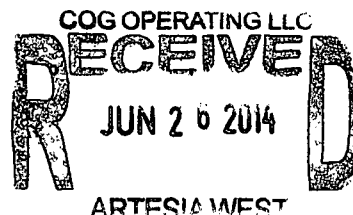


**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL



Well Name and Num: Crapshoot 13 Federal #1H
Location: Sec 24, T20S, R29E
Operator: COG
Drilling Contractor: McVay Drilling Company

30-015-42323

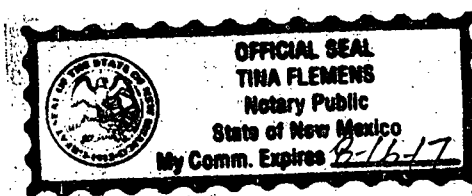
The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
1.60	391	0.50	6416	89.50	10618
0.90	504	0.30	6860	90.90	10905
1.90	1065	1.10	7398	89.90	11384
0.80	1222	0.70	7808	89.30	11862
1.50	1632	2.60	7840	90.10	12147
1.60	1760	3.30	7871	89.90	11384
0.60	2246	11.20	8003	89.30	11862
0.50	2498	13.80	8035	90.10	12147
0.30	2816	16.60	8067	90.90	12337
0.20	3228	29.30	8162	90.20	12811
1.60	3764	47.80	8289	89.40	13096
0.90	4018	66.20	8480		
0.60	4419	90.20	8797		
1.00	4979	90.10	9277		
0.80	5448	89.30	9660		
1.30	5797	90.90	9852		
1.00	6194	88.70	10235		

By: Andy Cross

Subscribed and sworn to before me this 24th day of June, 2014

Tina Flemens
Notary Public, Lea County, New Mexico





June 30, 2014

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

Attn: Kanicia Castillo

RE: Crapshoot 13 Federal No. 001H

Please find enclosed a copy of the survey from 0.00' to 7600.00' ran on the above referenced well.

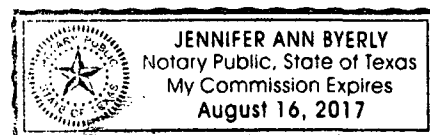
Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 30 day of June, A.D., 2014, by Keith Havelka.

Jennifer Ann Byerly
Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Crapshoot 13 Federal/001H
Location: Sec 24 T20S R29E
Rig Name: McVay 6
State/County: New Mexico/Eddy
Latitude: 32.57, Longitude: -104.02
GRID North is 0.17 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...shoot 13 fed #1h-de_01_int.ut

Minimum Curvature Method

Report Date/Time: 6/25/2014 / 10:54

VES Survey International

West Texas

432-563-5444

Surveyor: Chris Bankson

Crapshoot 13 Federal No 001H / API 30-015-42323

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	0.44	282.22	100.00	0.08	-0.38	0.08	0.39	282.22	0.44
200.00	0.89	204.45	199.99	-0.54	-1.08	-0.54	1.21	243.34	0.90
300.00	1.07	206.14	299.98	-2.08	-1.81	-2.08	2.76	220.96	0.19
400.00	1.25	197.83	399.96	-3.96	-2.56	-3.96	4.72	212.81	0.25
500.00	0.86	171.23	499.94	-5.75	-2.78	-5.75	6.38	205.78	0.62
600.00	0.47	134.62	599.94	-6.78	-2.37	-6.78	7.18	199.26	0.56
700.00	0.94	108.17	699.93	-7.32	-1.30	-7.32	7.44	190.07	0.56
800.00	1.41	81.72	799.91	-7.40	0.69	-7.40	7.43	174.66	0.70
900.00	1.55	80.37	899.87	-7.00	3.24	-7.00	7.71	155.16	0.15
1000.00	1.70	79.03	999.83	-6.49	6.03	-6.49	8.85	137.12	0.15
1100.00	1.62	69.71	1099.79	-5.72	8.80	-5.72	10.50	123.01	0.28
1200.00	1.54	60.40	1199.75	-4.56	11.30	-4.56	12.18	112.00	0.27
1300.00	1.04	22.79	1299.73	-3.06	12.82	-3.06	13.18	103.44	0.96
1400.00	0.54	335.18	1399.72	-1.80	12.97	-1.80	13.10	97.91	0.78
1500.00	1.11	308.91	1499.71	-0.77	12.02	-0.77	12.05	93.65	0.67
1600.00	1.68	282.63	1599.68	0.16	9.83	0.16	9.84	89.06	0.84
1700.00	1.77	282.11	1699.64	0.81	6.89	0.81	6.94	83.32	0.09
1800.00	1.86	281.58	1799.59	1.46	3.79	1.46	4.06	68.95	0.09

