



**Bighorn
Directional
Incorporated**

Job Number: 132
Company: Nighthawk Production
Lease/Well: Telluride 13-2
Location: Genoa CO
Rig Name: Xtreme #11
RKB:
G.L. or M.S.L.:

State/Country: Colorado
Declination:
Grid:
File name: C:\USERS\VENGAS~1\DESKTOP\WELLIN~1\132.SVY
Date/Time: 08-Dec-13 / 12:35
Curve Name: Survey's

Bighorn Directional Inc.

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 68.60
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>Vertical Section FT</i> | <i>N-S FT</i> | <i>E-W FT</i> | <i>Dogleg Severity Deg/100</i> |
|----------------------------------|-------------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------|-------------------|----------------------------------------|
| 284.00 | 1.01 | 52.34 | 283.98 | 2.64 | .85 | 2.50 | .00 |
| 368.00 | 1.00 | 69.80 | 367.97 | 4.08 | 1.55 | 3.78 | .36 |
| 430.00 | .90 | 80.70 | 429.96 | 5.10 | 1.82 | 4.76 | .33 |
| 491.00 | 1.00 | 79.10 | 490.95 | 6.09 | 2.00 | 5.76 | .17 |
| 553.00 | .80 | 61.90 | 552.94 | 7.05 | 2.30 | 6.67 | .54 |
| 614.00 | .80 | 38.50 | 613.94 | 7.84 | 2.84 | 7.31 | .53 |
| 676.00 | 1.00 | 27.60 | 675.93 | 8.63 | 3.65 | 7.83 | .42 |
| 737.00 | .90 | 29.80 | 736.92 | 9.40 | 4.54 | 8.32 | .17 |
| 800.00 | .90 | 33.70 | 799.91 | 10.19 | 5.38 | 8.84 | .10 |
| 861.00 | 1.60 | 4.00 | 860.90 | 10.95 | 6.63 | 9.16 | 1.53 |
| 922.00 | 1.90 | 3.30 | 921.87 | 11.74 | 8.49 | 9.28 | .49 |
| 983.00 | 3.00 | 7.70 | 982.81 | 12.94 | 11.08 | 9.55 | 1.83 |
| 1044.00 | 3.30 | 8.80 | 1043.72 | 14.60 | 14.40 | 10.04 | .50 |
| 1106.00 | 3.00 | 7.70 | 1105.63 | 16.28 | 17.77 | 10.53 | .49 |
| 1191.00 | 1.80 | 358.10 | 1190.55 | 17.81 | 21.31 | 10.78 | 1.48 |
| 1276.00 | 2.50 | 46.60 | 1275.50 | 19.98 | 23.92 | 12.08 | 2.21 |
| 1362.00 | 2.20 | 57.50 | 1361.43 | 23.33 | 26.09 | 14.84 | .62 |
| 1447.00 | 2.60 | 60.30 | 1446.35 | 26.84 | 27.92 | 17.89 | .49 |
| 1533.00 | 2.60 | 62.70 | 1532.26 | 30.71 | 29.78 | 21.32 | .13 |
| 1618.00 | 2.50 | 63.80 | 1617.18 | 34.48 | 31.49 | 24.69 | .13 |
| 1704.00 | 2.50 | 65.40 | 1703.10 | 38.22 | 33.10 | 28.08 | .08 |
| 1789.00 | 2.50 | 64.90 | 1788.02 | 41.92 | 34.65 | 31.44 | .03 |
| 1875.00 | 2.60 | 64.90 | 1873.93 | 45.74 | 36.28 | 34.91 | .12 |
| 1960.00 | 2.40 | 62.40 | 1958.85 | 49.43 | 37.92 | 38.23 | .27 |
| 2046.00 | 2.50 | 62.70 | 2044.77 | 53.09 | 39.61 | 41.50 | .12 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | Vertical Section FT | N-S FT | E-W FT | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|---------------------------|-----------|-----------|-------------------------------|
| 2131.00 | 2.50 | 57.70 | 2129.69 | 56.75 | 41.46 | 44.71 | .26 |
