



30-015-41618

October 2, 2014

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

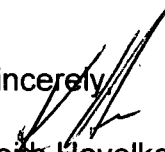
NM OIL CONSERVATION
ARTESIA DISTRICT
DEC 23 2014
RECEIVED

Attn: Kanicia Castillo

RE: **Sam Adams 12 Federal Com LBB 4H**

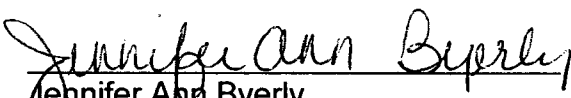
Please find enclosed a copy of the survey from 0.00' to 4190.00' ran on the above referenced well.

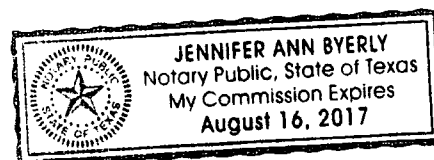
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of October, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas

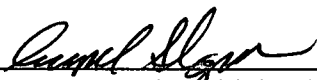


WELL NAME AND NUMBER Sam Adams 12 Federal Com UBB No. 4H
 LOCATION Section 12, T17S, R29E, Unit E, 2310 FNL, 230 FWL, Eddy County
 OPERATOR COG Operating LLC
 DRILLING CONTRACTOR United Drilling, Inc.

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
91.5° @ 8168'		
91.5° @ 8263'		
91.0° @ 8358'		
91.0° @ 8452'		
91.0° @ 8547'		
91.9° @ 8736'		
92.6° @ 8830'		
90.4° @ 8925'		
90.2° @ 9020'		
90.2° @ 9114'		

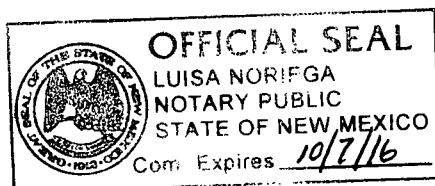
Drilling Contractor- UNITED DRILLING, INC.

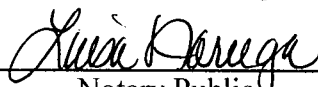
By: 
 (Angel Salazar)

Title: Vice President

Subscribed and sworn to before me this 6th day of October, 2014.

My Commission Expires:




 Notary Public
Charles NM
 County State

Company: Cog Operating LLC (Concho)
Lease/Well: Sam Adams 12 Federal Com LBB/4H



Rig Name: United 43
State/County: New Mexico/Eddy
Latitude: 32.85, Longitude: -104.04
GRID North is 0.16 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 12 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 10/2/2014 / 11:49

