

30-015-38013

COG Operating LLC

New Mexico

Eddy County, New Mexico.. . .

Skelly Unit #689

SL: 475'FNL 214'FWL BHL: 340'FNL 340'FWL

Survey: SL: 475'FNL 214'FWL BHL: 340'FNL 340'FWL

Standard Survey Report

21 January, 2012

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico...
Project:	New Mexico	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, New Mexico ...	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Skelly Unit #689	North Reference:	Grid
Wellbore:	SL 475'FNL 214'FWL BHL 340'FNL 340'FWL	Survey Calculation Method:	Minimum Curvature
Design:	SL 475'FNL 214'FWL BHL 340'FNL 340'FWL	Database:	EDM 5000.1 Single User Db

Project	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	Eddy County, New Mexico				
Site Position:		Northing:	664,459.40 usft	Latitude:	32° 49' 33.140 N
From:	Map	Easting:	638,627.00 usft	Longitude:	103° 52' 55.387 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.24 °

Well	Skelly Unit #689					
Well Position	+N/-S	0.0 usft	Northing:	664,459.40 usf	Latitude:	32° 49' 33.140 N
	+E/-W	0.0 usft	Easting:	638,627.00 usf	Longitude:	103° 52' 55.387 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usf	Ground Level:	0.0 usf

Wellbore	SL 475'FNL 214'FWL BHL 340'FNL 340'FWL
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2012/01/05	7.70	60.70	48,952

Design	SL 475'FNL 214'FWL BHL 340'FNL 340'FWL
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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	42.65

Survey Program		Date	2012/01/21		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	4,936.0	SL: 475'FNL 214'FWL BHL: 340'FNL 340'FWL	MWD	MWD	

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.39	343.25	100.0	0.3	-0.1	0.2	0.39	0.39	0.00
200.0	0.52	225.26	200.0	0.3	-0.5	-0.1	0.78	0.13	-117.99
300.0	0.91	209.10	300.0	-0.7	-1.2	-1.3	0.44	0.39	-16.16
400.0	1.39	220.90	400.0	-2.3	-2.4	-3.3	0.53	0.48	11.80
500.0	1.44	198.38	499.9	-4.4	-3.6	-5.7	0.55	0.05	-22.52
600.0	1.78	205.93	599.9	-7.0	-4.7	-8.3	0.40	0.34	7.55
700.0	1.54	213.67	699.9	-9.5	-6.1	-11.1	0.33	-0.24	7.74
800.0	1.36	202.38	799.8	-11.7	-7.3	-13.6	0.34	-0.18	-11.29

