



Company: Anadarko Petroleum
 Well: Roy Dutcher Unit #1
 API #: 05-123-07739
 Rig Name: Production / Warrior
 State/County: Colorado/Weld
 Latitude: 40.119, Longitude: -104.845
 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 / 11:54

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	1.398	245.114	99.990	-0.513	-1.107	-0.513	1.220	245.114	1.398
200.000	0.958	251.902	199.969	-1.286	-3.008	-1.286	3.272	246.844	0.461
300.000	0.561	262.206	299.960	-1.612	-4.287	-1.612	4.581	249.388	0.418
400.000	0.257	250.552	399.957	-1.753	-4.983	-1.753	5.283	250.615	0.314
500.000	0.296	261.706	499.956	-1.865	-5.450	-1.865	5.760	251.107	0.066
600.000	0.276	268.446	599.955	-1.909	-5.947	-1.909	6.245	252.202	0.039
700.000	0.317	258.615	699.953	-1.970	-6.459	-1.970	6.753	253.036	0.065
800.000	0.346	257.690	799.952	-2.089	-7.025	-2.089	7.330	253.438	0.029
900.000	0.248	242.693	899.950	-2.253	-7.513	-2.253	7.844	253.307	0.124
1000.000	0.262	252.239	999.949	-2.422	-7.924	-2.422	8.286	253.001	0.045
1100.000	0.274	245.395	1099.948	-2.592	-8.359	-2.592	8.751	252.774	0.034
1200.000	0.347	257.118	1199.947	-2.759	-8.871	-2.759	9.290	252.726	0.096
1300.000	0.383	253.128	1299.945	-2.923	-9.486	-2.923	9.926	252.874	0.044
1400.000	0.343	261.936	1399.943	-3.062	-10.102	-3.062	10.556	253.137	0.069
1500.000	0.445	276.991	1499.940	-3.057	-10.784	-3.057	11.208	254.175	0.145
1600.000	0.354	234.034	1599.938	-3.191	-11.420	-3.191	11.857	254.388	0.305
1700.000	0.437	285.164	1699.936	-3.273	-12.038	-3.273	12.475	254.791	0.350
1800.000	0.540	289.794	1799.933	-3.013	-12.850	-3.013	13.198	256.802	0.110
1900.000	0.497	294.119	1899.928	-2.676	-13.689	-2.676	13.949	258.938	0.058
2000.000	0.344	301.879	1999.926	-2.340	-14.341	-2.340	14.530	260.731	0.163
2100.000	0.418	297.695	2099.923	-2.012	-14.919	-2.012	15.054	262.318	0.079
2200.000	0.156	256.954	2199.922	-1.873	-15.374	-1.873	15.488	263.053	0.317
2300.000	0.276	221.912	2299.922	-2.083	-15.668	-2.083	15.806	262.426	0.174
2400.000	0.442	184.844	2399.920	-2.647	-15.861	-2.647	16.081	260.526	0.277
2500.000	0.284	201.353	2499.918	-3.262	-15.984	-3.262	16.314	258.466	0.187
2600.000	0.550	224.050	2599.915	-3.838	-16.408	-3.838	16.851	256.835	0.308
2700.000	0.585	243.454	2699.910	-4.411	-17.199	-4.411	17.756	255.615	0.194
2800.000	0.727	278.026	2799.904	-4.551	-18.285	-4.551	18.843	256.023	0.413
2900.000	0.643	261.004	2899.897	-4.550	-19.467	-4.550	19.992	256.844	0.219
3000.000	0.475	261.987	2999.892	-4.696	-20.432	-4.696	20.965	257.057	0.168
3100.000	0.436	280.682	3099.889	-4.683	-21.217	-4.683	21.728	257.553	0.153
3200.000	0.286	293.006	3199.887	-4.515	-21.821	-4.515	22.283	258.310	0.168
3300.000	0.348	272.914	3299.885	-4.402	-22.354	-4.402	22.783	258.860	0.126
3400.000	0.302	277.752	3399.884	-4.351	-22.919	-4.351	23.328	259.251	0.053

