

OPERATOR: COG Operating, LLC
WELL/LEASE: CTA State Com # 3 H
COUNTY: Eddy Co., New Mexico
Sec. 32, T18S, R30E

PATRIOT DRILLING, LLC

15- 42494

STATE OF NEW MEXICO
DEVIATION REPORT

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
269	1 1/2	3,857	1
991	1/2	4,634	2
1,276	1 1/4	5,117	2 3/4
1,623	3/4	5,601	1 3/4
2,306	2 1/2	6,077	2 1/2
2,524	2	6,555	3 3/4
2,901	1	6,783	3
3,166	1 1/4	7,631	2

NM OIL CONSERVATION
ARTESIA DISTRICT

NOV 06 2014

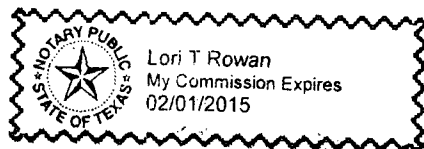
RECEIVED

Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 30th day of August
, 2014 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




Lori T. Rowan
Notary Public for Ector Co., Texas

September 4, 2014

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION
ARTESTA DISTRICT
NOV 6 2014
RECEIVED

Attn: Kanicia Castillo

RE: CTA State Com No. 003H

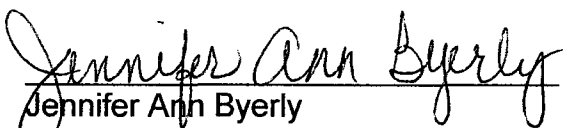
Please find enclosed a copy of the survey from 0.00' to 7500.00' ran on the
above referenced well.

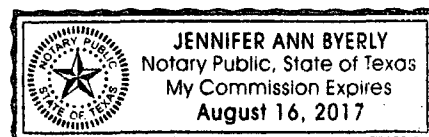
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 4 day of September
A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)
Lease/Well: CTA State Com /No. 003H
Location: S32 - T18/S - R30/E
Rig Name: Patriot #6
State/County: New Mexico/Eddy
Latitude: 32.71, Longitude: -104.00
GRID North is 0.18 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 17FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 9/4/2014 / 11:22

