

PATRIOT DRILLING, LLC

30-025-38970

OPERATOR: COG Operating, LLC.
WELL/LEASE: Patterson B-52 Fed # 5-H
COUNTY: Lea Co., New Mexico
Sec. 5, T19S, R32E

**STATE OF NEW MEXICO
DEVIATION REPORT**

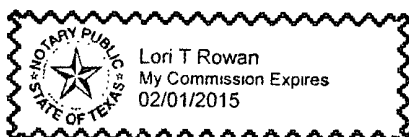
<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
779	3	3,125	1 3/4
1,148	1 1/2	3,488	3/4
1,309	1 1/4	3,973	1
1,447	1 1/2	4,441	3/4
1,572	1 3/4	4,884	1/2
1,698	1 1/4	5,429	1 3/4
1,819	1 1/4	5,617	1 1/2
1,947	1	5,880	1 1/2
2,070	1 1/2	6,134	1
2,261	1	6,476	1 1/4
2,394	1 1/2	6,790	1 1/2
2,515	1 1/2	7,230	1
2,643	2	7,723	1/2
2,771	3	8,225	2
2,840	2 1/4	8,425	2 3/4
2,994	2	8,541	3

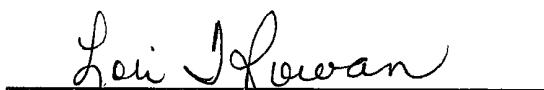
Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 15th day of August, 2011 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



DIRECTIONAL REPORT

WELLNAME: PATTERSON B-52 FEDERAL #5H

FIELD: LUSK NORTH

AFE NO.:

WELL ID NO.: 30-025-38970

API NO.: 30-025-38970

SURVEY TYPE: GMS-0

MD:

ANGLE:

AZIMUTH:

TVD:

N/S:

E/W:

VS:

TARGET:

MEASURED DEPTH	INCLINATION ANGLE	AZIMUTH ANGLE	TVD	+NORTH -SOUTH	+EAST -WEST	VERTICAL SECTION	DOGLEG SEVERITY
100	0.32	143.44	100	-0.22	0.17	-0.22	0.32
200	0.33	135.01	200	-0.65	0.54	-0.65	0.05
300	0.24	159.10	300	-1.05	0.81	-1.05	0.15
400	0.31	189.01	400	-1.51	0.85	-1.51	0.16
500	0.49	215.27	500	-2.13	0.56	-2.13	0.25
600	0.55	216.82	600	-2.86	0.02	-2.86	0.06
700	0.57	235.70	700	-3.53	-0.68	-3.53	0.18
800	0.68	248.44	800	-4.03	-1.64	-4.03	0.18
900	0.95	264.89	900	-4.32	-3.02	-4.32	0.35
1,000	1.18	264.25	1,000	-4.50	-4.87	-4.50	0.23
1,100	1.18	259.02	1,100	-4.79	-6.90	-4.79	0.11
1,200	1.13	248.07	1,200	-5.36	-8.83	-5.36	0.23
1,300	1.23	236.52	1,300	-6.32	-10.64	-6.32	0.26
1,400	1.35	240.93	1,400	-7.48	-12.56	-7.48	0.16
1,500	1.41	244.30	1,500	-8.59	-14.70	-8.59	0.10
1,600	1.45	251.07	1,600	-9.53	-17.00	-9.53	0.17
1,700	1.45	263.96	1,700	-10.08	-19.46	-10.08	0.33
1,800	1.24	283.43	1,800	-9.96	-21.77	-9.96	0.50
1,900	1.10	301.03	1,900	-9.21	-23.65	-9.21	0.38
2,000	0.99	321.82	2,000	-8.04	-25.00	-8.04	0.39
2,100	1.01	342.40	2,100	-6.52	-25.80	-6.52	0.36
2,200	1.06	1.05	2,200	-4.76	-26.05	-4.76	0.34
2,300	1.20	12.03	2,300	-2.81	-25.82	-2.81	0.26
2,400	1.54	20.06	2,400	-0.52	-25.14	-0.52	0.39
2,500	1.81	32.05	2,500	2.08	-23.84	2.08	0.44
2,600	2.21	37.71	2,600	4.95	-21.82	4.95	0.45
2,700	2.46	40.54	2,699	8.10	-19.25	8.10	0.28
2,800	2.45	41.62	2,799	11.33	-16.43	11.33	0.05
2,900	2.32	41.54	2,899	14.44	-13.67	14.44	0.13
3,000	1.97	40.87	2,999	17.26	-11.20	17.26	0.35
3,100	1.84	44.71	3,099	19.70	-8.95	19.70	0.18
3,200	1.85	41.02	3,199	22.06	-6.76	22.06	0.12
3,300	1.67	45.83	3,299	24.29	-4.66	24.29	0.23
3,400	1.34	42.57	3,399	26.17	-2.82	26.17	0.34
3,500	1.09	43.24	3,499	27.72	-1.38	27.72	0.25
3,600	0.92	41.24	3,599	29.02	-0.20	29.02	0.17
3,700	0.79	36.39	3,699	30.18	0.74	30.18	0.15
3,800	0.75	34.03	3,799	31.27	1.52	31.27	0.05
3,900	0.56	27.42	3,899	32.25	2.11	32.25	0.20
4,000	0.53	26.65	3,999	33.10	2.54	33.10	0.03
4,100	0.57	11.82	4,099	34.00	2.85	34.00	0.15
4,200	0.52	16.56	4,199	34.92	3.08	34.92	0.07
4,300	0.46	14.12	4,299	35.74	3.31	35.74	0.06
4,400	0.44	0.46	4,399	36.52	3.41	36.52	0.11
4,500	0.43	349.42	4,499	37.27	3.34	37.27	0.08
4,600	0.35	353.90	4,599	37.94	3.24	37.94	0.09
4,700	0.32	332.23	4,699	38.49	3.08	38.49	0.13
4,800	0.39	335.17	4,799	39.05	2.81	39.05	0.07
4,900	0.55	340.79	4,899	39.81	2.51	39.81	0.17
5,000	0.75	327.21	4,999	40.81	1.99	40.81	0.25
5,100	0.82	321.30	5,099	41.92	1.19	41.92	0.11



