

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy  
 Lease/Well: State A / 36-5  
 Location: S-36 T-6N R-65W

Rig Name: Production  
 State/County: Colorado / Weld County

Latitude: 40.44, Longitude: -104.51  
 GRID North is 0.64 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: outrun\_ed.ut  
 Minimum Curvature Method  
 Report Date/Time: 3/10/2011 / 10:35

Vaughn Energy Services  
 Denver, CO  
 720-215-1841  
 Robert Davis

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	0.04	129.41	100.00	-0.02	0.03	-0.02	0.03	129.41	0.04
200.00	0.33	48.15	200.00	0.15	0.27	0.15	0.31	60.86	0.33
300.00	0.24	113.49	300.00	0.26	0.67	0.26	0.72	69.13	0.32
400.00	0.22	177.93	400.00	-0.02	0.87	-0.02	0.87	91.18	0.25
500.00	0.19	352.92	500.00	-0.05	0.86	-0.05	0.86	93.07	0.41
600.00	0.34	84.22	600.00	0.15	1.13	0.15	1.14	82.63	0.39
700.00	0.31	166.20	700.00	-0.08	1.49	-0.08	1.49	93.24	0.42
800.00	0.12	293.42	800.00	-0.30	1.45	-0.30	1.48	101.72	0.40
900.00	0.42	189.33	899.99	-0.62	1.30	-0.62	1.43	115.46	0.46
1000.00	0.20	240.30	999.99	-1.06	1.09	-1.06	1.52	134.37	0.33
1100.00	0.47	192.02	1099.99	-1.55	0.85	-1.55	1.77	151.37	0.37
1200.00	0.15	242.42	1199.99	-2.02	0.65	-2.02	2.12	162.20	0.40
1300.00	0.60	230.98	1299.99	-2.41	0.13	-2.41	2.41	176.94	0.45
1400.00	0.34	187.18	1399.98	-3.03	-0.31	-3.03	3.05	185.92	0.42
1500.00	0.47	210.89	1499.98	-3.68	-0.56	-3.68	3.72	188.68	0.21
1600.00	0.38	203.10	1599.98	-4.34	-0.90	-4.34	4.43	191.75	0.10
1700.00	0.68	236.66	1699.97	-4.97	-1.53	-4.97	5.20	197.08	0.42
1800.00	0.56	193.58	1799.97	-5.77	-2.14	-5.77	6.15	200.32	0.47
1900.00	0.48	184.96	1899.97	-6.67	-2.29	-6.67	7.05	198.94	0.11
2000.00	0.61	234.94	1999.96	-7.39	-2.76	-7.39	7.89	200.48	0.48
2100.00	0.51	209.22	2099.96	-8.09	-3.41	-8.09	8.78	202.89	0.27
2200.00	0.56	224.94	2199.95	-8.82	-3.97	-8.82	9.67	204.26	0.15
2300.00	0.52	227.09	2299.95	-9.47	-4.65	-9.47	10.55	206.14	0.05
2400.00	0.56	222.27	2399.94	-10.14	-5.31	-10.14	11.44	207.63	0.07
2500.00	0.14	206.05	2499.94	-10.61	-5.69	-10.61	12.04	208.21	0.44
2600.00	0.17	239.64	2599.94	-10.79	-5.87	-10.79	12.28	208.54	0.09
2700.00	0.19	296.85	2699.94	-10.79	-6.14	-10.79	12.41	209.66	0.17
2800.00	0.20	290.02	2799.94	-10.65	-6.46	-10.65	12.46	211.23	0.03
2900.00	0.32	294.73	2899.94	-10.48	-6.88	-10.48	12.53	213.28	0.12
3000.00	0.38	17.88	2999.94	-10.04	-7.03	-10.04	12.26	214.98	0.47
3100.00	0.18	59.18	3099.94	-9.65	-6.79	-9.65	11.80	215.14	0.27
3200.00	0.47	230.62	3199.94	-9.83	-6.97	-9.83	12.05	215.35	0.65
3300.00	0.65	324.63	3299.93	-9.62	-7.62	-9.62	12.28	218.37	0.83
3400.00	1.26	324.60	3399.92	-8.27	-8.59	-8.27	11.92	226.09	0.60

