

Results of Directional Survey

API number:	30-025-41097		
OGRID:		Operator:	COG OPERATING LLC
		Property:	HAAS 6 FEDERAL COM # 1H

surface	ULSTR:	A	06	T 19S	R 32E
				330 FNL	380 FEL

BH Loc	ULSTR:	D	06	T 19S	R 32E
13558	MD	9205.0	TVD	427 FNL	299 FWL
				4981	FEL

Top Perf/OH	ULSTR:	A	06	T 19S	R 32E
9501	MD	9270.1	TVD	380 FNL	931 FEL

Bot Perf/OH	ULSTR:	D	06	T 19S	R 32E
13460	MD	9207.7	TVD	422 FNL	397 FWL
				4883	FEL

	MD	N/S	E/W	VD
	9499	-49.37	-549.24	9269.7
TOP PERFS/OH	9501	-49.59	-551.19	9270.08
	9531	-52.86	-580.45	9275.85
	13360	-86.65	-4403.51	9210.12
BOT PERFS/OH	13460	-91.81	-4503.34	9207.66
	13486	-93.15	-4529.30	9207.02

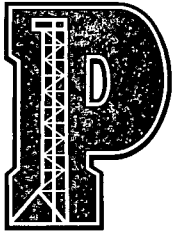
NEXT TO LAST	13486	-93.15	-4529.30	9207.02
LAST READING	13558	-97.31	-4601.15	9204.97
TD	13558	-97.31	-4601.15	9204.97

Surface Location	330	FN	380	FE
Projected BHL	427	FN	4981	FE
Location of				
Top Perfs/OH	380	FN	931	FE
Bottom Perfs/OH	422	FN	4883	FE

SUMMARY of Subsurface Locations

Surface Location	A-06-19S-32E	330	FN	380	FE	Vert. Depth
Top Perfs/OH	A-06-19S-32E	380	FN	931	FE	9270.08
Bottom Perfs/OH	D-06-19S-32E	422	FN	4883	FE	9207.66
Projected TD	D-06-19S-32E	427	FN	4981	FE	9204.97

APR 07 2014



PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Haas 6 Federal Com # 1 H
COUNTY: Lea Co., New Mexico
Sec. 16, T19S, R32E

HOBBS OCD
JAN 27 2014

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**STATE OF NEW MEXICO
DEVIATION REPORT**

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
235	1/2	5,121	2
725	1/2	5,540	2 1/4
1,130	1 1/4	5,757	2 1/4
1,230	1/2	6,105	1 1/4
1,470	1/2	6,512	2
1,803	1/2	6,871	1 1/2
2,166	1 3/4	7,177	1 1/2
2,527	2	7,493	2 3/4
2,622	2	7,782	3 1/2
2,716	1 3/4	8,024	1 3/4
2,904	1	8,309	2 1/4
3,188	3/4	8,408	2 1/2
3,710	1/4	8,594	1 3/4
4,251	1 1/2		

Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 22nd day of
October, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015


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



A GYRO TECHNOLOGIES INC. COMPANY

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

October 17, 2013

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

HOBBS OCD

JAN 27 2014

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Attn: Kanicia Castillo

RE: Haas 6 Federal Com No. 001H

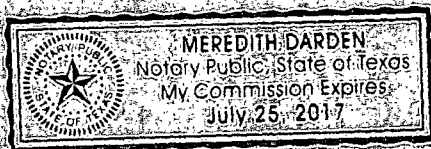
Please find enclosed a copy of the survey from 0.00' to 8500.00' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 17 day of October,
A.D. 2013, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas



Company: COG Operating, LLC
Lease/Well: Haas 6 Federal Com/No. 001H
Location: 19 mile from Carlsbad
Rig Name: Patriot 6
State/County: New Mexico/Lea
Latitude: 32.70, Longitude: -103.80
GRID North is 0.29 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 17 Feet

HOBBS OCD

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: haas 6 fed com 1h_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 10/17/2013 / 09:38

JAN 27 2014

Vaughn Energy Services

Midland, Texas

432-563-5444

Surveyor: Gene Heiss

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Haas 6 Federal Com No. 001H / API' 30-025-41097

