

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
Lease/Well: State Schmidt / 36-12

Location: S-36 T-5N R-65W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.35, Longitude: -104.62

GRID North is 0.57 Degrees East of True North

VS-Azi: 0.00 Degrees

**GTI**

GYRO TECHNOLOGIES, INC

## FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

## DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun\_ed.ut

Minimum Curvature Method

Report Date/Time: 3/21/2011 / 20:38

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	0.41	329.52	100.00	0.31	-0.18	0.31	0.35	329.52	0.41
200.00	0.38	302.74	200.00	0.79	-0.64	0.79	1.02	321.04	0.18
300.00	0.42	283.22	299.99	1.05	-1.27	1.05	1.65	309.61	0.14
400.00	0.33	300.83	399.99	1.28	-1.87	1.28	2.27	304.41	0.14
500.00	0.25	202.95	499.99	1.23	-2.21	1.23	2.53	299.09	0.44
600.00	0.20	212.38	599.99	0.88	-2.39	0.88	2.55	290.13	0.06
700.00	0.41	215.90	699.99	0.44	-2.69	0.44	2.73	279.23	0.21
800.00	0.38	207.93	799.99	-0.14	-3.06	-0.14	3.06	267.30	0.06
900.00	0.37	281.51	899.99	-0.37	-3.53	-0.37	3.55	263.98	0.45
1000.00	0.11	170.67	999.98	-0.40	-3.83	-0.40	3.86	264.04	0.42
1100.00	0.15	143.15	1099.98	-0.59	-3.74	-0.59	3.79	260.97	0.07
1200.00	0.12	27.05	1199.98	-0.61	-3.62	-0.61	3.67	260.50	0.22
1300.00	0.27	292.27	1299.98	-0.43	-3.79	-0.43	3.81	263.58	0.30
1400.00	0.24	356.43	1399.98	-0.13	-4.02	-0.13	4.02	268.15	0.27
1500.00	0.11	31.71	1499.98	0.16	-3.98	0.16	3.98	272.35	0.16
1600.00	0.38	308.63	1599.98	0.46	-4.19	0.46	4.22	276.22	0.39
1700.00	0.36	298.34	1699.98	0.81	-4.73	0.81	4.80	279.78	0.07
1800.00	0.45	306.29	1799.98	1.20	-5.32	1.20	5.45	282.67	0.11
1900.00	0.12	280.53	1899.98	1.45	-5.74	1.45	5.92	284.16	0.35
2000.00	0.48	263.15	1999.97	1.42	-6.26	1.42	6.42	282.75	0.37
2100.00	0.86	258.01	2099.97	1.21	-7.41	1.21	7.51	279.29	0.38
2200.00	0.71	273.49	2199.96	1.09	-8.76	1.09	8.83	277.12	0.25
2300.00	0.84	240.55	2299.95	0.77	-10.02	0.77	10.05	274.40	0.46
2400.00	0.82	273.99	2399.94	0.46	-11.37	0.46	11.38	272.32	0.48
2500.00	0.86	277.68	2499.93	0.61	-12.83	0.61	12.84	272.72	0.07
2600.00	0.93	274.38	2599.92	0.77	-14.38	0.77	14.40	273.08	0.09
2700.00	0.95	276.71	2699.90	0.93	-16.01	0.93	16.04	273.33	0.04
2800.00	0.80	268.81	2799.89	1.01	-17.53	1.01	17.56	273.31	0.19
2900.00	0.96	256.42	2899.88	0.80	-19.05	0.80	19.06	272.41	0.25
3000.00	0.72	252.53	2999.87	0.42	-20.46	0.42	20.47	271.16	0.25
3100.00	0.58	233.31	3099.86	-0.08	-21.47	-0.08	21.47	269.79	0.26
3200.00	0.76	216.76	3199.86	-0.91	-22.28	-0.91	22.30	267.65	0.26
3300.00	0.78	227.20	3299.85	-1.91	-23.17	-1.91	23.25	265.29	0.14
