

Results of Directional Survey

API number:	30-025-40635		
OGRID:		Operator:	COG OPERATING LLC
		Property:	WARHAWK 3 FEDERAL COM # 1H

surface	ULSTR:	D	03	T 19S	R 32E
				780 FNL	170 FWL

BH Loc	ULSTR:	A	03	T 19S	R 32E
13930	MD	9484.7	TVD	355 FNL	331 FEL
					4949 FWL

Top Perf/OH	ULSTR:	D	03	T 19S	R 32E
9650	MD	9415.7	TVD	726 FNL	689 FWL

Bot Perf/OH	ULSTR:	A	03	T 19S	R 32E
13907	MD	9484.4	TVD	357 FNL	354 FEL
					4926 FWL

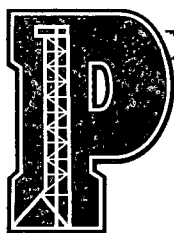
	MD	N/S	E/W	VD
	9620	52.69	490.51	9407.37
TOP PERFS/OH	9650	54.33	519.29	9415.67
	9652	54.44	521.21	9416.22
	13733	403.80	4583.44	9482.38
BOT PERFS/OH	13907	422.92	4756.37	9484.38
	13930	425.45	4779.23	9484.65

NEXT TO LAST	13733	403.80	4583.44	9482.38
LAST READING	13930	425.45	4779.23	9484.65
TD	13930	425.45	4779.23	9484.65

Surface Location	780	FN	170	FW
Projected BHL	355	FN	4949	FW
Location of				
Top Perfs/OH	726	FN	689	FW
Bottom Perfs/OH	357	FN	4926	FW

SUMMARY of Subsurface Locations

Surface Location	D-03-19S-32E	780	FN	170	FW	Vert. Depth
Top Perfs/OH	D-03-19S-32E	726	FN	689	FW	9415.67
Bottom Perfs/OH	A-03-19S-32E	357	FN	4926	FW	9484.38
Projected TD	A-03-19S-32E	355	FN	4949	FW	9484.65



COG OPER, LLC

RECEIVED

SEP 23 2013

ARTESIA WEST

OPERATOR:
WELL LEASE:
COUNTY:COG Operating, LLC
Warhawk 3 Federal Com # 1 H
Lea Co., New Mexico
Sec. 3, T19S, R32E

PATRIOT DRILLING, LLC

HOEBS OCD

OCT 04 2013

RECEIVED

STATE OF NEW MEXICO
DEVIATION REPORT

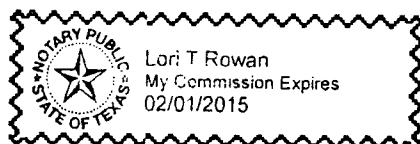
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
477	1/2	4,895	3/4
885	1/4	5,395	1/4
1,327	1/4	5,640	1/2
1,426	1/2	5,940	1/4
1,830	3/4	6,270	1 1/2
2,105	1 1/4	6,464	2
2,295	2 1/4	6,736	1 3/4
2,453	1/2	7,030	1 1/2
2,549	1/4	7,267	1
2,739	1/4	7,552	1/2
2,925	1/2	7,933	1
3,083	1 3/4	8,305	1
3,535	2 1/4	8,710	1/2
3,800	1 1/4	9,040	1 1/2
4,190	1 1/4	9,282	2 1/2
4,413	3/4	9,674	2
		9,790	2 3/4

Patriot Drilling, LLC

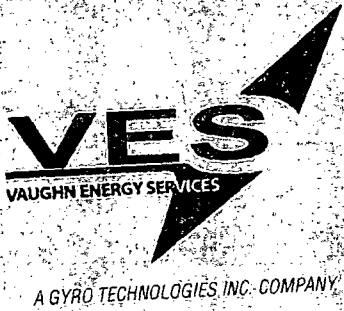
M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 13th day of August, 2013 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015


Lori T. Rowan

Notary Public for Ector Co., Texas



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

COG OPERATING, LLC
RECEIVED
AUG 27 2013
ARTESIA WEST

HOBBS OGD

OCT 04 2013

RECEIVED

August 16, 2013

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701

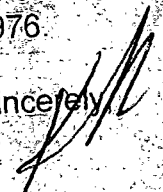
Attn: Kanicia Castillo

Re: **Warhawk 3 Federal Com No 001H**

Please find enclosed a copy of the survey from 0' to 8,682' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976

Sincerely,

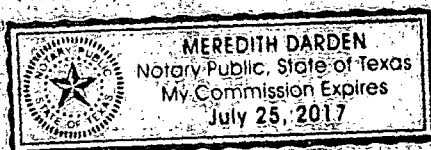

Keith Havelka
Operations

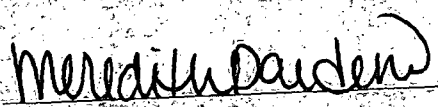
STATE OF TEXAS

COUNTY OF NUECES

§
§
§

This instrument was acknowledged before me on the 16th day of August, A.D., 2013, by Keith Havelka.