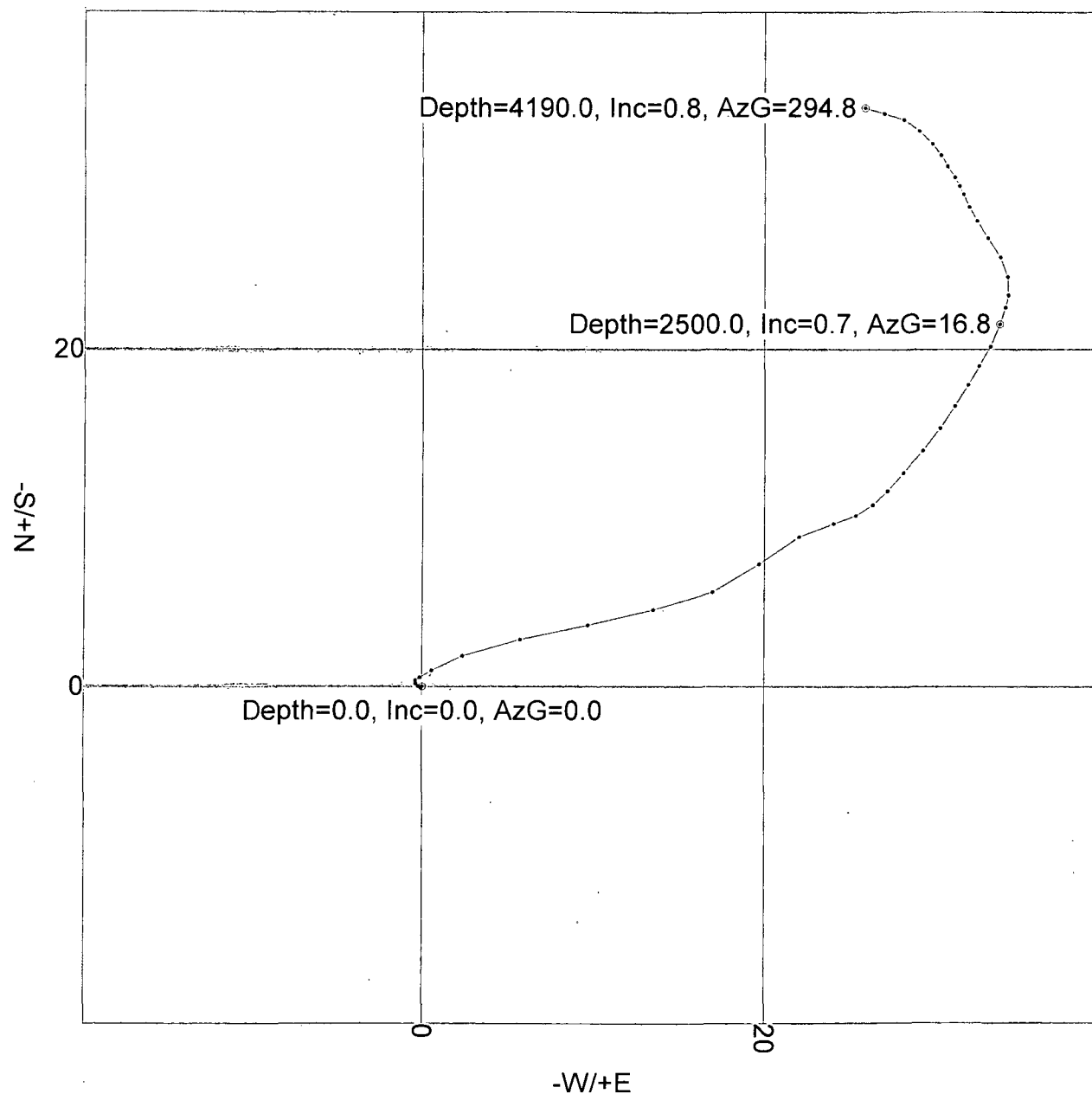
VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Sam Adams Federal Com LBB 4H / API 30-015-41618

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	0.07	224.98	100.00	-0.05	-0.05	-0.05	0.06	224.98	0.07
200.00	0.19	311.32	200.00	0.02	-0.21	0.02	0.22	274.84	0.20
300.00	0.07	319.10	300.00	0.18	-0.38	0.18	0.42	294.73	0.12
400.00	0.17	7.31	400.00	0.37	-0.40	0.37	0.55	312.49	0.13
500.00	0.28	85.37	500.00	0.54	-0.14	0.54	0.55	345.70	0.30
600.00	0.70	48.73	599.99	0.96	0.57	0.96	1.11	30.72	0.50
700.00	1.61	70.09	699.97	1.84	2.35	1.84	2.98	51.95	0.99
800.00	2.42	76.69	799.91	2.80	5.72	2.80	6.37	63.92	0.84
900.00	2.25	79.38	899.83	3.65	9.70	3.65	10.36	69.39	0.20
1000.00	2.25	73.79	999.75	4.56	13.51	4.56	14.26	71.37	0.22
1100.00	1.89	72.78	1099.69	5.59	16.97	5.59	17.87	71.76	0.37
1200.00	1.87	43.73	1199.63	7.26	19.67	7.26	20.97	69.75	0.94
1300.00	1.50	70.13	1299.59	8.88	22.03	8.88	23.76	68.04	0.85
1400.00	1.00	67.57	1399.57	9.66	24.07	9.66	25.93	68.13	0.51
1500.00	0.60	72.24	1499.56	10.15	25.37	10.15	27.33	68.19	0.40
1600.00	0.79	46.31	1599.55	10.79	26.37	10.79	28.49	67.75	0.36
1700.00	0.58	45.58	1699.54	11.62	27.23	11.62	29.61	66.89	0.21
1800.00	1.05	38.32	1799.53	12.69	28.16	12.69	30.89	65.73	0.48

