

COG OPERATING LLC

Eddy County, NM (NAN27 NME)

Skelly Unit #820

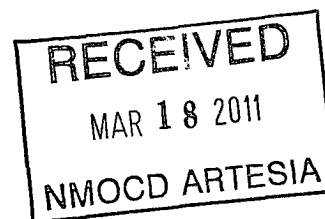
Skelly Unit #820

DH - Job #32D12101005

Survey: MWD Survey

SDI Standard Survey Report

03 February, 2011



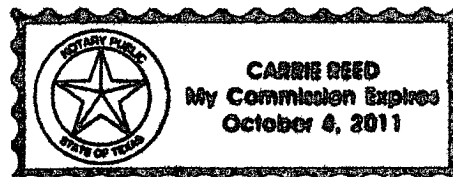
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 3rd of February, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas



MR

Scientific Drilling International, Inc.

SDI Standard Survey Report

Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Site Skelly Unit #820
Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	KB Elev (17') @ 3925.0usft (Silver Oak #8)
Site:	Skelly Unit #820	MD Reference:	KB Elev (17') @ 3925.0usft (Silver Oak #8)
Well:	Skelly Unit #820	North Reference:	Grid
Wellbore:	DH - Job #32D12101005	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

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 #820									
Site Position:		Northing:		669,559.60 usft		Latitude:		32° 50' 23.184 N			
From:		Map		Easting:		648,298.30 usft		Longitude:		103° 51' 1.777 W	
Position Uncertainty:		0.0 usft		Slot Radius:		0"		Grid Convergence:		0.26 °	

Well	Skelly Unit #820					
Well Position	+N/-S	0.0 usft	Northing:	669,559.60 usft	Latitude:	32° 50' 23.184 N
	+E/-W	0.0 usft	Easting:	648,298.30 usft	Longitude:	103° 51' 1.777 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,908.0 usft

Wellbore		DH - Job #32D12101005			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/26/2010	7.82	60.72	49,000

Design:	Actual			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	315.46

Survey Program		Date	2/3/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	1,788.0	Gyro Survey (DH - Job #32D12101005)	Keeper	Standard Wireline Keeper ver 1.0.2	
1,887.0	6,550.0	MWD Survey (DH - Job #32D12101005)	MWD	MWD - Standard	

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,788.0	1.69	54.10	1,787.8	8.8	8.9	45.53	12.5
1,887.0	1.55	52.06	1,886.8	10.5	11.2	46.91	15.3
1,950.0	1.44	44.94	1,949.8	11.5	12.4	47.08	17.0
2,013.0	1.63	21.77	2,012.8	12.9	13.3	45.80	18.6
2,077.0	2.53	3.12	2,076.7	15.2	13.7	42.09	20.5
2,140.0	3.52	347.88	2,139.6	18.5	13.4	35.94	22.8
2,203.0	4.70	339.87	2,202.5	22.8	12.1	27.96	25.8
2,265.0	5.38	331.98	2,264.2	27.7	9.9	19.57	29.4
2,329.0	5.99	322.43	2,327.9	33.0	6.4	10.99	33.7
2,372.0	6.61	316.46	2,370.7	36.6	3.3	5.22	36.8
2,456.0	7.19	299.97	2,454.1	42.7	-4.5	353.93	43.0

