



Company: Anadarko Petroleum
 Well: Roy Dutcher Unit #2
 API #: 05-123-10067
 Rig Name: Production / Warrior
 State/County: Colorado/Weld
 Latitude: 40.128, Longitude: -104.843
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB= Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hagro_7750-de_01.ut

Minimum Curvature Method

Report Date/Time: 2/26/2014 / 09:33

Vaughn Energy Services
 Henderson, Colorado
 303-853-4976
 Brian Brewbaker

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	0.281	162.370	100.000	-0.234	0.074	-0.234	0.245	162.370	0.281
200.000	0.082	90.026	199.999	-0.467	0.220	-0.467	0.517	154.757	0.268
300.000	0.291	43.472	299.999	-0.283	0.467	-0.283	0.546	121.216	0.242
400.000	0.285	26.106	399.997	0.124	0.751	0.124	0.761	80.596	0.087
500.000	0.297	359.983	499.996	0.607	0.860	0.607	1.053	54.806	0.132
600.000	0.635	316.425	599.993	1.267	0.478	1.267	1.354	20.686	0.467
700.000	0.871	310.248	699.984	2.159	-0.483	2.159	2.213	347.384	0.250
800.000	0.710	324.635	799.975	3.156	-1.422	3.156	3.461	335.743	0.254
900.000	0.819	326.887	899.966	4.259	-2.171	4.259	4.781	332.993	0.113
1000.000	0.776	321.535	999.956	5.388	-2.982	5.388	6.158	331.034	0.086
1100.000	0.696	308.173	1099.948	6.293	-3.881	6.293	7.394	328.339	0.189
1200.000	0.693	295.655	1199.941	6.931	-4.904	6.931	8.490	324.720	0.151
1300.000	0.630	302.040	1299.934	7.484	-5.915	7.484	9.539	321.681	0.097
1400.000	0.579	284.745	1399.929	7.904	-6.869	7.904	10.472	319.009	0.189
1500.000	0.617	293.886	1499.923	8.251	-7.849	8.251	11.388	316.427	0.103
1600.000	0.620	298.841	1599.917	8.729	-8.815	8.729	12.406	314.720	0.054
1700.000	0.401	305.339	1699.913	9.193	-9.575	9.193	13.273	313.835	0.225
1800.000	0.452	310.809	1799.911	9.653	-10.159	9.653	14.014	313.538	0.065
1900.000	0.507	320.000	1899.907	10.250	-10.742	10.250	14.848	313.657	0.094
2000.000	0.211	343.697	1999.905	10.766	-11.078	10.766	15.448	314.181	0.325
2100.000	0.232	3.466	2099.904	11.145	-11.118	11.145	15.743	315.071	0.079
2200.000	0.252	11.902	2199.903	11.563	-11.060	11.563	16.001	316.273	0.041
2300.000	0.356	24.241	2299.902	12.061	-10.887	12.061	16.248	317.928	0.122
2400.000	0.445	8.113	2399.900	12.729	-10.705	12.729	16.632	319.936	0.143
2500.000	0.644	24.144	2499.895	13.626	-10.421	13.626	17.154	322.593	0.248
2600.000	0.473	19.091	2599.890	14.529	-10.056	14.529	17.670	325.313	0.177
2700.000	0.620	33.361	2699.886	15.372	-9.623	15.372	18.135	327.953	0.199
2800.000	0.606	13.766	2799.880	16.338	-9.199	16.338	18.750	330.617	0.209
2900.000	0.522	22.541	2899.875	17.273	-8.899	17.273	19.430	332.742	0.120
3000.000	0.548	18.385	2999.871	18.147	-8.573	18.147	20.071	334.713	0.047
3100.000	0.523	19.743	3099.867	19.031	-8.268	19.031	20.749	336.516	0.029
3200.000	0.588	31.287	3199.862	19.898	-7.848	19.898	21.390	338.476	0.129
3300.000	0.461	21.395	3299.858	20.711	-7.435	20.711	22.005	340.252	0.155
3400.000	0.483	31.471	3399.854	21.444	-7.068	21.444	22.579	341.757	0.086