| 2217.00 | 2.60 | 59.90 | 2215.61 | 60.52 | 43.44 | 47.98 | .16 |
| 2302.00 | 2.60 | 58.70 | 2300.52 | 64.33 | 45.40 | 51.30 | .06 |
| 2388.00 | 2.90 | 59.20 | 2386.42 | 68.40 | 47.53 | 54.83 | .35 |
| 2473.00 | 3.00 | 57.50 | 2471.31 | 72.70 | 49.83 | 58.56 | .16 |
| 2559.00 | 2.80 | 61.90 | 2557.20 | 76.99 | 52.03 | 62.31 | .35 |
| 2644.00 | 2.80 | 60.80 | 2642.09 | 81.11 | 54.02 | 65.95 | .06 |
| 2730.00 | 2.80 | 61.30 | 2727.99 | 85.28 | 56.05 | 69.63 | .03 |
| 2815.00 | 2.70 | 59.80 | 2812.89 | 89.32 | 58.05 | 73.18 | .14 |
| 2901.00 | 2.60 | 66.10 | 2898.80 | 93.27 | 59.86 | 76.71 | .36 |
| 2987.00 | 2.30 | 68.40 | 2984.72 | 96.94 | 61.29 | 80.10 | .37 |
| 3072.00 | 2.20 | 68.00 | 3069.66 | 100.28 | 62.53 | 83.20 | .12 |
| 3157.00 | 2.20 | 60.60 | 3154.60 | 103.52 | 63.94 | 86.13 | .33 |
| 3243.00 | 2.70 | 47.30 | 3240.52 | 107.05 | 66.12 | 89.06 | .88 |
| 3330.00 | 3.90 | 48.50 | 3327.37 | 111.73 | 69.47 | 92.78 | 1.38 |
| 3416.00 | 3.40 | 52.60 | 3413.20 | 116.93 | 72.96 | 97.00 | .66 |
| 3501.00 | 2.80 | 48.20 | 3498.07 | 121.30 | 75.88 | 100.55 | .76 |
| 3629.00 | 3.60 | 58.20 | 3625.87 | 128.18 | 80.08 | 106.29 | .76 |
| 3672.00 | 3.50 | 61.20 | 3668.79 | 130.81 | 81.42 | 108.59 | .49 |
| 3757.00 | 3.20 | 59.40 | 3753.64 | 135.73 | 83.88 | 112.91 | .37 |
| 3843.00 | 3.30 | 67.50 | 3839.51 | 140.57 | 86.05 | 117.26 | .55 |
| 3929.00 | 3.10 | 70.00 | 3925.37 | 145.37 | 87.79 | 121.73 | .28 |
| 4014.00 | 2.90 | 71.50 | 4010.26 | 149.82 | 89.26 | 125.93 | .25 |
| 4100.00 | 2.50 | 75.20 | 4096.16 | 153.85 | 90.43 | 129.81 | .51 |
| 4185.00 | 2.60 | 81.00 | 4181.08 | 157.58 | 91.20 | 133.50 | .33 |
| 4270.00 | 2.10 | 84.20 | 4266.01 | 160.96 | 91.66 | 136.96 | .61 |
| 4356.00 | 2.50 | 94.40 | 4351.94 | 164.17 | 91.68 | 140.40 | .66 |
| 4442.00 | 2.50 | 85.80 | 4437.85 | 167.65 | 91.67 | 144.14 | .44 |
| 4527.00 | 2.60 | 66.60 | 4522.77 | 171.35 | 92.57 | 147.75 | 1.01 |
| 4613.00 | 4.00 | 68.90 | 4608.63 | 176.29 | 94.43 | 152.34 | 1.63 |
| 4700.00 | 3.60 | 66.40 | 4695.44 | 182.06 | 96.61 | 157.68 | .50 |
| 4785.00 | 3.40 | 61.70 | 4780.28 | 187.23 | 98.88 | 162.34 | .41 |
| 4873.00 | 3.20 | 59.50 | 4868.13 | 192.24 | 101.36 | 166.76 | .27 |
| 4958.00 | 3.00 | 58.00 | 4953.01 | 196.77 | 103.74 | 170.69 | .25 |
| 5044.00 | 2.70 | 58.70 | 5038.90 | 200.98 | 105.99 | 174.33 | .35 |
| 5129.00 | 3.90 | 62.90 | 5123.76 | 205.83 | 108.35 | 178.61 | 1.44 |
| 5215.00 | 3.30 | 62.00 | 5209.59 | 211.20 | 110.84 | 183.40 | .70 |
| 5300.00 | 3.60 | 66.40 | 5294.43 | 216.29 | 113.06 | 188.00 | .47 |
| 5386.00 | 3.30 | 65.40 | 5380.28 | 221.46 | 115.17 | 192.73 | .36 |
