



Company: NOBLE ENERGY

Lease/Well: PATRIOT B/ #16-17

Location:

Rig Name: PRODUCTION

State/County: COLORADO/WELD COUNTY

Latitude: 40.40

GRID North is 0.61 Degrees East of True North

VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run2_ed.ut

Minimum Curvature Method

Report Date/Time: 7/9/2011 / 17:02

Vaughn Energy Services

Rifle, Colorado

866-835-8333

Jay Hinman

Patriot B 16-17/ 05-123-23169

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	11.26	100.00	0.38	0.07	0.38	0.38	11.26	0.44
200.00	0.24	37.95	200.00	0.92	0.28	0.92	0.96	16.93	0.25
300.00	0.44	11.18	300.00	1.46	0.48	1.46	1.54	18.30	0.25
400.00	0.38	14.53	399.99	2.16	0.64	2.16	2.25	16.53	0.07
500.00	0.46	9.62	499.99	2.88	0.79	2.88	2.98	15.38	0.09
600.00	0.70	346.88	599.99	3.87	0.72	3.87	3.93	10.56	0.32
700.00	0.81	331.02	699.98	5.08	0.24	5.08	5.08	2.72	0.24
800.00	0.71	335.83	799.97	6.26	-0.36	6.26	6.27	356.75	0.11
900.00	0.95	329.06	899.96	7.54	-1.04	7.54	7.61	352.17	0.26
1000.00	0.89	328.63	999.94	8.92	-1.87	8.92	9.11	348.16	0.06
1100.00	0.82	313.62	1099.93	10.07	-2.79	10.07	10.45	344.52	0.24
1200.00	0.83	310.96	1199.92	11.04	-3.85	11.04	11.69	340.77	0.04
1300.00	0.84	303.69	1299.91	11.92	-5.00	11.92	12.93	337.22	0.11
1400.00	0.71	293.92	1399.90	12.57	-6.18	12.57	14.01	333.83	0.19
1500.00	0.42	285.83	1499.90	12.93	-7.10	12.93	14.75	331.21	0.30
1600.00	0.59	299.24	1599.89	13.28	-7.91	13.28	15.46	329.22	0.21
1700.00	0.73	302.97	1699.89	13.88	-8.90	13.88	16.49	327.34	0.14
1800.00	0.77	316.69	1799.88	14.71	-9.89	14.71	17.73	326.10	0.18
1900.00	0.87	319.31	1899.87	15.78	-10.85	15.78	19.15	325.50	0.11
2000.00	0.83	324.71	1999.86	16.95	-11.76	16.95	20.63	325.24	0.09
2100.00	0.79	332.16	2099.85	18.14	-12.50	18.14	22.03	325.44	0.11
2200.00	0.85	336.98	2199.84	19.43	-13.11	19.43	23.44	326.00	0.09
2300.00	0.64	347.79	2299.83	20.66	-13.51	20.66	24.68	326.80	0.25
2400.00	0.42	349.97	2399.83	21.56	-13.70	21.56	25.54	327.57	0.22
2500.00	0.26	162.39	2499.82	21.70	-13.69	21.70	25.66	327.76	0.68
2600.00	0.24	182.42	2599.82	21.28	-13.63	21.28	25.27	327.36	0.09
2700.00	0.18	199.02	2699.82	20.92	-13.69	20.92	25.00	326.80	0.08
2800.00	0.49	199.28	2799.82	20.37	-13.88	20.37	24.65	325.72	0.30
2900.00	0.84	191.48	2899.81	19.25	-14.17	19.25	23.91	323.65	0.36
3000.00	0.90	193.00	2999.80	17.77	-14.49	17.77	22.93	320.80	0.07
3100.00	1.22	189.23	3099.79	15.95	-14.84	15.95	21.79	317.06	0.33
3200.00	2.09	193.75	3199.74	13.13	-15.44	13.13	20.27	310.36	0.87
3300.00	2.26	181.87	3299.67	9.39	-15.94	9.39	18.50	300.49	0.48
3400.00	2.07	180.05	3399.60	5.61	-16.01	5.61	16.96	289.32	0.20