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	1.52	279.98	1899.54	2.01	0.89	2.01	2.20	23.83	0.35
2000.00	1.17	278.38	1999.51	2.39	-1.43	2.39	2.79	329.13	0.35
2100.00	0.79	283.19	2099.50	2.70	-3.12	2.70	4.12	310.89	0.39
2200.00	0.41	287.99	2199.49	2.97	-4.13	2.97	5.08	305.70	0.39
2300.00	0.37	289.25	2299.49	3.18	-4.77	3.18	5.73	303.71	0.04
2400.00	0.32	290.51	2399.49	3.39	-5.34	3.39	6.32	302.40	0.04
2500.00	0.33	353.58	2499.49	3.77	-5.63	3.77	6.78	303.81	0.34
2600.00	0.34	56.66	2599.49	4.22	-5.42	4.22	6.87	307.89	0.35
2700.00	0.29	58.91	2699.49	4.51	-4.96	4.51	6.70	312.27	0.05
2800.00	0.24	61.17	2799.48	4.74	-4.57	4.74	6.58	316.06	0.05
2900.00	0.43	85.31	2899.48	4.87	-4.01	4.87	6.30	320.55	0.24
3000.00	0.63	109.44	2999.48	4.72	-3.11	4.72	5.65	326.60	0.29
3100.00	0.63	116.63	3099.47	4.29	-2.10	4.29	4.77	333.91	0.08
3200.00	0.63	123.82	3199.47	3.74	-1.15	3.74	3.91	342.85	0.08
3300.00	0.50	118.87	3299.46	3.22	-0.31	3.22	3.23	354.46	0.13
3400.00	0.38	113.92	3399.46	2.87	0.38	2.87	2.90	7.46	0.13
3500.00	0.32	113.33	3499.46	2.63	0.93	2.63	2.79	19.52	0.06
3600.00	0.25	112.74	3599.46	2.43	1.39	2.43	2.80	29.69	0.06
3700.00	0.17	120.09	3699.46	2.27	1.72	2.27	2.85	37.08	0.09
3800.00	0.09	127.45	3799.45	2.15	1.91	2.15	2.88	41.58	0.08
3900.00	0.12	166.60	3899.45	2.01	1.99	2.01	2.83	44.84	0.07
4000.00	0.14	205.75	3999.45	1.79	1.96	1.79	2.66	47.59	0.09
4100.00	0.14	268.36	4099.45	1.68	1.79	1.68	2.45	46.80	0.15
4200.00	0.14	330.98	4199.45	1.78	1.61	1.78	2.40	42.05	0.14
4300.00	0.26	348.30	4299.45	2.11	1.50	2.11	2.59	35.48	0.13
4400.00	0.38	5.63	4399.45	2.66	1.49	2.66	3.04	29.25	0.15
4500.00	0.61	2.06	4499.45	3.52	1.54	3.52	3.84	23.62	0.24
4600.00	0.85	358.49	4599.44	4.79	1.54	4.79	5.03	17.81	0.24
4700.00	1.02	2.60	4699.43	6.41	1.56	6.41	6.60	13.67	0.18
4800.00	1.18	6.72	4799.41	8.33	1.72	8.33	8.50	11.68	0.19
4900.00	1.14	7.00	4899.39	10.34	1.96	10.34	10.53	10.75	0.04
5000.00	1.11	7.29	4999.37	12.29	2.21	12.29	12.49	10.18	0.04
5100.00	1.22	7.21	5099.35	14.31	2.46	14.31	14.52	9.77	0.12
5200.00	1.34	7.14	5199.32	16.52	2.74	16.52	16.75	9.43	0.12
5300.00	1.12	4.41	5299.30	18.66	2.96	18.66	18.89	9.03	0.23
5400.00	0.90	1.67	5399.28	20.41	3.06	20.41	20.64	8.53	0.23
5500.00	1.09	3.98	5499.27	22.13	3.15	22.13	22.36	8.10	0.19
5600.00	1.28	6.28	5599.25	24.18	3.34	24.18	24.41	7.86	0.20
5700.00	1.22	6.02	5699.22	26.35	3.57	26.35	26.59	7.72	0.06

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	1.16	5.76	5799.20	28.41	3.78	28.41	28.66	7.59	0.06
5900.00	1.05	1.35	5899.18	30.33	3.91	30.33	30.58	7.34	0.14
6000.00	0.94	356.94	5999.17	32.07	3.88	32.07	32.30	6.91	0.13
6100.00	0.91	355.92	6099.16	33.68	3.78	33.68	33.89	6.41	0.03
6200.00	0.89	354.90	6199.14	35.25	3.66	35.25	35.44	5.92	0.03
6300.00	0.77	357.26	6299.13	36.70	3.56	36.70	36.87	5.54	0.12
6400.00	0.66	359.63	6399.13	37.95	3.52	37.95	38.11	5.30	0.12
6500.00	0.63	341.23	6499.12	39.04	3.34	39.04	39.19	4.89	0.21
6600.00	0.61	322.84	6599.11	39.99	2.84	39.99	40.10	4.06	0.20
6700.00	0.58	305.31	6699.11	40.71	2.10	40.71	40.77	2.96	0.18
6800.00	0.55	287.78	6799.10	41.15	1.24	41.15	41.17	1.72	0.17
6900.00	0.60	285.00	6899.10	41.43	0.27	41.43	41.43	0.38	0.06
7000.00	0.65	282.21	6999.09	41.69	-0.79	41.69	41.70	358.92	0.06
7100.00	0.57	330.25	7099.09	42.24	-1.59	42.24	42.27	357.85	0.50
7200.00	0.49	18.29	7199.08	43.09	-1.70	43.09	43.12	357.74	0.44
7300.00	0.91	39.14	7299.08	44.11	-1.07	44.11	44.12	358.62	0.48
7400.00	1.33	60.00	7399.06	45.31	0.44	45.31	45.31	0.55	0.57
7500.00	1.02	68.53	7499.04	46.21	2.27	46.21	46.27	2.81	0.35
7600.00	0.71	77.06	7599.02	46.67	3.70	46.67	46.82	4.53	0.33