DIRECTIONAL REPORT

WELLNAME: PATTERSON B-52 FEDERAL #5H

FIELD: LUSK NORTH

WELL ID NO.: 30-025-38970

AFE NO.:

API NO.: 30-025-38970

SURVEY TYPE: GMS-0

MD:

ANGLE:

AZIMUTH:

TVD:

N/S:

E/W:

VS:

TARGET:

MEASURED DEPTH	INCLINATION ANGLE	AZIMUTH ANGLE	TVD	+NORTH -SOUTH	+EAST -WEST	VERTICAL SECTION	DOGLEG SEVERITY
5,200	1.08	308.28	5,199	43.06	0.00	43.06	0.34
5,300	1.27	307.86	5,299	44.33	-1.61	44.33	0.19
5,400	1.73	307.70	5,399	45.93	-3.68	45.93	0.46
5,500	1.67	306.26	5,499	47.72	-6.05	47.72	0.07
5,600	1.58	306.36	5,599	49.40	-8.33	49.40	0.09
5,700	1.37	298.94	5,699	50.79	-10.49	50.79	0.28
5,800	1.42	298.79	5,799	51.97	-12.62	51.97	0.05
5,900	1.19	295.17	5,899	53.01	-14.65	53.01	0.24
6,000	1.25	294.36	5,999	53.90	-16.58	53.90	0.06
6,100	1.22	297.26	6,099	54.83	-18.52	54.83	0.07
6,200	1.14	299.23	6,199	55.81	-20.34	55.81	0.09
6,300	1.08	293.24	6,299	56.66	-22.07	56.66	0.13
6,400	1.05	295.27	6,399	57.43	-23.77	57.43	0.05
6,500	1.10	294.26	6,499	58.21	-25.47	58.21	0.05
6,600	1.09	294.16	6,599	59.00	-27.21	59.00	0.01
6,700	1.02	295.56	6,698	59.77	-28.88	59.77	0.07
6,800	1.06	290.73	6,798	60.48	-30.55	60.48	0.10
6,900	1.03	291.67	6,898	61.14	-32.25	61.14	0.04
7,000	0.90	298.71	6,998	61.85	-33.77	61.85	0.18
7,100	0.84	295.63	7,098	62.55	-35.12	62.55	0.08
7,200	0.51	292.47	7,198	63.03	-36.20	63.03	0.33
7,300	0.88	261.86	7,298	63.09	-37.37	63.09	0.51
7,400	0.85	256.02	7,398	62.80	-38.85	62.80	0.09
7,500	0.77	236.95	7,498	62.26	-40.13	62.26	0.28
7,600	0.70	209.86	7,598	61.36	-41.00	61.36	0.35
7,700	0.63	143.33	7,698	60.39	-40.97	60.39	0.73
7,800	0.65	175.29	7,798	59.39	-40.60	59.39	0.35
7,900	0.90	218.23	7,898	58.20	-41.04	58.20	0.61
8,000	1.45	222.04	7,998	56.65	-42.37	56.65	0.56
8,100	1.47	236.29	8,098	55.00	-44.29	55.00	0.36
8,200	1.74	250.59	8,198	53.78	-46.78	53.78	0.48
8,300	2.42	249.85	8,298	52.55	-50.20	52.55	0.68
8,400	2.86	238.14	8,398	50.50	-54.30	50.50	0.69
8,500	3.35	232.91	8,498	47.42	-58.75	47.42	0.57
8,555	3.10	229.86	8,553	45.50	-61.17	45.50	0.55

