



**Job Number:** 1020374  
**Company:** Black Hills E&P  
**Lease/Well:** Ute #34-41  
**Location:** La Plata County, Colorado  
**Rig Name:** Aztec 507  
**RKB:** 7337'  
**G.L. or M.S.L.:** 7326'

**State/Country:** CO  
**Declination:** 10.00985  
**Grid:** 53.85  
**File name:** C:\102037~1\#34-41.SVY  
**Date/Time:** 05-Jul-10 / 06:27  
**Curve Name:** Ute #34-41 Surveys

### Ute #34-41 Surveys

WINSERVE SURVEY CALCULATIONS  
*Minimum Curvature Method*  
*Vertical Section Plane 212.20*  
*Vertical Section Referenced to Wellhead*  
*Rectangular Coordinates Referenced to Wellhead*

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E Distance FT</i>	<i>Direction Deg</i>	<i>Dogleg Severity Deg/100</i>
<b>Surface Tie In Point</b>									
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
<b>First Nevis MWD Surveys</b>									
450.00	.00	.00	450.00	.00	.00	.00	.00	.00	.00
512.00	.10	70.70	512.00	.02	.05	-.04	.05	70.69	.16
543.00	.10	237.00	543.00	.01	.05	-.04	.06	77.35	.64
574.00	.80	259.20	574.00	-.04	-.18	.13	.19	256.61	2.29
604.00	2.00	223.20	603.99	-.46	-.75	.79	.88	238.10	4.77
635.00	2.70	229.20	634.96	-1.34	-1.67	2.02	2.14	231.33	2.39
666.00	3.20	221.60	665.92	-2.46	-2.80	3.57	3.72	228.66	2.04
697.00	4.50	217.40	696.85	-4.07	-4.11	5.64	5.79	225.25	4.29
727.00	4.90	211.40	726.75	-6.10	-5.49	8.09	8.21	221.99	2.11
759.00	6.30	214.20	758.60	-8.72	-7.19	11.21	11.30	219.51	4.46
790.00	6.90	215.20	789.39	-11.65	-9.22	14.77	14.86	218.36	1.97
821.00	8.30	212.60	820.12	-15.06	-11.50	18.87	18.94	217.37	4.65
852.00	8.50	211.30	850.79	-18.90	-13.89	23.40	23.46	216.32	.89
882.00	9.10	216.00	880.43	-22.71	-16.44	27.98	28.04	215.90	3.12
913.00	9.70	215.60	911.02	-26.82	-19.40	33.03	33.10	215.88	1.95
943.00	10.40	216.00	940.56	-31.06	-22.46	38.26	38.34	215.87	2.34
974.00	11.60	215.30	970.99	-35.87	-25.91	44.16	44.25	215.84	3.89
1005.00	11.80	214.60	1001.34	-41.02	-29.51	50.44	50.54	215.73	.79
1038.00	12.70	217.00	1033.59	-46.70	-33.61	57.43	57.54	215.74	3.13
1069.00	13.70	216.40	1063.77	-52.38	-37.84	64.48	64.61	215.85	3.26

