



Survey Certification

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

Operator	KP Kauffman Co, Inc.
Well Name & No.	Frank M. Cavanaugh 3
API #	05-123-09021
County & State	Weld County, CO
SDI Job No.	410315K267682
Rig	N/A
Survey Date	31-Mar-2015

I, Seth M. Burstad, 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 4843.47 feet is true and correct as determined from all available records.

Seth M. Burstad

Signature

6-Apr-2015

Date

Seth M. Burstad

Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District

KP Kauffman Co, Inc.

Weld County, CO

Frank M. Cavanaugh

Frank M. Cavanaugh 3

OH

Design: OH

Standard Survey Report

06 April, 2015



Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Frank M. Cavanaugh 3
Project:	Weld County, CO	TVD Reference:	GL 2429' @ 2429.00ft
Site:	Frank M. Cavanaugh	MD Reference:	GL 2429' @ 2429.00ft
Well:	Frank M. Cavanaugh 3	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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	Frank M. Cavanaugh				
Site Position:		Northing:	1,264,074.95 usft	Latitude:	40° 3' 23.500 N
From:	Lat/Long	Easting:	3,177,754.15 usft	Longitude:	104° 51' 53.928 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.41 °

Well	Frank M. Cavanaugh 3, 620' FNL 650' FWL Sec 14 T1N R67W					
Well Position	+N/-S	0.00 ft	Northing:	1,264,074.95 usft	Latitude:	40° 3' 23.500 N
	+E/-W	0.00 ft	Easting:	3,177,754.15 usft	Longitude:	104° 51' 53.928 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	2,429.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/6/2015	8.47	66.62	52,472

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	130.87	

Survey Program	Date	4/6/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
88.75	4,843.47	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
88.75	0.67	11.26	88.75	0.51	0.10	-0.26	0.75	0.75	0.00
First SDI Gyro Survey									
122.95	0.78	14.98	122.95	0.93	0.20	-0.46	0.35	0.32	10.88
149.56	0.61	21.65	149.55	1.24	0.30	-0.58	0.71	-0.64	25.07
173.83	0.67	24.69	173.82	1.49	0.41	-0.66	0.28	0.25	12.53
199.55	0.50	33.73	199.54	1.72	0.53	-0.72	0.75	-0.66	35.15
223.63	0.59	27.32	223.62	1.91	0.65	-0.76	0.45	0.37	-26.62
247.90	0.69	21.19	247.89	2.16	0.76	-0.84	0.50	0.41	-25.26
274.45	0.50	30.17	274.44	2.41	0.87	-0.92	0.80	-0.72	33.82
296.53	0.48	44.48	296.52	2.56	0.99	-0.93	0.56	-0.09	64.81

