| Map Letter | Model Cross Section Number |
|---|---|
| A | 1.2 |
| B | 2.2 |
| C | 2.98 |
| D | 4.2 |
| E | 5 |
| F | 6.2 |
| G | 7 |
| H | 8.2 |
| I | 9 |
| J | 10.2 |
| K | 11 |
| L | 12 |
| M | 15 |
| N | 16 |
| O | 17 |
| P | 18.2 |
| Q | 19 |
| R | 20 |
| S | 21 |
| T | 22 |
| U | 23 |

```
                    HEC-RAS Version 3.1.3 May 2005
                     U.S. Army Corp of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Minnie Creek Special Study
Project File : Minnie.prj
Run Date and Time: 12/18/2006 8:16:34 AM

Project in English units

Project Description:
MINNIE CREEK 2006
THIS FILE CREATED AUGUST 2006
SECTIONS SURVEYED BY ROGERS
SURVEYING AUGUST 2006
DATUM NAD27, NGVD29
REDUCTION INCLUDED REDUCTION OF GR
CARDS.
SECTION 0.90 IS DOWNSTREAM THE RAILROAD CROSSING SOUTHEAST OF
CHENEY
DATA REDUCTION/UNSTEADY FLOW MODELING - T. SCHWARZ
STEADY FLOW
MODELING - G. SLACK

PLAN DATA

Plan Title: Minney Cr. Plan
Plan File : C:\Minnie Creek\Combined model 1-12-07\Minnie.p01

Geometry Title: Minnie
Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g01

Flow Title : Flow Data
Flow File : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Plan Description:
Note: This plan is the PF1 - 100 year floodplain
PF2 - Not used
PF3 - 10 year
floodplain
PF4 - 50 year floodplain
Not mapped upstream of Highway 904
bridge. See unsteady flow file for this area as it is backed up from highway
and rail road embankments with undersized culverts.

Plan Summary Information:

| | | | | | |
|---|---|---|---|---|---|
| Number of: | Cross Sections | = 68 | Multiple Openings | = | 0 |
| | Culverts | = 8 | Inline Structures | = | 0 |
| | Bridges | = 3 | Lateral Structures | = | 2 |

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 30
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Flow Data
Flow File : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Flow Data (cfs)

| River | Reach | RS | PF 1 | PF 2 | PF 3 | PF 4 |
|---|---|---|---|---|---|---|
| Minnie Cr | Lower | 15 | 270 | 270 | 125 | 220 |
| Minnie Cr | Lower | 12 | 270 | 270 | 125 | 220 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Minnie Cr | Lower | PF 1 | | Critical |
| Minnie Cr | Lower | PF 2 | | Critical |
| Minnie Cr | Lower | PF 3 | | Critical |
| Minnie Cr | Lower | PF 4 | | Critical |

GEOMETRY DATA

Geometry Title: Minnie
Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g01

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 15

INPUT
Description:
Station Elevation Data num= 85

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2382.4 | 45.85 | 2379.2 | 86.98 | 2375.87 | 109.34 | 2374.35 | 141.96 | 2372.69 |
| 209.68 | 2366.7 | 246.52 | 2366 | 284.87 | 2365.44 | 313.99 | 2364.54 | 355.62 | 2364.39 |
| 390.07 | 2364.3 | 407.7 | 2363.95 | 442.83 | 2363.73 | 479.54 | 2364.98 | 509.4 | 2366.23 |
| 535.33 | 2368.1 | 547.07 | 2370.76 | 555.77 | 2371.74 | 567.17 | 2373.69 | 578.9 | 2377.77 |
| 580.14 | 2380.9 | 586.46 | 2383.37 | 600.47 | 2384.69 | 606.79 | 2384.06 | 616.18 | 2385.33 |
| 639.64 | 2385.8 | 665.27 | 2385.02 | 675.52 | 2383.39 | 684.67 | 2385.46 | 717.31 | 2384.95 |
| 725.19 | 2388.3 | 740.12 | 2386.04 | 756.24 | 2385.74 | 757.89 | 2382.4 | 774.13 | 2382.2 |
| 784.13 | 2389.3 | 805.49 | 2389.04 | 818.09 | 2386.13 | 827.42 | 2385.42 | 857.01 | 2380.04 |
| 870 | 2377.3 | 877.69 | 2373.8 | 885.29 | 2373.69 | 889.03 | 2374.61 | 891.9 | 2375.6 |
| 897.44 | 2375.6 | 898.83 | 2374.89 | 905.75 | 2372.88 | 919.09 | 2373.06 | 937.94 | 2369.52 |
| 945.66 | 2370.3 | 951.7 | 2369.63 | 972.24 | 2368.79 | 1014.61 | 2368.18 | 1023.75 | 2367.17 |
| 1037.11 | 2367.3 | 1081.61 | 2367.89 | 1131.16 | 2368.36 | 1172.55 | 2368.06 | 1215.45 | 2368.04 |
| 1254.31 | 2368.4 | 1271.54 | 2366.97 | 1286.12 | 2367.99 | 1314.83 | 2368.06 | 1357.71 | 2367.96 |
| 1400.64 | 2369 | 1434.98 | 2371.03 | 1472.14 | 2373.31 | 1518.28 | 2374.88 | 1564.48 | 2377.4 |
| 1608.6 | 2380.1 | 1629.19 | 2386.22 | 1644.75 | 2387.47 | 1649.7 | 2386.63 | 1688.21 | 2388 |
| 1734.65 | 2388.4 | 1801.7 | 2388.82 | 1828.94 | 2388.26 | 1838.98 | 2388.08 | 1875.82 | 2389.8 |
| 1923.05 | 2390 | 1966.28 | 2389.53 | 2012.84 | 2390.8 | 2057.11 | 2389.48 | 2106.38 | 2388.91 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 284.87 | .035 | 509.4 | .03 | 1254.31 | .035 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1254.31 1286.12 100 144.9 150.67 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1004 | 2385 | F |
| 1550 | 2106.38 | 2385 | F |

Left Levee Station= 784.13 Elevation= 2389.3

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2379.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.035 |
| W.S. Elev (ft) | 2379.84 | Reach Len. (ft) | 100.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | 2368.20 | Flow Area (sq ft) | 2965.81 | 389.54 | 2350.72 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 4131.59 | 389.54 | 2440.25 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 161.06 | 18.50 | 90.44 |
| Top Width (ft) | 746.33 | Top Width (ft) | 396.34 | 31.81 | 318.18 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.05 | 0.05 | 0.04 |
| Max Chl Dpth (ft) | 16.11 | Hydr. Depth (ft) | 11.85 | 12.25 | 8.91 |
| Conv. Total (cfs) | 1279664.0 | Conv. (cfs) | 763338.8 | 87689.3 | 428635.5 |
| Length Wtd. (ft) | 121.10 | Wetted Per. (ft) | 250.38 | 31.90 | 264.10 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 121.98 | 53.99 | 72.51 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 39.08 | 12.80 | 35.45 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 14.75*

INPUT
Description:
Station Elevation Data num= 35

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 811.62 | 2368.5 | 862.43 | 2369.01 | 919.01 | 2369.44 | 966.27 | 2369.35 | 1015.25 | 2369.44 |
| 1023.62 | 2369.51 | 1059.63 | 2369.46 | 1074.23 | 2367.18 | 1077.69 | 2366.97 | 1078.57 | 2367.01 |
| 1098.33 | 2370.09 | 1120.22 | 2369.95 | 1152.91 | 2369.6 | 1175.32 | 2369.88 | 1185.63 | 2370.15 |
| 1211.81 | 2371.62 | 1240.14 | 2373.26 | 1275.32 | 2374.47 | 1310.54 | 2376.3 | 1344.17 | 2378.25 |
| 1359.87 | 2382.4 | 1371.73 | 2383.29 | 1375.51 | 2382.75 | 1404.86 | 2383.79 | 1440.27 | 2384.21 |
| 1440.9 | 2384.22 | 1491.38 | 2384.74 | 1512.15 | 2384.47 | 1519.8 | 2384.39 | 1547.89 | 2385.67 |
| 1583.89 | 2385.98 | 1616.85 | 2385.83 | 1652.35 | 2386.85 | 1686.1 | 2386.14 | 1723.66 | 2385.94 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 811.62 | .03 | 1059.63 | .035 | 1098.33 | .037 | 1723.66 | .037 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
1059.63 1098.33 120 144.9 150.67 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 811.62 | 887 | 2385 | F |
| 1270 | 1723.66 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2379.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.037 |
| W.S. Elev (ft) | 2379.84 | Reach Len. (ft) | 120.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | 2369.63 | Flow Area (sq ft) | 1801.13 | 446.64 | 1496.32 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2627.92 | 446.64 | 1773.07 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 148.11 | 33.43 | 88.46 |
| Top Width (ft) | 538.55 | Top Width (ft) | 248.01 | 38.70 | 251.84 |
| Vel Total (ft/s) | 0.07 | Avg. Vel. (ft/s) | 0.08 | 0.07 | 0.06 |
| Max Chl Dpth (ft) | 12.87 | Hydr. Depth (ft) | 10.43 | 11.54 | 8.72 |
| Conv. Total (cfs) | 776495.6 | Conv. (cfs) | 425960.0 | 96138.8 | 254396.8 |
| Length Wtd. (ft) | 133.68 | Wetted Per. (ft) | 172.63 | 39.12 | 171.78 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 114.22 | 52.60 | 65.22 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 38.34 | 12.69 | 34.47 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