Meredith Darden
Notary Public, State of Texas

Company: Concho Operating
Lease/Well: Warhawk 3 Federal Com/No 001H



Rig Name: Patriot 6
State/County: New Mexico/Lea
Latitude: 32.694, Longitude: -103.762
GRID North is 0.310 Degrees East of True North
VS-Azi: 0.000 Degrees



Depth Reference : RKB = 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ha gyro.ut

Minimum Curvature Method

Report Date/Time: 8/16/2013 / 11:31

Vaughn Energy Services

Midland, TX

432-563-5444

Surveyor: Charles Hines

Warhawk 3 Federal Com No 001H / API 30-025-40635

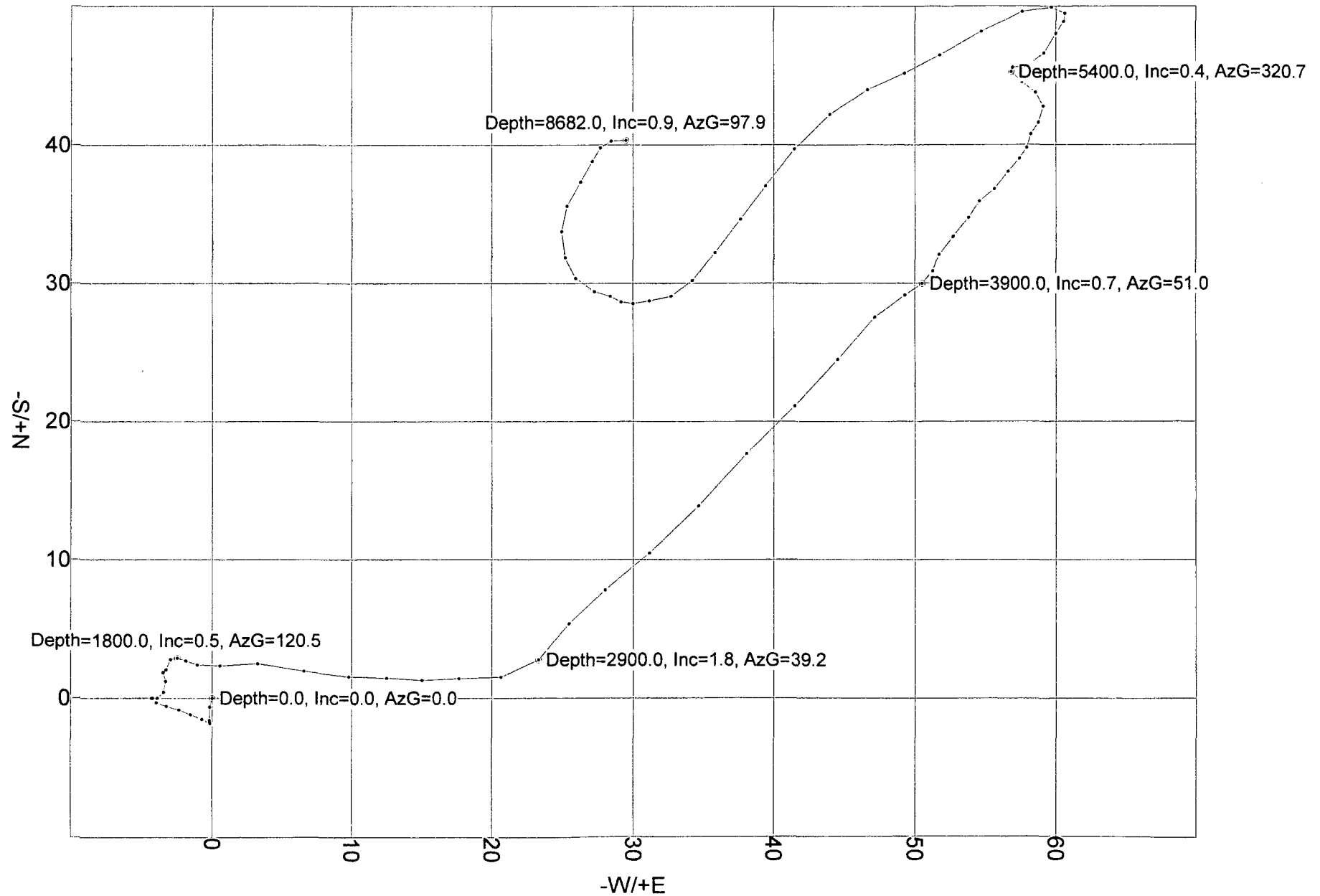
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.747	194.947	99.997	-0.630	-0.168	-0.630	0.652	194.947	0.747
200.000	0.431	158.157	199.992	-1.609	-0.197	-1.609	1.620	186.966	0.478
300.000	0.180	320.352	299.991	-1.836	-0.157	-1.836	1.843	184.889	0.605
400.000	0.576	291.282	399.989	-1.533	-0.726	-1.533	1.696	205.350	0.428
500.000	0.459	295.491	499.985	-1.178	-1.556	-1.178	1.952	232.885	0.123
600.000	0.569	290.166	599.981	-0.834	-2.384	-0.834	2.525	250.711	0.120
700.000	0.512	281.886	699.976	-0.571	-3.287	-0.571	3.336	260.144	0.096
800.000	0.362	302.094	799.974	-0.311	-3.992	-0.311	4.004	265.542	0.213
900.000	0.177	336.079	899.973	-0.002	-4.322	-0.002	4.322	269.968	0.237
1000.000	0.203	132.735	999.972	0.018	-4.254	0.018	4.254	270.246	0.372
1100.000	0.271	63.267	1099.972	0.004	-3.913	0.004	3.913	270.061	0.276
1200.000	0.438	34.093	1199.970	0.427	-3.488	0.427	3.514	276.983	0.241
1300.000	0.569	351.772	1299.966	1.235	-3.344	1.235	3.565	290.274	0.384
1400.000	0.208	333.268	1399.964	1.889	-3.497	1.889	3.975	298.378	0.377
1500.000	0.237	165.309	1499.963	1.852	-3.527	1.852	3.983	297.704	0.442
1600.000	0.522	22.751	1599.962	2.072	-3.298	2.072	3.895	302.140	0.724
1700.000	0.387	23.764	1699.959	2.802	-2.986	2.802	4.094	313.178	0.135
1800.000	0.477	120.494	1799.957	2.900	-2.490	2.900	3.822	319.341	0.649