VES Survey International
West Texas
(432) 563-5444

Surveyor: Cody Johnson
CTA State Com No. 003H / API 30-015-42494

NM OIL CONSERVATION
ARTESIA DISTRICT
NOV 06 2014
RECEIVED

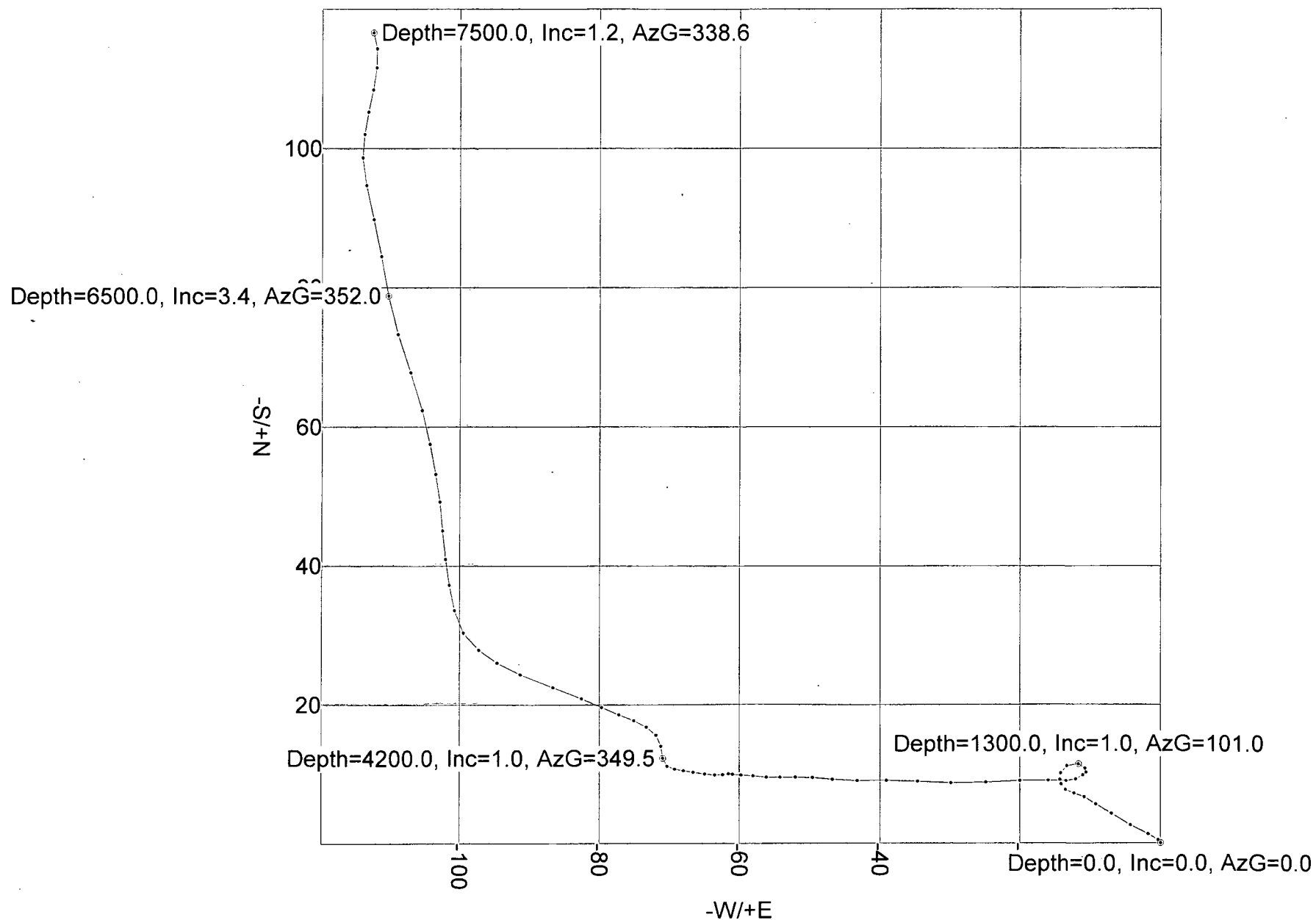
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.63	322.74	100.00	0.44	-0.33	0.44	0.55	322.74	0.63
200.00	1.36	291.65	199.98	1.32	-1.77	1.32	2.20	306.65	0.88
300.00	1.88	301.04	299.94	2.60	-4.27	2.60	5.00	301.30	0.59
400.00	1.72	302.55	399.89	4.25	-6.94	4.25	8.14	301.48	0.17
500.00	1.25	299.00	499.86	5.59	-9.16	5.59	10.73	301.38	0.48
600.00	1.01	306.97	599.84	6.64	-10.82	6.64	12.69	301.56	0.28
700.00	0.86	270.13	699.83	7.18	-12.27	7.18	14.21	300.32	0.61
800.00	0.81	315.22	799.82	7.68	-13.52	7.68	15.54	299.60	0.64
900.00	0.36	334.29	899.81	8.46	-14.15	8.46	16.49	300.88	0.49
1000.00	0.45	356.03	999.81	9.13	-14.31	9.13	16.97	302.53	0.18
1100.00	0.65	12.57	1099.81	10.07	-14.21	10.07	17.42	305.33	0.26
1200.00	1.05	59.86	1199.80	11.09	-13.30	11.09	17.31	309.83	0.77
1300.00	1.03	101.00	1299.78	11.38	-11.62	11.38	16.27	314.39	0.73
1400.00	0.52	172.79	1399.77	10.76	-10.69	10.76	15.17	315.19	0.99
1500.00	0.18	144.12	1499.77	10.18	-10.54	10.18	14.66	314.02	0.37
1600.00	0.70	242.21	1599.77	9.77	-10.99	9.77	14.71	311.64	0.75
1700.00	0.67	238.29	1699.76	9.18	-12.03	9.18	15.13	307.34	0.06
1800.00	1.00	274.26	1799.75	8.94	-13.40	8.94	16.11	303.71	0.61

