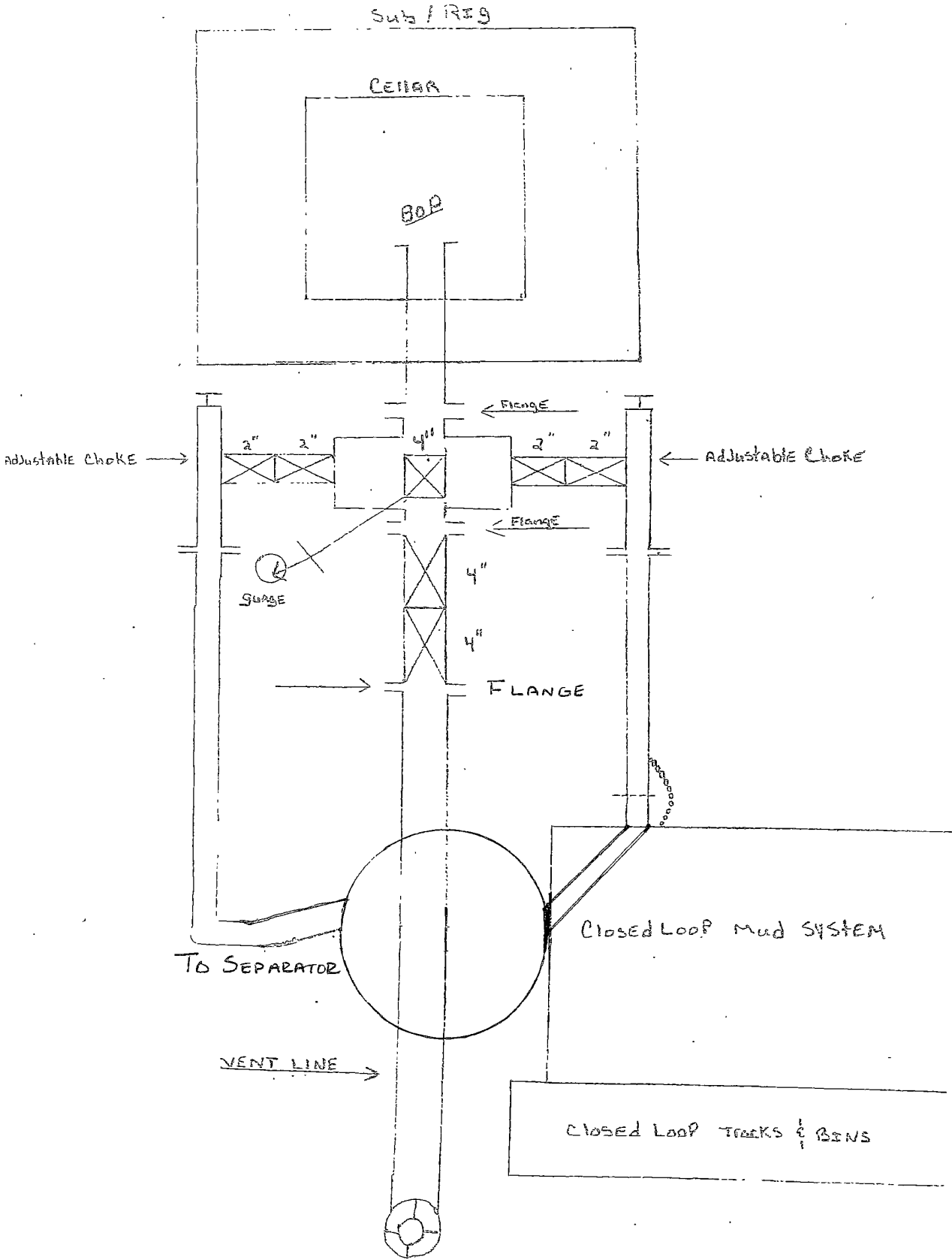
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



150' TO FLARE PIT