VAUGHN ENERGY SERVICES

A GYRO TECHNOLOGIES INC. COMPANY

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

30-015-41025

March 4, 2013

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

Attn: Kanicia Castillo

Re: **Illustrated Man Fee Com No 001H**

Please find enclosed a copy of the survey from 0' to 7,175' 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 4th day of March A.D., 2013, by Keith Havelka.

LAURA BALLEW
Notary Public, State of Texas
My Commission Expires
January 28, 2014

Laura Ballew
Notary Public, State of Texas

Company: COG Operating LLC (Concho)
Lease/Well: Illustrated Man Fee Com/No 001H

Rig Name: Patriot #2
State/County: New Mexico/Eddy
Latitude: 32.15, Longitude: 0.00
GRID North is 0.15 Degrees East of True North
VS-Azi: 0.00 Degrees

Depth Reference : RKB=17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: ...24 fed com #3h gyro survey.ut
Minimum Curvature Method
Report Date/Time: 3/4/2013 / 10:28

Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Logan Henry

Illustrated Man Fee Com No 001H / API 30-015-40946

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	0.39	175.62	100.00	-0.34	0.03	-0.34	0.34	175.62	0.39
200.00	1.01	140.85	199.99	-1.37	0.61	-1.37	1.49	156.06	0.72
300.00	1.35	175.89	299.97	-3.23	1.25	-3.23	3.46	158.89	0.78
400.00	1.58	180.85	399.94	-5.78	1.31	-5.78	5.93	167.24	0.26
500.00	1.54	194.81	499.90	-8.46	0.94	-8.46	8.51	173.63	0.38
600.00	1.47	181.70	599.87	-11.04	0.56	-11.04	11.06	177.08	0.35
700.00	1.62	169.51	699.83	-13.71	0.78	-13.71	13.74	176.74	0.36
800.00	1.87	195.25	799.79	-16.68	0.61	-16.68	16.69	177.91	0.81
900.00	1.77	178.63	899.74	-19.80	0.22	-19.80	19.80	179.37	0.54
1000.00	1.40	203.34	999.70	-22.46	-0.23	-22.46	22.46	180.58	0.77
1100.00	1.14	211.47	1099.68	-24.43	-1.23	-24.43	24.46	182.88	0.31
1200.00	1.07	197.35	1199.66	-26.17	-2.03	-26.17	26.25	184.43	0.28
1300.00	1.17	231.69	1299.64	-27.70	-3.11	-27.70	27.87	186.40	0.67
1400.00	1.21	203.45	1399.62	-29.30	-4.33	-29.30	29.61	188.40	0.58
1500.00	1.19	214.80	1499.60	-31.12	-5.34	-31.12	31.57	189.73	0.24
1600.00	1.21	215.38	1599.57	-32.83	-6.54	-32.83	33.47	191.27	0.02
1700.00	0.61	210.14	1699.56	-34.14	-7.42	-34.14	34.94	192.26	0.61
1800.00	0.25	250.88	1799.56	-34.67	-7.89	-34.67	35.56	192.81	0.45