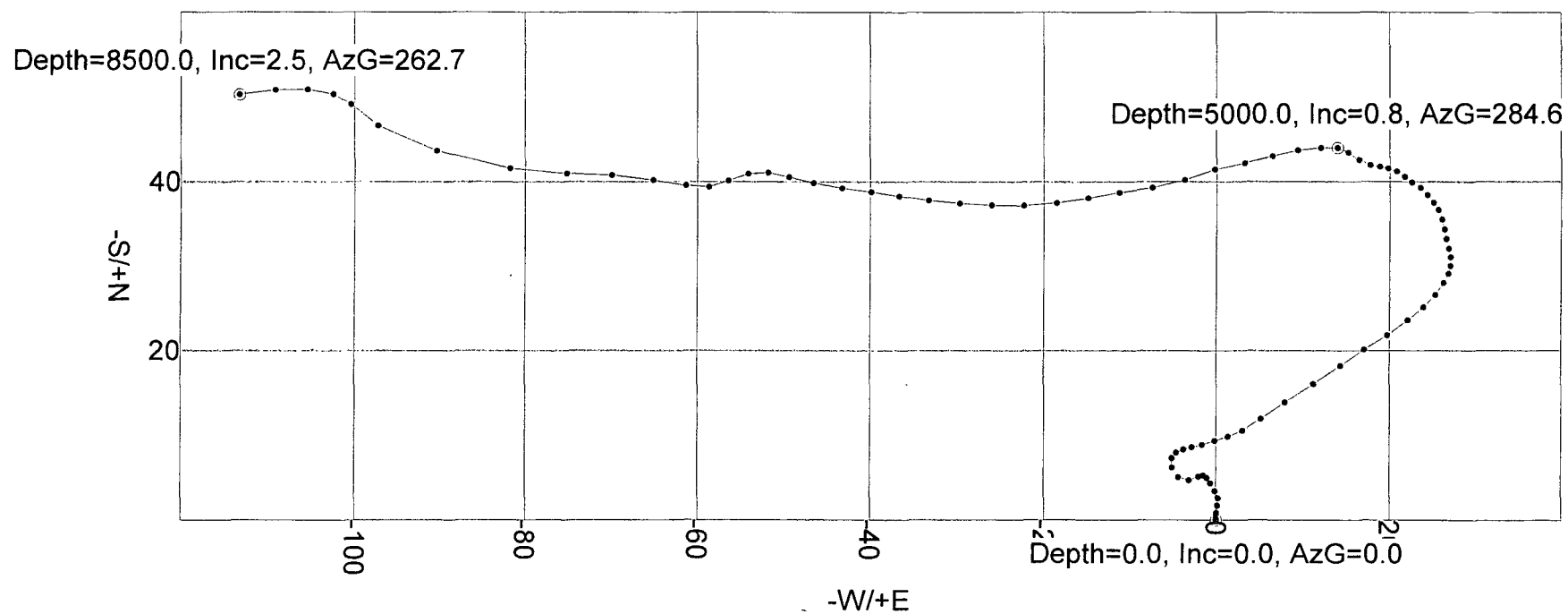
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.27	357.77	100.00	0.24	-0.01	0.24	0.24	357.77	0.27
200.00	0.49	6.45	200.00	0.90	0.03	0.90	0.90	1.87	0.22
300.00	0.51	9.13	299.99	1.77	0.15	1.77	1.78	4.80	0.03
400.00	0.46	359.04	399.99	2.62	0.21	2.62	2.63	4.65	0.10
500.00	0.60	324.26	499.99	3.45	-0.10	3.45	3.45	358.36	0.34
600.00	0.59	334.05	599.98	4.34	-0.63	4.34	4.38	351.74	0.10
700.00	0.29	311.69	699.98	4.97	-1.04	4.97	5.08	348.14	0.34
800.00	0.28	297.84	799.98	5.25	-1.45	5.25	5.45	344.60	0.07
900.00	0.53	236.65	899.97	5.11	-2.05	5.11	5.51	338.17	0.46
1000.00	0.79	257.76	999.97	4.71	-3.11	4.71	5.65	326.56	0.36
1100.00	0.85	310.90	1099.96	5.05	-4.35	5.05	6.66	319.26	0.74
1200.00	0.78	345.99	1199.95	6.20	-5.07	6.20	8.01	320.69	0.50
1300.00	0.52	16.75	1299.94	7.29	-5.11	7.29	8.90	324.99	0.43
1400.00	0.49	58.94	1399.94	7.95	-4.61	7.95	9.19	329.88	0.36
1500.00	0.58	71.81	1499.93	8.33	-3.76	8.33	9.14	335.71	0.15
1600.00	0.57	76.34	1599.93	8.60	-2.79	8.60	9.05	342.00	0.05
1700.00	0.82	76.67	1699.92	8.88	-1.62	8.88	9.03	349.67	0.25
1800.00	0.96	69.72	1799.91	9.34	-0.14	9.34	9.34	359.13	0.18

