

30-015-36851

COG Operating LLC

New Mexico

Eddy County, New Mexico .

Tex Mack 11 Federal #10

SL: 500' FNL 2030' FEL BHL: 340' FNL 2300' FEL

Survey: SL: 500'FNL 2030'FEL BHL: 340'FNL 2300'FEL

Standard Survey Report

09 November, 2011

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0ft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0ft (Original Well Elev)
Well:	Tex Mack 11 Federal #10	North Reference:	Grid
Wellbore:	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	Survey Calculation Method:	Minimum Curvature
Design:	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	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:	675,090.50 ft	Latitude:	32° 51' 17.735 N
From:	Map	Easting:	652,164.60 ft	Longitude:	103° 50' 16.157 W
Position Uncertainty:	0.0 ft	Slot Radius:	0 "	Grid Convergence:	0.27 °

Well	Tex Mack 11 Federal #10					
Well Position	+N/-S	0.0 ft	Northing:	675,090.50 ft	Latitude:	32° 51' 17.735 N
	+E/-W	0.0 ft	Easting:	652,164.60 ft	Longitude:	103° 50' 16.157 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	0.0 ft

Wellbore	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL
-----------------	--

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2011/10/29	7.70	60.74	48,992

Design	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL
---------------	--

Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	300.29

Survey Program		Date	2011/11/09		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.0	5,597.0	SL 500'FNL 2030'FEL BHL 340'FNL 230	MWD	MWD	

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.30	336.25	100.0	0.2	-0.1	0.2	0.30	0.30	0.00
200.0	0.55	340.87	200.0	0.9	-0.4	0.8	0.25	0.25	4.62
300.0	0.67	334.60	300.0	1.9	-0.8	1.6	0.14	0.12	-6.27
400.0	0.19	72.76	400.0	2.5	-0.9	2.0	0.72	-0.48	98.16
500.0	0.15	199.23	500.0	2.4	-0.8	1.9	0.30	-0.04	126.47
600.0	0.26	204.13	600.0	2.1	-0.9	1.8	0.11	0.11	4.90
700.0	0.41	258.84	700.0	1.8	-1.3	2.1	0.34	0.15	54.71
800.0	0.48	269.10	800.0	1.7	-2.1	2.7	0.11	0.07	10.26

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0ft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0ft (Original Well Elev)
Well:	Tex Mack 11 Federal #10	North Reference:	Grid
Wellbore:	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	Survey Calculation Method:	Minimum Curvature
Design:	SL 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	Database:	EDM 5000.1 Single User Db

