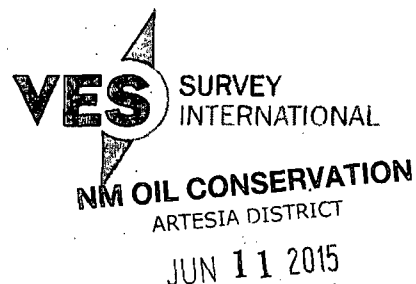


30 015 41 813



November 11, 2014

RECEIVED

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

Attn: Kanicia Castillo

RE: Hobgoblin 7 Federal Com UBB 2H

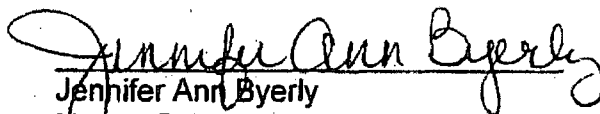
Please find enclosed a copy of the survey from 0.00' to 4391.00' ran on the above referenced well.

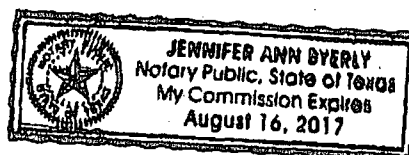
Sincerely,


Deb Salge
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 11 day of November, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating, LLC (Concho)
Lease/Well: Hobgoblin 7 Federal Com UBB/2H

Rig Name: United 43
State/County: New Mexico /Eddy
Latitude: 32.85, Longitude: -104.00
GRID North is 0.18 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB= 12.5 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 11/11/2014 / 14:31

