

Operator Copy

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

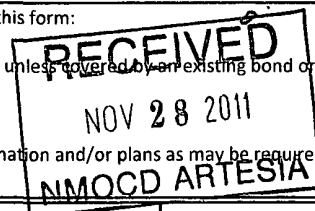
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM100342
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		8. Lease Name and Well No. Poptart 12 Federal #4H [38140]
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-015-39712
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 660' FNL & 760' FWL Unit Letter D NWNW SHL At proposed prod. Zone 660' FSL & 660' FWL Unit Letter M (SWSW) BHL		10. Field and Pool, or Exploratory Wildcat; Wolfcamp, Gas [97489]
14. Distance in miles and direction from nearest town or post office* About 10 miles from Loco Hills		11. Sec., T.R.M. or Blk and Survey or Area Sec. 12 - T19S - R31E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 660'		12. County or Parish Eddy County
16. No. of acres in lease 320		13. State NM
17. Spacing Unit dedicated to this well 160		
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. 80' To Dry Hole Marker		20. BLM/BIA Bond No. on file NMB000740
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3613.9		22. Approximate date work will start* 12/1/2011
		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:

- | | |
|---|--|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |



25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 10/12/2011
Title		
Regulatory Analyst Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed)	Date 11/23/11
Title <i>GM</i> 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.

(Continued on page 2)

Capitan Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

act

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Poptart 12 Federal #4H
SHL: 660' FNL & 760' FWL
BHL: 660' FSL & 660' FWL
Section 12 T19S R31E
Eddy County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven 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:

Fresh Water	~130'	
Ruslter	728'	
Top of Salt	810'	
Base of Salt	2350'	
Yates	2615'	
7 Rivers	2845'	
Queen	3445'	
San Andreas	4301'	
Delaware	5120'	Oil
Bone Spring	6747'	Oil
Wolfcamp	10,092'	Oil/Gas
PH TD	11,300'	
TD TVD	10,620'	
TD MD	14,218'	

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 755' and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement 500' into 9-5/8" csg shoe.

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

Hole Size	Depths <i>see COA</i>	Section	OD Casing	New/Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 1/2"	0' - 755' <i>825</i>	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 4500'	Intrmd	9 5/8"	New	40#	BTC	J-55	1.125	1.125	1.6
12 1/4"	4500' - 5200'	Intrmd	9 5/8"	New	40#	BTC	P-110	1.125	1.125	1.6
8 3/4 "	5200' - 11,300'	Pilot Hole								
7 7/8"	0' - 14,218'	Production Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.125	1.125	1.6

- While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

4. Proposed Cement Program

- | | |
|------------------------|--|
| a. 13-3/8" Surface | Lead: 350 sx Class C + 4% Gel + 2% CaCl ₂
(13.5 ppg / 1.75 cuft/sx)
Tail: 250 sx Class C + 2% CaCl ₂
(14.8 ppg / 1.35 cuft/sx)
**Calculated w/50% excess on OH volumes |
| b. 9 5/8" Intermediate | Lead : 1150 sx 35:65:6 C+Salt+Gilsonite+CFR-3+ HR601
(12.7 ppg /1.89 cuft/sx)
Tail: 250 sx Class C + 1% CaCl ₂
(14.8 ppg / 1.35 cuft/sx) |
| d. 5 1/2" Production | Lead: 700 sx 50:50:10 H + Salt+Gilsonite+CFR-3+ HR601
(11.8 ppg / 2.5 cuft/sx)
Tail: 850 sx 50:50:2 H +Salt+GasStop +HR601 +CFR-3
(14.4 ppg /1.25 cuft/sx)
**Calculated w/35% excess on OH volumes |

- The above cement volumes could be revised pending the caliper measurement from the open hole logs.
- The 9-5/8" intermediate string is designed to circulate to surface.
- The production string is design to tie back 500' into 9-5/8".
- After logging the PH, will plug back to kick off point by setting the following plug:
 PH TD/Kick off Plug:
 11,300 – 10,000'
 525 sx Class H + HR-800 @ 17.2 ppg/0.98 ft3/sx

5. Minimum Specifications for Pressure Control:

Nipple up on 13 3/8 with 2M system (Hydril) tested to 2000 psi by independent tester.
Nipple up on 9 5/8 with 5M system tested to 5000 psi 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 Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating.

6. Estimated BHP:

PH TD = 4900 psi
Lateral TD = 4610 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' - 755' <i>825</i>	Fresh Water	8.4	29	N.C.
755' - 5200'	Brine	10	29	N.C.
5200 - 11,300' (PH)	Brine	9.4 - 10.6	30	N.C.
5200' - 14,215' (Lateral)	WBM	10.0 - 13.6	36-42	15-20

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. SWCs maybe taken.
 - 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. May see abnormal pressures in Wolfcamp formation. 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. 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.
- b. Attached is a gyro of the Airbus Federal #1. At 3152' VS & 10,620' TVD of proposed lateral, the Airbus Federal #1 is 17' East of proposed lateral path. Will supply an anti-collision plan when final TVD of lateral is chosen after OH logs.

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.



Scientific Drilling

Gyroscopic Survey Report for COG OPERATING

Well Location	EDDY COUNTY, NEW MEXICO
Well Name	AIRBUS FEDERAL #1
Rig Name	PREMIRE MAST
Survey Date	10/21/2011
Latitude	32.67 deg
North Reference	True North
Grid Correction	0.00 deg
Depth Reference	GROUND
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 0.00Azim (deg)
Definitive Survey	FINAL OUTRUN SURVEY
Operator	A.MADRID

Comments



Survey Report

Well Name:		AIRBUS FEDERAL #1							
Survey:		FINAL OUTFRAN SURVEY							
Survey Date:		10/21/2011							
MD	Inc	Azim	TVD	VS	Northing	Easting	DLS	Closure Distance	Closure Angle
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg
0 00	0.00	0.00	0 00	0.00	0 00	0.00	Invalid	0.00	0 00
100 00	0 21	12.30	100.00	0.18	0.18	0.04	0.21	0.19	12.30
200.00	0.08	273 50	200 00	0.37	0.37	0.01	0.24	0.37	0 95
300.00	0.27	295.10	300.00	0.47	0.47	-0.28	0.20	0.55	329.25
400.00	0.24	304.82	400 00	0 69	0.69	-0 67	0.05	0.96	316.07
500.00	0.30	281.08	500 00	0.86	0.86	-1.10	0.13	1.40	308 19
600.00	0.31	289.07	600 00	1.00	1.00	-1.61	0 04	1.90	301.89
700.00	0.29	281.26	699.99	1.14	1.14	-2.12	0.04	2 40	298.32
800.00	0.14	262.19	799.99	1.17	1 17	-2.49	0 17	2.75	295.27
900.00	0.12	188.05	899.99	1.06	1.06	-2.62	0.15	2.83	291 98
1000.00	0 06	133 67	999.99	0.92	0.92	-2.60	0 09	2.76	289.57
1100.00	0.11	95.24	1099.99	0.88	0.88	-2.47	0 07	2.62	289.65
1200.00	0 23	114.82	1199.99	0.79	0.79	-2.20	0.13	2.33	289 79
1300.00	0.18	73.60	1299.99	0.75	0.75	-1.87	0.15	2.01	291 94
1400.00	0.42	74.93	1399.99	0.89	0 89	-1.36	0.24	1.63	303.26
1500.00	0.36	78.80	1499.99	1.05	1.05	-0.69	0.06	1.26	326.63
1600.00	0 84	49.77	1599.98	1.58	1 58	0 18	0 55	1.59	6.42
1700.00	1.56	44.88	1699.96	3.02	3 02	1.70	0.73	3.46	29 32
1800.00	1.82	52.31	1799.92	4.96	4.96	3.91	0.34	6.31	38.30
1900 00	2.01	54.27	1899 86	6.95	6 95	6.60	0.20	9.58	43.49
2000.00	1 95	51 80	1999.80	9 03	9.03	9.36	0.11	13.01	46.02
2100.00	1.71	50.88	2099 75	11.03	11.03	11.86	0.24	16 19	47.08
2200.00	1.79	53 84	2199.70	12 89	12 89	14.27	0.12	19.23	47 92
2300 00	1.53	51 95	2299.66	14.63	14.63	16.58	0.26	22.11	48.58
2400 00	1.00	42 27	2399.64	16.10	16.10	18 22	0 57	24.31	48.54
2500 00	0 61	18 30	2499.63	17.25	17.25	18.97	0.51	25.64	47 73
2600 00	0.54	359 04	2599.62	18.22	18.22	19.13	0.20	26.42	46.39
2700.00	0.45	355.55	2699.62	19 08	19 08	19.09	0.10	26.99	45.01
2800.00	0.45	20.69	2799.62	19.84	19.84	19.20	0.19	27.61	44 06
2900 00	0.46	32.44	2899.61	20.54	20.54	19.55	0.09	28.36	43.59
3000.00	0.51	13.82	2999.61	21.31	21.31	19.87	0 16	29.14	43 00
3100 00	0.36	16.86	3099.61	22.03	22.03	20.07	0.15	29.80	42.33
3200.00	0.36	340.87	3199.60	22.62	22.62	20.06	0.22	30.23	41.56
3300 00	0.33	350.36	3299 60	23.21	23 21	19.90	0 06	30.57	40 62
3400.00	0.42	342 35	3399.60	23.84	23 84	19.75	0 10	30.95	39 64
3500.00	0.43	334.48	3499.60	24.53	24 53	19.47	0.06	31.32	38.45
3600 00	0.38	326.27	3599 59	25.15	25.15	19.12	0.08	31.59	37.25
3700.00	0.48	337.51	3699.59	25.81	25.81	18.78	0.13	31 92	36.04
3800.00	0.48	347.39	3799.59	26.60	26 60	18.53	0.08	32.42	34 86