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	0.88	74.46	1899.90	9.83	1.39	9.83	9.93	8.02	0.11
2000.00	1.20	61.93	1999.88	10.53	3.05	10.53	10.97	16.16	0.39
2100.00	1.71	52.93	2099.85	11.92	5.16	11.92	13.00	23.42	0.56
2200.00	2.16	56.98	2199.79	13.85	7.93	13.85	15.96	29.80	0.47
2300.00	2.34	56.32	2299.71	16.01	11.21	16.01	19.54	35.00	0.18
2400.00	2.06	53.27	2399.64	18.21	14.35	18.21	23.19	38.23	0.30
2500.00	1.74	57.05	2499.59	20.12	17.07	20.12	26.38	40.31	0.34
2600.00	1.91	57.13	2599.53	21.85	19.74	21.85	29.45	42.10	0.16
2700.00	1.48	48.32	2699.49	23.61	22.10	23.61	32.34	43.11	0.50
2800.00	1.27	50.94	2799.46	25.17	23.93	25.17	34.73	43.56	0.21
2900.00	1.07	34.25	2899.44	26.64	25.32	26.64	36.75	43.54	0.40
3000.00	0.87	33.56	2999.43	28.04	26.26	28.04	38.42	43.12	0.20
3100.00	0.57	16.09	3099.42	29.15	26.82	29.15	39.61	42.61	0.37
3200.00	0.53	11.81	3199.41	30.08	27.05	30.08	40.46	41.97	0.06
3300.00	0.64	352.91	3299.41	31.09	27.08	31.09	41.23	41.05	0.23
3400.00	0.59	342.27	3399.40	32.14	26.85	32.14	41.88	39.88	0.13
3500.00	0.72	349.43	3499.40	33.24	26.58	33.24	42.56	38.64	0.16
3600.00	0.60	349.77	3599.39	34.38	26.37	34.38	43.33	37.49	0.12
3700.00	0.78	342.06	3699.38	35.54	26.07	35.54	44.07	36.26	0.20
3800.00	0.59	336.11	3799.38	36.65	25.65	36.65	44.74	34.99	0.20
3900.00	0.62	316.97	3899.37	37.52	25.08	37.52	45.13	33.76	0.20
4000.00	0.72	325.88	3999.36	38.43	24.36	38.43	45.50	32.37	0.15
4100.00	0.67	307.11	4099.36	39.30	23.54	39.30	45.81	30.93	0.23
4200.00	0.65	299.29	4199.35	39.93	22.59	39.93	45.87	29.50	0.09
4300.00	0.58	317.05	4299.34	40.57	21.75	40.57	46.03	28.19	0.20
4400.00	0.74	293.41	4399.34	41.20	20.81	41.20	46.16	26.80	0.31
4500.00	0.51	286.69	4499.33	41.58	19.79	41.58	46.05	25.45	0.24
4600.00	0.60	277.68	4599.33	41.78	18.84	41.78	45.83	24.27	0.12
4700.00	0.70	281.08	4699.32	41.97	17.71	41.97	45.56	22.88	0.11
4800.00	0.94	308.51	4799.31	42.60	16.47	42.60	45.67	21.14	0.45
4900.00	0.82	302.63	4899.30	43.49	15.23	43.49	46.08	19.30	0.15
5000.00	0.76	284.59	4999.29	44.04	13.99	44.04	46.21	17.63	0.25
5100.00	1.46	262.16	5099.27	44.03	12.09	44.03	45.66	15.35	0.81
5200.00	1.62	265.02	5199.23	43.74	9.42	43.74	44.74	12.16	0.18
5300.00	1.84	249.07	5299.19	43.04	6.51	43.04	43.53	8.60	0.53
5400.00	2.02	261.68	5399.13	42.21	3.27	42.21	42.34	4.42	0.46
5500.00	2.07	253.44	5499.07	41.44	-0.21	41.44	41.44	359.71	0.30
5600.00	2.18	247.84	5599.00	40.21	-3.70	40.21	40.38	354.74	0.23
5700.00	2.26	263.60	5698.93	39.28	-7.42	39.28	39.97	349.30	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
5800.00	2.13	259.22	5798.85	38.71	-11.21	38.71	40.30	343.85	0.21
5900.00	2.09	260.55	5898.79	38.06	-14.84	38.06	40.85	338.69	0.06
6000.00	2.20	261.50	5998.72	37.48	-18.55	37.48	41.81	333.67	0.12
6100.00	2.15	268.73	6098.64	37.15	-22.32	37.15	43.34	329.00	0.28
6200.00	2.07	273.09	6198.58	37.21	-26.01	37.21	45.39	325.05	0.18
6300.00	2.09	274.03	6298.51	37.43	-29.63	37.43	47.74	321.63	0.04
6400.00	2.04	277.40	6398.44	37.79	-33.22	37.79	50.32	318.68	0.13
6500.00	1.90	279.84	6498.39	38.30	-36.62	38.30	52.99	316.29	0.17
6600.00	1.88	276.87	6598.33	38.78	-39.88	38.78	55.62	314.20	0.10
6700.00	1.99	278.86	6698.27	39.24	-43.22	39.24	58.38	312.24	0.13
6800.00	1.87	282.33	6798.22	39.86	-46.54	39.86	61.27	310.58	0.17
6900.00	1.50	285.15	6898.17	40.55	-49.39	40.55	63.90	309.39	0.38
7000.00	1.34	278.97	6998.14	41.07	-51.81	41.07	66.12	308.41	0.22
7100.00	1.40	255.42	7098.12	40.95	-54.15	40.95	67.89	307.10	0.56
7200.00	1.41	245.15	7198.09	40.12	-56.44	40.12	69.25	305.41	0.25
7300.00	1.29	259.26	7298.06	39.40	-58.66	39.40	70.66	303.89	0.35
7400.00	1.83	284.36	7398.02	39.59	-61.31	39.59	72.98	302.85	0.86
7500.00	2.62	275.68	7497.95	40.21	-65.13	40.21	76.54	301.69	0.86
7600.00	2.91	277.73	7597.83	40.78	-69.92	40.78	80.94	300.25	0.31
7700.00	3.05	266.93	7697.69	40.98	-75.10	40.98	85.55	298.62	0.58
7800.00	4.72	280.76	7797.46	41.60	-81.80	41.60	91.77	296.96	1.90
7900.00	5.42	286.24	7897.07	43.69	-90.37	43.69	100.38	295.80	0.85
8000.00	3.31	304.69	7996.78	46.65	-97.28	46.65	107.89	295.62	2.51
8100.00	1.36	317.18	8096.69	49.16	-100.46	49.16	111.84	296.08	2.01
8200.00	1.51	285.02	8196.66	50.37	-102.53	50.37	114.24	296.16	0.81
8300.00	1.98	276.82	8296.62	50.92	-105.51	50.92	117.16	295.76	0.53
8400.00	2.27	262.01	8396.55	50.85	-109.19	50.85	120.45	294.97	0.62
8500.00	2.46	262.74	8496.46	50.30	-113.28	50.30	123.95	293.94	0.19