VES Survey International
West Texas
(432) 563-5444

Surveyor: Bryan Massey
Hobgoblin 7 Federal Com UBB 2H / API 30-015-41813

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 11 2015

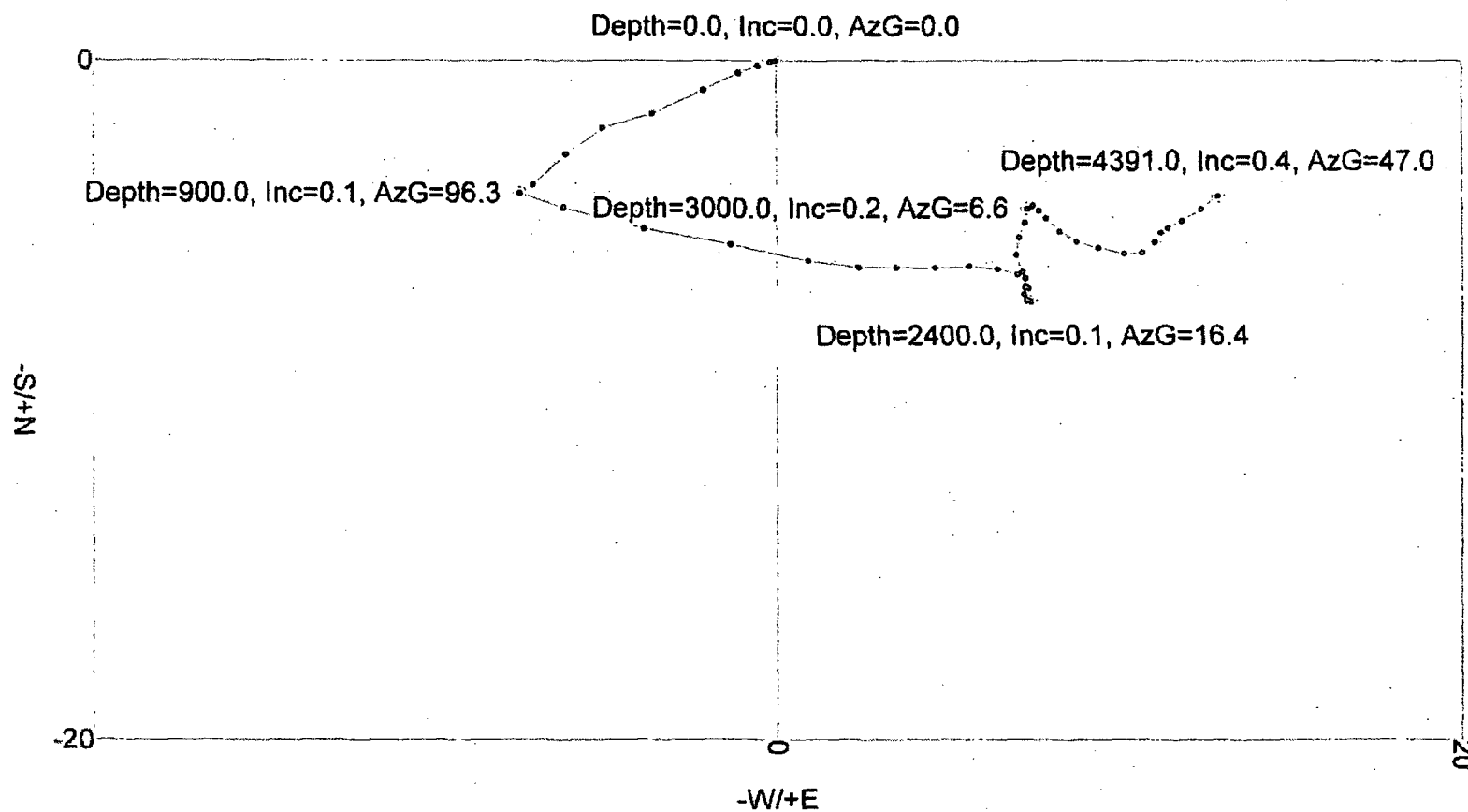
RECEIVED

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	0.19	256.67	100.00	-0.04	-0.16	-0.04	0.17	256.67	0.19
200.00	0.24	253.82	200.00	-0.14	-0.53	-0.14	0.54	255.55	0.06
300.00	0.44	246.62	300.00	-0.35	-1.09	-0.35	1.14	252.21	0.20
400.00	0.87	241.90	399.99	-0.86	-2.11	-0.86	2.28	247.84	0.43
500.00	1.02	248.83	499.98	-1.54	-3.62	-1.54	3.94	246.91	0.19
600.00	0.73	259.74	599.97	-1.98	-5.08	-1.98	5.45	248.71	0.34
700.00	0.92	215.05	699.96	-2.75	-8.16	-2.75	6.75	245.95	0.65
800.00	0.64	245.97	799.95	-3.64	-7.14	-3.64	8.01	243.00	0.50
900.00	0.14	96.29	899.94	-3.88	-7.53	-3.88	8.47	242.74	0.77
1000.00	1.41	110.02	999.93	-4.31	-6.24	-4.31	7.59	235.36	1.28
1100.00	1.40	98.52	1099.90	-4.92	-3.88	-4.92	6.26	218.25	0.28
1200.00	1.56	102.15	1199.87	-5.38	-1.34	-5.38	5.55	193.97	0.18
1300.00	1.10	102.00	1299.84	-5.87	0.93	-5.87	5.94	170.99	0.46
1400.00	0.60	88.88	1399.83	-6.06	2.40	-6.06	6.52	158.41	0.53
1500.00	0.66	92.11	1499.83	-6.07	3.50	-6.07	7.01	150.03	0.07
1600.00	0.64	89.54	1599.82	-6.09	4.63	-6.09	7.65	142.73	0.04
1700.00	0.51	84.06	1699.81	-6.04	5.63	-6.04	8.26	136.98	0.13
1800.00	0.47	108.19	1799.81	-6.12	6.47	-6.12	8.91	133.40	0.21