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Casper District

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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)
323.22	0.51	46.76	323.20	2.72	1.15	-0.91	0.13	0.11	8.54
349.65	0.60	48.41	349.63	2.89	1.34	-0.88	0.35	0.34	6.24
371.05	0.62	54.24	371.03	3.03	1.52	-0.84	0.30	0.09	27.24
397.56	0.85	72.90	397.54	3.18	1.82	-0.70	1.24	0.87	70.39
424.07	1.12	83.56	424.05	3.26	2.27	-0.42	1.23	1.02	40.21
445.99	1.40	92.54	445.96	3.28	2.75	-0.06	1.56	1.28	40.97
472.58	1.66	103.23	472.54	3.17	3.45	0.53	1.45	0.98	40.20
499.23	1.81	106.35	499.18	2.97	4.23	1.26	0.66	0.56	11.71
524.97	1.84	111.82	524.91	2.70	5.00	2.02	0.69	0.12	21.25
547.24	1.88	116.39	547.16	2.40	5.66	2.71	0.69	0.18	20.52
573.72	1.88	119.91	573.63	1.99	6.43	3.56	0.44	0.00	13.29
599.31	1.76	122.95	599.21	1.57	7.12	4.36	0.60	-0.47	11.88
621.72	1.76	126.53	621.61	1.18	7.68	5.04	0.49	0.00	15.98
647.17	1.69	123.71	647.05	0.74	8.31	5.80	0.43	-0.28	-11.08
673.75	1.69	125.80	673.61	0.29	8.95	6.58	0.23	0.00	7.86
695.89	1.63	124.18	695.74	-0.08	9.48	7.22	0.34	-0.27	-7.32
721.59	1.74	125.23	721.43	-0.51	10.10	7.97	0.44	0.43	4.09
748.60	1.71	121.63	748.43	-0.96	10.78	8.78	0.42	-0.11	-13.33
771.13	1.90	123.72	770.95	-1.34	11.38	9.48	0.89	0.84	9.28
797.26	2.19	126.64	797.06	-1.88	12.14	10.41	1.18	1.11	11.17
823.89	2.45	127.86	823.67	-2.53	12.99	11.48	0.99	0.98	4.58
846.17	2.88	130.62	845.93	-3.19	13.80	12.52	2.01	1.93	12.39
871.74	3.12	132.40	871.46	-4.08	14.80	13.86	1.01	0.94	6.96
899.30	3.47	133.78	898.98	-5.16	15.95	15.44	1.30	1.27	5.01
920.14	3.72	136.02	919.78	-6.08	16.88	16.74	1.38	1.20	10.75
946.70	3.92	137.56	946.28	-7.37	18.09	18.50	0.85	0.75	5.80
973.92	3.85	137.43	973.43	-8.73	19.33	20.33	0.26	-0.26	-0.48
995.25	3.75	138.92	994.72	-9.78	20.28	21.74	0.66	-0.47	6.99
1,022.03	3.53	137.88	1,021.44	-11.06	21.41	23.42	0.86	-0.82	-3.88
1,044.36	3.42	137.69	1,043.73	-12.06	22.32	24.76	0.50	-0.49	-0.85
1,073.62	3.48	140.72	1,072.94	-13.39	23.47	26.51	0.66	0.21	10.36
1,096.10	3.12	140.76	1,095.38	-14.39	24.28	27.78	1.60	-1.60	0.18
1,121.63	2.98	140.89	1,120.88	-15.45	25.14	29.12	0.55	-0.55	0.51
1,148.31	3.00	143.91	1,147.52	-16.55	25.99	30.48	0.60	0.07	11.32
1,170.43	2.83	141.43	1,169.61	-17.44	26.67	31.58	0.96	-0.77	-11.21
1,196.31	2.86	143.61	1,195.46	-18.46	27.45	32.84	0.43	0.12	8.42
1,222.93	2.62	142.62	1,222.05	-19.48	28.22	34.08	0.92	-0.90	-3.72
1,249.44	2.57	143.21	1,248.53	-20.44	28.94	35.26	0.21	-0.19	2.23
1,270.95	2.59	146.81	1,270.02	-21.23	29.50	36.20	0.76	0.09	16.74
1,297.09	2.35	143.47	1,296.13	-22.16	30.14	37.29	1.07	-0.92	-12.78
1,324.50	2.39	145.63	1,323.52	-23.08	30.80	38.39	0.36	0.15	7.88
1,346.05	2.41	146.89	1,345.05	-23.83	31.30	39.26	0.26	0.09	5.85
1,372.44	2.40	142.91	1,371.42	-24.73	31.93	40.33	0.63	-0.04	-15.08

