

Company: Anadarko Petroleum Corp.

Lease/Well: Carl Adler Gas Unit B / #2

API: 05-123-09779

Rig Name: Production / Canary

State/County: Colorado / Weld County

Latitude: 40.170, Longitude: -104.975

Directions are relative to True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/8/2013 / 16:39

Vaughn Energy Services

Henderson Colorado

303-853-4976

Norman Cowan

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	0.391	230.998	99.999	-0.215	-0.265	-0.215	0.341	230.998	0.391
200.000	0.529	232.549	199.996	-0.710	-0.897	-0.710	1.144	231.624	0.139
300.000	0.682	244.741	299.990	-1.245	-1.802	-1.245	2.191	235.356	0.199
400.000	0.957	243.607	399.980	-1.871	-3.089	-1.871	3.611	238.800	0.275
500.000	1.042	243.441	499.965	-2.648	-4.650	-2.648	5.352	240.337	0.085
600.000	1.049	242.847	599.948	-3.473	-6.278	-3.473	7.175	241.051	0.013
700.000	1.029	236.853	699.932	-4.381	-7.844	-4.381	8.985	240.815	0.110
800.000	1.000	252.194	799.916	-5.139	-9.427	-5.139	10.737	241.402	0.272
900.000	1.045	243.595	899.900	-5.811	-11.074	-5.811	12.506	242.311	0.160
1000.000	0.967	262.701	999.885	-6.324	-12.728	-6.324	14.212	243.579	0.342
1100.000	1.062	249.079	1099.870	-6.762	-14.431	-6.762	15.937	244.892	0.258
1200.000	1.028	232.025	1199.853	-7.645	-16.004	-7.645	17.736	244.466	0.312
1300.000	0.737	265.357	1299.842	-8.249	-17.351	-8.249	19.212	244.573	0.578
1400.000	0.834	266.223	1399.833	-8.349	-18.718	-8.349	20.496	245.961	0.098
1500.000	0.681	246.959	1499.824	-8.630	-19.991	-8.630	21.774	246.651	0.295
1600.000	0.693	261.740	1599.817	-8.949	-21.136	-8.949	22.952	247.052	0.177
1700.000	0.783	265.748	1699.809	-9.087	-22.415	-9.087	24.187	247.934	0.104
1800.000	0.661	261.370	1799.801	-9.224	-23.668	-9.224	25.401	248.708	0.134
1900.000	0.793	294.593	1899.793	-9.022	-24.867	-9.022	26.454	250.058	0.435
2000.000	0.863	313.155	1999.783	-8.219	-26.046	-8.219	27.312	252.486	0.276
2100.000	0.768	295.183	2099.773	-7.419	-27.201	-7.419	28.195	254.743	0.271
2200.000	0.759	318.335	2199.764	-6.640	-28.248	-6.640	29.018	256.773	0.306
2300.000	0.704	280.173	2299.757	-6.036	-29.293	-6.036	29.909	258.357	0.481
2400.000	0.610	231.924	2399.751	-6.256	-30.318	-6.256	30.956	258.341	0.544
2500.000	0.657	264.567	2499.745	-6.639	-31.308	-6.639	32.004	258.028	0.359
2600.000	0.734	262.711	2599.738	-6.774	-32.513	-6.774	33.211	258.231	0.080
2700.000	0.699	250.636	2699.730	-7.058	-33.724	-7.058	34.454	258.180	0.155
2800.000	0.712	241.762	2799.722	-7.554	-34.847	-7.554	35.656	257.769	0.110
2900.000	0.734	265.587	2899.714	-7.897	-36.033	-7.897	36.888	257.638	0.299
3000.000	0.721	265.029	2999.706	-8.001	-37.298	-8.001	38.147	257.893	0.015
3100.000	0.590	268.132	3099.700	-8.072	-38.440	-8.072	39.278	258.140	0.135
3200.000	0.689	252.301	3199.694	-8.272	-39.527	-8.272	40.383	258.180	0.202
3300.000	0.648	293.331	3299.687	-8.231	-40.619	-8.231	41.445	258.545	0.470
3400.000	0.428	240.878	3399.684	-8.189	-41.465	-8.189	42.266	258.828	0.515

