



A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

30-015-40966

March 12, 2013

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701

Attn: Kanicia Castillo

Re: Twelve Pack Federal Com No 004H

Please find enclosed a copy of the survey from 0' to 4,750' ran on the above referenced well.

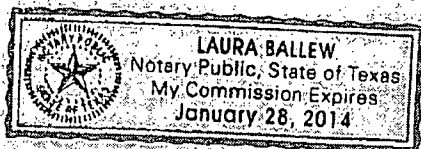
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 12th day of March, A.D., 2013, by Keith Havelka.




Laura Ballew
Notary Public, State of Texas

Company: COG Operating LLC (Concho)
Lease/Well: Twelve Pack Federal Com/No 004H



Rig Name: United 40
State/County: New Mexico/Eddy
Latitude: 32.86, Longitude: -104.02
GRID North is 0.17 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=14 Ft

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: survey.ut
Minimum Curvature Method
Report Date/Time: 3/12/2013 / 09:15

Vaughn Energy Services
Gardendale Texas
432-563-5444

Surveyor: Danny Spring
Twelve Pack Federal Com No 004H / API 30-015-40966

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	0.18	223.82	100.00	-0.11	-0.11	-0.11	0.16	223.82	0.18
200.00	0.21	175.10	200.00	-0.41	-0.20	-0.41	0.45	206.57	0.16
300.00	0.28	227.36	300.00	-0.75	-0.37	-0.75	0.84	206.21	0.23
400.00	1.27	272.34	399.99	-0.88	-1.66	-0.88	1.87	242.16	1.08
500.00	2.09	285.42	499.95	-0.35	-4.52	-0.35	4.54	265.63	0.90
600.00	2.19	278.61	599.88	0.43	-8.17	0.43	8.18	272.99	0.27
700.00	2.44	283.84	699.79	1.22	-12.13	1.22	12.20	275.75	0.33
800.00	2.37	265.35	799.71	1.57	-16.26	1.57	16.34	275.50	0.78
900.00	2.10	278.61	899.63	1.67	-20.13	1.67	20.20	274.75	0.58
1000.00	2.12	281.57	999.56	2.32	-23.75	2.32	23.86	275.57	0.11
1100.00	1.95	278.50	1099.50	2.94	-27.25	2.94	27.41	276.16	0.20
1200.00	1.58	275.92	1199.45	3.33	-30.30	3.33	30.49	276.28	0.38
1300.00	1.62	279.66	1299.41	3.71	-33.07	3.71	33.27	276.41	0.11
1400.00	1.05	299.80	1399.39	4.40	-35.25	4.40	35.53	277.12	0.73
1500.00	0.81	300.39	1499.37	5.22	-36.66	5.22	37.03	278.10	0.24
1600.00	0.46	303.81	1599.37	5.80	-37.60	5.80	38.05	278.77	0.35
1700.00	0.68	305.25	1699.36	6.36	-38.42	6.36	38.94	279.40	0.22
1800.00	0.45	294.96	1799.36	6.87	-39.25	6.87	39.85	279.92	0.25

