



Gyroscopic Survey Report
for
KPK

Well Location	WELD, CO
Well Name	MILLARD # 1
Rig Number	KPK
Survey Date	9/22/2014
Latitude	40.1037200°N
Longitude	104.8175130°W
North Reference	True North
Grid Correction	None
Depth Reference	GL (0.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 285.91Azim (deg)
Definitive Survey	MILLARD #1
Operator(s)	C KIRBY

Well Notes

API-05-123-08644

Survey Report

Well Name: MILLARD # 1
Survey: MILLARD #1
Survey Date: 9/22/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	0.00	0.00
87.10	0.11	169.48	87.10	-0.04	-0.08	0.02	0.13	0.09	169.48
107.73	0.12	175.89	107.73	-0.05	-0.13	0.02	0.07	0.13	170.57
134.73	0.08	212.44	134.73	-0.06	-0.17	0.01	0.27	0.17	175.84
161.71	0.09	242.69	161.71	-0.04	-0.20	-0.02	0.17	0.20	185.02
183.63	0.11	242.92	183.63	-0.01	-0.21	-0.05	0.07	0.22	193.42
210.61	0.13	261.99	210.61	0.04	-0.23	-0.10	0.17	0.25	204.35
236.89	0.18	264.48	236.89	0.10	-0.24	-0.17	0.17	0.29	216.16
259.44	0.20	273.33	259.44	0.17	-0.24	-0.25	0.17	0.34	226.00
286.30	0.14	259.65	286.30	0.25	-0.24	-0.33	0.26	0.41	233.47
308.12	0.22	258.61	308.12	0.31	-0.26	-0.39	0.37	0.47	237.12
335.08	0.20	263.71	335.08	0.40	-0.27	-0.49	0.12	0.56	241.20
361.17	0.20	259.69	361.17	0.48	-0.28	-0.58	0.06	0.65	244.00
383.80	0.17	235.38	383.80	0.54	-0.31	-0.65	0.37	0.72	244.45
410.59	0.18	246.25	410.59	0.60	-0.35	-0.72	0.12	0.80	244.08
436.81	0.15	233.19	436.81	0.65	-0.39	-0.78	0.18	0.87	243.77
459.20	0.13	235.63	459.20	0.68	-0.42	-0.83	0.09	0.93	243.23
486.10	0.15	259.35	486.10	0.73	-0.44	-0.89	0.22	0.99	243.56
508.00	0.05	223.66	508.00	0.76	-0.45	-0.92	0.50	1.03	243.80
534.91	0.08	207.12	534.90	0.77	-0.48	-0.94	0.12	1.05	242.97
561.96	0.13	195.32	561.96	0.77	-0.53	-0.95	0.21	1.09	241.18
583.83	0.11	208.08	583.83	0.78	-0.57	-0.97	0.15	1.13	239.65
610.74	0.17	223.44	610.74	0.80	-0.62	-1.01	0.25	1.19	238.43
636.85	0.19	219.52	636.84	0.84	-0.68	-1.07	0.08	1.26	237.35
659.08	0.21	206.75	659.08	0.86	-0.75	-1.11	0.22	1.33	235.99
685.70	0.12	194.34	685.70	0.87	-0.82	-1.13	0.37	1.40	234.29
711.50	0.09	193.18	711.50	0.87	-0.86	-1.15	0.12	1.43	233.10
733.77	0.04	181.10	733.77	0.86	-0.88	-1.15	0.20	1.45	232.42
759.57	0.03	134.15	759.57	0.85	-0.90	-1.14	0.12	1.46	231.83
786.08	0.02	170.46	786.07	0.84	-0.91	-1.14	0.08	1.46	231.36
808.55	0.02	21.56	808.55	0.84	-0.91	-1.14	0.17	1.46	231.30
833.63	0.05	240.60	833.63	0.85	-0.91	-1.14	0.25	1.46	231.44
860.24	0.17	196.73	860.24	0.86	-0.95	-1.16	0.52	1.50	230.66
886.06	0.26	179.58	886.05	0.84	-1.05	-1.17	0.43	1.57	228.23
908.32	0.23	184.97	908.32	0.82	-1.14	-1.18	0.18	1.64	225.85
934.92	0.26	175.56	934.92	0.79	-1.26	-1.18	0.20	1.72	223.13

