

**VES**

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Foos / 1-1614

Location: S-1 T-4N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.34, Longitude: -104.49

GRID North is 0.65 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: 3/25/2011 / 09:46

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	0.53	119.15	100.00	-0.22	0.40	-0.22	0.46	119.15	0.53
200.00	0.32	109.63	200.00	-0.54	1.07	-0.54	1.20	116.94	0.22
300.00	0.40	130.86	299.99	-0.87	1.60	-0.87	1.82	118.50	0.16
400.00	0.46	158.22	399.99	-1.47	2.01	-1.47	2.49	126.18	0.21
500.00	0.82	176.25	499.98	-2.56	2.21	-2.56	3.38	139.25	0.41
600.00	0.69	213.54	599.98	-3.78	1.92	-3.78	4.24	153.07	0.50
700.00	0.64	197.38	699.97	-4.82	1.42	-4.82	5.03	163.56	0.19
800.00	0.75	204.30	799.96	-5.95	0.99	-5.95	6.03	170.59	0.14
900.00	0.72	207.20	899.95	-7.10	0.43	-7.10	7.11	176.52	0.05
1000.00	0.65	194.69	999.95	-8.21	0.00	-8.21	8.21	179.98	0.16
1100.00	0.84	199.28	1099.94	-9.45	-0.38	-9.45	9.46	182.33	0.20
1200.00	0.30	155.13	1199.93	-10.38	-0.52	-10.38	10.39	182.86	0.66
1300.00	0.59	143.72	1299.93	-11.03	-0.10	-11.03	11.03	180.54	0.30
1400.00	0.51	128.68	1399.93	-11.73	0.55	-11.73	11.74	177.31	0.16
1500.00	0.58	120.15	1499.92	-12.26	1.33	-12.26	12.33	173.79	0.10
1600.00	0.07	166.83	1599.92	-12.57	1.78	-12.57	12.70	171.93	0.53
1700.00	0.61	328.05	1699.92	-12.18	1.52	-12.18	12.27	172.91	0.68
1800.00	0.87	333.84	1799.91	-11.05	0.90	-11.05	11.09	175.35	0.27
1900.00	0.91	338.70	1899.90	-9.63	0.28	-9.63	9.63	178.35	0.09
2000.00	0.52	1.84	1999.89	-8.44	0.00	-8.44	8.44	179.98	0.48
2100.00	0.18	295.86	2099.89	-7.92	-0.12	-7.92	7.92	180.89	0.47
2200.00	0.45	351.20	2199.89	-7.46	-0.32	-7.46	7.47	182.47	0.38
2300.00	0.27	71.94	2299.89	-7.00	-0.16	-7.00	7.01	181.32	0.48
2400.00	0.66	143.71	2399.88	-7.40	0.40	-7.40	7.41	176.88	0.63
2500.00	1.21	155.99	2499.87	-8.83	1.17	-8.83	8.90	172.42	0.58
2600.00	1.63	159.99	2599.84	-11.13	2.09	-11.13	11.32	169.36	0.43
2700.00	1.74	158.14	2699.79	-13.87	3.14	-13.87	14.23	167.23	0.12
2800.00	0.97	165.31	2799.77	-16.10	3.92	-16.10	16.57	166.31	0.78
2900.00	0.42	181.79	2899.76	-17.28	4.13	-17.28	17.77	166.57	0.58
3000.00	0.04	286.57	2999.76	-17.64	4.08	-17.64	18.10	166.98	0.43
3100.00	0.72	9.19	3099.75	-17.01	4.14	-17.01	17.51	166.30	0.71
3200.00	1.59	20.76	3199.73	-15.09	4.74	-15.09	15.82	162.57	0.90
3300.00	0.96	39.67	3299.71	-13.15	5.76	-13.15	14.36	156.34	0.75
3400.00	1.10	44.10	3399.69	-11.82	6.96	-11.82	13.72	149.51	0.16

