



Company: PDC Energy
 Well: Guttersen 34-8
 API: 05-123-26300
 Rig Name: Production / V.E.S.
 State/County: Colorado / Weld
 Latitude: 40.234, Longitude: -104.459
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hgyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 7/23/2014 / 15:40

VES Survey International
 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	1.221	217.404	99.992	-0.846	-0.647	-0.846	1.066	217.404	1.221
200.000	0.647	219.893	199.979	-2.126	-1.656	-2.126	2.695	217.925	0.576
300.000	0.424	243.014	299.974	-2.727	-2.348	-2.727	3.598	220.733	0.306
400.000	0.354	251.057	399.972	-2.995	-2.970	-2.995	4.218	224.761	0.089
500.000	0.442	252.061	499.970	-3.214	-3.629	-3.214	4.847	228.472	0.088
600.000	0.379	249.779	599.967	-3.447	-4.306	-3.447	5.516	231.324	0.065
700.000	0.470	203.406	699.965	-3.937	-4.779	-3.937	6.192	230.517	0.344
800.000	0.458	213.230	799.961	-4.647	-5.161	-4.647	6.945	227.996	0.080
900.000	0.404	197.552	899.959	-5.318	-5.486	-5.318	7.641	225.891	0.129
1000.000	0.433	185.557	999.956	-6.030	-5.629	-6.030	8.250	223.029	0.092
1100.000	0.354	183.586	1099.954	-6.715	-5.685	-6.715	8.798	220.253	0.079
1200.000	0.242	179.060	1199.952	-7.234	-5.701	-7.234	9.211	218.240	0.115
1300.000	0.238	133.263	1299.951	-7.587	-5.546	-7.587	9.398	216.167	0.187
1400.000	0.238	135.769	1399.951	-7.879	-5.250	-7.879	9.468	213.677	0.010
1500.000	0.234	135.731	1499.950	-8.174	-4.962	-8.174	9.563	211.260	0.004
1600.000	0.226	123.545	1599.949	-8.429	-4.655	-8.429	9.630	208.911	0.050
1700.000	0.271	142.769	1699.948	-8.726	-4.348	-8.726	9.750	206.487	0.094
1800.000	0.328	158.287	1799.947	-9.180	-4.100	-9.180	10.054	204.066	0.099
1900.000	0.276	161.584	1899.945	-9.674	-3.918	-9.674	10.437	202.049	0.055
2000.000	0.441	172.362	1999.943	-10.283	-3.791	-10.283	10.960	200.236	0.178
2100.000	0.325	316.126	2099.942	-10.461	-3.936	-10.461	11.177	200.622	0.730
2200.000	0.912	324.338	2199.936	-9.610	-4.597	-9.610	10.652	205.565	0.591
2300.000	1.230	321.133	2299.918	-8.127	-5.734	-8.127	9.947	215.205	0.324
2400.000	1.447	314.555	2399.891	-6.405	-7.308	-6.405	9.718	228.766	0.266
2500.000	1.654	307.472	2499.855	-4.641	-9.353	-4.641	10.442	243.609	0.281
2600.000	1.690	303.573	2599.812	-2.948	-11.728	-2.948	12.092	255.891	0.119
2700.000	1.759	290.648	2699.767	-1.591	-14.393	-1.591	14.480	263.692	0.394
2800.000	1.589	297.245	2799.725	-0.415	-17.061	-0.415	17.067	268.607	0.257
2900.000	1.708	297.136	2899.683	0.899	-19.620	0.899	19.641	272.625	0.119
3000.000	1.793	295.119	2999.636	2.243	-22.363	2.243	22.475	275.728	0.105
3100.000	1.789	292.549	3099.588	3.506	-25.221	3.506	25.464	277.914	0.080
3200.000	1.408	289.794	3199.549	4.521	-27.819	4.521	28.184	279.230	0.389
3300.000	1.388	293.356	3299.519	5.417	-30.087	5.417	30.571	280.206	0.089
3400.000	1.394	307.937	3399.490	6.645	-32.158	6.645	32.838	281.675	0.353

