



Company: Noble Energy
Lease/Well: Wells Ranch USX AA/13-7
Location: S-13 T-6N R-63W
Rig Name: Production
State/County: Colorado/Weld
Latitude: 40.49, Longitude: -104.38
GRID North is 0.73 Degrees East of True North
VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Elevation

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01_ed.ut

Minimum Curvature Method

Report Date/Time: 7/25/2011 / 18:08

Vaughn Energy Services

Henderson, CO.

866-835-8333

Surveyor: Daniel Miller

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	0.78	46.18	100.00	0.47	0.49	0.47	0.68	46.18	0.78
200.00	0.91	40.48	199.99	1.55	1.50	1.55	2.16	44.08	0.15
300.00	0.61	47.23	299.98	2.52	2.41	2.52	3.48	43.74	0.32
400.00	0.42	42.57	399.97	3.15	3.04	3.15	4.38	44.06	0.19
500.00	0.40	90.83	499.97	3.41	3.64	3.41	4.99	46.89	0.34
600.00	0.32	95.08	599.97	3.38	4.27	3.38	5.45	51.65	0.09
700.00	0.40	111.20	699.97	3.23	4.87	3.23	5.85	56.47	0.13
800.00	0.33	114.59	799.96	2.98	5.46	2.98	6.22	61.34	0.07
900.00	0.46	113.70	899.96	2.70	6.09	2.70	6.66	66.08	0.13
1000.00	0.56	112.49	999.96	2.35	6.91	2.35	7.30	71.21	0.10
1100.00	0.61	115.60	1099.95	1.93	7.85	1.93	8.08	76.16	0.06
1200.00	0.71	117.96	1199.95	1.41	8.87	1.41	8.99	80.95	0.10
1300.00	0.65	122.39	1299.94	0.82	9.89	0.82	9.93	85.24	0.08
1400.00	0.79	134.11	1399.93	0.04	10.86	0.04	10.86	89.77	0.20
1500.00	0.42	153.88	1499.93	-0.76	11.52	-0.76	11.54	93.77	0.42
1600.00	0.32	148.87	1599.92	-1.32	11.82	-1.32	11.89	96.37	0.10
1700.00	0.29	147.22	1699.92	-1.77	12.10	-1.77	12.23	98.32	0.03
1800.00	0.11	162.88	1799.92	-2.07	12.26	-2.07	12.44	99.60	0.18
1900.00	0.28	331.05	1899.92	-1.96	12.17	-1.96	12.33	99.13	0.39
2000.00	0.32	275.55	1999.92	-1.72	11.78	-1.72	11.90	98.29	0.28
2100.00	0.52	283.13	2099.92	-1.59	11.06	-1.59	11.17	98.17	0.20
2200.00	0.79	293.67	2199.91	-1.21	9.99	-1.21	10.06	96.90	0.30
2300.00	1.31	293.09	2299.89	-0.49	8.31	-0.49	8.33	93.35	0.52
2400.00	1.71	292.09	2399.86	0.52	5.88	0.52	5.91	84.94	0.40
2500.00	1.77	300.85	2499.81	1.87	3.18	1.87	3.69	59.51	0.27
2600.00	1.84	299.27	2599.76	3.45	0.45	3.45	3.48	7.44	0.09
2700.00	1.67	295.29	2699.72	4.86	-2.27	4.86	5.36	334.99	0.22
2800.00	1.43	295.10	2799.68	6.01	-4.71	6.01	7.63	321.90	0.23
2900.00	1.28	304.37	2899.65	7.17	-6.76	7.17	9.85	316.67	0.27
3000.00	1.19	306.62	2999.63	8.42	-8.52	8.42	11.97	314.66	0.10
3100.00	0.90	309.09	3099.61	9.53	-9.96	9.53	13.78	313.74	0.29
3200.00	0.66	319.37	3199.60	10.46	-10.94	10.46	15.14	313.72	0.27
3300.00	0.94	325.80	3299.59	11.58	-11.78	11.58	16.52	314.51	0.30
3400.00	0.63	76.44	3399.59	12.39	-11.71	12.39	17.05	316.62	1.30