Well Name:		AIRBUS FEDERAL #1								
Survey:		FINAL OUTFRAN SURVEY								
Survey Date:		10/21/2011								
MD	Inc	Azim	TVD	VS	Northing	Easting	DLS	Closure Distance	Closure Angle	
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg	
3900.00	0.44	346.96	3899.59	27.38	27.38	18.35	0.04	32.96	33.83	
4000.00	0.39	333.40	3999.58	28.06	28.06	18.11	0.11	33.40	32.84	
4100.00	0.50	353.50	4099.58	28.80	28.80	17.91	0.19	33.91	31.88	
4200.00	0.78	14.41	4199.57	29.89	29.89	18.03	0.36	34.91	31.10	
4300.00	0.63	6.52	4299.57	31.10	31.10	18.26	0.18	36.07	30.42	
4400.00	0.70	8.08	4399.56	32.25	32.25	18.41	0.07	37.13	29.72	
4500.00	0.62	2.81	4499.55	33.39	33.39	18.52	0.10	38.18	29.02	
4600.00	0.70	8.91	4599.55	34.53	34.53	18.64	0.11	39.24	28.37	
4700.00	0.78	9.52	4699.54	35.80	35.80	18.85	0.08	40.46	27.77	
4800.00	0.80	4.62	4799.53	37.17	37.17	19.02	0.07	41.75	27.10	
4900.00	0.99	11.98	4899.52	38.71	38.71	19.25	0.22	43.23	26.45	
5000.00	0.90	1.25	4999.50	40.34	40.34	19.45	0.20	44.78	25.74	
5100.00	1.01	10.81	5099.49	41.99	41.99	19.63	0.19	46.36	25.06	
5200.00	1.02	10.02	5199.47	43.73	43.73	19.95	0.02	48.07	24.52	
5300.00	1.11	6.85	5299.46	45.57	45.57	20.22	0.11	49.86	23.93	
5400.00	1.16	4.80	5399.44	47.54	47.54	20.42	0.06	51.74	23.25	
5500.00	1.10	14.65	5499.42	49.47	49.47	20.75	0.20	53.65	22.75	
5600.00	1.07	11.06	5599.40	51.32	51.32	21.17	0.07	55.52	22.42	
5700.00	1.00	18.62	5699.38	53.06	53.06	21.63	0.16	57.30	22.18	
5800.00	1.01	18.71	5799.37	54.73	54.73	22.19	0.01	59.05	22.07	
5900.00	1.06	22.62	5899.35	56.42	56.42	22.83	0.09	60.86	22.03	
6000.00	0.95	23.88	5999.34	58.03	58.03	23.52	0.12	62.62	22.07	
6100.00	1.00	23.99	6099.32	59.58	59.58	24.21	0.05	64.32	22.11	
6200.00	0.96	18.12	6199.31	61.18	61.18	24.83	0.11	66.02	22.09	
6300.00	0.99	16.49	6299.29	62.80	62.80	25.33	0.04	67.72	21.97	
6400.00	0.90	17.59	6399.28	64.39	64.39	25.82	0.10	69.37	21.85	
6500.00	0.94	16.98	6499.27	65.92	65.92	26.30	0.04	70.97	21.75	
6600.00	0.83	21.53	6599.25	67.38	67.38	26.80	0.14	72.52	21.69	
6700.00	0.77	8.16	6699.24	68.71	68.71	27.16	0.20	73.89	21.57	
6800.00	0.81	6.36	6799.23	70.08	70.08	27.33	0.05	75.22	21.31	
6900.00	0.85	9.49	6899.22	71.52	71.52	27.54	0.06	76.63	21.06	
7000.00	0.90	8.90	6999.21	73.02	73.02	27.78	0.05	78.13	20.83	
7100.00	0.87	16.83	7099.20	74.52	74.52	28.12	0.13	79.65	20.67	
7200.00	1.12	9.60	7199.19	76.21	76.21	28.50	0.28	81.36	20.51	
7300.00	1.27	358.68	7299.16	78.28	78.28	28.64	0.27	83.35	20.09	
7400.00	1.40	1.23	7399.14	80.61	80.61	28.64	0.14	85.54	19.56	
7500.00	1.38	5.80	7499.11	83.02	83.02	28.79	0.11	87.87	19.12	
7600.00	1.42	5.70	7599.08	85.45	85.45	29.03	0.04	90.25	18.76	



Well Name:		AIRBUS FEDERAL #1							
Survey:		FINAL OUTFRAN SURVEY							
Survey Date:		10/21/2011							
MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
7700.00	1.30	12.12	7699.05	87.79	87.79	29.39	0.19	92.57	18.51
7800.00	1.09	19.22	7799.03	89.79	89.79	29.94	0.25	94.65	18.44
7900.00	1.38	14.75	7899.00	91.85	91.85	30.56	0.31	96.80	18.40
8000.00	1.37	27.38	7998.98	94.08	94.08	31.42	0.30	99.19	18.47
8100.00	1.36	29.57	8098.95	96.18	96.18	32.56	0.05	101.55	18.70
8200.00	1.29	25.38	8198.92	98.24	98.24	33.63	0.12	103.84	18.90
8300.00	1.39	18.31	8298.89	100.41	100.41	34.49	0.19	106.17	18.96
8400.00	1.45	19.99	8398.86	102.75	102.75	35.31	0.08	108.64	18.96
8500.00	1.73	13.78	8498.82	105.40	105.40	36.10	0.32	111.41	18.91
8600.00	2.43	21.88	8598.76	108.83	108.83	37.25	0.76	115.02	18.89
8700.00	2.46	24.76	8698.67	112.74	112.74	38.94	0.13	119.28	19.05
8800.00	2.57	22.32	8798.57	116.77	116.77	40.69	0.15	123.65	19.21
8900.00	2.41	22.75	8898.48	120.78	120.78	42.35	0.16	127.99	19.32
9000.00	2.43	25.32	8998.39	124.64	124.64	44.07	0.11	132.20	19.47
9100.00	2.31	26.61	9098.30	128.36	128.36	45.88	0.13	136.31	19.67
9200.00	2.05	28.23	9198.23	131.73	131.73	47.63	0.27	140.08	19.88
9300.00	1.78	28.58	9298.17	134.67	134.67	49.22	0.26	143.39	20.08
9400.00	1.61	33.78	9398.13	137.20	137.20	50.74	0.24	146.29	20.30
9500.00	1.53	37.85	9498.09	139.42	139.42	52.34	0.14	148.92	20.58
9600.00	1.50	38.11	9598.06	141.50	141.50	53.96	0.03	151.44	20.87
9700.00	1.42	43.58	9698.02	143.43	143.43	55.62	0.16	153.83	21.20
9800.00	1.34	44.81	9798.00	145.15	145.15	57.30	0.08	156.05	21.54
9900.00	1.25	48.48	9897.97	146.70	146.70	58.93	0.12	158.09	21.89
10000.00	1.29	47.50	9997.95	148.18	148.18	60.58	0.04	160.09	22.24
10100.00	1.36	48.70	10097.92	149.73	149.73	62.30	0.08	162.17	22.59
10200.00	1.43	52.62	10197.89	151.27	151.27	64.19	0.12	164.33	22.99
10300.00	1.54	51.32	10297.86	152.87	152.87	66.23	0.12	166.60	23.43
10400.00	1.49	48.68	10397.82	154.57	154.57	68.26	0.09	168.97	23.83
10500.00	1.56	48.16	10497.78	156.34	156.34	70.25	0.08	171.40	24.20
10600.00	1.53	45.54	10597.75	158.18	158.18	72.22	0.08	173.89	24.54
10700.00	1.50	43.84	10697.71	160.05	160.05	74.07	0.05	176.36	24.83
10800.00	1.29	42.84	10797.68	161.82	161.82	75.74	0.20	178.67	25.08
10900.00	1.41	44.24	10897.66	163.53	163.53	77.37	0.12	180.91	25.32
11000.00	1.38	42.65	10997.63	165.30	165.30	79.04	0.04	183.22	25.56
11100.00	1.16	59.72	11097.60	166.69	166.69	80.73	0.44	185.22	25.84
11200.00	1.15	59.51	11197.58	167.72	167.72	82.48	0.01	186.90	26.19
11300.00	0.95	70.58	11297.56	168.50	168.50	84.13	0.29	188.34	26.53
11400.00	0.88	74.09	11397.55	168.99	168.99	85.65	0.09	189.45	26.88