Survey Report

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
960.71	0.08	150.50	960.70	0.75	-1.33	-1.16	0.77	1.77	221.19
983.06	0.26	187.83	983.05	0.74	-1.39	-1.16	0.90	1.82	219.88
1009.55	0.27	193.52	1009.55	0.73	-1.51	-1.19	0.10	1.92	218.13
1035.46	0.29	198.00	1035.46	0.73	-1.63	-1.22	0.14	2.04	216.78
1061.95	0.32	183.95	1061.95	0.71	-1.77	-1.25	0.30	2.17	215.13
1084.18	0.31	178.54	1084.18	0.68	-1.89	-1.25	0.15	2.27	213.41
1110.09	0.28	172.60	1110.08	0.64	-2.03	-1.24	0.16	2.38	211.46
1136.71	0.25	179.78	1136.70	0.59	-2.15	-1.23	0.16	2.48	209.80
1158.24	0.31	180.05	1158.23	0.57	-2.26	-1.23	0.26	2.57	208.62
1184.75	0.36	195.69	1184.74	0.55	-2.41	-1.25	0.40	2.72	207.50
1211.36	0.34	185.95	1211.36	0.53	-2.57	-1.29	0.24	2.87	206.57
1232.87	0.31	177.40	1232.87	0.50	-2.69	-1.29	0.26	2.98	205.59
1259.47	0.32	228.95	1259.47	0.52	-2.81	-1.34	1.04	3.12	205.51
1285.96	0.38	218.42	1285.96	0.59	-2.93	-1.45	0.32	3.27	206.37
1311.87	0.40	203.48	1311.86	0.64	-3.08	-1.54	0.41	3.45	206.59
1334.08	0.41	202.55	1334.07	0.66	-3.23	-1.60	0.05	3.61	206.43
1359.82	0.32	190.79	1359.81	0.66	-3.39	-1.65	0.46	3.77	206.04
1386.41	0.31	200.81	1386.40	0.66	-3.53	-1.69	0.21	3.91	205.66
1408.64	0.35	208.00	1408.63	0.68	-3.64	-1.75	0.25	4.04	205.62
1434.53	0.41	204.94	1434.52	0.71	-3.79	-1.82	0.25	4.21	205.65
1461.02	0.37	194.69	1461.00	0.73	-3.96	-1.88	0.31	4.39	205.43
1483.09	0.33	202.84	1483.08	0.73	-4.09	-1.93	0.27	4.52	205.23
1509.05	0.37	212.35	1509.04	0.76	-4.23	-2.00	0.28	4.68	205.32
1535.68	0.44	204.26	1535.66	0.80	-4.39	-2.09	0.33	4.86	205.42
1558.34	0.44	191.74	1558.32	0.81	-4.56	-2.14	0.42	5.03	205.17
1584.58	0.34	204.93	1584.56	0.81	-4.72	-2.19	0.49	5.21	204.91
1607.60	0.42	215.03	1607.59	0.85	-4.86	-2.27	0.46	5.36	205.07
1634.95	0.45	212.71	1634.93	0.92	-5.03	-2.39	0.12	5.57	205.39
1658.41	0.36	218.90	1658.39	0.97	-5.16	-2.48	0.44	5.73	205.68
1686.49	0.41	225.20	1686.47	1.06	-5.30	-2.61	0.24	5.91	206.20
1709.21	0.43	225.12	1709.19	1.14	-5.42	-2.73	0.07	6.07	206.71
1736.40	0.42	218.00	1736.38	1.22	-5.57	-2.86	0.19	6.26	207.19
1759.09	0.38	227.38	1759.07	1.30	-5.69	-2.97	0.34	6.42	207.56
1782.66	0.43	230.01	1782.64	1.39	-5.80	-3.09	0.23	6.57	208.08
1809.10	0.40	213.16	1809.08	1.47	-5.94	-3.22	0.48	6.75	208.47
1833.29	0.37	229.90	1833.27	1.54	-6.06	-3.32	0.47	6.91	208.76

