

Company: Anadarko Petroleum Corp.
 Well/API: HSR-Barach 8-16/05-123-15981
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/Core-Tech
 County/State: Weld/Colorado
 Latitude: 40.228, Longitude: -104.889
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4793'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/2/2014 / 15:53

Lat/Long & Elevation Obtained By Handheld GPS At Wellhead

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

VES Survey International - Henderson CO

Nick Kula

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	0.648	193.937	99.998	-0.549	-0.136	-0.549	0.565	193.937	0.648
200.000	0.620	185.501	199.992	-1.636	-0.324	-1.636	1.668	191.208	0.097
300.000	0.613	202.618	299.986	-2.669	-0.582	-2.669	2.732	192.301	0.184
400.000	0.594	197.178	399.981	-3.658	-0.941	-3.658	3.777	194.424	0.061
500.000	0.389	193.255	499.977	-4.483	-1.172	-4.483	4.634	194.646	0.208
600.000	0.569	217.661	599.973	-5.206	-1.553	-5.206	5.433	196.606	0.268
700.000	0.582	200.392	699.968	-6.075	-2.033	-6.075	6.406	198.500	0.173
800.000	0.601	207.722	799.963	-7.015	-2.453	-7.015	7.431	199.278	0.078
900.000	0.646	222.851	899.957	-7.893	-3.081	-7.893	8.473	201.324	0.170
1000.000	0.835	229.712	999.949	-8.777	-4.021	-8.777	9.654	204.611	0.208
1100.000	0.844	223.641	1099.938	-9.782	-5.085	-9.782	11.025	207.468	0.089
1200.000	1.046	227.750	1199.924	-10.929	-6.270	-10.929	12.600	209.841	0.213
1300.000	1.024	233.268	1299.908	-12.077	-7.662	-12.077	14.303	212.390	0.102
1400.000	1.115	232.790	1399.891	-13.200	-9.152	-13.200	16.063	214.736	0.091
1500.000	1.102	240.236	1499.872	-14.266	-10.762	-14.266	17.870	217.030	0.144
1600.000	1.284	253.652	1599.851	-15.058	-12.671	-15.058	19.680	220.080	0.332
1700.000	1.323	256.164	1699.825	-15.650	-14.867	-15.650	21.586	223.531	0.069
1800.000	1.424	266.290	1799.796	-16.006	-17.228	-16.006	23.516	227.106	0.262
1900.000	1.402	274.197	1899.766	-15.997	-19.688	-15.997	25.367	230.905	0.196
2000.000	1.455	277.269	1999.735	-15.747	-22.166	-15.747	27.190	234.610	0.093
2100.000	1.447	279.510	2099.703	-15.378	-24.671	-15.378	29.071	238.065	0.057
2200.000	1.193	290.411	2199.676	-14.806	-26.892	-14.806	30.699	241.165	0.357
2300.000	1.232	307.453	2299.654	-13.789	-28.721	-13.789	31.860	244.354	0.361
2400.000	1.094	304.058	2399.634	-12.601	-30.366	-12.601	32.876	247.463	0.154
2500.000	0.966	307.781	2499.617	-11.549	-31.823	-11.549	33.854	250.053	0.144
2600.000	1.001	304.401	2599.603	-10.539	-33.210	-10.539	34.842	252.393	0.067
2700.000	0.492	278.991	2699.594	-9.979	-34.355	-9.979	35.775	253.803	0.595
2800.000	0.592	289.090	2799.590	-9.743	-35.267	-9.743	36.588	254.556	0.138
2900.000	0.256	274.786	2899.587	-9.556	-35.977	-9.556	37.224	255.126	0.350
3000.000	0.295	113.182	2999.586	-9.638	-35.963	-9.638	37.232	254.997	0.543
3100.000	0.470	84.360	3099.584	-9.699	-35.318	-9.699	36.625	254.644	0.255
3200.000	0.259	84.159	3199.582	-9.636	-34.685	-9.636	35.999	254.474	0.212
3300.000	0.221	102.445	3299.581	-9.654	-34.272	-9.654	35.606	254.267	0.085