```
RIVER: Minnie Cr
REACH: Lower              RS: 14.5*

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  643.25 2370.12  706.86 2370.53  759.99 2370.64  815.06 2370.84  824.47  2370.9
  864.94 2370.51  880.22 2367.12  883.83 2366.97  884.97 2367.01  910.54  2372.2
   925.6 2371.84   948.1 2371.25  963.53  2371.1  970.63  2371.3  988.65 2372.21
 1008.15 2373.22 1032.36 2374.06  1056.6 2375.21 1079.75 2376.41 1090.55 2378.59
 1098.71 2379.11 1101.31 2378.86 1121.52 2379.58 1145.89 2380.03 1146.32 2380.04
 1181.07 2380.67 1195.36 2380.68 1200.63  2380.7 1219.96 2381.55 1244.74 2381.97
 1267.42 2382.13 1291.85  2382.9 1315.08 2382.79 1340.93 2382.97

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  643.25     .03  864.94    .035  910.54    .038 1340.93    .038

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        864.94  910.54              70   144.9  150.67             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  643.25     762    2385       F
     995 1340.93    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)          2379.84    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              0.00    Wt. n-Val.                0.030      0.035     0.038
  W.S. Elev (ft)          2379.84    Reach Len. (ft)           70.00     144.90    150.67
  Crit W.S. (ft)          2369.51    Flow Area (sq ft)        936.41     490.86    692.27
  E.G. Slope (ft/ft)      0.000000   Area (sq ft)            2051.47     490.86   1202.83
  Q Total (cfs)             270.00   Flow (cfs)               132.32      65.66     72.02
  Top Width (ft)            492.17   Top Width (ft)           221.69      45.60    224.88
  Vel Total (ft/s)            0.13   Avg. Vel. (ft/s)           0.14       0.13      0.10
  Max Chl Dpth (ft)          12.87   Hydr. Depth (ft)           9.10      10.76      8.20
  Conv. Total (cfs)       412399.3   Conv. (cfs)            202110.8   100285.4  110003.1
  Length Wtd. (ft)           118.37  Wetted Per. (ft)         102.94      46.50     84.51
  Min Ch El (ft)          2366.97    Shear (lb/sq ft)           0.00       0.00      0.00
  Alpha                      1.05    Stream Power (lb/ft s)     0.00       0.00      0.00
  Frctn Loss (ft)            0.00    Cum Volume (acre-ft)      107.78      51.04     60.08
  C & E Loss (ft)            0.00    Cum SA (acres)             37.70      12.55     33.64

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 14.25

INPUT
Description: Survey 14.1
end point of survey deleted and point 470 created by
             linear interpolation.
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     470 2371.48  625.31  2372.3  670.26 2371.57  686.21 2367.06  689.98 2366.97
  691.38 2367.01  722.75  2374.3  751.74 2372.31  851.74 2375.85  958.21    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     470     .03  670.26    .035  722.75     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        670.26  722.75              49.82    50.9   50.52             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     470     650    2385       F
     727  958.21    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)          2379.84    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              0.00    Wt. n-Val.                0.030      0.035     0.040
  W.S. Elev (ft)          2379.83    Reach Len. (ft)           49.82      50.90     50.52
  Crit W.S. (ft)          2369.57    Flow Area (sq ft)        164.10     522.04     24.14
  E.G. Slope (ft/ft)      0.000004   Area (sq ft)            1588.88     522.04    968.32
  Q Total (cfs)             270.00   Flow (cfs)                64.95     199.41      5.65
  Top Width (ft)            483.96   Top Width (ft)           200.26      52.49    231.21
  Vel Total (ft/s)            0.38   Avg. Vel. (ft/s)           0.40       0.38      0.23
  Max Chl Dpth (ft)          12.86   Hydr. Depth (ft)           8.10       9.95      5.68
  Conv. Total (cfs)       136265.9   Conv. (cfs)             32778.0   100637.6    2850.3
  Length Wtd. (ft)           50.74   Wetted Per. (ft)          20.26      53.95      4.26
  Min Ch El (ft)          2366.97    Shear (lb/sq ft)           0.00       0.00      0.00
  Alpha                      1.01    Stream Power (lb/ft s)     0.00       0.00      0.00
  Frctn Loss (ft)            0.00    Cum Volume (acre-ft)      104.85      49.35     56.32
  C & E Loss (ft)            0.00    Cum SA (acres)             37.36      12.38     32.86

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 14.2

INPUT
Description: Survey 14.2
Reduced data to width of max water surface without
             floodway encroachments.  This was so that the floodway width could
             be obtained.  Encroachments made on the privious wider cross
             section created erroneous results.
-200 = RR x-sec extended 200'
             on grade
```

```
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  653.41 2373.97  689.47 2373.25  704.82 2366.74  706.07 2366.51  707.43 2366.36
  719.64  2372.9   744.6 2374.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  653.41     .03  689.47    .035  719.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        689.47  719.64             43      44   43.28              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  653.41     688    2385       F
     722   744.6    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2379.84    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                0.030      0.035      0.040
  W.S. Elev (ft)           2379.83    Reach Len. (ft)           43.00      44.00      43.28
  Crit W.S. (ft)           2369.99    Flow Area (sq ft)          9.64     310.09      16.22
  E.G. Slope (ft/ft)      0.000019    Area (sq ft)             224.12     310.09     158.88
  Q Total (cfs)             270.00    Flow (cfs)                 7.26     253.31       9.44
  Top Width (ft)             91.19    Top Width (ft)            36.06      30.17      24.96
  Vel Total (ft/s)            0.80    Avg. Vel. (ft/s)           0.75       0.82       0.58
  Max Chl Dpth (ft)          13.47    Hydr. Depth (ft)           6.56      10.28       6.87
  Conv. Total (cfs)        62278.8    Conv. (cfs)             1673.8    58428.7     2176.3
  Length Wtd. (ft)           44.00    Wetted Per. (ft)           1.47      33.16       2.36
  Min Ch El (ft)           2366.36    Shear (lb/sq ft)           0.01       0.01       0.01
  Alpha                       1.01    Stream Power (lb/ft s)     0.01       0.01       0.00
  Frctn Loss (ft)                     Cum Volume (acre-ft)     103.82      48.87      55.67
  C & E Loss (ft)                     Cum SA (acres)            37.22      12.33      32.71


