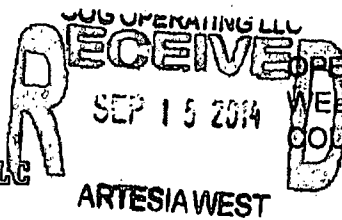




PATRIOT DRILLING, LLC



30-015-42472

OPERATOR:
WELL/LEASE:
COUNTY:

COG Operating, LLC
Barn Owl Fed #2H
Eddy Co., New Mexico
Sec. 19, T 26S, R 27E

STATE OF NEW MEXICO
DEVIATION REPORT

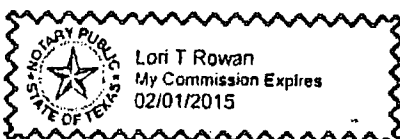
Depth	Deviation	Depth	Deviation
126	1/2	3,448	1/2
378	1 1/2	3,952	1
438	1 3/4	4,424	1
527	2	4,833	1 1/4
701	2	5,120	2 1/4
890	1/2	5,561	1 3/4
984	2 1/4	6,027	1 1/2
1,173	1	6,281	1/2
1,362	1 3/4	6,660	1 1/2
1,552	1 3/4	6,820	1 1/4
1,741	1	7,118	1
1,930	1 1/4	7,542	1/2
2,503	3/4	8,131	1/2
2,976	3/4	8,163	1 3/4

Patriot Drilling, LLC

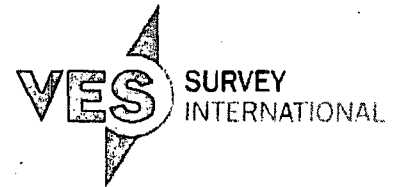
M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 20th day of August, 2014 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015



Lori T. Rowan
Notary Public for Ector Co., Texas



August 13, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: Barn Owl Federal No. 002H

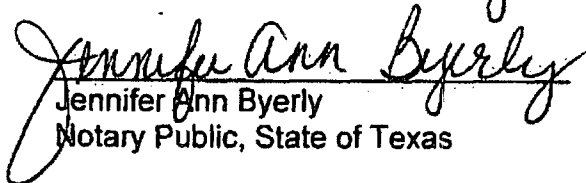
Please find enclosed a copy of the survey from 0.00' to 8040.00' ran on the above referenced well.

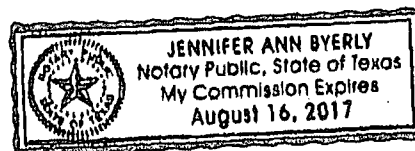
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

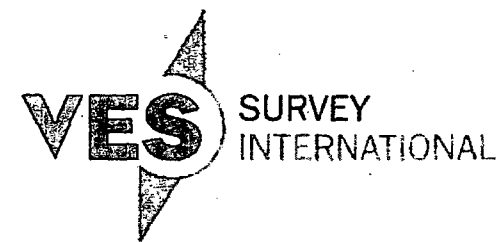
This instrument was acknowledged before me on the 13 day of August, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Rig Name: Patriot 2
State/County: New Mexico/Eddy
Latitude: 32.03, Longitude: -104.22
GRID North is 0.06 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 8/13/2014 / 09:24