VES Survey Date: 02/26/2013

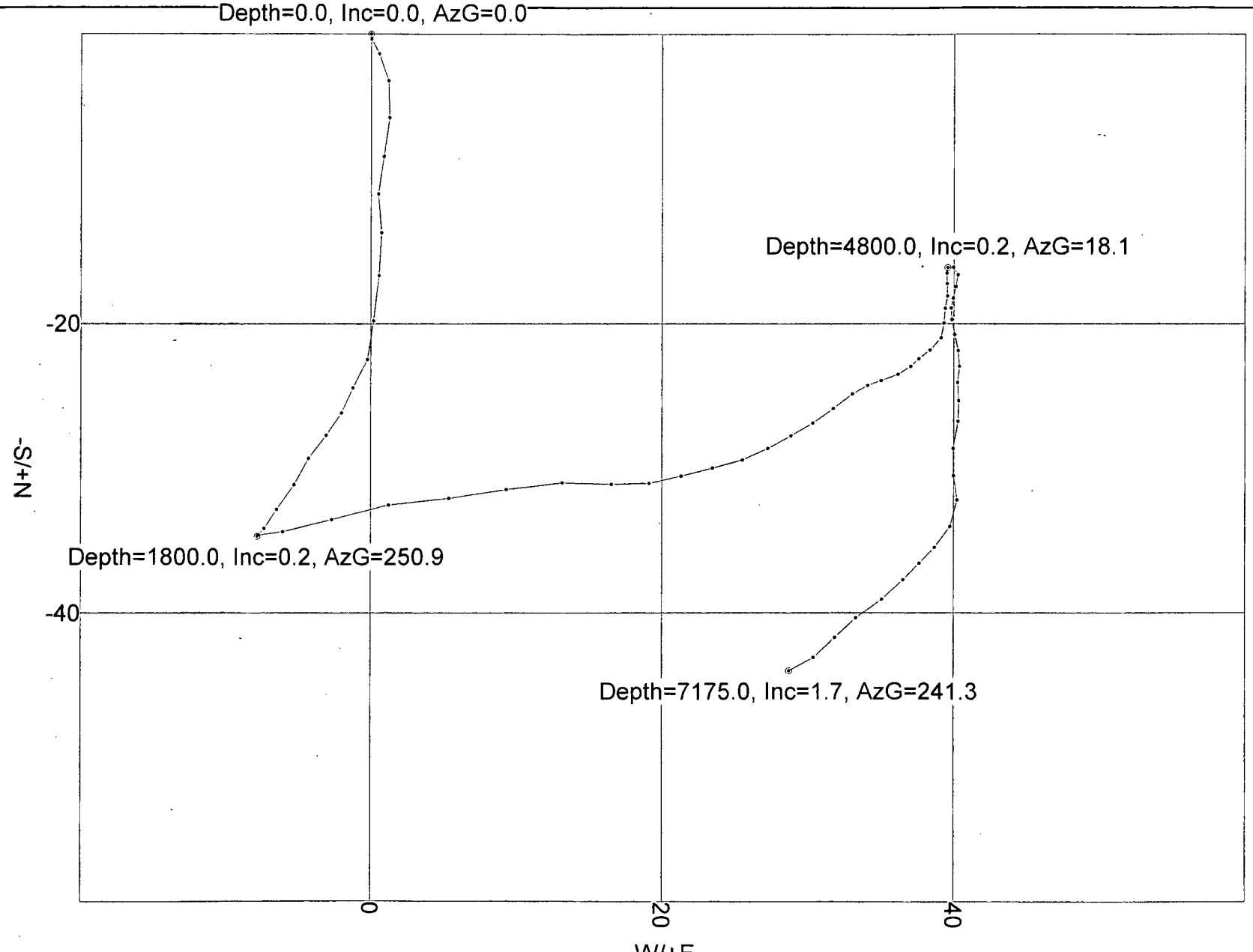
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.31	63.38	1899.56	-34.62	-7.85	-34.62	35.50	192.78	0.56
2000.00	1.70	84.87	1999.54	-34.37	-6.13	-34.37	34.91	190.11	1.42
2100.00	2.36	70.32	2099.48	-33.54	-2.71	-33.54	33.65	184.62	0.83
2200.00	2.36	81.11	2199.39	-32.53	1.26	-32.53	32.56	177.78	0.44
2300.00	2.37	86.15	2299.31	-32.07	5.36	-32.07	32.52	170.51	0.21
2400.00	2.22	76.25	2399.23	-31.47	9.31	-31.47	32.82	163.53	0.42
2500.00	2.23	90.00	2499.15	-31.01	13.14	-31.01	33.68	157.04	0.53
2600.00	1.67	93.23	2599.10	-31.10	16.54	-31.10	35.22	151.99	0.58
2700.00	1.31	82.60	2699.06	-31.03	19.13	-31.03	36.45	148.35	0.45
2800.00	1.26	71.59	2799.04	-30.54	21.31	-30.54	37.24	145.09	0.25
2900.00	1.28	79.53	2899.01	-29.98	23.46	-29.98	38.07	141.96	0.18
3000.00	1.16	69.13	2998.99	-29.42	25.50	-29.42	38.93	139.08	0.25
3100.00	1.06	61.79	3098.97	-28.62	27.26	-28.62	39.53	136.40	0.17
3200.00	1.00	59.48	3198.95	-27.75	28.82	-27.75	40.01	133.91	0.07
3300.00	1.01	59.28	3298.94	-26.85	30.33	-26.85	40.51	131.52	0.02
3400.00	0.98	50.32	3398.92	-25.85	31.75	-25.85	40.95	129.15	0.16
3500.00	0.90	55.44	3498.91	-24.86	33.06	-24.86	41.36	126.94	0.12
3600.00	0.48	69.95	3598.90	-24.27	34.11	-24.27	41.86	125.43	0.45
3700.00	0.64	70.96	3698.90	-23.94	35.03	-23.94	42.43	124.34	0.16
