



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

30-015-40102

June 22, 2012

COG, LLC
Fasken Center, Tower II
550 West Texas Ave, Suite 1300
Midland, TX 79701

RE: Skelly Unit #688
290' FNL & 890' FEL
Sec. 21, T17S, R31E
Eddy County, New Mexico

Dear Sir,

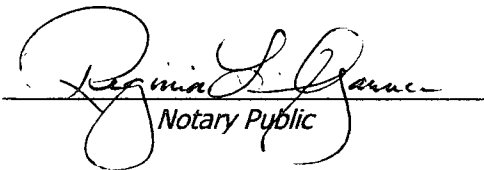
The attached is the Deviation Survey for the above captioned well.

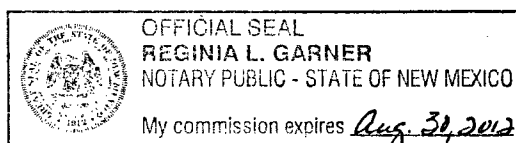
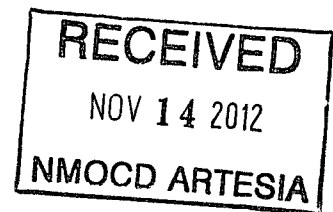
Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 22nd day of June, 2012.


Notary Public



Skelly Unit #688

Date	Depth	Dev/Inc	Dir/AZ
6/11/2012	111	0.4	0
6/12/2012	201	0.5	0
6/12/2012	295	0.5	0
6/12/2012	411	0.4	0
6/13/2012	654	0.6	0
6/13/2012	1118	0.9	0
6/14/2012	1557	0.8	0
6/14/2012	1763	0.8	0
6/15/2012	1851	0.4	338.3
6/15/2012	1945	1.1	224.9
6/15/2012	2039	2.9	232.1
6/15/2012	2134	2.7	233.9
6/15/2012	2228	169.9	282.6
6/16/2012	2321	2.8	217.7
6/16/2012	2415	2.6	222.3
6/16/2012	2509	2.7	208.6
6/16/2012	2602	2.5	211.7
6/16/2012	2696	2.4	209.3
6/16/2012	2790	2.6	209.6
6/16/2012	2884	2.3	216.0
6/16/2012	2978	2.3	212.8
6/16/2012	3072	2.5	213.7
6/16/2012	3166	2.6	205.9
6/16/2012	3760	2.6	207.5
6/16/2012	3354	2.5	210.0
6/16/2012	3448	2.6	208.0
6/16/2012	3543	2.7	200.0
6/16/2012	3636	2.5	204.3
6/17/2012	3730	2.4	226.3
6/17/2012	3825	2.6	229.8
6/17/2012	3919	2.0	225.4
6/17/2012	4200	1.7	211.9
6/17/2012	4294	1.7	216.8
6/17/2012	4388	1.6	215.6
6/17/2012	4482	1.5	210.9
6/17/2012	4576	1.5	213.0
6/18/2012	4764	0.5	144.6
6/18/2012	4858	0.4	164.8
6/18/2012	4952	0.5	171.1
6/18/2012	5045	0.6	183.6
6/18/2012	5140	0.4	172.9
6/18/2012	5234	0.3	158.5
6/18/2012	5328	0.3	135.1

Date	Depth	Dev/Inc	Dir/AZ
6/18/2012	5422	0.4	140.2
6/18/2012	5516	0.4	157.9
6/18/2012	5611	0.4	147.2
6/18/2012	5704	0.4	179.9
6/18/2012	5798	0.0	308.9
6/18/2012	5891	0.2	259.9
6/18/2012	5918	0.1	240.6
6/19/2012	6393	0.3	0.0
6/19/2012	6681	0.8	0.0



Company: COG Operating LLIC (Concho)

Lease/Well: Skelly Unit/688

Location: S21 T17s R31e

Rig Name: Silver Oak 1

State/County: New Mexico/Eddy

Latitude: 32.83

GRID North is 0.25 Degrees East of True North

VS-Azi: 0.00 Degrees



RKB : 12 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: skelly #688 gyro survey.ut

