Job Number: 111337	**State/Country: Colorado/USA**
Company: Ranchers	**Declination: 8.86**
Lease/Well: Ranchers #3	**Grid: Grid North**
Location: Eaton	**File name: C:\WINSERVE\111337.SVY**
Rig Name: Fort Drilling #5	**Date/Time: 19-Jun-11 / 22:08**
RKB: 4866	**Curve Name: Work**
G.L. or M.S.L.: 4854	

ARK Directional Services

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 320.13
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
578.00	1.19	196.37	577.96	-5.76	-1.69	-3.34	6.00	196.37	.21
671.00	.88	327.38	670.95	-6.08	-2.35	-3.16	6.52	201.11	2.03
764.00	2.11	304.00	763.92	-4.52	-4.15	-.81	6.14	222.55	1.45
858.00	4.48	327.07	857.76	-.48	-7.58	4.50	7.60	266.41	2.84
952.00	6.20	337.26	951.35	7.29	-11.54	12.99	13.65	302.27	2.08
1045.00	8.09	334.76	1043.62	17.84	-16.27	24.13	24.15	317.63	2.06
1139.00	10.42	337.75	1136.40	31.69	-22.31	38.63	38.76	324.85	2.53
1232.00	11.29	327.46	1227.74	47.15	-30.40	55.68	56.10	327.19	2.28
1325.00	12.30	333.75	1318.78	63.71	-39.68	74.33	75.06	328.09	1.76
1419.00	13.18	329.18	1410.47	81.90	-49.59	94.65	95.74	328.80	1.42
1512.00	15.29	327.24	1500.60	101.32	-61.66	117.29	118.61	328.67	2.33
1606.00	17.49	328.78	1590.78	123.82	-75.69	143.56	145.12	328.56	2.39
1699.00	18.11	320.65	1679.34	146.95	-92.10	171.83	173.43	327.92	2.75
1793.00	17.80	315.95	1768.77	168.58	-111.36	200.77	202.04	326.55	1.58
1886.00	17.40	314.46	1857.42	188.53	-131.17	228.79	229.67	325.17	.65
1980.00	17.01	314.06	1947.21	207.94	-151.08	256.44	257.03	324.00	.43
2073.00	17.40	316.08	2036.05	227.42	-170.50	283.84	284.23	323.14	.77
2167.00	17.18	318.85	2125.80	247.99	-189.38	311.74	312.04	322.63	.91
2260.00	17.49	316.65	2214.58	268.50	-208.02	339.42	339.65	322.23	.78
2354.00	17.71	315.38	2304.18	288.95	-227.76	367.77	367.92	321.75	.47
2448.00	18.19	316.87	2393.60	309.83	-247.83	396.67	396.76	321.34	.71
2541.00	18.19	312.35	2481.96	330.21	-268.48	425.54	425.58	320.89	1.52