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Well:	Skelly Unit #820	North Reference:	Grid
Wellbore:	DH - Job #32D12101005	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
2,550.0	8.09	319.83	2,547.2	50.7	-13.9	344.67	52.6
2,644.0	8.14	323.08	2,640.3	61.1	-22.2	340.06	65.0
2,707.0	8.17	317.95	2,702.7	68.0	-27.8	337.73	73.5
2,770.0	8.65	319.02	2,765.0	74.9	-34.0	335.61	82.2
2,833.0	9.26	319.90	2,827.2	82.4	-40.3	333.91	91.7
2,896.0	10.05	317.70	2,889.3	90.3	-47.3	332.36	101.9
2,959.0	10.41	315.19	2,951.3	98.4	-55.0	330.80	112.7
3,022.0	9.90	314.80	3,013.3	106.3	-62.9	329.39	123.5
3,116.0	8.94	315.21	3,106.1	117.1	-73.7	327.81	138.4
3,180.0	9.14	313.16	3,169.3	124.1	-80.9	326.89	148.2
3,274.0	10.28	310.01	3,261.9	134.6	-92.8	325.42	163.5
3,369.0	10.18	309.70	3,355.4	145.5	-105.8	323.98	179.8
3,464.0	9.82	309.74	3,449.0	156.0	-118.5	322.79	195.9
3,558.0	9.58	309.41	3,541.6	166.1	-130.7	321.81	211.3
3,653.0	10.97	308.83	3,635.1	176.8	-143.8	320.87	227.9
3,748.0	10.66	308.14	3,728.4	187.9	-157.8	319.98	245.3
3,842.0	10.36	306.34	3,820.8	198.2	-171.4	319.15	262.1
3,936.0	10.41	306.97	3,913.3	208.4	-185.0	318.40	278.6
4,030.0	10.34	307.27	4,005.8	218.6	-198.5	317.75	295.3
4,125.0	10.16	306.63	4,099.2	228.7	-212.0	317.17	311.9
4,219.0	10.17	309.09	4,191.8	238.9	-225.1	316.70	328.3
4,313.0	10.02	307.66	4,284.3	249.1	-238.0	316.31	344.6
4,407.0	9.92	309.19	4,376.9	259.3	-250.8	315.95	360.7
4,502.0	9.89	309.67	4,470.5	269.6	-263.4	315.67	376.9
4,597.0	9.65	312.29	4,564.1	280.2	-275.6	315.48	393.0
4,693.0	9.45	312.29	4,658.8	290.9	-287.3	315.35	408.9
4,787.0	8.97	310.30	4,751.6	300.9	-298.6	315.21	423.9
4,886.0	8.66	308.44	4,849.4	310.5	-310.4	315.01	439.0
4,975.0	9.00	315.10	4,937.3	319.6	-320.5	314.91	452.6
5,070.0	8.01	315.48	5,031.3	329.6	-330.4	314.93	466.7
5,133.0	7.58	315.08	5,093.7	335.6	-336.4	314.93	475.2
5,196.0	6.57	316.35	5,156.2	341.2	-341.9	314.94	483.0
5,260.0	5.60	314.73	5,219.9	346.0	-346.6	314.95	489.8
5,323.0	4.54	312.37	5,282.6	349.9	-350.6	314.94	495.3
5,386.0	3.34	310.62	5,345.5	352.7	-353.9	314.91	499.6
5,449.0	2.09	316.24	5,408.4	354.8	-356.0	314.90	502.6
5,512.0	1.06	1.82	5,471.4	356.2	-356.8	314.95	504.2
5,575.0	0.95	29.74	5,534.4	357.2	-356.5	315.05	504.7
5,639.0	1.00	15.93	5,598.3	358.2	-356.1	315.17	505.1
5,702.0	1.31	57.19	5,661.3	359.1	-355.4	315.30	505.2
5,765.0	1.91	76.85	5,724.3	359.8	-353.7	315.48	504.5
5,829.0	3.06	99.09	5,788.3	359.7	-351.0	315.70	502.6
5,895.0	3.31	98.27	5,854.2	359.2	-347.4	315.96	499.7
5,957.0	2.85	99.57	5,916.1	358.7	-344.1	316.19	497.0

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Survey								
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6,054.0	3.18	97.05	6,012.9	357.9	-339.1	316.55	493.0	
6,149.0	3.23	98.14	6,107.8	357.2	-333.8	316.94	488.9	
6,212.0	2.82	102.57	6,170.7	356.6	-330.5	317.18	486.3	
6,276.0	2.28	93.59	6,234.6	356.2	-327.7	317.39	484.0	
6,371.0	1.11	40.62	6,329.6	356.8	-325.2	317.65	482.8	
6,466.0	1.28	28.09	6,424.6	358.4	-324.1	317.88	483.3	
6,550.0	1.02	34.36	6,508.6	359.9	-323.3	318.07	483.8	

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,788.0	1,787.8	8.8	8.9	Gyro Tie-in
6,550.0	6,508.6	359.9	-323.3	Last MWD Survey
6,602.0	6,560.5	360.7	-322.7	Projection to Bit