Vaughn Energy Services
Midland, Texas
432-563-5444
Surveyor: Gene Heiss
Haas 6 Federal Com No. 001H / API 30-025-41097



VES Survey Date: 10/12/2013

HOBBS OCD

PathFinder – a Schlumberger company

BHL Report

JAN 27 2014

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Page 01/01
Tie-in Date: 10/11/2013
Date Completed: 10/19/2013

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM
API#: 30-025-41097 Rig: PATRIOT 6
PathFinder Office Supervisor: JOSEPH HOGAN
PathFinder Field Engineers: ZACH LOFTIES
 ROBERT RODRIGUEZ
 BILL KITCHENS

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.41.44.7188 N LON: 103.47.52.0358 W
GRID Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 664751.5000 Y: 617242.7000
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.15° EAST TO GRID
Vertical Section Plane: 269.21
Survey Vert. Reference: 18.00' Kelly Bushing To Ground
Altitude: 3675.00' Ground To MSL

Measured Depth	13558.00	(feet)
Inclination	91.63	(deg)
Azimuth	266.69	(deg)
True Vertical Depth	9204.97	(feet)
Vertical Section	4602.06	(feet)
Survey X cord	660150.35	(feet)
Survey Y cord	617145.39	(feet)
Survey Lat	32.69555072 N	(deg)
Survey Lon	103.81274537 W	(deg)
Rectangular Corr. N/S	97.31 S	(feet)
Rectangular Corr. E/W	4601.15 W	(feet)
Closure Distance	4602.18	(feet)
Direction of Closure	268.79	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM
API#: 30-025-41097 Rig: PATRIOT 6
PathFinder Office Supervisor: JOSEPH HOGAN
PathFinder Field Engineers: ZACH LOFTIES
ROBERT RODRIGUEZ

HOBBS OCD

JAN 27 2014

Survey Horiz. Reference: WELLHEAD
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Ref GRID Coord: X: 664751.5000 Y: 617242.7000
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.15° EAST TO GRID
Vertical Section Plane: 269.21
Survey Vert. Reference: 18.00' Kelly Bushing To Ground
Altitude: 3675.00' Ground To MSL

Survey Calculations by RX5 V6.05 using Minimum Curvature

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
THE FOLLOWING ARE VAUGHN ENERGY SERVICES GYRO SURVEYS.										
100.00	0.27	357.77	99.99	0.00	0.00	0.22 N	0.00 W	0.22@	358.75	0.00
200.00	0.49	6.45	199.99	100.00	-0.05	0.88 N	0.03 E	0.88@	2.21	0.23
300.00	0.51	9.13	299.99	100.00	-0.18	1.75 N	0.15 E	1.75@	4.99	0.03
400.00	0.46	359.04	399.98	100.00	-0.25	2.59 N	0.22 E	2.60@	4.78	0.10
500.00	0.60	324.26	499.98	100.00	0.05	3.41 N	0.10 W	3.42@	358.39	0.34
600.00	0.59	334.05	599.98	100.00	0.57	4.30 N	0.63 W	4.35@	351.71	0.10
700.00	0.29	311.69	699.97	100.00	0.97	4.93 N	1.04 W	5.04@	348.08	0.34
800.00	0.28	297.84	799.97	100.00	1.37	5.22 N	1.45 W	5.41@	344.50	0.07
900.00	0.53	236.65	899.97	100.00	1.98	5.08 N	2.05 W	5.47@	338.02	0.46
1000.00	0.79	257.76	999.96	100.00	3.04	4.68 N	3.11 W	5.61@	326.38	0.35
1100.00	0.85	310.90	1099.95	100.00	4.27	5.01 N	4.34 W	6.63@	319.10	0.74
1200.00	0.78	345.99	1199.94	100.00	4.98	6.16 N	5.07 W	7.98@	320.56	0.50
1300.00	0.52	16.25	1299.94	100.00	5.01	7.26 N	5.11 W	8.87@	324.87	0.42
1400.00	0.49	58.94	1399.93	100.00	4.50	7.91 N	4.61 W	9.16@	329.76	0.37
1500.00	0.58	71.81	1499.93	100.00	3.65	8.29 N	3.77 W	9.11@	335.57	0.15
1600.00	0.57	76.34	1599.92	100.00	2.68	8.57 N	2.80 W	9.01@	341.89	0.05
1700.00	0.82	76.67	1699.92	100.00	1.50	8.85 N	1.62 W	9.00@	349.61	0.25
1800.00	0.96	69.72	1799.91	100.00	0.01	9.31 N	0.14 W	9.31@	359.14	0.18
1900.00	0.88	74.46	1899.89	100.00	-1.52	9.80 N	1.39 E	9.90@	8.05	0.11
2000.00	1.20	61.93	1999.88	100.00	-3.19	10.50 N	3.05 E	10.93@	16.19	0.39
2100.00	1.71	52.93	2099.84	100.00	-5.33	11.89 N	5.16 E	12.96@	23.47	0.56
2200.00	2.16	56.98	2199.79	100.00	-8.12	13.82 N	7.93 E	15.93@	29.86	0.47
2300.00	2.34	56.32	2299.71	100.00	-11.43	15.98 N	11.21 E	19.52@	35.06	0.18
2400.00	2.06	53.27	2399.64	100.00	-14.60	18.18 N	14.35 E	23.17@	38.28	0.30
2500.00	1.74	57.05	2499.58	100.00	-17.34	20.08 N	17.07 E	26.36@	40.36	0.34