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
1900.00	0.41	300.01	1899.36	7.21	-39.91	7.21	40.56	280.24	0.06
2000.00	0.49	296.09	1999.35	7.57	-40.60	7.57	41.30	280.57	0.09
2100.00	0.36	298.68	2099.35	7.91	-41.27	7.91	42.02	280.86	0.13
2200.00	0.24	299.63	2199.35	8.17	-41.72	8.17	42.52	281.08	0.12
2300.00	0.26	287.30	2299.35	8.34	-42.12	8.34	42.94	281.20	0.06
2400.00	0.39	336.81	2399.35	8.72	-42.48	8.72	43.37	281.61	0.30
2500.00	0.50	328.94	2499.34	9.42	-42.84	9.42	43.86	282.40	0.13
2600.00	0.51	334.93	2599.34	10.20	-43.26	10.20	44.44	283.26	0.05
2700.00	0.49	350.31	2699.33	11.02	-43.52	11.02	44.89	284.21	0.13
2800.00	0.41	9.29	2799.33	11.80	-43.53	11.80	45.10	285.16	0.17
2900.00	0.46	348.69	2899.33	12.55	-43.55	12.55	45.32	286.07	0.16
3000.00	0.38	18.45	2999.33	13.26	-43.52	13.26	45.50	286.94	0.23
3100.00	0.44	356.47	3099.32	13.96	-43.44	13.96	45.63	287.82	0.17
3200.00	0.26	9.03	3199.32	14.57	-43.43	14.57	45.81	288.55	0.20
3300.00	0.27	10.48	3299.32	15.03	-43.35	15.03	45.88	289.12	0.01
3400.00	0.46	38.24	3399.32	15.57	-43.06	15.57	45.79	289.88	0.25
3500.00	0.40	47.21	3499.32	16.13	-42.56	16.13	45.51	290.76	0.09
3600.00	0.29	38.61	3599.31	16.56	-42.14	16.56	45.28	291.46	0.12
3700.00	0.23	46.00	3699.31	16.90	-41.83	16.90	45.12	292.00	0.07
3800.00	0.20	33.78	3799.31	17.19	-41.59	17.19	45.00	292.45	0.06
3900.00	0.21	22.15	3899.31	17.50	-41.43	17.50	44.97	292.90	0.04
4000.00	0.09	129.70	3999.31	17.61	-41.30	17.61	44.90	293.10	0.25
4100.00	0.01	92.90	4099.31	17.56	-41.23	17.56	44.82	293.07	0.08
4200.00	0.11	179.45	4199.31	17.47	-41.22	17.47	44.77	292.96	0.11
4300.00	0.14	278.11	4299.31	17.39	-41.33	17.39	44.84	292.81	0.19
4400.00	0.16	226.48	4399.31	17.31	-41.55	17.31	45.01	292.61	0.13
4500.00	0.22	251.61	4499.31	17.15	-41.83	17.15	45.21	292.29	0.10
4600.00	0.41	223.90	4599.31	16.83	-42.26	16.83	45.49	291.72	0.24
4700.00	0.44	250.86	4699.31	16.45	-42.87	16.45	45.92	290.99	0.20
4750.00	0.42	268.52	4749.30	16.38	-43.24	16.38	46.24	290.75	0.27



Archer Directional Drilling Services.
911 Regional Park Drive
Houston, Texas 77060
Tel: 281-934-9600
Fax: 281-951-2101

MWD Survey Certification

State of New Mexico
County of Eddy

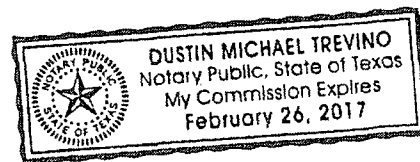
I, Amador Baggerly, certify that; I am employed by Archer Directional Drilling Services; that I did on the day(s) of 03/04/13 through 03/12/13, conduct or supervise the taking of MWD surveys from a depth of 4849 feet to a depth of 9770 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Archer Directional Drilling Services; that I am authorized and qualified to make this report; that these surveys were conducted at the request of COG Operating, LLC for the Twelve Pack Fed Com 4H (API # 30-015-40966), Well located in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Archer Directional Drilling Services

Amador Baggerly
MWD Coordinator

State of Texas
County of Harris

Before me, a notary public, on this day personally appeared Amador Baggerly, on this 2nd day of April, 2013, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statement therein contained are true and correct.