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	0.94	43.11	1899.52	14.01	29.29	14.01	32.47	64.43	0.13
2000.00	0.98	32.48	1999.51	15.33	30.31	15.33	33.97	63.16	0.18
2100.00	0.82	33.47	2099.49	16.65	31.16	16.65	35.34	61.88	0.15
2200.00	0.86	29.59	2199.48	17.91	31.93	17.91	36.61	60.72	0.07
2300.00	0.63	34.80	2299.47	19.01	32.62	19.01	37.75	59.76	0.24
2400.00	0.90	26.65	2399.46	20.17	33.28	20.17	38.92	58.79	0.30
2500.00	0.74	16.84	2499.45	21.49	33.83	21.49	40.08	57.57	0.21
2600.00	0.44	20.86	2599.45	22.48	34.15	22.48	40.88	56.65	0.30
2700.00	0.43	3.40	2699.45	23.22	34.31	23.22	41.43	55.92	0.13
2800.00	0.81	354.12	2799.44	24.29	34.26	24.29	42.00	54.66	0.39
2900.00	0.67	323.62	2899.43	25.46	33.84	25.46	42.35	53.05	0.41
3000.00	0.87	329.75	2999.42	26.59	33.12	26.59	42.47	51.24	0.22
3100.00	0.51	324.08	3099.42	27.60	32.47	27.60	42.62	49.63	0.37
3200.00	0.59	336.05	3199.41	28.43	32.00	28.43	42.81	48.38	0.14
3300.00	0.37	334.04	3299.41	29.19	31.66	29.19	43.06	47.32	0.22
3400.00	0.25	336.36	3399.41	29.67	31.43	29.67	43.22	46.65	0.12
3500.00	0.44	329.37	3499.40	30.19	31.15	30.19	43.38	45.89	0.20
3600.00	0.45	323.96	3599.40	30.84	30.72	30.84	43.53	44.89	0.04
3700.00	0.42	339.74	3699.40	31.51	30.36	31.51	43.75	43.94	0.12
3800.00	0.59	311.78	3799.39	32.19	29.85	32.19	43.90	42.85	0.29
3900.00	0.64	316.27	3899.39	32.94	29.08	32.94	43.94	41.45	0.07
4000.00	0.67	297.79	3999.38	33.61	28.18	33.61	43.86	39.97	0.21
4100.00	0.73	277.63	4099.37	33.97	27.03	33.97	43.41	38.51	0.25
4190.00	0.78	294.82	4189.37	34.31	25.91	34.31	42.99	37.06	0.26



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Sam Adams Federal Com LBB 4H / API 30-015-41618



VES Survey Date: 09/22/2014

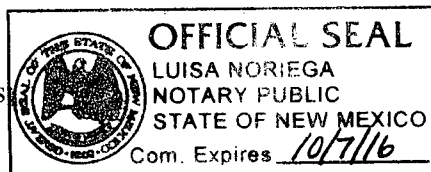
WELL NAME AND NUMBER Sam Adams 12 Federal Com UBB No. 4HLOCATION Section 12, T17S, R29E, Unit E, 2310 FNL, 230 FWL, Eddy CountyOPERATOR COG Operating LLCDRILLING CONTRACTOR United Drilling, Inc.

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
.5° @ 228'	16.7° @ 4481'	91.7° @ 6370'
.6° @ 615'	19.4° @ 4513'	90.8° @ 6464'
1° @ 1038'	22.7° @ 4544'	90.5° @ 6559'
1.8° @ 1273'	40.4° @ 4701'	90.9° @ 6654'
.8° @ 1366'	52.1° @ 4880'	91.0° @ 6748'
1.0° @ 1682'	67.3° @ 4986'	91.9° @ 6843'
.9° @ 1974'	72.4° @ 5049'	92.3° @ 6938'
.7° @ 2289'	75.5° @ 5080'	90.9° @ 7032'
1.1° @ 2699'	78.8° @ 5112'	90.5° @ 7127'
.5° @ 3098'	82.1° @ 5144'	91.3° @ 7221'
.6° @ 3541'	88.3° @ 5330'	90.6° @ 7316'
.8° @ 3983'	89.5° @ 5427'	89.5° @ 7410'
1.1° @ 4291'	90.2° @ 5613'	90.4° @ 7600'
1.0° @ 4323'	90.7° @ 5708'	90.6° @ 7694'
3.5° @ 4355'	91.6° @ 5803'	89.7° @ 7789'
7.0° @ 4386'	91.5° @ 5992'	88.4° @ 7884'
10.4° @ 4418'	91.9° @ 6087'	88.4° @ 7979'
14.1° @ 4449'	92.6° @ 6181'	90.9° @ 8073'