Well Name: AIRBUS FEDERAL #1
Survey: FINAL OUTRUN SURVEY
Survey Date: 10/21/2011

MD ft	Inc deg	Azim deg	TVD ft	VS ft	Northing ft	Easting ft	DLS deg/100ft	Closure Distance ft	Closure Angle deg
11500.00	0.88	73.93	11497.54	169.41	169.41	87 13	0.00	190.50	27.22
11600.00	0.92	60.82	11597.53	170.02	170.02	88.57	0.21	191.71	27.52
11670.00	0 77	79.97	11667.52	170 38	170.38	89.53	0.45	192.47	27.72



COG Operating LLC

Eddy County(NAD83)

Poptart "12" Federal

#4H

OH

Plan: Plan #1

Pathfinder X & Y Report

06 October, 2011



A Schlumberger Company



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 17 @ 3630.9usft (Original Well Elev)
MD Reference: KB = 17 @ 3630.9usft (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: Poptart "12" Federal

Site Position:	Map	Northing:	611,657.420 usft	Latitude:	32° 40' 49.717 N
From:		Easting:	696,507.170 usft	Longitude:	103° 49' 44.433 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.27 °

Well: #4H

Well Position	+N/-S	0.0 usft	Northing:	611,657.420 usft	Latitude:	32° 40' 49.717 N
	+E/-W	0.0 usft	Easting:	696,507.170 usft	Longitude:	103° 49' 44.433 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,613.9 usft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/6/2011	7.69	60.58	48,868

Design: Plan #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	181.00

Survey Tool Program: Date 10/6/2011

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	14,218.0	Plan #1 (OH)	MWD	MWD - Standard



Pathfinder
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Database: EDM 5000.1 Single User Db

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-3,630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
100.0	0.00	0.00	100.0	-3,530.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
200.0	0.00	0.00	200.0	-3,430.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
300.0	0.00	0.00	300.0	-3,330.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
400.0	0.00	0.00	400.0	-3,230.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
500.0	0.00	0.00	500.0	-3,130.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
600.0	0.00	0.00	600.0	-3,030.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
700.0	0.00	0.00	700.0	-2,930.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
800.0	0.00	0.00	800.0	-2,830.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
900.0	0.00	0.00	900.0	-2,730.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,000.0	0.00	0.00	1,000.0	-2,630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,100.0	0.00	0.00	1,100.0	-2,530.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,200.0	0.00	0.00	1,200.0	-2,430.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,300.0	0.00	0.00	1,300.0	-2,330.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,400.0	0.00	0.00	1,400.0	-2,230.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,500.0	0.00	0.00	1,500.0	-2,130.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,600.0	0.00	0.00	1,600.0	-2,030.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,700.0	0.00	0.00	1,700.0	-1,930.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,800.0	0.00	0.00	1,800.0	-1,830.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
1,900.0	0.00	0.00	1,900.0	-1,730.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,000.0	0.00	0.00	2,000.0	-1,630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,100.0	0.00	0.00	2,100.0	-1,530.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,200.0	0.00	0.00	2,200.0	-1,430.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,300.0	0.00	0.00	2,300.0	-1,330.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,400.0	0.00	0.00	2,400.0	-1,230.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,500.0	0.00	0.00	2,500.0	-1,130.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,600.0	0.00	0.00	2,600.0	-1,030.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17



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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,700.0	0.00	0.00	2,700.0	-930.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,800.0	0.00	0.00	2,800.0	-830.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,900.0	0.00	0.00	2,900.0	-730.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,000.0	0.00	0.00	3,000.0	-630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,100.0	0.00	0.00	3,100.0	-530.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,200.0	0.00	0.00	3,200.0	-430.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,300.0	0.00	0.00	3,300.0	-330.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,400.0	0.00	0.00	3,400.0	-230.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,500.0	0.00	0.00	3,500.0	-130.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,600.0	0.00	0.00	3,600.0	-30.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,700.0	0.00	0.00	3,700.0	69.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,800.0	0.00	0.00	3,800.0	169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,900.0	0.00	0.00	3,900.0	269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,000.0	0.00	0.00	4,000.0	369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,100.0	0.00	0.00	4,100.0	469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,200.0	0.00	0.00	4,200.0	569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,300.0	0.00	0.00	4,300.0	669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,400.0	0.00	0.00	4,400.0	769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,500.0	0.00	0.00	4,500.0	869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,600.0	0.00	0.00	4,600.0	969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,700.0	0.00	0.00	4,700.0	1,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,800.0	0.00	0.00	4,800.0	1,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,900.0	0.00	0.00	4,900.0	1,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,000.0	0.00	0.00	5,000.0	1,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,100.0	0.00	0.00	5,100.0	1,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,200.0	0.00	0.00	5,200.0	1,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,300.0	0.00	0.00	5,300.0	1,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17



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5,400.0	0.00	0.00	5,400.0	1,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,500.0	0.00	0.00	5,500.0	1,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,600.0	0.00	0.00	5,600.0	1,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,700.0	0.00	0.00	5,700.0	2,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,800.0	0.00	0.00	5,800.0	2,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,900.0	0.00	0.00	5,900.0	2,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,000.0	0.00	0.00	6,000.0	2,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,100.0	0.00	0.00	6,100.0	2,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,200.0	0.00	0.00	6,200.0	2,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,300.0	0.00	0.00	6,300.0	2,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,400.0	0.00	0.00	6,400.0	2,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,500.0	0.00	0.00	6,500.0	2,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,600.0	0.00	0.00	6,600.0	2,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,700.0	0.00	0.00	6,700.0	3,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,800.0	0.00	0.00	6,800.0	3,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,900.0	0.00	0.00	6,900.0	3,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,000.0	0.00	0.00	7,000.0	3,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,100.0	0.00	0.00	7,100.0	3,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,200.0	0.00	0.00	7,200.0	3,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,300.0	0.00	0.00	7,300.0	3,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,400.0	0.00	0.00	7,400.0	3,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,500.0	0.00	0.00	7,500.0	3,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,600.0	0.00	0.00	7,600.0	3,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,700.0	0.00	0.00	7,700.0	4,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,800.0	0.00	0.00	7,800.0	4,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,900.0	0.00	0.00	7,900.0	4,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,000.0	0.00	0.00	8,000.0	4,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17