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	0.22	98.59	1899.81	-6.28	7.05	-6.28	9.44	131.66	0.26
2000.00	0.10	155.92	1999.81	-6.38	7.28	-6.38	9.68	131.25	0.19
2100.00	0.23	190.16	2099.81	-6.65	7.28	-6.65	9.86	132.43	0.16
2200.00	0.01	164.56	2199.81	-6.86	7.24	-6.86	9.97	133.42	0.22
2300.00	0.21	154.34	2299.81	-7.03	7.33	-7.03	10.16	133.82	0.20
2400.00	0.15	16.41	2399.81	-7.08	7.44	-7.08	10.27	133.54	0.34
2500.00	0.33	340.72	2499.81	-6.68	7.38	-6.68	9.96	132.11	0.23
2600.00	0.27	335.06	2599.81	-6.19	7.19	-6.19	9.49	130.72	0.07
2700.00	0.35	346.09	2699.80	-5.68	7.02	-5.68	9.03	128.99	0.10
2800.00	0.30	35.50	2799.80	-5.18	7.10	-5.18	8.78	126.10	0.28
2900.00	0.26	8.58	2899.80	-4.74	7.28	-4.74	8.69	123.07	0.13
3000.00	0.22	6.56	2999.80	-4.32	7.34	-4.32	8.52	120.50	0.04
3100.00	0.21	127.65	3099.80	-4.24	7.51	-4.24	8.62	119.46	0.38
3200.00	0.07	135.64	3199.80	-4.40	7.70	-4.40	8.86	119.74	0.14
3300.00	0.27	136.80	3299.80	-4.61	7.90	-4.61	9.15	120.29	0.20
3400.00	0.37	131.13	3399.80	-5.00	8.31	-5.00	9.70	121.04	0.10
3500.00	0.28	114.37	3499.80	-5.31	8.77	-5.31	10.25	121.20	0.13
3600.00	0.49	99.67	3599.79	-5.48	9.42	-5.48	10.90	120.22	0.23
3700.00	0.39	106.54	3699.79	-5.65	10.16	-5.65	11.63	119.08	0.11
3800.00	0.26	58.78	3799.79	-5.63	10.69	-5.63	12.08	117.79	0.29
3900.00	0.30	40.48	3899.79	-5.32	11.05	-5.32	12.26	115.68	0.10
4000.00	0.10	18.64	3999.79	-5.04	11.25	-5.04	12.33	114.13	0.21
4100.00	0.20	71.86	4099.79	-4.91	11.44	-4.91	12.45	113.21	0.16
4200.00	0.33	58.02	4199.79	-4.70	11.85	-4.70	12.74	111.63	0.15
4300.00	0.42	56.55	4299.78	-4.34	12.40	-4.34	13.14	109.31	0.08
4391.00	0.39	46.96	4390.78	-3.95	12.90	-3.95	13.49	107.03	0.09



VES Survey International
West Texas
(432) 563-5444
Surveyor: Bryan Massey
Hobgoblin 7 Federal Com UBB 2H / API 30-015-41813



VES Survey Date: 10/31/2014

JUN 11 2015

RECEIVED

1 of 2

WELL NAME AND NUMBER Hobgoblin 7 Federal Com LBB No. 2H
LOCATION Section 7, T17S, R30E, Unit A, 1005 FNL, 15 FEL, Eddy County
OPERATOR COG Operating LLC
DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
.8° @ 356'	9.9° @ 4606'	77.4° @ 5303'
.9° @ 667'	13.1° @ 4637'	79.8° @ 5334'
1.5° @ 981'	16.2° @ 4668'	82.3° @ 5365'
.5° @ 1167'	22.6° @ 4732'	84.7° @ 5397'
.8° @ 1460'	26.1° @ 4763'	86.0° @ 5429'
.6° @ 1774'	29.1° @ 4794'	86.9° @ 5460'
.5° @ 2085'	32.2° @ 4826'	87.7° @ 5492'
.2° @ 2402'	41.6° @ 4920'	90.4° @ 5552'
.5° @ 2717'	47.6° @ 4983'	91.3° @ 5618'
.4° @ 3000'	50.9° @ 5015'	91.4° @ 5713'
.3° @ 3390'	54.0° @ 5047'	91.4° @ 5807'
1.7° @ 3661'	57.3° @ 5078'	91.0° @ 5901'
.5° @ 3692'	60.5° @ 5110'	90.9° @ 5996'
.7° @ 4102'	63.8° @ 5141'	91.0° @ 6090'
.5° @ 4434'	66.9° @ 5241'	91.3° @ 6185'
2.1° @ 4511'	70.1° @ 5708'	91.5° @ 6279'
4.7° @ 4542'	72.9° @ 5240'	90.7° @ 6374'
7.2° @ 4574'	75.2° @ 5271'	90.9° @ 6469'

Drilling Contractor- UNITED DRILLING, INC.

