



COG Operating LLC

Eddy County, NM (NAN27 NME)

Burch Keely Unit #725

Burch Keely Unit #725

OH

30-015-38954

Design: Actual

Standard Survey Report

10 July, 2011





Scientific Drilling

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Burch Keely Unit #725
Well: Burch Keely Unit #725
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Site Burch Keely Unit #725
TVD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
MD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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 #725		
Site Position:		Northing:	660,316 40 usft
From:	Map	Easting:	586,095 80 usft
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 48' 53 943 N
		Longitude:	104° 3' 11 137 W
		Grid Convergence:	0 15 °

Well	Burch Keely Unit #725		
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' 53 943 N
		Longitude:	104° 3' 11 137 W
		Ground Level:	3,573 00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	2011/07/06	(°)
			7 85
			Dip Angle
			(°)
			60 65
			Field Strength
			(nT)
			48,912

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
			(°)
			52 94

Survey Program	Date 2011/07/10		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100 00	798 00	Gyro Survey (OH)	Keeper
894 00	4,974 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 46	38 77	100 00	0 31	0 25	0 39	0 46	0 46	0 00
200 00	1 00	89 00	199 99	0 64	1 38	1 48	0 79	0 54	50 23
300 00	0 84	72 30	299 98	0 88	2 95	2 88	0 31	-0 16	-16 70
400 00	0 98	82 31	399 97	1 22	4 49	4 32	0 21	0 14	10 01
500 00	1 36	66 62	499 95	1 80	6 43	6 22	0 49	0 38	-15 69
600 00	1 52	68 91	599 91	2 75	8 76	8 64	0 17	0 16	2 29
700 00	1 41	81 69	699 88	3 41	11 21	11 00	0 34	-0 11	12 78
798 00	1 76	64 52	797 84	4 23	13 76	13 53	0 60	0 36	-17 52
Gyro Tie-in									