Notary Public's Signature





Company: COG Operating, LLC

Job Number:

04124-433-22

Calculation Method

Minimum Curvature

Well: Twelve Pack Fed Com 4H

Mag Decl.:

7.45

Proposed Azimuth

89.5

Location: Eddy County, New Mexico

Dir Driller:

Cody Styles

Depth Reference

KBG

Rig: UDI 40

MWD Eng:

Justin Warnack

Tie Into: Previous MWD Survey

Job Date: 03/04/13 - 03/12/13

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Direction Azimuth			
Tie In	4750.00	0.42	268.52	0	4749.31	43.11	16.36 N	43.25 W	0.00	0.00	0	0	0
1	4849	0.5	292.7	99	4848.31	-43.86	16.52 N	44.01 W	47.01	290.57	0.21	0.08	24.42
2	4881	1.0	50.8	32	4880.31	-43.77	16.75 N	43.92 W	47.01	290.87	4.10	1.56	-755.94
3	4912	3.4	67.5	31	4911.28	-42.71	17.27 N	42.86 W	46.21	291.94	7.93	7.74	53.87
4	4944	6.3	68.6	32	4943.16	-40.19	18.27 N	40.35 W	44.30	294.36	9.07	9.06	3.44
5	4976	9.7	70.9	32	4974.85	-35.99	19.80 N	36.17 W	41.23	298.69	10.67	10.63	7.19
6	5008	13.1	73.2	32	5006.21	-29.95	21.73 N	30.15 W	37.16	305.78	10.72	10.63	7.19
7	5039	16.4	75.0	31	5036.18	-22.34	23.88 N	22.56 W	32.85	316.63	10.75	10.65	5.81
8	5071	19.0	75.8	32	5066.67	-12.91	26.32 N	13.14 W	29.42	333.47	8.16	8.13	2.50
9	5103	21.4	76.6	32	5096.70	-2.15	28.96 N	2.41 W	29.06	355.24	7.55	7.50	2.50
10	5134	24.7	78.3	31	5125.22	9.72	31.58 N	9.44 E	32.96	16.64	10.86	10.65	5.48
11	5166	28.0	79.6	32	5153.89	23.68	34.29 N	23.38 E	41.50	34.28	10.47	10.31	4.06
12	5198	31.4	80.2	32	5181.68	39.31	37.07 N	38.98 E	53.79	46.44	10.67	10.63	1.88
13	5230	35.0	81.3	32	5208.45	56.63	39.88 N	56.28 E	68.97	54.68	11.41	11.25	3.44
14	5261	38.2	82.4	31	5233.34	74.94	42.49 N	74.57 E	85.83	60.33	10.54	10.32	3.55
15	5293	41.8	82.6	32	5257.85	95.36	45.17 N	94.96 E	105.16	64.56	11.26	11.25	0.62
16	5325	45.3	82.9	32	5281.04	117.25	47.95 N	116.83 E	126.29	67.68	10.96	10.94	0.94
17	5357	48.7	83.7	32	5302.86	140.51	50.68 N	140.07 E	148.95	70.11	10.78	10.63	2.50
18	5388	52.0	84.6	31	5322.64	164.28	53.11 N	163.81 E	172.20	72.04	10.88	10.65	2.90
19	5420	54.9	86.6	32	5341.69	189.92	55.07 N	189.44 E	197.28	73.79	10.36	9.06	6.25
20	5452	57.5	88.8	32	5359.49	216.49	56.13 N	216.00 E	223.18	75.43	9.93	8.13	6.88
21	5483	60.4	89.2	31	5375.48	243.05	56.59 N	242.55 E	249.07	76.87	9.42	9.35	1.29
22	5515	63.2	88.9	32	5390.60	271.24	57.06 N	270.75 E	276.69	78.10	8.79	8.75	-0.94
23	5547	66.8	88.7	32	5404.12	300.24	57.67 N	299.74 E	305.24	79.11	11.26	11.25	-0.63
24	5579	70.5	88.3	32	5415.77	330.03	58.45 N	329.53 E	334.67	79.94	11.62	11.56	-1.25
25	5610	74.1	88.8	31	5425.20	359.56	59.20 N	359.04 E	363.89	80.64	11.71	11.61	1.61
26	5642	77.5	90.4	32	5433.04	390.57	59.41 N	390.06 E	394.56	81.34	11.68	10.63	5.00
27	5674	80.4	91.8	32	5439.18	421.96	58.80 N	421.46 E	425.54	82.06	10.03	9.06	4.37
28	5705	82.9	93.2	31	5443.68	452.59	57.46 N	452.10 E	455.73	82.76	9.22	8.06	4.52
29	5737	85.8	93.7	32	5446.83	484.35	55.55 N	483.88 E	487.06	83.45	9.19	9.06	1.56
30	5768	88.5	93.9	31	5448.37	515.23	53.50 N	514.77 E	517.54	84.07	8.73	8.71	0.65
31	5800	88.7	93.9	32	5449.15	547.12	51.32 N	546.69 E	549.09	84.64	0.62	0.63	0.00
32	5895	89.1	92.5	95	5450.98	641.90	46.02 N	641.52 E	643.17	85.90	1.53	0.42	-1.47
33	5990	89.4	90.8	95	5452.22	736.82	43.28 N	736.47 E	737.74	86.64	1.82	0.32	-1.79
34	6085	91.1	90.0	95	5451.81	831.81	42.62 N	831.46 E	832.55	87.07	1.98	1.79	-0.84
35	6181	91.8	89.6	96	5449.38	927.77	42.96 N	927.43 E	928.42	87.35	0.84	0.73	-0.42
36	6276	92.2	89.6	95	5446.06	1022.72	43.62 N	1022.37 E	1023.30	87.56	0.42	0.42	0.00