By: [Signature]
(Angel Salazar)

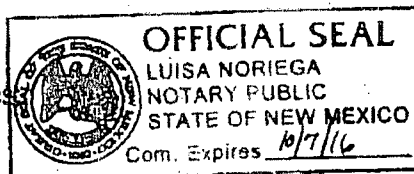
Title: Vice President

Subscribed and sworn to before me this 25th day of November 2014.

[Signature]
Notary Public

Craves NM
County State

My Commission Expires



JUN 11 2015

2 of 2

RECEIVED

WELL NAME AND NUMBER Hobgoblin 7 Federal Com LBB No. 2H
LOCATION Section 7, T17S, R30E, Unit A, 1005 FNL, 15 FEL, Eddy County
OPERATOR COG Operating LLC
DRILLING CONTRACTOR United Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and had conducted deviation test and obtained the following results:

Degrees @ Depth	Degrees @ Depth	Degrees @ Depth
90.9° @ 6563'	90.9° @ 8268'	
91.0° @ 6658'	91.2° @ 8363'	
91.4° @ 6758'	91.1° @ 8457'	
91.6° @ 6847'	90.9° @ 8552'	
90.6° @ 6942'	89.9° @ 8741'	
91.2° @ 7036'	90.9° @ 8836'	
90.9° @ 7131'	90.6° @ 9025'	
90.8° @ 7226'	91.4° @ 9119'	
90.9° @ 7321'	91.3° @ 9404'	
90.9° @ 7416'	91.3° @ 9499'	
91.1° @ 7510'	91.5° @ 9658'	
90.6° @ 7605'		
90.9° @ 7700'		
91.1° @ 7795'		
91.3° @ 7889'		
91.5° @ 7984'		
90.8° @ 8079'		
90.8° @ 8173'		

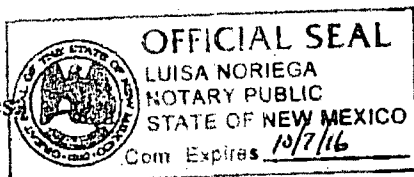
Drilling Contractor- UNITED DRILLING, INC.

By: Angel Salazar
(Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 25th day of November 2014.

My Commission Expires:



Luisa Noriega
Notary Public
Chaves NM
County State

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H:
Project:	Eddy County, NM	TVD Reference:	3671'GL+12'KB @ 3683.00usft (United 43)
Site:	Hobgoblin 7, Federal Com UBB 2H	MD Reference:	3671'GL+12'KB @ 3683.00usft (United 43)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Project:	Eddy County, NM		
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:	Hobgoblin 7, Federal Com UBB 2H				
Site Position:		Northing:	674,351.30 usft	Latitude:	32° 51' 12.38 N
From:	Map	Easting:	601,657.80 usft	Longitude:	104° 0' 8.27 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.18 °

Well:	2H					
Well Position	+N-S	0.00 usft	Northing:	674,351.30 usft	Latitude:	32° 51' 12.38 N
	+E-W	0.00 usft	Easting:	601,657.80 usft	Longitude:	104° 0' 8.27 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,671.00 usft

Wellbore		Lateral			
Magnetics	Model Name	Sample Date	Declination (μ)	Dip Angle (μ)	Field Strength (nT)
	HOGM	11/1/2014	7.80	60.72	48,553

Design:	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	270.08	

Survey Program		Date	11/21/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,391.00	Survey #1 (Lateral)	GYRO-NS	Gyrocompass Gyro	
4,416.00	9,593.00	Survey #2 (Lateral)	MWD+HDGM	OWSG MWD + HDGM	
9,662.00	9,662.00	Survey #3 (Lateral)	Project	Projection	

Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.19	256.67	100.00	-0.04	-0.16	0.16	0.19	0.19	0.00
200.00	0.24	253.82	200.00	-0.13	-0.52	0.52	0.05	0.05	-2.85
300.00	0.44	246.62	300.00	-0.35	-1.08	1.08	0.20	0.20	-7.20
400.00	0.87	241.90	399.99	-0.86	-2.10	2.10	0.43	0.43	-4.72
500.00	1.02	248.83	499.98	-1.53	-3.60	3.60	0.19	0.15	6.93
600.00	0.73	259.74	599.97	-1.97	-5.06	5.05	0.33	-0.29	10.91
700.00	0.92	215.05	699.96	-2.74	-6.14	6.14	0.65	0.19	-44.69
800.00	0.64	245.97	799.95	-3.62	-7.12	7.11	0.50	-0.28	30.92

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3671'GL+12'KB @ 3683.00usft (United 43)
Site:	Hobgoblin, 7 Federal Com UBB 2H	MD Reference:	3671'GL+12'KB @ 3683.00usft (United 43)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

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)
900.00	0.14	96.29	899.95	-3.87	-7.50	7.50	0.76	-0.50	-149.68
1,000.00	1.41	110.02	999.93	-4.30	-6.23	6.22	1.27	1.27	13.73
1,100.00	1.40	98.52	1,099.90	-4.90	-3.86	3.86	0.28	-0.01	-11.50
1,200.00	1.56	102.15	1,199.87	-5.37	-1.32	1.32	0.19	0.16	3.63
1,300.00	1.10	102.00	1,299.84	-5.86	0.95	-0.95	0.46	-0.46	-0.15
1,400.00	0.60	88.88	1,399.83	-6.05	2.41	-2.42	0.53	-0.50	-13.12
1,500.00	0.66	92.11	1,499.83	-6.06	3.51	-3.52	0.07	0.06	3.23
1,600.00	0.64	89.54	1,599.82	-6.07	4.64	-4.65	0.04	-0.02	-2.57
1,700.00	0.51	84.06	1,699.81	-6.02	5.64	-5.65	0.14	-0.13	-5.48
1,800.00	0.47	108.19	1,799.81	-6.10	6.48	-6.48	0.21	-0.04	24.13
1,900.00	0.22	98.59	1,899.81	-6.26	7.05	-7.06	0.26	-0.25	-9.60
2,000.00	0.10	155.92	1,999.81	-6.37	7.28	-7.29	0.19	-0.12	57.33
2,100.00	0.23	190.16	2,099.81	-6.65	7.28	-7.29	0.16	0.13	34.24
2,200.00	0.01	164.56	2,199.81	-6.85	7.25	-7.26	0.22	-0.22	-25.60
2,300.00	0.21	154.34	2,299.81	-7.03	7.33	-7.34	0.20	0.20	-10.22