Drilling Contractor- UNITED DRILLING, INC.By: Angel Salazar
(Angel Salazar)Title: Vice PresidentSubscribed and sworn to before me this 6th day of October, 2014.Luisa Noriega
Notary PublicCharles NM
County State

My Commission Expires



COG OPERATING, LLC

Eddy County, NM

Sam Adams 12 Federal Com UBB 4H

4H

Lateral

Design: Surveys

Standard Survey Report

30 September, 2014

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 4H
Project:	Eddy County, NM	TVD Reference:	3646 GL+12'KB @ 3658'00usft (United 43)
Site:	Sam Adams 12 Federal Com UBB 4H	MD Reference:	3646 GL+12'KB @ 3658'00usft (United 43)
Well:	4H	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: Sam Adams 12 Federal Com UBB 4H					
Site Position:		Northing:	673,013.40 usft	Latitude:	32° 50' 59.44 N
From:	Map	Easting:	591,438.60 usft	Longitude:	104° 2' 8.11 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.16 °

Well	4H					
Well Position	+N/-S	0.00 usft	Northing:	673,013.40 usft	Latitude:	32° 50' 59.44 N
	+E/-W	0.00 usft	Easting:	591,438.60 usft	Longitude:	104° 2' 8.11 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,646.00 usft	

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/22/2014	7.80	60.70	48,540

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	89.95	

Survey Program		Date	9/30/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,247.00	Survey #1 (Lateral)	MWD+HDGM	OWSG MWD + HDGM	
9,314.00	9,314.00	Survey #2 (Lateral)	Project	Projection	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.07	224.98	100.00	-0.04	-0.04	-0.04	0.07	0.07	0.00
200.00	0.19	311.32	200.00	0.02	-0.21	-0.21	0.20	0.12	86.34
300.00	0.07	319.10	300.00	0.18	-0.38	-0.38	0.12	-0.12	7.78
400.00	0.17	7.31	400.00	0.37	-0.40	-0.40	0.13	0.10	48.21
500.00	0.28	85.37	500.00	0.54	-0.13	-0.13	0.30	0.11	78.06
600.00	0.70	48.73	600.00	0.96	0.57	0.57	0.50	0.42	-36.64
700.00	1.61	70.09	699.97	1.84	2.35	2.35	0.99	0.91	21.36
800.00	2.42	76.69	799.91	2.81	5.72	5.73	0.84	0.81	6.60
900.00	2.25	79.38	899.83	3.66	9.71	9.71	0.20	-0.17	2.69

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 4H:
Project:	Eddy County, NM	TVD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Site:	Sam Adams 12 Federal Com UBB 4H	MD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Well:	4H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM R5000.1 MULTI