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
2635.00	17.40	314.37	2571.46	349.92	-289.37	454.06	454.07	320.41	1.07
2728.00	18.59	317.75	2659.91	370.62	-309.28	482.71	482.71	320.15	1.70
2822.00	18.02	321.05	2749.16	393.02	-328.50	512.22	512.22	320.11	1.26
2915.00	18.28	319.86	2837.53	415.35	-346.94	541.19	541.19	320.13	.49
3009.00	19.29	319.47	2926.53	438.42	-366.54	571.46	571.46	320.10	1.08
3102.00	19.60	320.65	3014.22	462.16	-386.41	602.42	602.42	320.10	.54
3196.00	16.70	318.85	3103.53	484.53	-405.30	631.69	631.69	320.09	3.14
3289.00	16.92	320.48	3192.56	505.03	-422.70	658.58	658.58	320.07	.56
3383.00	18.41	321.18	3282.13	527.15	-440.71	687.10	687.10	320.10	1.60
3477.00	17.40	320.87	3371.57	549.62	-458.89	716.00	716.00	320.14	1.08
3571.00	16.61	322.54	3461.46	571.18	-475.93	743.48	743.48	320.20	.99
3665.00	15.91	323.38	3551.70	592.19	-491.78	769.76	769.77	320.29	.79
3759.00	15.12	326.28	3642.28	612.73	-506.28	794.82	794.83	320.43	1.18
3852.00	13.89	321.18	3732.32	631.51	-520.01	818.04	818.06	320.53	1.91
3945.00	15.82	319.77	3822.20	649.89	-535.19	841.88	841.90	320.53	2.11
4039.00	18.72	323.07	3911.96	671.74	-552.54	869.76	869.79	320.56	3.26
4133.00	20.39	319.55	4000.54	696.26	-572.23	901.20	901.23	320.58	2.17
4227.00	19.60	317.27	4088.87	720.30	-593.55	933.33	933.35	320.51	1.18
4321.00	19.51	317.44	4177.45	743.44	-614.86	964.75	964.76	320.41	.11
4415.00	18.11	318.76	4266.43	765.99	-635.11	995.04	995.04	320.34	1.56
4508.00	16.89	320.26	4355.12	787.25	-653.28	1023.00	1023.00	320.31	1.40
4602.00	17.09	322.85	4445.02	808.76	-670.35	1050.45	1050.46	320.35	.83
4695.00	18.19	323.86	4533.65	831.38	-687.16	1078.59	1078.60	320.42	1.23
4789.00	17.89	321.18	4623.03	854.47	-704.87	1107.66	1107.68	320.48	.94
4882.00	19.38	321.84	4711.15	877.74	-723.36	1137.37	1137.40	320.51	1.62
4976.00	18.28	322.76	4800.12	901.74	-741.92	1167.69	1167.72	320.55	1.21
5070.00	17.40	321.66	4889.60	924.50	-759.56	1196.46	1196.50	320.59	1.00
5163.00	17.71	318.54	4978.27	946.01	-777.55	1224.51	1224.54	320.58	1.07
5257.00	17.89	320.48	5067.77	967.86	-796.20	1253.24	1253.27	320.56	.66
5351.00	18.98	319.55	5156.94	990.63	-815.31	1282.96	1282.99	320.54	1.20
5444.00	16.30	319.16	5245.56	1012.02	-833.66	1311.14	1311.17	320.52	2.88
5535.00	13.50	320.17	5333.49	1029.84	-848.81	1334.53	1334.56	320.50	3.09
5631.00	11.21	320.34	5427.26	1045.63	-861.95	1355.07	1355.10	320.50	2.39
5725.00	9.32	320.17	5519.75	1058.51	-872.66	1371.82	1371.85	320.50	2.01
5819.00	7.69	313.66	5612.72	1068.70	-882.08	1385.68	1385.71	320.46	2.01
5913.00	6.20	317.18	5706.03	1076.76	-890.08	1397.00	1397.02	320.42	1.65
6007.00	4.92	313.97	5799.58	1083.28	-896.44	1406.08	1406.09	320.39	1.40
6101.00	4.31	316.35	5893.28	1088.64	-901.77	1413.61	1413.62	320.36	.68
6194.00	3.12	317.44	5986.08	1093.03	-905.90	1419.63	1419.64	320.35	1.28
6288.00	2.11	304.74	6079.98	1095.90	-909.05	1423.85	1423.86	320.32	1.23
6381.00	1.58	301.76	6172.94	1097.55	-911.55	1426.72	1426.72	320.29	.58
6475.00	.88	287.08	6266.91	1098.45	-913.34	1428.55	1428.56	320.26	.81
6568.00	.88	293.14	6359.90	1098.94	-914.68	1429.79	1429.79	320.23	.10

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
6662.00	.48	214.35	6453.90	1098.90	-915.57	1430.32	1430.33	320.20	.98
6756.00	.22	238.17	6547.90	1098.48	-915.94	1430.24	1430.24	320.18	.31
6849.00	.09	332.47	6640.90	1098.45	-916.13	1430.34	1430.34	320.17	.26
6942.00	.70	263.07	6733.89	1098.44	-916.72	1430.72	1430.72	320.15	.72
7036.00	1.10	296.17	6827.88	1098.77	-918.10	1431.86	1431.86	320.12	.68
7130.00	.88	359.68	6921.87	1099.89	-918.92	1433.24	1433.24	320.12	1.13
7225.00	1.80	349.17	7016.84	1102.09	-919.20	1435.10	1435.10	320.17	1.00
7318.00	1.89	20.24	7109.80	1104.96	-918.95	1437.15	1437.15	320.25	1.07
7411.00	2.11	26.75	7202.74	1107.93	-917.64	1438.59	1438.60	320.37	.34
7505.00	2.20	24.46	7296.67	1111.11	-916.12	1440.06	1440.09	320.49	.13
7599.00	2.11	22.66	7390.61	1114.35	-914.71	1441.64	1441.69	320.62	.12
7694.00	2.20	9.48	7485.54	1117.77	-913.73	1443.63	1443.71	320.74	.53
7789.00	2.20	3.37	7580.47	1121.39	-913.32	1446.15	1446.26	320.84	.25
7883.00	1.71	15.67	7674.42	1124.54	-912.84	1448.26	1448.40	320.93	.68
7977.00	1.49	22.35	7768.38	1127.02	-911.99	1449.62	1449.79	321.02	.31
8071.00	1.58	26.35	7862.35	1129.31	-910.96	1450.71	1450.92	321.11	.15
8110.00	1.19	12.64	7901.33	1130.19	-910.63	1451.17	1451.40	321.14	1.31
Projection to Bit									
8160.00	1.19	12.64	7951.32	1131.20	-910.40	1451.81	1452.05	321.17	.00