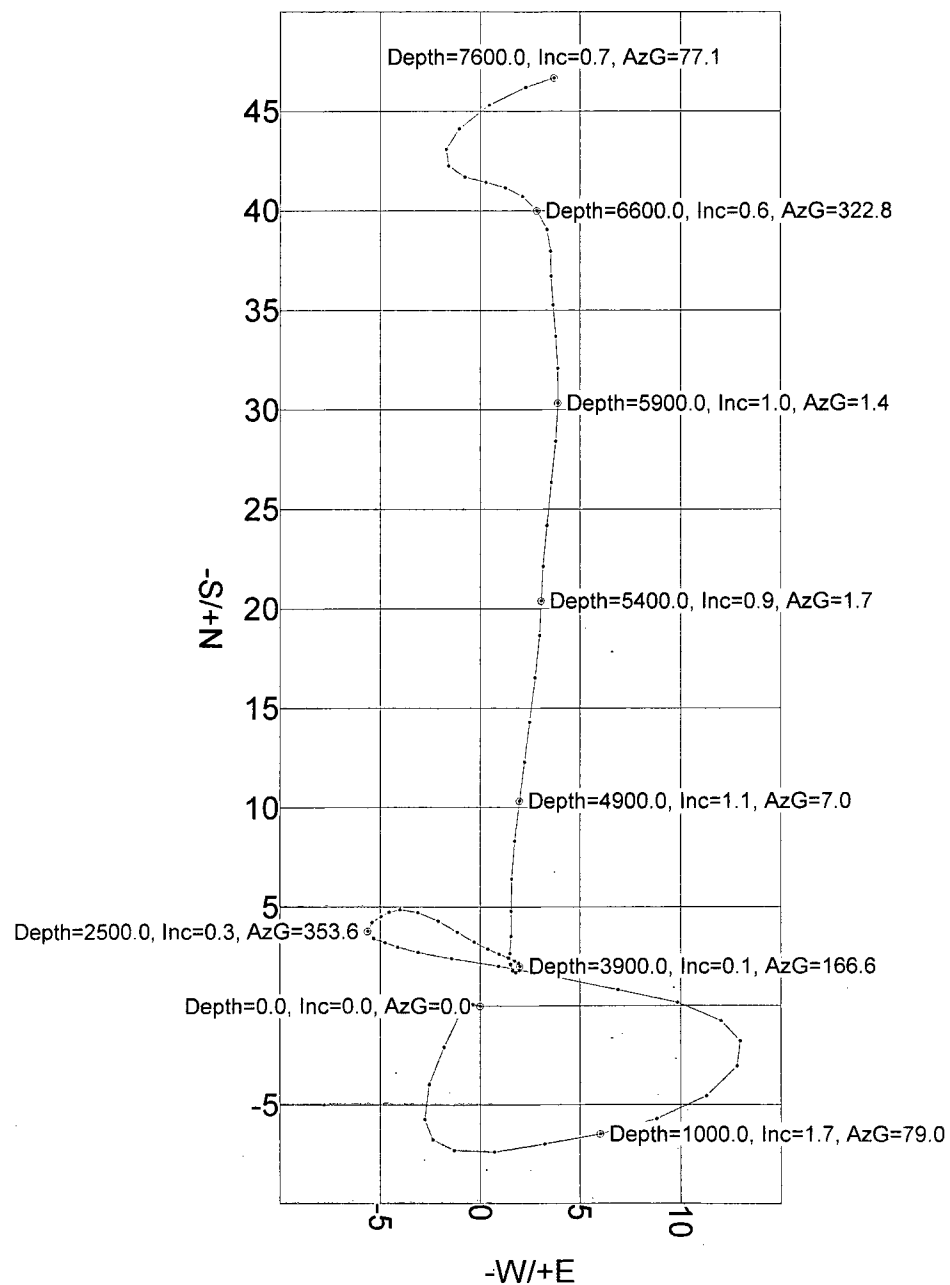
VES Survey International

West Texas

432-563-5444

Surveyor: Chris Bankson

Crapshoot 13 Federal No 001H / API 30-015-42323



VES Survey Date: 06/11/2014



COG Operating, LLC

Final Well Report

**Crapshoot 13 Fed 1H
Eddy County, New Mexico**

Prepared for Mr. Braxton Minor

Archer

Archer Directional Drilling Services LLC
Archer – The Well Company
12101 Cutten Road
Houston, TX 77066
USA
archerwell.com

June 25, 2014

Mr. Braxton Minor
COG Operating, LLC
2208 W. Main Street
Artesia, New Mexico 88210-3720

**Re: Final Directional Report
Crapshoot 13 Fed 1H
Eddy County, New Mexico**

Mr. Braxton Minor,

Included in this report are a directional comparison plot and final survey report, daily directional drilling reports, and final BHA reports.

The report covers the following:

Archer Job # 433-1-14-0052 from June 12, 2014 to June 19, 2014.

Drilling start depth of 7797' MD to 13383' total measured depth.

We appreciate you giving Archer Directional Drilling Services LLC the opportunity to do business with you and look forward to working with you in the future.