Survey									
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)
1,000.00	2.25	73.79	999.75	4.56	13.52	13.53	0.22	0.00	-5.59
1,100.00	1.89	72.78	1,099.69	5.60	16.98	16.99	0.36	-0.36	-1.01
1,200.00	1.87	43.73	1,199.63	7.27	19.69	19.69	0.94	-0.02	-29.05
1,300.00	1.50	70.13	1,299.59	8.89	22.04	22.05	0.85	-0.37	26.40
1,400.00	1.00	67.57	1,399.57	9.67	24.08	24.09	0.50	-0.50	-2.56
1,500.00	0.60	72.24	1,499.56	10.16	25.39	25.40	0.40	-0.40	4.67
1,600.00	0.79	46.31	1,599.55	10.80	26.38	26.39	0.36	0.19	-25.93
1,700.00	0.58	45.58	1,699.54	11.63	27.24	27.25	0.21	-0.21	-0.73
1,800.00	1.05	38.32	1,799.53	12.70	28.17	28.18	0.48	0.47	-7.26
1,900.00	0.94	43.11	1,899.52	14.02	29.30	29.31	0.14	-0.11	4.79
2,000.00	0.98	32.48	1,999.50	15.34	30.32	30.34	0.18	0.04	-10.63
2,100.00	0.82	33.47	2,099.49	16.66	31.18	31.19	0.16	-0.16	0.99
2,200.00	0.86	29.59	2,199.48	17.91	31.94	31.96	0.07	0.04	-3.88
2,300.00	0.63	34.80	2,299.47	19.01	32.63	32.64	0.24	-0.23	5.21
2,400.00	0.90	26.65	2,399.46	20.17	33.29	33.31	0.29	0.27	-8.15
2,500.00	0.74	16.84	2,499.45	21.49	33.83	33.85	0.21	-0.16	-9.81
2,600.00	0.44	20.86	2,599.45	22.46	34.15	34.17	0.30	-0.30	4.02
2,700.00	0.43	3.40	2,699.45	23.20	34.31	34.33	0.13	-0.01	-17.46
2,800.00	0.81	354.12	2,799.44	24.27	34.26	34.29	0.39	0.38	-9.28
2,900.00	0.67	323.62	2,899.43	25.45	33.84	33.87	0.41	-0.14	-30.50
3,000.00	0.87	329.75	2,999.42	26.57	33.12	33.14	0.22	0.20	6.13
3,100.00	0.51	324.08	3,099.42	27.59	32.47	32.50	0.37	-0.36	-5.67
3,200.00	0.59	336.05	3,199.41	28.42	32.00	32.03	0.14	0.08	11.97
3,300.00	0.37	334.04	3,299.41	29.18	31.65	31.68	0.22	-0.22	-2.01
3,400.00	0.25	336.36	3,399.41	29.67	31.42	31.45	0.12	-0.12	2.32
3,500.00	0.44	329.37	3,499.40	30.20	31.14	31.17	0.19	0.19	-6.99
3,600.00	0.45	323.96	3,599.40	30.85	30.71	30.74	0.04	0.01	-5.41
3,700.00	0.42	339.74	3,699.40	31.51	30.35	30.38	0.12	-0.03	15.78
3,800.00	0.59	311.78	3,799.39	32.20	29.84	29.87	0.29	0.17	-27.96
3,900.00	0.64	316.27	3,899.39	32.94	29.07	29.10	0.07	0.05	4.49
4,000.00	0.67	297.79	3,999.38	33.62	28.17	28.20	0.21	0.03	-18.48
4,100.00	0.73	277.63	4,099.37	33.98	27.02	27.05	0.25	0.06	-20.16
4,190.00	0.78	294.82	4,189.37	34.31	25.90	25.93	0.26	0.06	19.10
4,260.00	1.00	278.50	4,259.36	34.60	24.86	24.89	0.48	0.31	-23.31
4,292.00	1.10	303.20	4,291.35	34.81	24.33	24.36	1.44	0.31	77.19
4,323.00	1.00	15.30	4,322.35	35.24	24.15	24.18	3.99	-0.32	232.58
4,355.00	3.50	58.60	4,354.32	36.01	25.06	25.09	8.92	7.81	135.31
4,386.00	7.00	66.40	4,385.19	37.26	27.60	27.63	11.50	11.29	25.16
4,418.00	10.40	70.20	4,416.82	39.02	32.10	32.14	10.77	10.63	11.88
4,449.00	14.10	71.50	4,447.11	41.17	38.32	38.36	11.97	11.94	4.19
4,481.00	16.70	69.00	4,477.95	44.05	46.31	46.35	8.38	8.13	-7.81
4,513.00	19.40	73.60	4,508.38	47.20	55.70	55.74	9.53	8.44	14.38
4,544.00	22.70	78.50	4,537.31	49.85	66.51	66.55	12.06	10.65	15.81

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well: 4H
Project:	Eddy County, NM	TVD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Site:	Sam Adams 12 Federal Com UBB 4H	MD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Well:	4H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM-R5000.1 MULT