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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)
1,398.81	2.25	147.92	1,397.77	-25.61	32.54	41.37	0.96	-0.57	19.00
1,424.77	2.22	148.87	1,423.71	-26.48	33.07	42.33	0.18	-0.12	3.66
1,446.95	2.02	146.34	1,445.87	-27.17	33.51	43.12	1.00	-0.90	-11.41
1,473.55	2.03	148.15	1,472.46	-27.96	34.02	44.02	0.24	0.04	6.80
1,498.98	1.74	144.46	1,497.87	-28.66	34.48	44.82	1.24	-1.14	-14.51
1,521.85	1.84	149.76	1,520.73	-29.26	34.87	45.51	0.85	0.44	23.17
1,545.38	1.69	151.69	1,544.25	-29.89	35.22	46.19	0.69	-0.64	8.20
1,571.59	1.64	151.87	1,570.45	-30.56	35.58	46.90	0.19	-0.19	0.69
1,598.62	1.54	149.56	1,597.47	-31.21	35.95	47.61	0.44	-0.37	-8.55
1,621.33	1.56	152.38	1,620.17	-31.75	36.25	48.18	0.35	0.09	12.42
1,647.51	1.29	147.34	1,646.34	-32.31	36.57	48.80	1.14	-1.03	-19.25
1,674.34	1.33	149.38	1,673.17	-32.84	36.89	49.38	0.23	0.15	7.60
1,696.25	1.18	153.03	1,695.07	-33.26	37.12	49.83	0.78	-0.68	16.66
1,723.09	1.05	153.90	1,721.90	-33.72	37.36	50.32	0.49	-0.48	3.24
1,745.87	1.12	158.50	1,744.68	-34.12	37.53	50.71	0.49	0.31	20.19
1,771.88	1.07	163.19	1,770.69	-34.59	37.69	51.14	0.39	-0.19	18.03
1,798.90	1.02	166.34	1,797.70	-35.06	37.82	51.54	0.28	-0.19	11.66
1,820.57	0.97	163.50	1,819.37	-35.42	37.92	51.86	0.32	-0.23	-13.11
1,847.39	0.79	163.00	1,846.18	-35.82	38.04	52.20	0.67	-0.67	-1.86
1,874.58	0.98	171.78	1,873.37	-36.23	38.13	52.54	0.86	0.70	32.29
1,896.34	0.88	167.52	1,895.13	-36.58	38.19	52.81	0.56	-0.46	-19.58
1,923.39	0.95	173.19	1,922.18	-37.00	38.26	53.15	0.42	0.26	20.96
1,946.42	0.96	169.17	1,945.20	-37.38	38.32	53.44	0.29	0.04	-17.46
1,973.50	0.88	171.00	1,972.28	-37.81	38.40	53.78	0.31	-0.30	6.76
1,999.61	0.80	170.64	1,998.39	-38.19	38.46	54.07	0.31	-0.31	-1.38
2,022.87	0.76	177.72	2,021.64	-38.50	38.49	54.30	0.45	-0.17	30.44
2,048.24	0.61	181.58	2,047.01	-38.80	38.49	54.50	0.62	-0.59	15.21
2,070.81	0.41	184.42	2,069.58	-39.00	38.48	54.62	0.89	-0.89	12.58
2,097.83	0.37	192.80	2,096.60	-39.19	38.46	54.72	0.26	-0.15	31.01
2,123.70	0.23	201.98	2,122.47	-39.32	38.42	54.78	0.57	-0.54	35.49
2,146.20	0.13	238.50	2,144.97	-39.37	38.38	54.79	0.66	-0.44	162.31
2,172.33	0.16	241.75	2,171.10	-39.40	38.32	54.76	0.12	0.11	12.44
2,199.36	0.23	268.58	2,198.13	-39.42	38.24	54.71	0.42	0.26	99.26
2,221.99	0.25	286.23	2,220.76	-39.41	38.14	54.63	0.34	0.09	77.99
2,248.04	0.43	323.53	2,246.81	-39.32	38.03	54.48	1.06	0.69	143.19
2,274.75	0.52	333.11	2,273.52	-39.13	37.92	54.27	0.45	0.34	35.87
2,297.15	0.58	335.68	2,295.92	-38.93	37.82	54.08	0.29	0.27	11.47
2,322.88	0.55	328.41	2,321.65	-38.71	37.70	53.84	0.30	-0.12	-28.25
2,349.18	0.64	320.62	2,347.94	-38.49	37.55	53.58	0.46	0.34	-29.62
2,371.34	0.53	326.50	2,370.10	-38.31	37.41	53.36	0.56	-0.50	26.53
2,396.95	0.57	331.04	2,395.71	-38.10	37.28	53.12	0.23	0.16	17.73
2,423.32	0.48	326.99	2,422.08	-37.89	37.16	52.89	0.37	-0.34	-15.36
2,449.67	0.59	341.75	2,448.43	-37.67	37.06	52.67	0.67	0.42	56.02

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2,470.95	0.53	340.14	2,469.71	-37.47	36.99	52.49	0.29	-0.28	-7.57
2,497.45	0.51	344.01	2,496.21	-37.24	36.91	52.28	0.15	-0.08	14.60
2,523.02	0.57	355.81	2,521.78	-37.01	36.87	52.10	0.49	0.23	46.15
2,549.22	0.54	358.67	2,547.98	-36.75	36.86	51.92	0.16	-0.11	10.92
2,571.23	0.51	28.26	2,569.98	-36.56	36.91	51.83	1.23	-0.14	134.44
2,596.74	0.38	34.76	2,595.49	-36.39	37.01	51.80	0.55	-0.51	25.48
2,623.17	0.63	36.34	2,621.92	-36.20	37.14	51.78	0.95	0.95	5.98
2,649.58	0.62	41.78	2,648.33	-35.98	37.33	51.77	0.23	-0.04	20.60
2,674.88	0.61	59.48	2,673.63	-35.81	37.53	51.81	0.75	-0.04	69.96
2,696.88	0.65	59.28	2,695.63	-35.69	37.74	51.89	0.18	0.18	-0.91
2,722.39	0.66	68.64	2,721.14	-35.56	38.00	52.01	0.42	0.04	36.69
2,748.77	0.74	78.22	2,747.51	-35.47	38.31	52.18	0.54	0.30	36.32
2,770.85	0.74	79.93	2,769.59	-35.42	38.59	52.36	0.10	0.00	7.74
2,796.34	0.71	94.80	2,795.08	-35.40	38.91	52.59	0.75	-0.12	58.34
2,823.35	0.81	100.95	2,822.09	-35.45	39.26	52.89	0.48	0.37	22.77
2,849.45	0.85	116.45	2,848.19	-35.57	39.62	53.24	0.87	0.15	59.39
2,871.56	0.96	114.16	2,870.29	-35.72	39.93	53.57	0.52	0.50	-10.36
2,897.05	0.88	113.31	2,895.78	-35.89	40.31	53.96	0.32	-0.31	-3.33
2,923.06	1.06	118.03	2,921.79	-36.08	40.70	54.39	0.76	0.69	18.15
2,949.98	0.90	114.98	2,948.70	-36.28	41.12	54.83	0.62	-0.59	-11.33
2,971.62	0.91	119.64	2,970.34	-36.44	41.42	55.17	0.34	0.05	21.53
2,998.68	0.95	118.69	2,997.40	-36.65	41.80	55.60	0.16	0.15	-3.51
3,024.78	0.93	120.83	3,023.49	-36.87	42.17	56.02	0.15	-0.08	8.20
3,046.90	0.83	114.10	3,045.61	-37.02	42.47	56.35	0.65	-0.45	-30.42
3,073.45	0.82	123.81	3,072.16	-37.21	42.81	56.72	0.53	-0.04	36.57
3,098.97	0.78	114.85	3,097.67	-37.38	43.12	57.07	0.51	-0.16	-35.11
3,121.14	0.75	111.38	3,119.84	-37.50	43.39	57.35	0.25	-0.14	-15.65
3,146.64	0.75	127.26	3,145.34	-37.66	43.68	57.67	0.81	0.00	62.27
3,173.16	0.74	139.58	3,171.86	-37.90	43.93	58.02	0.60	-0.04	46.46
3,199.61	0.67	136.18	3,198.31	-38.14	44.14	58.34	0.31	-0.26	-12.85
3,220.91	0.69	136.30	3,219.60	-38.32	44.32	58.59	0.09	0.09	0.56
3,247.39	0.67	143.99	3,246.08	-38.56	44.52	58.90	0.35	-0.08	29.04
3,273.62	0.51	133.94	3,272.31	-38.77	44.69	59.17	0.72	-0.61	-38.31
3,299.25	0.53	141.38	3,297.94	-38.94	44.85	59.40	0.27	0.08	29.03
3,321.28	0.41	135.63	3,319.97	-39.07	44.97	59.57	0.58	-0.54	-26.10
3,347.46	0.43	136.28	3,346.15	-39.21	45.10	59.77	0.08	0.08	2.48
3,373.27	0.36	138.18	3,371.96	-39.34	45.22	59.94	0.28	-0.27	7.36
3,399.40	0.31	142.62	3,398.09	-39.46	45.32	60.09	0.22	-0.19	16.99
3,421.56	0.35	128.95	3,420.25	-39.55	45.41	60.22	0.40	0.18	-61.69
3,447.12	0.27	126.36	3,445.81	-39.64	45.52	60.36	0.32	-0.31	-10.13
3,473.18	0.24	133.01	3,471.87	-39.71	45.61	60.47	0.16	-0.12	25.52
3,499.73	0.40	155.15	3,498.42	-39.83	45.69	60.61	0.75	0.60	83.39
3,520.84	0.51	151.67	3,519.53	-39.98	45.76	60.77	0.54	0.52	-16.49
3,547.25	0.48	170.45	3,545.93	-40.19	45.84	60.96	0.62	-0.11	71.11