| 5471.00 | 3.50 | 71.70 | 5465.13 | 226.50 | 117.00 | 197.42 | .50 |
| 5556.00 | 3.20 | 93.30 | 5549.99 | 231.24 | 117.68 | 202.25 | 1.52 |
| 5599.00 | 3.20 | 93.90 | 5592.92 | 233.42 | 117.53 | 204.64 | .08 |
| 5642.00 | 3.40 | 84.90 | 5635.85 | 235.73 | 117.56 | 207.11 | 1.29 |
| 5728.00 | 3.70 | 76.30 | 5721.68 | 240.93 | 118.44 | 212.35 | .71 |
| 5813.00 | 3.40 | 75.10 | 5806.52 | 246.15 | 119.74 | 217.45 | .36 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | Vertical Section FT | N-S FT | E-W FT | Dogleg Severity Deg/100 |
|----------------------------|----------------------|---------------------------|---------------------------|---------------------------|-----------|-----------|-------------------------------|
| 5898.00 | 4.40 | 73.60 | 5891.32 | 251.90 | 121.31 | 223.01 | 1.18 |
| 5984.00 | 3.80 | 76.50 | 5977.10 | 258.01 | 122.91 | 228.95 | .74 |
| 6069.00 | 3.30 | 74.50 | 6061.94 | 263.23 | 124.22 | 234.04 | .61 |
| 6155.00 | 2.90 | 70.00 | 6147.81 | 267.87 | 125.62 | 238.47 | .54 |
| 6240.00 | 2.70 | 73.60 | 6232.71 | 272.01 | 126.92 | 242.41 | .31 |
| 6325.00 | 2.80 | 78.70 | 6317.61 | 276.05 | 127.90 | 246.37 | .31 |
| 6411.00 | 4.00 | 70.30 | 6403.46 | 281.12 | 129.32 | 251.26 | 1.51 |
| 6497.00 | 3.80 | 72.80 | 6489.26 | 286.96 | 131.17 | 256.80 | .31 |
| 6716.00 | 2.60 | 75.80 | 6707.92 | 299.12 | 134.54 | 268.55 | .55 |
| 6754.00 | 2.30 | 76.80 | 6745.88 | 300.73 | 134.92 | 270.13 | .80 |
| 6841.00 | 1.90 | 74.90 | 6832.82 | 303.90 | 135.70 | 273.22 | .47 |
| 6926.00 | 1.80 | 74.00 | 6917.78 | 306.63 | 136.43 | 275.86 | .12 |
| 7012.00 | 1.70 | 71.00 | 7003.74 | 309.24 | 137.22 | 278.37 | .16 |
| 7097.00 | 1.80 | 75.60 | 7088.70 | 311.83 | 137.96 | 280.85 | .20 |
| 7183.00 | 1.30 | 83.00 | 7174.67 | 314.11 | 138.42 | 283.13 | .63 |
| 7269.00 | 1.10 | 93.00 | 7260.65 | 315.81 | 138.49 | 284.92 | .34 |
| 7354.00 | 1.40 | 98.10 | 7345.63 | 317.46 | 138.30 | 286.77 | .38 |
| 7440.00 | 1.10 | 105.80 | 7431.61 | 319.03 | 137.93 | 288.60 | .40 |
| 7525.00 | 1.30 | 123.60 | 7516.59 | 320.23 | 137.18 | 290.19 | .49 |
| 7610.00 | 1.10 | 138.30 | 7601.57 | 321.07 | 136.03 | 291.53 | .43 |
| 7696.00 | 1.30 | 144.50 | 7687.55 | 321.59 | 134.62 | 292.65 | .28 |
| 7781.00 | 1.60 | 145.20 | 7772.53 | 322.10 | 132.86 | 293.89 | .35 |
| 7867.00 | 1.40 | 156.40 | 7858.50 | 322.42 | 130.91 | 294.99 | .41 |
| 7952.00 | 1.60 | 161.20 | 7943.47 | 322.41 | 128.84 | 295.79 | .28 |
| 8038.00 | 1.70 | 173.50 | 8029.43 | 322.03 | 126.44 | 296.32 | .43 |
| 8123.00 | 1.80 | 176.30 | 8114.39 | 321.30 | 123.85 | 296.55 | .15 |
| Projection @ T.D of | | | | | | | |
| 8300.00 | 1.80 | 176.30 | 8291.30 | 319.61 | 118.30 | 296.91 | .00 |