Minimum Curvature Method

Report Date/Time: 6/19/2012 / 10:18

Vaughn Energy Services

Gardendale, TX

(432) 563-5444

Surveyor: Dustin Wedel

Skelly Unit 688 / API 30-015-40102

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.42	82.30	100.00	0.05	0.36	0.05	0.36	82.30	0.42
200.00	0.36	333.09	200.00	0.37	0.58	0.37	0.69	57.13	0.63
300.00	0.47	271.95	300.00	0.67	0.03	0.67	0.67	2.35	0.43
400.00	0.64	285.19	399.99	0.82	-0.92	0.82	1.24	311.90	0.21
500.00	0.79	293.77	499.98	1.25	-2.09	1.25	2.43	300.89	0.19
600.00	1.06	294.58	599.97	1.91	-3.57	1.91	4.05	298.23	0.27
700.00	1.07	272.29	699.95	2.34	-5.34	2.34	5.83	293.65	0.41
800.00	1.08	266.12	799.94	2.31	-7.21	2.31	7.57	287.77	0.12
900.00	1.02	264.07	899.92	2.15	-9.04	2.15	9.29	283.41	0.08
1000.00	0.91	262.37	999.90	1.96	-10.72	1.96	10.89	280.35	0.11
1100.00	0.88	266.56	1099.89	1.81	-12.27	1.81	12.40	278.37	0.07
1200.00	1.01	289.51	1199.88	2.05	-13.87	2.05	14.02	278.43	0.40
1300.00	0.62	334.94	1299.87	2.84	-14.93	2.84	15.20	280.77	0.73
1400.00	0.90	350.23	1399.86	4.10	-15.29	4.10	15.83	285.01	0.34
1500.00	1.10	354.02	1499.85	5.82	-15.52	5.82	16.58	290.56	0.21
1600.00	1.00	359.09	1599.83	7.65	-15.64	7.65	17.41	296.05	0.14
1700.00	0.75	7.41	1699.82	9.16	-15.57	9.16	18.06	300.49	0.28
1753.00	0.55	12.95	1752.81	9.76	-15.46	9.76	18.29	302.25	0.39



COG Operating, LLC

EDDY COUNTY, NEW MEXICO

SKELLY UNIT

SKELLY UNIT #688

SKELLY UNIT #688

RECEIVED

NOV 14 2012

NMOCD ARTESIA

Plan: PLAN1REV1

SHL = 290' FNL & 890' FEL

BHL = 380' FNL & 980' FEL

Top of Paddock = 380' FNL & 980' FEL @ 4800' TVD

Final Survey Report

19 June, 2012



Childress Directional Drilling Survey Report

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SKELLY UNIT #668
Project:	EDDY COUNTY, NEW MEXICO	TVD Reference:	RKB @ 3831.00usft (Original Well Elev)
Site:	SKELLY UNIT #668	MD Reference:	RKB @ 3831.00usft (Original Well Elev)
Well:	SKELLY UNIT #668	North Reference:	Grid
Wellbore:	ORIGINAL HOLE	Survey Calculation Method:	Minimum Curvature
Design:	ORIGINAL HOLE	Database:	EDM 5000.1 Single User Db

Project	EDDY COUNTY, NEW MEXICO,		
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 #668				
Site Position:	Map	Northing:	664,672.90 usft	Latitude:	32° 49' 35.074 N
From:	Map	Easting:	642,802.50 usft	Longitude:	103° 52' 6.444 W
Position Uncertainty:	0.00 usft	Slot Radius:	8-5/8 "	Grid Convergence:	0.25 °

Well	SKELLY UNIT #668					
Well Position	+N/-S	0.00 usft	Northing:	664,672.90 usf	Latitude:	32° 49' 35.074 N
	+E/-W	0.00 usft	Easting:	642,802.50 usf	Longitude:	103° 52' 6.444 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usf	Ground Level:	3,819.00 usf

Wellbore	ORIGINAL HOLE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/6/2012	7.65	60.67	48,846

Design	ORIGINAL HOLE				
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	302.32	

Survey Program	Date 6/19/2012				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,753.00	GYROS (ORIGINAL HOLE)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,851.00	5,918.00	MWD SURVEYS (ORIGINAL HOLE)	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)
	1,753.00	0.55	12.95	1,752.81	9.78	-15.45	18.29	0.00	0.00	0.00
	1,851.00	0.40	338.30	1,850.81	10.55	-15.47	18.72	0.32	-0.15	-35.36
	1,945.00	1.10	224.90	1,944.80	10.22	-16.23	19.18	1.39	0.74	-120.64
	2,039.00	2.90	232.10	2,038.74	8.12	-18.74	20.18	1.93	1.91	7.66
	2,134.00	2.70	233.90	2,133.63	5.32	-22.45	21.82	0.23	-0.21	1.89
	2,228.00	3.20	219.30	2,227.51	1.99	-25.90	22.95	0.96	0.53	-15.53
	2,321.00	2.80	217.70	2,320.38	-1.82	-28.93	23.48	0.44	-0.43	-1.72
	2,415.00	2.60	222.30	2,414.28	-5.21	-31.77	24.06	0.31	-0.21	4.89
	2,509.00	2.70	208.60	2,508.18	-8.73	-34.27	24.29	0.68	0.11	-14.57
	2,602.00	2.50	211.70	2,601.08	-12.38	-36.38	24.12	0.26	-0.22	3.33



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Wellbore: ORIGINAL HOLE
Design: ORIGINAL HOLE