3800.00	0.78	67.34	3798.89	-23.49	36.19	-23.49	43.15	122.99	0.14
3900.00	0.41	39.05	3898.89	-22.96	37.04	-22.96	43.58	121.79	0.46
4000.00	0.47	53.43	3998.88	-22.44	37.60	-22.44	43.78	120.83	0.13
4100.00	0.67	51.00	4098.88	-21.82	38.38	-21.82	44.15	119.62	0.19
4200.00	0.64	32.04	4198.87	-20.98	39.13	-20.98	44.40	118.20	0.22
4300.00	0.64	349.24	4298.86	-19.96	39.33	-19.96	44.10	116.91	0.47
4400.00	0.58	20.78	4398.86	-18.93	39.40	-18.93	43.71	115.67	0.34
4500.00	0.43	358.03	4498.86	-18.09	39.57	-18.09	43.51	114.56	0.25
4600.00	0.56	358.35	4598.85	-17.22	39.54	-17.22	43.13	113.54	0.13
4700.00	0.26	358.99	4698.85	-16.51	39.52	-16.51	42.83	112.67	0.30
4800.00	0.19	18.09	4798.85	-16.12	39.57	-16.12	42.73	112.16	0.10
4900.00	0.42	111.47	4898.85	-16.09	39.96	-16.09	43.08	111.93	0.47
5000.00	0.45	183.82	4998.85	-16.62	40.27	-16.62	43.57	112.42	0.51
5100.00	0.51	194.98	5098.84	-17.44	40.13	-17.44	43.76	113.49	0.11
5200.00	0.42	191.21	5198.84	-18.23	39.95	-18.23	43.91	114.53	0.09
5300.00	0.38	190.29	5298.84	-18.91	39.82	-18.91	44.08	115.41	0.04
5400.00	0.56	169.04	5398.83	-19.72	39.85	-19.72	44.46	116.32	0.25
5500.00	0.65	169.72	5498.83	-20.75	40.05	-20.75	45.10	117.40	0.09
5600.00	0.65	165.38	5598.82	-21.86	40.29	-21.86	45.84	118.49	0.05
5700.00	0.60	185.40	5698.81	-22.94	40.39	-22.94	46.45	119.60	0.22