If you have any questions or needs please do not hesitate to contact me at the Houston office at 281-301-2600 or on my cell phone at 940-395-9690.

Regards,

Kip Myers
Sr. Account Manager

KM/ar

The logo for Archer Directional Drilling Services LLC, featuring the word "Archer" in a large, bold, serif font with a textured, metallic appearance.

Section One

Directional Comparison Plot

Actual vs. Proposed

COG OPERATING, LLC

Field: Eddy County, NM
Site: Crapshoot 13 Fed 1H
Well: 1H
Wellbore: Lateral
Plan: Surveys



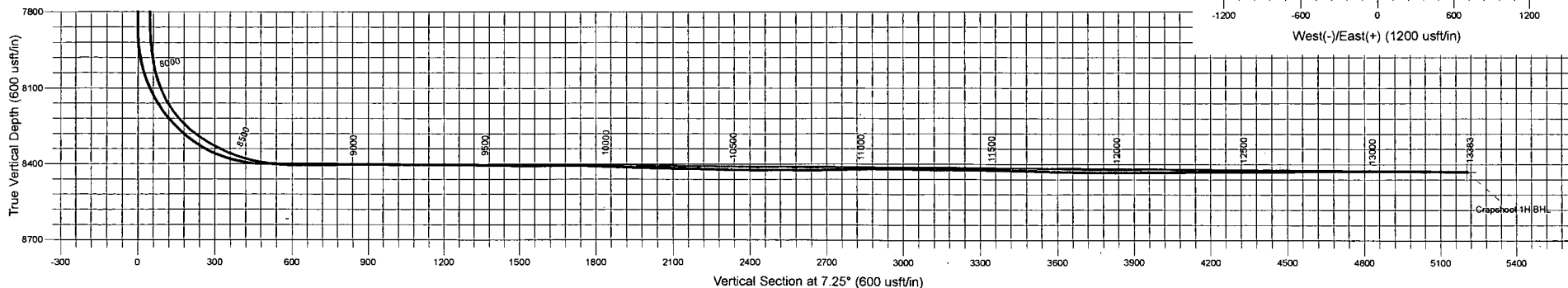
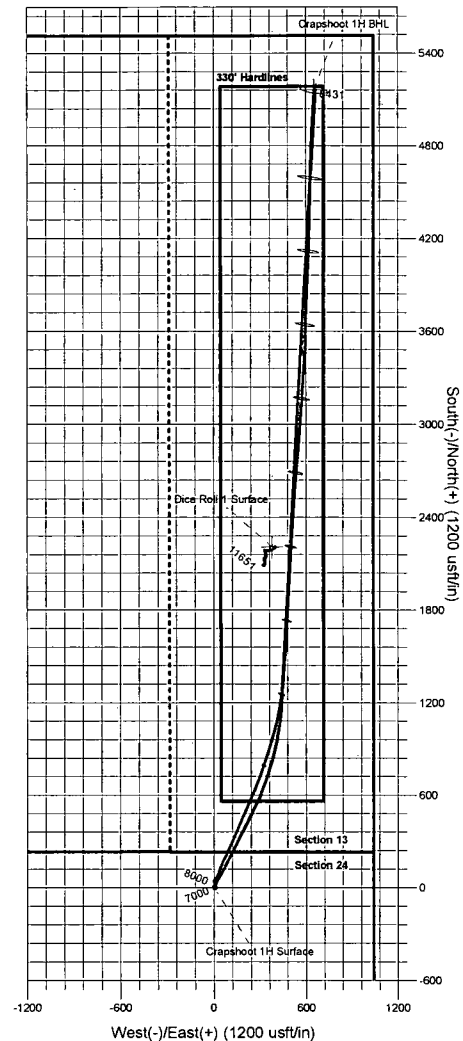
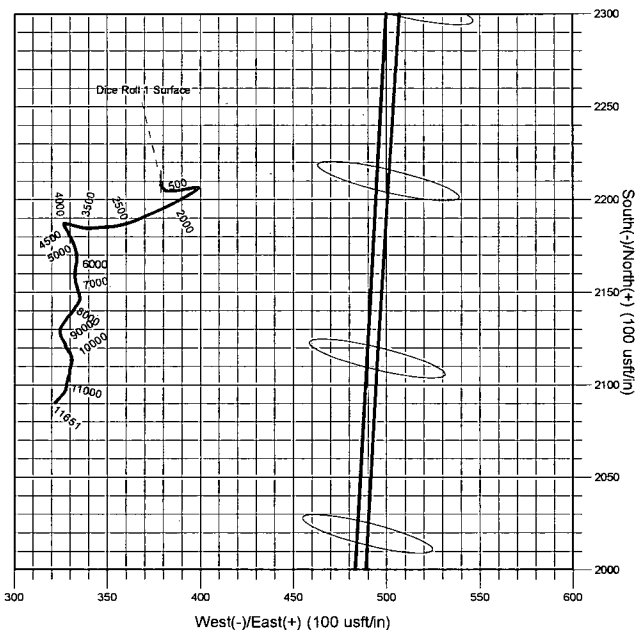
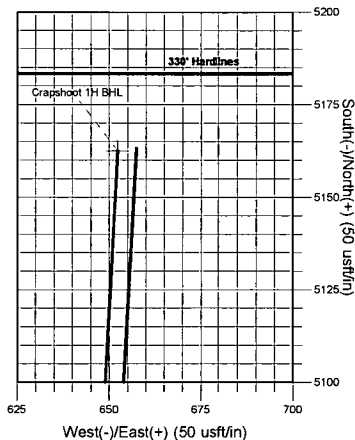
LEGEND

