



Company: Noble Energy
Lease / Well: Hoshiko C / 2-8
API#: 05-123-20167

Rig Name: Production / Noble Energy
State / County: Colorado / Weld County
Latitude: 40.343, Longitude: -104.511

GRID North is 0.640 Degrees East of True North
VS-Azi: 0.000 Degrees



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: 10/4/2011 / 10:41

Vaughn Energy Services
Henderson, CO
303-853-4976
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
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.309	37.690	100.000	0.214	0.165	0.214	0.270	37.690	0.309
200.000	0.183	4.798	199.999	0.586	0.343	0.586	0.679	30.353	0.185
300.000	0.178	10.776	299.998	0.898	0.386	0.898	0.977	23.244	0.020
400.000	0.344	249.222	399.998	0.944	0.134	0.944	0.954	8.094	0.462
500.000	0.524	220.620	499.995	0.490	-0.444	0.490	0.662	317.851	0.277
600.000	0.764	208.136	599.988	-0.444	-1.056	-0.444	1.146	247.182	0.276
700.000	0.787	206.652	699.979	-1.646	-1.678	-1.646	2.351	225.559	0.031
800.000	0.878	209.505	799.969	-2.927	-2.364	-2.927	3.762	218.928	0.099
900.000	0.849	205.613	899.957	-4.261	-3.061	-4.261	5.247	215.693	0.065
1000.000	0.851	208.915	999.946	-5.579	-3.741	-5.579	6.717	213.839	0.049
1100.000	0.850	194.128	1099.935	-6.948	-4.280	-6.948	8.161	211.636	0.219
1200.000	1.043	192.443	1199.922	-8.556	-4.657	-8.556	9.741	208.563	0.195
1300.000	1.047	194.781	1299.905	-10.327	-5.087	-10.327	11.512	206.222	0.043
1400.000	0.919	205.883	1399.890	-11.933	-5.670	-11.933	13.211	205.415	0.229
1500.000	0.897	216.893	1499.878	-13.280	-6.490	-13.280	14.781	206.045	0.176
1600.000	0.905	221.882	1599.866	-14.494	-7.487	-14.494	16.314	207.319	0.079
1700.000	0.970	233.895	1699.852	-15.581	-8.698	-15.581	17.844	209.173	0.207
1800.000	1.062	240.433	1799.837	-16.537	-10.188	-16.537	19.424	211.637	0.148
1900.000	1.176	257.254	1899.818	-17.221	-11.995	-17.221	20.987	214.859	0.346
2000.000	1.150	255.758	1999.797	-17.694	-13.969	-17.694	22.543	218.290	0.040
2100.000	1.197	274.502	2099.777	-17.859	-15.983	-17.859	23.966	221.827	0.385
2200.000	1.013	296.431	2199.758	-17.383	-17.816	-17.383	24.891	225.703	0.457
2300.000	1.349	315.725	2299.737	-16.147	-19.429	-16.147	25.263	230.271	0.516
2400.000	1.640	321.778	2399.703	-14.180	-21.136	-14.180	25.452	236.143	0.331
2500.000	1.677	323.660	2499.661	-11.877	-22.889	-11.877	25.787	242.576	0.066
2600.000	1.726	317.790	2599.617	-9.582	-24.768	-9.582	26.557	248.849	0.181
2700.000	1.766	322.993	2699.571	-7.236	-26.708	-7.236	27.670	254.840	0.163
2800.000	1.783	317.335	2799.523	-4.861	-28.690	-4.861	29.099	260.383	0.176
2900.000	1.818	328.924	2899.474	-2.359	-30.563	-2.359	30.654	265.587	0.365
3000.000	1.916	332.528	2999.421	0.483	-32.153	0.483	32.156	270.860	0.153
3100.000	1.980	332.188	3099.363	3.494	-33.730	3.494	33.910	275.914	0.066
3200.000	2.269	329.965	3199.294	6.736	-35.527	6.736	36.159	280.735	0.300
3300.000	2.667	326.017	3299.202	10.378	-37.818	10.378	39.216	285.345	0.433
3400.000	2.896	318.683	3399.084	14.204	-40.786	14.204	43.189	289.202	0.423