Company: COG Operating, LLC
Well: Twelve Pack Fed Com 4H
Location: Eddy County, New Mexico
Rig: UDI 40

Job Number: 04124-433-22
Mag Decl.: 7.45
Dir Driller: Cody Styles
MWD Eng: Justin Warnack

Calculation Method: Minimum Curvature
Proposed Azimuth: 89.5
Depth Reference: KBC
Tie Into: Previous MWD Survey

Job Date: 03/04/13 - 03/12/13

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Direction Azimuth			
37	6371	91.5	89.8	95	5442.99	1117.66	44.12 N	1117.32 E	1118.19	87.74	0.77	-0.74	0.21
38	6466	91.7	89.7	95	5440.34	1212.63	44.53 N	1212.28 E	1213.10	87.90	0.24	0.21	-0.11
39	6561	92.4	89.7	95	5436.94	1307.56	45.03 N	1307.22 E	1307.99	88.03	0.74	0.74	0.00
40	6656	91.3	90.0	95	5433.88	1402.51	45.28 N	1402.16 E	1402.89	88.15	1.20	-1.16	0.32
41	6751	91.6	89.7	95	5431.47	1497.48	45.52 N	1497.13 E	1497.82	88.26	0.45	0.32	-0.32
42	6846	90.6	89.8	95	5429.65	1592.46	45.94 N	1592.11 E	1592.78	88.35	1.06	-1.05	0.11
43	6941	90.4	89.5	95	5428.82	1687.45	46.52 N	1687.11 E	1687.75	88.42	0.38	-0.21	-0.32
44	7036	91.1	89.2	95	5427.58	1782.45	47.60 N	1782.09 E	1782.73	88.47	0.80	0.74	-0.32
45	7131	92.0	88.9	95	5425.01	1877.41	49.17 N	1877.04 E	1877.69	88.50	1.00	0.95	-0.32
46	7226	91.6	89.6	95	5422.02	1972.36	50.41 N	1971.99 E	1972.63	88.54	0.85	-0.42	0.74
47	7321	91.3	90.1	95	5419.62	2067.33	50.66 N	2066.96 E	2067.58	88.60	0.61	-0.32	0.53
48	7417	90.5	90.1	96	5418.11	2163.31	50.49 N	2162.94 E	2163.53	88.66	0.83	-0.83	0.00
49	7512	91.0	89.9	95	5416.87	2258.30	50.49 N	2257.94 E	2258.50	88.72	0.57	0.53	-0.21
50	7607	91.8	89.5	95	5414.55	2353.27	50.99 N	2352.90 E	2353.46	88.76	0.94	0.84	-0.42
51	7702	91.3	89.7	95	5411.98	2448.23	51.65 N	2447.87 E	2448.41	88.79	0.57	-0.53	0.21
52	7797	90.4	90.4	95	5410.57	2543.21	51.57 N	2542.86 E	2543.38	88.84	1.20	-0.95	0.74
