

30-025-40227



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COG Operating LLC

Lea County, NM (NAD27 NME)

GC Federal #61

GC Federal #61

OH

Design: Actual

Standard Survey Report

05 October, 2011



DEC 07 2011



Scientific Drilling Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well GC Federal #61
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB Elev (13') @ 3941.00usft (JW #4)
Site:	GC Federal #61	MD Reference:	KB Elev (13') @ 3941.00usft (JW #4)
Well:	GC Federal #61	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 #61		
Site Position:		Northing:	661,532.50 usft
From:	Map	Easting:	661,605.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	0 "
		Latitude:	32° 49' 3.127 N
		Longitude:	103° 48' 26.270 W
		Grid Convergence:	0.29 °

Well	GC Federal #61		
Well Position	+N/-S	0.00 usft	Northing: 661,532.50 usft
	+E/-W	0.00 usft	Easting: 661,605.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 3.127 N
		Longitude:	103° 48' 26.270 W
		Ground Level:	3,928.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	2011/09/28	7.70
			Dip Angle (°)
			60.69
			Field Strength (nT)
			48,916

Design	Actual		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			20.89

Survey Program	Date 2011/10/05		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	2,000.00	Gyro Survey (OH)	Keeper
2,148.00	7,095.00	MWD Survey (OH)	MWD
			Description
			Standard Wireline Keeper ver 1.0.2
			MWD - Standard

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	0.55	176.51	100.00	-0.48	0.03	-0.44	0.55	0.55	0.00
200.00	0.74	164.83	199.99	-1.58	0.23	-1.40	0.23	0.19	-11.68
300.00	0.76	159.53	299.98	-2.83	0.63	-2.42	0.07	0.02	-5.30
400.00	0.81	159.64	399.97	-4.11	1.11	-3.45	0.05	0.05	0.11
500.00	0.60	142.12	499.97	-5.19	1.67	-4.25	0.30	-0.21	-17.52
600.00	0.36	130.44	599.96	-5.80	2.23	-4.62	0.26	-0.24	-11.68
700.00	0.15	199.29	699.96	-6.13	2.43	-4.86	0.34	-0.21	68.85
800.00	0.19	287.87	799.96	-6.20	2.23	-5.00	0.24	0.04	88.58
900.00	0.24	294.94	899.96	-6.06	1.88	-4.99	0.06	0.05	7.07



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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	0 16	146 66	999 96	-6 09	1 77	-5 06	0 39	-0 08	-148 28
1,100 00	0 36	202 65	1,099 96	-6 50	1 72	-5 46	0 30	0 20	55 99
1,200 00	0 30	201.23	1,199 96	-7 03	1 51	-6 03	0 06	-0 06	-1 42
1,300 00	0 20	205 58	1,299 96	-7 43	1 34	-6 47	0 10	-0 10	4 35
1,400 00	0 10	210 34	1,399 96	-7 67	1.22	-6.73	0 10	-0 10	4 76
1,500 00	0 13	79 20	1,499 96	-7 72	1 29	-6 75	0 21	0 03	-131 14
1,600 00	0 54	59 70	1,599 96	-7 46	1 80	-6 33	0 42	0 41	-19 50
1,700 00	0 98	55.85	1,699 95	-6 74	2 92	-5.26	0 44	0 44	-3 85
1,800 00	1 05	73 33	1,799 93	-6 00	4 50	-4 00	0 32	0 07	17 48
1,900 00	0 97	73 40	1,899 92	-5 50	6 19	-2 93	0 08	-0 08	0 07
2,000 00	1 19	77 90	1,999 90	-5 04	8 02	-1 85	0 24	0 22	4 50
2,148 00	0 97	79 46	2,147 87	-4 49	10 75	-0 36	0 15	-0 15	1.05
2,210 00	1 28	55 03	2,209 86	-3 99	11 84	0 49	0 91	0 50	-39 40
2,272 00	2 16	46 58	2,271 83	-2 79	13 25	2 12	1 47	1 42	-13.63
2,334 00	3 07	37 83	2,333 77	-0 68	15 12	4 76	1 60	1 47	-14 11
2,396 00	3 77	28 89	2,395 66	2 42	17 12	8 36	1 42	1 13	-14.42
2,458 00	4 55	30 04	2,457 49	6 33	19 34	12 81	1 27	1 26	1 85
2,519 00	5 46	24 74	2,518 26	11 06	21 77	18 10	1 67	1 49	-8 69
2,581 00	5 52	21 24	2,579 97	16 52	24 08	24 02	0 55	0 10	-5 65
2,644 00	5 63	18 28	2,642 68	22 28	26 15	30 14	0 49	0 17	-4 70
2,705 00	6 42	19 85	2,703 34	28 33	28.24	36 54	1 32	1.30	2 57
2,768 00	7 00	20 18	2,765 91	35 24	30 76	43 90	0 92	0 92	0 52
2,861 00	6 64	18 47	2,858 25	45 66	34 42	54 94	0 44	-0 39	-1 84
2,954 00	6 91	15 37	2,950 60	56 16	37 61	65 88	0 49	0 29	-3 33
3,047 00	6 27	12 25	3,042 99	66 51	40 17	76 47	0 79	-0 69	-3.35
3,140 00	6 54	12 54	3,135 40	76 65	42 40	86 73	0 29	0 29	0 31
3,202 00	6 75	17 52	3,196 99	83 57	44 26	93 86	0 99	0 34	8 03
3,264 00	7 29	20 27	3,258 52	90 73	46 72	101 43	1 03	0 87	4 44
3,357 00	6 96	19 12	3,350 81	101 59	50 61	112 96	0 39	-0 35	-1 24
3,451 00	7 97	21 32	3,444 01	113 04	54 84	125 17	1 12	1 07	2 34
3,544 00	7 69	19 45	3,536 14	124 92	59.26	137 84	0 41	-0 30	-2 01
3,637 00	7 57	19 43	3,628 32	136 56	63 37	150 18	0 13	-0 13	-0 02
3,729 00	7 62	19 31	3,719 51	148 03	67 40	162 34	0 06	0 05	-0 13
3,822 00	7 10	17 82	3,811.74	159 32	71.20	174 24	0 60	-0 56	-1 60
3,915 00	6 75	16 88	3,904 07	170 03	74 55	185 43	0 40	-0 38	-1 01
4,008 00	6 55	15 67	3,996 44	180 36	77 57	196 17	0 26	-0 22	-1 30
4,102 00	7.51	22 39	4,089 73	191 21	81 35	207 65	1 34	1 02	7.15
4,194 00	7 48	21 24	4,180 95	202 35	85 81	219 64	0 17	-0 03	-1 25
4,286 00	7 17	22 98	4,272 20	213 21	90 22	231 37	0 41	-0 34	1 89
4,380 00	7 03	24 08	4,365 48	223 87	94 86	242 98	0 21	-0 15	1 17
4,472 00	7 01	23 29	4,456 79	234 16	99 38	254 21	0 11	-0 02	-0 86
4,566 00	6 92	22 70	4,550 09	244 65	103 83	265 60	0 12	-0 10	-0 63
4,659 00	6 82	22 17	4,642 43	254 94	108 08	276 72	0 13	-0 11	-0 57



