



30-015-38570

COG Operating LLC

Eddy County, NM (NAN27 NME)

Burch Keely Unit #601

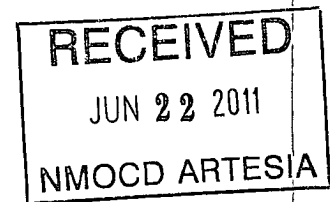
Burch Keely Unit #601

OH

Design: Acual

Standard Survey Report

03 May, 2011



Scientific Drilling
Directional Drilling Operations



Scientific Drilling Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Burch Keely Unit #601
Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	KB Elev (13') @ 3611 00usft (Cavalos #3)
Site:	Burch Keely Unit #601	MD Reference:	KB Elev (13') @ 3611 00usft (Cavalos #3)
Well:	Burch Keely Unit #601	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Acual	Database:	EDM-Julio

Project	Eddy County, NM (NAN27 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	Burch Keely Unit #601		
Site Position:		Northing:	663,067 30 usft
From:	Map	Easting:	589,900 80 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 49' 21 062 N
		Longitude:	104° 2' 26 462 W
		Grid Convergence:	0 16 °

Well	Burch Keely Unit #601		
Well Position	+N/-S	0 00 usft	Northing:
	+E/-W	0 00 usft	Easting:
Position Uncertainty	0 00 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 21 062 N
		Longitude:	104° 2' 26 462 W
		Ground Level:	3,598 00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2011/04/27	7 86
			Dip Angle
			(°)
			60 66
			Field Strength
			(nT)
			48,937

Design	Acual		
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
			(°)
			157 49

Survey Program	Date 2011/05/03		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100 00	923 00	Gyro Survey (OH)	Keeper
1,028 00	4,577 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 67	354 81	100 00	0 58	-0 05	-0 56	0 67	0 67	0 00
200 00	0 70	348 16	199 99	1 76	-0 23	-1 72	0 08	0 03	-6 65
300 00	0 92	10 18	299 98	3 15	-0 21	-2 99	0 38	0 22	22 02
400 00	1 03	14 91	399 97	4 81	0 16	-4 38	0 14	0 11	4 73
500 00	1 26	21 33	499 95	6 70	0 79	-5 89	0 26	0 23	6 42
600 00	1 43	27 04	599 92	8 84	1 76	-7 49	0 22	0 17	5 71
700 00	1 54	36 14	699 89	11 03	3 12	-9 00	0 26	0 11	9 10
800 00	1 55	47 47	799 85	13 03	4 91	-10 16	0 31	0 01	11 33
900 00	1 22	55 16	899 82	14 56	6 78	-10 85	0 38	-0 33	7 69