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CULVERT


RIVER: Minnie Cr
REACH: Lower              RS: 14.01

INPUT
Description:
Distance from Upstream XS =       2
Deck/Roadway Width        =    40.5
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -200 2375.28                 0 2375.32           44.99 2375.33
   92.51 2375.38          139.18 2375.48          188.77 2375.55
  234.46  2375.6          283.59  2375.7          330.27 2375.77
  378.75 2375.83          425.79 2375.94          473.19    2376
  520.84  2376.2          568.13 2376.27          615.45  2376.3
  662.56 2376.34          709.56  2376.4          754.64 2376.41
  782.31 2376.78          799.87 2376.67          808.75 2376.77
  826.65  2376.7          847.68 2376.71          856.34 2376.87
  871.28 2377.07          894.13 2377.01          903.97    2377
  951.07 2377.14          987.52 2377.25         1029.32 2377.37
 1034.24 2377.38         1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97         1226.53  2378.2         1276.96 2378.67
    1324    2379         1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87         1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5         1726.47  2380.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  653.41 2373.97  689.47 2373.25  704.82 2366.74  706.07 2366.51  707.43 2366.36
  719.64  2372.9   744.6 2374.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  653.41     .03  689.47    .035  719.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        689.47  719.64            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  653.41     688    2385       F
     722   744.6    2385       F

Downstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -200 2375.28                 0 2375.32           44.99 2375.33
   92.51 2375.38          139.18 2375.48          188.77 2375.55
  234.46  2375.6          283.59  2375.7          330.27 2375.77
  378.75 2375.83          425.79 2375.94          473.19    2376
  520.84  2376.2          568.13 2376.27          615.45  2376.3
  662.56 2376.34          709.56  2376.4          754.64 2376.41
  782.31 2376.78          799.87 2376.67          808.75 2376.77
  826.65  2376.7          847.68 2376.71          856.34 2376.87
  871.28 2377.07          894.13 2377.01          903.97    2377
  951.07 2377.14          987.52 2377.25         1029.32 2377.37
 1034.24 2377.38         1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97         1226.53  2378.2         1276.96 2378.67
    1324    2379         1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87         1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5         1726.47  2380.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -435.46 2380.04       7  2373.3   51.99 2373.33   99.51 2373.38  146.18 2373.48
  195.77 2373.55  241.46  2373.6  290.59  2373.7  337.27 2373.77  385.75 2373.83
  432.79 2373.94  480.19    2374  527.84  2374.2  575.13 2374.27  622.45  2374.3
  648.61  2374.2  696.47 2373.25  711.82 2366.74  713.07 2366.51  714.43 2366.36
  726.64  2372.9  756.85 2374.25  761.64 2374.41  789.31 2374.78  806.87 2374.67
  815.75 2374.77  833.65  2374.7  854.68 2374.71  863.34 2374.87  878.28 2375.07
  901.13 2375.01  910.97    2375  958.07 2375.14  994.52 2375.25 1036.32 2375.37
 1041.24 2375.38 1088.42  2375.4 1136.26 2375.78 1183.62 2375.97 1233.53  2376.2
 1283.96 2376.67    1331    2377 1377.05 2377.34 1423.97 2377.59 1472.43 2377.87
 1518.88 2378.11 1565.69  2378.3 1612.16  2378.5 1726.47    2380
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -435.46     .03  696.47    .035  726.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        696.47  726.64            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -435.46     607    2385       F
     816 1726.47    2385       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@14        Circular     3.2
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  2    40.5     .011     .011        0                  .5                  1
Upstream   Elevation =  2367.4
           Centerline Station =  705.8
Downstream Elevation =  2366.8
           Centerline Station =  713.7

CULVERT OUTPUT  Profile #PF 1  Culv Group:  culv@14

  Q Culv Group (cfs)         11.20    Culv Full Len (ft)         40.50
  # Barrels                      1    Culv Vel US (ft/s)         1.39
  Q Barrel (cfs)             11.20    Culv Vel DS (ft/s)         1.39
  E.G. US. (ft)            2379.84    Culv Inv El Up (ft)      2367.40
  W.S. US. (ft)            2379.83    Culv Inv El Dn (ft)      2366.80
  E.G. DS (ft)             2379.79    Culv Frctn Ls (ft)         0.01
  W.S. DS (ft)             2379.78    Culv Exit Loss (ft)        0.03
  Delta EG (ft)               0.05    Culv Entr Loss (ft)        0.02
  Delta WS (ft)               0.04    Q Weir (cfs)             258.80
  E.G. IC (ft)             2379.80    Weir Sta Lft (ft)        688.00
  E.G. OC (ft)             2379.84    Weir Sta Rgt (ft)        722.00
  Culvert Control           Outlet    Weir Submerg               0.99
  Culv WS Inlet (ft)       2370.60    Weir Max Depth (ft)        3.45
  Culv WS Outlet (ft)      2370.00    Weir Avg Depth (ft)        3.44
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)   116.81
  Culv Crt Depth (ft)         1.04    Min El Weir Flow (ft)   2376.38

Warning: The weir over culvert is submerged.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 13.98

INPUT
Description: -435.46 = point # 892 on section 15
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -435.46 2380.04       7  2373.3   51.99 2373.33   99.51 2373.38  146.18 2373.48
  195.77 2373.55  241.46  2373.6  290.59  2373.7  337.27 2373.77  385.75 2373.83
  432.79 2373.94  480.19    2374  527.84  2374.2  575.13 2374.27  622.45  2374.3
  648.61  2374.2  696.47 2373.25  711.82 2366.74  713.07 2366.51  714.43 2366.36
  726.64  2372.9  756.85 2374.25  761.64 2374.41  789.31 2374.78  806.87 2374.67
  815.75 2374.77  833.65  2374.7  854.68 2374.71  863.34 2374.87  878.28 2375.07
  901.13 2375.01  910.97    2375  958.07 2375.14  994.52 2375.25 1036.32 2375.37
 1041.24 2375.38 1088.42  2375.4 1136.26 2375.78 1183.62 2375.97 1233.53  2376.2
 1283.96 2376.67    1331    2377 1377.05 2377.34 1423.97 2377.59 1472.43 2377.87
 1518.88 2378.11 1565.69  2378.3 1612.16  2378.5 1726.47    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -435.46     .03  696.47    .035  726.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        696.47  726.64             91.58      80   73.15             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -435.46     607    2385       F
     816 1726.47    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2379.79    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035     0.040
  W.S. Elev (ft)           2379.78    Reach Len. (ft)           91.58      80.00     73.15
  Crit W.S. (ft)           2370.00    Flow Area (sq ft)        519.59     308.86    492.38
  E.G. Slope (ft/ft)      0.000002    Area (sq ft)            5523.21     308.86   3255.69
  Q Total (cfs)             270.00    Flow (cfs)               113.25      79.06     77.70
  Top Width (ft)           2128.72    Top Width (ft)          1115.15      30.17    983.40
  Vel Total (ft/s)            0.20    Avg. Vel. (ft/s)           0.22       0.26      0.16
  Max Chl Dpth (ft)          13.42    Hydr. Depth (ft)           5.81      10.24      5.51
  Conv. Total (cfs)       198232.4    Conv. (cfs)             83144.3    58042.9   57045.2
  Length Wtd. (ft)           81.75    Wetted Per. (ft)           89.48      33.16     89.40
  Min Ch El (ft)           2366.36    Shear (lb/sq ft)           0.00       0.00      0.00
  Alpha                       1.11    Stream Power (lb/ft s)     0.00       0.00      0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)     100.98      48.55     53.97
  C & E Loss (ft)             0.00    Cum SA (acres)            36.65      12.30     32.21

