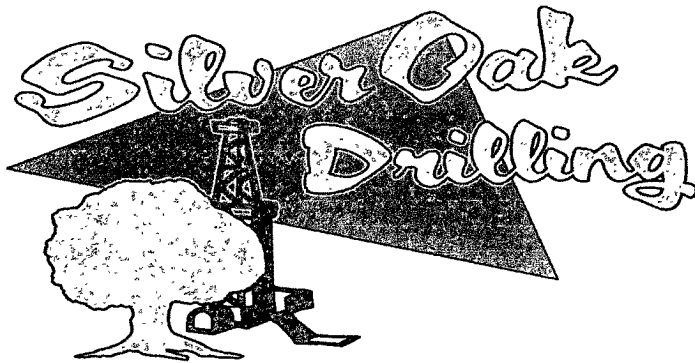




PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

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MAR 15 2010

HOBBSD

January 22, 2010

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: B C Federal #45
314' FNL & 1990' FWL
Sec. 19, T17S, R32E
Lea County, New Mexico

Dear Sir,

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

SUR: C-19-17s-32e, 314/N & 1990/W
BHL: C-19-17s-32e, 367/N & 2287/W
API # 30-025-39419

Very truly yours,

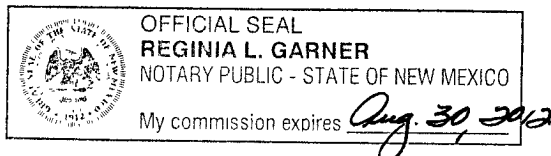
A handwritten signature in cursive script, appearing to read "Eddie C. LaRue".

Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 22nd day of January, 2010.

A handwritten signature in cursive script, appearing to read "Regina L. Garner".

Notary Public

Pason DataHub Deviation Survey 2010/01/29 08:29:25

Well Dossier 1263135229 - BC FED 45

#

#	Date	Depth	Deviation	Direction	TVD
	1/10/2010	231	0.6	0.00	0
	1/11/2010	501	0.6		
	1/11/2010	674	0.6	0.00	0
	1/12/2010	1158	0.5	0.00	0
	1/12/2010	1631	1.7	0.00	0
	1/14/2010	2142	1.98	56.54	2140
	1/14/2010	2267	2.83	80.22	2266
	1/14/2010	2393	4.29	93.91	2392
	1/14/2010	2204	2.49	66.53	2203
	1/14/2010	2330	3.59	89.82	2329
	1/14/2010	2456	5.04	98.51	2508
	1/14/2010	2583	5.43	114.50	2635
	1/14/2010	2741	4.94	107.00	2793
	1/14/2010	2519	5.64	109.50	2571
	1/14/2010	2646	4.91	115.80	2698
	1/14/2010	2867	4.28	108.30	2888
	1/15/2010	2836	4.29	108.36	2888
	1/15/2010	2930	4.22	106.60	2982
	1/15/2010	3024	5.01	103.58	
	1/15/2010	3119	4.54	107.29	3171
	1/15/2010	3245	5.21	106.20	3266
	1/15/2010	3309	4.61	104.80	3304
	1/15/2010	3404	5.16	109.70	3399
	1/15/2010	3499	6.08	115.00	3494
	1/15/2010	3549	5.69	116.80	3646
	1/15/2010	3819	5.24	116.50	3871
	1/15/2010	3689	5.47	114.30	3741
	1/16/2010	4004	4.96	119.50	
	1/16/2010	4056	4.32	114.06	4245
	1/16/2010	4099	4.88	110.40	
	1/16/2010	4288	4.97	97.19	4279
	1/16/2010	4383	4.73	98.83	4374
	1/16/2010	4478	5.2	103.65	4469
	1/16/2010	4573	5.19	109.20	4563
	1/17/2010	4673	5.08	110.00	4725
	1/17/2010	4768	5.01	112.40	4820
	1/17/2010	4871	5.32	112.40	4861
	1/17/2010	4967	4.92	118.00	4956
	1/17/2010	5061	4.04	102.70	5049
	1/17/2010	5156	3.27	102.90	5200
	1/17/2010	5344	1.28	82.47	54.2
	1/17/2010	5220	1.72	113.40	5294
	1/18/2010	5819	0.7	0.00	0
	1/19/2010	6258	0.7	0.00	6328
	1/19/2010	6762	0.4	0.00	0
	1/19/2010	6964	0.8	0.00	0

EOF



COG Operating LLC

Lea County, NM (NAD27 NME)