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	0.257	175.059	3399.581	-9.919	-34.064	-9.919	35.479	253.765	0.285
3500.000	0.202	206.698	3499.580	-10.301	-34.124	-10.301	35.645	253.203	0.136
3600.000	0.139	208.118	3599.579	-10.565	-34.261	-10.565	35.853	252.861	0.063
3700.000	0.133	229.962	3699.579	-10.747	-34.407	-10.747	36.046	252.654	0.052
3800.000	0.068	245.285	3799.579	-10.846	-34.549	-10.846	36.211	252.571	0.070
3900.000	0.090	226.727	3899.579	-10.925	-34.660	-10.925	36.341	252.505	0.034
4000.000	0.083	251.607	3999.579	-11.001	-34.785	-11.001	36.483	252.450	0.038
4100.000	0.205	266.088	4099.578	-11.036	-35.032	-11.036	36.729	252.514	0.126
4200.000	0.625	254.989	4199.576	-11.190	-35.737	-11.190	37.448	252.614	0.426
4300.000	0.564	257.925	4299.570	-11.434	-36.746	-11.434	38.483	252.716	0.069
4400.000	0.586	271.457	4399.565	-11.524	-37.738	-11.524	39.458	253.019	0.137
4500.000	0.857	296.455	4499.557	-11.178	-38.919	-11.178	40.493	253.976	0.410
4600.000	0.747	280.222	4599.548	-10.729	-40.230	-10.729	41.636	255.068	0.252
4700.000	0.503	278.671	4699.542	-10.547	-41.305	-10.547	42.631	255.676	0.245
4800.000	0.107	257.693	4799.540	-10.501	-41.831	-10.501	43.128	255.908	0.404
4900.000	0.102	263.059	4899.540	-10.531	-42.010	-10.531	43.310	255.927	0.011
5000.000	0.243	278.299	4999.539	-10.511	-42.309	-10.511	43.595	256.048	0.148
5100.000	0.090	266.223	5099.539	-10.486	-42.597	-10.486	43.869	256.171	0.157
5200.000	0.186	296.254	5199.539	-10.419	-42.821	-10.419	44.070	256.324	0.117
5300.000	0.210	340.480	5299.538	-10.175	-43.027	-10.175	44.214	256.696	0.151
5400.000	0.668	21.594	5399.535	-9.461	-42.874	-9.461	43.906	257.557	0.528
5500.000	1.259	33.244	5499.521	-8.000	-42.058	-8.000	42.812	259.230	0.620
5600.000	0.900	39.051	5599.503	-6.472	-40.961	-6.472	41.469	261.021	0.375
5700.000	0.479	335.235	5699.497	-5.483	-40.641	-5.483	41.010	262.317	0.812
5800.000	0.583	322.767	5799.492	-4.698	-41.124	-4.698	41.392	263.483	0.155
5900.000	0.670	323.432	5899.486	-3.823	-41.781	-3.823	41.955	264.772	0.087
6000.000	0.763	341.792	5999.479	-2.721	-42.337	-2.721	42.424	266.323	0.247
6100.000	0.939	354.735	6099.468	-1.272	-42.620	-1.272	42.639	268.291	0.260
6200.000	1.104	8.644	6199.452	0.497	-42.551	0.497	42.554	270.670	0.297
6300.000	1.432	11.457	6299.427	2.675	-42.158	2.675	42.243	273.631	0.333
6400.000	1.642	355.823	6399.392	5.329	-42.014	5.329	42.351	277.229	0.467
6500.000	1.779	359.771	6499.347	8.310	-42.125	8.310	42.936	281.160	0.180
6600.000	2.483	14.655	6599.278	11.959	-41.583	11.959	43.268	286.045	0.890
6700.000	3.262	20.431	6699.152	16.721	-40.041	16.721	43.392	292.665	0.830
6800.000	5.140	20.932	6798.879	23.572	-37.447	23.572	44.249	302.189	1.878
6900.000	4.373	18.480	6898.534	31.372	-34.638	31.372	46.733	312.167	0.794
6950.000	3.960	18.498	6948.401	34.817	-33.486	34.817	48.307	316.116	0.824
HORIZONTAL DISPLACEMENT IS 48.307 FEET AT 316.116 DEGREES									