VES Survey International

West Texas

(432) 563-5444

Surveyor: Adam Gathright

Barn Owl Federal No. 002H / API 30-015-42472

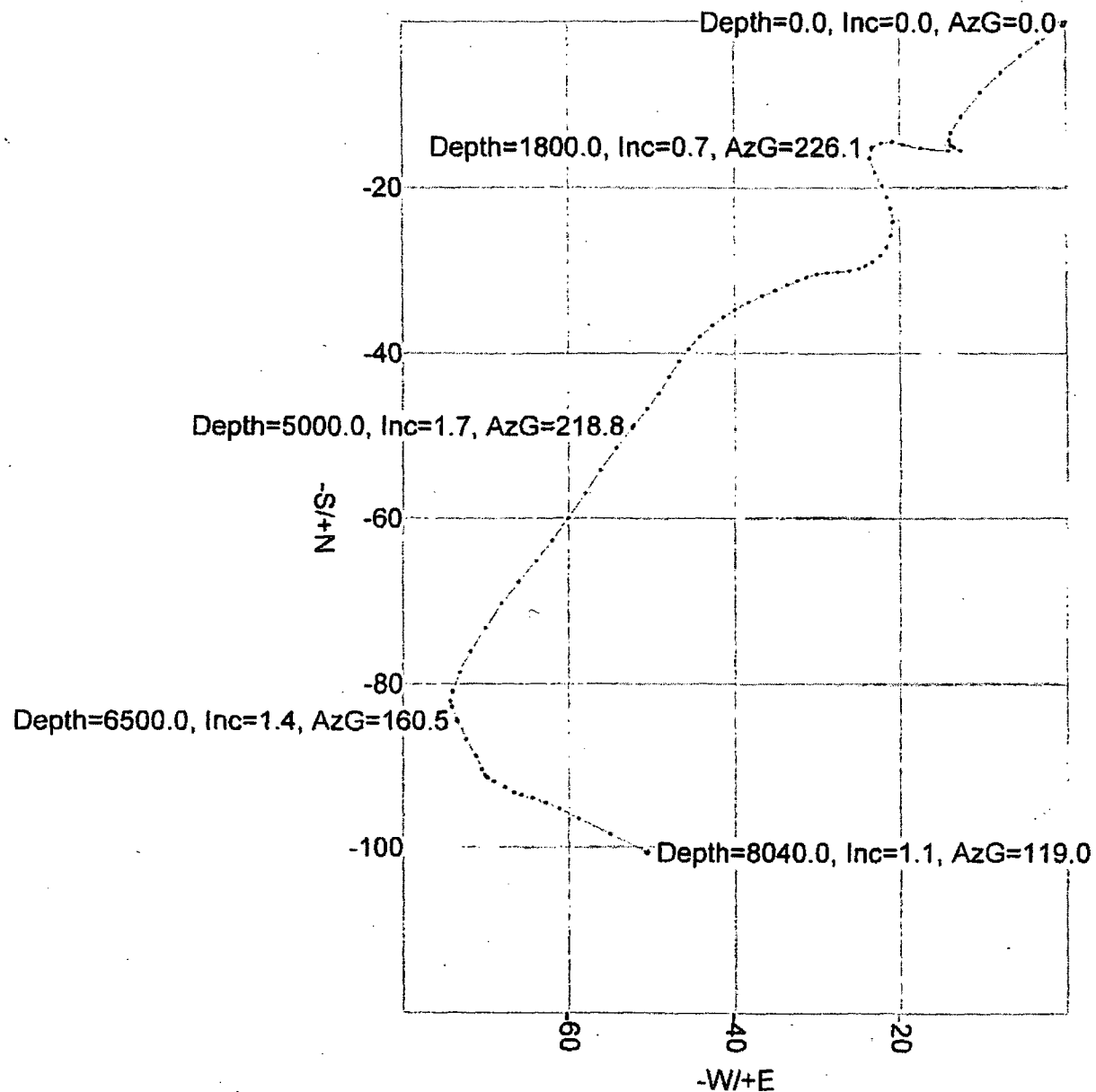
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	***
100.00	0.53	215.52	100.00	-0.38	-0.27	-0.38	0.46	215.52	0.53
200.00	1.31	239.79	199.99	-1.33	-1.52	-1.33	2.02	228.96	0.85
300.00	1.19	233.29	299.96	-2.52	-3.34	-2.52	4.19	232.97	0.18
400.00	1.75	233.41	399.93	-4.05	-5.40	-4.05	6.75	233.12	0.55
500.00	1.93	226.03	499.88	-6.13	-7.84	-6.13	9.95	231.96	0.30
600.00	2.02	224.34	599.82	-8.57	-10.29	-8.57	13.39	230.21	0.11
700.00	2.20	214.51	699.75	-11.41	-12.61	-11.41	17.01	227.85	0.40
800.00	0.53	201.65	799.72	-13.42	-13.87	-13.42	19.30	225.93	1.69
900.00	0.56	179.89	899.71	-14.34	-14.04	-14.34	20.06	224.39	0.21
1000.00	0.22	113.63	999.71	-14.90	-13.86	-14.90	20.35	222.92	0.51
1100.00	0.37	121.05	1099.71	-15.15	-13.40	-15.15	20.22	221.50	0.16
1200.00	0.62	119.25	1199.71	-15.58	-12.65	-15.58	20.07	219.08	0.24
1300.00	2.21	277.13	1299.69	-15.60	-14.10	-15.60	21.03	222.10	2.79
1400.00	1.61	272.75	1399.63	-15.29	-17.41	-15.29	23.17	228.70	0.62
1500.00	1.03	298.13	1499.60	-14.80	-19.61	-14.80	24.57	232.96	0.81
1600.00	0.61	263.97	1599.59	-14.43	-20.94	-14.43	25.43	235.42	0.63
1700.00	0.86	261.37	1699.59	-14.60	-22.21	-14.60	26.58	236.68	0.25
1800.00	0.67	226.08	1799.58	-15.12	-23.36	-15.12	27.83	237.10	0.50

