

30-025-40137



COG Operating LLC

Lea County, NM (NAD27 NME)

GC Federal #53

GC Federal #53

HOBBS OCD

OCT 05 2011

OH

RECEIVED

Design: Actual

Standard Survey Report

25 July, 2011



OCT 11 2011



Scientific Drilling
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well GC Federal #53
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (20') @ 3933.00usft (UDI #42)
Site:	GC Federal #53	MD Reference:	KB Elev (20') @ 3933.00usft (UDI #42)
Well:	GC Federal #53	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Julio

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:	GC Federal #53		
Site Position:		Northing:	660,423.20 usft
From:	Map	Easting:	660,410.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 48' 52.209 N
		Longitude:	103° 48' 40.343 W
		Grid Convergence:	0.28 °

Well:	GC Federal #53		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 48' 52.209 N
		Longitude:	103° 48' 40.343 W
		Ground Level:	3,913.00 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2011/07/20	7.73
			Dip Angle
			(°)
			60.69
			Field Strength
			(nT)
			48,933

Design:	Actual		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			19.45

Survey Program	Date: 2011/07/25		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	1,967.00	Gyro Survey (OH)	Keeper
2,075.00	5,575.00	MWD Survey (OH)	MWD
			Description
			Standard Wireline Keeper ver 1.0.2
			MWD - Standard

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.25	33.61	100.00	0.18	0.12	0.21	0.25	0.25	0.00	
200.00	0.26	26.21	200.00	0.57	0.34	0.65	0.03	0.01	-7.40	
300.00	0.26	0.72	300.00	1.00	0.44	1.09	0.11	0.00	-25.49	
400.00	0.37	255.28	400.00	1.14	0.14	1.12	0.51	0.11	-105.44	
500.00	1.36	247.00	499.98	0.60	-1.27	0.14	1.00	0.99	-8.28	
600.00	2.24	269.83	599.94	0.13	-4.32	-1.32	1.12	0.88	22.83	
700.00	2.10	285.68	699.86	0.62	-8.03	-2.09	0.61	-0.14	15.85	
800.00	1.66	294.39	799.81	1.71	-11.12	-2.09	0.52	-0.44	8.71	
900.00	1.79	289.18	899.77	2.82	-13.91	-1.97	0.20	0.13	-5.21	



