

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Millage / 12-3
 Location: S-12 T-4N R-64W

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

Latitude: 40.33, Longitude: -104.50
 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: 3/17/2011 / 20:16

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	0.27	286.72	100.00	0.07	-0.23	0.07	0.24	286.72	0.27
200.00	0.07	29.58	200.00	0.18	-0.42	0.18	0.46	293.64	0.29
300.00	0.22	270.05	300.00	0.23	-0.59	0.23	0.63	291.81	0.26
400.00	0.26	310.17	400.00	0.38	-0.95	0.38	1.02	291.81	0.17
500.00	0.70	305.64	499.99	0.88	-1.62	0.88	1.84	298.56	0.44
600.00	0.71	305.18	599.99	1.59	-2.62	1.59	3.07	301.30	0.02
700.00	0.82	296.61	699.98	2.27	-3.77	2.27	4.40	301.08	0.16
800.00	0.92	288.91	799.97	2.85	-5.17	2.85	5.91	298.90	0.15
900.00	0.92	275.70	899.95	3.19	-6.73	3.19	7.45	295.39	0.21
1000.00	1.00	253.14	999.94	3.02	-8.36	3.02	8.89	289.86	0.38
1100.00	1.01	238.17	1099.92	2.30	-9.94	2.30	10.21	283.04	0.26
1200.00	0.75	215.62	1199.91	1.31	-11.07	1.31	11.15	276.74	0.43
1300.00	0.70	217.28	1299.91	0.29	-11.82	0.29	11.83	271.41	0.05
1400.00	0.60	226.97	1399.90	-0.56	-12.58	-0.56	12.59	267.47	0.15
1500.00	0.53	216.08	1499.89	-1.29	-13.23	-1.29	13.30	264.45	0.13
1600.00	0.35	205.85	1599.89	-1.93	-13.64	-1.93	13.77	261.93	0.19
1700.00	0.80	192.15	1699.89	-2.89	-13.92	-2.89	14.21	258.29	0.46
1800.00	1.24	178.30	1799.87	-4.65	-14.03	-4.65	14.78	251.68	0.50
1900.00	1.06	168.11	1899.85	-6.63	-13.81	-6.63	15.32	244.36	0.27
2000.00	0.69	161.33	1999.84	-8.10	-13.43	-8.10	15.68	238.91	0.38
2100.00	0.30	141.99	2099.83	-8.87	-13.07	-8.87	15.80	235.83	0.41
2200.00	0.53	103.17	2199.83	-9.19	-12.46	-9.19	15.48	233.59	0.35
2300.00	0.64	79.56	2299.83	-9.19	-11.46	-9.19	14.69	231.25	0.26
2400.00	0.79	78.52	2399.82	-8.96	-10.23	-8.96	13.60	228.81	0.15
2500.00	1.06	62.50	2499.81	-8.39	-8.74	-8.39	12.11	226.16	0.38
2600.00	1.17	64.59	2599.79	-7.52	-6.99	-7.52	10.27	222.89	0.12
2700.00	1.50	55.31	2699.76	-6.34	-4.99	-6.34	8.07	218.21	0.39
2800.00	1.48	42.54	2799.73	-4.64	-3.04	-4.64	5.55	213.22	0.33
2900.00	1.25	12.05	2899.70	-2.63	-1.94	-2.63	3.27	216.44	0.75
3000.00	0.48	337.75	2999.69	-1.19	-1.87	-1.19	2.22	237.66	0.89
3100.00	0.93	277.14	3099.68	-0.70	-2.84	-0.70	2.93	256.13	0.81
3200.00	0.92	243.88	3199.67	-0.95	-4.37	-0.95	4.47	257.69	0.53
3300.00	1.04	237.28	3299.65	-1.80	-5.86	-1.80	6.13	252.92	0.16
3400.00	1.11	240.18	3399.64	-2.77	-7.47	-2.77	7.97	249.62	0.09

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	1.06	239.26	3499.62	-3.73	-9.10	-3.73	9.84	247.72	0.06
3600.00	1.24	253.13	3599.60	-4.52	-10.93	-4.52	11.83	247.55	0.33
3700.00	1.20	243.81	3699.58	-5.29	-12.90	-5.29	13.95	247.71	0.20
3800.00	0.65	215.23	3799.56	-6.21	-14.17	-6.21	15.47	246.32	0.70
3900.00	0.63	202.61	3899.56	-7.19	-14.71	-7.19	16.37	243.96	0.14
4000.00	0.51	241.16	3999.55	-7.91	-15.31	-7.91	17.24	242.67	0.39
4100.00	0.72	236.69	4099.55	-8.47	-16.23	-8.47	18.31	242.43	0.21
4200.00	0.41	207.18	4199.54	-9.14	-16.92	-9.14	19.23	241.63	0.41
4300.00	0.32	218.41	4299.54	-9.67	-17.25	-9.67	19.78	240.72	0.11
4400.00	0.43	215.20	4399.54	-10.20	-17.64	-10.20	20.38	239.97	0.11
4500.00	0.48	124.71	4499.54	-10.74	-17.51	-10.74	20.54	238.47	0.65
4600.00	0.85	91.69	4599.53	-11.00	-16.42	-11.00	19.77	236.18	0.51
4700.00	1.37	70.56	4699.51	-10.63	-14.56	-10.63	18.03	233.88	0.65
4800.00	1.40	75.93	4799.48	-9.93	-12.26	-9.93	15.78	230.97	0.13
4900.00	0.92	54.33	4899.46	-9.17	-10.43	-9.17	13.89	228.66	0.64
5000.00	0.62	38.50	4999.45	-8.29	-9.44	-8.29	12.56	228.73	0.36
5100.00	0.45	16.78	5099.45	-7.49	-8.99	-7.49	11.71	230.21	0.26
5200.00	0.23	35.29	5199.45	-6.96	-8.77	-6.96	11.19	231.57	0.24
5300.00	0.55	1.29	5299.44	-6.31	-8.64	-6.31	10.70	233.86	0.39
5400.00	0.63	10.21	5399.44	-5.29	-8.54	-5.29	10.04	238.22	0.12
5500.00	0.97	25.28	5499.43	-3.98	-8.08	-3.98	9.01	243.74	0.40
5600.00	0.97	21.96	5599.41	-2.44	-7.40	-2.44	7.79	251.77	0.06
5700.00	1.03	24.70	5699.40	-0.84	-6.71	-0.84	6.76	262.85	0.08
5800.00	1.42	28.97	5799.38	1.05	-5.74	1.05	5.83	280.41	0.40
5900.00	1.28	13.96	5899.35	3.22	-4.87	3.22	5.84	303.47	0.38
6000.00	0.44	4.51	5999.34	4.68	-4.57	4.68	6.54	315.69	0.85
6100.00	0.54	220.06	6099.34	4.70	-4.84	4.70	6.75	314.16	0.93
6200.00	0.57	239.49	6199.33	4.09	-5.57	4.09	6.91	306.31	0.19
6300.00	0.57	205.34	6299.33	3.39	-6.21	3.39	7.08	298.64	0.33
6400.00	0.74	214.09	6399.32	2.40	-6.79	2.40	7.20	289.49	0.20
6500.00	0.54	194.88	6499.31	1.41	-7.27	1.41	7.41	280.97	0.29
6600.00	0.52	195.63	6599.31	0.52	-7.51	0.52	7.53	273.95	0.02

HORIZONTAL DISPLACEMENT IS 7.53 FEET AT 273.95 DEGREES									
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