Scientific Drilling

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Burch Keely Unit #725
Well: Burch Keely Unit #725
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Site Burch Keely Unit #725
TVD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
MD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
894 00	1 44	70 14	893 81	5 27	16 23	16 13	0 37	-0.33	5 85
988 00	1 31	73 88	987 78	5 97	18 37	18 26	0 17	-0 14	3 98
1,084 00	1 04	69 97	1,083 76	6 57	20 24	20 12	0 29	-0 28	-4 07
1,147 00	1 61	63 89	1,146 74	7 16	21 57	21 53	0 93	0 90	-9 65
1,209 00	2 26	60 10	1,208 71	8 15	23 42	23 60	1 07	1 05	-6 11
1,271 00	3 09	57 77	1,270 64	9.65	25 89	26 48	1 35	1 34	-3 76
1,334 00	3 79	51 58	1,333 52	11 85	28 96	30 25	1 26	1 11	-9 83
1,396 00	4 21	50 27	1,395 37	14 58	32 31	34 57	0 69	0 68	-2 11
1,460 00	4 82	51 26	1,459 17	17 76	36 22	39 61	0 96	0 95	1 55
1,523 00	5 49	51 30	1,521 92	21 30	40 63	45.27	1 06	1 06	0 06
1,586 00	5 40	49 29	1,584 64	25.12	45 23	51.24	0 33	-0 14	-3 19
1,680 00	5 06	47 63	1,678 24	30 80	51 65	59 78	0 40	-0.36	-1 77
1,773 00	4 42	46 82	1,770 93	36.02	57 29	67 42	0 69	-0 69	-0 87
1,874 00	4 86	47 92	1,871 59	41.55	63 31	75 56	0 44	0 44	1 09
1,969 00	5 14	51 52	1,966 23	46.89	69 62	83 82	0 44	0 29	3 79
2,061 00	5 03	51 93	2,057 87	51 94	76 02	91 97	0 13	-0 12	0 45
2,156 00	5 32	49.42	2,152 48	57 38	82 65	100.53	0 39	0 31	-2 64
2,250 00	5 07	51 76	2,246 10	62.78	89 22	109 03	0 35	-0.27	2 49
2,344 00	5 73	54 68	2,339 68	68 07	96 31	117 88	0 76	0 70	3 11
2,437 00	5 46	56.18	2,432 24	73 21	103 78	126 94	0 33	-0 29	1 61
2,531 00	5 21	54 65	2,525 83	78 17	110 97	135 67	0 31	-0 27	-1 63
2,625 00	5 03	54 68	2,619 45	83.02	117 82	144 05	0 19	-0 19	0 03
2,720 00	5 00	53 91	2,714 09	87 87	124 56	152 35	0 08	-0 03	-0 81
2,813 00	5 12	54 81	2,806 73	92.65	131 23	160 55	0 15	0 13	0 97
2,907 00	5 04	52 57	2,900 36	97 57	137 93	168 87	0 23	-0.09	-2 38
3,001 00	4 95	54 13	2,994 00	102 46	144 50	177 06	0 17	-0 10	1 66
3,095 00	4 99	54 43	3,087 65	107 22	151 11	185 20	0 05	0 04	0 32
3,190 00	4 87	53 99	3,182 30	111.99	157 73	193 36	0 13	-0 13	-0 46
3,283 00	4 83	55 78	3,274 96	116 51	164 16	201.22	0 17	-0 04	1 92
3,376 00	4 63	56 53	3,367 65	120 78	170 53	208 87	0 23	-0 22	0 81
3,469 00	4 65	55 76	3,460 34	124 98	176 78	216 39	0 07	0 02	-0 83
3,565 00	5 02	49 81	3,556 00	129 88	183 20	224 47	0 65	0 39	-6 20
3,659 00	4 82	52 38	3,649 66	134 94	189 47	232 52	0 32	-0 21	2 73
3,722 00	3 98	54 31	3,712 47	137 83	193 35	237 35	1 35	-1 33	3 06
3,785 00	3 18	57 09	3,775 35	140 06	196 59	241 28	1 30	-1 27	4 41
3,854 00	3 29	62 86	3,844 24	142 00	199 96	245 14	0 50	0 16	8 36
3,916 00	2 74	54 85	3,906 15	143 66	202 75	248 38	1 12	-0 89	-12 92
3,979 00	1 62	64 31	3,969 10	144 92	204 79	250 75	1 86	-1 78	15 02
4,041 00	0 54	92 45	4,031 09	145 28	205 87	251 84	1 89	-1 74	45 39
4,104 00	0 56	124 10	4,094 09	145 10	206 42	252 17	0 48	0.03	50 24
4,199 00	0 38	129.44	4,189 09	144.64	207 05	252 39	0 19	-0 19	5 62
4,293 00	0 12	231 71	4,283 09	144 38	207 21	252 37	0 45	-0 28	108 80
4,388 00	0 11	136 80	4,378 09	144.25	207 19	252 28	0 18	-0 01	-99 91



Scientific Drilling
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Burch Keely Unit #725
Well: Burch Keely Unit #725
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Site Burch Keely Unit #725
TVD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
MD Reference: KB Elev (13') @ 3586 00usft (Cavaloz #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
4,482 00	0 07	33 62	4,472 09	144 23	207 29	252 34	0 15	-0.04	-109 77
4,574 00	0 28	311 25	4,564 08	144 43	207 15	252 35	0 30	0 23	-89 53
4,668 00	0 38	286 67	4,658 08	144 67	206 68	252 12	0 18	0 11	-26 15
4,761 00	0 34	285 72	4,751 08	144 83	206 12	251 77	0 04	-0 04	-1 02
4,855 00	0 24	334 43	4,845 08	145 09	205 76	251 64	0 27	-0 11	51 82
4,925 00	0 17	326 88	4,915 08	145 30	205 64	251.67	0 11	-0 10	-10 79
Last MWD Survey									
4,974 00	0 17	326 88	4,964 08	145 43	205 57	251 68	0 00	0 00	0 00
Projection to Bit									