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Julio

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)
1,000.00	1.55	290.83	999.72	3.81	-16.65	-1.95	0.24	-0.24	1.65
1,100.00	1.40	301.47	1,099.69	4.93	-18.96	-1.66	0.31	-0.15	10.64
1,200.00	1.47	312.32	1,199.66	6.43	-20.95	-0.91	0.28	0.07	10.85
1,300.00	1.16	325.38	1,299.63	8.13	-22.47	0.19	0.43	-0.31	13.06
1,400.00	1.14	318.92	1,399.61	9.71	-23.70	1.27	0.13	-0.02	-6.46
1,500.00	1.20	337.15	1,499.59	11.43	-24.76	2.53	0.38	0.06	18.23
1,600.00	1.46	354.37	1,599.56	13.66	-25.29	4.46	0.47	0.26	17.22
1,700.00	1.89	17.76	1,699.52	16.50	-24.91	7.26	0.80	0.43	23.39
1,800.00	1.89	24.66	1,799.47	19.57	-23.72	10.55	0.23	0.00	6.90
1,900.00	1.86	26.63	1,899.42	22.52	-22.31	13.81	0.07	-0.03	1.97
1,967.00	1.76	26.45	1,966.38	24.41	-21.36	15.91	0.15	-0.15	-0.27
Gyro Tie-in									
2,075.00	1.79	27.19	2,074.33	27.40	-19.85	19.22	0.03	0.03	0.69
2,138.00	2.09	20.99	2,137.29	29.34	-18.99	21.35	0.58	0.48	-9.84
2,201.00	3.20	25.07	2,200.23	32.01	-17.83	24.25	1.79	1.76	6.48
2,265.00	4.35	28.68	2,264.09	35.76	-15.91	28.42	1.83	1.80	5.64
2,328.00	5.29	27.08	2,326.86	40.44	-13.44	33.66	1.51	1.49	-2.54
2,392.00	5.87	27.98	2,390.56	45.96	-10.57	39.82	0.92	0.91	1.41
2,455.00	6.89	24.31	2,453.17	52.25	-7.50	46.77	1.74	1.62	-5.83
2,518.00	6.75	23.61	2,515.72	59.08	-4.46	54.23	0.26	-0.22	-1.11
2,613.00	6.40	21.44	2,610.10	69.13	-0.29	65.09	0.45	-0.37	-2.28
2,708.00	7.19	23.90	2,704.43	79.49	4.06	76.30	0.89	0.83	2.59
2,803.00	6.66	21.06	2,798.74	90.07	8.44	87.74	0.66	-0.56	-2.99
2,898.00	7.53	16.98	2,893.01	101.16	12.24	99.46	1.06	0.92	-4.29
2,993.00	6.93	14.25	2,987.25	112.67	15.47	111.39	0.73	-0.63	-2.87
3,088.00	7.55	20.93	3,081.50	124.05	19.11	123.34	1.10	0.65	7.03
3,183.00	7.05	16.55	3,175.73	135.47	23.00	135.40	0.79	-0.53	-4.61
3,278.00	7.21	23.41	3,269.99	146.53	27.03	147.17	0.91	0.17	7.22
3,373.00	8.37	28.55	3,364.12	158.08	32.70	159.94	1.42	1.22	5.41
3,468.00	8.48	31.24	3,458.09	170.14	39.64	173.63	0.43	0.12	2.83
3,570.00	8.34	30.95	3,559.00	182.91	47.35	188.24	0.14	-0.14	-0.28
3,665.00	8.37	29.57	3,652.99	194.84	54.30	201.80	0.21	0.03	-1.45
3,760.00	8.26	30.58	3,746.99	206.72	61.19	215.30	0.19	-0.12	1.06
3,855.00	6.92	23.52	3,841.16	217.85	66.94	227.71	1.72	-1.41	-7.43
3,950.00	6.83	23.34	3,935.47	228.28	71.46	239.05	0.10	-0.09	-0.19
4,045.00	7.04	22.47	4,029.78	238.85	75.93	250.50	0.25	0.22	-0.92
4,140.00	7.07	23.12	4,124.06	249.60	80.45	262.15	0.09	0.03	0.68
4,234.00	6.81	26.59	4,217.37	259.91	85.21	273.45	0.52	-0.28	3.69
4,329.00	6.88	25.13	4,311.69	270.10	90.15	284.70	0.20	0.07	-1.54
4,424.00	6.09	22.60	4,406.09	279.90	94.50	295.40	0.88	-0.83	-2.66
4,520.00	6.16	23.29	4,501.54	289.33	98.50	305.62	0.11	0.07	0.72
4,614.00	6.04	24.63	4,595.01	298.46	102.55	315.58	0.20	-0.13	1.43
4,709.00	6.13	25.63	4,689.47	307.58	106.83	325.60	0.15	0.09	1.05



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Julio

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)
4,804.00	6.09	23.67	4,783.93	316.77	111.05	335.67	0.22	-0.04	-2.06
4,899.00	6.13	19.81	4,878.39	326.15	114.79	345.76	0.43	0.04	-4.06
4,994.00	5.89	19.40	4,972.87	335.52	118.13	355.71	0.26	-0.25	-0.43
5,089.00	4.48	15.59	5,067.48	343.70	120.74	364.29	1.53	-1.48	-4.01
5,152.00	3.87	8.90	5,130.31	348.17	121.73	368.83	1.24	-0.97	-10.62
5,215.00	2.64	11.08	5,193.21	351.69	122.34	372.36	1.96	-1.95	3.46
5,310.00	1.61	23.01	5,288.14	355.07	123.28	375.85	1.17	-1.08	12.56
5,405.00	1.04	36.24	5,383.12	356.99	124.31	378.01	0.68	-0.60	13.93
5,500.00	0.23	48.74	5,478.11	357.81	124.97	379.00	0.86	-0.85	13.16
5,532.00	0.17	59.42	5,510.11	357.88	125.06	379.10	0.22	-0.19	33.38
Last MWD Survey									
5,575.00	0.17	59.42	5,553.11	357.94	125.17	379.19	0.00	0.00	0.00
Projection to Bit									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,967.00	1,966.38	24.41	-21.36	Gyro Tie-in
5,532.00	5,510.11	357.88	125.06	Last MWD Survey
5,575.00	5,553.11	357.94	125.17	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____