BC Federal #45

BC Federal #45

OH

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HOBBSOCD

Design: Actual

Standard Survey Report

18 January, 2010

SUR: C-19-17s-32e, 314/N & 1990/W
BHL: C-19-17s-32e, 367/N & 2287/W
API # 30-025-39419





Scientific Drilling
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well BC Federal #45
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3949 00ft (Silver Oak #8)
Site:	BC Federal #45	MD Reference:	GL Elev @ 3949 00ft (Silver Oak #8)
Well:	BC Federal #45	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000 1 Single User Db

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		BC Federal #45			
Site Position:		Northings:	664,772 50 ft	Latitude:	32° 49' 35 191 N
From:	Map	Easting:	661,525 20 ft	Longitude:	103° 48' 27 027 W
Position Uncertainty:	0 00 ft	Slot Radius:	0 "	Grid Convergence:	0 29 °

Well	BC Federal #45					
Well Position	+N/-S	0 00 ft	Northings:	664,772 50 ft	Latitude:	32° 49' 35 191 N
	+E/-W	0 00 ft	Easting:	661,525 20 ft	Longitude:	103° 48' 27 027 W
Position Uncertainty		0 00 ft	Wellhead Elevation:	ft	Ground Level:	3,949 00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2010/01/18	7 90	60 76	49,121

Design	Actual				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0 00	0 00	0 00	62 92	

Survey Program	Date 2010/01/18			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100 00	2,050 00	Gyro Survey (OH)	Keeper	Standard Wireline Keeper ver 1 0 2
2,141 00	5,500 00	MWD Survey (OH)	MWD	MWD - Standard

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
100 00	0 32	125 81	100 00	-0 16	0 23	0 13	0 32	0 32	0 00	
200 00	0 26	113 08	200 00	-0 42	0 66	0 40	0 09	-0 06	-12 73	
300 00	0 35	104 73	300 00	-0 58	1 17	0 77	0 10	0 09	-8 35	
400 00	0 52	89 99	399 99	-0 66	1 91	1 40	0 20	0 17	-14 74	
500 00	0 23	54 27	499 99	-0 54	2 53	2 01	0 36	-0 29	-35 72	
600 00	0 20	260 53	599 99	-0 45	2 52	2 04	0 42	-0 03	-153 74	
700 00	0 31	255 68	699 99	-0 55	2 09	1 61	0 11	0 11	-4 85	
800 00	0 11	208 22	799 99	-0 70	1 78	1 27	0 25	-0 20	-47 46	
900 00	0 17	52 22	899 99	-0 69	1 85	1 33	0 27	0 06	-156 00	



