

Company: Noble Energy
 Lease/Well: Bockius/34-7g
 Location: Sec 34, T4N, R65W
 Rig Name: Lightning Wire
 State/County: Colorado/Weld
 Latitude: 40.27
 GRID North is 0.55 Degrees East of True North
 VS-Azi: 0.00 Degrees

FIELD COPY ONLY (NOT DEFINITIVE)

Service Company : Vaughn Energy Services

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: bockius34-7g-01.ut

Minimum Curvature Method

Report Date/Time: 11/3/2010 / 14:23

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	0.65	196.40	100.00	-0.54	-0.16	-0.54	0.57	196.40	0.65
200.00	0.42	182.19	199.99	-1.45	-0.33	-1.45	1.49	192.97	0.27
300.00	0.68	196.31	299.99	-2.38	-0.51	-2.38	2.44	192.18	0.29
400.00	0.39	190.99	399.98	-3.28	-0.74	-3.28	3.36	192.78	0.29
500.00	0.58	190.21	499.98	-4.12	-0.90	-4.12	4.21	192.33	0.20
600.00	0.68	213.18	599.97	-5.11	-1.31	-5.11	5.28	194.40	0.27
700.00	0.75	245.17	699.97	-5.88	-2.23	-5.88	6.29	200.79	0.40
800.00	0.81	237.81	799.96	-6.53	-3.43	-6.53	7.38	207.69	0.11
900.00	0.74	253.92	899.95	-7.09	-4.65	-7.09	8.48	213.26	0.23
1000.00	0.89	248.08	999.94	-7.56	-5.99	-7.56	9.64	218.40	0.16
1100.00	0.73	253.82	1099.93	-8.02	-7.32	-8.02	10.86	222.36	0.18
1200.00	0.80	238.19	1199.92	-8.57	-8.52	-8.57	12.08	224.83	0.22
1300.00	0.92	259.15	1299.91	-9.09	-9.90	-9.09	13.44	227.46	0.34
1400.00	0.79	248.06	1399.90	-9.50	-11.33	-9.50	14.79	230.03	0.21
1500.00	0.96	262.79	1499.89	-9.86	-12.80	-9.86	16.16	232.39	0.28
1600.00	1.12	254.32	1599.87	-10.23	-14.57	-10.23	17.80	234.93	0.22
1700.00	1.22	264.02	1699.85	-10.60	-16.57	-10.60	19.67	237.38	0.22
1800.00	1.36	248.59	1799.82	-11.15	-18.73	-11.15	21.79	239.24	0.37
1900.00	1.40	249.96	1899.80	-12.00	-20.98	-12.00	24.16	240.24	0.05
2000.00	1.19	244.78	1999.77	-12.85	-23.06	-12.85	26.40	240.86	0.24
2100.00	1.14	223.03	2099.75	-14.02	-24.68	-14.02	28.38	240.39	0.44