VES Survey Date: 02/26/2013

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
5800.00	0.67	186.72	5798.81	-24.05	40.27	-24.05	46.90	120.85	0.07
5900.00	0.79	169.37	5898.80	-25.31	40.33	-25.31	47.61	122.11	0.25
6000.00	0.89	192.51	5998.79	-26.75	40.29	-26.75	48.36	123.58	0.35
6100.00	1.29	188.42	6098.77	-28.62	39.95	-28.62	49.15	125.61	0.41
6200.00	0.92	166.05	6198.75	-30.51	39.98	-30.51	50.29	127.35	0.57
6300.00	1.04	177.06	6298.74	-32.20	40.22	-32.20	51.52	128.68	0.23
6400.00	1.20	209.80	6398.72	-34.01	39.75	-34.01	52.31	130.55	0.65
6500.00	0.87	225.11	6498.70	-35.46	38.69	-35.46	52.48	132.51	0.42
6600.00	0.86	222.36	6598.69	-36.56	37.64	-36.56	52.47	134.16	0.04
6700.00	0.95	225.55	6698.68	-37.69	36.54	-37.69	52.50	135.89	0.10
6800.00	1.32	227.47	6798.66	-39.05	35.10	-39.05	52.51	138.05	0.37
6900.00	1.22	241.45	6898.64	-40.34	33.31	-40.34	52.32	140.45	0.32
7000.00	1.12	210.60	6998.62	-41.69	31.88	-41.69	52.48	142.60	0.63
7100.00	1.29	241.07	7098.60	-43.08	30.40	-43.08	52.73	144.79	0.65
7175.00	1.66	241.34	7173.57	-44.01	28.71	-44.01	52.54	146.88	0.50

VES Survey Date: 02/26/2013

Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Logan Henry
Illustrated Man Fee Com No 001H / API 30-015-40946



VES Survey Date: 02/26/2013

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

COG Operating, LLC
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

April 2, 2013

Re: COG Operating, LLC
Illustrated Man Fee Com #1H
Field: San Lorenzo
Rig: Patriot Drilling #2
Eddy County, New Mexico
API # 30-015-41025

Enclosed please find the original of the surveys performed on the referenced well by Archer Directional Drilling Services. Other information required by your office is as follows:

Name & Title Of Surveyor	Wellhole Number	Survey Depths	Dates Performed	Type Survey
Geo Davila Field Engineer	Original Hole	634-2510	02/19/13-03/05/13	MWD
	Curve_Lateral	7424-12865		

If additional information is required, please contact the undersigned at the letterhead address and phone number.

Amador Baggerly
MWD Coordinator

DUSTIN MICHAEL TREVINO
Notary Public, State of Texas
My Commission Expires
February 26, 2017

Archer
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 02/19/13 through 03/05/13 , conduct or supervise the taking of MWD surveys; **Original Hole**: from a depth of 634 feet to a depth of 2510 feet; **Curve_Lateral**: from a depth of 7424 feet to a depth of 12865 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 Illustrated Man Fee Com #1H (API # 30-015-41025), Well located in Eddy County, New Mexico; and that I have reviewed this report and find that if 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

DUSTIN MICHAEL TREVINO
Notary Public, State of Texas
My Commission Expires
February 26, 2017

Archer

Company:	COG Operating, LLC	**Job Number:**	04113-433-22	**Calculation Method**	Minimum Curvature
Well:	Illustrated Man Fee Com 1H-OH	**Mag Decl.:**	7.60	**Proposed Azimuth**	182.5
Location:	Eddy County, New Mexico	**Dir Driller:**	Levi Galvin	**Depth Reference**	KBG
Rig:	Patriot 2	**MWD Eng:**	Geo Davila	**Tie Into:**	Assumed Vertical
Job Date:	02/01/13 - 03/05/13				

