



COG Operating LLC

Eddy County, NM (NAN27 NME)

Skelly Unit #828

Skelly Unit #828

OH

30-015-38443

Design: Actual

Standard Survey Report

26 July, 2011



Scientific Drilling
Directional Drilling Operations



Scientific Drilling

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Skelly Unit #828
Project:	Eddy County, NM (NAN27-NME)	TVD Reference:	KB Elev (12') @ 3879.00usft (Basic #35)
Site:	Skelly Unit #828	MD Reference:	KB Elev (12') @ 3879.00usft (Basic #35)
Well:	Skelly Unit #828	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	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: Skelly Unit #828					
Site Position:		Northing:	665,074.60 usft	Latitude:	32° 49' 38.845 N
From:	Map	Easting:	647,417.00 usft	Longitude:	103° 51' 12.345 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.26 °

Well:	Skelly Unit #828					
Well Position	+N/-S	0 00 usft	Northing:	665,074 60 usft	Latitude:	32° 49' 38 845 N
	+E/-W	0 00 usft	Easting:	647,417 00 usft	Longitude:	103° 51' 12 345 W
Position Uncertainty		0 00 usft	Wellhead Elevation:	usft	Ground Level:	3,867 00 usft

Wellbore:	OH
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2011/07/19	7.75	60.69	48,936

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)	Direction (°)	
	0 00	0 00	0 00	338 07	

Survey Program		Date	2011/07/26		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,740.00	Gyro Survey (OH)	Keeper	Standard Wireline Keeper ver 1.0.2	
1,840.00	5,140.00	MWD Survey (OH)	MWD	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	0.77	53.18	100.00	0.40	0.54	0.17	0.77	0.77	0.00
200.00	0.62	44.96	199.99	1.19	1.46	0.56	0.18	-0.15	-8.22
300.00	0.40	39.17	299.99	1.84	2.06	0.94	0.23	-0.22	-5.79
400.00	0.40	41.95	399.98	2.37	2.51	1.26	0.02	0.00	2.78
500.00	0.44	49.22	499.98	2.88	3.04	1.54	0.07	0.04	7.27
600.00	0.24	63.72	599.98	3.23	3.52	1.68	0.22	-0.20	14.50
700.00	0.30	66.49	699.98	3.42	3.95	1.70	0.06	0.06	2.77
800.00	0.35	59.31	799.98	3.68	4.45	1.76	0.06	0.05	-7.18
900.00	0.31	71.00	899.97	3.93	4.97	1.79	0.08	-0.04	11.69