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
900.0	0.54	20.75	900.0	2.2	-2.4	3.1	0.84	0.06	111.65
1,000.0	0.28	41.96	1,000.0	2.8	-2.0	3.2	0.30	-0.26	21.21
1,100.0	0.44	325.47	1,100.0	3.3	-2.1	3.5	0.46	0.16	-76.49
1,200.0	0.40	36.35	1,200.0	3.9	-2.1	3.8	0.49	-0.04	70.88
1,300.0	0.61	320.77	1,300.0	4.6	-2.2	4.2	0.64	0.21	-75.58
1,400.0	1.02	339.83	1,400.0	5.8	-2.9	5.4	0.49	0.41	19.06
1,500.0	1.54	354.13	1,499.9	8.0	-3.3	6.9	0.61	0.52	14.30
1,600.0	1.12	16.98	1,599.9	10.3	-3.2	7.9	0.67	-0.42	22.85
1,700.0	1.77	19.45	1,699.9	12.7	-2.4	8.4	0.65	0.65	2.47
1,800.0	2.23	31.78	1,799.8	15.8	-0.8	8.7	0.63	0.46	12.33
1,900.0	1.65	55.34	1,899.8	18.2	1.4	8.0	0.97	-0.58	23.56
1,920.0	1.56	50.41	1,919.8	18.6	1.8	7.8	0.82	-0.45	-24.65
VES Gyro Tie-In 1920' MD									
2,044.0	2.10	57.00	2,043.7	20.9	5.0	6.2	0.47	0.44	5.31
2,107.0	2.10	49.30	2,106.6	22.3	6.9	5.3	0.45	0.00	-12.22
2,169.0	1.90	28.10	2,168.6	23.9	8.2	5.0	1.23	-0.32	-34.19
2,232.0	2.00	11.80	2,231.6	25.9	8.9	5.3	0.89	0.16	-25.87
2,294.0	2.40	351.40	2,293.5	28.3	9.0	6.5	1.41	0.65	-32.90
2,357.0	2.60	332.20	2,356.5	30.8	8.1	8.5	1.36	0.32	-30.48
2,420.0	2.90	317.10	2,419.4	33.3	6.4	11.3	1.24	0.48	-23.97
2,483.0	3.80	309.60	2,482.3	35.8	3.7	14.9	1.59	1.43	-11.90
2,546.0	4.40	304.30	2,545.1	38.5	0.1	19.3	1.13	0.95	-8.41
2,608.0	5.10	300.10	2,606.9	41.2	-4.3	24.5	1.26	1.13	-6.77
2,670.0	5.80	296.50	2,668.6	44.0	-9.5	30.4	1.26	1.13	-5.81
2,733.0	6.60	294.00	2,731.3	46.8	-15.6	37.1	1.34	1.27	-3.97
2,827.0	7.40	291.30	2,824.6	51.2	-26.2	48.5	0.92	0.85	-2.87
2,921.0	7.80	291.20	2,917.7	55.8	-37.8	60.8	0.43	0.43	-0.11
3,014.0	7.40	290.20	3,009.9	60.1	-49.3	72.9	0.45	-0.43	-1.08
3,108.0	7.50	289.70	3,103.1	64.3	-60.8	84.9	0.13	0.11	-0.53
3,201.0	7.10	289.70	3,195.4	68.2	-71.9	96.5	0.43	-0.43	0.00
3,296.0	7.30	289.10	3,289.6	72.2	-83.1	108.2	0.22	0.21	-0.63
3,389.0	7.50	289.70	3,381.9	76.2	-94.4	119.9	0.23	0.22	0.65
3,483.0	6.90	292.10	3,475.1	80.4	-105.4	131.6	0.71	-0.64	2.55
3,584.0	7.30	294.00	3,575.3	85.3	-116.9	143.9	0.46	0.40	1.88
3,676.0	7.00	295.40	3,666.6	90.0	-127.3	155.3	0.38	-0.33	1.52
3,772.0	6.90	296.30	3,761.9	95.1	-137.8	166.9	0.15	-0.10	0.94
3,866.0	6.80	297.90	3,855.2	100.2	-147.7	178.1	0.23	-0.11	1.70
3,959.0	6.20	298.10	3,947.6	105.2	-157.0	188.6	0.65	-0.65	0.22
4,053.0	6.80	298.40	4,041.0	110.2	-166.4	199.3	0.64	0.64	0.32
4,147.0	6.60	298.70	4,134.4	115.4	-176.0	210.2	0.22	-0.21	0.32
4,241.0	6.70	297.70	4,227.8	120.6	-185.6	221.1	0.16	0.11	-1.06
4,335.0	6.50	298.30	4,321.1	125.6	-195.2	231.9	0.23	-0.21	0.64

Gyrodata Survey Report

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site Eddy County, New Mexico
Project:	New Mexico	TVD Reference:	WELL @ 0.0ft (Original Well Elev)
Site:	Eddy County, New Mexico	MD Reference:	WELL @ 0.0ft (Original Well Elev)
Well:	Tex Mack 11 Federal #10	North Reference:	Grid
Wellbore:	SL: 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	Survey Calculation Method:	Minimum Curvature
Design:	SL: 500' FNL 2030' FEL BHL 340' FNL 2300' FEL	Database:	EDM 5000 1 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,430.0	6.90	295.40	4,415.5	130.6	-205.1	243.0	0.55	0.42	-3.05
4,524.0	6.70	295.90	4,508.8	135.5	-215.1	254.1	0.22	-0.21	0.53
4,619.0	6.90	295.30	4,603.2	140.3	-225.2	265.3	0.22	0.21	-0.63
4,713.0	6.40	292.30	4,696.5	144.7	-235.2	276.1	0.65	-0.53	-3.19
4,775.0	5.90	292.80	4,758.2	147.3	-241.3	282.7	0.81	-0.81	0.81
4,837.0	5.10	294.10	4,819.9	149.6	-246.8	288.6	1.31	-1.29	2.10
4,900.0	4.50	291.20	4,882.7	151.7	-251.6	293.8	1.03	-0.95	-4.60
4,963.0	3.80	290.90	4,945.5	153.3	-255.9	298.3	1.11	-1.11	-0.48
5,025.0	3.30	290.60	5,007.4	154.7	-259.5	302.1	0.81	-0.81	-0.48
5,087.0	2.50	296.60	5,069.3	155.9	-262.4	305.2	1.38	-1.29	9.68
5,150.0	1.70	301.50	5,132.3	157.0	-264.4	307.5	1.30	-1.27	7.78
5,213.0	1.10	299.90	5,195.2	157.8	-265.7	309.0	0.95	-0.95	-2.54
5,276.0	0.10	263.70	5,258.2	158.1	-266.3	309.7	1.62	-1.59	-57.46
5,370.0	0.20	165.50	5,352.2	157.9	-266.3	309.6	0.25	0.11	-104.47
5,464.0	0.20	182.30	5,446.2	157.6	-266.3	309.4	0.06	0.00	17.87
5,558.0	0.20	179.40	5,540.2	157.3	-266.3	309.3	0.01	0.00	-3.09
5,597.0	0.20	179.40	5,579.2	157.1	-266.3	309.2	0.00	0.00	0.00