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8,100.0	0.00	0.00	8,100.0	4,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,200.0	0.00	0.00	8,200.0	4,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,300.0	0.00	0.00	8,300.0	4,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,400.0	0.00	0.00	8,400.0	4,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,500.0	0.00	0.00	8,500.0	4,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,600.0	0.00	0.00	8,600.0	4,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,700.0	0.00	0.00	8,700.0	5,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,800.0	0.00	0.00	8,800.0	5,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,900.0	0.00	0.00	8,900.0	5,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,000.0	0.00	0.00	9,000.0	5,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,100.0	0.00	0.00	9,100.0	5,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,200.0	0.00	0.00	9,200.0	5,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,300.0	0.00	0.00	9,300.0	5,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,400.0	0.00	0.00	9,400.0	5,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,500.0	0.00	0.00	9,500.0	5,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,600.0	0.00	0.00	9,600.0	5,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,700.0	0.00	0.00	9,700.0	6,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,800.0	0.00	0.00	9,800.0	6,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,900.0	0.00	0.00	9,900.0	6,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,972.5	0.00	0.00	9,972.5	6,341.6	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,975.0	0.30	181.00	9,975.0	6,344.1	0.0	0.0	0.0	12.00	611,657.41	696,507.17
10,000.0	3.30	181.00	10,000.0	6,369.1	-0.8	0.0	0.8	12.00	611,656.63	696,507.16
10,025.0	6.30	181.00	10,024.9	6,394.0	-2.9	-0.1	2.9	12.00	611,654.54	696,507.12
10,050.0	9.30	181.00	10,049.7	6,418.8	-6.3	-0.1	6.3	12.00	611,651.15	696,507.06
10,075.0	12.30	181.00	10,074.2	6,443.3	-11.0	-0.2	11.0	12.00	611,646.46	696,506.98
10,100.0	15.30	181.00	10,098.5	6,467.6	-16.9	-0.3	16.9	12.00	611,640.50	696,506.88
10,125.0	18.30	181.00	10,122.4	6,491.5	-24.1	-0.4	24.1	12.00	611,633.28	696,506.75



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 17 @ 3630.9usft (Original Well Elev)
MD Reference: KB = 17 @ 3630.9usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (%)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
10,150.0	21.30	181.00	10,145.9	6,515.0	-32.6	-0.6	32.6	12.00	611,624.81	696,506.60
10,175.0	24.30	181.00	10,169.0	6,538.1	-42.3	-0.7	42.3	12.00	611,615.12	696,506.43
10,200.0	27.30	181.00	10,191.5	6,560.6	-53.2	-0.9	53.2	12.00	611,604.25	696,506.24
10,225.0	30.30	181.00	10,213.4	6,582.5	-65.2	-1.1	65.2	12.00	611,592.21	696,506.03
10,250.0	33.30	181.00	10,234.6	6,603.7	-78.4	-1.4	78.4	12.00	611,579.04	696,505.81
10,275.0	36.30	181.00	10,255.2	6,624.3	-92.6	-1.6	92.7	12.00	611,564.77	696,505.56
10,300.0	39.30	181.00	10,274.9	6,644.0	-108.0	-1.9	108.0	12.00	611,549.45	696,505.29
10,325.0	42.30	181.00	10,293.8	6,662.9	-124.3	-2.2	124.3	12.00	611,533.12	696,505.01
10,350.0	45.30	181.00	10,311.9	6,681.0	-141.6	-2.5	141.6	12.00	611,515.82	696,504.70
10,375.0	48.30	181.00	10,329.0	6,698.1	-159.8	-2.8	159.8	12.00	611,497.60	696,504.39
10,400.0	51.30	181.00	10,345.1	6,714.2	-178.9	-3.1	178.9	12.00	611,478.51	696,504.06
10,425.0	54.30	181.00	10,360.2	6,729.3	-198.8	-3.5	198.8	12.00	611,458.61	696,503.71
10,450.0	57.30	181.00	10,374.3	6,743.4	-219.5	-3.8	219.5	12.00	611,437.93	696,503.35
10,475.0	60.30	181.00	10,387.2	6,756.3	-240.9	-4.2	240.9	12.00	611,416.56	696,502.98
10,500.0	63.30	181.00	10,399.1	6,768.2	-262.9	-4.6	262.9	12.00	611,394.53	696,502.59
10,525.0	66.30	181.00	10,409.7	6,778.8	-285.5	-5.0	285.5	12.00	611,371.91	696,502.20
10,550.0	69.30	181.00	10,419.1	6,788.2	-308.6	-5.4	308.7	12.00	611,348.77	696,501.80
10,575.0	72.30	181.00	10,427.4	6,796.5	-332.2	-5.8	332.3	12.00	611,325.17	696,501.39
10,600.0	75.30	181.00	10,434.3	6,803.4	-356.3	-6.2	356.3	12.00	611,301.17	696,500.97
10,625.0	78.30	181.00	10,440.0	6,809.1	-380.6	-6.6	380.6	12.00	611,276.84	696,500.54
10,650.0	81.30	181.00	10,444.5	6,813.6	-405.2	-7.1	405.2	12.00	611,252.24	696,500.12
10,675.0	84.30	181.00	10,447.6	6,816.7	-430.0	-7.5	430.0	12.00	611,227.44	696,499.68
10,699.3	87.22	181.00	10,449.4	6,818.5	-454.2	-7.9	454.3	12.00	611,203.17	696,499.26
10,800.0	87.22	181.00	10,454.3	6,823.4	-554.8	-9.7	554.9	0.00	611,102.65	696,497.51
10,900.0	87.22	181.00	10,459.1	6,828.2	-654.6	-11.4	654.7	0.00	611,002.78	696,495.77
11,000.0	87.22	181.00	10,464.0	6,833.1	-754.5	-13.1	754.6	0.00	610,902.91	696,494.03
11,100.0	87.22	181.00	10,468.8	6,837.9	-854.4	-14.9	854.5	0.00	610,803.05	696,492.29



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PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
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Design: Plan #1

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V' Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,200.0	87.22	181.00	10,473.7	6,842.8	-954.2	-16.6	954.4	0.00	610,703.18	696,490.56
11,300.0	87.22	181.00	10,478.5	6,847.6	-1,054.1	-18.4	1,054.3	0.00	610,603.31	696,488.82
11,400.0	87.22	181.00	10,483.4	6,852.5	-1,154.0	-20.1	1,154.1	0.00	610,503.44	696,487.08
11,500.0	87.22	181.00	10,488.2	6,857.3	-1,253.8	-21.8	1,254.0	0.00	610,403.58	696,485.34
11,600.0	87.22	181.00	10,493.1	6,862.2	-1,353.7	-23.6	1,353.9	0.00	610,303.71	696,483.60
11,700.0	87.22	181.00	10,497.9	6,867.0	-1,453.6	-25.3	1,453.8	0.00	610,203.84	696,481.86
11,800.0	87.22	181.00	10,502.8	6,871.9	-1,553.4	-27.0	1,553.7	0.00	610,103.98	696,480.12
11,900.0	87.22	181.00	10,507.6	6,876.7	-1,653.3	-28.8	1,653.6	0.00	610,004.11	696,478.38
12,000.0	87.22	181.00	10,512.5	6,881.6	-1,753.2	-30.5	1,753.4	0.00	609,904.24	696,476.65
12,100.0	87.22	181.00	10,517.3	6,886.4	-1,853.0	-32.3	1,853.3	0.00	609,804.37	696,474.91
12,200.0	87.22	181.00	10,522.2	6,891.3	-1,952.9	-34.0	1,953.2	0.00	609,704.51	696,473.17
12,300.0	87.22	181.00	10,527.0	6,896.1	-2,052.8	-35.7	2,053.1	0.00	609,604.64	696,471.43
12,400.0	87.22	181.00	10,531.9	6,901.0	-2,152.6	-37.5	2,153.0	0.00	609,504.77	696,469.69
12,500.0	87.22	181.00	10,536.7	6,905.8	-2,252.5	-39.2	2,252.9	0.00	609,404.91	696,467.95
12,600.0	87.22	181.00	10,541.6	6,910.7	-2,352.4	-41.0	2,352.7	0.00	609,305.04	696,466.21
12,700.0	87.22	181.00	10,546.4	6,915.5	-2,452.2	-42.7	2,452.6	0.00	609,205.17	696,464.47
12,800.0	87.22	181.00	10,551.3	6,920.4	-2,552.1	-44.4	2,552.5	0.00	609,105.30	696,462.74
12,900.0	87.22	181.00	10,556.1	6,925.2	-2,652.0	-46.2	2,652.4	0.00	609,005.44	696,461.00
13,000.0	87.22	181.00	10,560.9	6,930.0	-2,751.9	-47.9	2,752.3	0.00	608,905.57	696,459.26
13,100.0	87.22	181.00	10,565.8	6,934.9	-2,851.7	-49.7	2,852.2	0.00	608,805.70	696,457.52
13,200.0	87.22	181.00	10,570.6	6,939.7	-2,951.6	-51.4	2,952.0	0.00	608,705.83	696,455.78
13,300.0	87.22	181.00	10,575.5	6,944.6	-3,051.5	-53.1	3,051.9	0.00	608,605.97	696,454.04
13,400.0	87.22	181.00	10,580.3	6,949.4	-3,151.3	-54.9	3,151.8	0.00	608,506.10	696,452.30
13,500.0	87.22	181.00	10,585.2	6,954.3	-3,251.2	-56.6	3,251.7	0.00	608,406.23	696,450.56
13,600.0	87.22	181.00	10,590.0	6,959.1	-3,351.1	-58.3	3,351.6	0.00	608,306.37	696,448.82
13,700.0	87.22	181.00	10,594.9	6,964.0	-3,450.9	-60.1	3,451.4	0.00	608,206.50	696,447.09
13,800.0	87.22	181.00	10,599.7	6,968.8	-3,550.8	-61.8	3,551.3	0.00	608,106.63	696,445.35



