

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Kern D / 2-2JI

Location: S-2 T-3N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.26, Longitude: -104.52

GRID North is 0.64 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: 5/3/2011 / 20:29

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	0.17	158.09	100.00	-0.14	0.06	-0.14	0.15	158.09	0.17
200.00	0.20	159.53	200.00	-0.44	0.17	-0.44	0.47	158.62	0.03
300.00	0.27	151.84	300.00	-0.81	0.34	-0.81	0.88	156.96	0.08
400.00	0.06	222.57	400.00	-1.06	0.42	-1.06	1.14	158.39	0.26
500.00	0.17	195.90	500.00	-1.24	0.34	-1.24	1.29	164.61	0.12
600.00	0.38	137.22	600.00	-1.63	0.52	-1.63	1.71	162.13	0.32
700.00	0.26	322.95	700.00	-1.69	0.61	-1.69	1.80	160.06	0.63
800.00	0.42	300.43	799.99	-1.33	0.17	-1.33	1.34	172.88	0.20
900.00	0.48	312.35	899.99	-0.86	-0.46	-0.86	0.97	208.09	0.12
1000.00	0.40	336.11	999.99	-0.25	-0.91	-0.25	0.95	254.48	0.20
1100.00	0.40	309.82	1099.99	0.29	-1.33	0.29	1.36	282.48	0.18
1200.00	0.49	320.94	1199.98	0.85	-1.87	0.85	2.05	294.54	0.12
1300.00	0.51	334.59	1299.98	1.59	-2.33	1.59	2.82	304.30	0.12
1400.00	0.60	334.81	1399.97	2.47	-2.75	2.47	3.69	311.96	0.09
1500.00	0.74	337.74	1499.97	3.54	-3.22	3.54	4.78	317.78	0.14
1600.00	0.77	353.13	1599.96	4.81	-3.54	4.81	5.97	323.63	0.20
1700.00	0.68	6.30	1699.95	6.06	-3.56	6.06	7.03	329.60	0.19
1800.00	0.26	345.84	1799.95	6.87	-3.55	6.87	7.73	332.71	0.44
1900.00	0.34	264.99	1899.95	7.07	-3.89	7.07	8.07	331.15	0.39
2000.00	0.69	256.28	1999.94	6.90	-4.77	6.90	8.39	325.33	0.36
2100.00	0.95	235.09	2099.93	6.29	-6.03	6.29	8.71	316.17	0.39
2200.00	1.47	238.74	2199.91	5.15	-7.81	5.15	9.35	303.38	0.53
2300.00	2.10	241.46	2299.86	3.60	-10.52	3.60	11.12	288.90	0.63
2400.00	2.18	242.44	2399.79	1.85	-13.82	1.85	13.94	277.62	0.08
2500.00	1.96	253.05	2499.73	0.47	-17.14	0.47	17.14	271.57	0.44
2600.00	1.93	271.74	2599.67	0.02	-20.46	0.02	20.46	270.06	0.63
2700.00	2.03	277.66	2699.61	0.31	-23.89	0.31	23.90	270.74	0.23
2800.00	1.88	275.81	2799.55	0.71	-27.28	0.71	27.29	271.49	0.17
2900.00	1.68	271.09	2899.50	0.90	-30.37	0.90	30.39	271.70	0.25
3000.00	1.32	267.63	2999.47	0.88	-32.98	0.88	33.00	271.53	0.37
3100.00	1.05	266.65	3099.45	0.78	-35.05	0.78	35.06	271.28	0.27
3200.00	0.54	260.88	3199.44	0.65	-36.43	0.65	36.44	271.03	0.51
3300.00	0.37	266.83	3299.43	0.56	-37.22	0.56	37.23	270.86	0.18
3400.00	0.29	312.05	3399.43	0.71	-37.73	0.71	37.74	271.08	0.27

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	1.20	342.93	3499.42	1.88	-38.23	1.88	38.27	272.82	0.96
3600.00	1.47	355.76	3599.40	4.16	-38.63	4.16	38.85	276.15	0.40
3700.00	1.37	2.65	3699.37	6.64	-38.67	6.64	39.24	279.74	0.20
3800.00	1.23	5.90	3799.34	8.90	-38.50	8.90	39.52	283.02	0.16
3900.00	1.19	19.16	3899.32	10.95	-38.05	10.95	39.60	286.05	0.28
4000.00	1.57	39.68	3999.29	12.98	-36.84	12.98	39.06	289.42	0.62
4100.00	1.78	47.78	4099.25	15.08	-34.81	15.08	37.94	293.43	0.31
4200.00	2.17	43.97	4199.19	17.49	-32.35	17.49	36.77	298.39	0.41
4300.00	2.08	44.10	4299.12	20.15	-29.77	20.15	35.95	304.10	0.08
4400.00	1.82	43.31	4399.06	22.61	-27.42	22.61	35.54	309.51	0.27
4500.00	1.38	46.21	4499.02	24.60	-25.46	24.60	35.41	314.02	0.45
4600.00	0.75	56.05	4599.00	25.80	-24.05	25.80	35.27	317.01	0.66
4700.00	0.22	48.92	4699.00	26.29	-23.37	26.29	35.17	318.36	0.53
4800.00	0.55	269.58	4799.00	26.41	-23.70	26.41	35.49	318.09	0.73
4900.00	1.06	276.39	4898.99	26.51	-25.10	26.51	36.51	316.56	0.52
5000.00	0.77	297.68	4998.98	26.92	-26.62	26.92	37.86	315.33	0.45
5100.00	0.19	27.29	5098.97	27.38	-27.13	27.38	38.55	315.26	0.79
5200.00	0.41	91.70	5198.97	27.52	-26.70	27.52	38.35	315.87	0.37
5300.00	0.58	57.62	5298.97	27.78	-25.92	27.78	37.99	316.99	0.33
5400.00	0.60	88.55	5398.96	28.06	-24.97	28.06	37.56	318.34	0.32
5500.00	0.69	93.69	5498.96	28.04	-23.84	28.04	36.80	319.63	0.11
5600.00	0.95	81.95	5598.95	28.11	-22.42	28.11	35.96	321.43	0.30
5700.00	0.92	81.43	5698.93	28.35	-20.81	28.35	35.17	323.72	0.03
5800.00	0.68	72.02	5798.92	28.65	-19.45	28.65	34.63	325.84	0.27
5900.00	0.72	64.31	5898.92	29.11	-18.31	29.11	34.39	327.83	0.10
6000.00	0.60	33.91	5998.91	29.82	-17.46	29.82	34.55	329.65	0.36
6100.00	0.46	51.47	6098.91	30.50	-16.85	30.50	34.84	331.09	0.21
6200.00	0.36	72.06	6198.90	30.85	-16.23	30.85	34.86	332.25	0.18
6300.00	0.62	72.21	6298.90	31.11	-15.42	31.11	34.72	333.64	0.25
6400.00	0.54	79.97	6398.89	31.36	-14.44	31.36	34.52	335.28	0.11
6500.00	0.63	82.95	6498.89	31.51	-13.43	31.51	34.25	336.92	0.09
6600.00	0.67	81.58	6598.88	31.66	-12.31	31.66	33.97	338.76	0.05
6700.00	1.10	81.42	6698.87	31.89	-10.78	31.89	33.66	341.32	0.43
6800.00	0.67	79.93	6798.86	32.14	-9.26	32.14	33.44	343.93	0.42
HORIZONTAL DISPLACEMENT IS 33.44 FEET AT 343.93 DEGREES									