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
1900.000	0.288	87.805	1899.955	2.698	-1.880	2.698	3.288	325.128	0.282
2000.000	0.723	117.833	1999.951	2.413	-1.071	2.413	2.640	336.067	0.495
2100.000	1.256	79.022	2099.937	2.327	0.563	2.327	2.394	13.598	0.828
2200.000	1.886	91.507	2199.899	2.493	3.284	2.493	4.123	52.800	0.713
2300.000	1.985	105.966	2299.843	1.973	6.594	1.973	6.883	73.341	0.497
2400.000	1.769	87.605	2399.790	1.561	9.801	1.561	9.925	80.949	0.636
2500.000	1.365	97.785	2499.752	1.465	12.524	1.465	12.610	83.330	0.489
2600.000	1.517	89.445	2599.721	1.316	15.028	1.316	15.085	84.995	0.258
2700.000	1.502	85.341	2699.686	1.435	17.658	1.435	17.716	85.353	0.109
2800.000	1.916	90.078	2799.642	1.539	20.636	1.539	20.693	85.734	0.437
2900.000	1.814	39.237	2899.595	2.763	23.309	2.763	23.473	83.240	1.604
3000.000	2.060	39.586	2999.538	5.374	25.456	5.374	26.017	78.079	0.247
3100.000	2.006	53.118	3099.475	7.810	28.002	7.810	29.070	74.415	0.482
3200.000	2.721	46.857	3199.390	10.484	31.134	10.484	32.852	71.389	0.759
3300.000	2.864	44.528	3299.271	13.888	34.618	13.888	37.300	68.140	0.183
3400.000	2.966	40.433	3399.142	17.639	38.048	17.639	41.938	65.127	0.232
3500.000	2.669	49.344	3499.021	21.126	41.493	21.126	46.561	63.017	0.529
3600.000	2.584	34.744	3598.917	24.495	44.544	24.495	50.835	61.193	0.673
3700.000	2.057	49.042	3698.836	27.525	47.184	27.525	54.626	59.743	0.779
3800.000	1.011	59.537	3798.799	29.148	49.300	29.148	57.272	59.407	1.079
3900.000	0.670	50.960	3898.788	29.964	50.514	29.964	58.732	59.325	0.362
4000.000	0.729	27.649	3998.781	30.895	51.263	30.895	59.854	58.924	0.288
4100.000	0.721	10.977	4098.773	32.076	51.678	32.076	60.824	58.173	0.210
4200.000	1.278	52.459	4198.758	33.373	52.683	33.373	62.364	57.647	0.879
4300.000	0.839	17.375	4298.742	34.752	53.786	34.752	64.036	57.133	0.764
4400.000	0.840	48.428	4398.732	35.937	54.553	35.937	65.326	56.625	0.449
4500.000	0.757	53.259	4498.722	36.818	55.631	36.818	66.711	56.502	0.107
4600.000	1.101	27.725	4598.709	38.064	56.607	38.064	68.215	56.082	0.530
4700.000	0.442	75.583	4698.700	39.011	57.428	39.011	69.425	55.812	0.869
4800.000	0.794	11.512	4798.695	39.786	57.940	39.786	70.285	55.524	0.720
4900.000	0.392	24.233	4898.690	40.777	58.219	40.777	71.079	54.992	0.420
5000.000	0.728	39.452	4998.685	41.579	58.763	41.579	71.985	54.718	0.364
5100.000	0.807	354.394	5098.677	42.771	59.098	42.771	72.951	54.106	0.593
5200.000	0.653	303.871	5198.670	43.789	58.556	43.789	73.118	53.210	0.638
5300.000	0.771	310.977	5298.662	44.547	57.575	44.547	72.797	52.270	0.147
5400.000	0.420	320.657	5398.656	45.272	56.835	45.272	72.662	51.461	0.364
5500.000	0.381	81.987	5498.655	45.601	56.933	45.601	72.944	51.307	0.699
5600.000	0.817	86.207	5598.650	45.695	57.974	45.695	73.817	51.755	0.438
5700.000	1.148	28.125	5698.637	46.625	59.158	46.625	75.323	51.757	0.997