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)
4,576.00	26.00	82.60	4,566.46	51.99	79.52	79.56	11.58	10.31	12.81
4,607.00	29.30	85.40	4,593.92	53.47	93.82	93.87	11.44	10.65	9.03
4,638.00	33.00	86.10	4,620.44	54.65	109.81	109.86	11.99	11.94	2.26
4,670.00	36.70	86.30	4,646.70	55.86	128.05	128.10	11.57	11.56	0.63
4,702.00	40.40	87.30	4,671.72	56.97	147.96	148.01	11.73	11.56	3.13
4,733.00	42.90	90.90	4,694.89	57.28	168.55	168.60	11.16	8.06	11.61
4,765.00	45.30	93.80	4,717.87	56.35	190.79	190.84	9.80	7.50	9.06
4,796.00	48.50	95.40	4,739.05	54.53	213.35	213.40	10.99	10.32	5.16
4,828.00	52.10	96.00	4,759.48	52.08	237.85	237.89	11.34	11.25	1.88
4,859.00	55.30	97.80	4,777.83	49.07	262.64	262.69	11.33	10.32	5.81
4,891.00	58.70	97.80	4,795.26	45.43	289.23	289.27	10.63	10.63	0.00
4,922.00	61.40	97.80	4,810.74	41.78	315.84	315.87	8.71	8.71	0.00
4,954.00	63.60	96.10	4,825.51	38.35	344.01	344.04	8.33	6.88	-5.31
4,986.00	67.30	93.90	4,838.81	35.83	373.00	373.03	13.14	11.56	-6.88
5,017.00	69.80	92.20	4,850.14	34.29	401.81	401.84	9.54	8.06	-5.48
5,049.00	72.40	92.50	4,860.51	33.05	432.05	432.08	8.17	8.13	0.94
5,080.00	75.50	92.20	4,869.08	31.83	461.82	461.85	10.04	10.00	-0.97
5,112.00	78.80	92.00	4,876.19	30.69	492.99	493.02	10.33	10.31	-0.63
5,144.00	82.10	93.20	4,881.50	29.26	524.51	524.54	10.96	10.31	3.75
5,175.00	84.90	95.30	4,885.01	26.97	555.22	555.25	11.26	9.03	6.77
5,235.00	87.20	99.50	4,889.14	19.26	614.56	614.58	7.97	3.83	7.00
5,330.00	88.30	97.50	4,892.87	5.23	708.44	708.44	2.40	1.16	-2.11
5,424.00	89.50	94.90	4,894.68	-4.92	801.86	801.86	3.05	1.28	-2.77
5,518.00	90.10	92.20	4,895.01	-10.74	895.67	895.66	2.94	0.64	-2.87
5,613.00	90.20	91.00	4,894.76	-13.39	990.63	990.62	1.27	0.11	-1.26
5,708.00	90.70	88.90	4,894.01	-13.31	1,085.63	1,085.61	2.27	0.53	-2.21
5,803.00	91.60	86.90	4,892.11	-9.83	1,180.54	1,180.53	2.31	0.95	-2.11
5,898.00	92.20	86.80	4,888.96	-4.61	1,275.34	1,275.34	0.64	0.63	-0.11
5,992.00	91.50	87.30	4,885.92	0.23	1,369.17	1,369.17	0.91	-0.74	0.53
6,087.00	91.90	86.70	4,883.10	5.20	1,463.99	1,464.00	0.76	0.42	-0.63
6,181.00	92.60	86.10	4,879.41	11.09	1,557.74	1,557.74	0.98	0.74	-0.64
6,276.00	91.70	87.30	4,875.85	16.56	1,652.51	1,652.52	1.58	-0.95	1.26
6,370.00	91.70	88.50	4,873.06	20.00	1,746.40	1,746.42	1.28	0.00	1.28
6,464.00	90.80	90.50	4,871.01	20.82	1,840.37	1,840.39	2.33	-0.96	2.13
6,559.00	90.50	89.50	4,869.93	20.82	1,935.36	1,935.38	1.10	-0.32	-1.05
6,654.00	90.90	88.90	4,868.77	22.15	2,030.35	2,030.36	0.76	0.42	-0.63
6,748.00	91.00	88.90	4,867.21	23.95	2,124.32	2,124.34	0.11	0.11	0.00
6,843.00	91.90	89.00	4,864.81	25.69	2,219.27	2,219.29	0.95	0.95	0.11
6,938.00	92.30	88.80	4,861.33	27.51	2,314.19	2,314.21	0.47	0.42	-0.21
7,032.00	90.90	88.90	4,858.70	29.40	2,408.13	2,408.15	1.49	-1.49	0.11
7,127.00	90.50	89.30	4,857.54	30.89	2,503.11	2,503.14	0.60	-0.42	0.42
7,221.00	91.30	89.40	4,856.07	31.96	2,597.09	2,597.12	0.86	0.85	0.11
7,316.00	90.60	90.20	4,854.49	32.29	2,692.08	2,692.10	1.12	-0.74	0.84

