



Company: PDC Energy  
Well: Zarlengo 23-4  
API: 05-001-09555  
Rig Name: Production/ VES  
State/County: Colorado/Adams  
Latitude: 39.992, Longitude: -104.896  
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: 7/15/2014 / 18:58

VES Survey International  
Henderson, CO 80640  
303-853-4976  
Sean Bratt

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	0.515	109.424	99.999	-0.149	0.424	-0.149	0.449	109.424	0.515
200.000	0.356	125.818	199.996	-0.481	1.100	-0.481	1.200	113.615	0.200
300.000	0.427	144.173	299.993	-0.965	1.570	-0.965	1.843	121.575	0.143
400.000	0.613	148.552	399.989	-1.723	2.067	-1.723	2.691	129.817	0.190
500.000	0.891	145.050	499.981	-2.817	2.791	-2.817	3.966	135.258	0.282
600.000	1.045	161.544	599.966	-4.319	3.526	-4.319	5.575	140.776	0.317
700.000	1.255	173.499	699.946	-6.273	3.938	-6.273	7.406	147.877	0.318
800.000	1.155	182.519	799.924	-8.368	4.018	-8.368	9.282	154.350	0.214
900.000	1.105	174.624	899.905	-10.334	4.064	-10.334	11.105	158.532	0.163
1000.000	1.119	164.618	999.886	-12.236	4.413	-12.236	13.007	160.166	0.194
1100.000	1.893	155.113	1099.851	-14.675	5.367	-14.675	15.626	159.910	0.810
1200.000	2.286	160.932	1199.785	-18.058	6.714	-18.058	19.266	159.605	0.447
1300.000	1.814	156.855	1299.720	-21.399	7.988	-21.399	22.841	159.531	0.494
1400.000	1.355	155.824	1399.682	-23.933	9.094	-23.933	25.602	159.194	0.460
1500.000	1.080	167.729	1499.659	-25.932	9.778	-25.932	27.714	159.340	0.372
1600.000	0.954	175.229	1599.644	-27.682	10.048	-27.682	29.449	160.050	0.183
1700.000	0.802	176.114	1699.632	-29.209	10.164	-29.209	30.927	160.813	0.153
1800.000	0.631	189.949	1799.624	-30.449	10.116	-30.449	32.086	161.621	0.241
1900.000	0.619	196.994	1899.618	-31.508	9.863	-31.508	33.016	162.618	0.078
2000.000	0.547	218.416	1999.613	-32.399	9.409	-32.399	33.737	163.806	0.228
2100.000	0.353	252.741	2099.610	-32.864	8.818	-32.864	34.027	164.980	0.324
2200.000	0.557	239.955	2199.607	-33.199	8.103	-33.199	34.174	166.284	0.226
2300.000	0.320	286.278	2299.604	-33.364	7.414	-33.364	34.178	167.472	0.408
2400.000	0.353	276.597	2399.602	-33.251	6.840	-33.251	33.947	168.376	0.066
2500.000	0.462	274.058	2499.600	-33.187	6.132	-33.187	33.748	169.532	0.110
2600.000	1.000	249.359	2599.592	-33.466	4.913	-33.466	33.825	171.649	0.612
2700.000	1.222	269.520	2699.573	-33.783	3.029	-33.783	33.918	174.876	0.446
2800.000	1.101	252.069	2799.553	-34.087	1.049	-34.087	34.103	178.237	0.372
2900.000	1.301	252.207	2899.531	-34.730	-0.946	-34.730	34.743	181.560	0.201
3000.000	1.846	258.887	2999.493	-35.387	-3.607	-35.387	35.570	185.820	0.574
3100.000	2.217	267.211	3099.430	-35.792	-7.119	-35.792	36.493	191.250	0.474
3200.000	2.419	287.860	3199.350	-35.239	-11.060	-35.239	36.934	197.425	0.854
3300.000	2.510	298.384	3299.258	-33.551	-14.995	-33.551	36.749	204.081	0.461
3400.000	2.442	289.692	3399.165	-31.792	-18.927	-31.792	36.999	210.766	0.381
3500.000	2.164	288.867	3499.084	-30.464	-22.719	-30.464	38.003	216.715	0.280