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM

API#: 30-025-41097 Rig: PATRIOT 6

Page 02/06

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist (ft)	Dir (deg)	DLS (dg/100ft)
2600.00	1.91	57.13	2599.53	100.00	-20.04	21.81 N	19.74 E	29.42@	42.14	0.17
2700.00	1.48	48.32	2699.49	100.00	-22.43	23.58 N	22.11 E	32.32@	43.15	0.50
2800.00	1.27	50.94	2799.46	100.00	-24.27	25.14 N	23.93 E	34.70@	43.59	0.22
2900.00	1.07	34.25	2899.44	100.00	-25.68	26.61 N	25.32 E	36.73@	43.58	0.39
3000.00	0.87	33.56	2999.42	100.00	-26.64	28.01 N	26.26 E	38.40@	43.15	0.20
3100.00	0.57	16.09	3099.41	100.00	-27.22	29.12 N	26.82 E	39.59@	42.64	0.37
3200.00	0.53	11.81	3199.41	100.00	-27.46	30.05 N	27.05 E	40.43@	41.99	0.06
3300.00	0.64	352.91	3299.40	100.00	-27.50	31.06 N	27.08 E	41.20@	41.08	0.22
3400.00	0.59	342.27	3399.40	100.00	-27.29	32.10 N	26.85 E	41.85@	39.91	0.12
3500.00	0.72	349.43	3499.39	100.00	-27.03	33.21 N	26.58 E	42.54@	38.67	0.15
3600.00	0.60	349.77	3599.39	100.00	-26.84	34.34 N	26.37 E	43.30@	37.52	0.12
3700.00	0.78	342.06	3699.38	100.00	-26.56	35.51 N	26.07 E	44.05@	36.29	0.20
3800.00	0.59	336.11	3799.37	100.00	-26.15	36.62 N	25.65 E	44.71@	35.01	0.20
3900.00	0.62	316.97	3899.37	100.00	-25.59	37.49 N	25.07 E	45.10@	33.77	0.20
4000.00	0.72	325.88	3999.36	100.00	-24.88	38.41 N	24.35 E	45.48@	32.38	0.14
4100.00	0.67	307.11	4099.35	100.00	-24.07	39.28 N	23.53 E	45.79@	30.93	0.23
4200.00	0.65	299.29	4199.34	100.00	-23.12	39.91 N	22.57 E	45.85@	29.49	0.09
4300.00	0.58	317.05	4299.34	100.00	-22.29	40.56 N	21.73 E	46.01@	28.18	0.20
4400.00	0.74	293.41	4399.33	100.00	-21.36	41.18 N	20.79 E	46.14@	26.79	0.31
4500.00	0.51	286.69	4499.33	100.00	-20.35	41.57 N	19.78 E	46.03@	25.44	0.24
4600.00	0.60	277.68	4599.32	100.00	-19.40	41.77 N	18.83 E	45.82@	24.27	0.13
4700.00	0.70	281.08	4699.32	100.00	-18.29	41.95 N	17.71 E	45.54@	22.89	0.11
4800.00	0.94	308.51	4799.31	100.00	-17.06	42.58 N	16.47 E	45.66@	21.15	0.45
4900.00	0.82	302.63	4899.29	100.00	-15.82	43.48 N	15.23 E	46.07@	19.30	0.15
5000.00	0.76	284.59	4999.28	100.00	-14.59	44.03 N	13.98 E	46.20@	17.62	0.25
5100.00	1.46	262.16	5099.27	100.00	-12.68	44.03 N	12.08 E	45.65@	15.34	0.81
5200.00	1.62	265.02	5199.23	100.00	-10.01	43.73 N	9.41 E	44.73@	12.14	0.18
5300.00	1.84	249.07	5299.18	100.00	-7.09	43.03 N	6.50 E	43.52@	8.59	0.53