Survey Report

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
1861.35	0.50	222.73	1861.33	1.64	-6.21	-3.48	0.52	7.11	209.26
1884.02	0.42	218.59	1884.00	1.72	-6.34	-3.60	0.42	7.29	209.55
1907.42	0.46	243.37	1907.39	1.82	-6.45	-3.73	0.83	7.45	210.05
1934.68	0.58	228.33	1934.66	1.98	-6.59	-3.93	0.65	7.68	210.83
1958.10	0.47	220.32	1958.08	2.08	-6.74	-4.08	0.57	7.88	211.20
1985.99	0.56	238.38	1985.97	2.22	-6.90	-4.27	0.67	8.12	211.77
2009.39	0.55	232.91	2009.36	2.36	-7.03	-4.46	0.23	8.33	212.40
2036.50	0.52	234.28	2036.47	2.52	-7.18	-4.67	0.12	8.56	213.01
2059.14	0.56	235.20	2059.11	2.65	-7.30	-4.84	0.17	8.76	213.53
2082.66	0.54	227.23	2082.63	2.78	-7.44	-5.01	0.33	8.97	213.96
2110.66	0.60	239.68	2110.63	2.95	-7.61	-5.24	0.50	9.24	214.55
2133.29	0.52	238.06	2133.25	3.10	-7.72	-5.43	0.38	9.44	215.10
2161.24	0.61	241.88	2161.21	3.29	-7.86	-5.67	0.36	9.69	215.79
2183.87	0.58	242.88	2183.84	3.47	-7.97	-5.87	0.14	9.90	216.40
2211.73	0.66	242.33	2211.69	3.68	-8.11	-6.14	0.27	10.17	217.15
2233.60	0.64	238.00	2233.57	3.86	-8.23	-6.36	0.23	10.40	217.68
2261.61	0.67	238.02	2261.57	4.07	-8.40	-6.63	0.10	10.70	218.28
2284.97	0.78	232.27	2284.93	4.26	-8.57	-6.87	0.58	10.98	218.72
2307.58	0.67	234.90	2307.54	4.43	-8.74	-7.10	0.54	11.26	219.09
2335.53	0.75	236.76	2335.49	4.65	-8.93	-7.39	0.31	11.59	219.58
2358.14	0.72	240.80	2358.10	4.85	-9.08	-7.63	0.26	11.86	220.04
2385.96	0.76	232.39	2385.91	5.08	-9.28	-7.93	0.41	12.21	220.52
2409.43	0.77	226.67	2409.38	5.26	-9.48	-8.17	0.33	12.52	220.74
2436.49	0.81	219.74	2436.44	5.43	-9.75	-8.42	0.39	12.89	220.81
2459.83	0.76	238.96	2459.77	5.60	-9.96	-8.66	1.14	13.20	221.01
2482.56	0.83	230.35	2482.50	5.79	-10.14	-8.92	0.62	13.51	221.32
2509.60	0.74	238.25	2509.54	6.02	-10.36	-9.22	0.52	13.87	221.66
2533.68	0.78	226.71	2533.62	6.21	-10.56	-9.47	0.66	14.18	221.89
2560.86	1.01	242.41	2560.79	6.48	-10.80	-9.82	1.23	14.59	222.29
2584.18	1.00	235.16	2584.11	6.76	-11.01	-10.17	0.55	14.99	222.73
2610.80	1.02	241.34	2610.72	7.08	-11.25	-10.57	0.42	15.44	223.20
2633.90	0.97	236.33	2633.82	7.35	-11.46	-10.91	0.45	15.82	223.59
2661.27	0.97	244.83	2661.19	7.67	-11.69	-11.31	0.52	16.27	224.06
2683.51	0.92	243.00	2683.42	7.95	-11.85	-11.64	0.26	16.61	224.49
2711.00	0.94	246.15	2710.91	8.28	-12.04	-12.04	0.20	17.03	225.01
2733.96	0.90	245.25	2733.87	8.56	-12.19	-12.38	0.18	17.38	225.44