- Dice Roll Federal Com 1, Original Hole, Surveys V0
- 1H, Lateral, Plan #4 V0
- Surveys



Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.29°

Magnetic Field
Strength: 48477.5nT
Dip Angle: 60.35°
Date: 5/30/2014
Model: IGRF2010



Archer

ARCHER DIRECTIONAL DRILLING SERVICES
12101 Cutten Rd. Houston, Texas 77066
Phone: 281-301-2600 Fax: 281-301-2795

Design: Surveys (1H/Lateral)
Created By: Ivonne Gonzalez
Date: 15/17, June 25 2014

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM	TVD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Site:	Crapshoot 13 Fed 1H	MD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Well:	1H	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	Crapshoot 13 Fed 1H		
Site Position:		Northing:	569,535.40 usft
From:	Map	Easting:	595,669.30 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32° 33' 55.35 N
		Longitude:	104° 1' 22.07 W
		Grid Convergence:	0.17 °

Well	1H		
Well Position	+N/-S	0.00 usft	Northing: 569,535.40 usft
	+E/-W	0.00 usft	Easting: 595,669.30 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 33' 55.35 N
		Longitude:	104° 1' 22.07 W
		Ground Level:	3,320.00 usft

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	5/30/2014	7.46	60.35	48,478

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	7.25	

Survey Program	Date	6/25/2014			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	7,600.00	Survey #1 (Lateral)	Gyroscope	Gyroscope	
7,745.00	13,191.00	Survey #2 (Lateral)	MWD - Std	MWD - Standard	
13,383.00	13,383.00	Survey #3 (Lateral)	Project	Projection	

Survey										
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	0.44	282.22	100.00	0.08	-0.38	0.03	0.44	0.44	0.00	
200.00	0.89	204.45	199.99	-0.54	-1.07	-0.68	0.91	0.45	-77.77	
300.00	1.07	206.14	299.98	-2.09	-1.80	-2.30	0.18	0.18	1.69	
400.00	1.25	197.83	399.96	-3.97	-2.55	-4.26	0.25	0.18	-8.31	
500.00	0.86	171.23	499.94	-5.75	-2.77	-6.05	0.62	-0.39	-26.60	
600.00	0.47	134.62	599.94	-6.78	-2.36	-7.02	0.56	-0.39	-36.61	
700.00	0.94	108.17	699.93	-7.32	-1.29	-7.42	0.56	0.47	-26.45	
800.00	1.41	81.72	799.91	-7.40	0.70	-7.25	0.71	0.47	-26.45	

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM	TVD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Site:	Crapshoot 13 Fed 1H	MD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Well:	1H	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)
900.00	1.55	80.37	899.87	-7.00	3.26	-6.53	0.14	0.14	-1.35
1,000.00	1.70	79.03	999.83	-6.49	6.05	-5.67	0.15	0.15	-1.34
1,100.00	1.62	69.71	1,099.79	-5.71	8.83	-4.55	0.28	-0.08	-9.32
1,200.00	1.54	60.40	1,199.75	-4.56	11.32	-3.10	0.27	-0.08	-9.31
1,300.00	1.04	22.79	1,299.73	-3.06	12.84	-1.41	0.96	-0.50	-37.61
1,400.00	0.54	335.18	1,399.72	-1.80	13.00	-0.14	0.78	-0.50	-47.61
1,500.00	1.11	308.91	1,499.71	-0.76	12.04	0.77	0.67	0.57	-26.27
1,600.00	1.68	282.63	1,599.68	0.17	9.86	1.41	0.84	0.57	-26.28
1,700.00	1.77	282.11	1,699.64	0.81	6.92	1.68	0.09	0.09	-0.52
1,800.00	1.86	281.58	1,799.59	1.46	3.82	1.93	0.09	0.09	-0.53
1,900.00	1.52	279.98	1,899.54	2.02	0.92	2.12	0.34	-0.34	-1.60
2,000.00	1.17	278.38	1,999.51	2.40	-1.39	2.20	0.35	-0.35	-1.60
2,100.00	0.79	283.19	2,099.50	2.70	-3.07	2.29	0.39	-0.38	4.81
2,200.00	0.41	287.99	2,199.49	2.97	-4.09	2.43	0.38	-0.38	4.80
2,300.00	0.37	289.25	2,299.49	3.19	-4.73	2.57	0.04	-0.04	1.26
2,400.00	0.32	290.51	2,399.49	3.39	-5.30	2.70	0.05	-0.05	1.26
2,500.00	0.33	353.58	2,499.49	3.78	-5.59	3.04	0.34	0.01	63.07
2,600.00	0.34	56.66	2,599.49	4.23	-5.38	3.51	0.35	0.01	63.08
2,700.00	0.29	58.91	2,699.49	4.52	-4.91	3.86	0.05	-0.05	2.25
2,800.00	0.24	61.17	2,799.48	4.75	-4.51	4.14	0.05	-0.05	2.26
2,900.00	0.43	85.31	2,899.48	4.88	-3.95	4.35	0.23	0.19	24.14
3,000.00	0.63	109.44	2,999.48	4.73	-3.06	4.31	0.30	0.20	24.13
3,100.00	0.63	116.63	3,099.47	4.30	-2.05	4.01	0.08	0.00	7.19
3,200.00	0.63	123.82	3,199.47	3.75	-1.10	3.58	0.08	0.00	7.19
3,300.00	0.50	118.87	3,299.46	3.23	-0.26	3.17	0.14	-0.13	-4.95
3,400.00	0.38	113.92	3,399.46	2.89	0.42	2.92	0.13	-0.12	-4.95
3,500.00	0.32	113.33	3,499.46	2.64	0.98	2.75	0.06	-0.06	-0.59
3,600.00	0.25	112.74	3,599.46	2.45	1.44	2.61	0.07	-0.07	-0.59
3,700.00	0.17	120.09	3,699.46	2.29	1.77	2.49	0.08	-0.08	7.35
3,800.00	0.09	127.45	3,799.45	2.17	1.96	2.40	0.08	-0.08	7.36
3,900.00	0.12	166.60	3,899.45	2.02	2.05	2.26	0.08	0.03	39.15
4,000.00	0.14	205.75	3,999.45	1.81	2.02	2.05	0.09	0.02	39.15
4,100.00	0.14	268.36	4,099.45	1.69	1.84	1.91	0.15	0.00	62.61
4,200.00	0.14	330.98	4,199.45	1.80	1.66	1.99	0.15	0.00	62.62
4,300.00	0.26	348.30	4,299.45	2.12	1.55	2.30	0.13	0.12	17.32
4,400.00	0.38	5.63	4,399.45	2.68	1.54	2.85	0.15	0.12	17.33
4,500.00	0.61	2.06	4,499.45	3.54	1.59	3.71	0.23	0.23	-3.57
4,600.00	0.85	358.49	4,599.44	4.81	1.59	4.97	0.24	0.24	-3.57
4,700.00	1.02	2.60	4,699.43	6.44	1.61	6.59	0.18	0.17	4.11
4,800.00	1.18	6.72	4,799.41	8.35	1.77	8.51	0.18	0.16	4.12
4,900.00	1.14	7.00	4,899.39	10.36	2.02	10.54	0.04	-0.04	0.28
5,000.00	1.11	7.29	4,999.37	12.31	2.26	12.50	0.03	-0.03	0.29
5,100.00	1.22	7.21	5,099.35	14.33	2.52	14.53	0.11	0.11	-0.08

