

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy
 Lease/Well: Houndskeeper / H 1-22
 Location: S-1 T-3N R-65W

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

Latitude: 40.26, Longitude: -104.61
 GRID North is 0.58 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: 1/26/2011 / 14:03

Vaughn Energy Services
 Fort Worth, Texas
 817-741-3610
 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	0.10	248.18	100.00	-0.03	-0.08	-0.03	0.09	248.18	0.10
200.00	0.13	316.55	200.00	0.01	-0.24	0.01	0.24	273.06	0.13
300.00	0.34	111.03	300.00	-0.01	-0.04	-0.01	0.04	249.28	0.46
400.00	0.21	131.07	400.00	-0.24	0.38	-0.24	0.45	122.57	0.17
500.00	0.35	111.73	500.00	-0.47	0.80	-0.47	0.93	120.70	0.17
600.00	0.54	129.21	599.99	-0.88	1.44	-0.88	1.69	121.45	0.23
700.00	0.74	98.04	699.99	-1.27	2.45	-1.27	2.76	117.40	0.40
800.00	0.51	86.62	799.98	-1.33	3.54	-1.33	3.78	110.65	0.26
900.00	0.83	121.59	899.98	-1.69	4.60	-1.69	4.90	110.14	0.51
1000.00	0.65	136.25	999.97	-2.48	5.62	-2.48	6.14	113.82	0.26
1100.00	0.80	157.97	1099.96	-3.54	6.27	-3.54	7.20	119.44	0.31
1200.00	0.68	163.77	1199.95	-4.76	6.70	-4.76	8.22	125.39	0.14
1300.00	0.84	124.30	1299.94	-5.74	7.47	-5.74	9.42	127.55	0.53
1400.00	0.33	146.38	1399.94	-6.39	8.23	-6.39	10.42	127.84	0.54
1500.00	0.77	159.52	1499.93	-7.27	8.63	-7.27	11.28	130.11	0.46
1600.00	0.39	215.15	1599.93	-8.18	8.67	-8.18	11.92	133.33	0.64
1700.00	0.48	280.12	1699.93	-8.38	8.07	-8.38	11.63	136.10	0.47
1800.00	0.53	262.94	1799.92	-8.37	7.20	-8.37	11.04	139.28	0.16
1900.00	0.69	274.37	1899.92	-8.38	6.15	-8.38	10.39	143.74	0.20
2000.00	1.05	321.63	1999.91	-7.61	4.98	-7.61	9.09	146.83	0.77
2100.00	1.49	301.36	2099.88	-6.22	3.30	-6.22	7.04	152.06	0.62
2200.00	1.34	277.42	2199.85	-5.39	1.03	-5.39	5.49	169.17	0.60
2300.00	1.77	294.63	2299.82	-4.60	-1.53	-4.60	4.85	198.36	0.63
2400.00	1.82	282.32	2399.77	-3.62	-4.48	-3.62	5.76	231.06	0.39
2500.00	1.95	262.36	2499.71	-3.51	-7.72	-3.51	8.48	245.56	0.67
2600.00	1.97	264.23	2599.66	-3.90	-11.11	-3.90	11.78	250.63	0.07
2700.00	2.13	269.70	2699.59	-4.09	-14.67	-4.09	15.23	254.43	0.25
2800.00	1.83	266.92	2799.53	-4.18	-18.13	-4.18	18.60	257.01	0.31
2900.00	1.71	272.60	2899.48	-4.20	-21.21	-4.20	21.63	258.80	0.21
3000.00	1.33	288.53	2999.45	-3.76	-23.81	-3.76	24.10	261.02	0.56
3100.00	0.96	271.98	3099.43	-3.37	-25.75	-3.37	25.97	262.55	0.49
3200.00	0.91	251.72	3199.42	-3.59	-27.35	-3.59	27.58	262.53	0.33
3300.00	0.84	209.17	3299.41	-4.48	-28.46	-4.48	28.81	261.06	0.64
3400.00	0.85	172.89	3399.39	-5.85	-28.73	-5.85	29.32	258.49	0.53

