

Company: Anadarko Petroleum Corp.
 Well/API: Olin 17-14K / 05-123-16251
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production / VES
 County/State: Weld/Colorado
 Latitude: 40.219, Longitude: -104.804
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4899 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hgyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/25/2014 / 12:05

Lat/Long & Elevation Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: ±9 Feet

VES Survey International - Henderson CO

Norman Cowan

303-853-4976

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	0.195	263.123	100.000	-0.020	-0.169	-0.020	0.170	263.123	0.195
200.000	0.106	219.750	199.999	-0.112	-0.397	-0.112	0.412	254.294	0.139
300.000	0.288	273.030	299.999	-0.169	-0.707	-0.169	0.727	256.539	0.240
400.000	0.160	305.670	399.998	-0.075	-1.071	-0.075	1.073	266.012	0.176
500.000	0.451	250.845	499.997	-0.123	-1.556	-0.123	1.561	265.491	0.382
600.000	0.512	283.557	599.993	-0.147	-2.363	-0.147	2.367	266.436	0.278
700.000	0.422	298.616	699.990	0.134	-3.121	0.134	3.123	272.457	0.152
800.000	0.497	276.457	799.987	0.359	-3.875	0.359	3.891	275.292	0.192
900.000	0.440	287.272	899.984	0.522	-4.673	0.522	4.702	276.371	0.105
1000.000	0.380	285.186	999.981	0.723	-5.360	0.723	5.408	277.679	0.062
1100.000	0.503	255.778	1099.978	0.702	-6.105	0.702	6.145	276.556	0.254
1200.000	0.453	268.757	1199.975	0.585	-6.926	0.585	6.951	274.830	0.119
1300.000	0.488	268.093	1299.971	0.563	-7.747	0.563	7.768	274.153	0.035
1400.000	0.514	271.384	1399.968	0.559	-8.621	0.559	8.640	273.711	0.039
1500.000	0.481	260.760	1499.964	0.503	-9.484	0.503	9.498	273.034	0.098
1600.000	0.477	248.250	1599.960	0.281	-10.285	0.281	10.289	271.565	0.104
1700.000	0.453	206.367	1699.957	-0.227	-10.848	-0.227	10.850	268.799	0.333
1800.000	0.562	258.125	1799.954	-0.682	-11.503	-0.682	11.523	266.606	0.454
1900.000	0.506	296.549	1899.950	-0.586	-12.377	-0.586	12.391	267.290	0.355
2000.000	0.706	278.725	1999.944	-0.295	-13.381	-0.295	13.385	268.737	0.273
2100.000	0.223	344.648	2099.941	-0.014	-14.042	-0.014	14.042	269.942	0.648
2200.000	0.085	142.056	2199.941	0.115	-14.048	0.115	14.049	270.468	0.303
2300.000	0.485	164.911	2299.940	-0.353	-13.892	-0.353	13.897	268.545	0.408
2400.000	0.651	148.599	2399.935	-1.246	-13.486	-1.246	13.544	264.720	0.230
2500.000	1.142	134.336	2499.922	-2.428	-12.477	-2.428	12.711	258.990	0.536
2600.000	1.289	145.626	2599.900	-4.053	-11.129	-4.053	11.844	249.992	0.280
2700.000	1.264	146.238	2699.875	-5.898	-9.881	-5.898	11.508	239.168	0.028
2800.000	1.046	143.317	2799.855	-7.547	-8.723	-7.547	11.535	229.133	0.226
2900.000	0.964	144.194	2899.839	-8.962	-7.685	-8.962	11.806	220.616	0.083
3000.000	0.597	158.076	2999.830	-10.128	-6.998	-10.128	12.310	214.644	0.410
3100.000	0.503	179.863	3099.825	-11.050	-6.803	-11.050	12.976	211.616	0.228
3200.000	0.349	173.944	3199.823	-11.792	-6.769	-11.792	13.597	209.858	0.160
3300.000	0.226	116.226	3299.822	-12.182	-6.560	-12.182	13.836	208.303	0.298