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Tie In	**534.00**	**1.5**	**196.4**	0	**534**	**0**	**0.00 0**	**0.00 0**					
1	634	1.5	196.4	100	633.97	2.54	2.51 S	0.74 W	2.62	196.40	0.00	0.00	0.00
2	689	1.6	191.8	55	688.95	4.00	3.95 S	1.10 W	4.10	195.54	0.29	0.18	-8.36
3	784	1.8	180.1	95	783.90	6.80	6.74 S	1.37 W	6.88	191.51	0.42	0.21	-12.32
4	880	1.8	182.8	96	879.86	9.81	9.76 S	1.45 W	9.86	188.45	0.09	0.00	2.81
5	975	1.5	205.6	95	974.82	12.45	12.37 S	2.06 W	12.54	189.45	0.75	-0.32	24.00
6	1070	1.4	211.4	95	1069.79	14.61	14.48 S	3.20 W	14.83	192.47	0.19	-0.11	6.11
7	1165	0.9	210.1	95	1164.77	16.28	16.12 S	4.18 W	16.65	194.54	0.53	-0.53	-1.37
8	1260	0.8	233.9	95	1259.76	17.36	17.15 S	5.09 W	17.89	196.53	0.38	-0.11	25.05
9	1354	1.1	219.7	94	1353.75	18.49	18.23 S	6.20 W	19.26	198.77	0.40	0.32	-15.11
10	1450	1.0	209.1	96	1449.73	19.97	19.67 S	7.19 W	20.95	200.08	0.23	-0.10	-11.04
11	1545	1.0	204.2	95	1544.71	21.48	21.16 S	7.94 W	22.59	200.56	0.09	0.00	-5.16
12	1640	0.6	201.2	95	1639.71	22.72	22.38 S	8.46 W	23.92	200.70	0.42	-0.42	-3.16
13	1735	0.2	272.1	95	1734.70	23.19	22.83 S	8.80 W	24.47	201.08	0.60	-0.42	74.63
14	1830	0.4	313.0	95	1829.70	22.98	22.60 S	9.21 W	24.41	202.17	0.30	0.21	43.05
15	1926	0.8	74.6	96	1925.70	22.55	22.19 S	8.81 W	23.88	201.65	1.11	0.42	-248.33
16	2020	2.1	87.9	94	2019.67	22.22	21.96 S	6.45 W	22.89	196.38	1.42	1.38	14.15
17	2115	2.4	76.8	95	2114.59	21.54	21.44 S	2.78 W	21.62	187.38	0.56	0.32	-11.68
18	2210	2.4	86.5	95	2209.51	20.79	20.86 S	1.14 E	20.89	176.86	0.43	0.00	10.21
19	2305	2.3	87.5	95	2304.43	20.42	20.66 S	5.03 E	21.26	166.31	0.11	-0.11	1.05
20	2400	2.2	87.7	95	2399.36	20.10	20.50 S	8.76 E	22.30	156.87	0.11	-0.11	0.21
21	2461	2.0	80.3	61	2460.32	19.78	20.28 S	10.98 E	23.06	151.57	0.55	-0.33	-12.13
Proj	2510	2.0	80.3	49	2509.29	19.42	19.99 S	12.66 E	23.66	147.64	0.00	0.00	0.00

Archer

Company:	COG Operating, LLC	**Job Number:**	04113-433-22	**Calculation Method**	Minimum Curvature
Well:	Illustrated Man Fee Com 1H - Lat.	**Mag Decl.:**	7.60	**Proposed Azimuth**	182.5
Location:	Eddy County, New Mexico	**Dir Driller:**	Levi Galvin	**Depth Reference**	KBG
Rig:	Patriot 2	**MWD Eng:**	Geo Davila	**Tie Into:**	Gyro Survey
Job Date:	02/19/13 - 03/05/13				