Gyrodata Survey Report

Company: COG Operating, LLC	Local Co-ordinate Reference: Site Eddy County, New Mexico...
Project: New Mexico	TVD Reference: WELL @ 0.0usft (Original Well Elev)
Site: Eddy County, New Mexico...	MD Reference: WELL @ 0.0usft (Original Well Elev)
Well: Skelly Unit #689	North Reference: Grid
Wellbore: SL 475'FNL 214'FWL BHL 340'FNL 340'FWL	Survey Calculation Method: Minimum Curvature
Design: SL 475'FNL 214'FWL BHL 340'FNL 340'FWL	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)
900.0	0.93	193.76	899.8	-13.6	-7.9	-15.4	0.46	-0.43	-8.62
1,000.0	0.67	209.85	999.8	-14.9	-8.4	-16.7	0.34	-0.26	16.09
1,100.0	0.33	226.87	1,099.8	-15.6	-8.9	-17.5	0.37	-0.34	17.02
1,200.0	0.12	5.82	1,199.8	-15.7	-9.1	-17.7	0.43	-0.21	138.95
1,300.0	0.79	358.00	1,299.8	-14.9	-9.1	-17.2	0.67	0.67	-7.82
1,400.0	0.96	39.63	1,399.8	-13.6	-8.6	-15.8	0.64	0.17	41.63
1,500.0	0.81	34.42	1,499.8	-12.3	-7.7	-14.3	0.17	-0.15	-5.21
1,600.0	0.84	47.89	1,599.8	-11.3	-6.7	-12.9	0.20	0.03	13.47
1,700.0	0.68	56.01	1,699.7	-10.4	-5.7	-11.6	0.19	-0.16	8.12
1,832.0	0.43	96.08	1,831.7	-10.1	-4.6	-10.5	0.34	-0.19	30.36
Gyro Tie-In 1832' MD									
1,917.0	0.30	159.40	1,916.7	-10.3	-4.2	-10.4	0.47	-0.15	74.49
1,979.0	0.50	184.60	1,978.7	-10.7	-4.1	-10.7	0.42	0.32	40.65
2,074.0	0.40	226.20	2,073.7	-11.4	-4.4	-11.3	0.35	-0.11	43.79
2,163.0	0.80	256.50	2,162.7	-11.7	-5.2	-12.2	0.56	0.45	34.04
2,262.0	0.80	269.30	2,261.7	-11.9	-6.6	-13.2	0.18	0.00	12.93
2,356.0	0.90	16.90	2,355.7	-11.2	-7.0	-13.0	1.46	0.11	114.47
2,450.0	2.10	39.90	2,449.7	-9.2	-5.7	-10.6	1.40	1.28	24.47
2,544.0	3.30	50.80	2,543.6	-6.1	-2.5	-6.2	1.38	1.28	11.60
2,638.0	4.30	51.10	2,637.4	-2.2	2.3	-0.1	1.06	1.06	0.32
2,738.0	4.90	52.10	2,737.0	2.8	8.6	7.9	0.61	0.60	1.00
2,832.0	4.90	52.50	2,830.7	7.7	15.0	15.8	0.04	0.00	0.43
2,926.0	5.60	46.00	2,924.3	13.3	21.4	24.3	0.98	0.74	-6.91
3,020.0	5.70	39.60	3,017.9	20.1	27.7	33.5	0.68	0.11	-6.81
3,113.0	5.30	41.70	3,110.4	26.9	33.5	42.5	0.48	-0.43	2.26
3,207.0	4.90	44.90	3,204.1	32.9	39.2	50.8	0.52	-0.43	3.40
3,301.0	5.10	44.20	3,297.7	38.8	45.0	59.0	0.22	0.21	-0.74
3,395.0	5.30	45.20	3,391.3	44.8	51.0	67.5	0.23	0.21	1.06
3,489.0	5.70	47.80	3,484.9	51.0	57.5	76.5	0.50	0.43	2.77
3,583.0	5.30	45.30	3,578.4	57.2	64.1	85.5	0.50	-0.43	-2.66
3,677.0	5.20	38.30	3,672.0	63.6	69.8	94.1	0.69	-0.11	-7.45
3,770.0	5.70	37.70	3,764.6	70.6	75.2	102.9	0.54	0.54	-0.65
3,864.0	5.20	41.30	3,858.2	77.5	80.9	111.8	0.64	-0.53	3.83
3,958.0	5.60	40.50	3,951.8	84.2	86.7	120.6	0.43	0.43	-0.85
4,052.0	5.00	40.70	4,045.4	90.7	92.3	129.3	0.64	-0.64	0.21
4,146.0	5.40	41.90	4,139.0	97.1	98.0	137.8	0.44	0.43	1.28
4,240.0	5.10	42.00	4,232.6	103.5	103.7	146.4	0.32	-0.32	0.11
4,334.0	5.50	44.90	4,326.2	109.8	109.7	155.1	0.51	0.43	3.09
4,428.0	5.10	39.60	4,419.8	116.2	115.5	163.8	0.67	-0.43	-5.64
4,490.0	4.70	41.20	4,481.6	120.3	119.0	169.1	0.68	-0.65	2.58
4,553.0	3.90	42.40	4,544.4	123.8	122.1	173.8	1.28	-1.27	1.90
4,615.0	3.30	45.20	4,606.3	126.6	124.8	177.7	1.01	-0.97	4.52

Gyrodatta

Survey Report

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Project: New Mexico	TVD Reference: WELL @ 0.0usft (Original Well Elev)
Site: Eddy County, New Mexico...	MD Reference: WELL @ 0.0usft (Original Well Elev)
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Design: SL 475'FNL 214'FWL BHL 340'FNL 340'FWL	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)
4,678.0	2.90	45.00	4,669.2	129.0	127.2	181.1	0.64	-0.63	-0.32
4,741.0	2.00	44.00	4,732.1	130.9	129.1	183.8	1.43	-1.43	-1.59
4,804.0	1.00	58.20	4,795.1	132.0	130.3	185.4	1.68	-1.59	22.54
4,866.0	0.60	82.60	4,857.1	132.4	131.1	186.2	0.83	-0.65	39.35
4,897.0	0.60	99.20	4,888.1	132.3	131.4	186.4	0.56	0.00	53.55
4,936.0	0.60	99.20	4,927.1	132.3	131.8	186.6	0.00	0.00	0.00

Projected Bottom Hole Location 4936' MD

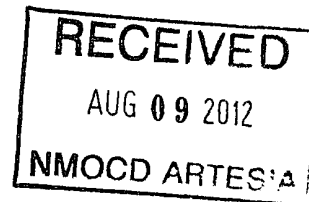
Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,832.0	1,831.7	-10.1	-4.6	Gyro Tie-In 1832' MD
4,936.0	4,927.1	132.3	131.8	Projected Bottom Hole Location 4936' MD

Checked By: _____	Approved By: _____	Date: _____
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PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288



January 25, 2012

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

RE: Skelly Unit #689
475' FNL & 214' FWL
Sec. 21, T17S, R31E
Eddy County, New Mexico

Dear Sir,

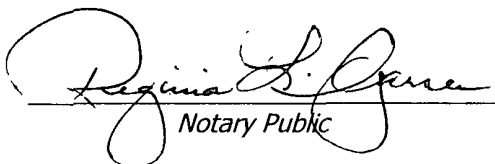
The attached is the Deviation Survey for the above captioned well.