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
				FT	FT	FT	Distance FT	Direction Deg	
1100.00	14.00	216.10	1093.87	-58.36	-42.23	71.89	72.04	215.89	1.00
1131.00	14.30	215.20	1123.93	-64.52	-46.64	79.45	79.61	215.87	1.20
1163.00	14.20	214.90	1154.95	-70.97	-51.17	87.32	87.49	215.79	.39
1194.00	14.90	213.60	1184.95	-77.40	-55.55	95.10	95.27	215.66	2.49
1225.00	15.30	213.90	1214.88	-84.12	-60.04	103.17	103.35	215.52	1.31
1255.00	15.80	212.50	1243.78	-90.85	-64.44	111.21	111.38	215.35	2.08
1286.00	16.70	214.40	1273.54	-98.08	-69.22	119.88	120.05	215.21	3.37
1318.00	17.30	215.70	1304.15	-105.74	-74.60	129.23	129.41	215.20	2.22
1350.00	17.20	213.10	1334.71	-113.57	-79.96	138.71	138.89	215.15	2.43
1382.00	17.50	215.40	1365.25	-121.45	-85.33	148.24	148.43	215.09	2.34
1413.00	18.40	214.90	1394.74	-129.27	-90.83	157.78	157.99	215.09	2.95
1444.00	18.20	216.80	1424.17	-137.16	-96.53	167.50	167.72	215.14	2.03
1476.00	18.60	217.20	1454.54	-145.22	-102.61	177.56	177.81	215.24	1.31
1507.00	19.10	217.20	1483.88	-153.20	-108.66	187.54	187.82	215.35	1.61
1539.00	20.40	215.80	1513.99	-161.89	-115.09	198.32	198.63	215.41	4.32
1570.00	21.30	216.00	1542.96	-170.83	-121.56	209.33	209.67	215.43	2.91
1602.00	22.80	215.90	1572.62	-180.56	-128.61	221.32	221.68	215.46	4.69
1633.00	22.70	216.50	1601.21	-190.23	-135.69	233.28	233.67	215.50	.82
1665.00	23.40	217.00	1630.65	-200.27	-143.19	245.77	246.19	215.56	2.27
1696.00	24.20	215.70	1659.02	-210.35	-150.60	258.24	258.70	215.60	3.09
1728.00	24.60	214.50	1688.16	-221.16	-158.20	271.45	271.92	215.58	1.99
1760.00	24.50	211.10	1717.27	-232.33	-165.40	284.74	285.19	215.45	4.43
1792.00	24.40	209.90	1746.40	-243.74	-172.12	297.97	298.39	215.23	1.58
1824.00	24.30	208.70	1775.55	-255.25	-178.58	311.15	311.52	214.98	1.58
1855.00	24.20	210.50	1803.82	-266.32	-184.87	323.87	324.19	214.77	2.41
1887.00	24.00	208.00	1833.03	-277.72	-191.25	336.91	337.20	214.55	3.25
1918.00	24.50	209.40	1861.29	-288.88	-197.37	349.62	349.87	214.34	2.46
1950.00	24.30	208.40	1890.44	-300.45	-203.76	362.82	363.03	214.14	1.43
1982.00	24.70	210.40	1919.56	-312.01	-210.27	376.07	376.25	213.98	2.88
2014.00	25.40	210.30	1948.55	-323.71	-217.12	389.61	389.78	213.85	2.19
2045.00	25.00	209.50	1976.59	-335.15	-223.70	402.80	402.94	213.72	1.69
2077.00	25.60	211.90	2005.53	-346.90	-230.68	416.47	416.60	213.62	3.71
2108.00	25.70	211.20	2033.47	-358.34	-237.70	429.89	430.01	213.56	1.03
2139.00	25.30	211.70	2061.45	-369.72	-244.66	443.23	443.35	213.49	1.47
2171.00	25.40	212.30	2090.37	-381.34	-251.92	456.93	457.04	213.45	.86
2202.00	25.50	212.60	2118.36	-392.58	-259.07	470.25	470.36	213.42	.53
2233.00	25.30	210.20	2146.37	-403.93	-266.00	483.55	483.65	213.37	3.38
2264.00	24.90	210.30	2174.44	-415.29	-272.62	496.69	496.78	213.28	1.30
2296.00	25.00	210.20	2203.45	-426.95	-279.42	510.18	510.26	213.20	.34
2328.00	25.10	211.30	2232.44	-438.59	-286.35	523.73	523.80	213.14	1.49
2360.00	25.40	210.30	2261.39	-450.32	-293.34	537.37	537.43	213.08	1.63
2391.00	25.40	211.50	2289.39	-461.73	-300.17	550.66	550.72	213.03	1.66
2423.00	25.40	211.60	2318.30	-473.42	-307.35	564.39	564.44	212.99	.13
2454.00	25.40	209.50	2346.30	-484.87	-314.11	577.68	577.73	212.94	2.91
2486.00	25.30	211.40	2375.22	-496.68	-321.05	591.37	591.41	212.88	2.56