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
3500.00	0.97	92.31	3499.58	12.48	-10.33	12.48	16.20	320.39	0.40
3600.00	1.45	99.02	3599.56	12.25	-8.23	12.25	14.76	326.09	0.50
3700.00	1.51	99.81	3699.52	11.83	-5.69	11.83	13.12	334.32	0.06
3800.00	1.79	98.84	3799.48	11.36	-2.85	11.36	11.72	345.93	0.28
3900.00	1.73	102.68	3899.43	10.79	0.16	10.79	10.79	0.87	0.13
4000.00	1.63	110.90	3999.39	9.96	2.96	9.96	10.39	16.56	0.26
4100.00	1.60	110.80	4099.35	8.95	5.59	8.95	10.56	32.00	0.02
4200.00	1.32	128.37	4199.32	7.74	7.81	7.74	10.99	45.26	0.53
4300.00	0.63	158.34	4299.30	6.51	8.92	6.51	11.04	53.86	0.84
4400.00	0.75	185.85	4399.30	5.35	9.05	5.35	10.52	59.41	0.35
4500.00	0.66	200.69	4499.29	4.16	8.78	4.16	9.72	64.63	0.20
4600.00	0.48	202.26	4599.29	3.24	8.42	3.24	9.02	68.95	0.17
4700.00	0.11	205.56	4699.28	2.77	8.22	2.77	8.68	71.40	0.37
4800.00	1.08	209.92	4799.28	1.86	7.71	1.86	7.93	76.41	0.97
4900.00	2.17	219.61	4899.24	-0.41	6.03	-0.41	6.05	93.92	1.12
5000.00	2.12	221.30	4999.17	-3.26	3.60	-3.26	4.86	132.15	0.08
5100.00	1.20	208.34	5099.12	-5.57	1.89	-5.57	5.88	161.28	0.99
5200.00	0.70	201.86	5199.11	-7.06	1.16	-7.06	7.15	170.64	0.51
5300.00	0.66	148.89	5299.10	-8.12	1.23	-8.12	8.21	171.35	0.61
5400.00	0.66	132.47	5399.10	-9.00	1.96	-9.00	9.22	167.73	0.19
5500.00	0.60	108.60	5499.09	-9.56	2.88	-9.56	9.99	163.22	0.27
5600.00	0.47	106.18	5599.09	-9.84	3.77	-9.84	10.54	159.02	0.13
5700.00	0.42	99.31	5699.08	-10.02	4.53	-10.02	10.99	155.68	0.07
5800.00	0.39	111.19	5799.08	-10.20	5.20	-10.20	11.45	152.97	0.09
5900.00	0.43	120.67	5899.08	-10.51	5.85	-10.51	12.03	150.93	0.08
6000.00	0.51	124.40	5999.07	-10.96	6.54	-10.96	12.76	149.18	0.08
6100.00	0.29	127.08	6099.07	-11.36	7.10	-11.36	13.40	147.98	0.22
6200.00	0.28	120.13	6199.07	-11.63	7.52	-11.63	13.85	147.14	0.04
6300.00	0.39	120.28	6299.07	-11.93	8.03	-11.93	14.38	146.07	0.11
6400.00	0.18	112.33	6399.07	-12.16	8.47	-12.16	14.82	145.16	0.22
6500.00	0.28	114.43	6499.07	-12.32	8.83	-12.32	15.16	144.37	0.11
6600.00	0.30	121.05	6599.07	-12.56	9.28	-12.56	15.61	143.55	0.04
6700.00	0.48	133.90	6699.06	-12.98	9.80	-12.98	16.26	142.95	0.20
HORIZONTAL DISPLACEMENT IS 16.26 FEET AT 142.95 DEGREES									