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	0.893	219.207	3499.677	-8.975	-42.284	-8.975	43.226	258.017	0.520
3600.000	1.040	199.776	3599.663	-10.432	-43.084	-10.432	44.329	256.388	0.357
3700.000	1.088	214.360	3699.646	-12.070	-43.926	-12.070	45.555	254.636	0.274
3800.000	0.818	202.582	3799.632	-13.512	-44.736	-13.512	46.732	253.193	0.332
3900.000	0.789	202.281	3899.622	-14.808	-45.271	-14.808	47.631	251.887	0.029
4000.000	0.899	195.821	3999.611	-16.200	-45.746	-16.200	48.530	250.500	0.146
4100.000	0.987	215.451	4099.598	-17.657	-46.460	-17.657	49.702	249.191	0.333
4200.000	0.950	215.504	4199.584	-19.034	-47.441	-19.034	51.117	248.139	0.037
4300.000	0.980	213.887	4299.569	-20.419	-48.400	-20.419	52.530	247.126	0.040
4400.000	0.976	213.919	4399.555	-21.835	-49.351	-21.835	53.966	246.133	0.004
4500.000	0.733	238.358	4499.544	-22.877	-50.371	-22.877	55.323	245.574	0.432
4600.000	0.778	230.625	4599.535	-23.644	-51.440	-23.644	56.614	245.315	0.111
4700.000	0.786	243.679	4699.526	-24.378	-52.580	-24.378	57.956	245.126	0.178
4800.000	0.664	256.379	4799.518	-24.819	-53.757	-24.819	59.210	245.218	0.201
4900.000	0.734	257.204	4899.511	-25.097	-54.945	-25.097	60.405	245.451	0.071
5000.000	0.705	278.324	4999.503	-25.150	-56.178	-25.150	61.550	245.883	0.265
5100.000	0.773	283.669	5099.495	-24.901	-57.441	-24.901	62.607	246.563	0.097
5200.000	0.768	272.765	5199.486	-24.710	-58.766	-24.710	63.750	247.195	0.147
5300.000	0.862	280.613	5299.476	-24.539	-60.175	-24.539	64.986	247.815	0.145
5400.000	0.959	229.974	5399.465	-24.938	-61.555	-24.938	66.415	247.945	0.783
5500.000	0.985	286.089	5499.452	-25.238	-63.021	-25.238	67.887	248.175	0.914
5600.000	0.815	288.129	5599.440	-24.779	-64.523	-24.779	69.117	248.992	0.173
5700.000	0.980	312.676	5699.428	-23.978	-65.827	-23.978	70.058	249.986	0.414
5800.000	0.981	308.325	5799.413	-22.868	-67.127	-22.868	70.915	251.188	0.074
5900.000	0.582	315.079	5899.404	-21.977	-68.158	-21.977	71.613	252.128	0.408
6000.000	0.474	319.189	5999.400	-21.304	-68.786	-21.304	72.010	252.791	0.115
6100.000	0.731	319.012	6099.394	-20.510	-69.475	-20.510	72.439	253.553	0.258
6200.000	0.542	259.008	6199.389	-20.118	-70.358	-20.118	73.178	254.043	0.657
6300.000	0.605	303.774	6299.384	-19.915	-71.261	-19.915	73.991	254.386	0.441
6400.000	0.808	303.141	6399.377	-19.236	-72.290	-19.236	74.805	255.099	0.203
6500.000	0.670	278.877	6499.368	-18.760	-73.458	-18.760	75.816	255.674	0.338
6600.000	0.627	287.622	6599.362	-18.504	-74.557	-18.504	76.819	256.062	0.108
6700.000	0.728	258.180	6699.355	-18.469	-75.701	-18.469	77.922	256.289	0.358
6800.000	0.252	316.629	6799.352	-18.439	-76.474	-18.439	78.666	256.444	0.634
HORIZONTAL DISPLACEMENT IS 78.666 FEET AT 256.444 DEGREES									