

Company: Anadarko Petroleum Corp.
 Well/API: HSR-Cantwell 7-16A/05-123-16048
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/CoreTech
 County/State: Weld/Colorado
 Latitude: 40.227, Longitude: -104.893
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB=GL Elevation= 4766 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 11/5/2014 / 10:40

Lat/Long Obtained By Handheld GPS At Wellhead
 Handheld GPS Reference: NAD83/Device Error: ±9 Feet
 VES Survey International - Henderson CO
 Mark Simmons
 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	0.420	221.795	99.999	-0.273	-0.244	-0.273	0.367	221.795	0.420
200.000	0.154	234.366	199.998	-0.625	-0.598	-0.625	0.865	223.734	0.272
300.000	0.380	200.334	299.997	-1.015	-0.823	-1.015	1.306	219.035	0.267
400.000	0.428	170.250	399.994	-1.694	-0.875	-1.694	1.907	207.305	0.215
500.000	0.459	188.057	499.991	-2.460	-0.868	-2.460	2.608	199.428	0.141
600.000	0.364	202.094	599.989	-3.151	-1.043	-3.151	3.319	198.318	0.138
700.000	0.420	217.853	699.986	-3.735	-1.387	-3.735	3.984	200.380	0.121
800.000	0.539	202.635	799.983	-4.458	-1.793	-4.458	4.805	201.912	0.174
900.000	0.510	199.408	899.979	-5.312	-2.122	-5.312	5.720	201.776	0.041
1000.000	0.484	228.062	999.975	-6.014	-2.584	-6.014	6.546	203.253	0.247
1100.000	0.592	212.584	1099.971	-6.732	-3.177	-6.732	7.444	205.263	0.180
1200.000	0.465	221.067	1199.967	-7.473	-3.721	-7.473	8.348	206.473	0.149
1300.000	0.549	239.448	1299.963	-8.022	-4.401	-8.022	9.150	208.747	0.182
1400.000	0.590	225.772	1399.958	-8.625	-5.182	-8.625	10.062	211.000	0.142
1500.000	0.732	233.250	1499.951	-9.367	-6.064	-9.367	11.158	212.917	0.166
1600.000	0.597	219.649	1599.944	-10.150	-6.908	-10.150	12.278	214.239	0.207
1700.000	0.663	205.549	1699.938	-11.073	-7.490	-11.073	13.368	214.075	0.168
1800.000	0.596	190.650	1799.932	-12.106	-7.835	-12.106	14.420	212.913	0.176
1900.000	0.630	200.336	1899.927	-13.132	-8.122	-13.132	15.441	211.738	0.109
2000.000	0.361	185.284	1999.923	-13.961	-8.342	-13.961	16.263	210.861	0.296
2100.000	0.389	185.891	2099.921	-14.612	-8.406	-14.612	16.857	209.912	0.028
2200.000	0.650	160.554	2199.917	-15.484	-8.252	-15.484	17.545	208.056	0.342
2300.000	0.636	162.190	2299.910	-16.547	-7.894	-16.547	18.333	205.504	0.023
2400.000	0.413	188.262	2399.906	-17.431	-7.776	-17.431	19.087	204.040	0.321
2500.000	0.565	204.901	2499.903	-18.235	-8.035	-18.235	19.927	203.780	0.207
2600.000	0.344	232.751	2599.900	-18.864	-8.482	-18.864	20.683	204.210	0.307
2700.000	0.454	223.982	2699.897	-19.331	-8.996	-19.331	21.322	204.955	0.126
2800.000	0.561	224.302	2799.893	-19.967	-9.613	-19.967	22.160	205.709	0.107
2900.000	0.744	221.811	2899.887	-20.801	-10.388	-20.801	23.251	206.538	0.185
3000.000	1.191	208.164	2999.872	-22.202	-11.312	-22.202	24.918	206.999	0.500
3100.000	1.024	208.174	3099.854	-23.906	-12.224	-23.906	26.850	207.083	0.168
3200.000	1.122	205.657	3199.836	-25.576	-13.070	-25.576	28.722	207.068	0.109
3300.000	0.658	164.571	3299.825	-27.012	-13.341	-27.012	30.127	206.285	0.761