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	0.630	268.305	3499.474	7.377	-33.667	7.377	34.466	282.359	0.994
3600.000	0.412	218.840	3599.471	7.081	-34.442	7.081	35.162	281.617	0.479
3700.000	0.304	163.746	3699.469	6.546	-34.593	6.546	35.207	280.715	0.345
3800.000	0.350	143.952	3799.467	6.044	-34.339	6.044	34.867	279.982	0.121
3900.000	0.557	147.267	3899.464	5.388	-33.896	5.388	34.322	279.031	0.209
4000.000	0.550	144.736	3999.459	4.587	-33.356	4.587	33.670	277.829	0.025
4100.000	0.810	157.210	4099.452	3.543	-32.805	3.543	32.996	276.164	0.298
4200.000	1.120	155.711	4199.438	2.000	-32.129	2.000	32.192	273.563	0.311
4300.000	1.266	159.438	4299.416	0.075	-31.339	0.075	31.339	270.138	0.165
4400.000	1.319	158.221	4399.391	-2.027	-30.525	-2.027	30.592	266.200	0.059
4500.000	1.663	164.455	4499.357	-4.494	-29.709	-4.494	30.047	261.399	0.380
4600.000	2.378	156.118	4599.294	-7.789	-28.480	-7.789	29.526	254.705	0.772
4700.000	2.772	156.653	4699.193	-11.906	-26.682	-11.906	29.217	245.952	0.394
4800.000	2.563	159.132	4799.085	-16.216	-24.927	-16.216	29.737	236.954	0.238
4900.000	2.485	157.255	4898.988	-20.305	-23.292	-20.305	30.900	228.920	0.114
5000.000	2.509	158.915	4998.893	-24.346	-21.666	-24.346	32.591	221.667	0.076
5100.000	2.080	161.286	5098.812	-28.107	-20.297	-28.107	34.669	215.834	0.439
5200.000	1.645	149.439	5198.760	-31.062	-18.984	-31.062	36.404	211.432	0.579
5300.000	1.020	132.821	5298.733	-32.903	-17.602	-32.903	37.315	208.145	0.729
5400.000	0.528	119.543	5398.723	-33.735	-16.548	-33.735	37.575	206.129	0.520
5500.000	0.572	119.662	5498.719	-34.210	-15.713	-34.210	37.646	204.670	0.043
5600.000	0.470	96.611	5598.715	-34.504	-14.872	-34.504	37.573	203.318	0.231
5700.000	0.333	110.146	5698.712	-34.651	-14.193	-34.651	37.445	202.274	0.165
5800.000	0.278	126.888	5798.711	-34.897	-13.726	-34.897	37.499	201.472	0.104
5900.000	0.298	113.596	5898.709	-35.146	-13.294	-35.146	37.576	200.720	0.069
6000.000	0.297	99.517	5998.708	-35.293	-12.801	-35.293	37.543	199.936	0.073
6100.000	0.593	119.788	6098.705	-35.593	-12.096	-35.593	37.592	198.770	0.331
6200.000	0.529	107.859	6198.700	-35.992	-11.207	-35.992	37.696	197.295	0.133
6300.000	0.685	139.213	6298.695	-36.586	-10.377	-36.586	38.029	195.835	0.360
6400.000	0.792	176.285	6398.687	-37.728	-9.942	-37.728	39.016	194.763	0.481
6500.000	1.040	231.308	6498.676	-38.985	-10.605	-38.985	40.402	195.218	0.874
6600.000	1.662	243.730	6598.648	-40.194	-12.613	-40.194	42.127	197.423	0.684
6700.000	1.607	245.574	6698.607	-41.415	-15.190	-41.415	44.113	200.142	0.076
6800.000	1.270	232.105	6798.576	-42.676	-17.342	-42.676	46.065	202.115	0.475
6875.000	1.257	238.776	6873.558	-43.613	-18.701	-43.613	47.453	203.209	0.197

<div> HORIZONTAL DISPLACEMENT IS 47.453 FEET AT 203.209 DEGREES </div>
