



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL: HETTINGER D30-05
DECLINATION: 8.32 DEGREES
TD AS DRILLED: 7210 FEET
COUNTY/STATE: WELD / COLORADO
Latitude: 40.197, Longitude: -104.601
GRID North is 0.580 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4786 FEET

DRILLOG GYRO SURVEY CALCULATIONS

Filename: survey.ut

Minimum Curvature Method

Report Date/Time: 10/6/2014 / 10:28

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

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	0.454	75.745	99.999	0.098	0.384	0.098	0.396	75.745	0.454
200.000	0.433	95.435	199.996	0.159	1.145	0.159	1.156	82.075	0.153
300.000	0.380	108.598	299.994	0.018	1.835	0.018	1.835	89.444	0.107
400.000	0.374	83.830	399.991	-0.053	2.474	-0.053	2.474	91.224	0.162
500.000	0.119	120.822	499.990	-0.071	2.887	-0.071	2.888	91.409	0.288
600.000	0.735	136.798	599.987	-0.592	3.415	-0.592	3.466	99.829	0.621
700.000	0.669	175.348	699.980	-1.641	3.902	-1.641	4.233	112.808	0.468
800.000	0.949	136.987	799.971	-2.828	4.514	-2.828	5.327	122.067	0.594
900.000	0.862	152.850	899.959	-4.103	5.422	-4.103	6.800	127.115	0.264
1000.000	1.031	145.512	999.945	-5.514	6.275	-5.514	8.353	131.306	0.207
1100.000	0.668	199.470	1099.935	-6.805	6.590	-6.805	9.473	135.920	0.836
1200.000	0.871	146.574	1199.927	-7.989	6.814	-7.989	10.501	139.538	0.709
1300.000	0.330	202.177	1299.922	-8.890	7.124	-8.890	11.393	141.291	0.737
1400.000	0.851	176.031	1399.917	-9.898	7.067	-9.898	12.162	144.472	0.574
1500.000	0.870	208.074	1499.906	-11.309	6.762	-11.309	13.176	149.124	0.475
1600.000	0.743	185.368	1599.896	-12.624	6.344	-12.624	14.128	153.320	0.341
1700.000	0.533	176.367	1699.890	-13.733	6.312	-13.733	15.115	155.314	0.232
1800.000	0.455	183.586	1799.886	-14.594	6.317	-14.594	15.902	156.594	0.099
1900.000	0.222	285.784	1899.885	-14.938	6.106	-14.938	16.137	157.768	0.547
2000.000	0.755	285.880	1999.881	-14.705	5.285	-14.705	15.626	160.231	0.533

