

COG OPERATING LLC

Eddy County, NM (NAN27 NME)

Skelly Unit #642

Skelly Unit #642

OH

30-015-37613

SDI Standard Survey Report

23 September, 2010

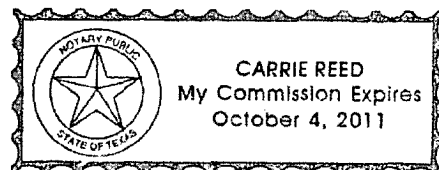
This survey is correct to the best of my knowledge and is supported by actual field data.

Sharta

Notorized this date 24th of September, 2010.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.

SDI Standard Survey Report

Company:	COG OPERATING LLC	Local Co-ordinate Reference:	Site Skelly Unit #642
Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Site:	Skelly Unit #642	MD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Well:	Skelly Unit #642	North Reference:	Grid
Wellbore:	OH	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		

Well	Skelly Unit #642, Directional				
Well Position	+N/-S	0.0 usft	Northing:	669,625.10 usft	Latitude: 32° 50' 23.584 N
	+E/-W	0.0 usft	Easting:	653,694.90 usft	Longitude: 103° 49' 58.521 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level: 3,936.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	BGGM2010	8/19/2010	7.92	60.74	49,077

Design	Actual			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	240.81

Survey Program	Date 9/23/2010			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	1,780.0	Gyro Survey (OH)	Keeper	Standard Wireline Keeper ver 1.0.2
1,915.0	7,038.0	MWD Survey (OH)	MWD	MWD - Standard

Survey								
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance	
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
100.0	0.51	280.14	100.0	0.1	-0.4	280.14	0.4	
200.0	0.68	271.38	200.0	0.2	-1.5	276.64	1.5	
300.0	0.96	245.26	300.0	-0.2	-2.8	266.65	2.8	
400.0	1.35	243.23	400.0	-1.0	-4.6	257.28	4.8	
500.0	1.58	240.50	499.9	-2.3	-6.9	251.86	7.2	
600.0	1.64	243.68	599.9	-3.6	-9.4	249.15	10.0	
700.0	1.68	247.31	699.8	-4.8	-12.0	248.33	12.9	
800.0	1.39	243.74	799.8	-5.9	-14.4	247.88	15.6	
900.0	1.42	246.89	899.8	-6.9	-16.7	247.53	18.0	
1,000.0	1.24	247.47	999.8	-7.8	-18.8	247.49	20.4	
1,100.0	0.92	244.04	1,099.7	-8.6	-20.5	247.37	22.2	
1,200.0	0.74	227.92	1,199.7	-9.3	-21.7	246.73	23.7	
1,300.0	0.71	228.56	1,299.7	-10.2	-22.7	245.81	24.9	
1,400.0	0.53	202.33	1,399.7	-11.0	-23.3	244.69	25.8	
1,500.0	0.45	229.70	1,499.7	-11.7	-23.8	243.80	26.5	

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Site:	Skelly Unit #642	MD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Well:	Skelly Unit #642	North Reference:	Grid
Wellbore:	OH	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)
1,600.0	0.44	169.39	1,599.7	-12.3	-24.0	242.81	27.0
1,700.0	0.18	99.63	1,699.7	-12.7	-23.8	241.83	27.0
1,780.0	0.78	108.57	1,779.7	-12.9	-23.2	240.81	26.5

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Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
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Wellbore:	OH	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)		
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Well	Skelly Unit #642, Directional				
Well Position	+N/-S	0.0 usft	Northing:	669,625.10 usft	Latitude: 32° 50' 23.584 N
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Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level: 3,936.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	8/19/2010	7.92	60.74	49,077

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	240.81

Survey Program	Date 9/23/2010			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,780.0	Gyro Survey (OH)	Keeper	Standard Wireline Keeper ver 1.0.2
1,915.0	6,994.0	MWD Survey (OH)	MWD	MWD - Standard