Projected Survey at 5597' MD

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,920.0	1,919.8	18.6	1.8	VES Gyro Tie-In 1920' MD
5,597.0	5,579.2	157.1	-266.3	Projected Survey at 5597' MD



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

November 14, 2011

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

RE: Tex Mack 11 Federal #10
500' FNL & 2030' FEL
Sec. 11, T17S, R31E
Eddy County, New Mexico

Dear Sir,

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

Very truly yours,

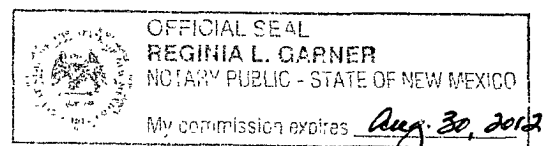
A handwritten signature in dark ink, appearing to read "Eddie C. LaRue".

Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 14th day of November, 2011.

A handwritten signature in dark ink, appearing to read "Regina L. Garner".

Notary Public

Pason DataHub Deviation Survey
 # Well Dossier 1320187134 - Tex Mack 11 Federal #10
 #

# Date	Depth	Deviation	Direction
11/2/2011	139	0.30	0.00
11/2/2011	312	0.60	0.00
11/2/2011	399	0.30	0.00
11/2/2011	487	0.10	0.00
11/3/2011	602	0.20	0.00
11/3/2011	703	0.20	0.00
11/4/2011	936	0.50	0.00
11/5/2011	1436	0.80	0.00
11/5/2011	1906	1.40	0.00
11/6/2011	2044	2.10	57.00
11/6/2011	2107	2.10	49.30
11/6/2011	2169	1.80	28.10
11/6/2011	2232	2.00	11.80
11/6/2011	2294	2.40	351.80
11/6/2011	2357	2.60	332.20
11/7/2011	2483	3.80	309.60
11/7/2011	2605	5.10	300.10
11/7/2011	2733	6.60	294.00
11/7/2011	2545	4.40	304.30
11/7/2011	2670	5.80	296.50
11/7/2011	2828	7.40	291.30
11/7/2011	3014	7.40	290.20
11/7/2011	3108	7.50	289.70
11/7/2011	3201	7.10	329.60
11/7/2011	3296	7.30	289.10
11/7/2011	3483	6.90	292.10
11/7/2011	3584	7.30	294.00
11/7/2011	3678	7.00	295.40
11/8/2011	3772	6.90	296.30
11/8/2011	3866	6.80	247.90
11/8/2011	3959	6.20	298.10
11/8/2011	4053	6.80	298.40
11/8/2011	4147	6.60	298.70
11/8/2011	4241	6.70	297.70
11/8/2011	4335	6.50	298.30
11/8/2011	4619	6.90	295.30
11/8/2011	4713	6.40	292.30
11/8/2011	4775	5.90	292.80
11/8/2011	4837	5.10	294.10
11/8/2011	4900	4.50	291.20
11/9/2011	4963	3.80	290.90
11/9/2011	5025	3.30	290.60
11/9/2011	5087	2.50	296.60
11/9/2011	5150	1.70	301.50
11/9/2011	5213	1.10	299.90
11/9/2011	5276	0.10	263.70
11/9/2011	5558	0.20	179.40
11/10/2011	5844	0.10	0.00
11/10/2011	6252	0.60	0.00

EOF