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 13.9

INPUT
```

```
Description: Survey 14.3
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -489.62 2386.13 -175.09    2380       0  2374.5   27.65 2375.82   39.43 2374.49
   59.56 2367.32   63.82 2366.93   66.64    2367   74.66 2370.43   78.26 2370.63
    92.6 2373.98  131.29 2375.49  155.75    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -489.62     .04   39.43    .035    92.6    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          39.43    92.6             35.2    45.1    51.9             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -489.62       2    2385       F
     130  155.75    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2379.79    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.040      0.035      0.045
  W.S. Elev (ft)           2379.78    Reach Len. (ft)             35.20      45.10      51.90
  Crit W.S. (ft)           2369.72    Flow Area (sq ft)          171.87     498.09     189.73
  E.G. Slope (ft/ft)      0.000004    Area (sq ft)               626.59     498.09     245.28
  Q Total (cfs)             270.00    Flow (cfs)                  37.31     193.50      39.18
  Top Width (ft)            322.75    Top Width (ft)             207.61      53.17      61.97
  Vel Total (ft/s)            0.31    Avg. Vel. (ft/s)            0.22       0.39       0.21
  Max Chl Dpth (ft)          12.85    Hydr. Depth (ft)            4.59       9.37       5.07
  Conv. Total (cfs)       127393.6    Conv. (cfs)                17605.8    91299.8    18488.1
  Length Wtd. (ft)           44.46    Wetted Per. (ft)           37.53      55.52      37.43
  Min Ch El (ft)          2366.93    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                      1.23    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)            0.00    Cum Volume (acre-ft)       94.52      47.81      51.03
  C & E Loss (ft)            0.00    Cum SA (acres)             35.26      12.23      31.33

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 13.25

INPUT
Description: Survey 13.1
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   32.92 2389.25  324.35    2380  541.99  2373.5  569.03 2374.12  589.95 2370.64
  602.58 2367.39  606.53 2366.71   608.7    2367  617.89 2372.08  669.28 2375.78
  722.24    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   32.92     .04  589.95    .035  617.89     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          589.95  617.89            45.81    48.1   46.76             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   32.92     562    2385       F
     644  722.24    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2379.78    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.040      0.035      0.040
  W.S. Elev (ft)           2379.78    Reach Len. (ft)             45.81      48.10      46.76
  Crit W.S. (ft)           2369.84    Flow Area (sq ft)          195.21     308.45     176.55
  E.G. Slope (ft/ft)      0.000006    Area (sq ft)               976.94     308.45     401.20
  Q Total (cfs)             270.00    Flow (cfs)                  63.44     150.13      56.43
  Top Width (ft)            387.84    Top Width (ft)             258.29      27.94     101.61
  Vel Total (ft/s)            0.40    Avg. Vel. (ft/s)            0.32       0.49       0.32
  Max Chl Dpth (ft)          13.07    Hydr. Depth (ft)            6.98      11.04       6.76
  Conv. Total (cfs)       112005.5    Conv. (cfs)                26315.3    62279.1    23411.1
  Length Wtd. (ft)           47.69    Wetted Per. (ft)           28.24      29.74      26.18
  Min Ch El (ft)          2366.71    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                      1.13    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)            0.00    Cum Volume (acre-ft)       93.87      47.40      50.65
  C & E Loss (ft)            0.00    Cum SA (acres)             35.07      12.19      31.23