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>TVD FT</i>	<i>+N-S FT</i>	<i>+E-W FT</i>	<i>Vertical Section FT</i>	<i>Closure Distance FT</i>	<i>Closure Direction Deg</i>	<i>Dogleg Severity Deg/100</i>
3500.00	1.99	175.65	3499.54	2.07	-15.88	2.07	16.01	277.42	0.17
3600.00	1.98	174.42	3599.48	-1.38	-15.58	-1.38	15.64	264.92	0.05
3700.00	2.00	168.86	3699.42	-4.81	-15.07	-4.81	15.82	252.29	0.20
3800.00	2.13	170.95	3799.35	-8.37	-14.44	-8.37	16.69	239.91	0.15
3900.00	2.13	175.53	3899.28	-12.06	-14.00	-12.06	18.48	229.27	0.17
4000.00	1.76	166.40	3999.23	-15.40	-13.50	-15.40	20.48	221.23	0.48
4100.00	1.50	153.80	4099.18	-18.07	-12.56	-18.07	22.01	214.79	0.44
4200.00	1.36	158.53	4199.15	-20.36	-11.54	-20.36	23.40	209.55	0.18
4300.00	1.23	156.67	4299.13	-22.45	-10.68	-22.45	24.86	205.45	0.14
4400.00	1.67	131.17	4399.10	-24.39	-9.16	-24.39	26.06	200.59	0.77
4500.00	1.69	121.39	4499.05	-26.12	-6.81	-26.12	26.99	194.61	0.29
4600.00	2.46	111.52	4598.99	-27.67	-3.56	-27.67	27.90	187.32	0.84
4700.00	2.37	90.10	4698.90	-28.46	0.50	-28.46	28.47	178.99	0.90
4800.00	2.91	83.01	4798.80	-28.16	5.08	-28.16	28.61	169.76	0.63
4900.00	2.66	97.79	4898.68	-28.16	9.91	-28.16	29.86	160.62	0.76
5000.00	2.05	108.74	4998.59	-29.06	13.91	-29.06	32.21	154.42	0.76
5100.00	1.40	119.71	5098.55	-30.23	16.66	-30.23	34.52	151.14	0.73
5200.00	0.87	128.36	5198.53	-31.31	18.31	-31.31	36.27	149.68	0.56
5300.00	1.14	136.69	5298.51	-32.50	19.59	-32.50	37.95	148.93	0.31
5400.00	1.64	148.92	5398.48	-34.45	21.01	-34.45	40.35	148.63	0.58
5500.00	1.44	156.88	5498.45	-36.84	22.24	-36.84	43.03	148.88	0.29
5600.00	1.63	167.10	5598.41	-39.38	23.05	-39.38	45.63	149.65	0.33
5700.00	1.17	164.24	5698.38	-41.75	23.65	-41.75	47.98	150.47	0.46
5800.00	1.08	167.65	5798.36	-43.65	24.13	-43.65	49.88	151.07	0.12
5900.00	0.89	151.00	5898.35	-45.25	24.70	-45.25	51.55	151.37	0.34
6000.00	0.73	147.29	5998.34	-46.46	25.42	-46.46	52.96	151.31	0.16
6100.00	0.93	140.26	6098.33	-47.63	26.29	-47.63	54.40	151.10	0.22
6200.00	1.03	150.21	6198.31	-49.04	27.26	-49.04	56.10	150.93	0.20
6300.00	0.67	149.27	6298.30	-50.32	28.01	-50.32	57.59	150.90	0.36
6400.00	0.74	172.38	6398.29	-51.47	28.39	-51.47	58.78	151.11	0.29
6500.00	0.73	181.89	6498.29	-52.74	28.46	-52.74	59.93	151.65	0.12
6600.00	0.75	159.59	6598.28	-53.99	28.66	-53.99	61.13	152.04	0.29
6700.00	0.62	105.35	6698.27	-54.75	29.42	-54.75	62.15	151.75	0.64

HORIZONTAL DISPLACEMENT IS
62.15 FEET AT 151.75 DEGREES