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	0.173	222.022	3499.883	-4.427	-23.281	-4.427	23.698	259.233	0.250
3600.000	0.372	255.439	3599.882	-4.621	-23.696	-4.621	24.143	258.966	0.247
3700.000	0.723	251.595	3699.877	-4.902	-24.609	-4.902	25.093	258.735	0.352
3800.000	0.649	249.087	3799.870	-5.303	-25.737	-5.303	26.277	258.357	0.080
3900.000	0.864	261.782	3899.861	-5.613	-27.012	-5.613	27.589	258.262	0.272
4000.000	0.592	310.856	3999.854	-5.382	-28.149	-5.382	28.659	259.175	0.654
4100.000	0.628	296.691	4099.848	-4.798	-29.030	-4.798	29.424	260.615	0.155
4200.000	0.486	332.698	4199.844	-4.175	-29.714	-4.175	30.006	262.001	0.370
4300.000	0.624	289.048	4299.840	-3.621	-30.423	-3.621	30.637	263.212	0.432
4400.000	0.705	323.271	4399.833	-2.950	-31.305	-2.950	31.444	264.616	0.399
4500.000	0.764	330.372	4499.825	-1.878	-32.002	-1.878	32.057	266.642	0.108
4600.000	0.804	325.642	4599.816	-0.719	-32.728	-0.719	32.736	268.741	0.076
4700.000	0.725	308.043	4699.807	0.249	-33.622	0.249	33.623	270.425	0.247
4800.000	0.886	325.939	4799.797	1.279	-34.553	1.279	34.576	272.121	0.297
4900.000	0.967	316.240	4899.784	2.529	-35.569	2.529	35.659	274.067	0.176
5000.000	1.175	285.173	4999.768	3.407	-37.143	3.407	37.299	275.241	0.608
5100.000	1.378	294.332	5099.743	4.171	-39.229	4.171	39.450	276.070	0.287
5200.000	1.052	309.263	5199.720	5.248	-41.035	5.248	41.370	277.288	0.452
5300.000	0.371	319.242	5299.712	6.074	-41.958	6.074	42.395	278.237	0.689
5400.000	0.666	297.388	5399.708	6.587	-42.685	6.587	43.190	278.772	0.350
5500.000	0.792	284.581	5499.700	7.028	-43.870	7.028	44.429	279.102	0.206
5600.000	0.852	311.790	5599.690	7.698	-45.093	7.698	45.746	279.687	0.391
5700.000	0.886	322.037	5699.679	8.803	-46.123	8.803	46.956	280.805	0.159
5800.000	0.733	329.941	5799.669	9.966	-46.919	9.966	47.966	281.991	0.189
5900.000	1.059	322.399	5899.656	11.251	-47.803	11.251	49.109	283.244	0.346
6000.000	1.348	288.396	5999.635	12.354	-49.483	12.354	51.002	284.018	0.756
6100.000	1.348	318.517	6099.609	13.607	-51.379	13.607	53.151	284.833	0.701
6200.000	1.077	308.190	6199.587	15.069	-52.897	15.069	55.002	285.901	0.348
6300.000	1.291	328.569	6299.566	16.612	-54.223	16.612	56.710	287.033	0.469
6400.000	1.086	327.374	6399.544	18.371	-55.321	18.371	58.292	288.370	0.206
6500.000	0.810	359.178	6499.531	19.876	-55.843	19.876	59.274	289.592	0.583
6600.000	0.904	39.746	6599.521	21.190	-55.348	21.190	59.266	290.949	0.601
6700.000	1.135	343.472	6699.507	22.746	-55.126	22.746	59.634	292.422	0.983
6800.000	1.013	19.167	6799.491	24.530	-55.117	24.530	60.329	293.991	0.668
6900.000	1.096	6.438	6899.474	26.315	-54.720	26.315	60.719	295.683	0.248
7000.000	0.619	339.130	6999.463	27.771	-54.805	27.771	61.440	296.872	0.615
7100.000	0.727	21.641	7099.456	28.865	-54.764	28.865	61.905	297.793	0.498
7200.000	0.549	346.595	7199.450	29.921	-54.641	29.921	62.297	298.705	0.420
7300.000	0.554	36.904	7299.446	30.774	-54.462	30.774	62.555	299.469	0.469
7400.000	0.728	13.439	7399.440	31.779	-54.024	31.779	62.677	300.466	0.311
7500.000	0.820	27.529	7499.431	33.031	-53.545	33.031	62.914	301.669	0.211
7600.000	0.404	331.829	7599.426	33.976	-53.381	33.976	63.276	302.476	0.680
7700.000	0.453	72.905	7699.424	34.403	-53.170	34.403	63.329	302.904	0.662
7800.000	0.208	29.603	7799.423	34.676	-52.702	34.676	63.087	303.344	0.334
7850.000	0.379	12.650	7849.422	34.916	-52.621	34.916	63.152	303.566	0.380

<div> HORIZONTAL DISPLACEMENT IS 63.152 FEET AT 303.566 DEGREES </div>
