



Gyroscopic Survey Report
for
K.P. KAUFFMAN

Well Location	WELD COUNTY, CO
Well Name	JACK BERGER #2
Rig Number	FMC HD-0325
Survey Date	6/4/2014
Latitude	40.0857500°N
Longitude	104.8702900°W
North Reference	True North
Grid Correction	None
Depth Reference	GROUND LEVEL (4948.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 233.49Azim (deg)
Definitive Survey	JACK BERGER #2
Operator(s)	C JAQUES

Well Notes

Survey Report

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Survey Date: 6/4/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	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
100.32	0.07	19.15	100.32	-0.05	0.06	0.02	0.07	0.07	19.15
125.61	0.18	30.90	125.61	-0.10	0.11	0.05	0.43	0.12	23.00
151.09	0.29	19.10	151.09	-0.19	0.21	0.09	0.46	0.22	23.30
175.39	0.36	19.03	175.39	-0.31	0.34	0.13	0.31	0.36	21.69
200.61	0.42	18.86	200.61	-0.45	0.50	0.19	0.24	0.53	20.80
225.64	0.34	66.02	225.64	-0.60	0.62	0.29	1.26	0.68	25.00
250.74	0.31	73.28	250.74	-0.74	0.67	0.42	0.20	0.79	32.29
275.73	0.37	60.88	275.73	-0.88	0.73	0.56	0.38	0.92	37.53
300.41	0.38	68.05	300.41	-1.04	0.80	0.70	0.19	1.06	41.49
325.61	0.25	52.03	325.61	-1.18	0.86	0.83	0.62	1.19	43.77
350.75	0.29	71.44	350.75	-1.29	0.92	0.93	0.39	1.30	45.41
375.53	0.33	59.93	375.53	-1.42	0.97	1.05	0.30	1.43	47.23
400.81	0.34	58.03	400.81	-1.57	1.05	1.18	0.06	1.58	48.32
426.09	0.31	67.94	426.08	-1.71	1.11	1.30	0.25	1.71	49.50
451.44	0.25	49.36	451.43	-1.83	1.17	1.41	0.42	1.83	50.17
475.09	0.14	72.87	475.08	-1.91	1.22	1.47	0.55	1.91	50.50
500.60	0.12	43.75	500.59	-1.97	1.25	1.52	0.28	1.97	50.76
526.06	0.12	35.90	526.05	-2.02	1.29	1.56	0.07	2.02	50.47
551.02	0.07	27.97	551.01	-2.06	1.32	1.58	0.20	2.06	50.13
576.13	0.08	347.37	576.12	-2.08	1.35	1.58	0.22	2.08	49.51
601.24	0.16	339.20	601.24	-2.10	1.40	1.57	0.32	2.10	48.15
625.93	0.15	319.71	625.92	-2.10	1.46	1.53	0.22	2.12	46.40
651.12	0.13	317.92	651.12	-2.10	1.51	1.49	0.07	2.12	44.75
675.01	0.16	310.70	675.01	-2.09	1.55	1.45	0.13	2.12	43.13
700.16	0.13	307.96	700.16	-2.07	1.59	1.40	0.09	2.12	41.40
725.75	0.14	316.23	725.74	-2.06	1.63	1.36	0.08	2.12	39.76
751.05	0.08	297.06	751.04	-2.05	1.66	1.32	0.28	2.12	38.50
775.91	0.06	300.71	775.91	-2.04	1.67	1.29	0.05	2.12	37.70
801.20	0.09	311.22	801.20	-2.03	1.70	1.27	0.13	2.12	36.76
825.33	0.10	274.60	825.33	-2.01	1.71	1.23	0.26	2.11	35.72
850.21	0.05	307.12	850.20	-1.99	1.72	1.20	0.27	2.10	34.88
875.89	0.12	288.14	875.88	-1.97	1.73	1.16	0.28	2.09	33.85
901.16	0.10	300.70	901.15	-1.94	1.75	1.12	0.13	2.08	32.56
925.19	0.09	233.18	925.18	-1.92	1.75	1.09	0.43	2.06	31.82
950.07	0.06	128.26	950.07	-1.90	1.73	1.08	0.48	2.04	31.97