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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)
4,752 00	6 76	21 88	4,734 77	265 13	112.20	287 71	0 07	-0 06	-0 31
4,847 00	6 40	19 40	4,829.15	275 31	116 04	298 59	0 48	-0 38	-2 61
4,940 00	7 75	19 68	4,921 44	286 11	119 88	310 04	1 45	1 45	0 30
5,032 00	7 52	19 03	5,012 62	297 64	123 93	322 26	0 27	-0 25	-0 71
5,125 00	7 27	18 84	5,104 85	308 96	127 81	334 23	0 27	-0 27	-0 20
5,220 00	7 31	19 29	5,199.08	320 35	131.75	346 27	0 07	0 04	0 47
5,313 00	7 29	18 94	5,291 33	331 52	135 62	358 09	0 05	-0 02	-0 38
5,407 00	7 19	20 12	5,384 58	342 68	139 58	369 93	0 19	-0 11	1 26
5,500 00	7 27	20 24	5,476 84	353 67	143 62	381 63	0 09	0 09	0 13
5,594 00	7 08	17 27	5,570 10	364 78	147 40	393 36	0 44	-0 20	-3 16
5,688 00	7 09	18 77	5,663 38	375 81	150 98	404.94	0 20	0 01	1 60
5,782 00	7 20	17 97	5,756 65	386 90	154 67	416 62	0 16	0 12	-0 85
5,872 00	7 06	18 02	5,845 96	397 53	158 12	427.78	0 16	-0 16	0 06
5,964 00	6 99	18 68	5,937 27	408 21	161 66	439 02	0 12	-0 08	0 72
6,050 00	6 54	18 47	6,022 67	417 81	164 89	449 14	0 52	-0 52	-0 24
6,183 00	6 48	18 97	6,154 81	432 09	169 73	464 21	0 06	-0 05	0 38
6,277 00	6 50	20 04	6,248 21	442 10	173 27	474 83	0 13	0 02	1 14
6,370 00	6 51	21 22	6,340 61	451 96	176 99	485 36	0 14	0 01	1 27
6,463 00	6 91	22 03	6,432 97	462 06	180 99	496 23	0 44	0.43	0 87
6,556 00	6 71	18 38	6,525 32	472 41	184 80	507 25	0 51	-0.22	-3 92
6,649 00	6 99	18 92	6,617 65	482 92	188 35	518 33	0 31	0 30	0 58
6,743 00	7 01	20 00	6,710 95	493 72	192 17	529 79	0 14	0 02	1 15
6,836 00	6 59	20 20	6,803 30	504 06	195 95	540 80	0 45	-0 45	0 22
6,929 00	6 52	21 03	6,895 69	513 99	199 69	551 41	0 13	-0.08	0 89
7,045 00	6 11	21 17	7,010.99	525 90	204 28	564 17	0 35	-0 35	0.12
Last MWD Survey									
7,095 00	6 11	21 17	7,060 70	530 86	206 20	569 49	0 00	0 00	0 00
Projection to Bit									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		
		+N/-S (usft)	+E/-W (usft)	Comment
7,045 00	7,010 99	525 90	204 28	Last MWD Survey
7,095 00	7,060 70	530 86	206 20	Projection to Bit

Checked By _____ Approved By: _____ Date: _____