Depth FT	Angle Deg	Dir Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	1.04	173.29	1899.57	-16.42	-23.68	-16.42	28.82	235.26	0.83
2000.00	1.08	144.79	1999.55	-18.10	-23.03	-18.10	29.29	231.84	0.52
2100.00	1.05	157.02	2099.53	-19.71	-22.13	-19.71	29.63	228.31	0.23
2200.00	0.66	165.38	2199.52	-21.08	-21.53	-21.08	30.13	225.60	0.39
2300.00	0.98	165.93	2299.51	-22.44	-21.08	-22.44	30.79	223.21	0.35
2400.00	0.94	178.11	2399.50	-24.08	-20.84	-24.08	31.85	220.87	0.21
2500.00	0.97	196.81	2499.48	-25.71	-21.06	-25.71	33.23	219.32	0.31
2600.00	0.77	206.30	2599.47	-27.12	-21.60	-27.12	34.67	218.54	0.25
2700.00	0.73	225.45	2699.46	-28.17	-22.35	-28.17	35.96	218.44	0.25
2800.00	0.71	239.34	2799.46	-28.93	-23.34	-28.93	37.17	218.90	0.18
2900.00	0.33	240.14	2899.45	-29.39	-24.12	-29.39	38.02	219.38	0.37
3000.00	0.69	250.69	2999.45	-29.73	-24.94	-29.73	38.81	219.99	0.37
3100.00	0.77	259.85	3099.44	-30.05	-26.18	-30.05	39.85	221.06	0.14
3200.00	0.80	268.58	3199.43	-30.19	-27.53	-30.19	40.86	222.37	0.12
3300.00	0.71	265.30	3299.42	-30.25	-28.84	-30.25	41.80	223.63	0.10
3400.00	0.74	255.50	3399.41	-30.47	-30.08	-30.47	42.81	224.63	0.13
3500.00	0.73	254.64	3499.41	-30.80	-31.32	-30.80	43.93	225.48	0.01
3600.00	0.58	243.06	3599.40	-31.20	-32.39	-31.20	44.97	226.07	0.20
3700.00	0.97	247.44	3699.39	-31.75	-33.62	-31.75	46.24	226.64	0.40
3800.00	0.83	246.70	3799.38	-32.36	-35.07	-32.36	47.72	227.30	0.14
3900.00	1.10	245.99	3899.36	-33.04	-36.61	-33.04	49.32	227.94	0.26
4000.00	1.01	246.71	3999.35	-33.78	-38.30	-33.78	51.07	228.59	0.09
4100.00	1.15	239.27	4099.33	-34.64	-39.97	-34.64	52.89	229.09	0.19
4200.00	0.77	230.95	4199.31	-35.57	-41.36	-35.57	54.55	229.30	0.40
4300.00	1.15	232.51	4299.30	-36.61	-42.67	-36.61	56.22	229.37	0.38
4400.00	1.18	224.84	4399.28	-37.95	-44.19	-37.95	58.25	229.35	0.16
4500.00	1.15	218.57	4499.26	-39.46	-45.55	-39.46	60.26	229.09	0.13
4600.00	1.12	214.74	4599.24	-41.04	-46.72	-41.04	62.19	228.70	0.08
4700.00	1.45	210.17	4699.21	-42.94	-47.92	-42.94	64.34	228.14	0.36
4800.00	1.22	215.68	4799.19	-44.90	-49.17	-44.90	66.58	227.60	0.27
4900.00	1.42	217.39	4899.16	-46.74	-50.54	-46.74	68.84	227.24	0.21
5000.00	1.68	218.76	4999.12	-48.87	-52.21	-48.87	71.52	226.89	0.27
5100.00	2.10	216.83	5099.07	-51.48	-54.23	-51.48	74.78	226.49	0.42
5200.00	1.72	214.00	5199.01	-54.20	-56.17	-54.20	78.05	226.02	0.39
5300.00	2.07	211.88	5298.96	-56.98	-57.97	-56.98	81.28	225.49	0.36
5400.00	2.03	215.34	5398.89	-59.96	-59.95	-59.96	84.79	224.99	0.13
5500.00	1.84	218.11	5498.84	-62.67	-61.96	-62.67	88.13	224.68	0.22
5600.00	1.72	218.36	5598.79	-65.11	-63.89	-65.11	91.22	224.46	0.11
5700.00	2.03	220.43	5698.74	-67.63	-65.97	-67.63	94.48	224.28	0.31

measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.82	215.05	5798.68	-70.28	-68.03	-70.28	97.81	224.07	0.27
5900.00	2.22	212.35	5898.62	-73.23	-69.98	-73.23	101.29	223.70	0.41
6000.00	1.67	213.05	5998.56	-76.09	-71.81	-76.09	104.63	223.34	0.55
6100.00	1.58	201.75	6098.52	-78.60	-73.12	-78.60	107.35	222.93	0.33
6200.00	1.22	198.53	6198.49	-80.89	-73.97	-80.89	109.62	222.44	0.37
6300.00	0.21	174.97	6298.48	-82.09	-74.30	-82.09	110.72	222.15	1.03
6400.00	0.67	155.14	6398.48	-82.81	-74.03	-82.81	111.08	221.80	0.47
6500.00	1.41	160.52	6498.46	-84.51	-73.38	-84.51	111.92	220.97	0.75
6600.00	1.42	147.72	6598.43	-86.72	-72.30	-86.72	112.91	219.82	0.32
6700.00	1.34	155.03	6698.40	-88.82	-71.15	-88.82	113.81	218.69	0.20
6800.00	0.70	156.65	6798.38	-90.44	-70.41	-90.44	114.62	217.90	0.64
6900.00	0.24	142.63	6898.38	-91.17	-70.04	-91.17	114.97	217.53	0.47
7000.00	0.20	124.81	6998.38	-91.44	-69.77	-91.44	115.02	217.34	0.08
7100.00	0.87	118.48	7098.37	-91.90	-68.96	-91.90	114.90	216.88	0.68
7200.00	0.85	121.72	7198.36	-92.65	-67.66	-92.65	114.73	216.14	0.05
7300.00	0.59	118.39	7298.35	-93.29	-66.58	-93.29	114.61	215.52	0.28
7400.00	0.50	98.82	7398.35	-93.60	-65.70	-93.60	114.35	215.06	0.21
7500.00	1.05	107.11	7498.34	-93.94	-64.39	-93.94	113.89	214.43	0.56
7600.00	0.95	112.00	7598.33	-94.52	-62.75	-94.52	113.45	213.58	0.13
7700.00	1.14	116.26	7698.31	-95.27	-61.08	-95.27	113.17	212.67	0.21
7800.00	1.83	117.88	7798.27	-96.46	-58.77	-96.46	112.95	211.35	0.89
7900.00	3.02	115.88	7898.18	-98.36	-54.99	-98.36	112.68	209.21	1.19
8040.00	1.06	118.97	8038.09	-100.60	-50.53	-100.60	112.57	206.67	1.40



VES Survey International
West Texas
(432) 563-5444
Surveyor: Adam Gathright
Barn Owl Federal No. 002H / API 30-015-42472



V.E.S. Survey Date: 08/06/2014



COG Operating LLC

Eddy County, NM

Barn Owl Federal

#2H

OH

Survey: MWD #1

Survey Report - Geographic

15 August, 2014



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3335.5usft (Original Well Elev)
Site:	Barn Owl Federal	MD Reference:	WELL @ 3335.5usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Databank:	EDM 5000.1 Single User Db

Project:	Eddy County, NM		
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:		Barn Owl Federal			
Site Position:		Northing:	375,865.70 usft	Latitude:	32° 2' 0.952 N
From:	Map	Easting:	533,617.30 usft	Longitude:	104° 13' 29.458 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well:	#2H					
Well Position	+N-S	0.0 usft	Northing:	375,865.70 usft	Latitude:	32° 2' 0.652 N
	+E-W	0.0 usft	Easting:	533,617.30 usft	Longitude:	104° 13' 29.458 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,318.5 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (μ)	Dip Angle (μ)	Field Strength (nT)
	IGRF2010	8/6/2014	7.48	59.62	48,117

Design:	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	355.09	

Survey Program		Date	8/15/2014	
From	To			
(usft)	(usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,040.0	GYRO (OH)	MWD	MWD - Standard
8,132.0	14,118.0	MWD #1 (OH)	MWD	MWD - Standard

Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
8,040.0	1.08	118.97	8,038.1	-100.5	-50.5	375,865.15	533,568.76	32° 1' 59.958 N	104° 13' 30.045 W
8,132.0	0.40	148.40	8,130.1	-101.2	-49.6	375,864.47	533,567.68	32° 1' 59.951 N	104° 13' 30.034 W
8,163.0	1.60	341.50	8,161.1	-100.9	-49.7	375,864.79	533,567.60	32° 1' 59.954 N	104° 13' 30.035 W
8,185.0	5.60	338.70	8,193.0	-99.0	-50.4	375,868.67	533,566.89	32° 1' 59.973 N	104° 13' 30.043 W
8,227.0	9.00	338.30	8,224.7	-95.2	-51.9	375,870.45	533,565.40	32° 2' 0.010 N	104° 13' 30.081 W
8,259.0	12.00	340.80	8,256.2	-89.8	-53.9	375,875.92	533,563.38	32° 2' 0.064 N	104° 13' 30.084 W
8,290.0	13.90	347.80	8,286.4	-83.1	-55.6	375,882.61	533,561.53	32° 2' 0.130 N	104° 13' 30.105 W
8,322.0	16.00	347.50	8,317.3	-75.0	-57.5	375,890.67	533,559.78	32° 2' 0.210 N	104° 13' 30.126 W
8,354.0	18.50	344.00	8,347.9	-65.6	-59.6	375,899.88	533,557.41	32° 2' 0.301 N	104° 13' 30.153 W
8,386.0	20.40	345.00	8,378.1	-55.6	-62.7	375,910.12	533,554.57	32° 2' 0.403 N	104° 13' 30.186 W
8,417.0	24.50	345.50	8,406.7	-44.1	-65.7	375,921.57	533,551.56	32° 2' 0.516 N	104° 13' 30.221 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H:
Project:	Eddy County, NM	TVD Reference:	WELL @ 3335.5usft (Original Well Elev)
Site:	Barn Owl Federal	MD Reference:	WELL @ 3335.5usft (Original Well Elev)
Well:	#2H	North Reference:	Grid:
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured	Inclination	Azimuth	Vertical	N-S	E-W	Map	Map	Latitude	Longitude
Depth (usft)	(°)	(°)	Depth (usft)	(usft)	(usft)	Northing (usft)	Easting (usft)		
8,449.0	28.50	345.70	8,435.3	-30.3	-69.3	375,935.40	533,548.01	32° 2' 0.653 N	104° 13' 30.282 W
8,481.0	31.50	345.40	8,463.0	-14.8	-73.3	375,950.89	533,544.02	32° 2' 0.806 N	104° 13' 30.308 W
8,512.0	35.40	345.00	8,488.9	1.7	-77.7	375,987.41	533,539.65	32° 2' 0.970 N	104° 13' 30.359 W
8,544.0	39.80	344.00	8,514.3	20.5	-82.9	375,986.21	533,534.42	32° 2' 1.158 N	104° 13' 30.419 W
8,576.0	43.60	344.70	8,538.1	41.0	-88.6	376,006.71	533,528.69	32° 2' 1.359 N	104° 13' 30.485 W
8,608.0	48.00	344.30	8,580.4	63.1	-94.7	376,028.81	533,522.55	32° 2' 1.578 N	104° 13' 30.556 W
8,639.0	52.60	344.00	8,580.2	86.0	-101.3	376,051.75	533,516.04	32° 2' 1.805 N	104° 13' 30.632 W
8,671.0	57.20	343.60	8,598.6	111.2	-108.6	376,078.88	533,508.74	32° 2' 2.054 N	104° 13' 30.718 W
8,703.0	62.30	343.30	8,614.8	137.7	-116.4	376,103.37	533,500.88	32° 2' 2.318 N	104° 13' 30.808 W
8,734.0	67.00	342.90	8,628.0	164.5	-124.6	376,130.17	533,492.72	32° 2' 2.581 N	104° 13' 30.902 W
8,766.0	71.30	342.20	8,639.4	193.0	-133.6	376,158.69	533,483.75	32° 2' 2.863 N	104° 13' 31.006 W
8,798.0	74.60	341.80	8,648.8	222.1	-143.0	376,187.78	533,474.30	32° 2' 3.151 N	104° 13' 31.115 W
8,830.0	77.80	343.30	8,658.4	251.7	-152.3	376,217.42	533,464.98	32° 2' 3.445 N	104° 13' 31.223 W
8,861.0	80.20	344.30	8,662.3	280.9	-160.8	376,246.64	533,456.49	32° 2' 3.734 N	104° 13' 31.321 W
8,893.0	81.60	345.70	8,667.4	311.5	-169.0	376,277.16	533,448.32	32° 2' 4.036 N	104° 13' 31.416 W
8,925.0	83.60	346.80	8,671.5	342.3	-176.5	376,307.98	533,440.78	32° 2' 4.341 N	104° 13' 31.503 W
8,956.0	86.00	347.10	8,674.3	372.4	-183.5	376,338.08	533,433.81	32° 2' 4.639 N	104° 13' 31.584 W
8,988.0	88.30	347.10	8,675.9	403.5	-190.6	376,368.21	533,426.67	32° 2' 4.947 N	104° 13' 31.666 W
9,020.0	89.40	347.10	8,678.6	434.7	-197.8	376,400.39	533,419.53	32° 2' 5.258 N	104° 13' 31.749 W
9,051.0	89.90	347.10	8,678.8	464.9	-204.7	376,430.61	533,412.81	32° 2' 5.555 N	104° 13' 31.829 W