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	0.619	19.049	3499.850	22.315	-6.672	22.315	23.291	343.353	0.181
3600.000	0.587	71.261	3599.845	22.990	-6.010	22.990	23.763	345.349	0.532
3700.000	0.660	59.177	3699.839	23.450	-5.030	23.450	23.983	347.893	0.150
3800.000	0.577	63.958	3799.833	23.967	-4.083	23.967	24.312	350.332	0.098
3900.000	0.574	51.071	3899.828	24.502	-3.240	24.502	24.716	352.466	0.129
4000.000	0.605	13.463	3999.823	25.331	-2.728	25.331	25.477	353.853	0.381
4100.000	0.927	3.727	4099.814	26.651	-2.552	26.651	26.773	354.529	0.346
4200.000	0.972	11.487	4199.801	28.290	-2.331	28.290	28.385	355.290	0.136
4300.000	1.140	3.933	4299.784	30.114	-2.094	30.114	30.187	356.023	0.218
4400.000	1.052	0.150	4399.765	32.025	-2.023	32.025	32.088	356.385	0.114
4500.000	1.131	359.546	4499.747	33.930	-2.028	33.930	33.990	356.579	0.081
4600.000	1.054	13.952	4599.729	35.809	-1.814	35.809	35.855	357.099	0.285
4700.000	0.631	1.290	4699.718	37.252	-1.580	37.252	37.286	357.571	0.460
4800.000	0.617	17.302	4799.712	38.316	-1.408	38.316	38.342	357.896	0.174
4900.000	0.916	42.053	4899.703	39.424	-0.712	39.424	39.430	358.965	0.440
5000.000	1.103	60.292	4999.688	40.495	0.659	40.495	40.500	0.933	0.370
5100.000	1.313	58.644	5099.666	41.568	2.474	41.568	41.641	3.406	0.212
5200.000	0.558	30.265	5199.652	42.584	3.697	42.584	42.745	4.962	0.864
5300.000	0.541	353.856	5299.648	43.474	3.892	43.474	43.648	5.116	0.344
5400.000	0.584	348.758	5399.643	44.444	3.742	44.444	44.601	4.813	0.066
5500.000	0.614	346.475	5499.638	45.464	3.517	45.464	45.600	4.424	0.038
5600.000	0.831	332.745	5599.630	46.630	3.060	46.630	46.730	3.755	0.276
5700.000	0.896	335.376	5699.618	47.985	2.403	47.985	48.045	2.866	0.076
5800.000	0.935	347.704	5799.606	49.493	1.903	49.493	49.529	2.202	0.200
5900.000	0.968	352.877	5899.592	51.128	1.625	51.128	51.154	1.820	0.092
6000.000	0.618	349.477	5999.582	52.496	1.421	52.496	52.515	1.551	0.353
6100.000	0.529	350.518	6099.577	53.482	1.247	53.482	53.496	1.336	0.089
6200.000	0.664	359.122	6199.572	54.517	1.162	54.517	54.529	1.221	0.161
6300.000	0.734	2.062	6299.564	55.737	1.176	55.737	55.749	1.209	0.079
6400.000	0.736	357.587	6399.556	57.019	1.172	57.019	57.031	1.178	0.057
6500.000	0.610	12.152	6499.549	58.181	1.257	58.181	58.195	1.238	0.212
6600.000	0.687	20.860	6599.543	59.262	1.583	59.262	59.283	1.530	0.125
6700.000	0.536	0.181	6699.537	60.289	1.797	60.289	60.316	1.708	0.265
6800.000	0.479	2.570	6799.533	61.174	1.818	61.174	61.201	1.702	0.060
6900.000	0.249	24.462	6899.531	61.790	1.926	61.790	61.820	1.786	0.265
7000.000	0.311	17.022	6999.530	62.248	2.096	62.248	62.283	1.928	0.071
7100.000	0.440	337.907	7099.528	62.863	2.031	62.863	62.896	1.850	0.280
7200.000	0.375	2.926	7199.526	63.546	1.903	63.546	63.574	1.715	0.188
7300.000	0.507	358.157	7299.523	64.315	1.905	64.315	64.343	1.697	0.137
7400.000	0.250	341.559	7399.520	64.963	1.822	64.963	64.989	1.607	0.277
7500.000	0.424	26.528	7499.519	65.501	1.919	65.501	65.529	1.678	0.304
7600.000	0.632	349.633	7599.515	66.375	1.985	66.375	66.404	1.713	0.388
7700.000	0.576	32.542	7699.510	67.340	2.156	67.340	67.375	1.834	0.445
7750.000	0.268	5.189	7749.508	67.668	2.302	67.668	67.708	1.948	0.718

<div> HORIZONTAL DISPLACEMENT IS 67.708 FEET AT 1.948 DEGREES </div>