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
975.43	0.16	273.11	975.42	-1.88	1.73	1.06	0.84	2.02	31.43
1000.80	0.23	291.67	1000.80	-1.82	1.75	0.97	0.36	2.00	29.07
1026.28	0.22	310.94	1026.27	-1.78	1.80	0.89	0.30	2.01	26.26
1050.59	0.22	288.57	1050.58	-1.75	1.84	0.81	0.35	2.01	23.68
1075.42	0.31	312.53	1075.41	-1.71	1.90	0.71	0.56	2.03	20.58
1100.05	0.26	303.81	1100.05	-1.68	1.98	0.62	0.25	2.07	17.35
1125.14	0.31	294.82	1125.14	-1.62	2.04	0.51	0.25	2.10	14.02
1150.38	0.40	291.51	1150.37	-1.54	2.10	0.37	0.37	2.13	9.88
1175.20	0.39	288.10	1175.19	-1.45	2.16	0.21	0.10	2.17	5.44
1200.81	0.34	293.40	1200.80	-1.36	2.22	0.05	0.23	2.22	1.36
1225.65	0.38	301.47	1225.64	-1.29	2.29	-0.09	0.26	2.29	357.85
1250.94	0.36	296.11	1250.93	-1.22	2.37	-0.23	0.16	2.38	354.46
1275.06	0.42	283.31	1275.05	-1.13	2.42	-0.38	0.43	2.45	350.99
1300.78	0.37	278.19	1300.77	-1.01	2.46	-0.56	0.24	2.52	347.23
1326.12	0.37	282.84	1326.11	-0.90	2.49	-0.72	0.12	2.59	343.93
1350.36	0.37	288.68	1350.34	-0.81	2.53	-0.87	0.16	2.67	341.07
1375.48	0.40	283.18	1375.46	-0.70	2.57	-1.03	0.17	2.77	338.21
1401.11	0.40	289.05	1401.10	-0.60	2.62	-1.20	0.16	2.88	335.43
1425.46	0.37	279.78	1425.44	-0.50	2.66	-1.36	0.28	2.99	333.03
1450.86	0.41	291.21	1450.84	-0.39	2.71	-1.52	0.35	3.11	330.72
1475.87	0.37	293.14	1475.86	-0.30	2.77	-1.68	0.18	3.24	328.85
1500.16	0.45	290.34	1500.15	-0.21	2.84	-1.84	0.33	3.38	327.09
1525.79	0.44	298.46	1525.78	-0.12	2.92	-2.02	0.25	3.55	325.36
1551.06	0.40	295.82	1551.04	-0.03	3.00	-2.18	0.17	3.71	324.01
1575.02	0.42	287.74	1575.01	0.06	3.07	-2.34	0.26	3.86	322.65
1601.30	0.42	292.94	1601.28	0.16	3.13	-2.52	0.15	4.02	321.17
1625.94	0.43	279.34	1625.92	0.27	3.19	-2.70	0.42	4.18	319.73
1651.14	0.42	292.78	1651.12	0.39	3.24	-2.88	0.40	4.33	318.36
1675.15	0.44	290.66	1675.13	0.48	3.30	-3.04	0.10	4.49	317.33
1700.51	0.53	288.09	1700.48	0.60	3.37	-3.25	0.37	4.68	316.11
1725.65	0.42	284.88	1725.63	0.73	3.43	-3.44	0.43	4.86	314.90
1751.03	0.47	299.84	1751.01	0.83	3.51	-3.62	0.49	5.04	314.06
1776.02	0.50	288.64	1776.00	0.93	3.59	-3.82	0.40	5.24	313.28
1800.22	0.49	286.20	1800.20	1.05	3.66	-4.01	0.10	5.43	312.32
1825.68	0.42	282.99	1825.65	1.18	3.71	-4.21	0.27	5.61	311.36
1851.03	0.47	289.88	1851.01	1.30	3.76	-4.40	0.28	5.79	310.54