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM	TVD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Site:	Crapshoot 13 Fed 1H	MD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Well:	1H	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)
5,200.00	1.34	7.14	5,199.32	16.55	2.80	16.77	0.12	0.12	-0.07
5,300.00	1.12	4.41	5,299.30	18.68	3.02	18.91	0.23	-0.22	-2.73
5,400.00	0.90	1.67	5,399.28	20.44	3.11	20.67	0.23	-0.22	-2.74
5,500.00	1.09	3.98	5,499.27	22.17	3.20	22.40	0.19	0.19	2.31
5,600.00	1.28	6.28	5,599.25	24.23	3.39	24.47	0.20	0.19	2.30
5,700.00	1.22	6.02	5,699.22	26.40	3.63	26.65	0.06	-0.06	-0.26
5,800.00	1.16	5.76	5,799.20	28.47	3.84	28.72	0.06	-0.06	-0.26
5,900.00	1.05	1.35	5,899.18	30.39	3.96	30.65	0.14	-0.11	-4.41
6,000.00	0.94	356.94	5,999.17	32.13	3.94	32.37	0.13	-0.11	-4.41
6,100.00	0.91	355.92	6,099.16	33.74	3.84	33.95	0.03	-0.03	-1.02
6,200.00	0.89	354.90	6,199.14	35.30	3.71	35.49	0.03	-0.02	-1.02
6,300.00	0.77	357.26	6,299.13	36.75	3.61	36.91	0.12	-0.12	2.36
6,400.00	0.66	359.63	6,399.12	37.99	3.58	38.14	0.11	-0.11	2.37
6,500.00	0.63	341.23	6,499.12	39.09	3.40	39.21	0.21	-0.03	-18.40
6,600.00	0.61	322.84	6,599.11	40.04	2.90	40.08	0.20	-0.02	-18.39
6,700.00	0.58	305.31	6,699.11	40.75	2.16	40.70	0.18	-0.03	-17.53
6,800.00	0.55	287.78	6,799.10	41.19	1.29	41.03	0.17	-0.03	-17.53
6,900.00	0.60	285.00	6,899.10	41.47	0.33	41.18	0.06	0.05	-2.78
7,000.00	0.65	282.21	6,999.09	41.73	-0.73	41.30	0.06	0.05	-2.79
7,100.00	0.57	330.25	7,099.09	42.28	-1.53	41.75	0.50	-0.08	48.04
7,200.00	0.49	18.29	7,199.08	43.12	-1.64	42.57	0.44	-0.08	48.04
7,300.00	0.91	39.14	7,299.08	44.14	-1.01	43.66	0.48	0.42	20.85
7,400.00	1.33	60.00	7,399.06	45.34	0.50	45.04	0.58	0.42	20.86
7,500.00	1.02	68.53	7,499.04	46.24	2.33	46.17	0.36	-0.31	8.53
7,600.00	0.71	77.06	7,599.02	46.71	3.76	46.81	0.33	-0.31	8.53
7,745.00	0.70	149.60	7,744.02	46.14	5.09	46.42	0.58	-0.01	50.03
7,776.00	1.00	165.10	7,775.01	45.72	5.25	46.02	1.21	0.97	50.00
7,808.00	0.70	72.40	7,807.01	45.51	5.51	45.84	3.90	-0.94	-289.69
7,840.00	2.60	54.80	7,839.00	45.99	6.29	46.41	6.08	5.94	-55.00
7,871.00	3.30	63.00	7,869.95	46.80	7.66	47.39	2.63	2.26	26.45
7,908.00	4.50	40.40	7,906.87	48.39	9.55	49.20	5.21	3.24	-61.08
7,940.00	6.30	33.00	7,938.73	50.81	11.32	51.84	6.02	5.63	-23.13
7,972.00	8.40	25.30	7,970.46	54.40	13.27	55.64	7.23	6.56	-24.06
8,003.00	11.20	21.60	8,001.01	59.25	15.35	60.71	9.25	9.03	-11.94
8,035.00	13.80	20.50	8,032.25	65.71	17.83	67.44	8.16	8.13	-3.44
8,067.00	16.60	21.20	8,063.12	73.55	20.82	75.59	8.77	8.75	2.19
8,098.00	20.20	22.00	8,092.53	82.65	24.43	85.07	11.64	11.61	2.58
8,130.00	25.00	21.20	8,122.07	94.08	28.95	96.98	15.03	15.00	-2.50
8,162.00	29.30	20.60	8,150.54	107.72	34.15	111.17	13.46	13.44	-1.88
8,194.00	33.70	20.10	8,177.81	123.39	39.96	127.45	13.77	13.75	-1.56
8,225.00	38.30	21.50	8,202.89	140.42	46.44	145.15	15.07	14.84	4.52
8,257.00	42.90	24.00	8,227.18	159.60	54.51	165.21	15.25	14.38	7.81
8,289.00	47.80	25.40	8,249.66	180.28	64.03	186.91	15.62	15.31	4.38

