

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Frank / 12-2
 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: 3/23/2011 / 13:48

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	0.37	118.62	100.00	-0.16	0.29	-0.16	0.33	118.62	0.37
200.00	0.17	9.84	200.00	-0.16	0.60	-0.16	0.62	105.16	0.46
300.00	0.34	19.77	300.00	0.26	0.72	0.26	0.77	69.88	0.17
400.00	0.46	54.57	400.00	0.77	1.15	0.77	1.38	56.04	0.26
500.00	0.27	175.00	499.99	0.77	1.49	0.77	1.68	62.66	0.63
600.00	0.54	222.01	599.99	0.19	1.20	0.19	1.21	81.01	0.41
700.00	0.71	233.24	699.99	-0.53	0.38	-0.53	0.66	144.37	0.21
800.00	0.77	235.06	799.98	-1.29	-0.67	-1.29	1.45	207.31	0.06
900.00	0.72	212.95	899.97	-2.20	-1.55	-2.20	2.69	215.28	0.29
1000.00	0.68	201.68	999.96	-3.27	-2.11	-3.27	3.89	212.86	0.14
1100.00	0.79	214.03	1099.95	-4.39	-2.71	-4.39	5.16	211.75	0.19
1200.00	0.71	250.03	1199.95	-5.17	-3.68	-5.17	6.35	215.48	0.47
1300.00	0.76	258.51	1299.94	-5.51	-4.92	-5.51	7.39	221.76	0.12
1400.00	0.81	261.27	1399.93	-5.75	-6.28	-5.75	8.51	227.49	0.06
1500.00	0.77	259.34	1499.92	-5.99	-7.64	-5.99	9.71	231.92	0.05
1600.00	0.74	259.41	1599.91	-6.23	-8.94	-6.23	10.89	235.12	0.03
1700.00	0.62	268.00	1699.90	-6.37	-10.12	-6.37	11.95	237.81	0.15
1800.00	0.76	248.45	1799.90	-6.63	-11.28	-6.63	13.08	239.55	0.27
1900.00	0.47	268.27	1899.89	-6.89	-12.31	-6.89	14.10	240.77	0.35
2000.00	0.49	221.97	1999.89	-7.22	-13.01	-7.22	14.88	240.98	0.38
2100.00	0.11	196.61	2099.89	-7.62	-13.32	-7.62	15.35	240.21	0.40
2200.00	0.79	349.26	2199.88	-7.04	-13.48	-7.04	15.20	242.43	0.88
2300.00	0.87	0.03	2299.87	-5.61	-13.60	-5.61	14.71	247.61	0.17
2400.00	0.40	345.49	2399.87	-4.51	-13.69	-4.51	14.41	251.78	0.49
2500.00	0.61	352.00	2499.86	-3.64	-13.85	-3.64	14.32	255.28	0.21
2600.00	0.98	356.25	2599.85	-2.26	-13.98	-2.26	14.17	260.84	0.38
2700.00	1.28	2.62	2699.83	-0.28	-13.99	-0.28	13.99	268.85	0.32
2800.00	1.38	3.62	2799.81	2.04	-13.86	2.04	14.01	278.37	0.10
2900.00	1.07	6.50	2899.78	4.17	-13.68	4.17	14.30	286.96	0.32
3000.00	0.69	45.21	2999.77	5.53	-13.14	5.53	14.26	292.80	0.68
3100.00	0.62	66.69	3099.76	6.17	-12.22	6.17	13.69	296.79	0.25
3200.00	0.25	120.07	3199.76	6.27	-11.53	6.27	13.12	298.55	0.51
3300.00	0.74	169.92	3299.76	5.52	-11.22	5.52	12.51	296.20	0.61
3400.00	0.64	157.50	3399.75	4.37	-10.90	4.37	11.74	291.85	0.18

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	0.93	168.56	3499.74	3.06	-10.52	3.06	10.96	286.21	0.33
3600.00	0.94	169.38	3599.73	1.46	-10.21	1.46	10.32	278.14	0.01
3700.00	1.36	168.05	3699.71	-0.50	-9.82	-0.50	9.83	267.08	0.42
3800.00	0.87	159.92	3799.69	-2.37	-9.31	-2.37	9.61	255.69	0.51
3900.00	0.64	163.72	3899.68	-3.63	-8.89	-3.63	9.60	247.80	0.23
4000.00	0.67	182.78	3999.67	-4.75	-8.76	-4.75	9.97	241.53	0.22
4100.00	0.63	215.30	4099.67	-5.78	-9.11	-5.78	10.79	237.59	0.37
4200.00	0.98	203.05	4199.66	-7.02	-9.76	-7.02	12.03	234.27	0.39
4300.00	1.02	210.54	4299.64	-8.58	-10.55	-8.58	13.60	230.89	0.14
4400.00	0.33	204.10	4399.63	-9.61	-11.12	-9.61	14.70	229.17	0.70
4500.00	0.48	40.60	4499.63	-9.55	-10.97	-9.55	14.55	228.94	0.80
4600.00	0.75	67.80	4599.63	-8.99	-10.09	-8.99	13.52	228.30	0.39
4700.00	0.86	66.81	4699.62	-8.45	-8.80	-8.45	12.20	226.16	0.12
4800.00	0.94	68.68	4799.61	-7.85	-7.34	-7.85	10.75	223.06	0.09
4900.00	0.37	86.39	4899.60	-7.53	-6.25	-7.53	9.79	219.67	0.60
5000.00	0.54	51.22	4999.60	-7.22	-5.56	-7.22	9.11	217.58	0.32
5100.00	0.56	38.60	5099.59	-6.54	-4.88	-6.54	8.16	216.74	0.12
5200.00	0.66	69.47	5199.59	-5.96	-4.04	-5.96	7.20	214.12	0.34
5300.00	0.54	97.59	5299.58	-5.82	-3.03	-5.82	6.56	207.50	0.32
5400.00	0.69	62.57	5399.57	-5.60	-2.03	-5.60	5.96	199.90	0.40
5500.00	0.67	54.65	5499.57	-4.99	-1.02	-4.99	5.09	191.53	0.10
5600.00	0.73	56.77	5599.56	-4.30	-0.01	-4.30	4.30	180.13	0.07
5700.00	0.58	51.35	5699.55	-3.63	0.92	-3.63	3.75	165.77	0.16
5800.00	0.40	355.18	5799.55	-2.97	1.29	-2.97	3.23	156.50	0.49
5900.00	0.62	31.40	5899.55	-2.16	1.54	-2.16	2.65	144.43	0.38
6000.00	0.62	8.55	5999.54	-1.16	1.90	-1.16	2.23	121.43	0.24
6100.00	0.58	12.33	6099.54	-0.14	2.09	-0.14	2.10	93.81	0.06
6200.00	0.85	341.29	6199.53	1.05	1.96	1.05	2.23	61.78	0.46
6300.00	0.43	30.82	6299.52	2.07	1.92	2.07	2.82	42.75	0.66
6400.00	1.10	20.99	6399.51	3.29	2.45	3.29	4.11	36.68	0.68
6500.00	1.25	20.05	6499.49	5.22	3.17	5.22	6.11	31.30	0.15
6600.00	1.72	21.08	6599.46	7.64	4.09	7.64	8.67	28.13	0.47

HORIZONTAL DISPLACEMENT IS 8.67 FEET AT 28.13 DEGREES									
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