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM

API#: 30-025-41097 Rig: PATRIOT 6

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
5400.00	2.02	261.68	5399.13	100.00	-3.84	42.20 N	3.26 E	42.33@	4.41	0.46
5500.00	2.07	253.44	5499.06	100.00	-0.35	41.43 N	0.22 W	41.43@	359.70	0.30
5600.00	2.18	247.84	5599.00	100.00	3.16	40.20 N	3.71 W	40.37@	354.73	0.23
5700.00	2.26	263.60	5698.92	100.00	6.89	39.26 N	7.43 W	39.96@	349.28	0.61
5800.00	2.13	259.22	5798.85	100.00	10.68	38.70 N	11.22 W	40.29@	343.83	0.21
5900.00	2.09	260.55	5898.78	100.00	14.32	38.05 N	14.84 W	40.84@	338.69	0.06
6000.00	2.20	261.50	5998.71	100.00	18.02	37.47 N	18.54 W	41.80@	333.67	0.12
6100.00	2.15	268.73	6098.64	100.00	21.80	37.14 N	22.31 W	43.33@	329.01	0.28
6200.00	2.07	273.09	6198.57	100.00	25.48	37.20 N	25.99 W	45.38@	325.06	0.18
6300.00	2.09	274.03	6298.50	100.00	29.09	37.42 N	29.61 W	47.72@	321.65	0.04
6400.00	2.04	277.40	6398.44	100.00	32.67	37.78 N	33.20 W	50.29@	318.69	0.13
6500.00	1.90	279.84	6498.38	100.00	36.06	38.29 N	36.60 W	52.97@	316.30	0.16
6600.00	1.88	276.87	6598.33	100.00	39.32	38.77 N	39.86 W	55.61@	314.21	0.10
6700.00	1.99	278.86	6698.27	100.00	42.66	39.24 N	43.20 W	58.36@	312.25	0.13
6800.00	1.87	282.33	6798.21	100.00	45.96	39.85 N	46.51 W	61.25@	310.59	0.17
6900.00	1.50	285.15	6898.17	100.00	48.80	40.54 N	49.37 W	63.88@	309.39	0.38
7000.00	1.34	278.97	6998.14	100.00	51.22	41.07 N	51.79 W	66.09@	308.41	0.22
7100.00	1.40	255.42	7098.11	100.00	53.55	40.94 N	54.12 W	67.86@	307.11	0.56
7200.00	1.41	245.15	7198.08	100.00	55.86	40.12 N	56.42 W	69.23@	305.41	0.25
7300.00	1.29	259.26	7298.05	100.00	58.10	39.39 N	58.65 W	70.65@	303.89	0.35
7400.00	1.83	284.36	7398.02	100.00	60.75	39.58 N	61.30 W	72.96@	302.85	0.86
7500.00	2.62	275.68	7497.94	100.00	64.56	40.20 N	65.12 W	76.53@	301.69	0.86
7600.00	2.91	277.73	7597.82	100.00	69.34	40.77 N	69.91 W	80.93@	300.25	0.31
7700.00	3.05	266.93	7697.69	100.00	74.51	40.97 N	75.08 W	85.53@	298.62	0.58
7800.00	4.72	280.76	7797.46	100.00	81.20	41.59 N	81.78 W	91.75@	296.96	1.90
7900.00	5.42	286.24	7897.07	100.00	89.75	43.68 N	90.36 W	100.36@	295.80	0.85
8000.00	3.31	304.69	7996.78	100.00	96.61	46.64 N	97.27 W	107.87@	295.62	2.51
8100.00	1.36	317.18	8096.69	100.00	99.76	49.16 N	100.45 W	111.83@	296.08	2.00

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM
API#: 30-025-41097 Rig: PATRIOT 6