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	1.21	317.73	3499.90	-6.59	-9.93	-6.59	11.92	236.41	0.16
3600.00	0.98	341.47	3599.88	-5.00	-10.91	-5.00	12.00	245.37	0.50
3700.00	0.98	321.22	3699.86	-3.52	-11.72	-3.52	12.23	253.27	0.35
3800.00	1.19	340.60	3799.85	-1.87	-12.60	-1.87	12.74	261.55	0.42
3900.00	0.69	316.18	3899.83	-0.45	-13.36	-0.45	13.37	268.06	0.63
4000.00	0.75	328.87	3999.82	0.54	-14.12	0.54	14.13	272.20	0.17
4100.00	0.58	347.16	4099.82	1.59	-14.57	1.59	14.66	276.24	0.27
4200.00	0.12	52.15	4199.82	2.15	-14.60	2.15	14.75	278.39	0.54
4300.00	0.34	346.93	4299.81	2.51	-14.58	2.51	14.79	279.76	0.31
4400.00	0.09	280.35	4399.81	2.81	-14.72	2.81	14.99	280.80	0.31
4500.00	0.19	342.41	4499.81	2.98	-14.85	2.98	15.15	281.36	0.17
4600.00	0.18	67.35	4599.81	3.20	-14.76	3.20	15.10	282.24	0.25
4700.00	0.15	46.92	4699.81	3.35	-14.52	3.35	14.91	282.99	0.06
4800.00	0.29	257.66	4799.81	3.38	-14.68	3.38	15.06	282.98	0.43
4900.00	0.07	230.09	4899.81	3.29	-14.98	3.29	15.33	282.39	0.23
5000.00	0.24	296.85	4999.81	3.34	-15.21	3.34	15.58	282.40	0.22
5100.00	0.18	296.47	5099.81	3.51	-15.54	3.51	15.93	282.72	0.06
5200.00	0.17	143.16	5199.81	3.46	-15.60	3.46	15.98	282.52	0.34
5300.00	0.48	247.72	5299.81	3.19	-15.89	3.19	16.21	281.35	0.54
5400.00	0.46	280.50	5399.81	3.10	-16.67	3.10	16.96	280.55	0.26
5500.00	0.17	151.07	5499.81	3.05	-16.99	3.05	17.26	280.17	0.58
5600.00	0.51	180.03	5599.80	2.47	-16.92	2.47	17.10	278.32	0.37
5700.00	0.60	168.98	5699.80	1.52	-16.82	1.52	16.89	275.15	0.14
5800.00	0.35	180.37	5799.80	0.70	-16.72	0.70	16.74	272.39	0.27
5900.00	0.48	196.33	5899.79	-0.01	-16.84	-0.01	16.84	269.97	0.18
6000.00	0.69	250.94	5999.79	-0.61	-17.53	-0.61	17.54	268.01	0.57
6100.00	0.61	258.31	6099.78	-0.91	-18.62	-0.91	18.64	267.19	0.12
6200.00	0.30	238.55	6199.78	-1.15	-19.36	-1.15	19.39	266.59	0.34
6300.00	0.42	240.81	6299.78	-1.47	-19.90	-1.47	19.96	265.78	0.13
6400.00	0.31	266.68	6399.77	-1.66	-20.49	-1.66	20.56	265.36	0.20
6500.00	0.18	290.64	6499.77	-1.62	-20.91	-1.62	20.97	265.56	0.16
6600.00	0.25	147.26	6599.77	-1.75	-20.94	-1.75	21.01	265.22	0.41
6700.00	0.33	215.22	6699.77	-2.17	-20.99	-2.17	21.10	264.09	0.33
6800.00	0.33	178.41	6799.77	-2.70	-21.15	-2.70	21.32	262.74	0.21
6900.00	0.60	176.04	6899.77	-3.50	-21.11	-3.50	21.39	260.57	0.28

<div> HORIZONTAL DISPLACEMENT IS  21.39 FEET AT 260.57 DEGREES </div>
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