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 13.2

INPUT
Description: Survey 13.2
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.55 2386.04  283.21    2380  526.11  2373.7  586.88 2373.56  603.27    2366
   605.2  2365.6  607.08    2366  620.73    2375   658.9 2376.32  702.61    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8.55    .035  586.88    .035  620.73     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          586.88  620.73           136.18     136  136.18             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.55  586.88    2385       F
  620.73  702.61    2385       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2379.78    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2379.77    Reach Len. (ft)            136.18     136.00     136.18
```

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | 2369.27 | Flow Area (sq ft) | | 343.62 | |
| E.G. Slope (ft/ft) | 0.000018 | Area (sq ft) | 1084.51 | 343.62 | 227.85 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 407.99 | Top Width (ft) | 294.94 | 33.85 | 79.19 |
| Vel Total (ft/s) | 0.79 | Avg. Vel. (ft/s) | | 0.79 | |
| Max Chl Dpth (ft) | 14.17 | Hydr. Depth (ft) | | 10.15 | |
| Conv. Total (cfs) | 62996.6 | Conv. (cfs) | | 62996.6 | |
| Length Wtd. (ft) | 136.00 | Wetted Per. (ft) | | 38.29 | |
| Min Ch El (ft) | 2365.60 | Shear (lb/sq ft) | | 0.01 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 92.78 | 47.04 | 50.31 |
| C & E Loss (ft) | | Cum SA (acres) | 34.78 | 12.15 | 31.13 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 13.01

INPUT
Description:
Distance from Upstream XS = .2
Deck/Roadway Width = 134.2
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 25

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 8.12 | 2384.66 | | 48.84 | 2384.46 | | 98.68 | 2384 | |
| 146.46 | 2383.67 | | 196.58 | 2383.2 | | 244.93 | 2382.78 | |
| 293.89 | 2382.31 | | 344.44 | 2381.7 | | 393.51 | 2381.16 | |
| 444.16 | 2380.8 | | 493.71 | 2380.57 | | 543.54 | 2380.38 | |
| 591.6 | 2380.19 | | 624.5 | 2380.24 | | 668.9 | 2380.5 | |
| 717.31 | 2380.75 | | 746.6 | 2380.94 | | 795.8 | 2381.05 | |
| 845.73 | 2381.1 | | 894.9 | 2381.08 | | 939.79 | 2380.87 | |
| 988.28 | 2380.7 | | 1037.77 | 2380.7 | | 1087.36 | 2380.53 | |
| 1136.9 | 2380.13 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.55 | 2386.04 | 283.21 | 2380 | 526.11 | 2373.7 | 586.88 | 2373.56 | 603.27 | 2366 |
| 605.2 | 2365.6 | 607.08 | 2366 | 620.73 | 2375 | 658.9 | 2376.32 | 702.61 | 2380 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.55 | .035 | 586.88 | .035 | 620.73 | .04 |

Bank Sta: Left Right Coeff Contr. Expan.
586.88 620.73 .1 .3

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 8.55 | 586.88 | 2385 | F |
| 620.73 | 702.61 | 2385 | F |

Downstream Deck/Roadway Coordinates
num= 25

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 8.12 | 2384.66 | | 48.84 | 2384.46 | | 98.68 | 2384 | |
| 146.46 | 2383.67 | | 196.58 | 2383.2 | | 244.93 | 2382.78 | |
| 293.89 | 2382.31 | | 344.44 | 2381.7 | | 393.51 | 2381.16 | |
| 444.16 | 2380.8 | | 493.71 | 2380.57 | | 543.54 | 2380.38 | |
| 591.6 | 2380.19 | | 624.5 | 2380.24 | | 668.9 | 2380.5 | |
| 717.31 | 2380.75 | | 746.6 | 2380.94 | | 795.8 | 2381.05 | |
| 845.73 | 2381.1 | | 894.9 | 2381.08 | | 939.79 | 2380.87 | |
| 988.28 | 2380.7 | | 1037.77 | 2380.7 | | 1087.36 | 2380.53 | |
| 1136.9 | 2380.13 | | | | | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 507.71 | 2373.7 | 568.48 | 2373.56 | 584.02 | 2365.56 | 586.8 | 2364.8 | 589.68 | 2365.56 |
| 602.33 | 2375 | 640.82 | 2376.32 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 507.71 | .04 | 568.48 | .035 | 602.33 | .04 |

Bank Sta: Left Right Coeff Contr. Expan.
568.48 602.33 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

| Culvert Name | Shape | Rise | Span |
|---|---|---|---|
| culv@13 | Circular | 4.5 | |

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG

| Culvert | Upstrm Dist | Length | Top n | Bottom n | Depth Blocked | Entrance Loss Coef | Exit Loss Coef |
|---|---|---|---|---|---|---|---|
| | .2 | 134.2 | .011 | .011 | 0 | .5 | 1 |

Upstream Elevation = 2365.7
Centerline Station = 605.2
Downstream Elevation = 2364.9
Centerline Station = 586.8

CULVERT OUTPUT Profile #PF 1 Culv Group: culv@13

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 270.00 | Culv Full Len (ft) | 134.20 |
| # Barrels | 1 | Culv Vel US (ft/s) | 16.98 |
| Q Barrel (cfs) | 270.00 | Culv Vel DS (ft/s) | 16.98 |
| E.G. US. (ft) | 2379.78 | Culv Inv El Up (ft) | 2365.70 |
| W.S. US. (ft) | 2379.77 | Culv Inv El Dn (ft) | 2364.90 |
| E.G. DS (ft) | 2371.41 | Culv Frctn Ls (ft) | 1.81 |
| W.S. DS (ft) | 2371.26 | Culv Exit Loss (ft) | 4.33 |
| Delta EG (ft) | 8.38 | Culv Entr Loss (ft) | 2.24 |
| Delta WS (ft) | 8.51 | Q Weir (cfs) | |
| E.G. IC (ft) | 2377.93 | Weir Sta Lft (ft) | |

| | | | |
|---|---|---|---|
| E.G. OC (ft) | 2379.78 | Weir Sta Rgt (ft) | |
| Culvert Control | Inlet | Weir Submerg | |
| Culv WS Inlet (ft) | 2370.20 | Weir Max Depth (ft) | |
| Culv WS Outlet (ft) | 2369.40 | Weir Avg Depth (ft) | |
| Culv Nml Depth (ft) | 4.50 | Weir Flow Area (sq ft) | |
| Culv Crt Depth (ft) | 4.50 | Min El Weir Flow (ft) | 2380.20 |

Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 12.98

INPUT
Description: Copy of Section 13.2
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 507.71 | 2373.7 | 568.48 | 2373.56 | 584.02 | 2365.56 | 586.8 | 2364.8 | 589.68 | 2365.56 |
| 602.33 | 2375 | 640.82 | 2376.32 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 507.71 | .04 | 568.48 | .035 | 602.33 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 568.48 | 602.33 | 62.62 | 61.2 | 58.67 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.41 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.26 | Reach Len. (ft) | 62.62 | 61.20 | 58.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 87.71 | |
| E.G. Slope (ft/ft) | 0.001138 | Area (sq ft) | | 87.71 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 24.37 | Top Width (ft) | | 24.37 | |
| Vel Total (ft/s) | 3.08 | Avg. Vel. (ft/s) | | 3.08 | |
| Max Chl Dpth (ft) | 6.46 | Hydr. Depth (ft) | | 3.60 | |
| Conv. Total (cfs) | 8002.2 | Conv. (cfs) | | 8002.2 | |
| Length Wtd. (ft) | 61.20 | Wetted Per. (ft) | | 27.84 | |