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	1.98	270.41	1899.72	9.02	-16.00	9.02	18.37	299.40	0.99
2000.00	2.63	269.38	1999.63	9.00	-20.03	9.00	21.96	294.20	0.65
2100.00	2.94	264.93	2099.52	8.75	-24.88	8.75	26.38	289.38	0.37
2200.00	2.85	273.73	2199.39	8.69	-29.91	8.69	31.15	286.19	0.45
2300.00	2.63	272.02	2299.28	8.93	-34.68	8.93	35.81	284.44	0.24
2400.00	2.45	271.19	2399.18	9.05	-39.10	9.05	40.14	283.04	0.18
2500.00	2.29	268.28	2499.09	9.04	-43.24	9.04	44.17	281.81	0.20
2600.00	1.83	278.61	2599.03	9.22	-46.81	9.22	47.71	281.14	0.59
2700.00	1.41	269.89	2698.99	9.45	-49.62	9.45	50.52	280.79	0.48
2800.00	1.38	272.04	2798.96	9.49	-52.06	9.49	52.92	280.33	0.06
2900.00	1.09	267.69	2898.93	9.50	-54.22	9.50	55.05	279.94	0.30
3000.00	1.12	272.73	2998.92	9.51	-56.16	9.51	56.96	279.61	0.10
3100.00	1.04	278.05	3098.90	9.68	-58.04	9.68	58.84	279.47	0.13
3200.00	0.95	271.84	3198.88	9.83	-59.77	9.83	60.57	279.34	0.14
3300.00	0.47	280.44	3298.87	9.94	-61.00	9.94	61.80	279.25	0.49
3400.00	0.20	270.70	3398.87	10.01	-61.57	10.01	62.38	279.24	0.28
3500.00	0.76	259.37	3498.87	9.89	-62.39	9.89	63.17	279.01	0.57
3600.00	0.61	275.21	3598.86	9.82	-63.57	9.82	64.32	278.78	0.24
3700.00	1.05	277.77	3698.85	9.99	-65.00	9.99	65.76	278.74	0.44
3800.00	0.87	278.88	3798.84	10.23	-66.66	10.23	67.44	278.73	0.18
3900.00	0.72	279.79	3898.83	10.46	-68.03	10.46	68.83	278.74	0.15
4000.00	0.74	282.49	3998.82	10.70	-69.28	10.70	70.10	278.78	0.04
4100.00	0.63	302.12	4098.81	11.13	-70.38	11.13	71.25	278.99	0.26
4200.00	0.98	349.53	4198.80	12.26	-71.00	12.26	72.05	279.80	0.72
4300.00	1.08	353.86	4298.79	14.04	-71.25	14.04	72.62	281.15	0.13
4400.00	1.01	318.46	4398.77	15.64	-71.94	15.64	73.62	282.26	0.64
4500.00	1.06	302.62	4498.76	16.80	-73.31	16.80	75.21	282.91	0.29
4600.00	1.25	292.85	4598.73	17.72	-75.09	17.72	77.15	283.28	0.27
4700.00	1.38	291.34	4698.71	18.59	-77.22	18.59	79.43	283.53	0.14
4800.00	1.70	295.13	4798.67	19.65	-79.68	19.65	82.07	283.86	0.33
4900.00	1.92	292.02	4898.62	20.91	-82.58	20.91	85.19	284.21	0.25
5000.00	3.10	291.04	4998.52	22.51	-86.66	22.51	89.53	284.56	1.18
5100.00	2.59	293.24	5098.40	24.37	-91.26	24.37	94.46	284.95	0.52
5200.00	1.72	302.08	5198.33	26.06	-94.60	26.06	98.13	285.40	0.93
5300.00	1.97	308.19	5298.28	27.92	-97.22	27.92	101.15	286.02	0.32
5400.00	1.88	328.30	5398.22	30.38	-99.44	30.38	103.97	286.99	0.68
5500.00	2.18	345.97	5498.16	33.62	-100.76	33.62	106.22	288.45	0.69
5600.00	2.07	349.24	5598.09	37.25	-101.56	37.25	108.18	290.14	0.16
5700.00	2.22	354.02	5698.02	40.95	-102.10	40.95	110.01	291.86	0.23