Local Co-ordinate Reference: Well SKELLY UNIT #668
TVD Reference: RKB @ 3831.00usft (Original Well Elev)
MD Reference: RKB @ 3831.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
2,696.00	2.40	209.30	2,694.99	-15.84	-38.42	24.00	0.15	-0.11	-2.55
2,790.00	2.60	209.60	2,788.90	-19.41	-40.44	23.79	0.21	0.21	0.32
2,884.00	2.30	216.00	2,882.82	-22.79	-42.60	23.81	0.43	-0.32	6.81
2,978.00	2.30	212.80	2,976.74	-25.90	-44.73	23.95	0.14	0.00	-3.40
3,072.00	2.50	213.70	3,070.66	-29.19	-46.89	24.02	0.22	0.21	0.96
3,165.00	2.60	205.90	3,163.57	-32.78	-48.94	23.83	0.39	0.11	-8.39
3,260.00	2.60	207.50	3,258.47	-36.63	-50.87	23.41	0.08	0.00	1.68
3,354.00	2.50	210.00	3,352.38	-40.29	-52.88	23.14	0.16	-0.11	2.66
3,448.00	2.60	208.00	3,446.28	-43.95	-54.91	22.90	0.14	0.11	-2.13
3,543.00	2.70	200.00	3,541.18	-47.96	-56.68	22.26	0.40	0.11	-8.42
3,636.00	2.50	204.30	3,634.09	-51.86	-58.27	21.51	0.30	-0.22	4.62
3,730.00	2.40	226.30	3,728.00	-55.09	-60.54	21.70	1.00	-0.11	23.40
3,824.00	2.60	229.80	3,821.91	-57.83	-63.59	22.81	0.27	0.21	3.72
3,919.00	2.00	225.40	3,916.84	-60.38	-66.41	23.84	0.66	-0.63	-4.63
4,012.00	2.10	223.90	4,009.78	-62.75	-68.75	24.55	0.12	0.11	-1.61
4,106.00	2.00	227.90	4,103.72	-65.09	-71.16	25.33	0.19	-0.11	4.26
4,200.00	1.70	211.90	4,197.67	-67.37	-73.11	25.76	0.63	-0.32	-17.02
4,294.00	1.70	216.80	4,291.63	-69.67	-74.69	25.86	0.15	0.00	5.21
4,388.00	1.60	215.60	4,385.59	-71.86	-76.29	26.05	0.11	-0.11	-1.28
4,482.00	1.50	210.90	4,479.55	-73.98	-77.68	26.09	0.17	-0.11	-5.00
4,576.00	1.50	213.00	4,573.52	-76.07	-78.98	26.07	0.06	0.00	2.23
4,670.00	0.90	213.10	4,667.50	-77.72	-80.06	26.10	0.64	-0.64	0.11
4,764.00	0.50	144.60	4,761.50	-78.67	-80.22	25.73	0.91	-0.43	-72.87
4,858.00	0.40	164.80	4,855.49	-79.32	-79.90	25.11	0.20	-0.11	21.49
4,952.00	0.50	171.10	4,949.49	-80.04	-79.75	24.60	0.12	0.11	6.70
5,045.00	0.60	183.60	5,042.49	-80.93	-79.72	24.09	0.17	0.11	13.44
5,140.00	0.40	172.90	5,137.48	-81.76	-79.71	23.64	0.23	-0.21	-11.26
5,233.00	0.30	158.50	5,230.48	-82.31	-79.58	23.24	0.14	-0.11	-15.48
5,328.00	0.30	135.10	5,325.48	-82.71	-79.31	22.80	0.13	0.00	-24.63
5,422.00	0.40	140.20	5,419.48	-83.14	-78.93	22.25	0.11	0.11	5.43
5,516.00	0.40	157.90	5,513.47	-83.70	-78.59	21.67	0.13	0.00	18.83
5,610.00	0.40	147.20	5,607.47	-84.28	-78.29	21.10	0.08	0.00	-11.38
5,704.00	0.40	179.90	5,701.47	-84.88	-78.11	20.63	0.24	0.00	34.79
SURVEY 5704' MD 0.40° INC 179.90° AZM									
5,798.00	0.00	308.90	5,795.47	-85.21	-78.11	20.45	0.43	-0.43	0.00
SURVEY 5798' MD 0.00° INC 308.90° AZM									
5,891.00	0.20	259.90	5,888.47	-85.24	-78.27	20.57	0.22	0.22	0.00
SURVEY 5891' MD 0.20° INC 259.90° AZM									
5,918.00	0.10	240.60	5,915.47	-85.26	-78.34	20.62	0.41	-0.37	-71.48
SURVEY 5918' MD 0.10° INC 240.60° AZM									



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Design: ORIGINAL HOLE

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MD Reference: RKB @ 3831.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,704.00	5,701.47	-84.88	-78.11	SURVEY 5704' MD 0.40° INC 179.90° AZM
5,798.00	5,795.47	-85.21	-78.11	SURVEY 5798' MD 0.00° INC 308.90° AZM
5,891.00	5,888.47	-85.24	-78.27	SURVEY 5891' MD 0.20° INC 259.90° AZM
5,918.00	5,915.47	-85.26	-78.34	SURVEY 5918' MD 0.10° INC 240.60° AZM