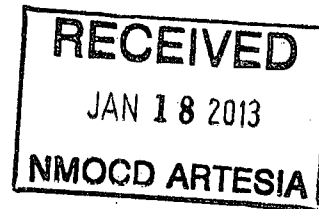




PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288



November 7, 2012

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

15-40570

RE: White Oak State #27
2270' FSL & 185' FEL
Sec. 23, T17S, R28E
Eddy County, New Mexico

Dear Sir,

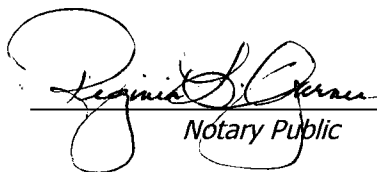
The attached is the Deviation Survey for the above captioned well.

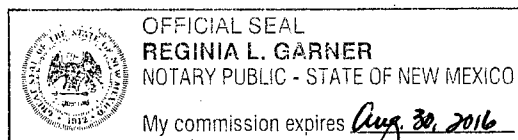
Very truly yours,


Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 7th day of November, 2012.

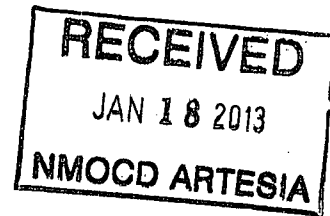
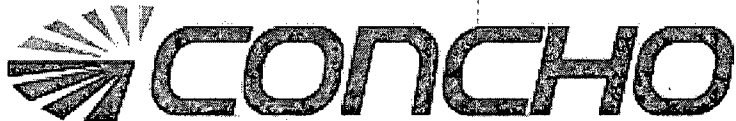

Notary Public



White Oak State #27

Date	Depth	Deviation	Direction	TVD
10/31/2012	105	0.50		
10/31/2012	240	0.50		
11/1/2012	342	0.40		
11/1/2012	572	0.30		
11/2/2012	854	0.30		
11/2/2012	960	0.30	339.50	
11/3/2012	1053	0.50	4.00	
11/3/2012	1148	1.70	337.20	
11/3/2012	1241	3.50	336.00	
11/3/2012	1335	4.70	338.10	
11/3/2012	1429	5.30	334.10	
11/3/2012	1553	5.60	326.20	
11/3/2012	1618	5.80	325.60	
11/3/2012	1712	5.30	322.80	
11/3/2012	1806	5.30	321.60	
11/3/2012	1900	5.30	320.90	
11/3/2012	1993	5.40	320.20	
11/3/2012	2087	5.80	318.80	
11/3/2012	2182	5.50	321.80	
11/3/2012	2276	5.00	322.30	
11/3/2012	2371	5.10	321.20	
11/3/2012	2464	5.60	319.70	
11/3/2012	2558	5.20	321.10	
11/3/2012	2652	4.70	325.80	
11/3/2012	2745	5.20	325.80	
11/4/2012	2839	4.70	327.20	
11/4/2012	2933	4.20	320.70	
11/4/2012	3026	4.60	318.30	
11/4/2012	3120	4.60	307.20	
11/4/2012	3214	4.10	303.10	
11/4/2012	3401	4.00	307.20	
11/4/2012	3495	4.00	306.70	
11/4/2012	3682	4.60	311.80	
11/4/2012	3776	4.40	313.50	
11/4/2012	3870	4.80	314.20	
11/4/2012	3963	4.70	317.60	
11/4/2012	4057	5.00	315.30	
11/4/2012	4152	4.70	319.70	
11/4/2012	4245	4.00	319.50	
11/4/2012	4339	4.20	318.80	
11/5/2012	4528	4.40	321.80	
11/5/2012	4622	4.50	321.10	
11/5/2012	4716	5.10	323.90	

Date	Depth	Deviation	Direction	TVD
11/5/2012	4810	4.70	324.90	
11/5/2012	4903	4.00	325.80	
11/5/2012	4997	4.20	325.10	
11/5/2012	5091	4.40	624.60	
11/5/2012	5278	4.20	326.30	
11/5/2012	5372	3.30	327.20	



COG Operating, LLC

Eddy County, NM (NAD27)