53	7892	90.7	89.6	95	5409.65	2638.20	51.57 N	2637.85 E	2638.35	88.88	0.90	0.32	-0.84
54	7987	91.5	89.2	95	5407.83	2733.19	52.57 N	2732.83 E	2733.33	88.90	0.94	0.84	-0.42
55	8082	90.7	89.6	95	5406.01	2828.17	53.56 N	2827.80 E	2828.31	88.91	0.94	-0.84	0.42
56	8178	91.1	88.9	96	5404.50	2924.15	54.82 N	2923.78 E	2924.30	88.93	0.84	0.42	-0.73
57	8273	91.6	87.9	95	5402.26	3019.11	57.47 N	3018.72 E	3019.26	88.91	1.18	0.53	-1.05
58	8368	91.9	88.7	95	5399.36	3114.04	60.29 N	3113.63 E	3114.21	88.89	0.90	0.32	0.84
59	8463	91.6	89.6	95	5396.46	3209.00	61.69 N	3208.57 E	3209.17	88.90	1.00	-0.32	0.95
60	8558	90.6	88.9	95	5394.64	3303.98	62.94 N	3303.55 E	3304.15	88.91	1.28	-1.05	-0.74
61	8653	90.1	89.6	95	5394.05	3398.97	64.18 N	3398.54 E	3399.14	88.92	0.91	-0.53	0.74
62	8748	90.8	88.7	95	5393.31	3493.97	65.59 N	3493.52 E	3494.14	88.92	1.20	0.74	-0.95
63	8844	89.8	88.3	96	5392.81	3589.95	68.10 N	3589.49 E	3590.13	88.91	1.12	-1.04	-0.42
64	8938	90.3	87.5	94	5392.72	3683.91	71.55 N	3683.42 E	3684.12	88.89	1.00	0.53	-0.85
65	9033	90.1	87.6	95	5392.39	3778.86	75.61 N	3778.33 E	3779.09	88.85	0.24	-0.21	0.11
66	9128	90.6	88.7	95	5391.81	3873.83	78.68 N	3873.28 E	3874.08	88.84	1.27	0.53	1.16
67	9224	90.4	91.2	96	5390.97	3969.81	78.76 N	3969.27 E	3970.05	88.86	2.61	-0.21	2.60
68	9319	90.5	92.1	95	5390.23	4064.74	76.02 N	4064.23 E	4064.94	88.93	0.95	0.11	0.95
69	9414	90.3	92.4	95	5389.56	4159.63	72.29 N	4159.15 E	4159.78	89.00	0.38	-0.21	0.32
70	9509	90.7	92.0	95	5388.74	4254.52	68.65 N	4254.08 E	4254.63	89.08	0.60	0.42	-0.42
71	9604	91.2	91.4	95	5387.16	4349.43	65.83 N	4349.02 E	4349.52	89.13	0.82	0.53	-0.63
72	9704	92.0	90.8	100	5384.37	4449.35	63.91 N	4448.96 E	4449.42	89.18	1.00	0.80	-0.60
Proj.	9770	92.0	90.8	66	5382.07	4515.30	62.99 N	4514.92 E	4515.35	89.20	0.00	0.00	0.00