2,400.00	0.15	16.41	2,399.81	-7.07	7.45	-7.46	0.34	-0.06	-137.93
2,500.00	0.33	340.72	2,499.81	-6.67	7.39	-7.40	0.23	0.18	-35.69
2,600.00	0.27	335.06	2,599.81	-6.18	7.19	-7.20	0.07	-0.06	-5.66
2,700.00	0.35	346.09	2,699.80	-5.67	7.02	-7.03	0.10	0.08	11.03
2,800.00	0.30	35.50	2,799.80	-5.16	7.10	-7.11	0.28	-0.05	49.41
2,900.00	0.26	8.58	2,899.80	-4.73	7.28	-7.29	0.14	-0.04	-26.92
3,000.00	0.22	6.56	2,999.80	-4.31	7.34	-7.35	0.04	-0.04	-2.02
3,100.00	0.21	127.65	3,099.80	-4.23	7.51	-7.51	0.37	-0.01	121.09
3,200.00	0.07	135.64	3,199.80	-4.39	7.69	-7.70	0.14	-0.14	7.99
3,300.00	0.27	136.80	3,299.80	-4.60	7.90	-7.91	0.20	0.20	1.16
3,400.00	0.37	131.13	3,399.80	-4.99	8.30	-8.31	0.10	0.10	-5.67
3,500.00	0.28	114.37	3,499.80	-5.30	8.77	-8.78	0.13	-0.09	-16.76
3,600.00	0.49	99.67	3,599.79	-5.47	9.41	-9.42	0.23	0.21	-14.70
3,700.00	0.39	106.54	3,699.79	-5.64	10.16	-10.17	0.11	-0.10	6.87
3,800.00	0.26	58.78	3,799.79	-5.62	10.68	-10.69	0.29	-0.13	-47.76
3,900.00	0.30	40.48	3,899.79	-5.30	11.05	-11.05	0.10	0.04	-18.30
4,000.00	0.10	18.64	3,999.79	-5.02	11.24	-11.25	0.21	-0.20	-21.84
4,100.00	0.20	71.86	4,099.79	-4.89	11.44	-11.44	0.16	0.10	53.22
4,200.00	0.33	58.02	4,199.79	-4.58	11.85	-11.85	0.14	0.13	-13.84
4,300.00	0.42	56.55	4,299.78	-4.32	12.40	-12.40	0.09	0.09	-1.47
4,391.00	0.39	48.96	4,390.78	-3.93	12.90	-12.91	0.08	-0.03	-10.54
4,416.00	0.40	40.70	4,415.78	-3.80	13.02	-13.03	0.18	0.04	-25.04
4,448.00	0.40	68.80	4,447.78	-3.68	13.20	-13.20	0.61	0.00	87.81
4,480.00	0.50	290.70	4,479.78	-3.59	13.17	-13.18	2.63	0.31	-431.58
4,511.00	2.10	277.80	4,510.77	-3.46	12.48	-12.49	5.21	5.16	-41.61
4,542.00	4.70	276.40	4,541.71	-3.25	10.66	-10.66	8.39	8.39	-4.52
4,574.00	7.20	275.40	4,573.54	-2.91	7.36	-7.36	7.82	7.81	-3.13
4,606.00	9.90	277.40	4,605.18	-2.37	2.63	-2.64	8.49	8.44	6.25