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
5800.000	0.742	35.594	5798.623	48.035	60.007	48.035	76.865	51.323	0.423
5900.000	0.471	26.620	5898.618	48.929	60.568	48.929	77.862	51.068	0.287
6000.000	0.265	329.555	5998.616	49.495	60.634	49.495	78.271	50.776	0.395
6100.000	1.005	284.645	6098.609	49.916	59.668	49.916	77.794	50.085	0.839
6200.000	1.521	246.638	6198.586	49.612	57.601	49.612	76.021	49.262	0.956
6300.000	2.188	241.628	6298.533	48.179	54.703	48.179	72.895	48.629	0.686
6400.000	1.715	238.784	6398.475	46.496	51.745	46.496	69.566	48.058	0.483
6500.000	1.522	245.721	6498.435	45.175	49.254	45.175	66.834	47.474	0.274
6600.000	1.753	245.292	6598.394	43.989	46.654	43.989	64.122	46.684	0.231
6700.000	1.967	228.220	6698.342	42.206	43.984	42.206	60.959	46.182	0.591
6800.000	2.111	222.218	6798.279	39.699	41.467	39.699	57.406	46.248	0.258
6900.000	1.762	212.446	6898.222	37.037	39.404	37.037	54.078	46.774	0.480
7000.000	1.674	221.200	6998.177	34.641	37.618	34.641	51.138	47.359	0.276
7100.000	1.814	213.484	7098.131	32.223	35.783	32.223	48.153	47.997	0.273
7200.000	1.149	225.184	7198.097	30.196	34.198	30.196	45.622	48.557	0.726
7300.000	1.038	241.845	7298.079	29.062	32.688	29.062	43.739	48.361	0.335
7400.000	0.855	278.029	7398.067	28.738	31.151	28.738	42.382	47.307	0.613
7500.000	0.595	232.201	7498.059	28.524	30.002	28.524	41.398	46.446	0.613
7600.000	0.720	315.238	7598.055	28.653	29.150	28.653	40.874	45.493	0.877
7700.000	0.378	264.545	7698.050	29.067	28.379	29.067	40.624	44.313	0.563
7800.000	0.979	295.078	7798.043	29.398	27.277	29.398	40.103	42.856	0.681
7900.000	0.930	317.208	7898.030	30.356	25.952	30.356	39.937	40.528	0.370
8000.000	1.067	346.810	7998.015	31.858	25.188	31.858	40.612	38.331	0.527
8100.000	1.119	357.681	8097.997	33.741	24.936	33.741	41.955	36.466	0.214
8200.000	1.110	26.080	8197.979	35.586	25.322	35.586	43.676	35.435	0.547
8300.000	1.162	31.682	8297.959	37.319	26.280	37.319	45.644	35.154	0.123
8400.000	0.807	24.658	8397.944	38.822	27.107	38.822	47.349	34.924	0.374
8500.000	0.491	40.818	8497.938	39.786	27.681	39.786	48.468	34.828	0.363
8600.000	0.583	69.902	8597.934	40.285	28.438	40.285	49.311	35.219	0.284
8682.000	0.917	97.852	8679.927	40.339	29.480	40.339	49.963	36.160	0.593



Vaughn Energy Services
Midland, TX
432-563-5444
Surveyor: Charles Hines
Warhawk 3 Federal Com No 001H / API 30-025-40635



VES Survey Date: 08/04/2013



A Schlumberger Company

DIRECTIONAL SURVEY REPORT

COG OPERATING LLC

WARHAWK 3 FEDERAL COM 1H

LEA COUNTY, NEW MEXICO

PREPARED BY: JOE HOGAN

Particular

621 W. R. 11
Midland, Texas 79701
Tel: (432) 687-1647
Fax: (432) 687-1647



A Schlumberger Company

August 13, 2013

COG OPERATING LLC
550 West Texas Avenue
Suite 1300
Midland, TX 79701

RE: COG OPERATING LLC
WARHAWK 3 FEDERAL COM 1H
LEA COUNTY, NEW MEXICO
API No: 30-025-40635
Rig: PATRIOT 6
PES File No.: 13MLD0320

Dear Sir or Madam:

We hereby certify that the enclosed Original Field Survey Data contained in this report represents to the best of our knowledge, a true and accurate survey of the well at the time the survey was run.

DIRECTIONAL SURVEY DATA
1 – Original survey report
2 – Survey report copies

We appreciate the opportunity to work with you and we look forward to your business support. If you have any questions, I can be reached at (432) 687-1647.

Sincerely,



JOE HOGAN
M/LWD Field Service Manager
Schlumberger Technology Corp.

00000000

6211 W. R. 1
Midland, Texas 79701-1234
Tel: (409) 681-1234
Fax: (409) 681-1234



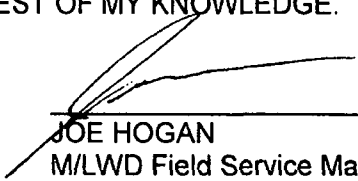
A Schlumberger Company

DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: SCHLUMBERGER TECHNOLOGY CORP.
2. NAME OF PERSON(S) PERFORMING SURVEY: A) ALLAN ABRAHAM
3. POSITION OF SAID PERSON(S): (A) SURVEYORS (FIELD ENGINEER)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 8/5/13 TO 8/10/13
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: LEA COUNTY
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

COG OPERATING LLC
WARHAWK 3 FEDERAL COM 1H
LEA COUNTY, NEW MEXICO
API NO.: 30-025-40635
RIG: PATRIOT 6
9. SURVEY CERTIFIED FROM: 8,832 TO 13,733 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 4,798.13 FEET ON A BEARING OF 84.91 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED DEPTH OF 13,930.00 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



JOE HOGAN
M/LWD Field Service Manager

PathFinder – a Schlumberger company

BHL Report

Page 01/01
Tie-in Date: 08/05/2013
Date Completed: 08/10/2013

COG OPERATING LLC
WARHAWK 3 FEDERAL COM 1H
LUSK; BONE SPRING, EAST
API#: 30-025-40635 Rig: PATRIOT 6
PathFinder Office Supervisor: JOSEPH HOGAN
PathFinder Field Engineers: ALLAN ABRAHAM
TIM CRAMER

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.41.40.4494 N LON: 103.45.43.8006 W
GRID Reference: NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 717045.8100 Y: 618888.6400
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.14° EAST TO GRID
Vertical Section Plane: 85.04
Survey Vert. Reference: 18.00' Rotary Table To Ground
Altitude: 3684.30' Ground To MSL

Measured Depth	13930.00	(feet)
Inclination	89.34	(deg)
Azimuth	83.69	(deg)
True Vertical Depth	9484.65	(feet)
Vertical Section	4798.12	(feet)
Survey X cord	721825.04	(feet)
Survey Y cord	617314.09	(feet)
Survey Lat	32.89566695 N	(deg)
Survey Lon	103.74662428 W	(deg)
Rectangular Corr. N/S	425.45 N	(feet)
Rectangular Corr. E/W	4779.23 E	(feet)
Closure Distance	4798.13	(feet)
Direction of Closure	84.91	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
WARHAWK 3 FEDERAL COM 1H
LEA COUNTY, NM
AP#: 30-025-40635 Rig: PATRIOT 6
PathFinder Office Supervisor: JOSEPH HOGAN
PathFinder Field Engineers: ALLAN ABRAHAM
TIM CRAMER