White Oak State #27

SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H

Top of Paddock @ 3700' TVD: 169' N/121' W of surface

Design: Surveys

Standard Survey Report

16 January, 2013





Childress Directional Drilling Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SHL: 2270' FNL; 185' FEL, Sec. 23, T17S, R28E, Unit H
Project:	Eddy County, NM (NAD27)	TVD Reference:	WELL @ 3704.00usft (Silver Oak 11)
Site:	White Oak State #27	MD Reference:	WELL @ 3704.00usft (Silver Oak 11)
Well:	SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H	North Reference:	Grid
Wellbore:	Top of Paddock @ 3700' TVD: 169' N/121' W of surface	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD27),		
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	White Oak State #27				
Site Position:		Northing:	0.00 usft	Latitude:	30° 59' 24.512 N
From:	Map	Easting:	0.00 usft	Longitude:	105° 55' 44.137 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.82 °

Well	SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H					
Well Position	+N-S	0.00 usft	Northing:	662,841.80 usft	Latitude:	32° 49' 19.516 N
	+E-W	0.00 usft	Easting:	559,865.90 usft	Longitude:	104° 8' 18.440 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,704.00 usft

Wellbore	Top of Paddock @ 3700' TVD: 169' N/121' W of surface				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2012/10/24	7.73	60.61	48,775

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	324.54	

Survey Program	Date 2013/01/16				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	5,433.00	VES gyro surveys (Top of Paddock @ 370	NS-GYRO-MS	North sensing gyrocompassing m/s	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.27	10.73	100.00	0.23	0.04	0.16	0.27	0.27	0.00	
200.00	0.21	4.64	200.00	0.65	0.10	0.47	0.07	-0.06	-6.09	
300.00	0.40	28.20	300.00	1.14	0.28	0.76	0.22	0.19	23.56	
400.00	0.48	43.47	399.99	1.75	0.74	1.00	0.14	0.08	15.27	
500.00	0.71	47.74	499.99	2.47	1.48	1.15	0.23	0.23	4.27	
600.00	0.54	49.20	599.98	3.19	2.30	1.27	0.17	-0.17	1.46	
700.00	0.48	54.08	699.98	3.75	2.99	1.31	0.07	-0.06	4.88	