9,146.0	88.00	349.90	8,678.5	556.0	-223.6	376,523.67	533,393.67	32° 2' 6.476 N	104° 13' 32.048 W
9,242.0	87.60	352.00	8,682.2	652.7	-238.7	376,618.40	533,378.58	32° 2' 7.414 N	104° 13' 32.222 W
9,337.0	87.10	354.50	8,686.6	746.9	-249.9	376,712.64	533,367.43	32° 2' 8.347 N	104° 13' 32.351 W
9,432.0	88.90	357.70	8,689.9	841.6	-258.3	376,807.34	533,360.88	32° 2' 9.284 N	104° 13' 32.425 W
9,527.0	89.40	357.00	8,691.3	936.5	-260.7	376,902.23	533,356.58	32° 2' 10.223 N	104° 13' 32.474 W
9,622.0	90.30	358.60	8,691.5	1,031.4	-266.0	376,997.08	533,351.28	32° 2' 11.162 N	104° 13' 32.535 W
9,717.0	90.80	355.90	8,690.6	1,126.2	-272.2	377,091.87	533,345.07	32° 2' 12.100 N	104° 13' 32.606 W
9,812.0	89.40	357.00	8,690.5	1,221.0	-278.1	377,186.68	533,339.19	32° 2' 13.039 N	104° 13' 32.673 W
9,907.0	87.10	357.30	8,693.4	1,315.8	-282.8	377,281.52	533,334.47	32° 2' 13.977 N	104° 13' 32.727 W
10,003.0	88.70	357.70	8,696.9	1,411.7	-287.0	377,377.38	533,330.28	32° 2' 14.926 N	104° 13' 32.775 W
10,098.0	89.60	357.70	8,698.3	1,508.6	-290.8	377,472.27	533,326.47	32° 2' 15.865 N	104° 13' 32.818 W
10,193.0	89.40	355.60	8,699.1	1,601.4	-296.4	377,567.10	533,320.92	32° 2' 16.804 N	104° 13' 32.881 W
10,289.0	89.40	354.80	8,700.1	1,697.1	-304.3	377,662.78	533,312.97	32° 2' 17.750 N	104° 13' 32.972 W
10,384.0	89.60	358.00	8,701.0	1,791.9	-310.2	377,757.56	533,307.09	32° 2' 18.689 N	104° 13' 33.040 W
10,479.0	88.30	358.70	8,702.7	1,886.8	-312.9	377,852.51	533,304.35	32° 2' 19.628 N	104° 13' 33.070 W
10,573.0	88.90	358.00	8,705.0	1,980.7	-315.7	377,946.44	533,301.65	32° 2' 20.558 N	104° 13' 33.101 W
10,669.0	89.70	357.70	8,706.2	2,076.7	-319.3	378,042.36	533,298.05	32° 2' 21.507 N	104° 13' 33.141 W
10,764.0	87.60	357.70	8,708.4	2,171.6	-323.1	378,137.25	533,294.23	32° 2' 22.446 N	104° 13' 33.185 W
10,859.0	88.00	357.70	8,712.1	2,266.4	-326.9	378,232.11	533,290.42	32° 2' 23.385 N	104° 13' 33.228 W
10,954.0	88.50	357.30	8,715.0	2,361.3	-331.0	378,326.97	533,286.28	32° 2' 24.324 N	104° 13' 33.275 W
11,049.0	90.10	358.00	8,716.1	2,456.2	-334.9	378,421.88	533,282.39	32° 2' 25.263 N	104° 13' 33.319 W
11,145.0	91.10	358.00	8,715.1	2,552.1	-338.3	378,517.82	533,279.04	32° 2' 26.213 N	104° 13' 33.357 W
11,240.0	90.40	358.30	8,713.9	2,647.0	-343.0	378,612.69	533,274.31	32° 2' 27.152 N	104° 13' 33.410 W
11,335.0	88.00	357.30	8,715.2	2,741.8	-348.3	378,707.52	533,269.01	32° 2' 28.090 N	104° 13' 33.471 W
11,430.0	86.00	358.00	8,718.5	2,836.7	-352.2	378,802.38	533,265.12	32° 2' 29.028 N	104° 13' 33.515 W
11,525.0	88.90	357.70	8,721.1	2,931.6	-355.7	378,897.28	533,261.56	32° 2' 29.969 N	104° 13' 33.555 W
11,621.0	90.40	359.10	8,721.7	3,027.5	-358.4	378,993.24	533,258.80	32° 2' 30.918 N	104° 13' 33.585 W
11,716.0	91.70	358.40	8,719.9	3,122.5	-359.7	379,088.21	533,257.63	32° 2' 31.858 N	104° 13' 33.589 W
11,811.0	90.60	358.40	8,718.0	3,217.5	-361.5	379,183.17	533,255.81	32° 2' 32.798 N	104° 13' 33.619 W
11,932.0	90.60	357.70	8,716.9	3,338.4	-365.8	379,304.09	533,251.69	32° 2' 33.995 N	104° 13' 33.665 W
12,027.0	89.70	357.70	8,716.5	3,433.3	-369.4	379,399.02	533,247.88	32° 2' 34.934 N	104° 13' 33.709 W
12,122.0	89.70	355.90	8,717.0	3,528.2	-374.7	379,493.86	533,242.58	32° 2' 35.873 N	104° 13' 33.769 W
12,218.0	87.60	355.60	8,719.3	3,623.9	-381.8	379,589.57	533,235.47	32° 2' 36.820 N	104° 13' 33.851 W
12,313.0	89.70	355.60	8,721.5	3,718.6	-389.1	379,684.25	533,228.18	32° 2' 37.757 N	104° 13' 33.934 W
12,408.0	88.70	358.60	8,722.8	3,813.3	-395.6	379,779.02	533,221.72	32° 2' 38.695 N	104° 13' 34.008 W