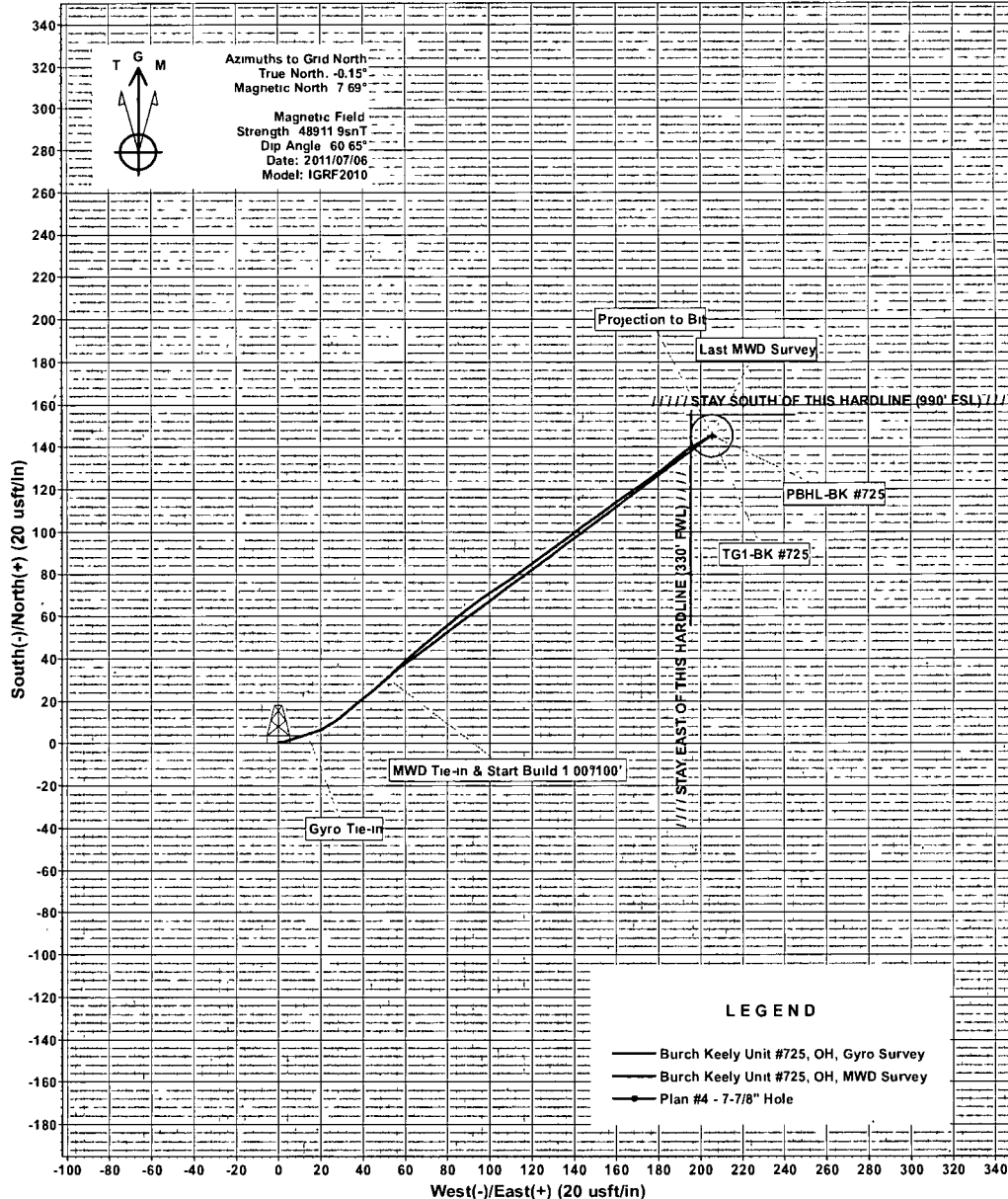
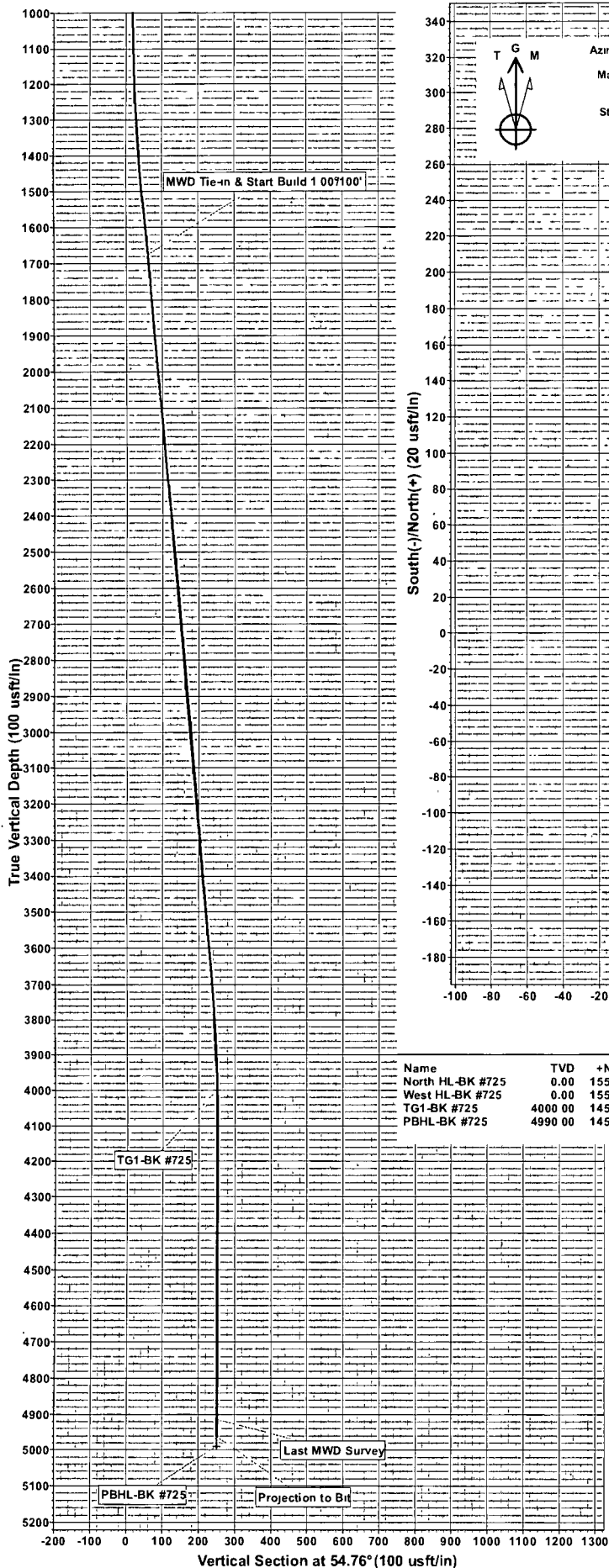
Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
798 00	797 84	4.23	13 76	Gyro Tie-in
4,925 00	4,915 08	145 30	205 64	Last MWD Survey
4,974 00	4,964 08	145 43	205 57	Projection to Bit