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
3500.000	3.179	308.408	3498.944	17.825	-44.627	17.825	48.055	291.773	0.612
3600.000	3.262	314.080	3598.786	21.527	-48.844	21.527	53.377	293.784	0.329
3700.000	3.359	318.641	3698.620	25.705	-52.823	25.705	58.745	295.948	0.280
3800.000	3.435	312.802	3798.444	29.939	-56.957	29.939	64.346	297.728	0.354
3900.000	3.252	317.476	3898.274	34.064	-61.072	34.064	69.929	299.152	0.328
4000.000	3.067	322.657	3998.123	38.281	-64.611	38.281	75.100	300.646	0.340
4100.000	3.178	332.268	4097.975	42.861	-67.524	42.861	79.978	302.406	0.534
4200.000	3.317	339.011	4197.815	48.016	-69.850	48.016	84.761	304.505	0.406
4300.000	3.811	343.546	4297.621	53.904	-71.827	53.904	89.804	306.887	0.568
4400.000	3.971	343.362	4397.390	60.409	-73.760	60.409	95.340	309.317	0.161
4500.000	3.903	344.918	4497.154	67.013	-75.637	67.013	101.053	311.541	0.127
4600.000	3.521	342.901	4596.945	73.235	-77.426	73.235	106.574	313.407	0.404
4700.000	3.297	338.302	4696.768	78.842	-79.392	78.842	111.889	314.801	0.353
4800.000	2.820	338.981	4796.625	83.810	-81.337	83.810	116.790	315.858	0.479
4900.000	2.736	340.358	4896.507	88.354	-83.022	88.354	121.239	316.782	0.107
5000.000	2.617	343.123	4996.398	92.786	-84.487	92.786	125.488	317.681	0.175
5100.000	2.271	343.349	5096.307	96.869	-85.717	96.869	129.349	318.495	0.346
5200.000	1.601	344.245	5196.250	100.112	-86.664	100.112	132.413	319.118	0.670
5300.000	1.328	346.098	5296.217	102.581	-87.322	102.581	134.715	319.594	0.277
5400.000	1.174	351.160	5396.193	104.719	-87.758	104.719	136.629	320.036	0.189
5500.000	1.151	354.421	5496.172	106.731	-88.013	106.731	138.339	320.490	0.070
5600.000	1.017	344.532	5596.155	108.585	-88.347	108.585	139.986	320.867	0.229
5700.000	0.948	351.097	5696.140	110.258	-88.712	110.258	141.516	321.180	0.132
5800.000	1.095	346.064	5796.124	112.003	-89.070	112.003	143.102	321.507	0.172
5900.000	1.087	333.551	5896.106	113.780	-89.723	113.780	144.900	321.742	0.238
6000.000	1.164	323.457	5996.087	115.445	-90.750	115.445	146.844	321.829	0.212
6100.000	1.368	322.499	6096.062	117.208	-92.082	117.208	149.053	321.846	0.204
6200.000	1.704	316.529	6196.026	119.234	-93.831	119.234	151.727	321.799	0.372
6300.000	1.944	317.665	6295.976	121.567	-95.997	121.567	154.900	321.703	0.243
6400.000	1.600	314.280	6395.928	123.796	-98.139	123.796	157.976	321.595	0.359
6500.000	1.834	311.592	6495.883	125.833	-100.335	125.833	160.938	321.432	0.247
6600.000	2.462	312.207	6595.812	128.338	-103.123	128.338	164.636	321.217	0.629
6700.000	3.317	312.841	6695.684	131.749	-106.836	131.749	169.622	320.961	0.855
HORIZONTAL DISPLACEMENT IS 169.622 FEET AT 320.961 DEGREES									