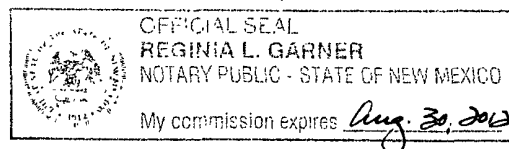
Very truly yours,


Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 25th day of December, 2011.


Notary Public



Pason DataHub Deviation Survey

Well Dossier 1326496112 - Skelly Unit #689

#

# Date	Depth	Deviation	Direction
1/14/2012	164	0.30	0.00
1/14/2012	250	0.50	0.00
1/14/2012	337	0.80	0.00
1/14/2012	453	1.70	0.00
1/15/2012	689	1.50	0.00
1/15/2012	936	0.70	0.00
1/16/2012	1436	1.00	0.00
1/16/2012	1875	0.20	0.00
1/17/2012	1917	0.30	159.40
1/18/2012	1980	0.50	184.60
1/18/2012	2074	0.40	226.20
1/18/2012	2163	0.80	256.50
1/18/2012	2262	0.80	269.30
1/18/2012	2356	0.90	16.90
1/18/2012	2450	2.10	39.90
1/19/2012	2533	3.30	50.80
1/19/2012	2677	4.30	51.10
1/19/2012	2738	4.90	52.10
1/19/2012	2832	4.90	52.50
1/19/2012	2926	5.60	46.00
1/19/2012	3020	5.70	39.60
1/19/2012	3113	5.30	41.70
1/19/2012	3207	4.90	44.90
1/19/2012	3301	5.10	44.20
1/19/2012	3395	5.30	45.20
1/19/2012	3489	5.70	47.80
1/20/2012	3583	5.30	45.30
1/20/2012	3677	5.20	38.30
1/20/2012	3770	5.78	37.70
1/20/2012	3864	5.20	41.30
1/20/2012	3958	5.60	40.50
1/20/2012	4052	5.00	40.70
1/20/2012	4240	5.10	42.00
1/20/2012	4324	5.50	44.90
1/20/2012	4428	5.10	39.60
1/20/2012	4553	3.90	42.40
1/20/2012	4615	3.30	45.20
1/20/2012	4678	2.90	45.00
1/20/2012	4741	2.00	44.40
1/20/2012	4808	1.00	58.20
1/20/2012	4866	0.60	82.60

1/21/2012	4996	0.70	0.00
1/21/2012	5246	0.60	0.00
1/21/2012	5590	0.50	0.00
1/22/2012	5998	0.40	0.00
1/22/2012	6374	0.70	0.00
1/22/2012	6689	0.50	0.00

EOF



Company: COG Operating (Concho)

Lease/Well: Skelly/689

Location: Sec21 T17s R31e

Rig Name: Silver Oak #1

State/County: New Mexico/Eddy

Latitude: 32.82

GRID North is 0.17 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB = 12 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: skelly #689_ed.ut

Minimum Curvature Method

Report Date/Time: 1/31/2012 / 12:31

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Seth Hardin

Skelly 689 / API 30-015-38013

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W 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	****
100.00	0.39	343.25	100.00	0.33	-0.10	0.34	343.25	0.39
200.00	0.52	225.26	200.00	0.33	-0.52	0.61	302.82	0.78
300.00	0.91	209.10	299.99	-0.68	-1.23	1.40	240.91	0.44
400.00	1.39	220.90	399.97	-2.30	-2.41	3.33	226.36	0.53
500.00	1.44	198.38	499.94	-4.41	-3.60	5.69	219.26	0.55
600.00	1.78	205.93	599.90	-6.99	-4.68	8.41	213.77	0.40
700.00	1.54	213.67	699.86	-9.51	-6.10	11.30	212.68	0.33
800.00	1.36	202.38	799.83	-11.72	-7.29	13.80	211.90	0.34
900.00	0.93	193.76	899.81	-13.60	-7.94	15.74	210.27	0.46
1000.00	0.67	209.85	999.80	-14.89	-8.42	17.10	209.49	0.34
1100.00	0.33	226.87	1099.79	-15.59	-8.92	17.96	209.77	0.37
1200.00	0.12	5.82	1199.79	-15.68	-9.11	18.14	210.16	0.42
1300.00	0.79	358.00	1299.79	-14.89	-9.13	17.46	211.51	0.68
1400.00	0.96	39.63	1399.78	-13.55	-8.61	16.05	212.45	0.65
1500.00	0.81	34.42	1499.77	-12.31	-7.68	14.51	211.94	0.17
1600.00	0.84	47.89	1599.76	-11.24	-6.73	13.10	210.93	0.20
1700.00	0.68	56.01	1699.75	-10.41	-5.70	11.87	208.68	0.19
1832.00	0.43	96.08	1831.74	-10.03	-4.55	11.01	204.40	0.34