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3671'GL+12KB @ 3683.00usft (United 43)
Site:	Hobgoblin 7 Federal Com UBB 2H	MD Reference:	3671'GL+12KB @ 3683.00usft (United 43)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1\MULTI

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)
4,637.00	13.10	277.80	4,635.55	-1.55	-3.49	3.49	10.33	10.32	1.29
4,658.00	16.20	276.70	4,665.54	-0.57	-11.27	11.27	10.04	10.00	-3.55
4,700.00	19.50	276.00	4,696.00	0.51	-21.02	21.02	10.33	10.31	-2.19
4,732.00	22.60	275.10	4,725.86	1.62	-32.46	32.46	9.74	9.69	-2.81
4,763.00	26.10	273.90	4,754.10	2.61	-45.20	45.20	11.40	11.29	-3.87
4,794.00	29.10	273.00	4,781.57	3.47	-59.53	59.54	9.77	9.68	-2.90
4,826.00	32.20	272.40	4,809.09	4.23	-75.82	75.83	9.73	9.69	-1.88
4,857.00	35.40	272.20	4,834.85	4.93	-93.05	93.06	10.33	10.32	-0.65
4,889.00	38.40	272.20	4,860.44	5.66	-112.25	112.26	9.38	9.38	0.00
4,920.00	41.60	272.50	4,884.18	6.48	-132.16	132.17	10.34	10.32	0.97
4,952.00	44.70	273.40	4,907.53	7.61	-154.01	154.02	9.88	9.69	2.81
4,983.00	47.60	274.20	4,929.00	9.10	-176.31	176.33	9.54	9.35	2.58
5,015.00	50.90	274.80	4,949.88	11.00	-200.48	200.49	10.41	10.31	1.88
5,047.00	54.00	275.20	4,969.38	13.22	-225.75	225.77	9.74	9.69	1.25
5,078.00	57.30	275.30	4,986.87	15.56	-251.23	251.25	10.65	10.65	0.32
5,110.00	60.50	275.00	5,003.40	18.02	-278.52	278.54	10.03	10.00	-0.94
5,141.00	63.80	274.50	5,017.88	20.28	-305.83	305.86	10.74	10.65	-1.61
5,167.00	65.60	270.90	5,028.99	21.38	-329.30	329.33	14.30	6.92	-13.85
5,176.00	66.90	271.10	5,032.62	21.53	-337.54	337.57	14.59	14.44	2.22
5,208.00	70.10	270.20	5,044.35	21.86	-367.31	367.34	10.34	10.00	-2.81
5,240.00	72.90	269.30	5,054.50	21.73	-397.65	397.68	9.15	8.75	-2.81
5,271.00	75.20	268.60	5,063.02	21.18	-427.45	427.48	7.73	7.42	-2.26
5,303.00	77.40	267.50	5,070.60	20.12	-458.52	458.55	7.64	6.88	-3.44
5,334.00	79.80	267.30	5,076.72	18.74	-488.87	488.90	7.77	7.74	-0.65
5,365.00	82.30	268.00	5,081.55	17.49	-519.47	519.49	8.37	8.06	2.26
5,397.00	84.70	268.30	5,085.17	16.46	-551.24	551.27	7.56	7.50	0.94
5,429.00	86.00	268.70	5,087.76	15.63	-583.13	583.15	4.25	4.06	1.25
5,460.00	86.90	269.20	5,089.68	15.06	-614.06	614.08	3.32	2.90	1.61
5,492.00	87.70	270.90	5,091.19	15.09	-646.02	646.04	5.87	2.50	5.31
5,520.00	89.00	271.80	5,091.99	15.75	-674.00	674.02	5.65	4.64	3.21
5,618.00	91.30	271.40	5,091.74	18.49	-771.96	771.98	2.38	2.35	-0.41
5,713.00	91.40	271.10	5,089.50	20.56	-866.91	866.94	0.33	0.11	-0.32
5,807.00	91.40	271.10	5,087.20	22.36	-960.86	960.89	0.00	0.00	0.00
5,901.00	91.00	270.10	5,085.23	23.35	-1,054.84	1,054.87	1.15	-0.43	-1.06
5,996.00	90.90	269.80	5,083.66	23.26	-1,149.82	1,149.85	0.33	-0.11	-0.32
6,090.00	91.00	271.00	5,082.10	23.92	-1,243.81	1,243.84	1.28	0.11	1.28
6,185.00	91.30	270.80	5,080.19	25.41	-1,338.78	1,338.81	0.38	0.32	-0.21
6,279.00	91.50	270.40	5,077.90	26.39	-1,432.74	1,432.78	0.48	0.21	-0.43
6,374.00	90.70	271.50	5,076.07	27.97	-1,527.71	1,527.75	1.43	-0.84	1.16
6,469.00	90.90	271.50	5,074.75	30.46	-1,622.67	1,622.71	0.21	0.21	0.00
6,563.00	90.90	271.30	5,073.27	32.75	-1,716.63	1,716.67	0.21	0.00	-0.21
6,658.00	91.00	271.10	5,071.70	34.74	-1,811.59	1,811.64	0.24	0.11	-0.21
6,753.00	91.40	271.00	5,069.71	36.48	-1,906.56	1,906.61	0.43	0.42	-0.11

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 2H
Project:	Eddy County, NM	TVD Reference:	3671'GL+12'KB @ 3883.00usft (United 43)
Site:	Hobgoblin 7 Federal Com UBB 2H	MD Reference:	3671'GL+12'KB @ 3883.00usft (United 43)
Well:	2H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1.MULTI