Childress Directional Drilling Survey Report



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Site:	White Oak State #27	MD Reference:	WELL @ 3704.00usft (Silver Oak 11)
Well:	SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H	North Reference:	Grid
Wellbore:	Top of Paddock @ 3700' TVD: 169' N/121' W of surface	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User, Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
800.00	0.64	15.26	799.97	4.53	3.48	1.67	0.40	0.16	-38.82
897.00	0.40	352.40	896.97	5.39	3.58	2.31	0.32	-0.25	-23.57
960.00	0.30	339.50	959.97	5.76	3.49	2.67	0.20	-0.16	-20.48
991.00	0.30	346.60	990.97	5.92	3.44	2.82	0.12	0.00	22.90
1,053.00	0.50	4.00	1,052.97	6.34	3.42	3.18	0.37	0.32	28.06
1,148.00	1.70	337.20	1,147.95	8.06	2.91	4.88	1.34	1.26	-28.21
1,241.00	3.50	336.00	1,240.85	11.92	1.22	9.00	1.94	1.94	-1.29
1,335.00	4.70	338.10	1,334.61	18.12	-1.39	15.56	1.29	1.28	2.23
1,429.00	5.30	334.10	1,428.25	25.60	-4.72	23.59	0.74	0.64	-4.26
1,523.00	5.60	326.20	1,521.83	33.31	-9.17	32.45	0.86	0.32	-8.40
1,618.00	5.80	325.60	1,616.36	41.12	-14.46	41.88	0.22	0.21	-0.63
1,712.00	5.30	322.80	1,709.91	48.50	-19.76	50.97	0.60	-0.53	-2.98
1,806.00	5.30	321.60	1,803.51	55.36	-25.09	59.65	0.12	0.00	-1.28
1,899.00	5.30	320.90	1,896.12	62.06	-30.46	68.22	0.07	0.00	-0.75
1,993.00	5.40	320.30	1,989.71	68.83	-36.03	76.97	0.12	0.11	-0.64
2,087.00	5.80	318.80	2,083.26	75.81	-41.98	86.10	0.45	0.43	-1.60
2,182.00	5.50	321.80	2,177.80	83.00	-47.96	95.43	0.44	-0.32	3.16
2,276.00	5.00	322.30	2,271.40	89.78	-53.25	104.02	0.53	-0.53	0.53
2,370.00	5.10	321.20	2,365.04	96.28	-58.37	112.28	0.15	0.11	-1.17
2,464.00	5.60	319.10	2,458.63	103.00	-63.99	121.02	0.57	0.53	-2.23
2,558.00	5.20	321.10	2,552.21	109.78	-69.67	129.84	0.47	-0.43	2.13
2,652.00	4.70	325.80	2,645.86	116.28	-74.51	137.94	0.68	-0.53	5.00
2,745.00	5.20	325.80	2,738.51	122.92	-79.02	145.96	0.54	0.54	0.00
2,839.00	4.70	327.20	2,832.16	129.68	-83.50	154.07	0.55	-0.53	1.49
2,933.00	4.20	320.70	2,925.88	135.58	-87.77	161.35	0.75	-0.53	-6.91
3,026.00	4.60	318.30	3,018.60	141.00	-92.41	168.46	0.47	0.43	-2.58
3,120.00	4.60	307.20	3,112.30	146.10	-97.92	175.80	0.95	0.00	-11.81
3,214.00	4.10	303.10	3,206.03	150.21	-103.73	182.53	0.63	-0.53	-4.36
3,308.00	4.50	303.30	3,299.77	154.07	-109.63	189.09	0.43	0.43	0.21
3,401.00	4.00	307.20	3,392.51	158.03	-115.26	195.59	0.62	-0.54	4.19
3,495.00	4.00	306.70	3,486.28	161.97	-120.50	201.84	0.04	0.00	-0.53
3,588.00	4.40	311.80	3,579.03	166.29	-125.76	208.41	0.59	0.43	5.48
3,682.00	4.60	311.80	3,672.74	171.21	-131.26	215.60	0.21	0.21	0.00
3,776.00	4.40	313.50	3,766.45	176.20	-136.69	222.82	0.26	-0.21	1.81
3,869.00	4.80	313.50	3,859.15	181.34	-142.10	230.14	0.43	0.43	0.00
3,963.00	4.70	317.60	3,952.83	186.89	-147.55	237.82	0.38	-0.11	4.36
4,057.00	5.00	315.30	4,046.49	192.64	-153.02	245.69	0.38	0.32	-2.45
4,152.00	4.70	319.70	4,141.15	198.55	-158.45	253.65	0.50	-0.32	4.63
4,245.00	4.00	319.50	4,233.89	203.93	-163.03	260.68	0.75	-0.75	-0.22
4,339.00	4.20	318.80	4,327.65	209.01	-167.42	267.37	0.22	0.21	-0.74
4,433.00	4.20	320.70	4,421.39	214.26	-171.87	274.23	0.15	0.00	2.02
4,528.00	4.40	321.80	4,516.13	219.82	-176.33	281.34	0.23	0.21	1.16



Childress Directional Drilling Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H
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Site:	White Oak State #27	MD Reference:	WELL @ 3704.00usft (Silver Oak 11)
Well:	SHL: 2270' FNL, 185' FEL, Sec. 23, T17S, R28E, Unit H	North Reference:	Grid
Wellbore:	Top of Paddock @ 3700' TVD: 169' N/121' W of surface	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,622.00	4.50	321.80	4,609.84	225.55	-180.84	288.62	0.11	0.11	0.00
4,716.00	5.10	323.90	4,703.51	231.82	-185.58	296.49	0.67	0.64	2.23
4,810.00	4.70	324.90	4,797.17	238.35	-190.25	304.51	0.44	-0.43	1.06
4,903.00	4.00	325.80	4,889.90	244.15	-194.27	311.57	0.76	-0.75	0.97
4,997.00	4.20	325.10	4,983.66	249.68	-198.08	318.29	0.22	0.21	-0.74
5,091.00	4.40	324.60	5,077.39	255.45	-202.14	325.34	0.22	0.21	-0.53
5,184.00	4.40	324.10	5,170.12	261.24	-206.30	332.47	0.04	0.00	-0.54
5,278.00	4.20	326.30	5,263.86	267.03	-210.32	339.52	0.28	-0.21	2.34
5,372.00	3.30	327.20	5,357.65	272.17	-213.70	345.66	0.96	-0.96	0.96
5,433.00	3.30	327.20	5,418.55	275.12	-215.60	349.17	0.00	0.00	0.00
PTB at TD @ 5433' MD 3.30° INC 327.20° AZM 5418.55° AZM									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,433.00	5,418.55	275.12	-215.60	PTB at TD @ 5433' MD 3.30° INC 327.20° AZM 5418.55° AZM

Checked By: _____	Approved By: _____	Date: _____
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