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	2.49	354.35	5797.94	45.05	-102.52	45.05	111.98	293.72	0.27
5900.00	2.28	354.30	5897.85	49.19	-102.93	49.19	114.08	295.54	0.21
6000.00	2.35	348.06	5997.77	53.17	-103.55	53.17	116.40	297.18	0.26
6100.00	2.73	350.18	6097.67	57.51	-104.38	57.51	119.17	298.86	0.39
6200.00	3.02	342.99	6197.55	62.38	-105.55	62.38	122.61	300.58	0.47
6300.00	3.49	343.08	6297.38	67.81	-107.21	67.81	126.85	302.31	0.47
6400.00	3.15	339.61	6397.22	73.29	-109.05	73.29	131.39	303.90	0.39
6500.00	3.41	352.02	6497.05	78.82	-110.43	78.82	135.67	305.52	0.76
6600.00	3.22	347.93	6596.89	84.51	-111.43	84.51	139.85	307.18	0.31
6700.00	3.00	348.05	6696.74	89.82	-112.55	89.82	144.00	308.59	0.21
6800.00	2.70	346.28	6796.61	94.67	-113.66	94.67	147.92	309.79	0.31
6900.00	1.94	1.49	6896.53	98.65	-114.17	98.65	150.89	310.83	0.98
7000.00	1.96	7.08	6996.47	102.03	-113.92	102.03	152.93	311.85	0.19
7100.00	1.75	13.71	7096.42	105.21	-113.34	105.21	154.65	312.87	0.30
7200.00	2.02	10.21	7196.37	108.42	-112.67	108.42	156.37	313.90	0.29
7300.00	1.66	7.64	7296.32	111.58	-112.17	111.58	158.22	314.85	0.37
7400.00	1.50	354.32	7396.28	114.31	-112.10	114.31	160.11	315.56	0.40
7500.00	1.22	338.61	7496.25	116.60	-112.62	116.60	162.11	316.00	0.46



VES Survey International
West Texas
(432) 563-5444
Surveyor: Cody Johnson
CTA State Com No. 003H / API 30-015-42494



VES Survey Date: 08/23/2014

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well CTA State Com Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Site:	CTA State Com	MD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Well:	CTA State Com Well 3H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

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	CTA State Com		
Site Position:		Northing:	622,145.40 usft
From:	Map	Easting:	602,330.60 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.70993367
		Longitude:	-104.00064091
		Grid Convergence:	0.18 °

Well	CTA State Com Well 3H, Surf Loc: 430 FNL 480 FWL Sect 32		
Well Position	+N/-S	0.00 usft	Northing: 622,145.40 usft
	+E/-W	0.00 usft	Easting: 602,330.60 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.70993367
		Longitude:	-104.00064091
		Ground Level:	3,439.20 usft

Wellbore	Original hole		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	8/4/2014	(°)
			7.44
			Dip Angle (°)
			60.48
			Field Strength (nT)
			48,548

Design	Surveys Original hole		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			89.29

Survey Program	Date	8/28/2014		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	7,500.00	Gyro (Original hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
7,631.00	12,580.00	MWD (Original hole)	MWD	MWD - Standard

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Map Northing	Map Easting	Latitude	Longitude
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
0.00	0.00	0.00	0.00	0.00	0.00	622,145.40	602,330.60	32.70993367	-104.00064091
100.00	0.63	322.74	100.00	0.44	-0.33	622,145.84	602,330.27	32.70993487	-104.00064199
Gyro									
200.00	1.36	291.65	199.98	1.31	-1.77	622,146.72	602,328.83	32.70993729	-104.00064665
300.00	1.88	301.04	299.94	2.60	-4.28	622,148.00	602,326.33	32.70994084	-104.00065479
400.00	1.72	302.55	399.89	4.25	-6.95	622,149.65	602,323.66	32.70994541	-104.00066346
500.00	1.25	299.00	499.86	5.59	-9.17	622,150.99	602,321.44	32.70994910	-104.00067066
600.00	1.01	306.97	599.84	6.64	-10.82	622,152.05	602,319.78	32.70995203	-104.00067604
700.00	0.86	270.13	699.83	7.18	-12.28	622,152.58	602,318.32	32.70995350	-104.00068076
800.00	0.81	315.22	799.82	7.68	-13.53	622,153.08	602,317.08	32.70995490	-104.00068482
900.00	0.36	334.29	899.81	8.46	-14.16	622,153.87	602,316.44	32.70995706	-104.00068687