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,780.0	0.78	108.57	1,779.7	-12.9	-23.2	240.81	26.5
1,915.0	0.84	110.40	1,914.7	-13.6	-21.4	237.56	25.3
1,979.0	0.54	331.60	1,978.7	-13.5	-21.1	237.39	25.0
2,042.0	1.71	324.40	2,041.7	-12.4	-21.8	240.22	25.1
2,105.0	2.96	321.70	2,104.6	-10.4	-23.3	245.94	25.5
2,167.0	4.13	322.80	2,166.5	-7.4	-25.6	253.96	26.7
2,232.0	4.78	308.90	2,231.3	-3.8	-29.2	262.56	29.4
2,295.0	5.91	305.10	2,294.0	-0.3	-33.9	269.50	33.9
2,358.0	7.48	309.50	2,356.6	4.2	-39.7	276.01	39.9
2,421.0	9.19	311.50	2,418.9	10.1	-46.6	282.25	47.7
2,517.0	8.73	311.65	2,513.8	20.0	-57.8	289.12	61.2
2,611.0	7.63	308.80	2,606.8	28.7	-68.0	292.88	73.8
2,707.0	7.77	309.00	2,701.9	36.8	-78.0	295.24	86.2
2,802.0	8.50	309.80	2,796.0	45.3	-88.4	297.14	99.3
2,898.0	8.65	316.00	2,890.9	55.0	-98.9	299.11	113.1
2,995.0	8.74	316.00	2,986.8	65.6	-109.0	301.03	127.3

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Site:	Skelly Unit #642	MD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Well:	Skelly Unit #642	North Reference:	Grid
Wellbore:	OH	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)
3,059.0	9.40	314.40	3,050.0	72.7	-116.2	302.06	137.1
3,122.0	10.35	307.70	3,112.1	79.8	-124.3	302.70	147.7
3,185.0	10.59	299.70	3,174.0	86.1	-133.8	302.77	159.1
3,249.0	10.43	296.60	3,236.9	91.6	-144.1	302.45	170.8
3,311.0	10.49	299.90	3,297.9	97.0	-154.0	302.19	182.0
3,375.0	10.50	307.50	3,360.8	103.4	-163.7	302.29	193.6
3,438.0	9.99	308.00	3,422.8	110.3	-172.6	302.58	204.8
3,532.0	9.44	319.30	3,515.5	121.1	-184.0	303.36	220.3
3,627.0	9.38	319.60	3,609.2	133.0	-194.1	304.41	235.3
3,722.0	9.23	319.20	3,703.0	144.6	-204.1	305.32	250.1
3,817.0	8.78	309.40	3,796.8	155.0	-214.7	305.83	264.8
3,912.0	9.16	309.70	3,890.6	164.4	-226.1	306.02	279.6
4,007.0	8.96	310.06	3,984.5	174.0	-237.6	306.22	294.5
4,101.0	8.54	310.50	4,077.4	183.3	-248.5	306.41	308.8
4,197.0	8.45	308.70	4,172.3	192.3	-259.4	306.55	322.9
4,291.0	8.53	305.50	4,265.3	200.7	-270.5	306.57	336.8
4,386.0	9.21	314.30	4,359.2	210.1	-281.7	306.72	351.4
4,483.0	9.16	313.80	4,454.9	220.8	-292.8	307.02	366.7
4,566.0	9.24	311.00	4,536.8	229.8	-302.6	307.21	379.9
4,577.0	9.15	313.20	4,547.7	230.9	-303.9	307.23	381.7
4,672.0	8.93	311.30	4,641.5	241.0	-314.9	307.42	396.6
4,768.0	8.78	310.10	4,736.4	250.6	-326.1	307.54	411.3
4,863.0	8.91	309.80	4,830.2	260.0	-337.3	307.62	425.9
4,959.0	8.54	310.00	4,925.1	269.3	-348.5	307.70	440.5
5,054.0	7.45	313.40	5,019.2	278.1	-358.4	307.81	453.6
5,117.0	6.73	307.80	5,081.7	283.2	-364.3	307.86	461.4
5,180.0	5.63	318.50	5,144.4	287.8	-369.2	307.93	468.1
5,243.0	4.95	315.80	5,207.1	292.0	-373.2	308.04	473.9
5,306.0	4.06	304.70	5,269.9	295.2	-376.9	308.07	478.8
5,366.0	3.56	304.70	5,329.8	297.5	-380.2	308.04	482.8
5,464.0	3.64	306.80	5,427.6	301.1	-385.2	308.02	488.9
5,533.0	3.50	299.70	5,496.4	303.5	-388.8	307.97	493.2
5,633.0	3.59	290.20	5,596.3	306.0	-394.4	307.81	499.2
5,749.0	3.19	303.00	5,712.0	309.1	-400.5	307.66	505.9
5,844.0	3.26	299.80	5,806.9	311.8	-405.0	307.59	511.2
5,938.0	3.21	325.10	5,900.8	315.3	-408.9	307.64	516.3
6,035.0	3.38	323.70	5,997.6	319.9	-412.1	307.82	521.7
6,130.0	1.89	326.92	6,092.5	323.4	-414.6	307.96	525.8
6,225.0	2.17	335.20	6,187.4	326.4	-416.2	308.10	528.9
6,321.0	2.10	337.60	6,283.4	329.7	-417.7	308.28	532.1
6,415.0	1.96	311.20	6,377.3	332.3	-419.5	308.38	535.2
6,511.0	2.04	310.10	6,473.2	334.5	-422.1	308.40	538.5
6,574.0	2.49	313.40	6,536.2	336.1	-423.9	308.41	541.0
6,669.0	3.32	293.30	6,631.1	338.7	-427.9	308.36	545.7