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.41.40.4494 N LON: 103.45.43.8006 W
GRID Reference: NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 717045.8100 Y: 616888.6400
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.14° EAST TO GRID
Vertical Section Plane: 85.04
Survey Vert. Reference: 18.00' Rotary Table To Ground
Altitude: 3684.30' Ground To MSL

Survey Calculations by RX5 V6.05 using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft)	Closure Dist (ft)	Dir (deg)	DLS (dg/100ft)
THE FOLLOWING ARE VAUGHN ENERGY SERVICES GYRO SURVEYS.									
100.00	0.75	194.95	100.00	0.00	-0.19	0.61 S	0.14 W	0.63@ 192.77	0.00
200.00	0.43	158.16	199.99	100.00	-0.30	1.59 S	0.17 W	1.60@ 186.00	0.48
300.00	0.18	320.35	299.99	100.00	-0.28	1.82 S	0.13 W	1.82@ 184.01	0.60
400.00	0.58	291.28	399.99	100.00	-0.82	1.52 S	0.70 W	1.67@ 204.65	0.43
500.00	0.46	295.49	499.99	100.00	-1.62	1.16 S	1.53 W	1.92@ 232.71	0.12
600.00	0.57	290.17	599.98	100.00	-2.42	0.82 S	2.35 W	2.49@ 250.82	0.12
700.00	0.51	281.89	699.98	100.00	-3.29	0.56 S	3.26 W	3.30@ 260.32	0.10
800.00	0.36	302.09	799.97	100.00	-3.97	0.30 S	3.96 W	3.97@ 265.73	0.21
900.00	0.18	336.08	899.97	100.00	-4.27	0.01 N	4.29 W	4.29@ 270.18	0.24
1000.00	0.20	132.74	999.97	100.00	-4.21	0.03 N	4.22 W	4.22@ 270.47	0.37
1100.00	0.27	63.30	1099.97	100.00	-3.87	0.02 N	3.88 W	3.88@ 270.30	0.28
1200.00	0.44	34.09	1199.97	100.00	-3.41	0.44 N	3.46 W	3.49@ 277.30	0.24
1300.00	0.57	351.77	1299.97	100.00	-3.19	1.25 N	3.31 W	3.54@ 290.68	0.38
1400.00	0.21	333.27	1399.97	100.00	-3.29	1.90 N	3.47 W	3.96@ 298.78	0.38
1500.00	0.24	165.31	1499.96	100.00	-3.32	1.87 N	3.50 W	3.96@ 298.10	0.44
1600.00	0.52	22.75	1599.96	100.00	-3.08	2.09 N	3.27 W	3.88@ 302.56	0.72
1700.00	0.39	23.76	1699.96	100.00	-2.70	2.82 N	2.96 W	4.08@ 313.61	0.13
1800.00	0.48	120.49	1799.96	100.00	-2.20	2.91 N	2.46 W	3.81@ 319.82	0.65
1900.00	0.29	87.80	1899.96	100.00	-1.61	2.71 N	1.85 W	3.28@ 325.69	0.28
2000.00	0.72	117.83	1999.95	100.00	-0.83	2.43 N	1.04 W	2.64@ 336.77	0.49
2100.00	1.26	79.02	2099.94	100.00	0.79	2.34 N	0.59 E	2.42@ 14.19	0.83
2200.00	1.87	91.51	2199.90	100.00	3.50	2.51 N	3.30 E	4.14@ 52.73	0.70
2300.00	1.99	105.97	2299.85	100.00	6.74	1.99 N	6.59 E	6.88@ 73.21	0.50
2400.00	1.77	87.61	2399.79	100.00	9.90	1.58 N	9.80 E	9.92@ 80.86	0.64
2500.00	1.37	97.78	2499.75	100.00	12.60	1.48 N	12.52 E	12.60@ 83.26	0.49

