

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Hanson D / 30-13

Location: S-30 T-3N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.19, Longitude: -104.60

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: 2/24/2011 / 11:06

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	0.22	40.16	100.00	0.15	0.12	0.15	0.19	40.16	0.22
200.00	0.14	59.87	200.00	0.36	0.36	0.36	0.51	45.00	0.10
300.00	0.15	321.28	300.00	0.53	0.38	0.53	0.65	36.06	0.23
400.00	0.22	22.98	400.00	0.81	0.37	0.81	0.89	24.85	0.20
500.00	0.22	72.96	500.00	1.04	0.63	1.04	1.22	31.29	0.19
600.00	0.11	166.28	600.00	1.00	0.84	1.00	1.30	40.02	0.25
700.00	0.14	41.86	700.00	0.99	0.94	0.99	1.37	43.54	0.22
800.00	0.18	100.53	800.00	1.05	1.17	1.05	1.58	48.09	0.16
900.00	0.38	130.84	900.00	0.81	1.58	0.81	1.77	62.91	0.25
1000.00	0.36	159.31	999.99	0.29	1.94	0.29	1.96	81.40	0.18
1100.00	0.13	135.26	1099.99	-0.08	2.13	-0.08	2.13	92.18	0.25
1200.00	0.19	136.89	1199.99	-0.28	2.33	-0.28	2.34	96.97	0.06
1300.00	0.27	127.70	1299.99	-0.55	2.63	-0.55	2.68	101.82	0.08
1400.00	0.27	196.33	1399.99	-0.92	2.74	-0.92	2.89	108.46	0.30
1500.00	0.29	127.04	1499.99	-1.29	2.88	-1.29	3.16	114.19	0.32
1600.00	0.26	119.33	1599.99	-1.56	3.28	-1.56	3.63	115.40	0.05
1700.00	0.42	143.29	1699.99	-1.97	3.70	-1.97	4.19	117.99	0.21
1800.00	0.20	203.18	1799.99	-2.43	3.86	-2.43	4.56	122.21	0.37
1900.00	0.28	33.90	1899.99	-2.39	3.92	-2.39	4.59	121.34	0.48
2000.00	0.48	7.62	1999.98	-1.77	4.11	-1.77	4.48	113.29	0.26
2100.00	0.64	356.67	2099.98	-0.80	4.14	-0.80	4.21	100.91	0.20
2200.00	0.64	357.17	2199.97	0.32	4.08	0.32	4.09	85.46	0.01
2300.00	0.69	346.74	2299.97	1.47	3.91	1.47	4.18	69.38	0.13
2400.00	0.76	326.98	2399.96	2.61	3.41	2.61	4.30	52.53	0.26
2500.00	1.17	328.17	2499.94	4.04	2.51	4.04	4.76	31.88	0.41
2600.00	1.44	342.70	2599.92	6.11	1.60	6.11	6.32	14.66	0.43
2700.00	1.44	344.85	2699.89	8.52	0.90	8.52	8.57	6.00	0.05
2800.00	1.41	325.58	2799.86	10.75	-0.13	10.75	10.75	359.31	0.48
2900.00	1.57	333.25	2899.82	12.99	-1.44	12.99	13.07	353.66	0.25
3000.00	1.56	352.99	2999.78	15.56	-2.22	15.56	15.72	351.87	0.54
3100.00	1.45	340.91	3099.75	18.11	-2.80	18.11	18.33	351.20	0.34
3200.00	1.04	343.95	3199.73	20.18	-3.47	20.18	20.48	350.25	0.42
3300.00	0.84	347.75	3299.71	21.77	-3.87	21.77	22.11	349.91	0.21
3400.00	0.79	305.56	3399.70	22.88	-4.59	22.88	23.34	348.65	0.59

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	0.70	303.47	3499.70	23.62	-5.67	23.62	24.29	346.51	0.09
3600.00	0.23	334.07	3599.69	24.14	-6.26	24.14	24.94	345.45	0.52
3700.00	0.36	67.58	3699.69	24.44	-6.07	24.44	25.18	346.06	0.43
3800.00	0.37	131.22	3799.69	24.34	-5.53	24.34	24.96	347.19	0.38
3900.00	0.76	156.93	3899.68	23.52	-5.03	23.52	24.05	347.93	0.45
4000.00	1.13	152.75	3999.67	22.03	-4.32	22.03	22.45	348.91	0.38
4100.00	1.43	130.78	4099.65	20.34	-2.92	20.34	20.55	351.82	0.57
4200.00	2.15	125.73	4199.60	18.43	-0.45	18.43	18.43	358.59	0.74
4300.00	2.74	129.92	4299.51	15.80	2.90	15.80	16.06	10.41	0.61
4400.00	2.93	114.53	4399.38	13.20	7.06	13.20	14.97	28.14	0.78
4500.00	2.78	102.24	4499.26	11.63	11.76	11.63	16.54	45.32	0.63
4600.00	2.49	82.30	4599.16	11.41	16.27	11.41	19.87	54.97	0.95
4700.00	2.39	62.46	4699.07	12.66	20.27	12.66	23.90	58.01	0.85
4800.00	2.41	42.19	4798.98	15.18	23.54	15.18	28.01	57.17	0.84
4900.00	1.75	21.60	4898.92	18.16	25.51	18.16	31.31	54.55	0.98
5000.00	1.76	11.73	4998.87	21.09	26.39	21.09	33.78	51.37	0.30
5100.00	2.03	353.28	5098.82	24.36	26.49	24.36	35.99	47.40	0.66
5200.00	2.06	335.02	5198.75	27.75	25.53	27.75	37.70	42.61	0.65
5300.00	1.86	336.53	5298.70	30.86	24.12	30.86	39.17	38.01	0.20
5400.00	2.18	0.83	5398.64	34.26	23.50	34.26	41.54	34.45	0.91
5500.00	1.71	341.89	5498.58	37.58	23.07	37.58	44.10	31.54	0.79
5600.00	0.98	353.89	5598.55	39.86	22.51	39.86	45.77	29.46	0.78
5700.00	0.38	58.04	5698.54	40.89	22.70	40.89	46.77	29.04	0.89
5800.00	0.74	109.76	5798.54	40.85	23.59	40.85	47.17	30.01	0.59
5900.00	1.18	151.74	5898.53	39.72	24.68	39.72	46.77	31.86	0.80
6000.00	1.29	105.17	5998.51	38.52	26.26	38.52	46.62	34.28	0.98
6100.00	1.15	127.14	6098.48	37.62	28.14	37.62	46.98	36.79	0.48
6200.00	0.64	122.44	6198.47	36.72	29.41	36.72	47.04	38.69	0.51
6300.00	0.63	127.23	6298.46	36.08	30.32	36.08	47.13	40.04	0.05
6400.00	0.38	114.71	6398.46	35.61	31.06	35.61	47.25	41.09	0.28
6500.00	0.73	108.85	6498.46	35.27	31.96	35.27	47.59	42.18	0.35
6600.00	0.69	108.59	6598.45	34.87	33.13	34.87	48.10	43.53	0.04
6700.00	0.64	100.45	6698.44	34.58	34.25	34.58	48.67	44.72	0.11
6800.00	0.63	109.45	6798.44	34.30	35.32	34.30	49.23	45.84	0.10
6900.00	0.51	97.48	6898.43	34.05	36.28	34.05	49.76	46.81	0.17
7000.00	0.88	107.67	6998.42	33.76	37.44	33.76	50.42	47.96	0.39
<div> <div>HORIZONTAL DISPLACEMENT IS</div> <div>50.42 FEET AT 47.96 DEGREES</div> </div>									