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13,900.0	87.22	181.00	10,604.6	6,973.7	-3,650.7	-63.6	3,651.2	0.00	608,006.76	696,443.61
14,000.0	87.22	181.00	10,609.4	6,978.5	-3,750.5	-65.3	3,751.1	0.00	607,906.90	696,441.87
14,100.0	87.22	181.00	10,614.3	6,983.4	-3,850.4	-67.0	3,851.0	0.00	607,807.03	696,440.13
14,200.0	87.22	181.00	10,619.1	6,988.2	-3,950.3	-68.8	3,950.9	0.00	607,707.16	696,438.39
14,218.0	87.22	181.00	10,620.0	6,989.1	-3,968.2	-69.1	3,968.8	0.00	607,689.23	696,438.08

Checked By: _____

Approved By: _____

Date: _____



Project: Eddy County(NAD83)
Site: Poptart "12" Federa
Well: #4H
Wellbore: OH
Plan: Plan #1 (#4H/OH)



Azimuths to Grid North
True North: -0.27°
Magnetic North: 7.42°

Magnetic Field
Strength: 48867.7snT
Dip Angle: 60.58°
Date: 10/6/2011
Model: IGRF200510

PATHFINDER

A Schlumberger Company

PROJECT DETAILS Eddy County(NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

WELL DETAILS #4H

Ground Elevation 3613.9
RKB Elevation KB = 17 @ 3630.9usft (Original Well Elev)
Rig Name Original Well Elev

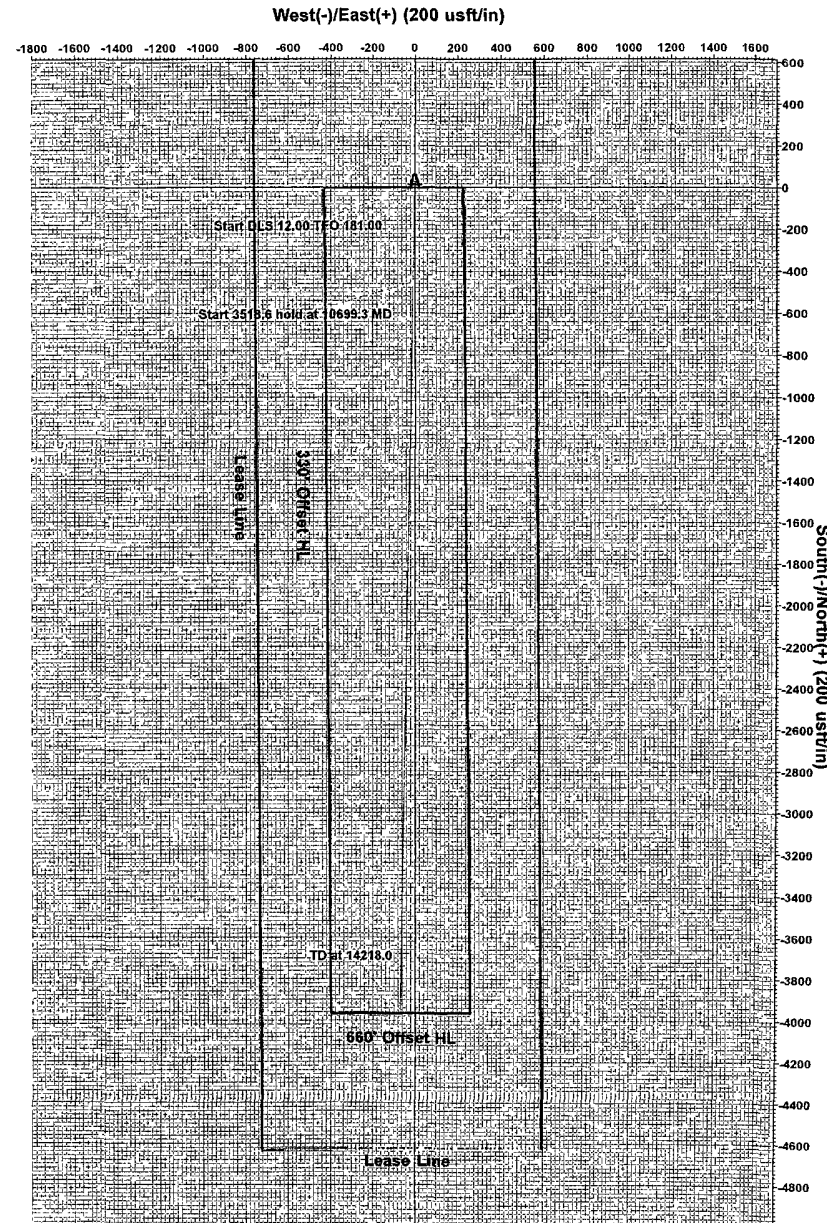
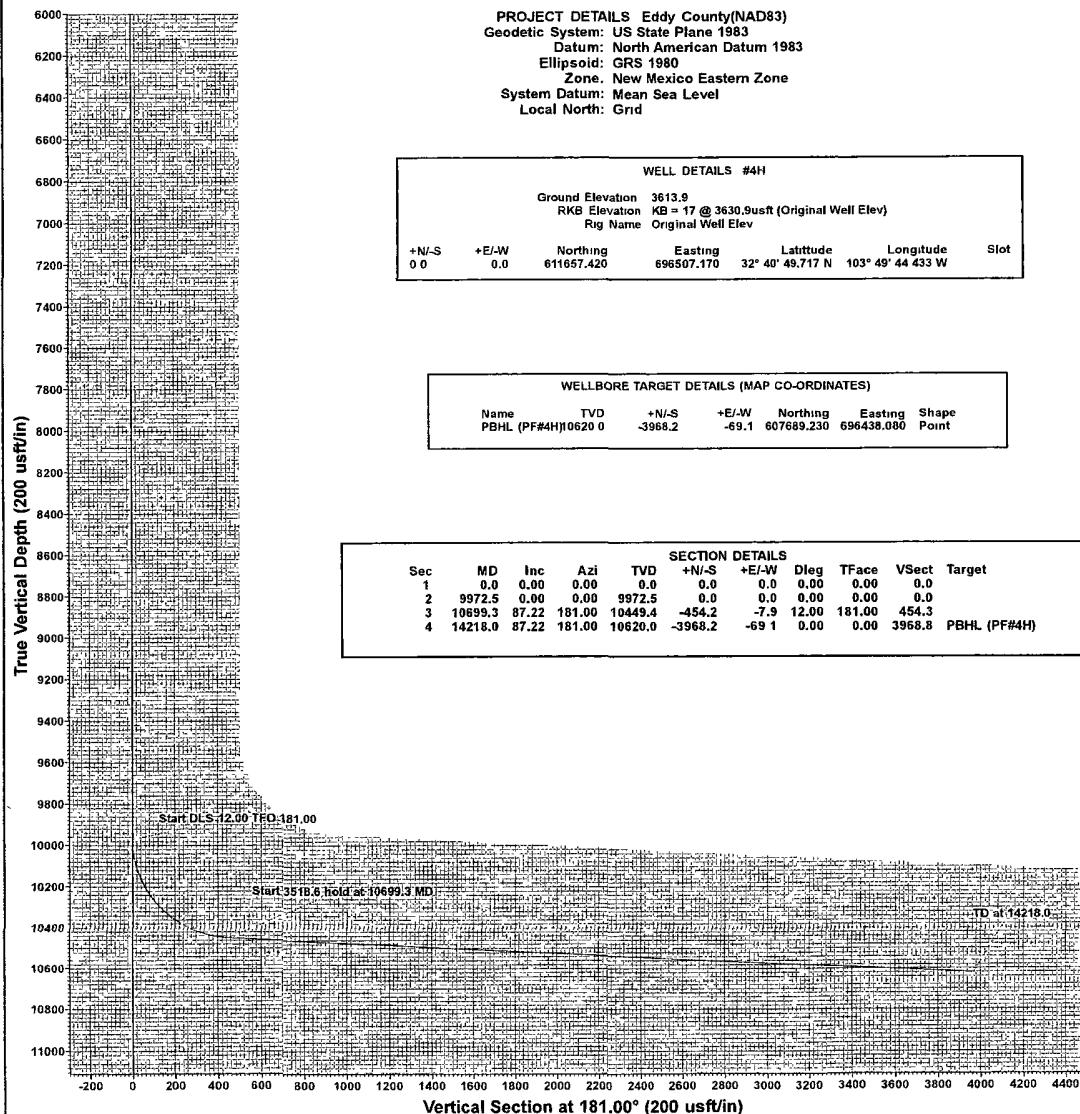
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	611657.420	696507.170	32° 40' 49.717 N	103° 49' 44.433 W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL (PF#4H)0620 0		-3968.2	-69.1	607689.230	696438.080	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	9972.5	0.00	0.00	9972.5	0.0	0.0	0.00	0.00	0.0	
3	10699.3	87.22	181.00	10449.4	-454.2	-7.9	12.00	181.00	454.3	
4	14218.0	87.22	181.00	10620.0	-3968.2	-69.1	0.00	0.00	3968.8	PBHL (PF#4H)

