



Company: Anadarko Petroleum Corp
 Well: Wright 31-21
 API: 05-123-24037
 Rig Name: Production/Black Warrior
 State/County: Colorado/ Weld
 Latitude: 40.042, Longitude: -104.894
 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: hgyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 3/8/2014 / 09:39

Vaughn Energy Services
 Henderson, Colorado
 303-853-4976
 Jason Kinchelov

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	0.804	64.359	99.997	0.304	0.632	0.304	0.702	64.359	0.804
200.000	0.358	63.867	199.991	0.745	1.545	0.745	1.715	64.269	0.446
300.000	0.137	124.369	299.990	0.815	1.924	0.815	2.090	67.053	0.314
400.000	0.235	194.364	399.990	0.549	1.972	0.549	2.047	74.456	0.228
500.000	0.257	226.204	499.989	0.195	1.760	0.195	1.771	83.679	0.136
600.000	0.286	222.892	599.988	-0.143	1.428	-0.143	1.435	95.721	0.034
700.000	0.286	220.687	699.987	-0.516	1.095	-0.516	1.210	115.210	0.011
800.000	0.330	228.266	799.985	-0.897	0.717	-0.897	1.148	141.362	0.060
900.000	0.317	209.447	899.984	-1.330	0.366	-1.330	1.379	164.623	0.107
1000.000	0.243	213.635	999.983	-1.748	0.112	-1.748	1.752	176.334	0.076
1100.000	0.349	231.996	1099.981	-2.112	-0.246	-2.112	2.127	186.634	0.141
1200.000	0.418	199.273	1199.979	-2.644	-0.606	-2.644	2.713	192.909	0.226
1300.000	0.380	199.836	1299.977	-3.301	-0.839	-3.301	3.405	194.263	0.038
1400.000	0.284	236.515	1399.975	-3.749	-1.158	-3.749	3.924	197.167	0.228
1500.000	0.508	236.221	1499.973	-4.133	-1.734	-4.133	4.482	202.757	0.224
1600.000	0.507	281.770	1599.969	-4.289	-2.535	-4.289	4.982	210.586	0.393
1700.000	0.671	270.725	1699.964	-4.192	-3.553	-4.192	5.495	220.289	0.199
1800.000	0.562	249.283	1799.958	-4.358	-4.597	-4.358	6.334	226.532	0.253
1900.000	0.644	273.294	1899.953	-4.499	-5.616	-4.499	7.196	231.306	0.263
2000.000	0.545	254.102	1999.947	-4.597	-6.635	-4.597	8.071	235.285	0.221
2100.000	0.664	261.222	2099.942	-4.815	-7.664	-4.815	9.052	237.861	0.140
2200.000	0.852	260.529	2199.933	-5.026	-8.971	-5.026	10.283	240.739	0.189
2300.000	1.266	259.997	2299.916	-5.340	-10.792	-5.340	12.041	243.672	0.414
2400.000	1.335	261.749	2399.890	-5.699	-13.033	-5.699	14.224	246.380	0.080
2500.000	1.549	258.686	2499.858	-6.132	-15.511	-6.132	16.679	248.431	0.227
2600.000	1.773	259.151	2599.816	-6.688	-18.356	-6.688	19.537	249.980	0.225
2700.000	1.636	260.122	2699.772	-7.224	-21.282	-7.224	22.475	251.250	0.140
2800.000	1.004	266.109	2799.745	-7.529	-23.563	-7.529	24.737	252.281	0.646
2900.000	1.047	213.041	2899.731	-8.354	-24.936	-8.354	26.298	251.478	0.917
3000.000	0.982	225.355	2999.716	-9.722	-26.044	-9.722	27.799	249.529	0.227
3100.000	1.181	269.843	3099.699	-10.327	-27.684	-10.327	29.548	249.542	0.840
3200.000	1.332	290.133	3199.676	-9.930	-29.807	-9.930	31.418	251.574	0.467
3300.000	1.895	303.981	3299.636	-8.606	-32.269	-8.606	33.397	255.067	0.680
3400.000	1.769	303.832	3399.585	-6.823	-34.922	-6.823	35.582	258.945	0.125