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Frank M. Cavanaugh 3
Project:	Weld County, CO	TVD Reference:	GL 2429' @ 2429.00ft
Site:	Frank M. Cavanaugh	MD Reference:	GL 2429' @ 2429.00ft
Well:	Frank M. Cavanaugh 3	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)
3,572.81	0.40	156.49	3,571.49	-40.38	45.89	61.13	0.52	-0.31	-54.62
3,598.66	0.36	164.97	3,597.34	-40.54	45.95	61.27	0.27	-0.15	32.80
3,624.58	0.49	161.12	3,623.26	-40.73	46.01	61.44	0.51	0.50	-14.85
3,649.49	0.39	150.28	3,648.17	-40.90	46.08	61.61	0.52	-0.40	-43.52
3,674.97	0.36	180.36	3,673.65	-41.05	46.13	61.74	0.77	-0.12	118.05
3,697.52	0.42	187.94	3,696.20	-41.21	46.11	61.83	0.35	0.27	33.61
3,723.61	0.26	130.53	3,722.29	-41.34	46.15	61.95	1.36	-0.61	-220.05
3,746.84	0.20	142.67	3,745.52	-41.41	46.21	62.04	0.33	-0.26	52.26
3,772.53	0.21	220.02	3,771.21	-41.48	46.21	62.08	1.00	0.04	301.09
3,799.40	0.17	247.90	3,798.08	-41.53	46.14	62.07	0.37	-0.15	103.76
3,821.80	0.16	265.28	3,820.48	-41.55	46.08	62.03	0.23	-0.04	77.59
3,847.74	0.26	267.62	3,846.42	-41.55	45.98	61.96	0.39	0.39	9.02
3,874.53	0.39	288.57	3,873.21	-41.53	45.83	61.83	0.65	0.49	78.20
3,896.57	0.53	279.89	3,895.25	-41.48	45.66	61.67	0.71	0.64	-39.38
3,922.68	0.71	281.62	3,921.36	-41.43	45.39	61.43	0.69	0.69	6.63
3,949.26	0.76	290.52	3,947.93	-41.34	45.06	61.12	0.47	0.19	33.48
3,972.31	0.80	286.90	3,970.98	-41.24	44.76	60.83	0.28	0.17	-15.70
3,999.68	0.80	304.61	3,998.35	-41.07	44.42	60.47	0.90	0.00	64.71
4,021.04	0.72	315.67	4,019.71	-40.89	44.20	60.18	0.78	-0.37	51.78
4,047.76	0.59	336.46	4,046.43	-40.64	44.03	59.89	1.01	-0.49	77.81
4,073.43	0.51	4.02	4,072.10	-40.41	43.99	59.71	1.06	-0.31	107.36
4,099.96	0.37	42.50	4,098.62	-40.23	44.05	59.64	1.20	-0.53	145.04
4,122.00	0.57	56.46	4,120.66	-40.12	44.19	59.67	1.04	0.91	63.34
4,147.98	0.57	74.24	4,146.64	-40.01	44.43	59.77	0.68	0.00	68.44
4,174.53	0.71	63.36	4,173.19	-39.90	44.70	59.91	0.70	0.53	-40.98
4,196.51	0.75	77.38	4,195.17	-39.81	44.96	60.05	0.83	0.18	63.79
4,222.36	0.78	82.32	4,221.02	-39.75	45.30	60.26	0.28	0.12	19.11
4,248.46	0.74	91.11	4,247.11	-39.73	45.65	60.51	0.47	-0.15	33.68
4,274.86	0.86	79.38	4,273.51	-39.69	46.01	60.77	0.77	0.45	-44.43
4,296.37	0.89	79.16	4,295.02	-39.63	46.33	60.97	0.14	0.14	-1.02
4,323.00	0.64	75.89	4,321.65	-39.56	46.68	61.18	0.95	-0.94	-12.28
4,349.75	0.56	81.34	4,348.40	-39.50	46.96	61.35	0.37	-0.30	20.37
4,371.65	0.50	84.93	4,370.29	-39.48	47.16	61.49	0.31	-0.27	16.39
4,398.52	0.37	62.22	4,397.16	-39.42	47.35	61.60	0.79	-0.48	-84.52
4,420.08	0.32	61.53	4,418.72	-39.36	47.46	61.65	0.23	-0.23	-3.20
4,447.43	0.18	118.52	4,446.07	-39.35	47.57	61.72	0.98	-0.51	208.37
4,474.22	0.19	122.68	4,472.86	-39.39	47.64	61.80	0.06	0.04	15.53
4,499.66	0.23	76.81	4,498.30	-39.40	47.73	61.88	0.66	0.16	-180.31
4,522.50	0.23	132.43	4,521.14	-39.42	47.81	61.95	0.94	0.00	243.52
4,549.04	0.46	160.53	4,547.68	-39.56	47.88	62.09	1.05	0.87	105.88
4,574.92	0.42	151.83	4,573.56	-39.74	47.96	62.27	0.30	-0.15	-33.62
4,597.33	0.32	130.36	4,595.97	-39.85	48.05	62.41	0.76	-0.45	-95.81
4,623.81	0.28	149.17	4,622.45	-39.96	48.14	62.55	0.40	-0.15	71.03

Company:	KP Kauffman Co, Inc.	Local Co-ordinate Reference:	Well Frank M. Cavanaugh 3
Project:	Weld County, CO	TVD Reference:	GL 2429' @ 2429.00ft
Site:	Frank M. Cavanaugh	MD Reference:	GL 2429' @ 2429.00ft
Well:	Frank M. Cavanaugh 3	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)	
4,649.47	0.34	145.96	4,648.11	-40.07	48.21	62.68	0.24	0.23	-12.51	
4,670.61	0.16	129.62	4,669.25	-40.15	48.27	62.77	0.91	-0.85	-77.29	
4,697.60	0.12	160.63	4,696.24	-40.20	48.31	62.83	0.31	-0.15	114.89	
4,723.07	0.38	243.91	4,721.71	-40.26	48.24	62.82	1.51	1.02	326.97	
4,749.02	0.59	239.23	4,747.66	-40.36	48.05	62.75	0.82	0.81	-18.03	
4,773.82	0.51	229.72	4,772.46	-40.50	47.86	62.69	0.49	-0.32	-38.35	
4,798.61	0.39	238.29	4,797.25	-40.62	47.70	62.65	0.55	-0.48	34.57	
4,824.68	0.82	235.87	4,823.32	-40.77	47.47	62.57	1.65	1.65	-9.28	
4,843.47	0.57	237.57	4,842.10	-40.89	47.28	62.51	1.33	-1.33	9.05	
Last SDI Gyro Survey										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
88.75	88.75	0.51	0.10	First SDI Gyro Survey	
4,843.47	4,842.10	-40.89	47.28	Last SDI Gyro Survey	

Checked By: _____ Approved By: _____ Date: _____