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
 WARHAWK 3 FEDERAL COM 1H
 LEA COUNTY, NM
 API#: 30-025-40635 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)
2600.00	1.52	89.45	2599.72	100.00	15.08	1.33 N	15.02 E	15.08@	84.94	0.26
2700.00	1.50	85.34	2699.69	100.00	17.71	1.45 N	17.65 E	17.71@	85.30	0.11
2800.00	1.92	90.08	2799.64	100.00	20.69	1.55 N	20.63 E	20.69@	85.69	0.44
2900.00	1.81	39.24	2899.60	100.00	23.46	2.78 N	23.30 E	23.47@	83.20	1.60
3000.00	2.06	39.59	2999.54	100.00	25.82	5.39 N	25.45 E	26.01@	78.04	0.25
3100.00	2.01	53.12	3099.48	100.00	28.57	7.82 N	27.99 E	29.07@	74.38	0.48
3200.00	2.72	46.86	3199.39	100.00	31.92	10.50 N	31.13 E	32.85@	71.36	0.76
3300.00	2.86	44.53	3299.27	100.00	35.68	13.90 N	34.61 E	37.30@	68.12	0.18
3400.00	2.97	40.43	3399.14	100.00	39.42	17.65 N	38.04 E	41.94@	65.11	0.23
3500.00	2.67	49.34	3499.02	100.00	43.16	21.14 N	41.48 E	46.56@	63.00	0.53
3600.00	2.58	34.74	3598.92	100.00	46.49	24.51 N	44.54 E	50.83@	61.18	0.67
3700.00	2.06	49.04	3698.84	100.00	49.38	27.54 N	47.18 E	54.62@	59.73	0.78
3800.00	1.01	59.54	3798.80	100.00	51.63	29.16 N	49.29 E	57.27@	59.39	1.08
3900.00	0.67	50.96	3898.79	100.00	52.91	29.98 N	50.51 E	58.73@	59.31	0.36
4000.00	0.73	27.65	3998.78	100.00	53.74	30.91 N	51.25 E	59.85@	58.91	0.29
4100.00	0.72	10.98	4098.78	100.00	54.25	32.09 N	51.67 E	60.82@	58.16	0.21
4200.00	1.28	52.46	4198.76	100.00	55.36	33.39 N	52.67 E	62.36@	57.63	0.88
4300.00	0.83	17.38	4298.75	100.00	56.58	34.76 N	53.77 E	64.03@	57.12	0.77
4400.00	0.84	48.43	4398.73	100.00	57.44	35.93 N	54.54 E	65.31@	56.62	0.45
4500.00	0.76	53.26	4498.72	100.00	58.59	36.81 N	55.62 E	66.70@	56.50	0.11
4600.00	1.10	27.73	4598.71	100.00	59.67	38.06 N	56.59 E	68.20@	56.08	0.53
4700.00	0.44	75.58	4698.70	100.00	60.57	39.01 N	57.41 E	69.41@	55.81	0.87
4800.00	0.79	11.51	4798.70	100.00	61.15	39.78 N	57.92 E	70.27@	55.52	0.72
4900.00	0.39	24.23	4898.69	100.00	61.51	40.77 N	58.20 E	71.06@	54.99	0.42
5000.00	0.73	39.45	4998.69	100.00	62.12	41.57 N	58.75 E	71.97@	54.71	0.36
5100.00	0.81	354.39	5098.68	100.00	62.56	42.77 N	59.08 E	72.94@	54.10	0.59
5200.00	0.65	303.87	5198.67	100.00	62.11	43.78 N	58.54 E	73.10@	53.21	0.64
5300.00	0.77	310.98	5298.66	100.00	61.20	44.54 N	57.56 E	72.78@	52.26	0.15

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
 WARHAWK 3 FEDERAL COM 1H
 LEA COUNTY, NM
 API#: 30-025-40635 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)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
5400.00	0.42	320.66	5398.66	100.00	60.52	45.27 N	56.82 E	72.65@	51.46	0.36
5500.00	0.38	81.99	5498.66	100.00	60.65	45.60 N	56.92 E	72.93@	51.30	0.70
5600.00	0.82	86.21	5598.65	100.00	61.69	45.69 N	57.96 E	73.80@	51.75	0.44
5700.00	1.15	28.13	5698.64	100.00	62.95	46.62 N	59.14 E	75.31@	51.75	1.00
5800.00	0.74	35.59	5798.63	100.00	63.92	48.03 N	59.99 E	76.85@	51.32	0.42
5900.00	0.47	26.62	5898.62	100.00	64.55	48.93 N	60.55 E	77.85@	51.06	0.29
6000.00	0.26	329.56	5998.62	100.00	64.67	49.49 N	60.62 E	78.26@	50.77	0.39
6100.00	1.01	284.64	6098.61	100.00	63.74	49.91 N	59.65 E	77.78@	50.08	0.84
6200.00	1.52	246.64	6198.59	100.00	61.66	49.61 N	57.58 E	76.01@	49.26	0.96
6300.00	2.19	241.63	6298.54	100.00	58.65	48.18 N	54.69 E	72.88@	48.62	0.69
6400.00	1.71	238.78	6398.48	100.00	55.55	46.49 N	51.73 E	69.55@	48.05	0.48
6500.00	1.52	245.72	6498.44	100.00	52.96	45.17 N	49.24 E	66.82@	47.47	0.27
6600.00	1.75	245.29	6598.40	100.00	50.27	43.99 N	46.64 E	64.11@	46.68	0.23
6700.00	1.97	228.22	6698.35	100.00	47.45	42.20 N	43.97 E	60.95@	46.17	0.59
6800.00	2.11	222.22	6798.28	100.00	44.73	39.70 N	41.45 E	57.39@	46.24	0.26
6900.00	1.76	212.45	6898.22	100.00	42.44	37.03 N	39.39 E	54.06@	46.76	0.48
7000.00	1.67	221.20	6998.18	100.00	40.46	34.64 N	37.60 E	51.12@	47.35	0.28
7100.00	1.81	213.48	7098.13	100.00	38.42	32.22 N	35.77 E	48.14@	47.99	0.27
7200.00	1.15	225.18	7198.10	100.00	36.66	30.19 N	34.18 E	45.61@	48.55	0.73
7300.00	1.04	241.85	7298.08	100.00	35.06	29.06 N	32.67 E	43.72@	48.35	0.34
7400.00	0.86	278.03	7398.07	100.00	33.50	28.74 N	31.13 E	42.37@	47.29	0.61
7500.00	0.60	232.20	7498.06	100.00	32.34	28.52 N	29.98 E	41.38@	46.43	0.61
7600.00	0.72	315.24	7598.06	100.00	31.50	28.65 N	29.13 E	40.86@	45.48	0.88
7700.00	0.38	264.54	7698.05	100.00	30.77	29.06 N	28.36 E	40.61@	44.30	0.56
7800.00	0.98	295.08	7798.05	100.00	29.70	29.39 N	27.26 E	40.09@	42.84	0.68
7900.00	0.93	317.21	7898.03	100.00	28.46	30.35 N	25.93 E	39.92@	40.51	0.37
8000.00	1.07	346.81	7998.02	100.00	27.83	31.85 N	25.17 E	40.60@	38.31	0.53
8100.00	1.12	357.68	8098.00	100.00	27.74	33.74 N	24.92 E	41.94@	36.45	0.21