Scientific Drilling
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well BC Federal #45
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3949.00ft (Silver Oak #8)
Site:	BC Federal #45	MD Reference:	GL Elev @ 3949.00ft (Silver Oak #8)
Well:	BC Federal #45	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000 1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,000.00	0.19	83.37	999.99	-0.58	2.13	1.63	0.10	0.02	31.15
1,100.00	0.17	49.12	1,099.99	-0.47	2.41	1.93	0.11	-0.02	-34.25
1,200.00	0.23	319.03	1,199.99	-0.22	2.39	2.03	0.29	0.06	-90.09
1,300.00	0.17	55.85	1,299.99	0.01	2.38	2.13	0.30	-0.06	96.82
1,400.00	0.92	34.51	1,399.98	0.76	2.96	2.98	0.76	0.75	-21.34
1,500.00	1.56	52.58	1,499.96	2.25	4.50	5.03	0.74	0.64	18.07
1,600.00	1.89	60.75	1,599.91	3.88	7.02	8.01	0.41	0.33	8.17
1,700.00	2.54	64.42	1,699.84	5.64	10.45	11.88	0.66	0.65	3.67
1,800.00	2.71	63.96	1,799.73	7.64	14.58	16.46	0.17	0.17	-0.46
1,900.00	2.58	65.63	1,899.63	9.60	18.75	21.07	0.15	-0.13	1.67
2,000.00	2.31	66.29	1,999.54	11.34	22.65	25.33	0.27	-0.27	0.66
2,050.00	1.73	60.33	2,049.50	12.12	24.22	27.09	1.23	-1.16	-11.92
Gyro Tie-in									
2,141.00	1.98	56.54	2,140.46	13.67	26.73	30.02	0.31	0.27	-4.16
2,204.00	2.49	66.53	2,203.41	14.81	28.89	32.47	1.02	0.81	15.86
2,267.00	2.83	80.22	2,266.34	15.62	31.68	35.32	1.14	0.54	21.73
2,330.00	3.59	89.82	2,329.24	15.89	35.19	38.56	1.47	1.21	15.24
2,393.00	4.29	93.91	2,392.09	15.74	39.51	42.34	1.20	1.11	6.49
2,456.00	5.04	98.91	2,454.89	15.15	44.59	46.60	1.35	1.19	7.94
2,519.00	5.64	109.56	2,517.61	13.69	50.25	50.97	1.84	0.95	16.90
2,583.00	5.43	114.51	2,581.31	11.38	55.96	55.01	0.81	-0.33	7.73
2,646.00	4.91	115.84	2,644.06	8.96	61.10	58.48	0.85	-0.83	2.11
2,741.00	4.94	107.05	2,738.71	5.99	68.67	63.87	0.79	0.03	-9.25
2,836.00	4.29	108.36	2,833.40	3.67	75.96	69.30	0.69	-0.68	1.38
2,930.00	4.22	106.68	2,927.14	1.57	82.61	74.26	0.15	-0.07	-1.79
3,024.00	5.01	103.58	3,020.84	-0.38	89.91	79.87	0.88	0.84	-3.30
3,119.00	4.54	107.29	3,115.51	-2.47	97.53	85.71	0.59	-0.49	3.91
3,214.00	5.21	106.21	3,210.16	-4.80	105.26	91.54	0.71	0.71	-1.14
3,309.00	4.61	104.85	3,304.81	-6.98	113.09	97.51	0.64	-0.63	-1.43
3,404.00	5.16	109.70	3,399.47	-9.40	120.81	103.28	0.72	0.58	5.11
3,499.00	6.08	115.05	3,494.01	-12.97	129.39	109.29	1.11	0.97	5.63
3,594.00	5.69	116.85	3,588.51	-17.22	138.15	115.15	0.45	-0.41	1.89
3,689.00	5.47	114.31	3,683.06	-21.22	146.47	120.75	0.35	-0.23	-2.67
3,815.00	5.24	116.56	3,808.51	-26.26	157.09	127.91	0.25	-0.18	1.79
3,909.00	5.32	120.48	3,902.11	-30.39	164.69	132.79	0.39	0.09	4.17
4,004.00	4.96	119.56	3,996.73	-34.65	172.06	137.41	0.39	-0.38	-0.97
4,099.00	4.88	110.41	4,091.38	-38.09	179.42	142.40	0.83	-0.08	-9.63
4,193.00	4.32	114.06	4,185.08	-40.92	186.40	147.32	0.67	-0.60	3.88
4,288.00	4.97	97.19	4,279.77	-42.90	193.75	152.97	1.58	0.68	-17.76
4,383.00	4.73	98.83	4,374.43	-44.01	201.70	159.54	0.29	-0.25	1.73
4,478.00	5.20	103.65	4,469.07	-45.63	209.75	165.98	0.66	0.49	5.07
4,573.00	5.19	109.20	4,563.68	-48.06	218.00	172.21	0.53	-0.01	5.84
4,681.00	5.08	110.06	4,671.25	-51.31	227.10	178.83	0.12	-0.10	0.80



Scientific Drilling
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well BC Federal #45
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL Elev @ 3949 00ft (Silver Oak #8)
Site:	BC Federal #45	MD Reference:	GL Elev @ 3949 00ft (Silver Oak #8)
Well:	BC Federal #45	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,776 00	5 01	112 40	4,765 88	-54 33	234 89	184 39	0 23	-0 07	2 46	
4,872 00	5 32	112 49	4,861 49	-57 63	242 87	190 00	0 32	0 32	0 09	
4,967 00	4 92	118.05	4,956.11	-61.23	250 54	195 18	0 67	-0 42	5 85	
5,061 00	4 04	102 70	5,049 83	-63 85	257 33	200 03	1 57	-0 94	-16 33	
5,156 00	3 27	102 92	5,144 64	-65 19	263 23	204 68	0 81	-0 81	0 23	
5,250 00	1 72	113.47	5,238 54	-66 36	267 14	207 63	1 71	-1 65	11 22	
5,344 00	1 28	82 47	5,332 51	-66.78	269 47	209 52	0 96	-0 47	-32 98	
5,456 00	0 97	36 30	5,444 49	-65 85	271 28	211 54	0 83	-0 28	-41 22	
MWD Survey										
5,500 00	0 97	36 30	5,488 49	-65 25	271 72	212 21	0 00	0 00	0 00	
Projection to Bit										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,050 00	2,049 50	12 12	24 22	Gyro Tie-in	
5,456 00	5,444 49	-65 85	271 28	MWD Survey	
5,500 00	5,488 49	-65 25	271 72	Projection to Bit	

Checked By: _____	Approved By: _____	Date: _____
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