Wellplanning Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3335.5usft (Original Well Elev)
Site:	Barn Owl Federal	MD Reference:	WELL @ 3335.5usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,504.0	91.00	357.00	8,723.1	3,909.2	-400.9	379,874.87	533,218.36	32° 2' 39.644 N	104° 13' 34.089 W
12,599.0	87.30	355.20	8,724.5	4,003.9	-407.4	379,969.62	533,209.90	32° 2' 40.582 N	104° 13' 34.143 W
12,694.0	69.00	354.90	8,727.6	4,098.5	-415.6	380,064.21	533,201.71	32° 2' 41.518 N	104° 13' 34.237 W
12,789.0	88.20	355.20	8,729.9	4,193.1	-423.8	380,158.83	533,193.51	32° 2' 42.454 N	104° 13' 34.331 W
12,884.0	89.40	354.90	8,731.9	4,287.7	-432.0	380,253.45	533,185.32	32° 2' 43.391 N	104° 13' 34.428 W
12,979.0	88.00	354.50	8,734.0	4,382.3	-440.6	380,348.02	533,176.55	32° 2' 44.327 N	104° 13' 34.526 W
13,074.0	90.10	354.20	8,735.6	4,476.8	-450.1	380,442.54	533,167.20	32° 2' 45.262 N	104° 13' 34.634 W
13,169.0	90.30	354.50	8,735.3	4,571.4	-459.5	380,537.07	533,157.84	32° 2' 46.198 N	104° 13' 34.742 W
13,265.0	88.20	355.60	8,736.5	4,667.0	-467.7	380,632.70	533,148.56	32° 2' 47.144 N	104° 13' 34.837 W
13,359.0	86.60	356.30	8,740.8	4,760.7	-474.4	380,726.36	533,142.93	32° 2' 48.071 N	104° 13' 34.913 W
13,455.0	88.20	356.30	8,745.1	4,856.4	-480.6	380,822.06	533,136.74	32° 2' 49.019 N	104° 13' 34.983 W
13,550.0	90.40	355.90	8,746.3	4,951.1	-487.0	380,916.63	533,130.28	32° 2' 49.957 N	104° 13' 35.057 W
13,645.0	90.30	356.30	8,745.7	5,045.9	-493.5	381,011.61	533,123.82	32° 2' 50.895 N	104° 13' 35.131 W
13,740.0	89.00	357.00	8,746.3	5,140.7	-499.0	381,106.44	533,118.27	32° 2' 51.833 N	104° 13' 35.195 W
13,836.0	88.80	356.30	8,748.1	5,236.6	-504.6	381,202.26	533,112.66	32° 2' 52.782 N	104° 13' 35.259 W
13,931.0	89.70	357.00	8,749.2	5,331.4	-510.2	381,297.09	533,107.11	32° 2' 53.720 N	104° 13' 35.322 W
14,026.0	89.60	357.70	8,749.8	5,426.3	-514.6	381,391.99	533,102.71	32° 2' 54.658 N	104° 13' 35.372 W
14,118.0	89.60	357.70	8,750.4	5,518.2	-518.3	381,483.91	533,098.02	32° 2' 55.589 N	104° 13' 35.414 W
PBHL(BOF#2H)									