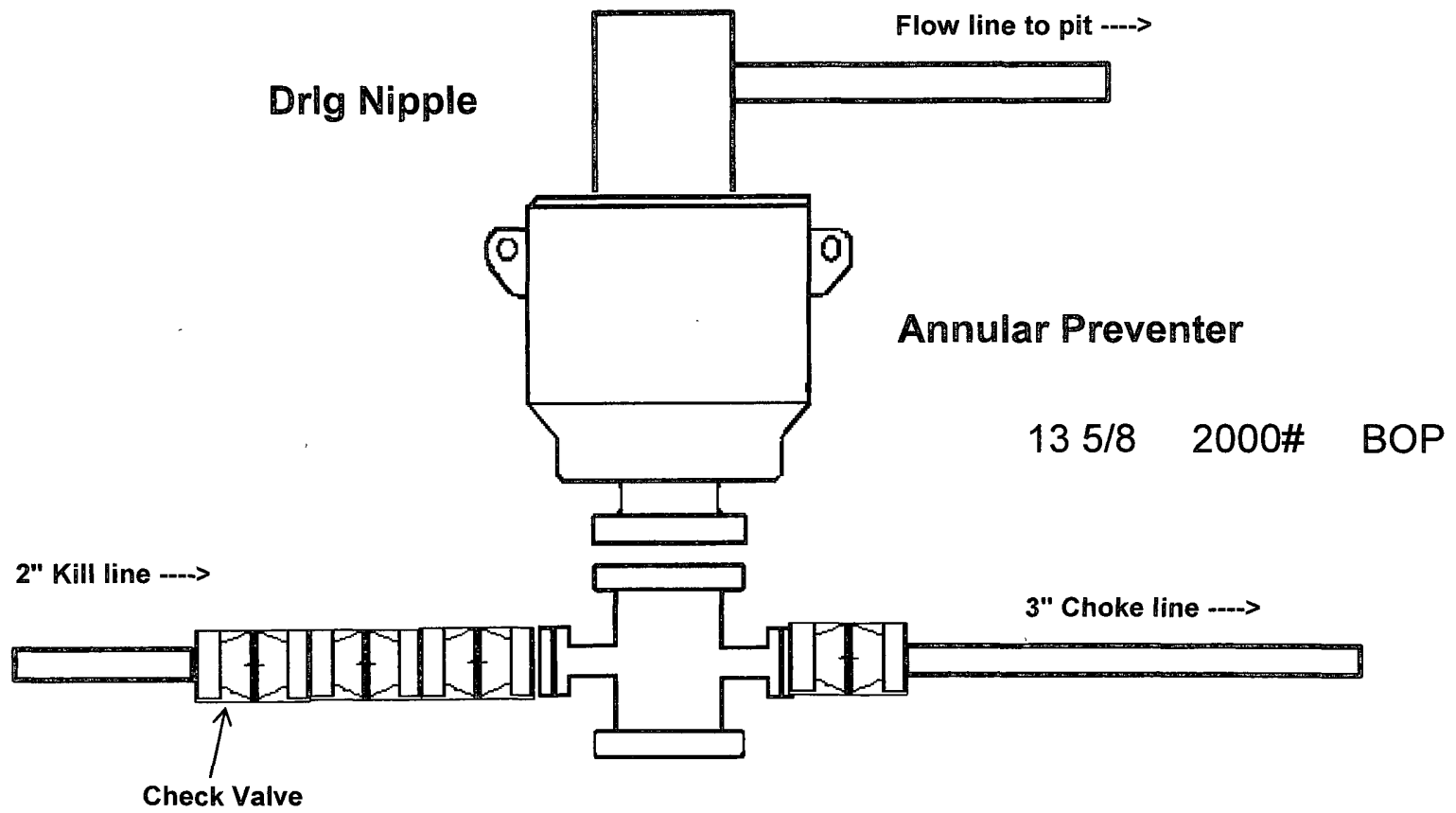


Plan Plan #1 (#4H/OH)

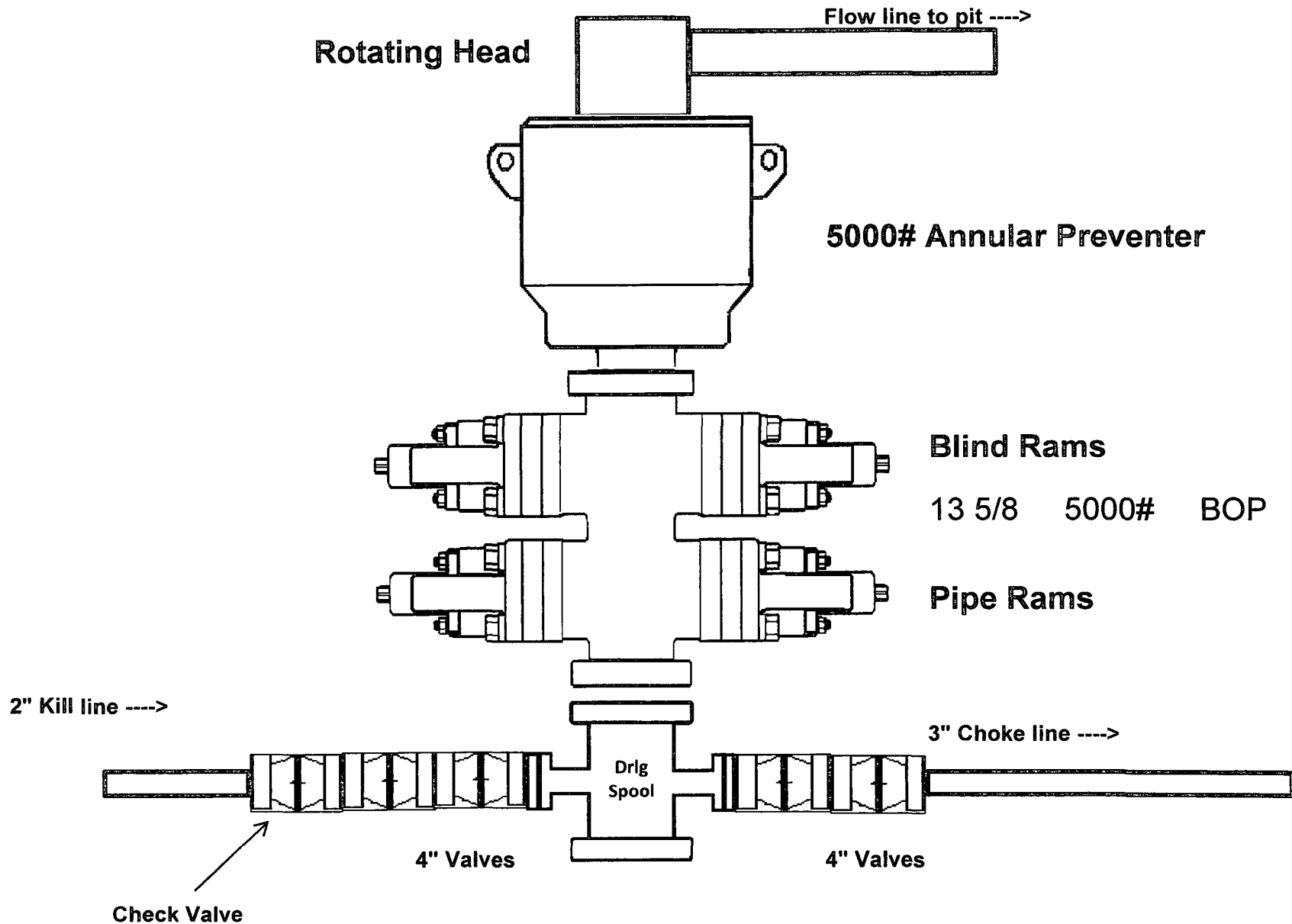
Created By: Sam Biffle Date: 16 42, October 06 2011