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
1875.15	0.48	287.72	1875.13	1.41	3.83	-4.59	0.08	5.98	309.83
1900.68	0.43	283.06	1900.65	1.54	3.88	-4.78	0.23	6.16	309.06
1925.02	0.51	289.80	1924.99	1.66	3.94	-4.97	0.38	6.35	308.37
1950.71	0.52	288.29	1950.68	1.79	4.01	-5.19	0.08	6.56	307.71
1975.94	0.49	278.79	1975.91	1.93	4.07	-5.41	0.35	6.77	306.94
2000.90	0.52	286.03	2000.87	2.07	4.11	-5.62	0.28	6.97	306.19
2025.51	0.54	283.69	2025.47	2.21	4.17	-5.84	0.12	7.18	305.53
2050.99	0.57	278.33	2050.95	2.38	4.22	-6.09	0.25	7.41	304.73
2075.60	0.59	283.92	2075.57	2.55	4.27	-6.33	0.24	7.64	303.98
2100.21	0.55	282.93	2100.17	2.71	4.33	-6.57	0.15	7.87	303.36
2125.34	0.65	277.51	2125.30	2.89	4.37	-6.83	0.44	8.11	302.62
2150.50	0.66	277.18	2150.46	3.10	4.41	-7.11	0.07	8.37	301.78
2175.57	0.69	280.54	2175.53	3.30	4.45	-7.41	0.20	8.64	301.01
2200.30	0.60	286.04	2200.26	3.49	4.52	-7.68	0.45	8.91	300.46
2225.50	0.65	274.02	2225.46	3.67	4.56	-7.95	0.55	9.17	299.86
2250.81	0.66	279.17	2250.76	3.88	4.60	-8.24	0.24	9.43	299.17
2276.23	0.70	273.81	2276.18	4.10	4.63	-8.53	0.30	9.71	298.48
2300.52	0.71	279.15	2300.47	4.32	4.66	-8.83	0.27	9.99	297.84
2325.77	0.67	285.15	2325.71	4.52	4.73	-9.12	0.33	10.28	297.39
2350.98	0.67	277.23	2350.93	4.72	4.78	-9.41	0.37	10.56	296.94
2375.85	0.61	275.50	2375.80	4.92	4.81	-9.69	0.24	10.82	296.43
2400.99	0.63	267.55	2400.93	5.14	4.82	-9.96	0.35	11.07	295.83
2425.05	0.63	272.56	2424.99	5.35	4.82	-10.23	0.23	11.31	295.25
2451.02	0.63	268.15	2450.96	5.58	4.82	-10.51	0.19	11.56	294.65
2475.03	0.57	260.05	2474.97	5.79	4.80	-10.76	0.42	11.78	294.04
2500.26	0.57	254.98	2500.20	6.02	4.74	-11.00	0.20	11.98	293.32
2526.49	0.51	258.35	2526.43	6.25	4.69	-11.25	0.25	12.18	292.62
2550.96	0.51	262.38	2550.90	6.45	4.65	-11.46	0.15	12.37	292.08
2575.92	0.52	246.40	2575.85	6.66	4.59	-11.68	0.58	12.55	291.46
2600.81	0.53	261.22	2600.75	6.87	4.53	-11.90	0.55	12.73	290.83
2625.27	0.55	249.90	2625.21	7.08	4.47	-12.12	0.44	12.92	290.24
2650.13	0.50	248.15	2650.06	7.30	4.39	-12.33	0.20	13.09	289.58
2675.08	0.56	237.39	2675.01	7.53	4.28	-12.54	0.45	13.25	288.86
2701.18	0.45	224.62	2701.11	7.76	4.14	-12.71	0.60	13.37	288.04
2725.71	0.43	229.17	2725.64	7.94	4.01	-12.85	0.15	13.46	287.34
2750.44	0.53	218.54	2750.37	8.14	3.86	-12.99	0.54	13.55	286.56