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SDI Standard Survey Report

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Project:	Eddy County, NM (NAN27 NME)	TVD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Site:	Skelly Unit #642	MD Reference:	RKB Elev (12') @ 3948.0usft (Basic #35)
Well:	Skelly Unit #642	North Reference:	Grid
Wellbore:	OH	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)
6,764.0	2.90	294.00	6,725.9	340.7	-432.7	308.22	550.7
6,859.0	4.38	297.00	6,820.7	343.3	-438.1	308.09	556.6
6,994.0	4.12	297.30	6,955.4	347.9	-447.0	307.89	566.4

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,780.0	1,779.7	-12.9	-23.2	Gyro Tie-in
6,994.0	6,955.4	347.9	-447.0	Last MWD Survey
7,038.0	6,999.3	349.4	-449.8	Projection to Bit



Scientific Drilling
Directional Drilling Operations

Project: Eddy County, NM (NAN27 NME)

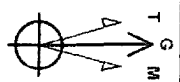
Well: Skelly Unit #642

Wellbore: OH

Design: Plan #2 - 7-7/8" Hole



CONCHO



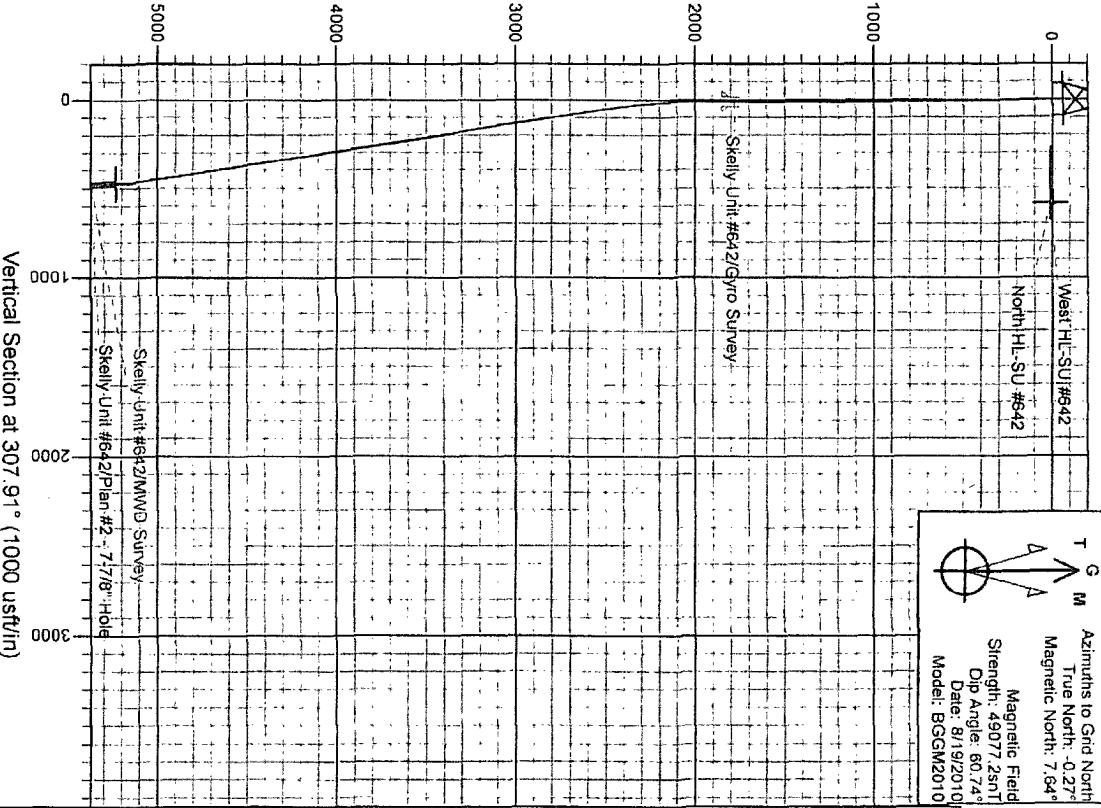
Azimuths to Grid North
True North: -0.27°
Magnetic North: 7.64°
Magnetic Field
Strength: 49077.25nT
Dip Angle: 60.74°
Date: 8/19/2010
Model: BSGM2010