Archer Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM	TVD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Site:	Crapshoot 13 Fed 1H	MD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Well:	1H	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)	
8,321.00	52.40	25.00	8,270.18	202.48	74.48	210.26	14.41	14.38	-1.25	
8,353.00	55.90	24.30	8,288.92	226.05	85.29	235.01	11.08	10.94	-2.19	
8,384.00	58.40	23.80	8,305.74	249.84	95.90	259.94	8.18	8.06	-1.61	
8,416.00	60.80	23.50	8,321.93	275.12	106.97	286.42	7.54	7.50	-0.94	
8,448.00	63.50	23.20	8,336.87	301.09	118.18	313.60	8.48	8.44	-0.94	
8,480.00	66.20	23.20	8,350.47	327.71	129.59	341.45	8.44	8.44	0.00	
8,512.00	69.40	23.70	8,362.56	354.89	141.38	369.89	10.10	10.00	1.56	
8,544.00	72.30	24.60	8,373.06	382.47	153.75	398.81	9.44	9.06	2.81	
8,576.00	75.00	24.70	8,382.07	410.37	166.56	428.11	8.44	8.44	0.31	
8,608.00	77.80	24.30	8,389.59	438.67	179.45	457.81	8.83	8.75	-1.25	
8,640.00	80.60	23.50	8,395.59	467.41	192.18	487.92	9.09	8.75	-2.50	
8,672.00	83.60	22.80	8,399.98	496.55	204.64	518.40	9.62	9.38	-2.19	
8,703.00	86.60	22.50	8,402.63	525.05	216.54	548.18	9.73	9.68	-0.97	
8,799.00	90.20	22.40	8,405.31	613.73	253.18	640.77	3.75	3.75	-0.10	
8,895.00	90.90	21.40	8,404.39	702.79	288.98	733.64	1.27	0.73	-1.04	
8,991.00	90.70	19.40	8,403.05	792.76	322.44	827.11	2.09	-0.21	-2.08	
9,086.00	90.10	17.70	8,402.39	882.82	352.66	920.26	1.90	-0.63	-1.79	
9,182.00	89.50	15.50	8,402.72	974.81	380.08	1,014.98	2.38	-0.63	-2.29	
9,277.00	90.10	12.90	8,403.05	1,066.90	403.38	1,109.27	2.81	0.63	-2.74	
9,373.00	89.80	10.50	8,403.14	1,160.90	422.85	1,204.98	2.52	-0.31	-2.50	
9,469.00	89.20	8.30	8,403.97	1,255.60	438.53	1,300.90	2.38	-0.63	-2.29	
9,564.00	88.60	4.90	8,405.80	1,349.94	449.44	1,395.86	3.63	-0.63	-3.58	
9,660.00	89.30	3.40	8,407.56	1,445.66	456.39	1,491.70	1.72	0.73	-1.56	
9,756.00	89.90	3.40	8,408.23	1,541.49	462.08	1,587.48	0.63	0.63	0.00	
9,852.00	90.90	4.00	8,407.56	1,637.29	468.28	1,683.29	1.21	1.04	0.63	
9,947.00	87.90	4.30	8,408.55	1,732.02	475.15	1,778.14	3.17	-3.16	0.32	
10,043.00	87.90	2.60	8,412.07	1,827.78	480.92	1,873.86	1.77	0.00	-1.77	
10,139.00	88.30	2.50	8,415.25	1,923.63	485.19	1,969.48	0.43	0.42	-0.10	
10,235.00	88.70	3.00	8,417.77	2,019.49	489.80	2,065.16	0.67	0.42	0.52	
10,330.00	88.90	3.30	8,419.76	2,114.32	495.02	2,159.89	0.38	0.21	0.32	
10,426.00	89.00	3.90	8,421.52	2,210.12	501.04	2,255.68	0.63	0.10	0.63	
10,521.00	89.10	3.40	8,423.09	2,304.91	507.09	2,350.48	0.54	0.11	-0.53	
10,618.00	89.50	3.90	8,424.28	2,401.71	513.27	2,447.28	0.66	0.41	0.52	
10,713.00	89.90	4.00	8,424.77	2,496.48	519.81	2,542.12	0.43	0.42	0.11	
10,809.00	90.30	4.00	8,424.61	2,592.25	526.51	2,637.97	0.42	0.42	0.00	
10,905.00	90.90	4.50	8,423.60	2,687.98	533.62	2,733.83	0.81	0.63	0.52	
11,001.00	91.50	4.70	8,421.59	2,783.65	541.32	2,829.70	0.66	0.63	0.21	
11,096.00	90.20	5.50	8,420.18	2,878.26	549.76	2,924.62	1.61	-1.37	0.84	
11,192.00	88.40	3.70	8,421.35	2,973.93	557.46	3,020.51	2.65	-1.88	-1.88	
11,288.00	89.10	4.10	8,423.45	3,069.69	563.99	3,116.32	0.84	0.73	0.42	
11,384.00	89.90	4.30	8,424.29	3,165.42	571.02	3,212.18	0.86	0.83	0.21	
11,479.00	89.50	3.20	8,424.78	3,260.22	577.23	3,307.00	1.23	-0.42	-1.16	
11,575.00	89.00	3.20	8,426.04	3,356.06	582.59	3,402.75	0.52	-0.52	0.00	
11,670.00	88.20	2.00	8,428.36	3,450.93	586.90	3,497.41	1.52	-0.84	-1.26	