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	1.15	27.43	3499.67	-10.24	8.09	-10.24	13.05	141.69	0.33
3600.00	1.47	38.48	3599.65	-8.34	9.35	-8.34	12.53	131.73	0.40
3700.00	1.24	18.54	3699.62	-6.31	10.49	-6.31	12.25	121.02	0.52
3800.00	0.42	337.00	3799.61	-4.95	10.70	-4.95	11.78	114.81	0.97
3900.00	0.76	308.69	3899.60	-4.19	10.03	-4.19	10.87	112.67	0.44
4000.00	0.88	334.77	3999.59	-3.08	9.19	-3.08	9.69	108.54	0.39
4100.00	0.94	351.64	4099.58	-1.58	8.74	-1.58	8.88	100.23	0.27
4200.00	0.97	338.53	4199.57	0.02	8.31	0.02	8.31	89.84	0.22
4300.00	1.09	344.14	4299.55	1.73	7.74	1.73	7.93	77.41	0.16
4400.00	1.01	340.79	4399.53	3.48	7.19	3.48	7.99	64.19	0.10
4500.00	1.20	353.69	4499.52	5.35	6.78	5.35	8.64	51.73	0.31
4600.00	1.38	347.25	4599.49	7.57	6.40	7.57	9.91	40.22	0.23
4700.00	1.38	344.89	4699.46	9.91	5.82	9.91	11.50	30.43	0.06
4800.00	1.18	337.02	4799.44	12.02	5.11	12.02	13.06	23.01	0.27
4900.00	0.61	329.89	4899.42	13.44	4.43	13.44	14.15	18.26	0.58
5000.00	0.47	282.96	4999.42	13.99	3.76	13.99	14.49	15.05	0.45
5100.00	0.44	299.41	5099.42	14.27	3.02	14.27	14.59	11.96	0.14
5200.00	0.77	255.51	5199.41	14.29	2.04	14.29	14.44	8.13	0.55
5300.00	0.49	253.31	5299.41	14.00	0.98	14.00	14.03	3.99	0.28
5400.00	0.43	314.58	5399.40	14.14	0.30	14.14	14.14	1.21	0.47
5500.00	0.35	311.01	5499.40	14.60	-0.20	14.60	14.60	359.23	0.08
5600.00	0.62	287.63	5599.40	14.96	-0.94	14.96	14.99	356.41	0.33
5700.00	0.92	256.50	5699.39	14.94	-2.23	14.94	15.10	351.50	0.50
5800.00	1.80	269.47	5799.36	14.74	-4.58	14.74	15.43	342.75	0.93
5900.00	2.54	274.28	5899.29	14.89	-8.35	14.89	17.07	330.71	0.77
6000.00	3.33	270.69	5999.16	15.09	-13.47	15.09	20.22	318.25	0.81
6100.00	3.77	281.87	6098.96	15.80	-19.59	15.80	25.17	308.88	0.82
6200.00	3.94	288.30	6198.74	17.55	-26.07	17.55	31.43	303.95	0.46
6300.00	3.87	285.95	6298.51	19.56	-32.58	19.56	38.00	300.98	0.17
6400.00	4.16	290.95	6398.26	21.78	-39.21	21.78	44.86	299.05	0.45
6500.00	4.07	291.21	6498.00	24.36	-45.91	24.36	51.97	297.96	0.09
6600.00	4.39	296.36	6597.73	27.35	-52.65	27.35	59.33	297.45	0.50
6700.00	3.56	302.78	6697.49	30.73	-58.69	30.73	66.25	297.64	0.94
6800.00	2.85	291.62	6797.33	33.33	-63.61	33.33	71.82	297.65	0.95
6900.00	1.93	300.48	6897.25	35.10	-67.38	35.10	75.97	297.52	0.98
7000.00	1.01	310.15	6997.21	36.53	-69.50	36.53	78.52	297.72	0.95
7100.00	0.34	329.61	7097.20	37.35	-70.33	37.35	79.63	297.97	0.70
HORIZONTAL DISPLACEMENT IS 79.63 FEET AT 297.97 DEGREES									