Checked: _____ Date: _____

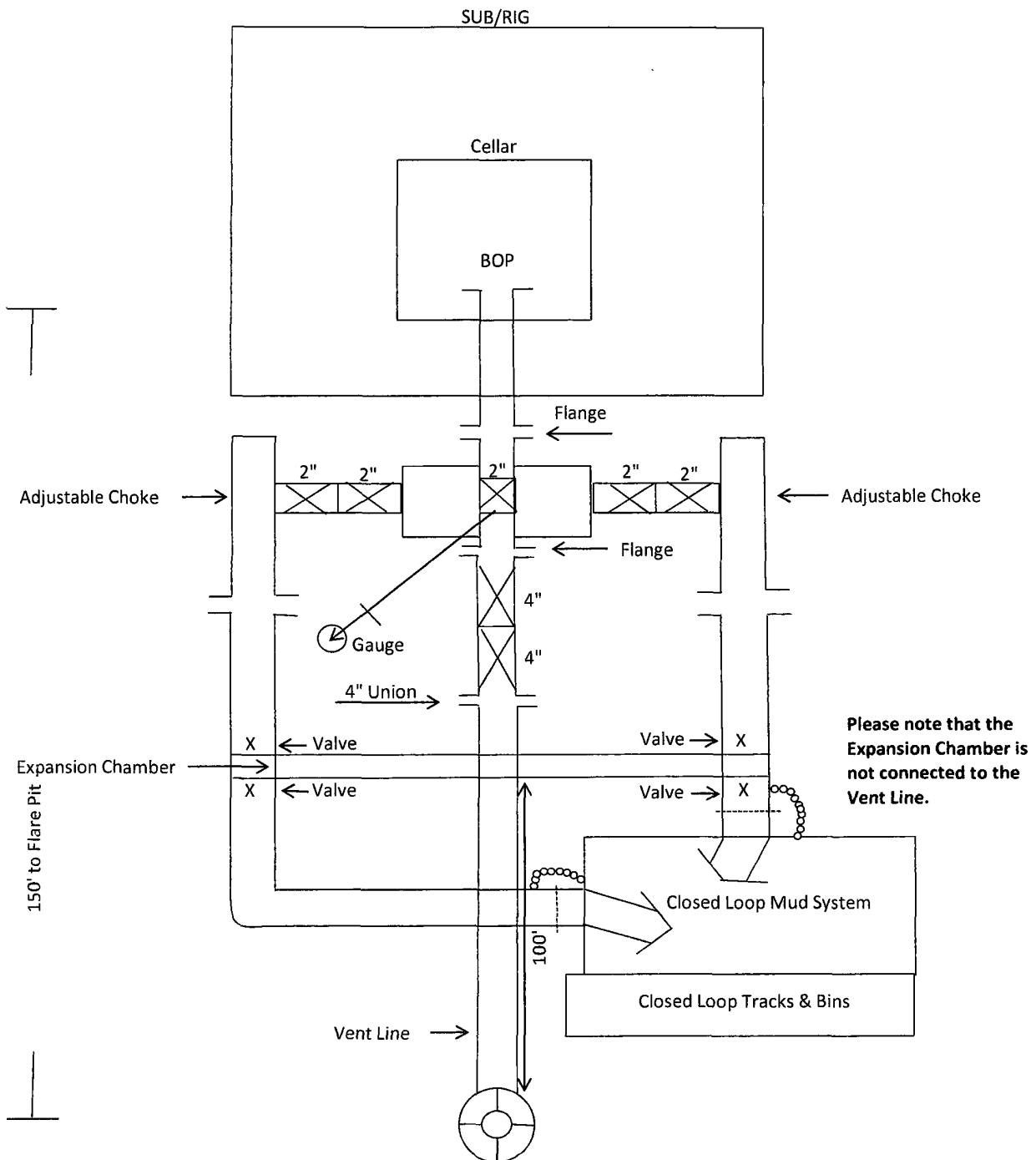
2,000 psi BOP Schematic



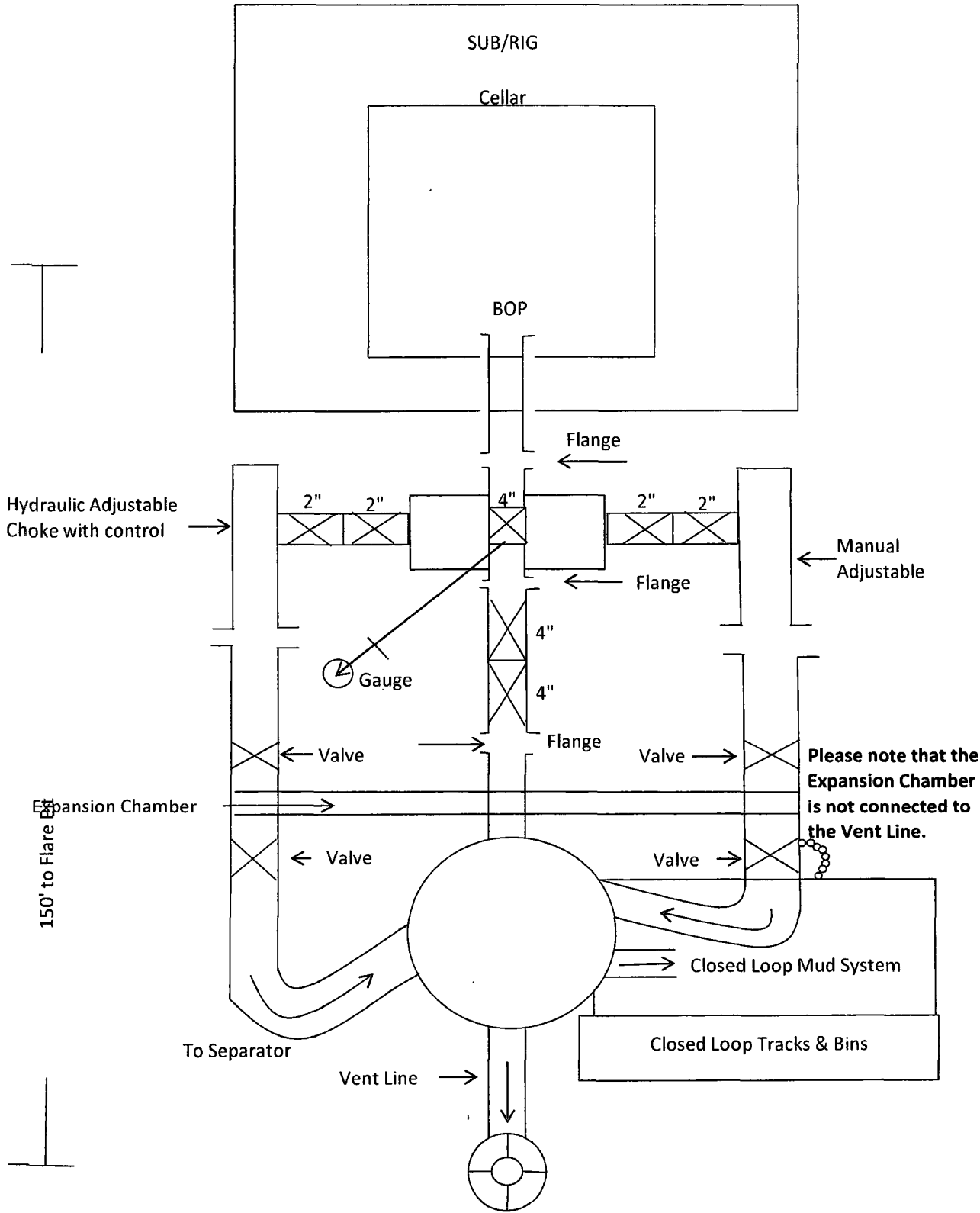
5,000 psi BOP Schematic



2M Choke Manifold Equipment



5M Choke Manifold Equipment



**Design Plan
Operating and Maintenance Plan
Closure Plan**

**Poptart 12 Federal #4H
SHL: 660' FNL & 760' FWL
BHL: 660' FSL & 660' FWL
Section 12 T19S R31E
Eddy County, New Mexico**

COG Operating LLC will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. All leaks should be kept to less than 5 barrels. Rig crews will monitor the tanks at all times.