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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
2775.45	0.52	225.91	2775.38	8.37	3.69	-13.14	0.27	13.65	285.70
2801.19	0.44	217.03	2801.12	8.58	3.53	-13.29	0.41	13.75	284.90
2826.15	0.53	220.19	2826.07	8.78	3.37	-13.42	0.36	13.84	284.10
2851.16	0.57	229.72	2851.09	9.02	3.20	-13.59	0.40	13.96	283.26
2876.43	0.52	228.08	2876.35	9.26	3.04	-13.77	0.19	14.10	282.47
2900.89	0.57	236.40	2900.81	9.49	2.90	-13.95	0.39	14.25	281.75
2925.86	0.59	224.28	2925.78	9.74	2.74	-14.15	0.50	14.41	280.96
2950.95	0.60	226.10	2950.87	10.00	2.56	-14.33	0.09	14.56	280.11
2975.51	0.54	229.18	2975.43	10.25	2.39	-14.52	0.27	14.71	279.35
3000.64	0.61	225.14	3000.55	10.50	2.22	-14.70	0.30	14.87	278.58
3025.50	0.61	227.09	3025.42	10.76	2.04	-14.89	0.08	15.03	277.78
3050.59	0.62	226.11	3050.50	11.02	1.85	-15.08	0.05	15.20	277.00
3075.11	0.60	227.88	3075.02	11.28	1.67	-15.28	0.10	15.37	276.25
3100.18	0.63	225.81	3100.09	11.55	1.49	-15.47	0.14	15.54	275.50
3125.55	0.61	224.85	3125.46	11.82	1.30	-15.67	0.10	15.72	274.73
3150.45	0.73	227.69	3150.36	12.11	1.10	-15.88	0.51	15.92	273.95
3176.60	0.74	234.86	3176.50	12.44	0.89	-16.14	0.35	16.16	273.15
3201.06	0.69	243.07	3200.96	12.75	0.73	-16.40	0.46	16.41	272.55
3226.01	0.89	210.34	3225.91	13.07	0.49	-16.63	1.95	16.64	271.70
3250.89	0.78	215.47	3250.79	13.41	0.19	-16.83	0.53	16.83	270.64
3275.35	0.76	207.85	3275.25	13.72	-0.09	-17.00	0.43	17.00	269.69
3300.21	0.75	202.18	3300.10	14.00	-0.39	-17.14	0.31	17.14	268.71
3325.20	0.68	219.35	3325.09	14.29	-0.65	-17.29	0.89	17.30	267.84
3350.02	0.76	210.40	3349.91	14.58	-0.91	-17.47	0.54	17.49	267.03
3376.15	0.71	206.12	3376.03	14.88	-1.20	-17.63	0.26	17.67	266.10
3400.62	0.82	207.96	3400.50	15.18	-1.49	-17.78	0.46	17.84	265.20
3425.59	0.69	201.01	3425.47	15.47	-1.79	-17.91	0.64	18.00	264.29
3450.84	0.59	207.44	3450.72	15.71	-2.05	-18.03	0.50	18.15	263.51
3475.67	0.67	210.29	3475.55	15.96	-2.29	-18.16	0.37	18.30	262.82
3500.30	0.65	192.34	3500.18	16.20	-2.55	-18.26	0.84	18.44	262.05
3525.97	0.64	213.86	3525.85	16.44	-2.81	-18.37	0.94	18.59	261.30
3551.01	0.71	213.85	3550.89	16.72	-3.05	-18.54	0.27	18.79	260.64
3576.06	0.75	182.54	3575.93	16.97	-3.35	-18.63	1.58	18.93	259.81
3600.70	0.74	212.44	3600.57	17.22	-3.64	-18.72	1.57	19.08	258.99
3625.53	0.78	223.67	3625.40	17.54	-3.90	-18.93	0.62	19.33	258.35
3650.74	0.63	221.08	3650.61	17.84	-4.13	-19.14	0.62	19.58	257.82