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
2760.58	0.90	245.29	2760.49	8.88	-12.37	-12.76	0.01	17.77	225.90
2783.68	0.93	252.09	2783.58	9.18	-12.50	-13.11	0.49	18.11	226.35
2810.17	0.97	247.46	2810.07	9.53	-12.65	-13.52	0.32	18.52	226.89
2833.23	0.99	254.13	2833.12	9.85	-12.78	-13.89	0.51	18.88	227.38
2860.68	1.04	245.80	2860.57	10.25	-12.95	-14.35	0.56	19.33	227.93
2882.87	1.08	248.91	2882.76	10.57	-13.11	-14.72	0.34	19.71	228.32
2910.33	1.08	244.03	2910.21	10.97	-13.31	-15.20	0.34	20.21	228.78
2936.91	1.14	246.56	2936.79	11.36	-13.53	-15.66	0.29	20.70	229.19
2959.85	1.10	242.92	2959.72	11.69	-13.72	-16.07	0.34	21.13	229.51
2982.67	1.22	249.57	2982.54	12.05	-13.90	-16.49	0.79	21.57	229.87
3009.51	1.25	252.53	3009.38	12.53	-14.09	-17.04	0.25	22.11	230.41
3036.98	1.30	251.63	3036.84	13.03	-14.28	-17.62	0.18	22.68	230.98
3059.95	1.35	253.69	3059.80	13.48	-14.44	-18.13	0.30	23.18	231.47
3086.64	1.42	251.54	3086.48	14.01	-14.63	-18.74	0.34	23.78	232.02
3110.30	1.48	252.21	3110.13	14.51	-14.82	-19.31	0.25	24.34	232.50
3136.15	1.49	255.54	3135.98	15.08	-15.00	-19.95	0.34	24.97	233.06
3159.06	1.60	253.40	3158.88	15.60	-15.17	-20.55	0.52	25.54	233.57
3186.45	1.58	255.23	3186.26	16.25	-15.37	-21.28	0.20	26.25	234.15
3208.62	1.57	251.05	3208.42	16.76	-15.55	-21.86	0.52	26.83	234.58
3235.92	1.89	259.74	3235.70	17.47	-15.75	-22.66	1.50	27.60	235.19
3258.21	1.87	256.60	3257.98	18.12	-15.90	-23.37	0.47	28.27	235.77
3285.47	1.98	257.72	3285.23	18.92	-16.10	-24.27	0.42	29.12	236.43
3308.34	1.89	255.83	3308.09	19.60	-16.28	-25.02	0.46	29.85	236.95
3334.99	2.07	255.63	3334.72	20.39	-16.51	-25.91	0.65	30.72	237.50
3357.87	2.28	256.68	3357.58	21.15	-16.72	-26.75	0.95	31.55	238.00
3385.25	2.37	255.25	3384.94	22.11	-16.98	-27.83	0.39	32.61	238.61
3411.74	2.46	256.32	3411.40	23.08	-17.26	-28.91	0.38	33.67	239.17
3434.58	2.52	258.62	3434.22	23.95	-17.47	-29.88	0.51	34.62	239.68
3461.19	2.51	267.20	3460.81	25.02	-17.62	-31.04	1.42	35.69	240.42
3483.92	2.45	273.02	3483.52	25.97	-17.62	-32.02	1.14	36.55	241.18
3511.13	2.39	278.74	3510.71	27.10	-17.50	-33.17	0.92	37.50	242.18
3533.23	2.44	282.32	3532.78	28.03	-17.33	-34.08	0.72	38.24	243.05
3560.40	2.34	284.02	3559.93	29.16	-17.07	-35.19	0.48	39.11	244.12
3586.86	2.45	289.82	3586.37	30.26	-16.75	-36.24	1.01	39.93	245.20
3609.33	2.40	291.33	3608.82	31.21	-16.42	-37.13	0.36	40.60	246.15
3636.23	2.44	294.72	3635.70	32.34	-15.97	-38.18	0.55	41.38	247.30