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	1.676	293.745	3499.540	-5.374	-37.543	-5.374	37.926	261.853	0.317
3600.000	1.379	275.892	3599.505	-4.662	-40.078	-4.662	40.349	263.365	0.558
3700.000	1.303	278.607	3699.478	-4.368	-42.399	-4.368	42.623	264.117	0.099
3800.000	1.380	277.125	3799.450	-4.049	-44.718	-4.049	44.901	264.826	0.085
3900.000	1.367	282.618	3899.421	-3.639	-47.077	-3.639	47.218	265.580	0.132
4000.000	1.748	294.924	3999.385	-2.736	-49.625	-2.736	49.700	266.845	0.505
4100.000	2.111	296.118	4099.328	-1.282	-52.662	-1.282	52.677	268.605	0.366
4200.000	1.966	288.318	4199.265	0.068	-55.944	0.068	55.944	270.070	0.313
4300.000	1.728	281.757	4299.213	0.914	-59.048	0.914	59.055	270.887	0.318
4400.000	1.871	295.837	4399.164	1.933	-61.994	1.933	62.024	271.786	0.463
4500.000	2.074	297.874	4499.104	3.490	-65.063	3.490	65.156	273.071	0.215
4600.000	2.228	296.873	4599.034	5.215	-68.397	5.215	68.595	274.360	0.159
4700.000	2.348	297.588	4698.954	7.043	-71.947	7.043	72.291	275.591	0.123
4800.000	2.505	294.230	4798.865	8.888	-75.755	8.888	76.275	276.692	0.211
4900.000	2.564	276.569	4898.768	10.041	-79.970	10.041	80.598	277.157	0.780
5000.000	2.714	257.477	4998.664	9.784	-84.503	9.784	85.068	276.604	0.887
5100.000	2.928	243.198	5098.544	8.119	-89.094	8.119	89.463	275.207	0.732
5200.000	3.897	242.097	5198.366	5.377	-94.377	5.377	94.530	273.261	0.971
5300.000	3.479	241.012	5298.158	2.316	-100.034	2.316	100.061	271.326	0.423
5400.000	2.788	238.123	5398.008	-0.439	-104.753	-0.439	104.754	269.760	0.709
5500.000	2.078	236.367	5497.918	-2.727	-108.328	-2.727	108.362	268.558	0.713
5600.000	1.138	245.128	5597.877	-4.149	-110.739	-4.149	110.817	267.854	0.969
5700.000	0.554	226.522	5697.866	-4.900	-111.991	-4.900	112.098	267.495	0.638
5800.000	0.450	220.219	5797.862	-5.532	-112.595	-5.532	112.731	267.187	0.117
5900.000	0.562	201.900	5897.858	-6.287	-113.032	-6.287	113.206	266.816	0.195
6000.000	0.614	177.693	5997.853	-7.277	-113.193	-7.277	113.427	266.321	0.252
6100.000	0.550	157.742	6097.848	-8.258	-112.990	-8.258	113.291	265.820	0.211
6200.000	0.630	136.551	6197.843	-9.101	-112.430	-9.101	112.797	265.372	0.231
6300.000	0.663	119.310	6297.837	-9.783	-111.547	-9.783	111.975	264.988	0.197
6400.000	0.561	103.299	6397.831	-10.179	-110.566	-10.179	111.033	264.740	0.198
6500.000	0.896	111.469	6497.823	-10.578	-109.361	-10.578	109.871	264.475	0.350
6600.000	1.392	109.722	6597.803	-11.274	-107.490	-11.274	108.079	264.012	0.497
6700.000	1.812	121.133	6697.763	-12.502	-104.993	-12.502	105.734	263.209	0.526
6800.000	2.077	122.288	6797.706	-14.287	-102.107	-14.287	103.102	262.035	0.267
6900.000	2.417	125.341	6897.629	-16.475	-98.856	-16.475	100.219	260.538	0.361
7000.000	3.143	136.113	6997.511	-19.671	-95.235	-19.671	97.245	258.330	0.891
7100.000	3.963	141.184	7097.318	-24.340	-91.168	-24.340	94.361	255.052	0.878
7200.000	4.560	150.390	7197.043	-30.488	-87.037	-30.488	92.223	250.695	0.906
7300.000	5.686	148.918	7296.642	-38.187	-82.516	-38.187	90.924	245.166	1.134
7400.000	6.446	140.209	7396.083	-46.743	-76.365	-46.743	89.536	238.529	1.192
7500.000	7.270	139.056	7495.367	-55.836	-68.626	-55.836	88.472	230.867	0.835
7600.000	8.453	140.872	7594.425	-66.318	-59.841	-66.318	89.325	222.061	1.208
HORIZONTAL DISPLACEMENT IS 89.325 FEET AT 222.061 DEGREES									