Archer

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM	TVD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Site:	Crapshoot 13 Fed 1H	MD Reference:	3320'GL+19'KB @ 3339.00usft (Planning)
Well:	1H	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)	
11,734.00	88.60	1.90	8,430.15	3,514.87	589.07	3,561.11	0.64	0.63	-0.16	
11,862.00	89.30	2.10	8,432.49	3,642.77	593.54	3,688.55	0.57	0.55	0.16	
11,957.00	89.80	2.50	8,433.24	3,737.69	597.35	3,783.19	0.67	0.53	0.42	
12,052.00	90.30	2.70	8,433.16	3,832.59	601.66	3,877.88	0.57	0.53	0.21	
12,147.00	90.10	2.60	8,432.82	3,927.49	606.06	3,972.57	0.24	-0.21	-0.11	
12,242.00	90.30	2.00	8,432.49	4,022.41	609.87	4,067.22	0.67	0.21	-0.63	
12,337.00	90.90	2.20	8,431.50	4,117.34	613.35	4,161.83	0.67	0.63	0.21	
12,432.00	89.80	1.70	8,430.92	4,212.28	616.58	4,256.42	1.27	-1.16	-0.53	
12,527.00	90.10	1.30	8,431.00	4,307.25	619.07	4,350.94	0.53	0.32	-0.42	
12,621.00	90.40	1.40	8,430.59	4,401.22	621.28	4,444.44	0.34	0.32	0.11	
12,716.00	90.90	1.40	8,429.51	4,496.19	623.60	4,538.94	0.53	0.53	0.00	
12,811.00	90.20	1.70	8,428.60	4,591.15	626.17	4,633.46	0.80	-0.74	0.32	
12,906.00	90.90	1.70	8,427.69	4,686.10	628.99	4,728.01	0.74	0.74	0.00	
13,001.00	89.40	2.60	8,427.44	4,781.03	632.56	4,822.63	1.84	-1.58	0.95	
13,096.00	89.40	3.00	8,428.44	4,875.91	637.20	4,917.34	0.42	0.00	0.42	
13,191.00	89.50	3.00	8,429.35	4,970.78	642.17	5,012.08	0.11	0.11	0.00	
13,383.00	89.50	3.00	8,431.02	5,162.51	652.22	5,203.54	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude		Longitude
- hit/miss target										
- Shape										
Dice Roll 1 Surface	0.00	0.00	0.00	2,209.96	378.75	571,745.36	596,048.05	32° 34' 17.21 N		104° 1' 17.57 W
- actual wellpath misses target center by 2242.18usft at 0.37usft MD (0.37 TVD, 0.00 N, 0.00 E)										
- Point										
Crapshoot 1H Surface	0.00	0.00	0.00	0.00	0.00	569,535.40	595,669.30	32° 33' 55.35 N		104° 1' 22.07 W
- actual wellpath hits target center										
- Point										
Crapshoot 1H BHL	0.00	0.00	8,431.02	5,162.51	652.22	574,697.91	596,321.52	32° 34' 46.42 N		104° 1' 14.27 W
- actual wellpath hits target center										
- Point										