3400.00	0.60	183.84	3399.84	-2.90	-23.71	-2.90	23.89	263.03	0.54
3500.00	0.78	198.84	3499.83	-4.07	-23.96	-4.07	24.31	260.36	0.25
3600.00	0.99	197.57	3599.82	-5.54	-24.44	-5.54	25.06	257.24	0.21
3700.00	0.95	210.57	3699.81	-7.07	-25.13	-7.07	26.10	254.28	0.22
3800.00	0.86	182.75	3799.79	-8.54	-25.59	-8.54	26.97	251.55	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
3900.00	0.89	219.86	3899.78	-9.89	-26.12	-9.89	27.93	249.27	0.56
4000.00	0.51	192.56	3999.78	-10.92	-26.71	-10.92	28.86	247.77	0.49
4100.00	0.05	142.08	4099.77	-11.40	-26.78	-11.40	29.11	246.95	0.48
4200.00	0.30	165.39	4199.77	-11.69	-26.69	-11.69	29.13	246.35	0.25
4300.00	0.15	4.54	4299.77	-11.82	-26.61	-11.82	29.12	246.06	0.44
4400.00	0.04	30.27	4399.77	-11.66	-26.58	-11.66	29.03	246.32	0.12
4500.00	0.20	11.50	4499.77	-11.46	-26.53	-11.46	28.90	246.64	0.17
4600.00	0.30	4.95	4599.77	-11.03	-26.47	-11.03	28.68	247.39	0.10
4700.00	0.20	355.82	4699.77	-10.60	-26.46	-10.60	28.51	248.18	0.11
4800.00	0.14	315.20	4799.77	-10.34	-26.56	-10.34	28.50	248.73	0.13
4900.00	0.23	288.38	4899.77	-10.19	-26.83	-10.19	28.70	249.20	0.12
5000.00	0.21	192.59	4999.77	-10.31	-27.06	-10.31	28.96	249.14	0.33
5100.00	0.50	202.47	5099.77	-10.90	-27.27	-10.90	29.37	248.21	0.30
5200.00	0.40	209.73	5199.76	-11.61	-27.61	-11.61	29.95	247.20	0.12
5300.00	0.64	232.76	5299.76	-12.24	-28.22	-12.24	30.76	246.55	0.31
5400.00	0.88	247.03	5399.75	-12.88	-29.37	-12.88	32.07	246.32	0.31
5500.00	0.80	250.25	5499.74	-13.41	-30.73	-13.41	33.53	246.42	0.09
5600.00	0.98	265.59	5599.73	-13.72	-32.24	-13.72	35.04	246.96	0.29
5700.00	0.91	228.71	5699.72	-14.31	-33.69	-14.31	36.60	246.99	0.60
5800.00	0.96	262.51	5799.70	-14.94	-35.12	-14.94	38.16	246.95	0.55
5900.00	0.37	181.36	5899.70	-15.37	-35.95	-15.37	39.10	246.85	0.97
6000.00	0.93	113.42	5999.69	-16.02	-35.22	-16.02	38.69	245.54	0.86
6100.00	0.57	101.02	6099.68	-16.43	-33.99	-16.43	37.75	244.19	0.39
6200.00	0.60	105.05	6199.68	-16.67	-32.99	-16.67	36.96	243.20	0.05
6300.00	0.33	137.27	6299.68	-17.02	-32.29	-17.02	36.50	242.21	0.37
6400.00	0.31	104.19	6399.67	-17.29	-31.83	-17.29	36.22	241.48	0.18
6500.00	0.29	108.65	6499.67	-17.44	-31.33	-17.44	35.86	240.89	0.03
6600.00	0.39	90.76	6599.67	-17.53	-30.74	-17.53	35.39	240.31	0.14
6700.00	0.25	87.55	6699.67	-17.52	-30.18	-17.52	34.90	239.86	0.14
6800.00	0.27	138.79	6799.67	-17.69	-29.81	-17.69	34.66	239.31	0.23
6900.00	0.19	106.53	6899.67	-17.91	-29.49	-17.91	34.50	238.72	0.15
7000.00	0.22	336.57	6999.67	-17.79	-29.40	-17.79	34.37	238.82	0.37
HORIZONTAL DISPLACEMENT IS 34.37 FEET AT 238.82 DEGREES									