| Min Ch El (ft) | 2364.80 | Shear (lb/sq ft) | | 0.22 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.69 | |
| Frctn Loss (ft) | 0.08 | Cum Volume (acre-ft) | 91.09 | 46.36 | 49.95 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 34.32 | 12.06 | 31.01 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 12.9

INPUT
Description: Survey 13.3
Station Elevation Data num= 14

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -468.15 | 2380 | -80.78 | 2366.23 | 532.9 | 2368 | 552.85 | 2368.71 | 576.34 | 2370.05 |
| 587.39 | 2366.87 | 592.08 | 2366.51 | 596.24 | 2367 | 603.6 | 2370.22 | 617.72 | 2372.01 |
| 630.09 | 2368.24 | 635.91 | 2369.38 | 646.49 | 2369.3 | 665.33 | 2372.79 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -468.15 | .04 | 576.34 | .04 | 603.6 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 576.34 | 603.6 | 818.6 | 818.6 | 818.6 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -468.15 | 576.34 | 2378 | F |
| 603.6 | 665.33 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.33 | Element | | | |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2371.18 | Reach Len. (ft) | 818.60 | 818.60 | 818.60 |
| Crit W.S. (ft) | 2369.20 | Flow Area (sq ft) | | 88.47 | |
| E.G. Slope (ft/ft) | 0.001485 | Area (sq ft) | 2939.02 | 88.47 | 60.68 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 867.46 | Top Width (ft) | 796.41 | 27.26 | 43.79 |
| Vel Total (ft/s) | 3.05 | Avg. Vel. (ft/s) | | 3.05 | |
| Max Chl Dpth (ft) | 4.95 | Hydr. Depth (ft) | | 3.25 | |
| Conv. Total (cfs) | 7006.5 | Conv. (cfs) | | 7006.5 | |
| Length Wtd. (ft) | 818.60 | Wetted Per. (ft) | | 28.42 | |
| Min Ch El (ft) | 2366.51 | Shear (lb/sq ft) | | 0.29 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.88 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 88.98 | 46.24 | 49.91 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 33.75 | 12.02 | 30.98 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 12

INPUT
Description: 1249.98 and 1255.07 are top of RR, 1116.95 is CL highway
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2379.9 | 47.55 | 2379.07 | 94 | 2377.06 | 140.31 | 2374.86 | 187.41 | 2373.28 |
| 233.81 | 2371.6 | 284.12 | 2369.41 | 323.37 | 2367.36 | 371.16 | 2367.06 | 373.58 | 2367.66 |
| 384.85 | 2366.1 | 405.4 | 2365.71 | 425.17 | 2366.41 | 468.96 | 2366.15 | 509.59 | 2366.19 |
| 540.18 | 2364.9 | 585.74 | 2365.55 | 629.75 | 2365.09 | 675.89 | 2364.97 | 712.82 | 2365.28 |
| 760.76 | 2366.2 | 805.89 | 2367.01 | 853.18 | 2369.26 | 896.29 | 2371.96 | 974.5 | 2374.12 |
| 993.89 | 2374.4 | 1021.16 | 2375.34 | 1042.11 | 2374.76 | 1059.08 | 2375.3 | 1078.5 | 2374.92 |
| 1093.1 | 2379.5 | 1116.95 | 2379.66 | 1140.44 | 2378.7 | 1141.76 | 2378.66 | 1153.56 | 2374.3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1162.05 | 2372.7 | 1176.15 | 2372.07 | 1187.7 | 2375.04 | 1198.19 | 2375.37 | 1211.35 | 2373.23 |
| 1224.72 | 2373.5 | 1236.39 | 2376.08 | 1241.8 | 2376.18 | 1247.43 | 2378.43 | 1249.98 | 2379.22 |
| 1255.07 | 2379.2 | 1257.36 | 2378.36 | 1265.8 | 2375.7 | 1311.36 | 2375.03 | 1356.65 | 2375.05 |
| 1406.17 | 2375.4 | 1458.19 | 2376.76 | 1514.73 | 2379.99 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .03 | 371.16 | .035 | 540.18 | .045 | 760.76 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 509.59 | 760.76 | 228 | 277.63 | 266 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.034 | 0.044 | 0.040 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 228.00 | 277.63 | 266.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1047.55 | 1494.81 | 392.26 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 1047.55 | 1494.81 | 392.26 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 101.98 | 141.58 | 26.44 |
| Top Width (ft) | 644.26 | Top Width (ft) | 268.42 | 251.17 | 124.67 |
| Vel Total (ft/s) | 0.09 | Avg. Vel. (ft/s) | 0.10 | 0.09 | 0.07 |
| Max Chl Dpth (ft) | 6.38 | Hydr. Depth (ft) | 3.90 | 5.95 | 3.15 |
| Conv. Total (cfs) | 319242.9 | Conv. (cfs) | 120578.1 | 167397.1 | 31267.6 |
| Length Wtd. (ft) | 254.92 | Wetted Per. (ft) | 268.71 | 251.21 | 124.79 |
| Min Ch El (ft) | 2364.90 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 51.52 | 31.36 | 45.66 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 23.74 | 9.41 | 29.40 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11.6666

INPUT
Description: Interpolated
Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2380.5 | 41.11 | 2379.84 | 53.21 | 2379.58 | 80.43 | 2378.58 | 105.18 | 2377.64 |
| 121.34 | 2376.99 | 157 | 2375.65 | 159.84 | 2375.57 | 200.82 | 2374.36 | 209.71 | 2374.1 |
| 240.43 | 2373.12 | 261.63 | 2372.44 | 280.84 | 2371.75 | 317.93 | 2370.65 | 322.2 | 2370.5 |
| 361.85 | 2368.68 | 365.01 | 2368.62 | 400.39 | 2367.66 | 415.32 | 2367.42 | 418.03 | 2367.78 |
| 430.64 | 2366.58 | 440.65 | 2366.34 | 453.64 | 2366.12 | 475.76 | 2366.47 | 480.18 | 2366.43 |
| 514.66 | 2366.08 | 524.76 | 2365.98 | 554.92 | 2365.79 | 570.22 | 2366.39 | 583.46 | 2365.53 |
| 595.47 | 2364.94 | 631.58 | 2365.85 | 662.77 | 2366.33 | 675.15 | 2366.35 | 676.56 | 2366.36 |
| 720.83 | 2365.93 | 726.55 | 2365.92 | 757.39 | 2366.26 | 777.48 | 2366.63 | 804.85 | 2367.28 |
| 827.19 | 2367.8 | 849.53 | 2368.11 | 877.98 | 2369.08 | 896.34 | 2369.68 | 927.59 | 2371.02 |
| 939.02 | 2371.6 | 976.18 | 2372.58 | 1016.45 | 2373.57 | 1024.75 | 2373.7 | 1035.65 | 2373.79 |
| 1062.65 | 2374.38 | 1075.38 | 2374.12 | 1083.39 | 2374.02 | 1100.19 | 2374.5 | 1119.41 | 2374.38 |
| 1125 | 2375.59 | 1133.87 | 2377.51 | 1157.48 | 2377.72 | 1175.51 | 2377.31 | 1180.73 | 2377.09 |
| 1182.04 | 2377.04 | 1188.37 | 2375.37 | 1193.72 | 2374.11 | 1202.13 | 2373.16 | 1216.09 | 2372.92 |
| 1227.52 | 2375.06 | 1228.78 | 2375.1 | 1237.91 | 2375.31 | 1250.93 | 2373.9 | 1264.17 | 2374.09 |
| 1275.72 | 2375.83 | 1281.08 | 2375.9 | 1286.65 | 2377.41 | 1289.18 | 2377.94 | 1290.83 | 2377.94 |
| 1294.22 | 2377.98 | 1296.49 | 2377.45 | 1304.84 | 2375.8 | 1339.61 | 2375.96 | 1349.95 | 2375.96 |
| 1383.69 | 2376.3 | 1394.78 | 2376.41 | 1414.74 | 2376.69 | 1443.81 | 2377.04 | 1463.63 | 2377.54 |