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3657.97	2.27	298.51	3657.42	33.21	-15.57	-38.98	1.05	41.97	248.22
3684.74	2.24	300.69	3684.16	34.24	-15.05	-39.89	0.34	42.64	249.33
3711.60	2.20	302.15	3711.01	35.24	-14.51	-40.78	0.26	43.28	250.41
3733.31	2.22	302.04	3732.70	36.04	-14.07	-41.49	0.09	43.81	251.27
3760.16	2.24	305.39	3759.53	37.04	-13.49	-42.36	0.49	44.45	252.34
3786.88	2.21	308.46	3786.23	38.00	-12.86	-43.19	0.46	45.06	253.41
3808.58	2.25	312.51	3807.92	38.77	-12.32	-43.83	0.75	45.52	254.30
3835.40	2.17	310.73	3834.71	39.70	-11.63	-44.60	0.38	46.09	255.39
3861.30	2.15	316.71	3860.59	40.57	-10.96	-45.30	0.88	46.61	256.41
3883.85	2.19	319.43	3883.13	41.29	-10.32	-45.87	0.49	47.02	257.32
3910.65	2.14	325.52	3909.91	42.10	-9.52	-46.49	0.88	47.45	258.43
3936.72	2.11	324.45	3935.96	42.85	-8.73	-47.04	0.19	47.85	259.49
3959.10	2.05	329.61	3958.32	43.46	-8.05	-47.48	0.88	48.16	260.38
3985.04	2.21	331.84	3984.25	44.14	-7.21	-47.95	0.68	48.49	261.45
4011.80	2.09	334.17	4010.99	44.82	-6.32	-48.41	0.56	48.82	262.57
4034.16	2.17	333.09	4033.33	45.38	-5.57	-48.78	0.42	49.10	263.48
4060.18	2.02	332.26	4059.33	46.03	-4.73	-49.22	0.61	49.44	264.51
4086.78	1.99	336.49	4085.92	46.65	-3.89	-49.62	0.56	49.77	265.52
4109.08	2.05	335.43	4108.21	47.16	-3.17	-49.94	0.29	50.04	266.37
4135.08	1.92	332.74	4134.19	47.75	-2.36	-50.33	0.62	50.39	267.31
4161.75	1.92	334.93	4160.84	48.35	-1.56	-50.72	0.27	50.75	268.24
4184.02	2.03	335.00	4183.10	48.86	-0.87	-51.05	0.50	51.06	269.03
4209.84	2.05	336.82	4208.91	49.45	-0.03	-51.42	0.26	51.42	269.97
4236.49	2.12	337.41	4235.54	50.05	0.87	-51.80	0.31	51.81	270.96
4258.04	2.02	334.64	4257.08	50.55	1.58	-52.12	0.68	52.14	271.73
4284.52	2.14	336.89	4283.54	51.17	2.45	-52.51	0.54	52.57	272.67
4311.12	2.13	337.00	4310.12	51.79	3.36	-52.90	0.02	53.00	273.64
4332.63	2.24	335.73	4331.61	52.32	4.12	-53.23	0.55	53.39	274.42
4359.19	2.13	335.60	4358.15	52.97	5.04	-53.64	0.43	53.88	275.37
4385.61	2.37	332.32	4384.55	53.66	5.97	-54.10	1.02	54.43	276.29
4411.42	2.45	331.99	4410.34	54.41	6.93	-54.61	0.34	55.04	277.23
4433.56	2.41	330.88	4432.46	55.07	7.75	-55.06	0.29	55.60	278.01
4459.17	2.48	330.26	4458.05	55.85	8.70	-55.59	0.29	56.27	278.90
4485.45	2.42	335.17	4484.30	56.62	9.70	-56.11	0.83	56.94	279.81
4511.73	2.41	335.33	4510.56	57.34	10.71	-56.57	0.05	57.58	280.72
4536.61	2.13	334.37	4535.42	57.98	11.60	-56.99	1.15	58.16	281.50

Well Name: MILLARD # 1
Survey: MILLARD #1
Survey Date: 9/22/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft	Closure Distance ft	Closure Direction deg
4558.33	2.20	334.49	4557.13	58.53	12.34	-57.34	0.33	58.65	282.14
4584.86	2.01	339.44	4583.64	59.14	13.23	-57.72	0.99	59.22	282.91
4610.87	1.93	343.19	4609.63	59.65	14.07	-58.01	0.58	59.69	283.64
4636.25	1.93	346.34	4635.00	60.09	14.90	-58.24	0.42	60.11	284.35
4658.89	1.99	351.01	4657.63	60.44	15.66	-58.39	0.75	60.45	285.01
4686.04	1.49	352.48	4684.76	60.78	16.47	-58.51	1.86	60.78	285.73
4694.09	1.68	344.90	4692.81	60.88	16.69	-58.55	3.52	60.88	285.91