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
 WARHAWK 3 FEDERAL COM 1H
 LEA COUNTY, NM
 API#: 30-025-40635 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	1.11	26.08	8197.98	100.00	28.29	35.58 N	25.30 E	43.66@	35.42	0.55
8300.00	1.16	31.68	8297.96	100.00	29.39	37.31 N	26.26 E	45.63@	35.14	0.12
8400.00	0.81	24.66	8397.95	100.00	30.34	38.82 N	27.09 E	47.34@	34.91	0.37
8500.00	0.49	40.82	8497.94	100.00	31.00	39.78 N	27.66 E	48.45@	34.81	0.36
8600.00	0.59	69.90	8597.94	100.00	31.81	40.28 N	28.43 E	49.31@	35.21	0.29
** TIED INTO VAUGHN ENERGY SERVICES GYRO SURVEY AT 8682' MD.										
8682.00	0.92	97.85	8679.93	82.00	32.86	40.34 N	29.48 E	49.96@	36.16	0.59
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
8832.00	0.79	128.69	8829.91	150.00	34.78	39.53 N	31.48 E	50.53@	38.53	0.31
8867.00	0.97	127.73	8864.91	35.00	35.17	39.20 N	31.90 E	50.54@	39.14	0.52
8898.00	5.19	89.41	8895.86	31.00	36.76	39.05 N	33.51 E	51.46@	40.64	14.42
8930.00	11.17	90.46	8927.52	32.00	41.30	39.04 N	38.06 E	54.53@	44.27	18.69
8962.00	16.36	87.30	8958.59	32.00	48.89	39.23 N	45.67 E	60.21@	49.34	16.38
8993.00	20.40	89.76	8988.00	31.00	58.64	39.46 N	55.44 E	68.05@	54.56	13.27
9025.00	23.57	93.98	9017.67	32.00	70.52	39.04 N	67.40 E	77.89@	59.92	11.06
9057.00	24.97	93.18	9046.85	32.00	83.53	38.22 N	80.53 E	89.14@	64.61	4.49
9082.00	26.29	91.69	9069.39	25.00	94.26	37.76 N	91.33 E	98.83@	67.54	5.87
9113.00	28.23	91.69	9096.94	31.00	108.36	37.34 N	105.52 E	111.94@	70.51	6.26
9145.00	30.07	90.55	9124.89	32.00	123.86	37.04 N	121.11 E	126.65@	72.99	6.01
9177.00	34.38	90.37	9151.95	32.00	140.84	36.91 N	138.17 E	143.01@	75.04	13.47
9208.00	37.81	88.53	9177.00	31.00	159.05	37.09 N	156.42 E	160.76@	76.66	11.60
9240.00	41.59	90.28	9201.62	32.00	179.42	37.29 N	176.86 E	180.75@	78.09	12.32
9272.00	43.70	90.11	9225.15	32.00	201.01	37.22 N	198.53 E	201.99@	79.38	6.60
9303.00	47.31	91.34	9246.88	31.00	223.01	36.93 N	220.64 E	223.71@	80.50	11.98
9334.00	49.77	90.46	9267.40	31.00	246.12	36.57 N	243.87 E	246.60@	81.47	8.21
9367.00	53.46	89.93	9287.89	33.00	271.88	36.49 N	269.73 E	272.19@	82.30	11.25
9398.00	55.13	88.53	9305.98	31.00	296.98	36.83 N	294.90 E	297.19@	82.88	6.52
9430.00	56.81	86.94	9323.89	32.00	323.47	37.88 N	321.40 E	323.62@	83.28	6.67
9462.00	57.95	85.19	9341.14	32.00	350.41	39.73 N	348.28 E	350.54@	83.49	5.82

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
 WARHAWK 3 FEDERAL COM 1H
 LEA COUNTY, NM
 API#: 30-025-40635 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)
9493.00	59.88	83.87	9357.14	31.00	376.96	42.27 N	374.71 E	377.08@	83.56	7.21
9525.00	62.78	84.48	9372.49	32.00	405.03	45.11 N	402.64 E	405.16@	83.61	9.22
9557.00	66.57	84.13	9386.18	32.00	433.95	47.98 N	431.41 E	434.07@	83.65	11.88
9588.00	70.79	85.45	9397.45	31.00	462.82	50.60 N	460.17 E	462.94@	83.72	14.18
9620.00	73.07	86.68	9407.37	32.00	493.23	52.69 N	490.51 E	493.33@	83.87	8.01
9652.00	74.83	86.77	9416.22	32.00	523.97	54.44 N	521.21 E	524.05@	84.04	5.51
9683.00	76.33	87.47	9423.94	31.00	553.97	55.95 N	551.20 E	554.03@	84.20	5.31
9715.00	79.40	86.86	9430.67	32.00	585.23	57.50 N	582.44 E	585.27@	84.36	9.77
9746.00	83.89	86.42	9435.17	31.00	615.88	59.30 N	613.05 E	615.91@	84.48	14.55
9778.00	87.58	85.63	9437.55	32.00	647.78	61.51 N	644.88 E	647.81@	84.55	11.79
9810.00	87.76	85.71	9438.85	32.00	679.76	63.92 N	676.76 E	679.77@	84.60	0.61
9905.00	88.81	85.10	9441.69	95.00	774.71	71.53 N	771.41 E	774.72@	84.70	1.28
10000.00	89.43	85.19	9443.15	95.00	869.70	79.57 N	866.06 E	869.71@	84.75	0.66
10095.00	89.43	85.01	9444.10	95.00	964.69	87.68 N	960.71 E	964.70@	84.79	0.19
10189.00	88.81	84.48	9445.54	94.00	1058.68	96.29 N	1054.30 E	1058.69@	84.78	0.87
10284.00	89.16	83.25	9447.22	95.00	1153.64	106.44 N	1148.74 E	1153.66@	84.71	1.35
10379.00	87.93	85.10	9449.64	95.00	1248.60	116.08 N	1243.21 E	1248.62@	84.67	2.34
10474.00	88.90	84.04	9452.26	95.00	1343.55	125.07 N	1337.75 E	1343.58@	84.66	1.51
10569.00	90.48	83.60	9452.78	95.00	1438.53	135.29 N	1432.19 E	1438.57@	84.60	1.73
10664.00	90.22	85.63	9452.20	95.00	1533.52	144.21 N	1526.77 E	1533.56@	84.60	2.16
10759.00	89.52	87.65	9452.41	95.00	1628.47	149.78 N	1621.60 E	1628.50@	84.72	2.25
10854.00	91.01	87.47	9451.97	95.00	1723.38	153.82 N	1716.51 E	1723.39@	84.88	1.58
10949.00	89.43	88.09	9451.61	95.00	1818.27	157.50 N	1811.43 E	1818.27@	85.03	1.79
11044.00	88.37	87.38	9453.43	95.00	1913.14	161.25 N	1906.34 E	1913.15@	85.16	1.34
11139.00	89.87	87.91	9454.89	95.00	2008.03	165.16 N	2001.24 E	2008.05@	85.28	1.67
11233.00	89.60	86.86	9455.33	94.00	2101.95	169.45 N	2095.14 E	2101.98@	85.38	1.15
11328.00	89.60	86.94	9455.99	95.00	2196.90	174.58 N	2190.00 E	2196.95@	85.44	0.08
11423.00	89.69	86.33	9456.58	95.00	2291.86	180.16 N	2284.84 E	2291.93@	85.49	0.65