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
8200.00	1.51	285.02	8196.66	100.00	101.82	50.37 N	102.53 W	114.23@	296.16	0.81
8300.00	1.98	276.82	8296.61	100.00	104.80	50.92 N	105.51 W	117.16@	295.76	0.53
8400.00	2.27	262.01	8396.55	100.00	108.48	50.85 N	109.19 W	120.45@	294.97	0.62
** TIED INTO VAUGHN ENERGY SERVICES GYRO SURVEYS AT 8500'MD.										
8500.00	2.46	262.74	8496.46	100.00	112.58	50.30 N	113.28 W	123.95@	293.94	0.19
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
8677.00	1.41	219.41	8673.37	177.00	117.76	48.14 N	118.43 W	127.84@	292.12	0.98
8708.00	1.49	213.78	8704.36	31.00	118.23	47.51 N	118.90 W	128.04@	291.78	0.53
8740.00	2.37	248.59	8736.34	32.00	119.09	46.92 N	119.74 W	128.61@	291.40	4.46
8772.00	2.90	269.50	8768.30	32.00	120.52	46.67 N	121.17 W	129.85@	291.07	3.40
8813.00	3.17	279.35	8809.25	41.00	122.67	46.85 N	123.33 W	131.92@	290.80	1.43
8845.00	4.75	267.13	8841.17	32.00	124.86	46.92 N	125.52 W	134.01@	290.50	5.57
8877.00	9.50	254.12	8872.92	32.00	128.74	46.13 N	129.39 W	137.37@	289.62	15.58
8908.00	14.68	247.62	8903.22	31.00	134.87	43.94 N	135.49 W	142.43@	287.97	17.25
8940.00	19.87	244.46	8933.77	32.00	143.58	40.05 N	144.15 W	149.61@	285.53	16.48
8971.00	24.01	244.63	8962.51	31.00	154.11	35.07 N	154.60 W	158.53@	282.78	13.36
9003.00	26.47	246.30	8991.46	32.00	166.60	29.41 N	167.02 W	169.59@	279.99	8.00
9035.00	29.90	247.97	9019.66	32.00	180.60	23.55 N	180.95 W	182.47@	277.42	11.00
9066.00	34.73	249.46	9045.85	31.00	196.13	17.55 N	196.39 W	197.17@	275.11	15.79
9098.00	40.01	251.49	9071.27	32.00	214.52	11.08 N	214.69 W	214.98@	272.96	16.94
9130.00	44.41	253.42	9094.97	32.00	235.10	4.62 N	235.19 W	235.23@	271.13	14.33
9161.00	46.60	254.91	9116.70	31.00	256.46	1.41 S	256.46 W	256.46@	269.69	7.85
9193.00	49.15	255.88	9138.16	32.00	279.50	7.39 S	279.43 W	279.52@	268.49	8.28
9214.00	51.97	257.02	9151.50	21.00	295.32	11.18 S	295.19 W	295.40@	267.83	14.07
9246.00	56.10	258.61	9170.29	32.00	320.70	16.64 S	320.50 W	320.94@	267.03	13.52
9278.00	59.00	259.57	9187.46	32.00	347.28	21.75 S	347.02 W	347.70@	266.41	9.41
9309.00	61.82	260.10	9202.76	31.00	373.88	26.50 S	373.55 W	374.49@	265.94	9.22
9341.00	64.28	260.98	9217.27	32.00	402.07	31.19 S	401.68 W	402.89@	265.56	8.07
9373.00	66.74	261.95	9230.53	32.00	430.93	35.51 S	430.48 W	431.94@	265.28	8.17

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC.
HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM
API#: 30-025-41097 Rig: PATRIOT 6

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
9404.00	69.29	263.09	9242.14	31.00	459.47	39.25 S	458.98 W	460.65@	265.11	8.90
9436.00	71.67	263.70	9252.83	32.00	489.48	42.71 S	488.94 W	490.80@	265.01	7.65
9468.00	74.39	263.70	9262.17	32.00	519.94	46.07 S	519.36 W	521.39@	264.93	8.50
9499.00	77.47	263.70	9269.70	31.00	549.87	49.37 S	549.24 W	551.45@	264.86	9.94
9531.00	80.37	263.53	9275.85	32.00	581.12	52.86 S	580.45 W	582.85@	264.80	9.08
9562.00	83.36	263.18	9280.24	31.00	611.64	56.41 S	610.92 W	613.52@	264.72	9.71
9594.00	86.70	263.35	9283.01	32.00	643.35	60.15 S	642.58 W	645.39@	264.65	10.45
9626.00	89.96	264.05	9283.94	32.00	675.18	63.66 S	674.37 W	677.37@	264.61	10.42
9657.00	91.28	265.55	9283.61	31.00	706.09	66.47 S	705.24 W	708.36@	264.62	6.45
9752.00	91.98	267.31	9280.90	95.00	800.93	72.38 S	800.01 W	803.28@	264.83	1.99
9847.00	92.77	266.25	9276.97	95.00	895.76	77.72 S	894.78 W	898.14@	265.04	1.39
9942.00	92.42	266.16	9272.66	95.00	990.53	84.00 S	989.47 W	993.03@	265.15	0.38
10037.00	92.33	266.25	9268.73	95.00	1085.32	90.28 S	1084.18 W	1087.93@	265.24	0.13
10164.00	89.96	267.92	9266.19	127.00	1212.20	96.73 S	1210.98 W	1214.83@	265.43	2.28
10227.00	89.60	267.57	9266.43	63.00	1275.17	99.21 S	1273.93 W	1277.79@	265.55	0.80
10322.00	90.31	266.60	9266.51	95.00	1370.11	104.04 S	1368.80 W	1372.75@	265.65	1.27
10417.00	90.40	267.83	9265.92	95.00	1465.05	108.66 S	1463.69 W	1467.71@	265.75	1.30
10512.00	89.16	268.54	9266.28	95.00	1560.03	111.67 S	1558.64 W	1562.63@	265.90	1.50
10606.00	90.04	269.24	9266.94	94.00	1654.02	113.49 S	1652.61 W	1656.51@	266.07	1.20
10701.00	91.71	269.77	9265.49	95.00	1749.01	114.31 S	1747.60 W	1751.33@	266.26	1.84
10796.00	93.12	270.73	9261.49	95.00	1843.90	113.90 S	1842.51 W	1846.03@	266.46	1.80
10891.00	93.56	270.73	9255.95	95.00	1938.71	112.69 S	1937.34 W	1940.61@	266.67	0.46
10986.00	92.24	272.32	9251.14	95.00	2033.50	110.16 S	2032.18 W	2035.16@	266.90	2.17
11081.00	92.95	271.61	9246.84	95.00	2128.30	106.91 S	2127.02 W	2129.71@	267.12	1.06
11176.00	91.89	271.96	9242.83	95.00	2223.11	103.95 S	2221.89 W	2224.32@	267.32	1.18
11271.00	90.66	272.76	9240.72	95.00	2317.94	100.04 S	2316.79 W	2318.94@	267.53	1.54
11366.00	90.92	273.11	9239.41	95.00	2412.73	95.18 S	2411.65 W	2413.53@	267.74	0.46
11461.00	90.92	273.02	9237.88	95.00	2507.51	90.10 S	2506.50 W	2508.12@	267.94	0.09