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Tie In	**7330.00**	**2.3**	**249**	0	**7328.48**	**45.12**	**46.19 S**	**23.80 E**	0.00	0.00	**0**	**0**	**0**
1	7424	1.9	289.7	94	7422.42	45.40	46.34 S	20.57 E	50.70	156.06	1.60	-0.43	43.30
2	7519	1.8	290.7	95	7517.37	44.47	45.28 S	17.69 E	48.62	158.66	0.11	-0.11	1.05
3	7613	1.8	286.2	94	7611.33	43.66	44.35 S	14.89 E	46.78	161.44	0.15	0.00	-4.79
4	7708	2.2	290.9	95	7706.27	42.73	43.28 S	11.76 E	44.85	164.80	0.45	0.42	4.95
5	7739	2.2	281.8	31	7737.25	42.44	42.95 S	10.62 E	44.24	166.11	1.13	0.00	-29.35
6	7771	2.0	258.6	32	7769.22	42.48	42.93 S	9.47 E	43.97	167.56	2.71	-0.63	-72.50
7	7803	4.0	213.1	32	7801.18	43.57	43.98 S	8.31 E	44.76	169.29	9.26	6.25	-142.19
8	7834	7.6	199.1	31	7832.02	46.47	46.82 S	7.05 E	47.35	171.43	12.39	11.61	-45.16
9	7866	10.8	191.1	32	7863.61	51.46	51.77 S	5.78 E	52.09	173.63	10.75	10.00	-25.00
10	7897	15.0	189.5	31	7893.82	58.32	58.58 S	4.56 E	58.75	175.55	13.60	13.55	-5.16
11	7929	18.8	188.7	32	7924.43	67.56	67.76 S	3.10 E	67.83	177.38	11.90	11.88	-2.50
12	7960	21.9	189.3	31	7953.49	78.27	78.41 S	1.41 E	78.42	178.97	10.02	10.00	1.94
13	7992	24.3	188.4	32	7982.92	90.75	90.81 S	0.52 W	90.81	180.33	7.58	7.50	-2.81
14	8024	27.4	187.2	32	8011.72	104.64	104.63 S	2.41 W	104.66	181.32	9.82	9.69	-3.75
15	8055	30.3	186.0	31	8038.87	119.56	119.49 S	4.12 W	119.56	181.97	9.54	9.35	-3.87
16	8087	33.4	184.5	32	8066.05	136.42	136.30 S	5.65 W	136.42	182.37	10.00	9.69	-4.69
17	8118	35.9	184.3	31	8091.55	154.03	153.88 S	7.00 W	154.03	182.61	8.07	8.06	-0.65
18	8150	38.4	182.6	32	8117.05	173.35	173.16 S	8.16 W	173.35	182.70	8.44	7.81	-5.31
19	8182	41.4	182.4	32	8141.60	193.88	193.67 S	9.05 W	193.88	182.68	9.38	9.38	-0.62
20	8213	44.7	182.6	31	8164.25	215.04	214.81 S	9.98 W	215.04	182.66	10.65	10.65	0.65
21	8244	48.2	182.7	31	8185.60	237.50	237.25 S	11.02 W	237.50	182.66	11.29	11.29	0.32
22	8276	52.0	183.3	32	8206.13	262.04	261.76 S	12.30 W	262.05	182.69	11.96	11.88	1.88
23	8308	55.7	183.3	32	8225.00	287.88	287.55 S	13.79 W	287.88	182.75	11.56	11.56	0.00
24	8339	59.9	181.6	31	8241.52	314.10	313.75 S	14.90 W	314.10	182.72	14.32	13.55	-5.48
25	8371	63.3	179.8	32	8256.73	342.23	341.89 S	15.24 W	342.23	182.55	11.72	10.63	-5.62
26	8402	66.0	178.0	31	8270.01	370.19	369.90 S	14.70 W	370.19	182.28	10.17	8.71	-5.81
27	8434	68.3	177.7	32	8282.43	399.57	399.36 S	13.59 W	399.59	181.95	7.24	7.19	-0.94
28	8466	72.1	177.9	32	8293.27	429.58	429.44 S	12.43 W	429.62	181.66	11.89	11.88	0.63
29	8498	76.6	178.4	32	8301.90	460.29	460.23 S	11.44 W	460.37	181.42	14.14	14.06	1.56
30	8529	80.4	178.9	31	8308.08	490.60	490.60 S	10.73 W	490.71	181.25	12.36	12.26	1.61
31	8561	83.6	178.7	32	8312.53	522.22	522.27 S	10.06 W	522.37	181.10	10.02	10.00	-0.63
32	8593	86.4	178.7	32	8315.32	554.02	554.14 S	9.34 W	554.22	180.97	8.75	8.75	0.00
33	8624	89.4	179.2	31	8316.46	584.94	585.11 S	8.77 W	585.18	180.86	9.81	9.68	1.61
34	8690	90.8	177.9	66	8316.34	650.78	651.09 S	7.10 W	651.12	180.63	2.89	2.12	-1.97
35	8785	89.8	177.7	95	8315.84	745.45	746.01 S	3.46 W	746.02	180.27	1.07	-1.05	-0.21
36	8975	87.3	177.2	190	8320.65	934.64	935.75 S	4.99 E	935.76	179.69	1.34	-1.32	-0.26
37	9070	88.0	178.7	95	8324.55	1029.26	1030.61 S	8.39 E	1030.64	179.53	1.74	0.74	1.58

