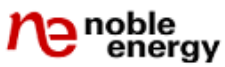


Company/Rig: Noble Energy/Production/VES
 Well/API: UPV 31-16 G3/05-123-18635
 Declination: 8.47
 TD as Drilled: 6777'
 County/State: Weld/Colorado
 Latitude: 40.437, Longitude: -104.472
 GRID North is 0.660 Degrees East of True North
 VS-Azi: 0.000 Degrees



Depth Reference : RKB = GL / Elevation = 4663'

DRILLOG MV GYRO SURVEY CALCULATIONS

Filename: run3_rev_intgv.ut

Minimum Curvature Method

Report Date/Time: 4/9/2013 / 13:17

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, CO

303-853-4976

SURVEYOR: NORMAN COWAN

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
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.442	308.078	99.999	0.238	-0.303	0.238	0.385	308.078	0.442
200.000	0.499	312.430	199.996	0.769	-0.928	0.769	1.206	309.649	0.068
300.000	0.557	316.781	299.991	1.417	-1.583	1.417	2.125	311.847	0.070
400.000	0.614	321.133	399.986	2.189	-2.252	2.189	3.140	314.188	0.073
500.000	0.672	325.484	499.980	3.090	-2.921	3.090	4.251	316.610	0.075
600.000	0.729	329.836	599.972	4.123	-3.573	4.123	5.456	319.091	0.078
700.000	0.787	334.187	699.964	5.292	-4.192	5.292	6.751	321.617	0.081
800.000	0.845	338.539	799.954	6.596	-4.760	6.596	8.134	324.182	0.085
900.000	0.902	342.891	899.942	8.034	-5.261	8.034	9.604	326.779	0.088
1000.000	0.960	347.242	999.929	9.603	-5.678	9.603	11.156	329.406	0.091
1100.000	0.892	341.105	1099.916	11.157	-6.115	11.157	12.722	331.272	0.120
1200.000	0.845	333.744	1199.904	12.555	-6.693	12.555	14.228	331.936	0.121
1300.000	0.798	326.383	1299.894	13.796	-7.405	13.796	15.658	331.774	0.115
1400.000	0.751	319.022	1399.885	14.871	-8.221	14.871	16.992	331.066	0.110
1500.000	0.704	311.661	1499.877	15.775	-9.110	15.775	18.216	329.993	0.105
1600.000	0.657	304.300	1599.870	16.506	-10.043	16.506	19.322	328.682	0.099
1700.000	0.610	296.939	1699.864	17.071	-10.992	17.071	20.303	327.223	0.094
1800.000	0.563	289.578	1799.858	17.477	-11.929	17.477	21.160	325.683	0.089
1900.000	0.516	282.217	1899.854	17.737	-12.833	17.737	21.893	324.114	0.084
2000.000	0.469	274.856	1999.850	17.867	-13.681	17.867	22.504	322.558	0.079