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well CTA State Com Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Site:	CTA State Com	MD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Well:	CTA State Com Well 3H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,000.00	0.45	356.03	999.81	9.14	-14.33	622,154.54	602,316.28	32.70995892	-104.00068739
1,100.00	0.65	12.57	1,099.81	10.09	-14.23	622,155.49	602,316.37	32.70996151	-104.00068707
1,200.00	1.05	59.86	1,199.80	11.10	-13.31	622,156.50	602,317.29	32.70996429	-104.00068408
1,300.00	1.03	101.00	1,299.78	11.39	-11.64	622,156.79	602,318.96	32.70996507	-104.00067864
1,400.00	0.52	172.79	1,399.77	10.77	-10.70	622,156.17	602,319.90	32.70996335	-104.00067559
1,500.00	0.18	144.12	1,499.77	10.19	-10.55	622,155.59	602,320.05	32.70996176	-104.00067511
1,600.00	0.70	242.21	1,599.77	9.78	-11.00	622,155.18	602,319.60	32.70996064	-104.00067657
1,700.00	0.67	238.29	1,699.76	9.18	-12.04	622,154.59	602,318.57	32.70995902	-104.00067995
1,800.00	1.00	274.26	1,799.75	8.94	-13.40	622,154.35	602,317.20	32.70995836	-104.00068440
1,900.00	1.98	270.41	1,899.72	9.02	-16.00	622,154.42	602,314.60	32.70995860	-104.00069285
2,000.00	2.63	269.38	1,999.63	9.01	-20.02	622,154.41	602,310.58	32.70995860	-104.00070592
2,100.00	2.94	264.93	2,099.52	8.75	-24.87	622,154.16	602,305.73	32.70995795	-104.00072169
2,200.00	2.85	273.73	2,199.39	8.69	-29.91	622,154.09	602,300.70	32.70995781	-104.00073806
2,300.00	2.63	272.02	2,299.27	8.93	-34.68	622,154.34	602,295.92	32.70995852	-104.00075358
2,400.00	2.45	271.19	2,399.18	9.06	-39.11	622,154.46	602,291.49	32.70995890	-104.00076798
2,500.00	2.29	268.28	2,499.09	9.04	-43.24	622,154.45	602,287.36	32.70995890	-104.00078142
2,600.00	1.83	278.61	2,599.03	9.22	-46.82	622,154.63	602,283.78	32.70995942	-104.00079304
2,700.00	1.41	269.89	2,698.99	9.46	-49.63	622,154.86	602,280.97	32.70996009	-104.00080217
2,800.00	1.38	272.04	2,798.96	9.50	-52.06	622,154.90	602,278.54	32.70996023	-104.00081008
2,900.00	1.09	267.69	2,898.93	9.50	-54.22	622,154.91	602,276.39	32.70996026	-104.00081708
3,000.00	1.12	272.73	2,998.92	9.51	-56.14	622,154.92	602,274.46	32.70996030	-104.00082335
3,100.00	1.04	278.05	3,098.90	9.68	-58.02	622,155.09	602,272.58	32.70996079	-104.00082944
3,200.00	0.95	271.84	3,198.88	9.84	-59.75	622,155.24	602,270.86	32.70996123	-104.00083505
3,300.00	0.47	280.44	3,298.87	9.94	-60.98	622,155.34	602,269.63	32.70996152	-104.00083906
3,400.00	0.20	270.70	3,398.87	10.02	-61.56	622,155.42	602,269.05	32.70996173	-104.00084094
3,500.00	0.76	259.37	3,498.87	9.90	-62.38	622,155.30	602,268.22	32.70996141	-104.00084362
