

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Wells Ranch USX BB / 15-5
 Location: S-15 T-5N R-63W
 Rig Name: Production
 State/County: Colorado / Weld County
 Latitude: 40.40, Longitude: -104.43
 GRID North is 0.69 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: 4/13/2011 / 19:23

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	0.20	274.59	100.00	0.01	-0.18	0.01	0.18	274.59	0.20
200.00	0.23	280.16	200.00	0.06	-0.55	0.06	0.56	276.64	0.04
300.00	0.36	298.28	300.00	0.25	-1.03	0.25	1.06	283.62	0.16
400.00	0.41	313.26	400.00	0.64	-1.57	0.64	1.70	292.29	0.11
500.00	0.21	258.36	499.99	0.85	-2.01	0.85	2.18	292.89	0.33
600.00	0.40	30.16	599.99	1.11	-2.02	1.11	2.30	298.89	0.57
700.00	0.40	280.17	699.99	1.48	-2.19	1.48	2.64	304.04	0.66
800.00	0.35	267.38	799.99	1.52	-2.84	1.52	3.22	298.25	0.10
900.00	0.39	305.30	899.99	1.71	-3.42	1.71	3.82	296.51	0.24
1000.00	0.36	351.54	999.99	2.21	-3.74	2.21	4.34	300.57	0.29
1100.00	0.22	335.08	1099.98	2.70	-3.87	2.70	4.71	304.87	0.16
1200.00	0.17	117.37	1199.98	2.81	-3.82	2.81	4.74	306.28	0.37
1300.00	0.26	211.47	1299.98	2.55	-3.81	2.55	4.58	303.78	0.31
1400.00	0.44	321.74	1399.98	2.66	-4.16	2.66	4.94	302.56	0.58
1500.00	0.14	128.17	1499.98	2.88	-4.30	2.88	5.18	303.82	0.58
1600.00	0.51	0.76	1599.98	3.25	-4.20	3.25	5.31	307.72	0.60
1700.00	0.32	196.53	1699.98	3.43	-4.27	3.43	5.48	308.72	0.82
1800.00	0.46	323.30	1799.98	3.49	-4.59	3.49	5.77	307.20	0.70
1900.00	0.29	286.08	1899.98	3.88	-5.08	3.88	6.39	307.38	0.29
2000.00	0.44	289.62	1999.97	4.08	-5.69	4.08	7.00	305.66	0.15
2100.00	0.40	303.80	2099.97	4.41	-6.34	4.41	7.72	304.79	0.11
2200.00	0.32	209.21	2199.97	4.35	-6.77	4.35	8.05	302.75	0.54
2300.00	0.40	170.57	2299.97	3.76	-6.85	3.76	7.82	298.79	0.25
2400.00	0.58	311.74	2399.97	3.76	-7.17	3.76	8.09	297.64	0.93
2500.00	0.84	354.60	2499.96	4.82	-7.62	4.82	9.02	302.32	0.57
2600.00	0.89	5.59	2599.95	6.32	-7.61	6.32	9.89	309.70	0.17
2700.00	0.93	2.09	2699.94	7.90	-7.51	7.90	10.90	316.46	0.07
2800.00	1.18	354.55	2799.92	9.73	-7.57	9.73	12.33	322.11	0.29
2900.00	1.13	343.86	2899.90	11.71	-7.95	11.71	14.15	325.84	0.22
3000.00	0.96	4.61	2999.88	13.49	-8.15	13.49	15.77	328.86	0.41
3100.00	0.94	23.95	3099.87	15.08	-7.75	15.08	16.96	332.80	0.32
3200.00	0.90	6.06	3199.86	16.62	-7.34	16.62	18.16	336.18	0.29
3300.00	0.89	348.09	3299.84	18.16	-7.41	18.16	19.61	337.79	0.28
3400.00	1.00	1.83	3399.83	19.78	-7.54	19.78	21.17	339.12	0.25

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	1.56	344.02	3499.81	21.96	-7.89	21.96	23.34	340.23	0.68
3600.00	1.97	355.85	3599.76	24.99	-8.39	24.99	26.36	341.44	0.55
3700.00	1.95	1.78	3699.70	28.40	-8.46	28.40	29.64	343.41	0.20
3800.00	1.87	2.46	3799.64	31.73	-8.34	31.73	32.81	345.27	0.08
3900.00	1.72	349.09	3899.60	34.83	-8.55	34.83	35.87	346.20	0.44
4000.00	1.41	338.35	3999.56	37.45	-9.29	37.45	38.58	346.06	0.42
4100.00	1.88	333.02	4099.52	40.06	-10.49	40.06	41.41	345.32	0.50
4200.00	1.84	341.40	4199.46	43.04	-11.75	43.04	44.62	344.73	0.28
4300.00	1.45	348.31	4299.42	45.80	-12.52	45.80	47.48	344.71	0.44
4400.00	1.25	17.59	4399.40	48.08	-12.44	48.08	49.66	345.49	0.71
4500.00	0.80	0.02	4499.38	49.81	-12.12	49.81	51.27	346.33	0.55
4600.00	0.49	89.64	4599.38	50.51	-11.69	50.51	51.85	346.97	0.93
4700.00	0.67	46.55	4699.37	50.91	-10.84	50.91	52.05	347.99	0.45
4800.00	0.56	123.60	4799.37	51.04	-10.01	51.04	52.02	348.91	0.77
4900.00	0.54	251.73	4899.37	50.62	-10.05	50.62	51.61	348.77	0.99
5000.00	0.62	343.20	4999.36	51.00	-10.66	51.00	52.10	348.19	0.84
5100.00	0.76	8.22	5099.35	52.18	-10.72	52.18	53.27	348.39	0.33
5200.00	1.02	331.80	5199.34	53.62	-11.05	53.62	54.75	348.36	0.61
5300.00	0.95	1.52	5299.33	55.24	-11.45	55.24	56.41	348.29	0.51
5400.00	0.77	345.08	5399.32	56.72	-11.60	56.72	57.89	348.44	0.31
5500.00	0.46	51.06	5499.31	57.61	-11.46	57.61	58.74	348.75	0.71
5600.00	0.30	134.11	5599.31	57.68	-10.96	57.68	58.71	349.25	0.52
5700.00	0.31	78.06	5699.31	57.55	-10.50	57.55	58.50	349.66	0.29
5800.00	0.47	276.19	5799.31	57.65	-10.65	57.65	58.63	349.53	0.77
5900.00	0.38	247.46	5899.31	57.57	-11.37	57.57	58.68	348.83	0.23
6000.00	0.62	247.69	5999.30	57.24	-12.17	57.24	58.52	347.99	0.24
6100.00	1.14	204.90	6099.29	56.13	-13.09	56.13	57.63	346.87	0.81
6200.00	1.65	206.58	6199.26	53.93	-14.16	53.93	55.76	345.29	0.50
6300.00	1.95	192.19	6299.21	50.99	-15.16	50.99	53.19	343.44	0.54
6400.00	2.33	177.21	6399.14	47.29	-15.42	47.29	49.74	341.94	0.67
6500.00	2.88	160.70	6499.04	42.90	-14.49	42.90	45.28	341.33	0.92
6600.00	3.66	169.37	6598.88	37.39	-13.07	37.39	39.61	340.73	0.92

HORIZONTAL DISPLACEMENT IS 39.61 FEET AT 340.73 DEGREES									
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