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
3400.000	0.367	72.663	3399.820	-12.174	-6.078	-12.174	13.607	206.530	0.256
3500.000	0.699	50.827	3499.816	-11.693	-5.299	-11.693	12.838	204.378	0.384
3600.000	1.123	42.731	3599.803	-10.588	-4.161	-10.588	11.376	201.454	0.442
3700.000	0.737	56.636	3699.790	-9.514	-2.959	-9.514	9.964	197.275	0.445
3800.000	0.913	72.400	3799.780	-8.920	-1.663	-8.920	9.073	190.558	0.286
3900.000	0.944	100.878	3899.767	-8.835	-0.094	-8.835	8.835	180.610	0.458
4000.000	0.843	108.931	3999.755	-9.229	1.411	-9.229	9.336	171.308	0.161
4100.000	0.790	105.751	4099.745	-9.655	2.771	-9.655	10.044	163.988	0.069
4200.000	0.444	119.446	4199.739	-10.032	3.772	-10.032	10.718	159.394	0.374
4300.000	0.505	155.012	4299.736	-10.622	4.296	-10.622	11.458	157.981	0.295
4400.000	0.643	171.557	4399.731	-11.576	4.564	-11.576	12.443	158.482	0.214
4500.000	0.553	181.374	4499.725	-12.613	4.635	-12.613	13.438	159.823	0.136
4600.000	0.496	183.206	4599.721	-13.527	4.599	-13.527	14.288	161.222	0.059
4700.000	0.533	168.290	4699.717	-14.414	4.669	-14.414	15.152	162.051	0.138
4800.000	0.434	176.142	4799.713	-15.247	4.789	-15.247	15.982	162.563	0.119
4900.000	0.355	203.415	4899.711	-15.909	4.691	-15.909	16.586	163.570	0.201
5000.000	0.220	209.907	4999.710	-16.359	4.473	-16.359	16.960	164.709	0.139
5100.000	0.216	228.300	5099.709	-16.651	4.236	-16.651	17.181	165.726	0.070
5200.000	0.205	201.635	5199.708	-16.942	4.030	-16.942	17.415	166.621	0.098
5300.000	0.221	220.599	5299.708	-17.255	3.838	-17.255	17.677	167.460	0.072
5400.000	0.211	248.250	5399.707	-17.470	3.541	-17.470	17.825	168.541	0.104
5500.000	0.155	233.693	5499.707	-17.618	3.261	-17.618	17.918	169.512	0.072
5600.000	0.270	316.652	5599.706	-17.527	2.991	-17.527	17.781	170.317	0.294
5700.000	0.559	62.510	5699.704	-17.131	3.261	-17.131	17.439	169.221	0.684
5800.000	2.525	72.078	5799.663	-16.228	5.790	-16.228	17.230	160.365	1.976
5900.000	2.670	92.954	5899.563	-15.670	10.212	-15.670	18.704	146.909	0.952
6000.000	2.032	101.280	5999.478	-16.137	14.277	-16.137	21.546	138.501	0.723
6100.000	1.492	95.502	6099.431	-16.609	17.311	-16.609	23.990	133.814	0.567
6200.000	0.956	59.741	6199.409	-16.313	19.327	-16.313	25.292	130.166	0.909
6300.000	1.216	31.348	6299.392	-14.987	20.600	-14.987	25.475	126.037	0.590
6400.000	1.098	46.683	6399.372	-13.423	21.849	-13.423	25.643	121.565	0.330
6500.000	0.868	50.536	6499.357	-12.285	23.130	-12.285	26.190	117.974	0.239
6600.000	1.170	6.775	6599.342	-10.790	23.835	-10.790	26.164	114.356	0.809
6700.000	1.362	17.674	6699.318	-8.644	24.316	-8.644	25.807	109.569	0.307
6800.000	1.625	1.106	6799.284	-6.094	24.705	-6.094	25.445	103.857	0.503
6900.000	2.515	359.350	6899.218	-2.482	24.707	-2.482	24.832	95.738	0.893
7000.000	3.387	353.985	6999.085	2.649	24.373	2.649	24.516	83.797	0.913
7100.000	3.599	352.952	7098.899	8.702	23.678	8.702	25.226	69.821	0.222
7190.000	2.834	1.071	7188.757	13.731	23.373	13.731	27.108	59.567	0.987
HORIZONTAL DISPLACEMENT IS 27.108 FEET AT 59.567 DEGREES									