Archer

Company:	COG Operating, LLC	**Job Number:**	04113-433-22	**Calculation Method**	Minimum Curvature
Well:	Illustrated Man Fee Cjom 1H - Lat	**Mag Decl.:**	7.60	**Proposed Azimuth**	182.5
Location:	Eddy County, New Mexico	**Dir Driller:**	Levi Galvin	**Depth Reference**	KBG
Rig:	Patriot 2	**MWD Eng:**	Geo Davila	**Tie Into:**	Gyro Survey
Job Date:	02/19/13 - 03/05/13				

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
38	9166	90.2	179.7	96	8326.05	1125.08	1126.58 S	9.73 E	1126.62	179.51	2.52	2.29	1.04
39	9260	91.4	181.3	94	8324.74	1219.01	1220.56 S	8.91 E	1220.59	179.58	2.13	1.28	1.70
40	9355	91.9	182.1	95	8322.01	1313.96	1315.48 S	6.09 E	1315.49	179.73	0.99	0.53	0.84
41	9451	92.4	183.3	96	8318.41	1409.89	1411.30 S	1.57 E	1411.30	179.94	1.35	0.52	1.25
42	9546	92.1	182.5	95	8314.68	1504.81	1506.11 S	3.23 W	1506.11	180.12	0.90	-0.32	-0.84
43	9640	91.8	181.6	94	8311.48	1598.75	1599.99 S	6.59 W	1600.00	180.24	1.01	-0.32	-0.96
44	9735	91.6	180.8	95	8308.66	1693.69	1694.93 S	8.58 W	1694.95	180.29	0.87	-0.21	-0.84
45	9831	89.5	180.8	96	8307.74	1789.64	1790.91 S	9.92 W	1790.93	180.32	2.19	-2.19	0.00
46	9926	89.0	181.9	95	8308.98	1884.61	1885.87 S	12.16 W	1885.91	180.37	1.27	-0.53	1.16
47	10021	89.2	183.6	95	8310.47	1979.59	1980.75 S	16.71 W	1980.82	180.48	1.80	0.21	1.79
48	10116	89.2	183.1	95	8311.80	2074.57	2075.57 S	22.27 W	2075.69	180.61	0.53	0.00	-0.53
49	10211	89.1	182.5	95	8313.21	2169.56	2170.45 S	26.91 W	2170.62	180.71	0.64	-0.11	-0.63
50	10306	89.3	184.5	95	8314.54	2264.53	2265.26 S	32.70 W	2265.49	180.83	2.12	0.21	2.11
51	10401	91.0	185.3	95	8314.29	2359.44	2359.91 S	40.82 W	2360.26	180.99	1.98	1.79	0.84
52	10496	91.1	184.7	95	8312.55	2454.33	2454.53 S	49.10 W	2455.02	181.15	0.64	0.11	-0.63
53	10591	90.8	184.5	95	8310.97	2549.26	2549.21 S	56.71 W	2549.84	181.27	0.38	-0.32	-0.21
54	10687	90.7	183.9	96	8309.71	2645.21	2644.94 S	63.74 W	2645.71	181.38	0.63	-0.10	-0.62
55	10782	90.5	183.1	95	8308.72	2740.19	2739.76 S	69.54 W	2740.64	181.45	0.87	-0.21	-0.84
56	10877	89.8	182.6	95	8308.47	2835.18	2834.64 S	74.27 W	2835.61	181.50	0.91	-0.74	-0.53
57	10972	89.6	181.6	95	8308.97	2930.18	2929.58 S	77.75 W	2930.61	181.52	1.07	-0.21	-1.05
58	11067	89.7	182.4	95	8309.55	3025.17	3024.51 S	81.06 W	3025.60	181.54	0.85	0.11	0.84