3,600.00	0.61	275.21	3,598.86	9.82	-63.56	622,155.23	602,267.04	32.70996121	-104.00084747
3,700.00	1.05	277.77	3,698.85	9.99	-65.00	622,155.40	602,265.60	32.70996170	-104.00085214
3,800.00	0.87	278.88	3,798.84	10.23	-66.66	622,155.64	602,263.94	32.70996238	-104.00085753
3,900.00	0.72	279.79	3,898.83	10.46	-68.03	622,155.86	602,262.57	32.70996300	-104.00086198
4,000.00	0.74	282.49	3,998.82	10.71	-69.28	622,156.11	602,261.32	32.70996369	-104.00086604
4,100.00	0.63	302.12	4,098.81	11.14	-70.37	622,156.54	602,260.23	32.70996489	-104.00086960
4,200.00	0.98	349.53	4,198.80	12.27	-71.00	622,157.67	602,259.61	32.70996801	-104.00087160
4,300.00	1.08	353.86	4,298.79	14.05	-71.25	622,159.45	602,259.35	32.70997290	-104.00087242
4,400.00	1.01	318.46	4,398.77	15.65	-71.94	622,161.05	602,258.67	32.70997729	-104.00087463
4,500.00	1.06	302.62	4,498.76	16.80	-73.30	622,162.21	602,257.30	32.70998049	-104.00087905
4,600.00	1.25	292.85	4,598.73	17.73	-75.08	622,163.13	602,255.52	32.70998304	-104.00088484
4,700.00	1.38	291.34	4,698.71	18.59	-77.21	622,163.99	602,253.39	32.70998543	-104.00089175
4,800.00	1.70	295.13	4,798.67	19.66	-79.68	622,165.06	602,250.93	32.70998838	-104.00089975
4,900.00	1.92	292.02	4,898.62	20.91	-82.57	622,166.32	602,248.03	32.70999187	-104.00090915
5,000.00	3.10	291.04	4,998.52	22.51	-86.65	622,167.92	602,243.95	32.70999630	-104.00092239
5,100.00	2.59	293.24	5,098.40	24.37	-91.25	622,169.78	602,239.35	32.71000146	-104.00093732
5,200.00	1.72	302.08	5,198.33	26.06	-94.60	622,171.47	602,236.01	32.71000613	-104.00094819
5,300.00	1.97	308.19	5,298.28	27.92	-97.22	622,173.33	602,233.38	32.71001126	-104.00095670
5,400.00	1.88	328.30	5,398.22	30.38	-99.43	622,175.79	602,231.17	32.71001804	-104.00096387
5,500.00	2.18	345.97	5,498.16	33.62	-100.75	622,179.03	602,229.85	32.71002696	-104.00096814
5,600.00	2.07	349.24	5,598.09	37.24	-101.55	622,182.65	602,229.05	32.71003691	-104.00097069
5,700.00	2.22	354.02	5,698.02	40.94	-102.09	622,186.35	602,228.51	32.71004709	-104.00097241
5,800.00	2.49	354.35	5,797.94	45.03	-102.51	622,190.43	602,228.10	32.71005833	-104.00097372
5,900.00	2.28	354.30	5,897.85	49.17	-102.92	622,194.58	602,227.68	32.71006972	-104.00097501
6,000.00	2.35	348.06	5,997.77	53.16	-103.54	622,198.56	602,227.06	32.71008068	-104.00097699
6,100.00	2.73	350.18	6,097.67	57.51	-104.37	622,202.91	602,226.23	32.71009265	-104.00097965
6,200.00	3.02	342.99	6,197.55	62.37	-105.55	622,207.78	602,225.06	32.71010603	-104.00098343
6,300.00	3.49	343.08	6,297.38	67.81	-107.20	622,213.21	602,223.40	32.71012097	-104.00098876
6,400.00	3.15	339.61	6,397.22	73.29	-109.05	622,218.70	602,221.56	32.71013607	-104.00099469