PathFinder Energy Services, Inc.

Survey Report

Page 01/02
Tie-in Date: 08/07/2011
Date Completed: 08/12/2011

COG OPERATING, LLC.
PATTERSON B-52 FEDERAL #5H.
LEA COUNTY, NM
Rig: PATRIOT # 6
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers: P.DAS
M.SAKAS

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.41.18.3835 N LON: 103.46.53.4614 W
GRID Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 669770.8000 Y: 614607.0000
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.39° EAST TO GRID
Vertical Section Plane: 180.00
Survey Vert. Reference: 18.00' Kelly Bushing To Ground
Altitude: 3659.00' Ground To MSL

Survey Calculations by RX5 V6.03E using Minimum Curvature

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)
TIED-IN TO SCIENTIFIC DRILLING GYRO SURVEY @ 8555' MD.										
8555.00	3.10	229.86	8552.87	0.00	-45.42	45.42 N	61.25 W	76.25@	306.56	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
8723.00	3.17	227.12	8720.62	168.00	-39.33	39.33 N	68.13 W	78.66@	300.00	0.10
8818.00	3.25	221.14	8815.47	95.00	-35.52	35.52 N	71.82 W	80.12@	296.31	0.36
8850.00	3.25	221.58	8847.42	32.00	-34.15	34.15 N	73.02 W	80.61@	295.07	0.08
8914.00	6.42	191.08	8911.19	64.00	-29.28	29.28 N	74.91 W	80.43@	291.35	6.21
8946.00	11.61	180.80	8942.79	32.00	-24.30	24.30 N	75.30 W	79.13@	287.89	16.92
8977.00	13.98	179.04	8973.02	31.00	-17.44	17.44 N	75.28 W	77.28@	283.04	7.75
9009.00	18.03	179.66	9003.77	32.00	-8.62	8.62 N	75.19 W	75.68@	276.54	12.67
9041.00	21.98	180.62	9033.83	32.00	2.33	2.33 S	75.23 W	75.26@	268.23	12.39
9073.00	25.32	183.26	9063.14	32.00	15.15	15.15 S	75.68 W	77.18@	258.68	10.95
9105.00	29.02	183.96	9091.61	32.00	29.73	29.73 S	76.60 W	82.17@	248.79	11.61
9136.00	32.01	182.47	9118.31	31.00	45.44	45.44 S	77.48 W	89.82@	239.61	9.95
9168.00	34.82	181.33	9145.02	32.00	63.05	63.05 S	78.06 W	100.34@	231.07	9.00
9200.00	37.55	179.57	9170.84	32.00	81.94	81.94 S	78.19 W	113.26@	223.66	9.13
9232.00	39.66	179.30	9195.85	32.00	101.91	101.91 S	78.00 W	128.33@	217.43	6.62
9264.00	42.56	179.83	9219.96	32.00	122.94	122.94 S	77.84 W	145.51@	212.34	9.13
9295.00	45.02	180.89	9242.33	31.00	144.39	144.39 S	77.98 W	164.10@	208.37	8.28
9327.00	48.19	182.38	9264.32	32.00	167.63	167.63 S	78.65 W	185.17@	205.14	10.47
9359.00	53.29	182.82	9284.56	32.00	192.37	192.37 S	79.78 W	208.26@	202.52	15.97
9391.00	57.24	182.91	9302.79	32.00	218.63	218.63 S	81.09 W	233.19@	200.35	12.35
9422.00	60.50	182.91	9318.82	31.00	245.13	245.13 S	82.44 W	258.62@	198.59	10.52
9454.00	64.90	183.00	9333.49	32.00	273.52	273.52 S	83.91 W	286.10@	197.05	13.75
9486.00	69.56	182.12	9345.87	32.00	302.99	302.99 S	85.22 W	314.75@	195.71	14.78
9518.00	73.51	181.85	9356.00	32.00	333.32	333.32 S	86.27 W	344.30@	194.51	12.37