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Survey Report



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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)
923 00	1 33	53 39	922 81	14 85	7 19	-10 97	0 51	0 48	-7 70
Gyro Tie-in									
1,028 00	0 95	61 66	1,027 79	15 99	8 94	-11 35	0 39	-0 36	7 88
1,122 00	0 69	124 28	1,121 79	16 05	10 09	-10 96	0 94	-0 28	66.62
1,217 00	1 56	185 18	1,216 77	14 44	10.45	-9 34	1 44	0 92	64 11
1,311 00	2 73	190 64	1,310 70	10.96	9 92	-6 33	1 26	1 24	5 81
1,406 00	4 02	192 12	1,405.53	5 48	8 80	-1.69	1 36	1 36	1 56
1,501 00	4 97	182 76	1,500 24	-1 88	7 90	4 77	1 26	1 00	-9 85
1,595 00	6 35	184 76	1,593 78	-11 13	7 27	13 07	1 48	1 47	2 13
1,689 00	7 65	179 94	1,687 08	-22 57	6.85	23 47	1 52	1 38	-5 13
1,784 00	7 08	176 58	1,781 30	-34 74	7 21	34 85	0 75	-0 60	-3 54
1,879 00	6 65	175 47	1,875 62	-46 07	7.99	45 61	0 47	-0 45	-1 17
1,973 00	7 45	182 72	1,968 91	-57 58	8.13	56 30	1 27	0 85	7 71
2,067 00	6 88	183 20	2,062 17	-69 29	7 53	66 89	0 61	-0 61	0 51
2,162 00	6 29	181 83	2,156 54	-80 17	7 04	76 76	0 64	-0 62	-1 44
2,257 00	7 05	187 80	2,250 90	-91 15	6 09	86 53	1 08	0 80	6 28
2,351 00	7 00	189 00	2,344 20	-102.52	4 41	96 39	0 16	-0 05	1 28
2,445 00	7 00	190 74	2,437 50	-113 81	2.44	106.07	0 23	0 00	1 85
2,538 00	6 97	190 33	2,529 81	-124.92	0 38	115 55	0 06	-0 03	-0 44
2,633.00	7 16	190 24	2,624 08	-136 42	-1 71	125 37	0 20	0 20	-0 09
2,727 00	7 49	188 22	2,717 32	-148 25	-3 63	135 56	0 45	0 35	-2 15
2,822 00	8 06	188 70	2,811 44	-160 96	-5 52	146 58	0 60	0 60	0 51
2,916 00	8 52	189 98	2,904 46	-174 33	-7 72	158 09	0 53	0 49	1 36
3,010 00	8 12	186 20	2,997 47	-187 79	-9 65	169 78	0 72	-0 43	-4 02
3,104 00	7 29	186 03	3,090 62	-200 32	-10 99	180 85	0 88	-0 88	-0 18
3,198 00	6 78	183 84	3,183 91	-211 79	-11 99	191 06	0 61	-0 54	-2 33
3,293 00	7 05	183.42	3,278 22	-223 20	-12 71	201 33	0 29	0 28	-0 44
3,386 00	6 83	181 82	3,370 54	-234 43	-13 23	211 50	0 31	-0 24	-1 72
3,481 00	6 23	182 12	3,464 93	-245 23	-13 60	221 33	0 63	-0 63	0 32
3,575 00	6 30	182 33	3,558 36	-255.48	-14.00	230 65	0 08	0 07	0 22
3,638 00	6 51	182 33	3,620 97	-262 50	-14 28	237 02	0 33	0 33	0 00
3,701 00	6 45	180 52	3,683 57	-269 60	-14 46	243 52	0 34	-0 10	-2 87
3,764 00	5 81	176 67	3,746 21	-276 33	-14 31	249 79	1 21	-1 02	-6 11
3,827 00	5 31	175 80	3,808 91	-282 42	-13 91	255 57	0 80	-0 79	-1 38
3,858 00	5 16	174 26	3,839 78	-285 24	-13 66	258 26	0 66	-0.48	-4 97
3,890 00	4 67	175 11	3,871 66	-287 96	-13 41	260 88	1.55	-1 53	2 66
3,921 00	4 07	175 39	3,902 57	-290 32	-13 21	263 13	1 94	-1 94	0 90
3,959 00	3 54	178 12	3,940 49	-292 84	-13 07	265 51	1 47	-1 39	7 18
3,993 00	2 76	182 59	3,974 44	-294 70	-13 07	267 24	2 40	-2 29	13 15
4,023 00	2 58	185 93	4,004 41	-296 10	-13 17	268 49	0 79	-0 60	11 13
4,053 00	2 24	184 32	4,034 38	-297 35	-13 29	269.60	1 16	-1 13	-5 37
4,085 00	1 96	185 95	4,066 36	-298 52	-13 39	270 64	0 89	-0 88	5 09
4,116 00	1 93	179 63	4,097 34	-299 57	-13 44	271 59	0 70	-0 10	-20 39



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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)
4,148 00	1 88	166 93	4,129 32	-300 62	-13 32	272 61	1 33	-0 16	-39 69
4,236 00	0 36	58 32	4,217 31	-301 88	-12 76	273 99	2.30	-1 73	-123 42
4,332.00	0 50	58 45	4,313 30	-301 50	-12 14	273 87	0 15	0 15	0 14
4,426 00	0 62	59 32	4,407 30	-301 03	-11.36	273 74	0.13	0 13	0 93
4,523 00	0 81	61 70	4,504 29	-300 44	-10 30	273 59	0 20	0 20	2 45
Last MWD Survey									
4,577 00	0 78	66 41	4,558 29	-300 11	-9 63	273 55	0 13	-0 06	8 72
Projection to Bit									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
923 00	922 81	14 85	7 19	Gyro Tie-in
4,523 00	4,504 29	-300 44	-10 30	Last MWD Survey
4,577 00	4,558 29	-300 11	-9 63	Projection to Bit

Checked By _____ Approved By _____ Date _____



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Burch Keely Unit #601
Wellbore: OH
Design: Plan #3 7-7/8" Hole