PathFinder – a Schlumberger company

Survey Report

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HAAS 6 FEDERAL COM #1H
LEA COUNTY, NM
API#: 30-025-41097 Rig: PATRIOT 6

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
11555.00	91.45	272.93	9235.94	94.00	2601.28	85.22 S	2600.36 W	2601.75@	268.12	0.57
11650.00	92.51	271.79	9232.66	95.00	2696.08	81.31 S	2695.22 W	2696.44@	268.27	1.64
11745.00	91.28	271.96	9229.51	95.00	2790.92	78.20 S	2790.11 W	2791.21@	268.39	1.31
11840.00	90.48	272.67	9228.06	95.00	2885.77	74.37 S	2885.02 W	2885.98@	268.52	1.13
11935.00	89.52	273.46	9228.06	95.00	2980.56	69.29 S	2979.88 W	2980.69@	268.67	1.31
12030.00	90.04	272.93	9228.42	95.00	3075.32	63.99 S	3074.73 W	3075.40@	268.81	0.78
12125.00	89.52	272.84	9228.79	95.00	3170.13	59.21 S	3169.61 W	3170.17@	268.93	0.56
12220.00	89.69	272.14	9229.44	95.00	3264.97	55.08 S	3264.52 W	3264.98@	269.03	0.76
12315.00	89.96	270.56	9229.73	95.00	3359.90	52.85 S	3359.49 W	3359.91@	269.10	1.69
12410.00	89.69	269.77	9230.02	95.00	3454.88	52.57 S	3454.49 W	3454.89@	269.13	0.88
12505.00	89.78	269.33	9230.46	95.00	3549.88	53.32 S	3549.48 W	3549.88@	269.14	0.47
12600.00	91.54	268.36	9229.37	95.00	3644.87	55.23 S	3644.45 W	3644.87@	269.13	2.11
12695.00	90.92	268.01	9227.33	95.00	3739.83	58.24 S	3739.38 W	3739.84@	269.11	0.75
12790.00	91.71	267.92	9225.15	95.00	3834.78	61.61 S	3834.30 W	3834.79@	269.08	0.84
12885.00	91.01	267.66	9222.89	95.00	3929.73	65.28 S	3929.20 W	3929.74@	269.05	0.79
12979.00	92.42	268.01	9220.08	94.00	4023.66	68.83 S	4023.09 W	4023.68@	269.02	1.55
13075.00	92.07	266.87	9216.32	96.00	4119.53	73.11 S	4118.92 W	4119.57@	268.98	1.24
13170.00	91.89	267.57	9213.04	95.00	4214.42	77.72 S	4213.75 W	4214.46@	268.94	0.76
13265.00	90.22	267.13	9211.29	95.00	4309.35	82.11 S	4308.63 W	4309.41@	268.91	1.82
13360.00	91.19	267.39	9210.12	95.00	4404.29	86.65 S	4403.51 W	4404.36@	268.87	1.06
13486.00	91.63	266.69	9207.02	126.00	4530.16	93.15 S	4529.30 W	4530.26@	268.82	0.66
STRAIGHT LINE PROJECTION TO BIT AT 13558'MD.										
13558.00	91.63	266.69	9204.97	72.00	4602.06	97.31 S	4601.15 W	4602.18@	268.79	0.00

** The survey data at tie-in point was furnished by a recognized survey company and entered as submitted. Survey stations above the tie-in point represent recalculated data by PathFinder – a Schlumberger company and may reflect minor changes due to rounding differences between survey programs. Only survey stations taken by qualified PathFinder personnel are subject to certification.

HAAS 6 FEDERAL COM #1H

30-025-41097

Sec 6-T19S-R32E

HOBBS OCD

JAN 27 2014

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<u>Perforations</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
13226-13413'	7014	300960	403620
12853-13135'	5982	303107	278292
12480-12760'	6552	297840	292446
12108-12391'	6006	298626	256998
11735-12014'	6024	299893	260652
11362-11642'	6024	297477	256872
10987-11269'	6048	297692	233310
10617-10896'	6048	298786	234696
10244-10529'	6048	301248	233478
9872-10147'	6009	299768	233142
9501-9778'	<u>6594</u>	<u>309525</u>	<u>234192</u>
Totals	68349	3304922	2917698