Checked By: _____	Approved By: _____	Date: _____
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COG Operating LLC
 Project: Eddy County, NM
 Site: Barn Owl Federal
 Well: #2H
 Wellbore: OH
 Plan: Plan 04 (#2H/OH)

Section Details									
Soc	MD	Inc	Azi	TVD	+N-S	+E-W	Dlog	TFace	VSeet
1	8040.0	1.06	110.97	8038.1	-100.6	-50.5	0.00	0.00	-95.8
2	8206.8	1.06	118.97	8206.8	-102.1	-47.8	0.00	0.00	-97.6
3	8066.1	09.23	345.00	8060.0	354.5	-163.6	12.00	-133.98	367.2
4	8572.0	09.23	357.28	8566.3	359.9	-257.9	2.00	90.10	978.4
5	14140.0	09.23	357.28	8760.0	5522.3	-474.7	0.00	0.00	5542.7

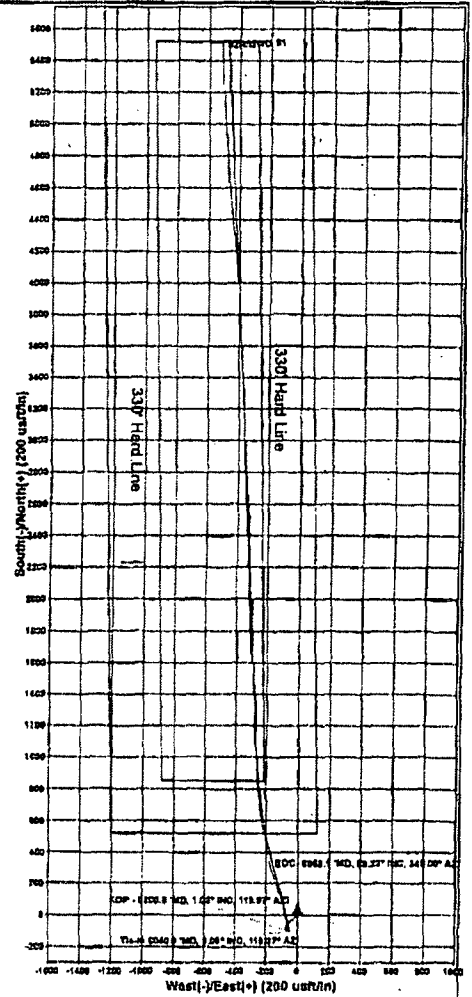
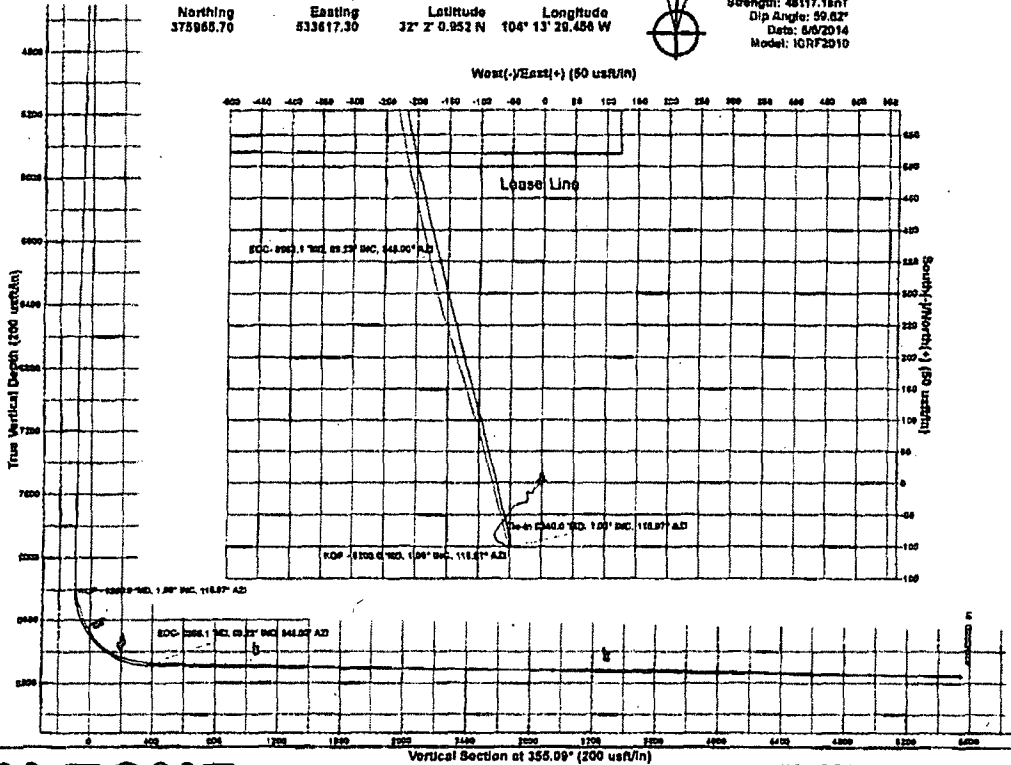
WELL DETAILS: #2H

Ground Elevation: 3318.5
 RKB Elevation: WELL @ 3335.5usft (Original Well Elev)
 Rig Name: Original Well Elev

Northing: 375966.70 Easting: 533617.30 Latitude: 32° 2' 0.952 N Longitude: 104° 13' 29.456 W



Azimuth to Grid North:
 True North: -0.06°
 Magnetic North: 7.43°
 Magnetic Field
 Strength: 48117.1nT
 Dip Angle: 59.82°
 Date: 6/6/2014
 Model: IGRF2010



N-ZONE

N-ZONE Guidance
 921 W. New Hope DR. Suite 703
 Cedar Park, TX 78613

PROJECT DETAILS: Eddy County, NM
 Geoside System: US State Plane 1983 (Eads solution)
 Datum: NAD 1983 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid