



**Scientific  
Drilling**

## Survey Certification

7327 West Barton Road  
Casper, WY 82604  
(307)-472-6621 Fax (307) 472-5439

Operator	KP Kauffman
Well Name & No.	Carl A Miller A#2
API #	05-123-07682
County & State	Weld, CO
SDI Job No.	410115K243410
Rig	N/A
Survey Date	10-Jan-2015

I, Claudia Birge, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 0 feet to a measured depth of 4754.78 feet is true and correct as determined from all available records.

Signature

3-Feb-2015

Date

**Claudia L. Birge**

Rockies Region Well Planner  
Scientific Drilling - Rocky Mountain District

# **KP Kauffman Co, Inc.**

**Weld County, CO**

**Carl A Miller**

**Carl A Miller A #2**

**OH**

**Design: OH**

## **Standard Survey Report**

**02 February, 2015**



<b>Company:</b>	KP Kauffman Co, Inc.	<b>Local Co-ordinate Reference:</b>	Well Carl A Miller A #2
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	GL 5046' @ 5046.00ft
<b>Site:</b>	Carl A Miller	<b>MD Reference:</b>	GL 5046' @ 5046.00ft
<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Carl A Miller				
Site Position:		Northing:	1,270,393.56 usft	Latitude:	40° 4' 26.933 N
From:	Lat/Long	Easting:	3,163,163.91 usft	Longitude:	104° 55' 1.031 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.38 °

Well	Carl A Miller A #2, 660' FSL, 660FWL, SEC33, 2N, R67W					
Well Position	+N-S	0.00 ft	Northing:	1,275,938.69 usfi	Latitude:	40° 5' 21.480 N
	+E-W	0.00 ft	Easting:	3,167,000.65 usfi	Longitude:	104° 54' 11.196 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	5,046.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	1/10/2015	8.53	66.65	52,461

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)	
	0.00	0.00	0.00	293.11	

Survey Program		Date	2/2/2015	
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
25.00	4,754.78	Survey #1 - Gyro Survey (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.22	298.74	25.00	0.02	-0.04	0.05	0.88	0.88	0.00
1st SDI Gyro Survey									
50.00	0.44	298.74	50.00	0.09	-0.17	0.19	0.88	0.88	0.00
75.00	0.66	298.74	75.00	0.21	-0.38	0.43	0.88	0.88	0.00
100.00	0.92	284.85	100.00	0.33	-0.70	0.77	1.28	1.04	-55.56
125.00	0.55	291.33	124.99	0.42	-1.00	1.09	1.51	-1.48	25.92
150.00	0.60	289.01	149.99	0.51	-1.24	1.34	0.22	0.20	-9.28
175.00	0.60	287.38	174.99	0.59	-1.49	1.60	0.07	0.00	-6.52
200.00	0.61	286.85	199.99	0.67	-1.74	1.86	0.05	0.04	-2.12
225.00	0.75	299.12	224.99	0.79	-2.01	2.16	0.80	0.56	49.08

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<b>Site:</b>	Carl A Miller	<b>MD Reference:</b>	GL 5046' @ 5046.00ft
<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

**Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
250.00	0.80	293.65	249.99	0.94	-2.31	2.50	0.36	0.20	-21.88
275.00	0.76	294.16	274.98	1.07	-2.63	2.84	0.16	-0.16	2.04
300.00	0.77	296.09	299.98	1.22	-2.93	3.17	0.11	0.04	7.72
325.00	0.77	296.11	324.98	1.36	-3.23	3.51	0.00	0.00	0.08
350.00	0.75	299.70	349.98	1.52	-3.52	3.84	0.21	-0.08	14.36
375.00	0.82	292.19	374.97	1.67	-3.83	4.18	0.50	0.28	-30.04
400.00	0.77	291.90	399.97	1.80	-4.15	4.52	0.20	-0.20	-1.16
425.00	0.79	295.51	424.97	1.94	-4.46	4.86	0.21	0.08	14.44
450.00	0.82	293.83	449.97	2.08	-4.78	5.22	0.15	0.12	-6.72
475.00	0.76	292.53	474.96	2.22	-5.10	5.56	0.25	-0.24	-5.20
500.00	0.83	293.99	499.96	2.35	-5.42	5.91	0.29	0.28	5.84
525.00	0.80	293.18	524.96	2.50	-5.74	6.26	0.13	-0.12	-3.24
550.00	0.83	294.09	549.96	2.64	-6.07	6.62	0.13	0.12	3.64
575.00	0.78	292.23	574.95	2.78	-6.39	6.97	0.23	-0.20	-7.44
600.00	0.73	290.12	599.95	2.90	-6.70	7.30	0.23	-0.20	-8.44
625.00	0.72	287.93	624.95	3.00	-7.00	7.61	0.12	-0.04	-8.76
650.00	0.64	289.39	649.95	3.09	-7.28	7.91	0.33	-0.32	5.84
675.00	0.65	287.32	674.95	3.18	-7.55	8.19	0.10	0.04	-8.28
700.00	0.63	295.76	699.95	3.29	-7.81	8.47	0.39	-0.08	33.76
725.00	0.69	295.12	724.94	3.41	-8.07	8.76	0.24	0.24	-2.56
750.00	0.77	291.98	749.94	3.54	-8.36	9.07	0.36	0.32	-12.56
775.00	0.66	287.75	774.94	3.64	-8.65	9.39	0.49	-0.44	-16.92
800.00	0.67	295.93	799.94	3.75	-8.92	9.68	0.38	0.04	32.72
825.00	0.64	289.74	824.94	3.86	-9.18	9.96	0.31	-0.12	-24.76
850.00	0.73	292.19	849.94	3.97	-9.46	10.26	0.38	0.36	9.80
875.00	0.57	287.39	874.93	4.07	-9.73	10.54	0.68	-0.64	-19.20
900.00	0.59	272.13	899.93	4.11	-9.97	10.79	0.62	0.08	-61.04
925.00	0.67	286.64	924.93	4.15	-10.24	11.05	0.71	0.32	58.04
950.00	0.49	268.98	949.93	4.19	-10.49	11.29	1.01	-0.72	-70.64
975.00	0.57	270.63	974.93	4.19	-10.72	11.51	0.33	0.32	6.60
1,000.00	0.57	281.37	999.93	4.22	-10.97	11.74	0.43	0.00	42.96
1,025.00	0.56	260.78	1,024.93	4.22	-11.21	11.97	0.81	-0.04	-82.36
1,050.00	0.58	266.84	1,049.92	4.20	-11.46	12.19	0.25	0.08	24.24
1,075.00	0.51	264.24	1,074.92	4.18	-11.69	12.40	0.30	-0.28	-10.40
1,100.00	0.55	267.74	1,099.92	4.16	-11.92	12.60	0.21	0.16	14.00
1,125.00	0.63	271.48	1,124.92	4.16	-12.18	12.84	0.35	0.32	14.96
1,150.00	0.53	262.14	1,149.92	4.15	-12.43	13.07	0.55	-0.40	-37.36
1,175.00	0.54	257.92	1,174.92	4.11	-12.66	13.26	0.16	0.04	-16.88
1,200.00	0.60	263.71	1,199.92	4.07	-12.91	13.47	0.33	0.24	23.16
1,225.00	0.51	252.72	1,224.92	4.02	-13.15	13.67	0.56	-0.36	-43.96
1,250.00	0.60	254.08	1,249.92	3.95	-13.38	13.86	0.36	0.36	5.44
1,275.00	0.40	253.85	1,274.91	3.89	-13.59	14.03	0.80	-0.80	-0.92
1,300.00	0.38	248.51	1,299.91	3.84	-13.75	14.15	0.17	-0.08	-21.36

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<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	GL 5046' @ 5046.00ft
<b>Site:</b>	Carl A Miller	<b>MD Reference:</b>	GL 5046' @ 5046.00ft
<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

**Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,325.00	0.39	250.77	1,324.91	3.78	-13.91	14.27	0.07	0.04	9.04
1,350.00	0.30	263.77	1,349.91	3.75	-14.05	14.39	0.47	-0.36	52.00
1,375.00	0.33	246.07	1,374.91	3.71	-14.18	14.50	0.41	0.12	-70.80
1,400.00	0.38	251.57	1,399.91	3.65	-14.33	14.61	0.24	0.20	22.00
1,425.00	0.36	259.54	1,424.91	3.61	-14.48	14.74	0.22	-0.08	31.88
1,450.00	0.31	249.95	1,449.91	3.58	-14.62	14.85	0.30	-0.20	-38.36
1,475.00	0.43	249.14	1,474.91	3.52	-14.77	14.97	0.48	0.48	-3.24
1,500.00	0.35	259.88	1,499.91	3.47	-14.94	15.10	0.43	-0.32	42.96
1,525.00	0.34	247.01	1,524.91	3.43	-15.08	15.22	0.31	-0.04	-51.48
1,550.00	0.34	253.40	1,549.91	3.38	-15.22	15.33	0.15	0.00	25.56
1,575.00	0.37	265.20	1,574.91	3.35	-15.37	15.45	0.32	0.12	47.20
1,600.00	0.40	254.71	1,599.91	3.32	-15.54	15.59	0.31	0.12	-41.96
1,625.00	0.48	265.39	1,624.91	3.29	-15.72	15.75	0.46	0.32	42.72
1,650.00	0.50	278.29	1,649.91	3.30	-15.94	15.95	0.45	0.08	51.60
1,675.00	0.55	283.21	1,674.91	3.34	-16.16	16.18	0.27	0.20	19.68
1,700.00	0.73	291.79	1,699.90	3.43	-16.43	16.45	0.81	0.72	34.32
1,725.00	0.76	300.54	1,724.90	3.57	-16.72	16.78	0.47	0.12	35.00
1,750.00	0.81	301.89	1,749.90	3.75	-17.01	17.12	0.21	0.20	5.40
1,775.00	0.91	309.16	1,774.90	3.97	-17.31	17.48	0.59	0.40	29.08
1,800.00	0.93	318.56	1,799.89	4.25	-17.60	17.86	0.61	0.08	37.60
1,825.00	0.91	320.73	1,824.89	4.55	-17.86	18.21	0.16	-0.08	8.68
1,850.00	0.99	323.61	1,849.89	4.88	-18.12	18.58	0.37	0.32	11.52
1,875.00	0.96	334.83	1,874.88	5.24	-18.33	18.92	0.77	-0.12	44.88
1,900.00	0.91	337.83	1,899.88	5.62	-18.50	19.22	0.28	-0.20	12.00
1,925.00	0.97	344.57	1,924.88	6.00	-18.63	19.49	0.50	0.24	26.96
1,950.00	0.96	353.30	1,949.87	6.42	-18.71	19.73	0.59	-0.04	34.92
1,975.00	0.87	354.85	1,974.87	6.81	-18.75	19.92	0.37	-0.36	6.20
2,000.00	0.91	2.88	1,999.87	7.20	-18.76	20.08	0.52	0.16	32.12
2,025.00	0.84	13.84	2,024.86	7.58	-18.70	20.18	0.72	-0.28	43.84
2,050.00	0.77	12.73	2,049.86	7.92	-18.62	20.24	0.29	-0.28	-4.44
2,075.00	0.83	14.21	2,074.86	8.26	-18.54	20.29	0.25	0.24	5.92
2,100.00	0.78	23.51	2,099.86	8.59	-18.43	20.32	0.56	-0.20	37.20
2,125.00	0.66	22.81	2,124.85	8.88	-18.30	20.32	0.48	-0.48	-2.80
2,150.00	0.51	30.17	2,149.85	9.11	-18.19	20.31	0.67	-0.60	29.44
2,175.00	0.41	25.05	2,174.85	9.28	-18.10	20.29	0.43	-0.40	-20.48
2,200.00	0.41	18.37	2,199.85	9.45	-18.03	20.30	0.19	0.00	-26.72
2,225.00	0.42	11.40	2,224.85	9.62	-17.99	20.32	0.21	0.04	-27.88
2,250.00	0.35	17.57	2,249.85	9.79	-17.95	20.35	0.33	-0.28	24.68
2,275.00	0.43	351.38	2,274.85	9.95	-17.94	20.40	0.77	0.32	-104.76
2,300.00	0.65	359.17	2,299.85	10.19	-17.95	20.51	0.93	0.88	31.16
2,325.00	0.65	335.37	2,324.85	10.46	-18.01	20.67	1.07	0.00	-95.20
2,350.00	0.81	4.07	2,349.85	10.76	-18.06	20.84	1.57	0.64	114.80
2,375.00	0.71	356.70	2,374.84	11.09	-18.06	20.96	0.56	-0.40	-29.48

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<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
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<b>Design:</b>	OH	<b>Database:</b>	Casper District

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,400.00	0.68	351.97	2,399.84	11.40	-18.09	21.11	0.26	-0.12	-18.92
2,425.00	0.68	357.59	2,424.84	11.69	-18.11	21.25	0.27	0.00	22.48
2,450.00	0.62	5.18	2,449.84	11.97	-18.11	21.35	0.42	-0.24	30.36
2,475.00	0.49	2.62	2,474.84	12.22	-18.09	21.43	0.53	-0.52	-10.24
2,500.00	0.45	347.78	2,499.84	12.42	-18.11	21.53	0.51	-0.16	-59.36
2,525.00	0.41	351.98	2,524.84	12.60	-18.14	21.63	0.20	-0.16	16.80
2,550.00	0.43	4.65	2,549.83	12.78	-18.14	21.71	0.38	0.08	50.68
2,575.00	0.56	344.65	2,574.83	13.00	-18.17	21.81	0.86	0.52	-80.00
2,600.00	0.49	357.47	2,599.83	13.22	-18.21	21.93	0.55	-0.28	51.28
2,625.00	0.26	21.10	2,624.83	13.38	-18.19	21.98	1.09	-0.92	94.52
2,650.00	0.36	23.08	2,649.83	13.51	-18.14	21.98	0.40	0.40	7.92
2,675.00	0.37	34.67	2,674.83	13.64	-18.06	21.97	0.30	0.04	46.36
2,700.00	0.31	32.20	2,699.83	13.77	-17.98	21.94	0.25	-0.24	-9.88
2,725.00	0.39	46.93	2,724.83	13.88	-17.88	21.90	0.48	0.32	58.92
2,750.00	0.40	61.10	2,749.83	13.98	-17.74	21.81	0.39	0.04	56.68
2,775.00	0.41	64.61	2,774.83	14.06	-17.59	21.70	0.11	0.04	14.04
2,800.00	0.59	51.15	2,799.83	14.18	-17.41	21.58	0.85	0.72	-53.84
2,825.00	0.83	46.76	2,824.83	14.39	-17.17	21.44	0.98	0.96	-17.56
2,850.00	0.88	39.91	2,849.82	14.66	-16.92	21.31	0.45	0.20	-27.40
2,875.00	1.02	37.25	2,874.82	14.98	-16.66	21.20	0.59	0.56	-10.64
2,900.00	1.01	32.60	2,899.82	15.35	-16.41	21.11	0.33	-0.04	-18.60
2,925.00	0.97	36.16	2,924.81	15.70	-16.16	21.03	0.29	-0.16	14.24
2,950.00	1.06	35.46	2,949.81	16.06	-15.90	20.93	0.36	0.36	-2.80
2,975.00	1.13	40.91	2,974.80	16.44	-15.61	20.81	0.50	0.28	21.80
3,000.00	1.04	32.48	2,999.80	16.81	-15.33	20.70	0.73	-0.36	-33.72
3,025.00	1.25	34.55	3,024.79	17.23	-15.05	20.60	0.86	0.84	8.28
3,050.00	1.38	41.47	3,049.79	17.68	-14.70	20.46	0.82	0.52	27.68
3,075.00	1.22	41.88	3,074.78	18.10	-14.32	20.28	0.64	-0.64	1.64
3,100.00	1.23	35.87	3,099.78	18.52	-13.98	20.13	0.52	0.04	-24.04
3,125.00	1.19	35.10	3,124.77	18.95	-13.68	20.02	0.17	-0.16	-3.08
3,150.00	0.92	42.39	3,149.77	19.31	-13.39	19.90	1.20	-1.08	29.16
3,175.00	0.70	37.20	3,174.76	19.58	-13.16	19.79	0.93	-0.88	-20.76
3,200.00	0.55	47.16	3,199.76	19.78	-12.98	19.71	0.74	-0.60	39.84
3,225.00	0.41	75.85	3,224.76	19.89	-12.81	19.59	1.10	-0.56	114.76
3,250.00	0.10	59.60	3,249.76	19.92	-12.70	19.50	1.26	-1.24	-65.00
3,275.00	0.09	16.22	3,274.76	19.95	-12.68	19.49	0.28	-0.04	-173.52
3,300.00	0.08	99.63	3,299.76	19.97	-12.66	19.48	0.45	-0.04	333.64
3,325.00	0.12	251.21	3,324.76	19.95	-12.66	19.48	0.78	0.16	606.32
3,350.00	0.09	50.39	3,349.76	19.96	-12.67	19.49	0.83	-0.12	636.72
3,375.00	0.09	131.25	3,374.76	19.96	-12.64	19.46	0.47	0.00	323.44
3,400.00	0.25	207.78	3,399.76	19.90	-12.66	19.45	0.98	0.64	306.12
3,425.00	0.16	228.76	3,424.76	19.83	-12.71	19.47	0.46	-0.36	83.92
3,450.00	0.30	185.09	3,449.76	19.74	-12.74	19.46	0.86	0.56	-174.68
3,475.00	0.40	189.93	3,474.76	19.59	-12.76	19.42	0.42	0.40	19.36

<b>Company:</b>	KP Kauffman Co, Inc.	<b>Local Co-ordinate Reference:</b>	Well Carl A Miller A #2
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	GL 5046' @ 5046.00ft
<b>Site:</b>	Carl A Miller	<b>MD Reference:</b>	GL 5046' @ 5046.00ft
<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

**Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,500.00	0.45	185.48	3,499.76	19.40	-12.78	19.37	0.24	0.20	-17.80
3,525.00	0.57	183.57	3,524.76	19.18	-12.80	19.30	0.48	0.48	-7.64
3,550.00	0.49	188.61	3,549.76	18.95	-12.83	19.23	0.37	-0.32	20.16
3,575.00	0.48	206.47	3,574.76	18.75	-12.89	19.21	0.60	-0.04	71.44
3,600.00	0.48	194.60	3,599.76	18.56	-12.96	19.20	0.40	0.00	-47.48
3,625.00	0.58	202.02	3,624.75	18.34	-13.03	19.19	0.48	0.40	29.68
3,650.00	0.49	199.36	3,649.75	18.12	-13.12	19.18	0.37	-0.36	-10.64
3,675.00	0.50	216.01	3,674.75	17.93	-13.22	19.19	0.57	0.04	66.60
3,700.00	0.48	213.21	3,699.75	17.75	-13.34	19.24	0.12	-0.08	-11.20
3,725.00	0.46	214.95	3,724.75	17.58	-13.45	19.28	0.10	-0.08	6.96
3,750.00	0.35	239.55	3,749.75	17.46	-13.58	19.34	0.81	-0.44	98.40
3,775.00	0.31	227.78	3,774.75	17.38	-13.69	19.42	0.31	-0.16	-47.08
3,800.00	0.40	247.02	3,799.75	17.30	-13.82	19.50	0.59	0.36	76.96
3,825.00	0.45	254.38	3,824.75	17.24	-14.00	19.64	0.30	0.20	29.44
3,850.00	0.13	289.02	3,849.75	17.22	-14.12	19.75	1.40	-1.28	138.56
3,875.00	0.11	246.77	3,874.75	17.22	-14.17	19.79	0.35	-0.08	-169.00
3,900.00	0.30	304.13	3,899.75	17.25	-14.24	19.87	1.03	0.76	229.44
3,925.00	0.18	282.68	3,924.75	17.29	-14.34	19.97	0.59	-0.48	-85.80
3,950.00	0.25	280.51	3,949.75	17.31	-14.43	20.07	0.28	0.28	-8.68
3,975.00	0.22	282.48	3,974.75	17.33	-14.53	20.17	0.12	-0.12	7.88
4,000.00	0.10	70.30	3,999.75	17.35	-14.56	20.20	1.24	-0.48	591.28
4,025.00	0.43	257.28	4,024.75	17.34	-14.63	20.26	2.12	1.32	-692.08
4,050.00	0.33	236.36	4,049.75	17.28	-14.78	20.37	0.68	-0.40	-83.68
4,075.00	0.63	234.22	4,074.75	17.16	-14.95	20.48	1.20	1.20	-8.56
4,100.00	0.36	173.65	4,099.74	17.00	-15.05	20.52	2.20	-1.08	-242.28
4,125.00	0.64	226.30	4,124.74	16.82	-15.14	20.53	2.04	1.12	210.60
4,150.00	0.70	219.52	4,149.74	16.61	-15.34	20.63	0.40	0.24	-27.12
4,175.00	0.64	208.86	4,174.74	16.37	-15.51	20.69	0.55	-0.24	-42.64
4,200.00	0.58	199.77	4,199.74	16.13	-15.62	20.69	0.45	-0.24	-36.36
4,225.00	0.80	217.13	4,224.74	15.87	-15.77	20.73	1.20	0.88	69.44
4,250.00	0.78	200.04	4,249.73	15.57	-15.93	20.76	0.94	-0.08	-68.36
4,275.00	0.85	221.45	4,274.73	15.27	-16.11	20.81	1.24	0.28	85.64
4,300.00	0.62	194.89	4,299.73	15.00	-16.27	20.85	1.62	-0.92	-106.24
4,325.00	0.83	212.32	4,324.73	14.72	-16.40	20.86	1.21	0.84	69.72
4,350.00	0.65	215.99	4,349.73	14.45	-16.58	20.92	0.74	-0.72	14.68
4,375.00	0.85	226.39	4,374.72	14.21	-16.80	21.03	0.96	0.80	41.60
4,400.00	0.73	207.83	4,399.72	13.94	-17.01	21.11	1.12	-0.48	-74.24
4,425.00	0.99	221.18	4,424.72	13.64	-17.22	21.19	1.31	1.04	53.40
4,450.00	0.56	214.26	4,449.72	13.37	-17.43	21.28	1.76	-1.72	-27.68
4,475.00	0.85	223.95	4,474.71	13.14	-17.63	21.37	1.25	1.16	38.76
4,500.00	1.11	217.05	4,499.71	12.81	-17.91	21.50	1.14	1.04	-27.60
4,525.00	1.04	229.46	4,524.71	12.47	-18.22	21.66	0.97	-0.28	49.64
4,550.00	1.30	216.61	4,549.70	12.10	-18.57	21.82	1.47	1.04	-51.40

<b>Company:</b>	KP Kauffman Co, Inc.	<b>Local Co-ordinate Reference:</b>	Well Carl A Miller A #2
<b>Project:</b>	Weld County, CO	<b>TVD Reference:</b>	GL 5046' @ 5046.00ft
<b>Site:</b>	Carl A Miller	<b>MD Reference:</b>	GL 5046' @ 5046.00ft
<b>Well:</b>	Carl A Miller A #2	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Casper District

#### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,575.00	1.09	216.31	4,574.70	11.68	-18.88	21.94	0.84	-0.84	-1.20
4,600.00	1.09	228.06	4,599.69	11.33	-19.19	22.10	0.89	0.00	47.00
4,625.00	1.26	219.19	4,624.69	10.95	-19.54	22.27	0.99	0.68	-35.48
4,650.00	1.16	225.01	4,649.68	10.56	-19.90	22.45	0.63	-0.40	23.28
4,675.00	1.20	228.50	4,674.68	10.21	-20.27	22.65	0.33	0.16	13.96
4,700.00	1.14	223.21	4,699.67	9.85	-20.64	22.85	0.49	-0.24	-21.16
4,725.00	1.12	229.56	4,724.67	9.52	-20.99	23.04	0.51	-0.08	25.40
4,750.00	1.03	226.21	4,749.66	9.20	-21.34	23.24	0.44	-0.36	-13.40
4,754.78	1.06	226.66	4,754.44	9.14	-21.41	23.28	0.65	0.63	9.41
Last SDI Gyro Survey									

#### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.02	-0.04	1st SDI Gyro Survey
4,754.78	4,754.44	9.14	-21.41	Last SDI Gyro Survey

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_