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
2100.000	0.497	274.164	2099.847	17.933	-14.522	17.933	23.076	321.000	0.028
2200.000	0.481	274.992	2199.843	18.001	-15.373	18.001	23.672	319.504	0.017
2300.000	0.466	275.820	2299.840	18.079	-16.196	18.079	24.272	318.145	0.017
2400.000	0.451	276.648	2399.836	18.166	-16.991	18.166	24.873	316.914	0.017
2500.000	0.435	277.475	2499.833	18.261	-17.758	18.261	25.472	315.799	0.017
2600.000	0.420	278.303	2599.831	18.363	-18.498	18.363	26.065	314.791	0.017
2700.000	0.405	279.131	2699.828	18.472	-19.209	18.472	26.650	313.879	0.016
2800.000	0.389	279.959	2799.826	18.587	-19.893	18.587	27.225	313.056	0.016
2900.000	0.374	280.786	2899.823	18.707	-20.548	18.707	27.788	312.314	0.016
3000.000	0.359	281.614	2999.821	18.831	-21.176	18.831	28.337	311.646	0.016
3100.000	0.600	286.845	3099.818	19.046	-21.984	19.046	29.086	310.904	0.245
3200.000	0.840	294.799	3199.810	19.505	-23.150	19.505	30.271	310.116	0.259
3300.000	1.079	302.754	3299.796	20.321	-24.607	20.321	31.913	309.551	0.273
3400.000	1.318	310.708	3399.774	21.581	-26.270	21.581	33.998	309.403	0.291
3500.000	1.558	318.662	3499.743	23.352	-28.040	23.352	36.490	309.787	0.311
3600.000	1.797	326.617	3599.700	25.681	-29.800	25.681	39.339	310.754	0.333
3700.000	2.036	334.571	3699.644	28.595	-31.426	28.595	42.488	312.299	0.357
3800.000	2.276	342.525	3799.573	32.093	-32.785	32.093	45.878	314.389	0.383
3900.000	2.515	350.480	3899.486	36.150	-33.744	36.150	49.452	316.972	0.409
4000.000	2.754	358.434	3999.381	40.716	-34.173	40.716	53.156	319.994	0.436
4100.000	2.797	7.662	4099.264	45.536	-33.913	45.536	56.777	323.323	0.448
4200.000	2.829	16.979	4199.144	50.315	-32.867	50.315	60.098	326.846	0.458
4300.000	2.861	26.297	4299.021	54.913	-31.040	54.913	63.079	330.522	0.463
4400.000	2.893	35.614	4398.896	59.202	-28.465	59.202	65.690	334.321	0.468
4500.000	2.925	44.932	4498.767	63.060	-25.193	63.060	67.907	338.223	0.473
4600.000	2.958	54.250	4598.636	66.374	-21.297	66.374	69.707	342.211	0.479
4700.000	2.990	63.567	4698.502	69.042	-16.868	69.042	71.073	346.271	0.484
4800.000	3.022	72.885	4798.365	70.979	-12.014	70.979	71.989	350.393	0.489
4900.000	3.054	82.202	4898.225	72.116	-6.856	72.116	72.441	354.569	0.494
5000.000	3.086	91.520	4998.082	72.406	-1.526	72.406	72.422	358.793	0.499
5100.000	3.162	85.719	5097.934	72.541	3.915	72.541	72.646	3.089	0.325
5200.000	3.240	79.675	5197.778	73.253	9.445	73.253	73.859	7.347	0.346
5300.000	3.318	73.631	5297.615	74.575	15.002	74.575	76.069	11.374	0.354
5400.000	3.397	67.587	5397.443	76.520	20.517	76.520	79.223	15.010	0.362
5500.000	3.475	61.544	5497.264	79.094	25.920	79.094	83.233	18.145	0.370
5600.000	3.553	55.500	5597.076	82.293	31.139	82.293	87.987	20.726	0.378
5700.000	3.632	49.456	5696.880	86.107	36.099	86.107	93.368	22.745	0.387
5800.000	3.710	43.412	5796.675	90.516	40.729	90.516	99.257	24.226	0.395
5900.000	3.788	37.368	5896.462	95.491	44.958	95.491	105.545	25.211	0.403
6000.000	3.867	31.325	5996.239	100.997	48.716	100.997	112.132	25.750	0.411
6100.000	4.144	31.659	6095.995	106.953	52.365	106.953	119.084	26.087	0.279
6200.000	4.424	31.749	6195.715	113.308	56.291	113.308	126.521	26.418	0.280

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
6300.000	4.704	31.838	6295.398	120.072	60.484	120.072	134.445	26.736	0.280
6400.000	4.984	31.928	6395.041	127.242	64.944	127.242	142.857	27.040	0.280
6500.000	5.264	32.017	6494.641	134.818	69.673	134.818	151.757	27.330	0.280
6600.000	5.544	32.107	6594.197	142.799	74.673	142.799	161.145	27.606	0.280
20.1 Ellipse of Uncertainty									
6700.000	5.818	33.576	6693.705	151.113	80.043	151.113	171.003	27.910	0.310