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)
6,847.00	91.60	271.00	5,067.25	38.12	-2,000.51	2,000.58	0.21	0.21	0.00
6,942.00	90.60	271.20	5,065.42	39.95	-2,095.47	2,095.53	1.07	-1.05	0.21
7,036.00	91.20	271.00	5,063.95	41.75	-2,189.44	2,189.50	0.67	0.64	-0.21
7,131.00	90.90	270.40	5,062.20	42.91	-2,284.42	2,284.48	0.71	-0.32	-0.63
7,226.00	90.80	270.10	5,060.80	43.32	-2,379.41	2,379.47	0.33	-0.11	-0.32
7,321.00	90.90	269.90	5,059.39	43.32	-2,474.40	2,474.46	0.24	0.11	-0.21
7,416.00	90.90	269.70	5,057.89	42.99	-2,569.39	2,569.44	0.21	0.00	-0.21
7,510.00	91.10	269.70	5,056.25	42.50	-2,663.37	2,663.43	0.21	0.21	0.00
7,605.00	90.60	269.40	5,054.84	41.75	-2,758.36	2,758.41	0.61	-0.53	-0.32
7,700.00	90.90	269.30	5,053.60	40.68	-2,853.34	2,853.40	0.33	0.32	-0.11
7,795.00	91.10	269.20	5,051.94	39.43	-2,948.32	2,948.37	0.24	0.21	-0.11
7,889.00	91.30	269.10	5,049.97	38.04	-3,042.29	3,042.34	0.24	0.21	-0.11
7,984.00	91.50	269.00	5,047.65	36.47	-3,137.25	3,137.30	0.24	0.21	-0.11
8,079.00	90.80	268.80	5,045.75	34.64	-3,232.21	3,232.26	0.77	-0.74	-0.21
8,173.00	90.80	268.70	5,044.43	32.59	-3,326.18	3,326.22	0.11	0.00	-0.11
8,268.00	90.90	268.50	5,043.02	30.27	-3,421.14	3,421.18	0.24	0.11	-0.21
8,363.00	91.20	268.50	5,041.28	27.78	-3,516.09	3,516.13	0.32	0.32	0.00
8,457.00	91.10	269.30	5,039.40	25.98	-3,610.05	3,610.09	0.66	-0.11	0.85
8,552.00	90.90	269.00	5,037.74	24.57	-3,705.03	3,705.06	0.38	-0.21	-0.32
8,646.00	90.30	268.70	5,036.75	22.68	-3,799.00	3,799.03	0.71	-0.64	-0.32
8,741.00	89.90	268.30	5,036.59	20.20	-3,893.97	3,894.00	0.60	-0.42	-0.42
8,836.00	90.90	268.90	5,035.93	17.88	-3,988.94	3,988.96	1.23	1.05	0.63
8,930.00	90.90	268.80	5,034.45	15.99	-4,082.91	4,082.93	0.11	0.00	-0.11
9,025.00	90.60	268.50	5,033.21	13.75	-4,177.87	4,177.89	0.45	-0.32	-0.32
9,119.00	91.40	268.90	5,031.57	11.62	-4,271.83	4,271.85	0.95	0.85	0.43
9,214.00	90.70	269.80	5,029.82	10.54	-4,366.81	4,366.82	1.20	-0.74	0.95
9,309.00	91.20	269.60	5,028.25	10.05	-4,461.80	4,461.81	0.57	0.53	-0.21
9,404.00	91.30	269.70	5,026.18	9.46	-4,556.77	4,556.78	0.15	0.11	0.11
9,498.00	91.30	269.40	5,024.04	8.73	-4,650.74	4,650.75	0.32	0.00	-0.32
9,593.00	91.50	269.40	5,021.72	7.73	-4,745.71	4,745.72	0.21	0.21	0.00
9,662.00	91.50	269.40	5,019.92	7.01	-4,814.68	4,814.69	0.00	0.00	0.00

Target Name	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Eastings (usft)	Latitude	Longitude
Hobgoblin 2H Surface - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	674,351.30	601,657.80	32° 51' 12.38 N	104° 0' 8.27 W
Hobgoblin 2H BHL - actual wellpath hits target center - Point	0.00	0.00	5,019.92	7.01	-4,814.68	674,358.31	596,843.12	32° 51' 12.59 N	104° 1' 4.71 W