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
2200.00	1.08	217.32	2199.73	-15.51	-25.93	-15.51	30.21	239.12	0.13
2300.00	1.02	218.00	2299.71	-16.96	-27.05	-16.96	31.93	237.91	0.06
2400.00	1.11	222.66	2399.70	-18.37	-28.26	-18.37	33.70	236.97	0.12
2500.00	1.03	220.25	2499.68	-19.77	-29.49	-19.77	35.51	236.16	0.08
2600.00	1.04	227.10	2599.66	-21.08	-30.74	-21.08	37.28	235.56	0.12
2700.00	0.89	221.69	2699.65	-22.28	-31.92	-22.28	38.93	235.09	0.18
2800.00	0.80	223.28	2799.64	-23.36	-32.92	-23.36	40.36	234.63	0.09
2900.00	0.80	214.50	2899.63	-24.44	-33.79	-24.44	41.70	234.12	0.12
3000.00	0.71	203.84	2999.62	-25.58	-34.43	-25.58	42.89	233.39	0.17
3100.00	0.38	188.13	3099.62	-26.47	-34.72	-26.47	43.66	232.69	0.36
3200.00	0.86	336.32	3199.61	-26.11	-35.07	-26.11	43.72	233.34	1.19
3300.00	1.19	346.73	3299.60	-24.41	-35.61	-24.41	43.17	235.57	0.38
3400.00	1.25	342.88	3399.57	-22.35	-36.17	-22.35	42.52	238.29	0.10
3500.00	1.42	340.75	3499.55	-20.13	-36.90	-20.13	42.04	241.39	0.18
3600.00	1.65	338.90	3599.51	-17.62	-37.83	-17.62	41.73	245.03	0.23
3700.00	1.77	343.94	3699.47	-14.79	-38.77	-14.79	41.50	249.12	0.19
3800.00	1.72	334.92	3799.42	-11.95	-39.84	-11.95	41.59	253.30	0.28
3900.00	1.84	338.59	3899.37	-9.10	-41.06	-9.10	42.05	257.50	0.16
4000.00	1.84	333.30	3999.32	-6.17	-42.37	-6.17	42.81	261.71	0.17
4100.00	1.96	323.74	4099.27	-3.35	-44.10	-3.35	44.23	265.65	0.34
4200.00	2.09	322.49	4199.20	-0.53	-46.22	-0.53	46.23	269.34	0.13
4300.00	2.25	317.05	4299.13	2.35	-48.67	2.35	48.72	272.76	0.26
4400.00	2.15	318.41	4399.06	5.19	-51.25	5.19	51.51	275.78	0.11
4500.00	1.70	311.54	4499.00	7.58	-53.61	7.58	54.14	278.05	0.51
4600.00	1.18	287.09	4598.97	8.86	-55.70	8.86	56.40	279.04	0.79
4700.00	1.06	292.61	4698.95	9.52	-57.54	9.52	58.32	279.40	0.17
4800.00	0.81	318.88	4798.94	10.41	-58.86	10.41	59.77	280.03	0.49
4900.00	0.43	343.34	4898.93	11.30	-59.43	11.30	60.49	280.77	0.45
5000.00	0.40	357.64	4998.93	12.01	-59.55	12.01	60.75	281.40	0.11
5100.00	0.65	15.05	5098.93	12.91	-59.42	12.91	60.80	282.26	0.29
5200.00	0.60	356.09	5198.92	13.98	-59.31	13.98	60.93	283.26	0.21
5300.00	0.78	49.03	5298.91	14.95	-58.83	14.95	60.70	284.25	0.63
5400.00	0.83	58.55	5398.90	15.77	-57.70	15.77	59.82	285.28	0.14
5500.00	0.78	22.94	5498.89	16.77	-56.82	16.77	59.24	286.45	0.49
5600.00	1.09	11.64	5598.88	18.33	-56.36	18.33	59.27	288.02	0.36
5700.00	1.87	328.65	5698.85	20.66	-57.02	20.66	60.64	289.91	1.31
5800.00	1.11	302.59	5798.82	22.57	-58.68	22.57	62.88	291.04	1.00

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
5900.00	0.70	298.24	5898.80	23.39	-60.04	23.39	64.44	291.28	0.41
6000.00	0.56	314.88	5998.80	24.02	-60.93	24.02	65.49	291.52	0.23
6100.00	0.20	311.53	6098.79	24.48	-61.40	24.48	66.10	291.73	0.36
6200.00	0.20	313.21	6198.79	24.71	-61.66	24.71	66.42	291.84	0.01
6300.00	0.15	326.46	6298.79	24.93	-61.85	24.93	66.69	291.96	0.06
6400.00	0.20	257.62	6398.79	25.01	-62.09	25.01	66.94	291.94	0.20
6500.00	0.31	246.73	6498.79	24.86	-62.51	24.86	67.27	291.69	0.12
6600.00	0.29	235.48	6598.79	24.61	-62.97	24.61	67.61	291.35	0.06
6700.00	0.43	214.70	6698.79	24.15	-63.40	24.15	67.84	290.86	0.19
6800.00	0.49	172.07	6798.79	23.42	-63.56	23.42	67.73	290.23	0.34
6900.00	0.94	169.99	6898.78	22.19	-63.35	22.19	67.13	289.30	0.45
7000.00	1.41	153.79	6998.76	20.28	-62.67	20.28	65.87	287.93	0.58
7050.00	1.42	156.35	7048.74	19.16	-62.15	19.16	65.03	287.13	0.13

HORIZONTAL DISPLACEMENT IS
65.03 FEET AT 287.13 DEGREES