PathFinder Energy Services, Inc.

Survey Report

COG OPERATING, LLC.
PATTERSON B-52 FEDERAL #5H
LEA COUNTY, NM
RIG: PATRIOT # 6

Page 02/02

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)
9550.00	77.91	181.59	9363.90	32.00	364.31	364.31 S	87.20 W	374.60@	193.46	13.77
9581.00	82.22	181.06	9369.25	31.00	394.83	394.83 S	87.90 W	404.49@	192.55	14.00
9612.00	83.89	180.80	9373.00	31.00	425.59	425.59 S	88.40 W	434.68@	191.73	5.45
9647.00	87.32	180.62	9375.68	35.00	460.48	460.48 S	88.84 W	468.97@	190.92	9.81
9679.00	88.02	180.54	9376.98	32.00	492.46	492.46 S	89.16 W	500.46@	190.26	2.20
9710.00	88.11	180.36	9378.02	31.00	523.44	523.44 S	89.40 W	531.02@	189.69	0.65
9774.00	88.90	180.45	9379.69	64.00	587.41	587.41 S	89.85 W	594.25@	188.70	1.24
9838.00	90.22	180.62	9380.19	64.00	651.41	651.41 S	90.45 W	657.66@	187.91	2.08
9901.00	90.66	180.45	9379.70	63.00	714.40	714.40 S	91.04 W	720.18@	187.26	0.75
9997.00	90.84	180.89	9378.45	96.00	810.39	810.39 S	92.16 W	815.61@	186.49	0.50
10092.00	90.13	180.01	9377.64	95.00	905.38	905.38 S	92.91 W	910.13@	185.86	1.19
10156.00	90.57	179.39	9377.25	64.00	969.38	969.38 S	92.57 W	973.79@	185.46	1.19
10251.00	90.75	179.30	9376.16	95.00	1064.36	1064.36 S	91.49 W	1068.29@	184.91	0.21
10346.00	90.92	178.60	9374.77	95.00	1159.34	1159.34 S	89.75 W	1162.81@	184.43	0.76
10442.00	90.75	178.25	9373.37	96.00	1255.29	1255.29 S	87.11 W	1258.31@	183.97	0.41
10537.00	91.71	177.81	9371.33	95.00	1350.21	1350.21 S	83.84 W	1352.81@	183.55	1.11
10632.00	90.22	178.34	9369.73	95.00	1445.14	1445.14 S	80.65 W	1447.39@	183.19	1.66
10728.00	89.25	179.66	9370.18	96.00	1541.12	1541.12 S	78.98 W	1543.14@	182.93	1.71
10823.00	88.64	178.95	9371.93	95.00	1636.10	1636.10 S	77.83 W	1637.95@	182.72	0.98
10918.00	89.52	179.22	9373.45	95.00	1731.07	1731.07 S	76.31 W	1732.75@	182.52	0.97
11014.00	89.25	178.60	9374.48	96.00	1827.05	1827.05 S	74.48 W	1828.57@	182.33	0.70
STRAIGHT- LINE PROJECTION TO BIT @ 11130' MD.										
11130.00	89.25	178.60	9376.00	116.00	1943.01	1943.01 S	71.65 W	1944.33@	182.11	0.00