Checked By _____ Approved By _____ Date: _____



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Burch Keely Unit #725
Wellbore: OH
Design: Plan #4 vs Actual - 7-7/8" Hole



LEGEND

- Burch Keely Unit #725, OH, Gyro Survey
- Burch Keely Unit #725, OH, MWD Survey
- Plan #4 - 7-7/8" Hole

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
North HL-BK #725	0.00	155.10	195.40	660471.50	586291.20	32°48' 55.473 N	104°3' 8.843 W	Rectangle (Sides: L0 00 W50 00)
West HL-BK #725	0.00	155.10	195.40	660471.50	586291.20	32°48' 55.473 N	104°3' 8.843 W	Rectangle (Sides: L100 00 W0 00)
TG1-BK #725	4000.00	145.10	205.40	660461.50	586301.20	32°48' 55.373 N	104°3' 8.726 W	Point
PBHL-BK #725	4990.00	145.10	205.40	660461.50	586301.20	32°48' 55.373 N	104°3' 8.726 W	Circle (Radius: 10.00)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Target
1	1680.00	5.06	47.63	1678.24	30.80	51.65	0.00	0.00	59.96	
2	1731.43	4.98	53.44	1729.47	33.66	55.12	1.00	101.51	64.44	
3	3760.79	4.98	53.44	3751.17	138.65	196.70	0.00	0.00	240.66	
4	4009.94	0.00	0.00	4000.00	145.10	205.40	2.00	180.00	251.48	TG1-BK #725
5	4999.94	0.00	0.00	4990.00	145.10	205.40	0.00	0.00	251.48	PBHL-BK #725

WELL DETAILS: Burch Keely Unit #725

		Ground Level		3573.00	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	660316.40	586095.80	32°48' 53.943 N	104°3' 11.137 W

PROJECT DETAILS: Eddy County, NM (NAN27 NME) Plan #4 - 7-7/8" Hole (Burch Keely Unit #725/OH)

Geodetic System	US State Plane 1927 (Exact solution)	Created By	Julio Pina	Date	06-Jul-11
Datum	NAD 1927 (NADCON CONUS)	Checked		Date	
Ellipsoid	Clarke 1866	Reviewed		Date	
Zone	New Mexico East 3001	Approved		Date	
System Datum	Mean Sea Level				