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
3600.000	2.074	288.328	3599.016	-29.284	-26.224	-29.284	39.310	221.845	0.092
3700.000	1.894	286.725	3698.956	-28.239	-29.524	-28.239	40.855	226.274	0.189
3800.000	1.851	291.627	3798.902	-27.169	-32.608	-27.169	42.443	230.199	0.166
3900.000	1.901	283.099	3898.849	-26.198	-35.725	-26.198	44.301	233.747	0.283
4000.000	1.975	292.158	3998.792	-25.172	-38.935	-25.172	46.364	237.117	0.315
4100.000	1.781	291.065	4098.738	-23.964	-41.981	-23.964	48.339	240.281	0.197
4200.000	1.891	288.258	4198.687	-22.888	-44.998	-22.888	50.485	243.040	0.142
4300.000	2.020	285.151	4298.629	-21.910	-48.266	-21.910	53.007	245.584	0.167
4400.000	2.076	295.690	4398.565	-20.665	-51.600	-20.665	55.584	248.175	0.380
4500.000	1.943	282.279	4498.504	-19.519	-54.888	-19.519	58.256	250.424	0.487
4600.000	1.647	272.989	4598.455	-19.083	-57.980	-19.083	61.040	251.782	0.414
4700.000	1.658	272.854	4698.414	-18.936	-60.860	-18.936	63.738	252.716	0.011
4800.000	1.709	275.020	4798.371	-18.734	-63.790	-18.734	66.484	253.633	0.082
4900.000	1.875	252.807	4898.323	-19.087	-66.838	-19.087	69.510	254.062	0.709
5000.000	2.087	255.597	4998.263	-20.024	-70.164	-20.024	72.966	254.072	0.232
5100.000	2.097	253.467	5098.196	-20.997	-73.682	-20.997	76.615	254.094	0.078
5200.000	2.185	251.404	5198.127	-22.126	-77.243	-22.126	80.350	254.016	0.117
5300.000	2.076	235.193	5298.058	-23.768	-80.538	-23.768	83.972	253.558	0.610
5400.000	2.235	223.600	5397.988	-26.214	-83.370	-26.214	87.394	252.545	0.463
5500.000	2.341	219.704	5497.908	-29.198	-86.020	-29.198	90.840	251.251	0.188
5600.000	2.441	210.724	5597.822	-32.600	-88.413	-32.600	94.232	249.760	0.387
5700.000	2.027	205.604	5697.745	-36.026	-90.265	-36.026	97.189	248.242	0.459
5800.000	1.641	217.392	5797.694	-38.759	-91.899	-38.759	99.738	247.132	0.538
5900.000	1.138	222.801	5897.665	-40.625	-93.444	-40.625	101.893	246.503	0.519
6000.000	1.119	224.537	5997.645	-42.050	-94.804	-42.050	103.711	246.080	0.039
6100.000	1.181	235.343	6097.625	-43.333	-96.336	-43.333	105.633	245.782	0.225
6200.000	1.318	259.216	6197.602	-44.134	-98.314	-44.134	107.766	245.824	0.534
6300.000	0.726	287.202	6297.586	-44.162	-100.050	-44.162	109.363	246.184	0.758
6400.000	0.793	342.864	6397.579	-43.313	-100.859	-43.313	109.766	246.759	0.712
6500.000	0.959	357.463	6497.567	-41.816	-101.100	-41.816	109.406	247.530	0.277
6600.000	0.995	354.806	6597.553	-40.115	-101.216	-40.115	108.875	248.380	0.058
6700.000	1.170	337.579	6697.535	-38.306	-101.684	-38.306	108.660	249.358	0.368
6800.000	0.910	343.327	6797.518	-36.602	-102.301	-36.602	108.652	250.314	0.281
6900.000	1.306	343.961	6897.500	-34.746	-102.844	-34.746	108.555	251.332	0.397
7000.000	1.135	336.989	6997.477	-32.738	-103.546	-32.738	108.598	252.455	0.226
7100.000	1.171	327.319	7097.457	-30.966	-104.485	-30.966	108.977	253.492	0.198
7200.000	1.089	303.447	7197.438	-29.582	-105.830	-29.582	109.887	254.383	0.474
7300.000	1.428	321.783	7297.414	-28.080	-107.393	-28.080	111.004	255.347	0.522
7400.000	1.491	319.130	7397.382	-26.117	-109.015	-26.117	112.100	256.527	0.092
7500.000	1.511	319.846	7497.347	-24.126	-110.717	-24.126	113.315	257.707	0.027
7600.000	1.644	317.641	7597.309	-22.058	-112.533	-22.058	114.675	258.910	0.146
7700.000	1.758	320.161	7697.265	-19.820	-114.482	-19.820	116.185	260.178	0.137
7800.000	1.768	332.759	7797.218	-17.270	-116.172	-17.270	117.448	261.544	0.387
7900.000	1.529	329.296	7897.177	-14.752	-117.559	-14.752	118.481	262.848	0.259
7930.000	1.610	327.023	7927.166	-14.054	-117.993	-14.054	118.827	263.208	0.340
HORIZONTAL DISPLACEMENT IS 118.827 FEET AT 263.208 DEGREES									