

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Kate White D / 29-7

Location: S-29 T-3N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.20, Longitude: -104.57

GRID North is 0.60 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: 5/10/2011 / 11:08

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	0.26	152.50	100.00	-0.20	0.10	-0.20	0.23	152.50	0.26
200.00	0.10	216.25	200.00	-0.47	0.16	-0.47	0.50	161.65	0.23
300.00	0.25	318.55	300.00	-0.38	-0.04	-0.38	0.38	186.21	0.29
400.00	0.35	329.90	400.00	0.05	-0.34	0.05	0.34	277.98	0.11
500.00	0.45	353.88	500.00	0.70	-0.53	0.70	0.88	322.79	0.20
600.00	0.27	340.31	599.99	1.32	-0.65	1.32	1.47	333.59	0.20
700.00	0.33	331.34	699.99	1.79	-0.87	1.79	1.99	334.07	0.07
800.00	0.28	332.51	799.99	2.26	-1.12	2.26	2.52	333.61	0.05
900.00	0.33	328.11	899.99	2.72	-1.38	2.72	3.05	333.00	0.05
1000.00	0.32	334.11	999.99	3.21	-1.66	3.21	3.62	332.70	0.03
1100.00	0.36	305.43	1099.99	3.65	-2.04	3.65	4.18	330.81	0.17
1200.00	0.28	358.15	1199.98	4.08	-2.31	4.08	4.69	330.53	0.29
1300.00	0.37	343.77	1299.98	4.64	-2.40	4.64	5.22	332.59	0.12
1400.00	0.17	3.10	1399.98	5.10	-2.49	5.10	5.67	334.00	0.22
1500.00	0.45	318.44	1499.98	5.55	-2.74	5.55	6.18	333.71	0.35
1600.00	0.36	322.16	1599.98	6.09	-3.19	6.09	6.87	332.32	0.09
1700.00	0.33	255.72	1699.98	6.27	-3.66	6.27	7.26	329.70	0.38
1800.00	0.23	331.76	1799.98	6.37	-4.03	6.37	7.54	327.68	0.35
1900.00	0.26	327.26	1899.97	6.73	-4.25	6.73	7.96	327.77	0.04
2000.00	0.34	324.64	1999.97	7.17	-4.54	7.17	8.48	327.64	0.09
2100.00	0.31	259.48	2099.97	7.36	-4.98	7.36	8.89	325.92	0.35
2200.00	0.39	290.78	2199.97	7.43	-5.57	7.43	9.29	323.16	0.21
2300.00	0.42	307.12	2299.97	7.78	-6.19	7.78	9.94	321.51	0.12
2400.00	0.59	315.37	2399.96	8.37	-6.84	8.37	10.81	320.73	0.18
2500.00	0.72	328.79	2499.96	9.27	-7.53	9.27	11.95	320.92	0.20
2600.00	0.70	298.86	2599.95	10.10	-8.39	10.10	13.13	320.29	0.37
2700.00	0.74	302.48	2699.94	10.74	-9.47	10.74	14.32	318.61	0.06
2800.00	0.72	304.08	2799.93	11.44	-10.53	11.44	15.55	317.37	0.03
2900.00	0.85	301.09	2899.92	12.18	-11.69	12.18	16.88	316.17	0.14
3000.00	0.91	313.85	2999.91	13.11	-12.90	13.11	18.39	315.47	0.20
3100.00	0.76	322.19	3099.90	14.18	-13.88	14.18	19.84	315.63	0.19
3200.00	0.73	323.97	3199.89	15.22	-14.66	15.22	21.13	316.08	0.04
3300.00	0.57	312.37	3299.89	16.07	-15.40	16.07	22.26	316.23	0.21
3400.00	0.61	322.17	3399.88	16.83	-16.09	16.83	23.28	316.28	0.11

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	0.69	327.87	3499.88	17.75	-16.74	17.75	24.40	316.69	0.10
3600.00	0.69	324.58	3599.87	18.75	-17.40	18.75	25.58	317.13	0.04
3700.00	0.50	331.48	3699.86	19.62	-17.95	19.62	26.59	317.53	0.20
3800.00	0.49	330.63	3799.86	20.37	-18.37	20.37	27.43	317.95	0.01
3900.00	0.45	309.35	3899.86	20.99	-18.89	20.99	28.24	318.02	0.18
4000.00	0.55	276.13	3999.85	21.29	-19.67	21.29	28.99	317.27	0.30
4100.00	0.80	275.13	4099.85	21.41	-20.84	21.41	29.88	315.77	0.25
4200.00	0.87	260.17	4199.83	21.34	-22.29	21.34	30.86	313.75	0.23
4300.00	1.08	253.16	4299.82	20.94	-23.94	20.94	31.80	311.18	0.24
4400.00	1.01	270.75	4399.80	20.68	-25.72	20.68	33.00	308.80	0.33
4500.00	1.20	279.06	4499.79	20.86	-27.63	20.86	34.62	307.04	0.24
4600.00	1.19	267.81	4599.76	20.98	-29.70	20.98	36.36	305.24	0.23
4700.00	0.99	283.50	4699.75	21.14	-31.58	21.14	38.01	303.80	0.36
4800.00	1.07	294.61	4799.73	21.73	-33.28	21.73	39.75	303.15	0.22
4900.00	0.14	266.58	4899.72	22.12	-34.25	22.12	40.77	302.85	0.95
5000.00	0.62	253.33	4999.72	21.95	-34.90	21.95	41.23	302.17	0.48
5100.00	0.33	283.68	5099.72	21.86	-35.70	21.86	41.86	301.48	0.38
5200.00	0.62	275.86	5199.71	21.99	-36.52	21.99	42.63	301.05	0.30
5300.00	0.63	262.88	5299.71	21.97	-37.60	21.97	43.55	300.30	0.14
5400.00	0.18	254.93	5399.70	21.87	-38.29	21.87	44.10	299.73	0.45
5500.00	0.45	278.86	5499.70	21.88	-38.83	21.88	44.57	299.40	0.29
5600.00	1.26	279.02	5599.69	22.12	-40.30	22.12	45.97	298.76	0.81
5700.00	1.42	310.42	5699.67	23.09	-42.33	23.09	48.22	298.61	0.74
5800.00	1.60	312.87	5799.63	24.85	-44.30	24.85	50.79	299.29	0.19
5900.00	1.59	334.25	5899.59	27.05	-45.92	27.05	53.30	300.50	0.59
6000.00	2.00	333.81	5999.54	29.86	-47.30	29.86	55.94	302.27	0.41
6100.00	1.75	324.40	6099.49	32.67	-48.96	32.67	58.86	303.72	0.39
6200.00	1.70	326.67	6199.44	35.16	-50.66	35.16	61.67	304.76	0.09
6300.00	1.28	358.15	6299.41	37.52	-51.52	37.52	63.73	306.06	0.90
6400.00	1.10	10.93	6399.39	39.58	-51.37	39.58	64.85	307.61	0.32
6500.00	0.78	326.28	6499.38	41.09	-51.57	41.09	65.93	308.55	0.77
6600.00	0.45	222.00	6599.37	41.36	-52.21	41.36	66.61	308.39	0.99
6700.00	0.37	132.36	6699.37	40.85	-52.24	40.85	66.31	308.03	0.58
6800.00	0.62	105.90	6799.37	40.49	-51.48	40.49	65.49	308.19	0.34
6900.00	0.93	109.84	6899.36	40.06	-50.19	40.06	64.21	308.60	0.31

<div> HORIZONTAL DISPLACEMENT IS 64.21 FEET AT 308.60 DEGREES </div>