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	1.183	283.231	2099.866	-14.288	3.646	-14.288	14.746	165.683	0.430
2200.000	1.020	257.068	2199.849	-14.251	1.774	-14.251	14.361	172.904	0.523
2300.000	0.869	253.583	2299.835	-14.665	0.179	-14.665	14.666	179.301	0.161
2400.000	0.856	265.979	2399.824	-14.931	-1.294	-14.931	14.987	184.952	0.187
2500.000	0.750	259.018	2499.814	-15.108	-2.681	-15.108	15.344	190.063	0.144
2600.000	0.873	282.620	2599.804	-15.067	-4.066	-15.067	15.606	195.104	0.353
2700.000	0.827	290.213	2699.793	-14.651	-5.486	-14.651	15.644	200.530	0.121
2800.000	0.869	317.199	2799.783	-13.845	-6.679	-13.845	15.372	205.752	0.398
2900.000	0.756	245.217	2899.775	-13.566	-7.793	-13.566	15.645	209.876	0.959
3000.000	0.932	292.520	2999.765	-13.531	-9.144	-13.531	16.330	214.050	0.696
3100.000	0.602	259.562	3099.757	-13.314	-10.412	-13.314	16.902	218.027	0.538
3200.000	0.216	253.944	3199.754	-13.461	-11.110	-13.461	17.454	219.534	0.388
3300.000	0.430	264.175	3299.752	-13.552	-11.665	-13.552	17.881	220.721	0.221
3400.000	0.144	167.846	3399.751	-13.712	-12.012	-13.712	18.230	221.219	0.468
3500.000	0.401	193.335	3499.750	-14.176	-12.067	-14.176	18.616	220.405	0.279
3600.000	0.827	200.397	3599.744	-15.193	-12.399	-15.193	19.610	219.217	0.431
3700.000	0.616	264.432	3699.737	-15.922	-13.185	-15.922	20.672	219.629	0.786
3800.000	0.300	278.187	3799.734	-15.937	-13.979	-15.937	21.199	221.257	0.332
3900.000	0.727	260.665	3899.730	-16.002	-14.865	-16.002	21.841	222.890	0.450
4000.000	0.810	287.303	3999.721	-15.895	-16.166	-15.895	22.671	225.485	0.363
4100.000	0.843	292.930	4099.711	-15.398	-17.519	-15.398	23.324	228.686	0.087
4200.000	0.725	290.431	4199.701	-14.891	-18.789	-14.891	23.974	231.603	0.122
4300.000	1.209	287.496	4299.687	-14.352	-20.389	-14.352	24.934	234.857	0.486
4400.000	0.453	263.650	4399.676	-14.079	-21.787	-14.079	25.940	237.129	0.816
4500.000	0.597	311.796	4499.672	-13.776	-22.568	-13.776	26.440	238.599	0.448
4600.000	0.729	354.142	4599.666	-12.796	-23.021	-12.796	26.338	240.933	0.494
4700.000	0.752	17.365	4699.658	-11.537	-22.890	-11.537	25.633	243.252	0.299
4800.000	1.570	26.809	4799.637	-9.688	-22.076	-9.688	24.108	246.307	0.837
4900.000	2.413	28.390	4899.575	-6.613	-20.457	-6.613	21.500	252.085	0.845
5000.000	2.368	29.814	4999.488	-2.969	-18.429	-2.969	18.667	260.848	0.074
5100.000	2.346	37.816	5099.404	0.441	-16.147	0.441	16.153	271.563	0.330
5200.000	2.522	51.593	5199.315	3.425	-13.168	3.425	13.606	284.578	0.609
5300.000	2.761	59.719	5299.209	6.006	-9.364	6.006	11.124	302.676	0.444
5400.000	2.193	75.820	5399.116	7.689	-5.429	7.689	9.412	324.778	0.893
5500.000	2.436	89.947	5499.035	8.160	-1.449	8.160	8.288	349.933	0.618
5600.000	1.592	89.507	5598.972	8.174	2.066	8.174	8.431	14.184	0.843
5700.000	0.734	91.754	5698.951	8.166	4.096	8.166	9.136	26.635	0.859
5800.000	1.003	65.624	5798.940	8.508	5.533	8.508	10.148	33.037	0.472
5900.000	1.162	70.772	5898.922	9.203	7.287	9.203	11.738	38.373	0.186
6000.000	0.191	80.800	5998.914	9.563	8.409	9.563	12.734	41.324	0.974

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
6100.000	0.457	52.954	6098.912	9.830	8.891	9.830	13.255	42.129	0.302
6200.000	0.700	106.693	6198.908	9.895	9.795	9.895	13.923	44.707	0.566
6300.000	0.381	130.658	6298.903	9.504	10.631	9.504	14.260	48.206	0.384
6400.000	0.196	100.316	6398.902	9.256	11.052	9.256	14.416	50.052	0.234
6500.000	0.405	100.685	6498.900	9.160	11.567	9.160	14.755	51.622	0.209
6600.000	0.436	74.455	6598.898	9.197	12.280	9.197	15.342	53.170	0.193
6700.000	0.387	132.492	6698.896	9.071	12.896	9.071	15.767	54.880	0.402
6800.000	0.107	211.897	6798.895	8.763	13.096	8.763	15.758	56.213	0.383
6900.000	0.737	236.771	6898.892	8.331	12.509	8.331	15.029	56.336	0.642
6950.000	0.371	201.636	6948.889	8.004	12.180	8.004	14.575	56.689	0.967