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3675.43	0.49	218.43	3675.29	18.08	-4.32	-19.29	0.58	19.77	257.39
3700.18	0.66	233.29	3700.04	18.32	-4.48	-19.47	0.89	19.98	257.03
3725.76	0.48	240.86	3725.63	18.57	-4.62	-19.68	0.73	20.22	256.78
3750.42	0.49	232.05	3750.28	18.78	-4.74	-19.86	0.30	20.41	256.58
3775.21	0.54	235.28	3775.07	19.00	-4.87	-20.04	0.25	20.62	256.34
3800.67	0.50	206.50	3800.53	19.22	-5.04	-20.18	1.03	20.80	255.98
3825.67	0.43	249.80	3825.53	19.41	-5.17	-20.32	1.40	20.97	255.73
3850.75	0.37	246.63	3850.61	19.58	-5.23	-20.48	0.27	21.14	255.67
3875.17	0.36	209.84	3875.03	19.72	-5.33	-20.59	0.94	21.27	255.49
3900.40	0.49	219.01	3900.26	19.90	-5.48	-20.70	0.58	21.41	255.16
3926.05	0.56	243.97	3925.91	20.13	-5.62	-20.88	0.92	21.62	254.93
3950.93	0.72	228.22	3950.79	20.40	-5.78	-21.11	0.95	21.88	254.69
3975.74	0.88	228.39	3975.60	20.75	-6.01	-21.36	0.66	22.19	254.29
4000.05	0.83	227.05	3999.91	21.11	-6.25	-21.63	0.20	22.52	253.88
4025.16	0.92	233.77	4025.00	21.49	-6.50	-21.93	0.52	22.87	253.50
4050.84	0.70	228.80	4050.69	21.85	-6.72	-22.21	0.90	23.21	253.16
4076.62	0.96	217.28	4076.46	22.21	-7.00	-22.46	1.21	23.52	252.70
4100.73	0.92	215.22	4100.57	22.59	-7.31	-22.69	0.23	23.84	252.14
4125.51	0.93	211.60	4125.35	22.97	-7.65	-22.91	0.25	24.16	251.54
4150.60	0.89	202.95	4150.43	23.32	-8.00	-23.10	0.58	24.44	250.89
4175.18	1.05	204.34	4175.01	23.68	-8.38	-23.26	0.67	24.73	250.19
4201.07	0.91	199.43	4200.89	24.06	-8.79	-23.43	0.61	25.02	249.43
4226.16	1.02	200.19	4225.98	24.41	-9.19	-23.57	0.44	25.30	248.70
4250.94	1.05	199.67	4250.75	24.79	-9.61	-23.73	0.12	25.60	247.95
4275.63	0.97	197.33	4275.45	25.14	-10.02	-23.86	0.39	25.88	247.22
4301.16	1.17	198.64	4300.97	25.53	-10.48	-24.01	0.83	26.20	246.43
4325.87	1.15	197.24	4325.67	25.94	-10.95	-24.17	0.15	26.53	245.62
4351.15	1.17	192.33	4350.95	26.34	-11.45	-24.30	0.40	26.86	244.77
4375.89	1.10	193.62	4375.69	26.71	-11.93	-24.41	0.30	27.16	243.96
4400.78	1.12	196.23	4400.57	27.09	-12.39	-24.53	0.22	27.48	243.20
4426.14	1.20	196.82	4425.93	27.50	-12.88	-24.68	0.32	27.84	242.43
4450.67	1.29	193.48	4450.44	27.92	-13.40	-24.81	0.47	28.20	241.64
4476.19	1.34	198.20	4475.96	28.38	-13.96	-24.98	0.47	28.61	240.80
4500.53	1.43	201.48	4500.29	28.87	-14.51	-25.18	0.49	29.06	240.03
4526.10	1.43	195.30	4525.86	29.39	-15.12	-25.38	0.60	29.54	239.21
4550.01	1.44	194.79	4549.76	29.86	-15.70	-25.53	0.07	29.97	238.42

Well Name: JACK BERGER #2
Survey: JACK BERGER #2
Survey Date: 6/4/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft	Closure Distance ft	Closure Direction deg
4575.57	1.47	197.72	4575.31	30.38	-16.32	-25.71	0.32	30.46	237.60
4600.13	1.61	197.75	4599.87	30.91	-16.95	-25.91	0.55	30.97	236.81
4625.52	1.41	200.13	4625.24	31.46	-17.58	-26.13	0.80	31.50	236.07
4651.03	1.40	195.55	4650.75	31.97	-18.18	-26.32	0.44	31.99	235.37
4675.36	1.99	213.65	4675.07	32.60	-18.82	-26.64	3.25	32.61	234.76
4700.57	1.44	205.03	4700.26	33.29	-19.47	-27.01	2.40	33.30	234.22
4725.86	1.35	208.28	4725.54	33.84	-20.02	-27.29	0.49	33.84	233.74
4740.61	1.36	209.31	4740.29	34.16	-20.32	-27.46	0.18	34.16	233.49