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well CTA State Com Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Site:	CTA State Com	MD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Well:	CTA State Com Well 3H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,500.00	3.41	352.02	6,497.05	78.81	-110.42	622,224.22	602,220.19	32.71015126	-104.00099909
6,600.00	3.22	347.93	6,596.89	84.51	-111.42	622,229.91	602,219.19	32.71016691	-104.00100228
6,700.00	3.00	348.05	6,696.74	89.81	-112.55	622,235.22	602,218.06	32.71018151	-104.00100590
6,800.00	2.70	346.28	6,796.61	94.66	-113.65	622,240.06	602,216.96	32.71019484	-104.00100943
6,900.00	1.94	1.49	6,896.53	98.64	-114.16	622,244.04	602,216.44	32.71020579	-104.00101106
7,000.00	1.96	7.08	6,996.48	102.03	-113.91	622,247.43	602,216.70	32.71021510	-104.00101020
7,100.00	1.75	13.71	7,096.42	105.21	-113.33	622,250.61	602,217.27	32.71022384	-104.00100830
7,200.00	2.02	10.21	7,196.37	108.43	-112.66	622,253.83	602,217.94	32.71023268	-104.00100608
7,300.00	1.66	7.64	7,296.32	111.60	-112.16	622,257.00	602,218.45	32.71024139	-104.00100441
7,400.00	1.50	354.32	7,396.28	114.34	-112.09	622,259.74	602,218.51	32.71024891	-104.00100417
7,500.00	1.22	338.61	7,496.25	116.63	-112.61	622,262.03	602,217.99	32.71025522	-104.00100583
7,631.00	1.80	292.70	7,627.21	118.72	-115.02	622,264.13	602,215.59	32.71026100	-104.00101364
MWD surveys									
7,663.00	1.50	292.70	7,659.20	119.08	-115.87	622,264.48	602,214.74	32.71026198	-104.00101640
7,694.00	0.90	47.50	7,690.19	119.40	-116.06	622,264.80	602,214.54	32.71026287	-104.00101703
7,726.00	4.20	73.70	7,722.16	119.90	-114.75	622,265.30	602,215.85	32.71026423	-104.00101276
7,758.00	7.10	77.60	7,754.00	120.65	-111.69	622,266.06	602,218.91	32.71026627	-104.00100282
7,790.00	9.50	77.20	7,785.66	121.66	-107.19	622,267.07	602,223.42	32.71026901	-104.00098815
7,821.00	13.10	79.30	7,816.05	122.88	-101.24	622,268.28	602,229.36	32.71027231	-104.00096880
7,853.00	17.10	81.60	7,846.94	124.24	-93.02	622,269.65	602,237.59	32.71027598	-104.00094206
7,884.00	20.70	83.00	7,876.27	125.58	-83.07	622,270.98	602,247.54	32.71027956	-104.00090970
7,916.00	23.80	86.20	7,905.88	126.69	-71.01	622,272.10	602,259.60	32.71028253	-104.00087048
7,948.00	26.90	90.20	7,934.80	127.10	-57.32	622,272.50	602,273.28	32.71028352	-104.00082598
7,979.00	29.50	93.60	7,962.12	126.59	-42.69	622,272.00	602,287.91	32.71028201	-104.00077841
8,011.00	32.10	95.80	7,989.61	125.24	-26.36	622,270.64	602,304.24	32.71027814	-104.00072535
8,043.00	35.30	97.30	8,016.22	123.20	-8.73	622,268.61	602,321.87	32.71027240	-104.00066804
8,074.00	39.50	96.60	8,040.85	120.93	9.96	622,266.34	602,340.56	32.71026599	-104.00060731
8,106.00	43.10	95.80	8,064.88	118.66	30.95	622,264.06	602,361.55	32.71025956	-104.00053908
8,138.00	47.00	95.70	8,087.49	116.39	53.48	622,261.79	602,384.08	32.71025313	-104.00046586
8,169.00	50.80	96.90	8,107.86	113.82	76.69	622,259.22	602,407.30	32.71024586	-104.00039041
8,201.00	54.80	98.10	8,127.21	110.48	101.96	622,255.89	602,432.56	32.71023648	-104.00030831
8,233.00	58.80	98.80	8,144.72	106.55	128.44	622,251.95	602,459.04	32.71022543	-104.00022226
8,264.00	62.80	99.40	8,159.84	102.27	155.15	622,247.67	602,485.75	32.71021343	-104.00013546
8,277.00	64.38	98.86	8,165.63	100.42	166.65	622,245.82	602,497.25	32.71020825	-104.00009810
330 Hard line intercept @ 8277 MD									
8,296.00	66.70	98.10	8,173.49	97.87	183.75	622,243.27	602,514.35	32.71020110	-104.00004252
8,328.00	70.30	96.60	8,185.22	94.07	213.27	622,239.47	602,543.88	32.71019039	-103.99994657
8,360.00	73.00	96.20	8,195.29	90.68	243.46	622,236.09	602,574.06	32.71018083	-103.99984849
8,392.00	76.20	96.00	8,203.79	87.40	274.13	622,232.81	602,604.73	32.71017155	-103.99974880
8,423.00	79.60	95.50	8,210.29	84.37	304.28	622,229.77	602,634.89	32.71016295	-103.99965080
8,455.00	82.50	95.10	8,215.26	81.45	335.75	622,226.85	602,666.36	32.71015465	-103.99954851
8,487.00	84.30	94.60	8,218.94	78.76	367.43	622,224.17	602,698.03	32.71014699	-103.99944556
8,519.00	86.40	94.60	8,221.54	76.20	399.22	622,221.61	602,729.82	32.71013968	-103.99934224
8,550.00	88.40	94.10	8,222.94	73.86	430.09	622,219.26	602,760.70	32.71013296	-103.99924188
8,582.00	88.70	92.50	8,223.75	72.01	462.03	622,217.42	602,792.63	32.71012762	-103.99913807
8,614.00	88.90	91.80	8,224.42	70.81	494.00	622,216.22	602,824.60	32.71012405	-103.99903414
8,709.00	89.40	92.20	8,225.83	67.50	588.93	622,212.90	602,919.53	32.71011411	-103.99872554
8,804.00	88.10	91.80	8,227.90	64.18	683.85	622,209.59	603,014.45	32.71010418	-103.99841699
8,899.00	88.10	89.90	8,231.05	62.78	778.78	622,208.18	603,109.38	32.71009948	-103.99810837
8,994.00	88.50	90.20	8,233.87	62.69	873.74	622,208.10	603,204.34	32.71009843	-103.99779965
9,119.00	88.00	89.20	8,237.69	63.35	998.68	622,208.75	603,329.28	32.71009914	-103.99739346
9,214.00	89.00	90.60	8,240.18	63.51	1,093.64	622,208.92	603,424.24	32.71009876	-103.99708472
9,309.00	89.00	89.90	8,241.83	63.10	1,188.63	622,208.50	603,519.23	32.71009680	-103.99677592
9,404.00	89.00	89.70	8,243.49	63.43	1,283.61	622,208.83	603,614.21	32.71009688	-103.99646711
9,530.00	88.90	89.00	8,245.80	64.86	1,409.58	622,210.26	603,740.18	32.71009971	-103.99605755