| 1495.31 | 2378.16 | 1510.78 | 2378.79 | 1525.25 | 2377.7 | 1551.28 | 2380.86 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 415.32 | .033 | 570.22 | .042 | 631.58 | .037 | 1551.28 | .037 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 570.22 | 675.15 | 265 | 277.63 | 317 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.032 | 0.040 | 0.037 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 265.00 | 277.63 | 317.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1027.37 | 578.53 | 939.18 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 1027.37 | 578.53 | 939.18 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 118.69 | 64.93 | 86.38 |
| Top Width (ft) | 636.00 | Top Width (ft) | 273.52 | 104.93 | 257.55 |
| Vel Total (ft/s) | 0.11 | Avg. Vel. (ft/s) | 0.12 | 0.11 | 0.09 |
| Max Chl Dpth (ft) | 6.34 | Hydr. Depth (ft) | 3.76 | 5.51 | 3.65 |
| Conv. Total (cfs) | 279233.1 | Conv. (cfs) | 122745.9 | 67149.0 | 89338.2 |
| Length Wtd. (ft) | 284.53 | Wetted Per. (ft) | 273.69 | 104.99 | 257.64 |
| Min Ch El (ft) | 2364.94 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 46.09 | 24.75 | 41.59 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 22.33 | 8.27 | 28.23 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11.3333

INPUT
Description:
Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 45.48 | 2380.42 | 58.87 | 2380.09 | 88.98 | 2379.14 | 116.37 | 2378.22 |
| 134.25 | 2377.6 | 173.7 | 2376.44 | 176.83 | 2376.36 | 222.18 | 2375.18 | 232.01 | 2374.91 |
| 265.99 | 2373.95 | 289.45 | 2373.29 | 310.71 | 2372.64 | 351.73 | 2371.89 | 356.46 | 2371.79 |
| 400.32 | 2370.01 | 403.82 | 2369.91 | 442.97 | 2368.18 | 459.48 | 2367.77 | 462.48 | 2367.9 |
| 476.43 | 2367.06 | 487.5 | 2366.74 | 501.87 | 2366.53 | 526.35 | 2366.52 | 531.24 | 2366.47 |
| 569.38 | 2365.96 | 580.56 | 2365.81 | 613.92 | 2365.41 | 630.86 | 2366.6 | 641.29 | 2365.54 |
| 650.75 | 2364.97 | 677.41 | 2366.15 | 708.29 | 2367.45 | 720.54 | 2367.61 | 721.95 | 2367.63 |
| 765.76 | 2366.89 | 771.43 | 2366.82 | 801.95 | 2367.24 | 821.85 | 2367.59 | 848.94 | 2368.37 |
| 871.05 | 2368.99 | 893.16 | 2369.22 | 921.33 | 2369.78 | 939.51 | 2370.1 | 970.44 | 2370.81 |
| 981.76 | 2371.24 | 1018.54 | 2372.17 | 1058.4 | 2373.02 | 1066.62 | 2373.16 | 1077.41 | 2373.18 |
| 1104.13 | 2373.41 | 1116.73 | 2373.25 | 1124.66 | 2373.29 | 1141.29 | 2373.7 | 1160.33 | 2373.83 |
| 1165.85 | 2374.5 | 1174.63 | 2375.52 | 1198.01 | 2375.79 | 1215.85 | 2375.71 | 1221.03 | 2375.47 |
| 1222.32 | 2375.42 | 1228.58 | 2374.44 | 1233.89 | 2373.92 | 1242.21 | 2373.61 | 1256.02 | 2373.78 |
| 1267.34 | 2375.07 | 1268.59 | 2375.12 | 1277.62 | 2375.24 | 1290.52 | 2374.56 | 1303.62 | 2374.68 |
| 1315.06 | 2375.57 | 1320.36 | 2375.62 | 1325.88 | 2376.39 | 1328.38 | 2376.66 | 1330.01 | 2376.66 |
| 1333.37 | 2376.75 | 1335.61 | 2376.54 | 1343.88 | 2375.89 | 1378.3 | 2376.73 | 1388.53 | 2376.88 |
| 1421.94 | 2377.55 | 1432.92 | 2377.76 | 1452.67 | 2378.19 | 1481.45 | 2378.68 | 1501.07 | 2379.15 |
| 1532.43 | 2379.56 | 1547.74 | 2379.92 | 1562.06 | 2376.92 | 1587.84 | 2381.73 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 459.48 | .032 | 630.86 | .038 | 677.41 | .033 | 1587.84 | .033 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 630.86 | 677.41 | 274 | 277.63 | 292 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.032 | 0.038 | 0.033 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 274.00 | 277.63 | 292.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1016.70 | 263.79 | 894.89 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 1016.70 | 263.79 | 894.89 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 141.70 | 36.48 | 91.82 |
| Top Width (ft) | 614.25 | Top Width (ft) | 261.81 | 46.55 | 305.90 |
| Vel Total (ft/s) | 0.12 | Avg. Vel. (ft/s) | 0.14 | 0.14 | 0.10 |
| Max Chl Dpth (ft) | 6.31 | Hydr. Depth (ft) | 3.88 | 5.67 | 2.93 |
| Conv. Total (cfs) | 242330.6 | Conv. (cfs) | 127182.4 | 32740.8 | 82407.4 |
| Length Wtd. (ft) | 279.72 | Wetted Per. (ft) | 261.96 | 46.65 | 305.98 |
| Min Ch El (ft) | 2364.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 39.87 | 22.07 | 34.92 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 20.70 | 7.79 | 26.18 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11

INPUT
Description:
Station Elevation Data num= 41

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.7 | 49.85 | 2381 | 97.53 | 2379.7 | 147.15 | 2378.21 | 193.83 | 2377.15 |
| 243.53 | 2376 | 291.56 | 2374.78 | 340.57 | 2373.54 | 390.72 | 2373.08 | 442.63 | 2371.19 |
| 485.54 | 2368.7 | 534.36 | 2367.15 | 582.3 | 2366.51 | 624.11 | 2365.84 | 672.93 | 2365.03 |
| 691.49 | 2366.8 | 699.12 | 2365.55 | 706.04 | 2365.01 | 723.25 | 2366.45 | 753.81 | 2368.56 |
| 767.33 | 2368.9 | 816.31 | 2367.72 | 866.21 | 2368.55 | 914.91 | 2370.19 | 964.68 | 2370.48 |
| 1013.29 | 2370.6 | 1060.9 | 2371.76 | 1108.49 | 2372.62 | 1158.09 | 2372.39 | 1206.71 | 2373.4 |
| 1256.2 | 2374.1 | 1268.8 | 2373.51 | 1308.4 | 2375.14 | 1369.19 | 2375.38 | 1416.99 | 2377.5 |
| 1460.18 | 2378.8 | 1490.6 | 2379.69 | 1538.51 | 2380.76 | 1584.7 | 2381.06 | 1598.88 | 2376.13 |
| 1624.39 | 2382.6 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 691.49 | .035 | 723.25 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 691.49 | 723.25 | 265 | 264.15 | 260 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 265.00 | 264.15 | 260.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1032.53 | 175.94 | 637.30 |
| E.G. Slope (ft/ft) | 0.000002 | Area (sq ft) | 1032.53 | 175.94 | 637.30 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 173.04 | 30.74 | 66.21 |
| Top Width (ft) | 600.94 | Top Width (ft) | 251.29 | 31.76 | 317.89 |
| Vel Total (ft/s) | 0.15 | Avg. Vel. (ft/s) | 0.17 | 0.17 | 0.10 |
| Max Chl Dpth (ft) | 6.27 | Hydr. Depth (ft) | 4.11 | 5.54 | 2.00 |
| Conv. Total (cfs) | 204597.6 | Conv. (cfs) | 131127.6 | 23296.4 | 50173.6 |
| Length Wtd. (ft) | 263.73 | Wetted Per. (ft) | 251.49 | 31.94 | 318.02 |
| Min Ch El (ft) | 2365.01 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 33.42 | 20.67 | 29.78 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 19.08 | 7.54 | 24.09 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.8125*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.55 | 47.48 | 2380.89 | 51.87 | 2380.85 | 93.23 | 2380.04 | 101.47 | 2379.86 |
| 139.36 | 2378.93 | 153.1 | 2378.53 | 184.74 | 2377.79 | 201.67 | 2377.48 | 231.21 | 2376.92 |