+N/-S 0.0
+E/-W 0.0
Northing 669625.10
Easting 653694.90

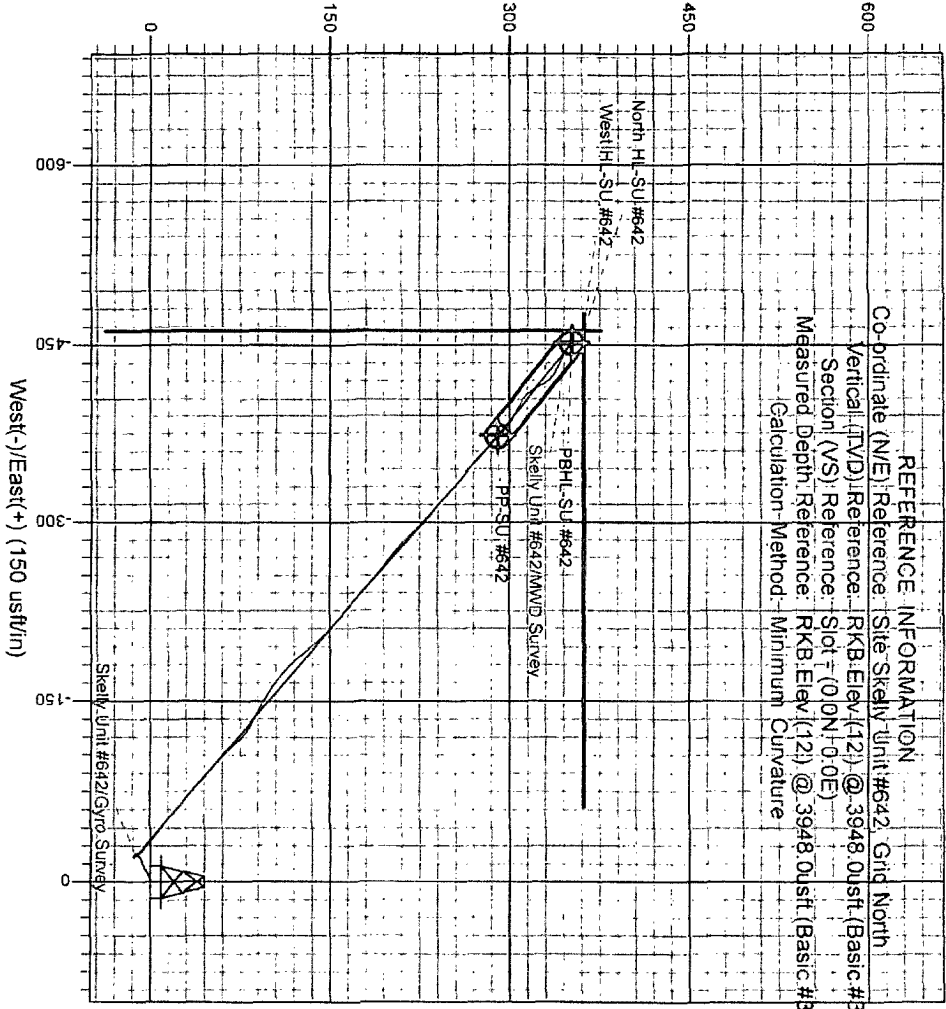
WELL DETAILS: Skelly Unit #642
RKB Elev (12) @ 3948.0usft (Basic #35)
Ground Level: 3936.0
Latitude 32° 50' 23.584 N
Longitude 103° 49' 58.521 W
Slot

REFERENCE INFORMATION
Co-ordinate (N/E) Reference: Site Skelly Unit #642, Grid North
Vertical (TVD) Reference: RKB Elev (12) @ 3948.0usft (Basic #35)
Section (VS) Reference: Slot (0.00N, 0.00E)
Measured Depth Reference: RKB Elev (12) @ 3948.0usft (Basic #35)
Calculation Method: Minimum Curvature

True Vertical Depth (1000 usft/in)



South(-)/North(+) (150 usft/in)



COMPANY DETAILS: COG OPERATING LLC
223032

Calculation Method: Minimum Curvature

Error System: ISCWSA

Scan Method: Closest Approach 3D

Error Surface: Elliptical Conic

Warning Method: Error Ratio

PROJECT DETAILS: Eddy County, NM (NAN27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)

Ellipsoid: Clarke 1866

Zone: New Mexico East 3001

System Datum: Mean Sea Level

SITE DETAILS: Skelly Unit #642

Site Centre Latitude: 32° 50' 23.584 N

Longitude: 103° 49' 58.521 W

Positional Uncertainty: 0.0

Convergence: 0.27

Local North: Grid