PathFinder – a Schlumberger company

Survey Report

COG OPERATING LLC
 WARHAWK 3 FEDERAL COM 1H
 LEA COUNTY, NM
 API#: 30-025-40635 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)
11518.00	89.96	86.15	9456.87	95.00	2386.84	186.39 N	2379.63 E	2386.92@	85.52	0.34
11613.00	88.81	84.84	9457.89	95.00	2481.82	193.85 N	2474.33 E	2481.91@	85.52	1.84
11708.00	89.34	84.40	9459.42	95.00	2576.81	202.76 N	2568.90 E	2576.89@	85.49	0.72
11803.00	88.90	84.13	9460.88	95.00	2671.79	212.25 N	2663.41 E	2671.85@	85.44	0.54
11898.00	88.55	83.43	9462.99	95.00	2766.74	222.54 N	2757.83 E	2766.79@	85.39	0.82
11993.00	88.20	82.90	9465.69	95.00	2861.65	233.84 N	2852.11 E	2861.68@	85.31	0.67
12088.00	89.16	83.34	9467.88	95.00	2956.57	245.22 N	2946.40 E	2956.59@	85.24	1.11
12183.00	89.34	84.22	9469.12	95.00	3051.54	255.51 N	3040.83 E	3051.55@	85.20	0.94
12278.00	89.69	85.36	9469.92	95.00	3146.53	264.13 N	3135.44 E	3146.54@	85.18	1.26
12373.00	89.96	84.84	9470.22	95.00	3241.53	272.25 N	3230.09 E	3241.54@	85.18	0.62
12468.00	90.31	84.84	9469.99	95.00	3336.53	280.79 N	3324.70 E	3336.54@	85.17	0.37
12563.00	90.92	84.92	9468.97	95.00	3431.52	289.27 N	3419.32 E	3431.53@	85.16	0.65
12658.00	89.87	84.57	9468.32	95.00	3526.52	297.97 N	3513.92 E	3526.53@	85.15	1.16
12753.00	88.90	84.13	9469.34	95.00	3621.51	307.32 N	3608.45 E	3621.51@	85.13	1.12
12847.00	89.52	83.78	9470.63	94.00	3715.48	317.22 N	3701.92 E	3715.48@	85.10	0.76
12942.00	89.87	82.37	9471.14	95.00	3810.42	328.68 N	3796.22 E	3810.42@	85.05	1.53
13037.00	87.93	84.75	9472.96	95.00	3905.36	339.33 N	3890.59 E	3905.36@	85.02	3.23
13132.00	88.37	85.63	9476.03	95.00	4000.31	347.29 N	3985.20 E	4000.31@	85.02	1.04
13227.00	88.55	85.10	9478.58	95.00	4095.27	354.96 N	4079.86 E	4095.27@	85.03	0.59
13322.00	89.60	84.75	9480.12	95.00	4190.26	363.37 N	4174.47 E	4190.26@	85.03	1.16
13417.00	90.92	84.22	9479.68	95.00	4285.25	372.50 N	4269.03 E	4285.25@	85.01	1.50
13512.00	90.04	84.48	9478.89	95.00	4380.24	381.85 N	4363.56 E	4380.24@	85.00	0.97
13607.00	88.55	84.57	9480.06	95.00	4475.23	390.91 N	4458.12 E	4475.23@	84.99	1.57
13733.00	89.34	83.69	9482.38	126.00	4601.19	403.80 N	4583.44 E	4601.19@	84.97	0.94
STRAIGHT LINE PROJECTION TO BIT AT 13930'MD.										
13930.00	89.34	83.69	9484.65	197.00	4798.12	425.45 N	4779.23 E	4798.13@	84.91	0.00

PathFinder – a Schlumberger company

Survey Report

**COG OPERATING LLC
WARHAWK 3 FEDERAL COM 1H
LEA COUNTY, NM
API#: 30-025-40635 Rig: PATRIOT 6**

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**** 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.**