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well: 4H
Project:	Eddy County, NM	TVD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Site:	Sam Adams 12 Federal Com UBB 4H	MD Reference:	3646'GL+12'KB @ 3658.00usft (United 43)
Well:	4H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM: R5000: 1 MULTI

Survey										
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)	
7,410.00	89.50	90.50	4,854.41	31.72	2,786.07	2,786.10	1.21	-1.17	0.32	
7,505.00	90.20	90.30	4,854.66	31.05	2,881.07	2,881.10	0.77	0.74	-0.21	
7,600.00	90.40	89.50	4,854.16	31.22	2,976.07	2,976.09	0.87	0.21	-0.84	
7,694.00	90.60	88.90	4,853.34	32.53	3,070.05	3,070.08	0.67	0.21	-0.64	
7,789.00	89.70	89.10	4,853.09	34.19	3,165.04	3,165.07	0.97	-0.95	0.21	
7,884.00	88.40	91.10	4,854.67	34.02	3,260.02	3,260.05	2.51	-1.37	2.11	
7,979.00	88.40	91.20	4,857.32	32.12	3,354.96	3,354.99	0.11	0.00	0.11	
8,073.00	90.90	91.00	4,857.89	30.31	3,448.94	3,448.96	2.67	2.66	-0.21	
8,168.00	91.50	90.50	4,855.90	29.07	3,543.91	3,543.93	0.82	0.63	-0.53	
8,263.00	91.50	90.10	4,853.42	28.57	3,638.87	3,638.90	0.42	0.00	-0.42	
8,358.00	91.00	90.00	4,851.34	28.49	3,733.85	3,733.87	0.54	-0.53	-0.11	
8,452.00	91.00	89.60	4,849.70	28.82	3,827.83	3,827.86	0.43	0.00	-0.43	
8,547.00	91.00	89.60	4,848.05	29.48	3,922.82	3,922.84	0.00	0.00	0.00	
8,641.00	90.90	89.30	4,846.49	30.38	4,016.80	4,016.83	0.34	-0.11	-0.32	
8,736.00	91.90	91.50	4,844.17	29.72	4,111.76	4,111.79	2.54	1.05	2.32	
8,830.00	92.60	91.60	4,840.48	27.18	4,205.65	4,205.68	0.75	0.74	0.11	
8,925.00	90.40	90.60	4,837.99	25.36	4,300.60	4,300.62	2.54	-2.32	-1.05	
9,020.00	90.20	91.20	4,837.49	23.87	4,395.58	4,395.60	0.67	-0.21	0.63	
9,114.00	90.20	91.10	4,837.16	21.98	4,489.56	4,489.58	0.11	0.00	-0.11	
9,209.00	90.20	91.10	4,836.83	20.16	4,584.55	4,584.56	0.00	0.00	0.00	
9,247.00	90.40	91.30	4,836.63	19.36	4,622.54	4,622.55	0.74	0.53	0.53	
9,314.00	90.40	91.30	4,836.16	17.84	4,689.52	4,689.53	0.00	0.00	0.00	

Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Sam Adams 4H Surface	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	673,013.40	591,438.60	32° 50' 59.44 N	104° 2' 8.11 W
- Point										
Sam Adams 4H BHL	- actual wellpath hits target center	0.00	0.00	4,836.16	17.84	4,689.52	673,031.23	596,128.12	32° 50' 59.48 N	104° 1' 13.14 W
- Point										