59	11163	89.3	183.6	96	8310.39	3121.16	3120.38 S	86.09 W	3121.56	181.58	1.32	-0.42	1.25
60	11258	89.1	183.2	95	8311.71	3216.14	3215.20 S	91.72 W	3216.51	181.63	0.47	-0.21	-0.42
61	11353	90.8	184.6	95	8311.80	3311.11	3309.97 S	98.18 W	3311.43	181.70	2.32	1.79	1.47
62	11448	90.0	184.0	95	8311.13	3406.06	3404.70 S	105.31 W	3406.33	181.77	1.05	-0.84	-0.63
63	11543	91.3	184.7	95	8310.05	3501.00	3499.42 S	112.51 W	3501.23	181.84	1.55	1.37	0.74
64	11638	91.4	184.3	95	8307.82	3595.91	3594.10 S	119.96 W	3596.10	181.91	0.43	0.11	-0.42
65	11733	91.7	183.8	95	8305.25	3690.84	3688.83 S	126.67 W	3691.00	181.97	0.61	0.32	-0.53
66	11828	90.9	182.9	95	8303.09	3785.81	3783.64 S	132.22 W	3785.95	182.00	1.27	-0.84	-0.95
67	11923	91.3	182.3	95	8301.27	3880.79	3878.53 S	136.53 W	3880.93	182.02	0.76	0.42	-0.63
68	12017	91.2	182.2	94	8299.22	3974.77	3972.43 S	140.22 W	3974.90	182.02	0.15	-0.11	-0.11
69	12113	91.6	181.6	96	8296.87	4070.73	4068.35 S	143.40 W	4070.88	182.02	0.75	0.42	-0.62
70	12208	90.8	183.1	95	8294.88	4165.71	4163.24 S	147.29 W	4165.85	182.03	1.79	-0.84	1.58
71	12303	90.2	182.4	95	8294.05	4260.70	4258.13 S	151.85 W	4260.84	182.04	0.97	-0.63	-0.74
72	12398	88.7	183.3	95	8294.96	4355.69	4353.00 S	156.57 W	4355.82	182.06	1.84	-1.58	0.95
73	12493	88.5	182.6	95	8297.29	4450.66	4447.85 S	161.46 W	4450.78	182.08	0.77	-0.21	-0.74
74	12588	88.7	182.4	95	8299.61	4545.63	4542.73 S	165.60 W	4545.75	182.09	0.30	0.21	-0.21
75	12682	90.0	182.8	94	8300.67	4639.62	4636.63 S	169.87 W	4639.74	182.10	1.45	1.38	0.43
76	12776	91.6	183.6	94	8299.36	4733.60	4730.47 S	175.11 W	4733.71	182.12	1.90	1.70	0.85

Archer

Company:	COG Operating, LLC	**Job Number:**	04113-433-22	**Calculation Method**	Minimum Curvature
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Location:	Eddy County, New Mexico	**Dir Driller:**	Levi Galvin	**Depth Reference**	KBG
Rig:	Patriot 2	**MWD Eng:**	Geo Davila	**Tie Into:**	Gyro Survey
Job Date:	02/19/13 - 03/05/13				

Survey Number	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Direction Azimuth	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
77	12816	91.6	182.7	40	8298.24	4773.58	4770.39 S	177.31 W	4773.68	182.13	2.25	0.00	-2.25
Proj	12865	91.6	182.7	49	8296.88	4822.56	4819.32 S	179.62 W	4822.66	182.13	0.00	0.00	0.00