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	1.12	167.90	3499.38	-7.55	-28.43	-7.55	29.41	255.14	0.29
3600.00	1.18	189.65	3599.36	-9.52	-28.40	-9.52	29.95	251.46	0.44
3700.00	1.45	155.62	3699.34	-11.69	-28.05	-11.69	30.39	247.37	0.81
3800.00	1.35	154.09	3799.31	-13.90	-27.01	-13.90	30.38	242.77	0.10
3900.00	1.28	161.30	3899.28	-16.02	-26.14	-16.02	30.66	238.49	0.18
4000.00	1.62	140.14	3999.25	-18.16	-24.88	-18.16	30.80	233.87	0.63
4100.00	1.48	133.28	4099.21	-20.13	-23.03	-20.13	30.59	228.85	0.23
4200.00	1.50	137.23	4199.18	-21.97	-21.21	-21.97	30.54	223.98	0.10
4300.00	1.48	139.63	4299.14	-23.91	-19.48	-23.91	30.85	219.17	0.06
4400.00	1.61	126.60	4399.11	-25.73	-17.52	-25.73	31.13	214.25	0.37
4500.00	1.75	110.78	4499.07	-27.11	-14.97	-27.11	30.97	208.90	0.48
4600.00	1.90	117.55	4599.01	-28.42	-12.07	-28.42	30.88	203.01	0.26
4700.00	2.04	113.73	4698.96	-29.90	-8.97	-29.90	31.22	196.70	0.19
4800.00	2.36	116.69	4798.88	-31.54	-5.51	-31.54	32.02	189.90	0.34
4900.00	2.61	129.76	4898.79	-33.92	-1.92	-33.92	33.98	183.24	0.62
5000.00	2.52	138.63	4998.69	-37.03	1.28	-37.03	37.05	178.01	0.41
5100.00	2.33	133.73	5098.60	-40.08	4.21	-40.08	40.30	174.01	0.28
5200.00	2.47	128.79	5198.51	-42.84	7.36	-42.84	43.47	170.25	0.25
5300.00	2.75	115.15	5298.41	-45.21	11.21	-45.21	46.58	166.08	0.68
5400.00	2.09	104.02	5398.32	-46.67	15.15	-46.67	49.07	162.02	0.80
5500.00	2.20	102.77	5498.25	-47.54	18.80	-47.54	51.12	158.42	0.12
5600.00	1.90	117.38	5598.19	-48.72	22.14	-48.72	53.52	155.56	0.60
5700.00	1.01	128.26	5698.15	-50.03	24.31	-50.03	55.62	154.09	0.92
5800.00	0.09	122.07	5798.15	-50.62	25.07	-50.62	56.49	153.66	0.93
5900.00	0.11	220.35	5898.15	-50.74	25.07	-50.74	56.59	153.71	0.15
6000.00	0.24	99.89	5998.15	-50.85	25.21	-50.85	56.76	153.63	0.32
6100.00	0.26	115.72	6098.15	-50.98	25.63	-50.98	57.06	153.31	0.07
6200.00	0.53	116.16	6198.14	-51.29	26.25	-51.29	57.62	152.89	0.27
6300.00	0.24	87.66	6298.14	-51.48	26.88	-51.48	58.08	152.43	0.34
6400.00	0.36	120.29	6398.14	-51.64	27.36	-51.64	58.44	152.08	0.21
6500.00	0.51	119.57	6498.14	-52.02	28.03	-52.02	59.09	151.68	0.15
6600.00	0.60	117.21	6598.13	-52.48	28.89	-52.48	59.91	151.17	0.09
6700.00	0.69	109.44	6698.13	-52.92	29.92	-52.92	60.79	150.51	0.12
6800.00	0.77	132.44	6798.12	-53.57	30.99	-53.57	61.89	149.96	0.30
6900.00	0.96	118.43	6898.11	-54.43	32.22	-54.43	63.25	149.38	0.28
7000.00	0.70	101.10	6998.10	-54.94	33.56	-54.94	64.38	148.59	0.36
<div> <div></div> <div> HORIZONTAL DISPLACEMENT IS 64.38 FEET AT 148.59 DEGREES </div> </div>									