Equipment List:

2- Mongoose Shale Shakers
1- 414 Centrifuge
1- 518 Centrifuge
2- Roll Off Bins w/ Tracks
2- 500 BBL Frac Tanks

During drilling operations all liquids, drilling fluids and cuttings will be hauled off via CRI (Controlled Recovery Inc.) Permit R-9166 or any other approved facility.

COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

Well pads will be 300' X 300'
with cellar in center of pad

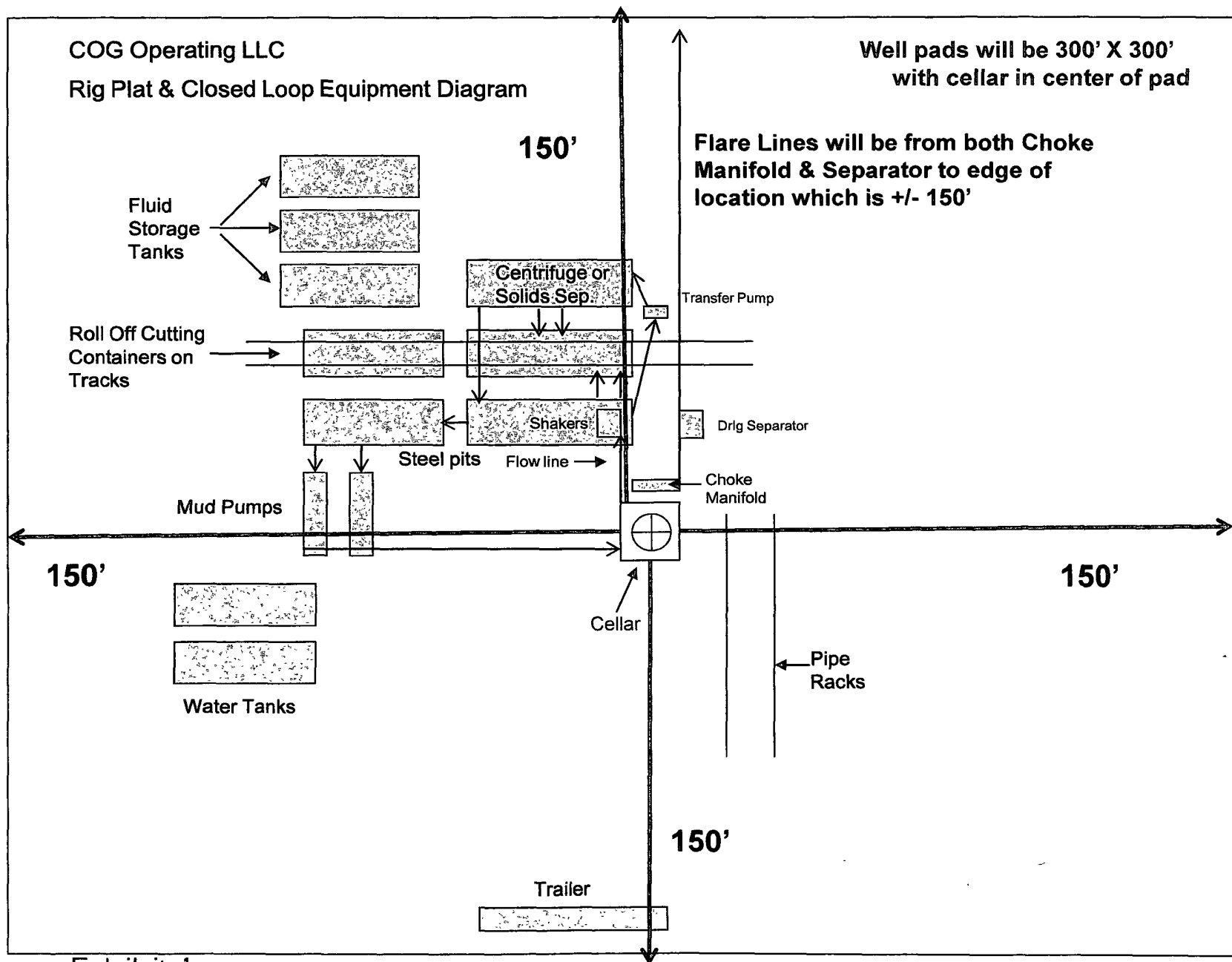


Exhibit 1

DISTRICT 2 -- CHECKLIST FOR INTENTS TO DRILL

38940

Operator COG OPR OGRID # 229134
Well Name & # POTASH 12 FERTIL 004H Surface Type (F) (S) (P)
Location: UL D Sect 12 Township 15 s, RNG 31 e, Sub-surface Type (F) (S) (P)

- A. Date C101 rec'd 11/28/2011 C101 reviewed 11/28/2011
- B. 1. Check mark, Information is OK on Forms:
OGRID ☒, BONDING ☒, PROP CODE ☒, WELL # ☒, SIGNATURE ☒
2. Inactive Well list as of: 11/28/2011 # wells 307 # Inactive wells 8
a. District Grant APD but see number of inactive wells:
No letter required ☒; Sent Letter to Operator ☐, to Santa Fe ☐
3. Additional Bonding as of: 11/28/2011
a. District Denial because operator needs addition bonding:
No Letter required ☒; Sent Letter to Operator ☐, To Santa Fe ☐
b. District Denial because of Inactive well list and Financial Assurance:
No Letter required ☒; Sent Letter to Operator ☐, To Santa Fe ☐
- C. C102 YES ☒ NO ☐, Signature ☒
1. Pool WILDCAT W.C. GAS, Code 97489
a. Dedicated acreage 160, What Units D-E-L-M
b. SUR. Location Standard ☐: Non-Standard Location ☐
c. Well shares acres: Yes ☐, No ☒, # of wells ☐ plus this well # ☐
2. 2nd. Operator in same acreage, Yes ☐, No ☒
Agreement Letter ☐, Disagreement letter ☐
3. Intent to Directional Drill Yes ☒, No ☐
a. Dedicated acreage 160, What Units D-E-L-M
b. Bottomhole Location Standard ☒, Non-Standard Bottomhole ☐
4. Downhole Commingle: Yes ☐, No ☒
a. Pool #2 ☐, Code ☐, Acres ☐
Pool #3 ☐, Code ☐, Acres ☐
Pool #4 ☐, Code ☐, Acres ☐
5. POTASH Area Yes ☐, No ☒
D. Blowout Preventer Yes ☒, No ☐
E. H2S Yes ☒, No ☐
F. C144 Pit Registration Yes ☐, No ☐
G. Does APD require Santa Fe Approval:
1. Non-Standard Location: Yes ☐, No ☒, NSL # ☐
2. Non-Standard Proration: Yes ☐, No ☒, NSP # ☐
3. Simultaneous Dedication: Yes ☐, No ☒, SD # ☐
Number of wells ☐ Plus # ☐
4. Injection order Yes ☐, No ☒; PMX # ☐ or WFX # ☐
5. SWD order Yes ☐, NO ☒; SWD # ☐
6. DHC from SF ☐; DHC-HOB ☐; Holding ☐
7. OCD Approval Date 11/28/2011 API #30-0 15-39712
8. Reviewers 105