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well CTA State Com Well 3H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Site:	CTA State Com	MD Reference:	RKB=3439.2+18 @ 3457.20usft (Patriot 6)
Well:	CTA State Com Well 3H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,625.00	89.00	90.80	8,247.54	65.02	1,504.56	622,210.43	603,835.16	32.71009933	-103.99574876
9,720.00	89.20	90.40	8,249.03	64.03	1,599.54	622,209.43	603,930.15	32.71009577	-103.99543997
9,847.00	89.10	92.50	8,250.92	60.82	1,726.48	622,206.22	604,057.08	32.71008582	-103.99502731
9,974.00	89.40	92.50	8,252.58	55.28	1,853.35	622,200.68	604,183.95	32.71006948	-103.99461491
10,101.00	89.80	92.30	8,253.47	49.96	1,980.23	622,195.36	604,310.84	32.71005375	-103.99420245
10,228.00	89.90	92.90	8,253.80	44.20	2,107.10	622,189.60	604,437.71	32.71003680	-103.99379004
10,355.00	90.00	91.80	8,253.91	38.99	2,233.99	622,184.39	604,564.60	32.71002137	-103.99337756
10,481.00	89.50	90.20	8,254.46	36.79	2,359.97	622,182.20	604,690.57	32.71001421	-103.99296803
10,608.00	89.50	90.60	8,255.57	35.91	2,486.96	622,181.31	604,817.56	32.71001065	-103.99255517
10,735.00	90.00	89.30	8,256.12	36.02	2,613.96	622,181.42	604,944.56	32.71000983	-103.99214229
10,861.00	90.90	90.00	8,255.13	36.79	2,739.95	622,182.19	605,070.55	32.71001083	-103.99173267
10,988.00	90.00	90.00	8,254.14	36.79	2,866.94	622,182.19	605,197.55	32.71000971	-103.99131980
11,115.00	90.30	90.60	8,253.80	36.12	2,993.94	622,181.52	605,324.54	32.71000675	-103.99090693
11,241.00	89.40	90.20	8,254.13	35.24	3,119.93	622,180.64	605,450.54	32.71000322	-103.99049731
11,368.00	90.00	90.60	8,254.80	34.35	3,246.93	622,179.76	605,577.53	32.70999965	-103.99008445
11,495.00	88.90	89.30	8,256.02	34.47	3,373.92	622,179.87	605,704.52	32.70999882	-103.98967159
11,621.00	89.30	88.80	8,258.00	36.55	3,499.88	622,181.96	605,830.49	32.71000344	-103.98926204
11,748.00	89.60	88.60	8,259.22	39.44	3,626.85	622,184.84	605,957.45	32.71001023	-103.98884925
11,875.00	88.70	88.50	8,261.10	42.65	3,753.79	622,188.05	606,084.39	32.71001793	-103.98843650
12,001.00	88.50	88.50	8,264.18	45.95	3,879.71	622,191.35	606,210.31	32.71002586	-103.98802709
12,128.00	88.40	87.60	8,267.61	50.27	4,006.59	622,195.67	606,337.19	32.71003660	-103.98761455
12,255.00	89.30	88.10	8,270.16	55.03	4,133.47	622,200.43	606,464.07	32.71004856	-103.98720199
12,413.00	90.60	86.90	8,270.30	61.92	4,291.31	622,207.32	606,621.92	32.71006608	-103.98668875
12,580.00	90.60	86.90	8,268.55	70.95	4,458.06	622,216.36	606,788.66	32.71008941	-103.98614655
Survey projected to 12580.00 MD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.44	-0.33	Gyro
7,631.00	7,627.21	118.72	-115.02	MWD surveys
8,277.00	8,165.63	100.42	166.65	330 Hard line intercept @ 8277 MD
12,580.00	8,268.55	70.95	4,458.06	Survey projected to 12580.00 MD