



Company: Anadarko Petroleum Corp.
 Well/API: HSR-B/R 15-20/ 05-123-18240
 Tool Type: North Seeking Rate Gyro
 Rig Name: Production/ CoreTech
 County/State: Weld County / Colorado
 Latitude: 40.206, Longitude: -104.911
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4772 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/12/2014 / 13:35

Lat/Long 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	0.642	225.834	99.998	-0.390	-0.402	-0.390	0.560	225.834	0.642
200.000	0.577	239.999	199.992	-1.032	-1.240	-1.032	1.613	230.216	0.163
300.000	1.013	259.132	299.983	-1.451	-2.544	-1.451	2.929	240.307	0.505
400.000	1.969	264.894	399.948	-1.771	-5.124	-1.771	5.421	250.939	0.966
500.000	2.553	283.076	499.871	-1.420	-9.004	-1.420	9.116	261.041	0.918
600.000	2.989	292.263	599.754	0.072	-13.586	0.072	13.587	270.304	0.621
700.000	2.970	289.407	699.619	1.921	-18.443	1.921	18.543	275.945	0.150
800.000	2.953	287.050	799.485	3.537	-23.350	3.537	23.616	278.614	0.123
900.000	2.849	287.859	899.357	5.054	-28.178	5.054	28.628	280.169	0.112
1000.000	2.835	287.365	999.234	6.555	-32.904	6.555	33.550	281.266	0.028
1100.000	2.571	287.811	1099.123	7.979	-37.400	7.979	38.241	282.043	0.265
1200.000	2.410	286.293	1199.028	9.255	-41.553	9.255	42.571	282.556	0.174
1300.000	2.192	290.318	1298.948	10.508	-45.364	10.508	46.565	283.042	0.271
1400.000	2.178	293.367	1398.875	11.926	-48.901	11.926	50.335	283.706	0.117
1500.000	2.259	288.915	1498.800	13.319	-52.510	13.319	54.173	284.232	0.190
1600.000	2.126	296.879	1598.727	14.796	-56.029	14.796	57.950	284.793	0.332
1700.000	2.250	290.938	1698.654	16.336	-59.516	16.336	61.717	285.348	0.258
1800.000	2.151	292.723	1798.581	17.762	-63.081	17.762	65.534	285.726	0.120
1900.000	2.083	289.685	1898.512	19.100	-66.523	19.100	69.211	286.019	0.131
2000.000	1.847	293.595	1998.454	20.357	-69.712	20.357	72.623	286.279	0.272
2100.000	1.557	301.532	2098.409	21.712	-72.346	21.712	75.534	286.705	0.373
2200.000	1.572	300.374	2198.372	23.116	-74.687	23.116	78.183	287.198	0.035
2300.000	1.549	293.326	2298.335	24.345	-77.112	24.345	80.863	287.521	0.193
2400.000	1.619	287.900	2398.297	25.314	-79.697	25.314	83.620	287.622	0.165
2500.000	1.666	288.532	2498.256	26.210	-82.419	26.210	86.486	287.641	0.050
2600.000	1.924	287.426	2598.207	27.175	-85.398	27.175	89.617	287.652	0.260
2700.000	1.744	284.569	2698.156	28.060	-88.472	28.060	92.815	287.597	0.202
2800.000	1.718	295.475	2798.110	29.088	-91.298	29.088	95.820	287.672	0.330
2900.000	1.839	298.828	2898.062	30.506	-94.057	30.506	98.880	287.970	0.159
3000.000	1.778	296.343	2998.012	31.968	-96.852	31.968	101.991	288.266	0.099
3100.000	1.733	308.349	3097.966	33.594	-99.428	33.594	104.950	288.669	0.370
3200.000	1.445	317.661	3197.927	35.465	-101.463	35.465	107.483	289.266	0.386
3300.000	1.407	313.542	3297.896	37.243	-103.203	37.243	109.717	289.843	0.109