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	0.469	187.129	3399.820	-27.972	-13.239	-27.972	30.947	205.328	0.288
3500.000	0.669	218.974	3499.815	-28.832	-13.657	-28.832	31.903	205.346	0.366
3600.000	1.089	223.220	3599.803	-29.979	-14.675	-29.979	33.378	206.083	0.425
3700.000	1.095	221.733	3699.785	-31.384	-15.962	-31.384	35.210	206.958	0.029
3800.000	1.175	224.328	3799.765	-32.831	-17.315	-32.831	37.117	207.807	0.095
3900.000	0.819	223.952	3899.750	-34.079	-18.527	-34.079	38.789	208.531	0.356
4000.000	0.981	213.099	3999.738	-35.310	-19.490	-35.310	40.332	208.898	0.234
4100.000	1.025	217.943	4099.723	-36.733	-20.508	-36.733	42.070	209.175	0.096
4200.000	1.014	236.567	4199.707	-37.926	-21.796	-37.926	43.743	209.886	0.330
4300.000	1.161	235.246	4299.689	-38.991	-23.367	-38.991	45.456	210.934	0.150
4400.000	1.752	235.447	4399.656	-40.435	-25.459	-40.435	47.782	212.195	0.590
4500.000	1.587	234.712	4499.614	-42.102	-27.848	-42.102	50.479	213.482	0.166
4600.000	1.404	231.355	4599.580	-43.668	-29.936	-43.668	52.943	214.432	0.203
4700.000	1.055	238.006	4699.556	-44.920	-31.673	-44.920	54.964	215.187	0.377
4800.000	0.691	252.166	4799.545	-45.592	-33.027	-45.592	56.298	215.920	0.420
4900.000	0.685	241.307	4899.538	-46.064	-34.125	-46.064	57.327	216.532	0.130
5000.000	0.525	259.405	4999.532	-46.435	-35.100	-46.435	58.208	217.085	0.248
5100.000	0.500	267.366	5099.528	-46.539	-35.985	-46.539	58.829	217.712	0.075
5200.000	0.607	246.127	5199.524	-46.774	-36.905	-46.774	59.580	218.274	0.230
5300.000	0.450	248.430	5299.519	-47.133	-37.755	-47.133	60.390	218.696	0.158
5400.000	1.156	237.436	5399.509	-47.820	-38.971	-47.820	61.688	219.178	0.719
5500.000	1.374	240.754	5499.484	-48.949	-40.867	-48.949	63.766	219.858	0.230
5600.000	1.155	236.681	5599.460	-50.088	-42.756	-50.088	65.855	220.484	0.236
5700.000	1.150	220.880	5699.440	-51.401	-44.255	-51.401	67.828	220.728	0.317
5800.000	0.879	231.906	5799.424	-52.633	-45.516	-52.633	69.584	220.852	0.333
5900.000	0.786	223.844	5899.414	-53.601	-46.594	-53.601	71.022	221.000	0.150
6000.000	0.474	213.158	5999.408	-54.442	-47.295	-54.442	72.116	220.982	0.331
6100.000	0.248	116.112	6099.406	-54.884	-47.327	-54.884	72.471	220.772	0.562
6200.000	0.685	86.984	6199.403	-54.948	-46.536	-54.948	72.006	220.262	0.483
6300.000	1.577	88.082	6299.382	-54.870	-44.564	-54.870	70.687	219.082	0.892
6400.000	2.454	91.843	6399.320	-54.893	-41.049	-54.893	68.544	216.789	0.886
6500.000	1.573	91.666	6499.257	-55.002	-37.537	-55.002	66.590	214.313	0.881
6600.000	0.716	106.426	6599.236	-55.218	-35.566	-55.218	65.681	212.786	0.899
6700.000	0.413	148.183	6699.232	-55.701	-34.777	-55.701	65.666	211.978	0.492
6800.000	0.663	120.415	6799.227	-56.301	-34.088	-56.301	65.816	211.193	0.354
6900.000	0.672	110.479	6899.221	-56.799	-33.039	-56.799	65.709	210.186	0.116
7000.000	0.775	84.437	6999.213	-56.939	-31.817	-56.939	65.225	209.196	0.341
7050.000	0.778	90.386	7049.208	-56.908	-31.141	-56.908	64.872	208.688	0.161
HORIZONTAL DISPLACEMENT IS 64.872 FEET AT 208.688 DEGREES									