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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)
1,000 00	0 24	75 67	999 97	4 07	5 43	1 75	0 07	-0 07	4 67
1,100 00	0 28	83 46	1,099 97	4 15	5 87	1 65	0 05	0 04	7 79
1,200 00	0 33	83 25	1,199 97	4 21	6 40	1 51	0 05	0 05	-0 21
1,300 00	0 40	69 44	1,299 97	4 36	7 01	1 43	0 11	0 07	-13 81
1,400 00	0 69	65 15	1,399 96	4 74	7 89	1 45	0 29	0 29	-4 29
1,500 00	0 95	41 33	1,499 95	5 62	8 98	1 86	0 42	0 26	-23 82
1,600 00	1 33	44 34	1,599 93	7 07	10 34	2 70	0 38	0 38	3 01
1,700 00	1 17	48 20	1,699 91	8 58	11 91	3 51	0 18	-0 16	3 86
1,740 00	1 21	50 40	1,739 90	9 12	12 54	3 78	0 15	0 10	5 50
Gyro Tie-in									
1,840 00	0 81	37 27	1,839 89	10 36	13 78	4 46	0 46	-0 40	-13 13
1,871 00	0 72	26 12	1,870 88	10 71	14 00	4 70	0 56	-0 29	-35 97
1,966 00	1 46	9 96	1,965 87	12 43	14 47	6 13	0 84	0 78	-17 01
2,062 00	2 33	5 30	2,061 81	15 58	14 86	8 90	0 92	0 91	-4 85
2,157 00	3 23	358 72	2,156 70	20 18	14 98	13 12	1 00	0 95	-6 93
2,252 00	4 31	351 14	2,251 49	26 38	14 37	19 11	1 25	1 14	-7 98
2,347 00	5 01	339 01	2,346 18	33 78	12 34	26 73	1 27	0 74	-12 77
2,443 00	5 78	332 60	2,441 76	41 99	8 61	35 73	1 02	0 80	-6 68
2,539 00	5 28	330 14	2,537 31	50 11	4 19	44 92	0 58	-0 52	-2 56
2,634 00	5 10	334 38	2,631 92	57 71	0 18	53 46	0 45	-0 19	4 46
2,728 00	5 42	336 32	2,725 52	65 54	-3 40	62 07	0 39	0 34	2 06
2,824 00	5 84	333 07	2,821 06	74 05	-7 44	71 47	0 55	0 44	-3 39
2,919 00	5 44	331 23	2,915 60	82 31	-11 79	80 75	0 46	-0 42	-1 94
3,015 00	6 20	333 41	3,011 11	90 93	-16 30	90 44	0 82	0 79	2 27
3,109 00	6 11	333 78	3,104 56	99 96	-20 79	100 49	0 10	-0 10	0 39
3,203 00	6 18	334 35	3,198 02	109 01	-25 19	110 52	0 10	0 07	0 61
3,297 00	6 24	333 86	3,291 47	118 15	-29 63	120 67	0 09	0 06	-0 52
3,393 00	6 31	334 20	3,386 90	127 59	-34 22	131 14	0 08	0 07	0 35
3,487 00	6 20	333 77	3,480 34	136 79	-38 71	141 35	0 13	-0 12	-0 46
3,583 00	6 26	335 17	3,575 77	146 19	-43 20	151 75	0 17	0 06	1 46
3,678 00	6 25	336 48	3,670 20	155 63	-47 44	162 09	0 15	-0 01	1 38
3,772 00	6 56	333 34	3,763 62	165 12	-51 89	172 56	0 50	0 33	-3 34
3,867 00	6 39	330 60	3,858 01	174 58	-56 92	183 21	0 37	-0 18	-2 88
3,962 00	6 61	330 73	3,952 40	183 95	-62 19	193 87	0 23	0 23	0 14
4,058 00	6 03	332 81	4,047 82	193 26	-67 20	204 37	0 65	-0 60	2 17
4,153 00	5 96	331 80	4,142 30	202 04	-71 81	214 24	0 13	-0 07	-1 06
4,247 00	5 99	331 51	4,235 79	210 66	-76 45	223 97	0 05	0 03	-0 31
4,342 00	6 24	331 53	4,330 25	219 55	-81 28	234 02	0 26	0 26	0 02
4,437 00	5 38	329 40	4,424 76	227 92	-86 01	243 55	0 93	-0 91	-2 24
4,533 00	5 41	328 36	4,520 33	235 65	-90 67	252 46	0 11	0 03	-1 08
4,629 00	5 44	327 25	4,615 90	243 33	-95 51	261 39	0 11	0 03	-1 16
4,724 00	4 44	329 02	4,710 55	250 27	-99 84	269 45	1 06	-1 05	1 86
4,819 00	3 11	324 88	4,805 34	255 53	-103 21	275 59	1 43	-1 40	-4 36



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Survey										
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4,915 00	2 14	330 55	4,901 24	259 22	-105 59	279 90	1 04	-1 01	5 91	
5,010 00	0 81	294 40	4,996 21	261 04	-107 08	282 14	1 64	-1 40	-38 05	
5,073 00	0 37	291 76	5,059 20	261 30	-107 67	282 61	0 70	-0 70	-4 19	
5,090 00	0 26	284 22	5,076 20	261 33	-107 76	282 67	0 69	-0 65	-44 35	
Last MWD Survey										
5,140 00	0 26	284 22	5,126 20	261 39	-107 98	282 80	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)	
1,740 00	1,739 90	9 12	12 54	Gyro Tie-in
5,090 00	5,076 20	261 33	-107 76	Last MWD Survey
5,140 00	5,126 20	261 39	-107 98	Projection to Bit

Checked By: _____	Approved By: _____	Date: _____
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