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	1.457	325.425	3397.865	39.135	-104.814	39.135	111.882	290.474	0.300
3500.000	1.549	318.740	3497.831	41.198	-106.427	41.198	114.122	291.161	0.198
3600.000	1.646	316.270	3597.792	43.252	-108.311	43.252	116.628	291.768	0.119
3700.000	1.798	317.145	3697.747	45.440	-110.371	45.440	119.359	292.377	0.154
3800.000	1.686	308.281	3797.701	47.501	-112.592	47.501	122.202	292.874	0.291
3900.000	1.317	276.134	3897.668	48.535	-114.889	48.535	124.720	292.902	0.904
4000.000	0.625	250.838	3997.654	48.479	-116.547	48.479	126.228	292.585	0.797
4100.000	0.395	278.874	4097.650	48.352	-117.403	48.352	126.970	292.384	0.333
4200.000	0.414	296.350	4197.647	48.566	-118.067	48.566	127.665	292.359	0.124
4300.000	0.362	289.911	4297.645	48.834	-118.688	48.834	128.341	292.365	0.068
4400.000	0.523	265.374	4397.642	48.905	-119.440	48.905	129.064	292.267	0.245
4500.000	1.044	280.674	4497.632	49.036	-120.790	49.036	130.364	292.095	0.557
4600.000	1.315	289.459	4597.611	49.587	-122.767	49.587	132.403	291.995	0.325
4700.000	1.349	291.155	4697.584	50.394	-124.946	50.394	134.726	291.966	0.052
4800.000	1.432	289.631	4797.555	51.239	-127.221	51.239	137.151	291.937	0.091
4900.000	1.389	272.867	4897.525	51.719	-129.607	51.719	139.545	291.754	0.413
5000.000	1.330	286.343	4997.497	52.106	-131.931	52.106	141.848	291.552	0.324
5100.000	1.517	298.417	5097.466	53.063	-134.209	53.063	144.318	291.573	0.352
5200.000	1.355	286.098	5197.435	54.020	-136.509	54.020	146.809	291.590	0.347
5300.000	1.397	274.711	5297.407	54.448	-138.860	54.448	149.154	291.411	0.276
5400.000	1.452	271.298	5397.376	54.577	-141.342	54.577	151.513	291.113	0.101
5500.000	0.654	266.260	5497.358	54.569	-143.178	54.569	153.225	290.863	0.802
5600.000	0.781	313.641	5597.351	55.002	-144.242	55.002	154.372	290.873	0.588
5700.000	0.832	326.920	5697.341	56.081	-145.131	56.081	155.590	291.127	0.193
5800.000	1.619	323.276	5797.317	57.822	-146.373	57.822	157.380	291.556	0.791
5900.000	2.176	336.548	5897.263	60.696	-147.973	60.696	159.938	292.303	0.705
6000.000	2.701	347.735	5997.172	64.740	-149.229	64.740	162.667	293.453	0.707
6100.000	3.594	352.054	6097.021	70.147	-150.163	70.147	165.740	295.039	0.924
6200.000	3.675	350.823	6196.819	76.416	-151.108	76.416	169.331	296.826	0.112
6300.000	2.477	343.844	6296.674	81.655	-152.220	81.655	172.738	298.210	1.254
6400.000	1.689	328.188	6396.608	84.983	-153.598	84.983	175.541	298.955	0.964
6500.000	1.194	293.688	6496.578	86.654	-155.329	86.654	177.865	299.156	0.977
6600.000	1.435	252.807	6596.553	86.702	-157.479	86.702	179.769	298.836	0.945
6700.000	1.457	238.364	6696.522	85.665	-159.757	85.665	181.276	298.201	0.364
6800.000	0.699	204.020	6796.504	84.442	-161.088	84.442	181.878	297.663	0.965
6900.000	1.101	211.162	6896.492	83.063	-161.833	83.063	181.905	297.170	0.417
7000.000	1.249	217.362	6996.471	81.374	-162.992	81.374	182.176	296.531	0.195
HORIZONTAL DISPLACEMENT IS 182.176 FEET AT 296.531 DEGREES									