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
				FT	FT	FT	Distance FT	Direction Deg	
2518.00	25.20	209.50	2404.16	-508.45	-327.97	605.01	605.05	212.82	2.55
2549.00	24.60	208.70	2432.28	-519.85	-334.32	618.05	618.07	212.74	2.22
2581.00	25.00	209.50	2461.33	-531.58	-340.84	631.45	631.47	212.67	1.63
2612.00	24.80	211.40	2489.45	-542.83	-347.46	644.49	644.51	212.62	2.66
2644.00	25.10	210.70	2518.46	-554.40	-354.42	657.99	658.00	212.59	1.32
2676.00	25.10	209.90	2547.44	-566.12	-361.27	671.55	671.57	212.54	1.06
2707.00	25.00	211.60	2575.52	-577.40	-367.98	684.68	684.69	212.51	2.34
2738.00	24.70	212.10	2603.65	-588.46	-374.85	697.70	697.71	212.50	1.18
2770.00	25.00	213.20	2632.69	-599.78	-382.11	711.15	711.16	212.50	1.72
2801.00	24.50	211.20	2660.84	-610.76	-389.02	724.13	724.14	212.50	3.15
2833.00	24.80	210.70	2689.93	-622.21	-395.89	737.47	737.48	212.47	1.14
2865.00	24.50	212.90	2719.01	-633.55	-402.92	750.81	750.82	212.46	3.02
2896.00	25.00	214.00	2747.16	-644.38	-410.07	763.79	763.80	212.47	2.19
2928.00	25.00	214.50	2776.17	-655.56	-417.68	777.30	777.31	212.50	.66
2960.00	25.30	213.70	2805.13	-666.82	-425.31	790.89	790.91	212.53	1.42
2992.00	24.80	214.80	2834.12	-678.02	-432.93	804.43	804.45	212.56	2.14
3023.00	25.30	214.00	2862.21	-688.85	-440.35	817.55	817.57	212.59	1.95
3054.00	24.70	214.40	2890.30	-699.68	-447.71	830.64	830.66	212.61	2.01
3086.00	25.00	213.30	2919.34	-710.85	-455.20	844.08	844.11	212.63	1.72
3118.00	24.70	214.20	2948.38	-722.03	-462.67	857.53	857.55	212.65	1.51
3150.00	24.70	213.10	2977.45	-733.17	-470.08	870.89	870.92	212.67	1.44
3181.00	24.50	213.00	3005.64	-743.98	-477.12	883.80	883.83	212.67	.66
3213.00	24.60	213.50	3034.74	-755.10	-484.41	897.09	897.12	212.68	.72
3245.00	24.60	213.80	3063.84	-766.19	-491.79	910.41	910.44	212.69	.39
3276.00	23.90	212.90	3092.10	-776.82	-498.79	923.14	923.17	212.70	2.55
3308.00	23.60	212.90	3121.39	-787.65	-505.79	936.02	936.06	212.71	.94
3340.00	24.50	214.40	3150.62	-798.50	-513.02	949.06	949.10	212.72	3.40
3372.00	23.90	213.90	3179.80	-809.35	-520.38	962.17	962.21	212.74	1.98
3404.00	24.30	214.50	3209.01	-820.16	-527.73	975.23	975.27	212.76	1.47
3435.00	24.90	214.60	3237.20	-830.79	-535.05	988.12	988.17	212.78	1.94
3467.00	25.00	215.00	3266.21	-841.87	-542.75	1001.61	1001.66	212.81	.61
3498.00	24.60	215.70	3294.35	-852.48	-550.27	1014.59	1014.65	212.84	1.60
3529.00	24.90	216.50	3322.51	-862.96	-557.92	1027.54	1027.61	212.88	1.45
3559.00	24.70	216.70	3349.74	-873.07	-565.42	1040.08	1040.17	212.93	.72
3591.00	24.10	216.30	3378.88	-883.69	-573.29	1053.27	1053.36	212.97	1.94
3621.00	23.90	213.80	3406.29	-893.68	-580.29	1065.45	1065.55	213.00	3.45
3652.00	23.70	213.90	3434.65	-904.07	-587.26	1077.95	1078.06	213.01	.66
3685.00	23.10	212.80	3464.94	-915.02	-594.47	1091.06	1091.17	213.01	2.25
3716.00	22.90	214.60	3493.47	-925.09	-601.19	1103.16	1103.28	213.02	2.36
3747.00	22.70	212.90	3522.05	-935.08	-607.86	1115.17	1115.29	213.03	2.22
3779.00	22.40	213.50	3551.61	-945.35	-614.58	1127.44	1127.56	213.03	1.18
3811.00	22.80	212.90	3581.15	-955.64	-621.31	1139.74	1139.86	213.03	1.44
3842.00	22.40	211.70	3609.77	-965.71	-627.68	1151.65	1151.77	213.02	1.97
3873.00	23.30	211.00	3638.34	-975.99	-633.94	1163.69	1163.80	213.01	3.03
3905.00	22.40	209.50	3667.82	-986.72	-640.20	1176.10	1176.21	212.98	3.35

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3936.00	22.00	210.70	3696.53	-996.85	-646.07	1187.81	1187.91	212.95	1.95
3967.00	21.80	208.00	3725.29	-1006.93	-651.74	1199.35	1199.45	212.91	3.31
3999.00	21.80	206.70	3755.00	-1017.48	-657.20	1211.19	1211.27	212.86	1.51
4031.00	21.40	205.40	3784.75	-1028.06	-662.38	1222.91	1222.97	212.79	1.95
4063.00	21.00	203.90	3814.59	-1038.58	-667.20	1234.38	1234.43	212.72	2.11
4094.00	21.30	203.90	3843.50	-1048.81	-671.73	1245.44	1245.48	212.64	.97
4125.00	21.20	205.10	3872.39	-1059.03	-676.39	1256.58	1256.60	212.57	1.44
4157.00	21.50	204.90	3902.20	-1069.59	-681.32	1268.14	1268.15	212.50	.96
4188.00	22.30	207.50	3930.96	-1079.96	-686.42	1279.63	1279.64	212.44	4.05
4219.00	22.00	207.30	3959.67	-1090.34	-691.80	1291.28	1291.29	212.39	1.00
4251.00	21.40	206.50	3989.41	-1100.89	-697.16	1303.06	1303.07	212.34	2.09
4283.00	21.40	208.70	4019.20	-1111.23	-702.57	1314.70	1314.70	212.30	2.51
4313.00	21.20	210.70	4047.15	-1120.70	-707.96	1325.58	1325.58	212.28	2.51
4345.00	20.80	208.70	4077.03	-1130.66	-713.65	1337.04	1337.04	212.26	2.56
Last Nevis MWD Survey									
4376.00	21.10	211.30	4105.98	-1140.25	-719.19	1348.11	1348.11	212.24	3.15
Projection to TD									
4428.00	21.20	211.30	4154.47	-1156.28	-728.94	1366.87	1366.87	212.23	.19