| 237.91 | 2376.86 | 253.37 | 2376.46 | 281.24 | 2375.69 | 303.35 | 2375.12 | 324.87 | 2374.56 |
| 354.34 | 2373.86 | 368.74 | 2373.69 | 406.51 | 2373.37 | 413.07 | 2373.19 | 456.54 | 2371.85 |
| 460.52 | 2371.72 | 499.42 | 2369.89 | 505.17 | 2369.62 | 539.43 | 2368.7 | 555.96 | 2368.26 |
| 583.7 | 2367.89 | 605.84 | 2367.63 | 624.71 | 2367.36 | 649.34 | 2367.02 | 665.58 | 2366.79 |
| 678.05 | 2366.44 | 700.13 | 2366.14 | 719.44 | 2367.43 | 726.6 | 2365.93 | 730.29 | 2365.41 |
| 731.24 | 2365.23 | 733.08 | 2365.1 | 739.67 | 2365.71 | 745.18 | 2366.14 | 749.91 | 2366.94 |
| 781.32 | 2368.57 | 788.97 | 2368.72 | 795.22 | 2369.19 | 797.65 | 2369.29 | 840.93 | 2368.72 |
| 845.56 | 2368.66 | 885.46 | 2369.29 | 896.85 | 2369.43 | 929.2 | 2370.23 | 946.9 | 2370.68 |
| 973.88 | 2370.81 | 998.06 | 2371.02 | 1021.9 | 2371.17 | 1048.02 | 2371.21 | 1065.87 | 2371.52 |
| 1096.95 | 2372.05 | 1110.14 | 2372.22 | 1145.86 | 2372.7 | 1154.31 | 2372.67 | 1183.45 | 2372.7 |
| 1196.84 | 2372.72 | 1241.21 | 2373.61 | 1246.82 | 2373.73 | 1285.02 | 2374.34 | 1297.68 | 2374.58 |
| 1310.63 | 2374.24 | 1329.09 | 2374.94 | 1351.33 | 2375.67 | 1373.89 | 2375.8 | 1413.81 | 2375.97 |
| 1419.18 | 2376.15 | 1449.4 | 2377.11 | 1462.94 | 2377.59 | 1489.63 | 2378.26 | 1507.33 | 2378.55 |
| 1533.97 | 2378.96 | 1538.6 | 2379.04 | 1577.11 | 2379.52 | 1587.84 | 2379.76 | 1589.94 | 2379.78 |
| 1602.7 | 2379.94 | 1635.32 | 2380.13 | 1649.89 | 2376.45 | 1650.99 | 2376.65 | 1658.1 | 2377.5 |
| 1676.11 | 2382.13 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 719.44 | .035 | 749.91 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 719.44 | 749.91 | 265 | 264.15 | 258 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 265.00 | 264.15 | 258.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 812.82 | 161.12 | 465.61 |
| E.G. Slope (ft/ft) | 0.000004 | Area (sq ft) | 812.82 | 161.12 | 465.61 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 170.78 | 39.81 | 59.42 |
| Top Width (ft) | 581.99 | Top Width (ft) | 249.52 | 30.47 | 302.00 |
| Vel Total (ft/s) | 0.19 | Avg. Vel. (ft/s) | 0.21 | 0.25 | 0.13 |

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 6.18 | Hydr. Depth (ft) | 3.26 | 5.29 | 1.54 |
| Conv. Total (cfs) | 139829.8 | Conv. (cfs) | 88443.4 | 20615.3 | 30771.2 |
| Length Wtd. (ft) | 263.30 | Wetted Per. (ft) | 249.63 | 30.80 | 302.09 |
| Min Ch El (ft) | 2365.10 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 27.81 | 19.65 | 26.49 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 17.56 | 7.35 | 22.24 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.625*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.4 | 49.32 | 2380.73 | 53.88 | 2380.7 | 96.86 | 2380.17 | 105.42 | 2380.02 |
| 144.77 | 2379.25 | 159.05 | 2378.86 | 191.91 | 2378.06 | 209.5 | 2377.8 | 240.19 | 2377.35 |
| 247.15 | 2377.37 | 263.22 | 2376.91 | 292.17 | 2376.06 | 315.13 | 2375.45 | 337.5 | 2374.86 |
| 368.1 | 2374.19 | 383.07 | 2373.97 | 422.31 | 2373.66 | 429.12 | 2373.53 | 474.27 | 2372.37 |
| 478.42 | 2372.26 | 518.82 | 2370.76 | 524.79 | 2370.55 | 560.38 | 2369.75 | 577.56 | 2369.38 |
| 606.37 | 2368.99 | 629.38 | 2368.74 | 648.99 | 2368.51 | 674.57 | 2368.21 | 691.44 | 2368 |
| 704.39 | 2367.49 | 727.33 | 2367.24 | 747.4 | 2368.06 | 754.07 | 2366.32 | 757.52 | 2365.59 |
| 758.4 | 2365.29 | 760.13 | 2365.19 | 766.57 | 2365.84 | 771.95 | 2366.23 | 776.58 | 2367.43 |
| 808.83 | 2368.58 | 816.69 | 2368.69 | 823.11 | 2369.48 | 825.6 | 2369.73 | 870.06 | 2369.61 |
| 874.81 | 2369.59 | 915.79 | 2370.21 | 927.49 | 2370.3 | 960.71 | 2370.85 | 978.89 | 2371.16 |
| 1006.6 | 2371.28 | 1031.43 | 2371.57 | 1055.92 | 2371.81 | 1082.74 | 2371.82 | 1101.08 | 2372.01 |
| 1133 | 2372.34 | 1146.54 | 2372.45 | 1183.24 | 2372.77 | 1191.91 | 2372.76 | 1221.84 | 2372.96 |
| 1235.6 | 2373.06 | 1281.16 | 2373.94 | 1286.92 | 2374.06 | 1326.16 | 2374.76 | 1339.16 | 2375.05 |
| 1352.46 | 2374.97 | 1371.42 | 2375.63 | 1394.27 | 2376.21 | 1417.43 | 2376.38 | 1458.44 | 2376.56 |
| 1463.95 | 2376.69 | 1494.99 | 2377.31 | 1508.9 | 2377.69 | 1536.3 | 2378.24 | 1554.49 | 2378.29 |
| 1581.84 | 2378.36 | 1586.6 | 2378.39 | 1626.15 | 2378.52 | 1637.17 | 2378.76 | 1639.33 | 2378.79 |
| 1652.43 | 2379.02 | 1685.93 | 2379.2 | 1700.9 | 2376.76 | 1702.03 | 2376.9 | 1709.33 | 2376.84 |
| 1727.83 | 2381.67 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 747.4 | .035 | 776.58 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 747.4 | 776.58 | 265 | 264.15 | 263 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.28 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.28 | Reach Len. (ft) | 265.00 | 264.15 | 263.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 580.63 | 147.05 | 321.80 |
| E.G. Slope (ft/ft) | 0.000009 | Area (sq ft) | 580.63 | 147.05 | 321.80 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 155.12 | 54.62 | 60.26 |
| Top Width (ft) | 500.59 | Top Width (ft) | 242.46 | 29.18 | 228.95 |
| Vel Total (ft/s) | 0.26 | Avg. Vel. (ft/s) | 0.27 | 0.37 | 0.19 |
| Max Chl Dpth (ft) | 6.09 | Hydr. Depth (ft) | 2.39 | 5.04 | 1.41 |
| Conv. Total (cfs) | 89584.3 | Conv. (cfs) | 51467.5 | 18123.1 | 19993.8 |
| Length Wtd. (ft) | 264.33 | Wetted Per. (ft) | 242.52 | 29.73 | 229.04 |
| Min Ch El (ft) | 2365.19 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 23.57 | 18.71 | 24.16 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 16.06 | 7.17 | 20.67 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.4375*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.25 | 51.17 | 2380.56 | 55.9 | 2380.55 | 100.48 | 2380.3 | 109.36 | 2380.18 |
| 150.19 | 2379.58 | 164.99 | 2379.18 | 199.09 | 2378.33 | 217.34 | 2378.13 | 249.18 | 2377.77 |
| 256.4 | 2377.88 | 273.06 | 2377.37 | 303.09 | 2376.43 | 326.92 | 2375.79 | 350.12 | 2375.17 |
| 381.87 | 2374.51 | 397.39 | 2374.25 | 438.1 | 2373.96 | 445.17 | 2373.86 | 492.01 | 2372.89 |
| 496.31 | 2372.79 | 538.23 | 2371.62 | 544.42 | 2371.47 | 581.34 | 2370.8 | 599.16 | 2370.49 |
| 629.05 | 2370.09 | 652.92 | 2369.86 | 673.26 | 2369.65 | 699.8 | 2369.39 | 717.3 | 2369.21 |
| 730.74 | 2368.55 | 754.54 | 2368.35 | 775.35 | 2368.7 | 781.55 | 2366.7 | 784.75 | 2365.76 |
| 785.57 | 2365.35 | 787.17 | 2365.27 | 793.46 | 2365.97 | 798.72 | 2366.32 | 803.24 | 2367.92 |
| 836.35 | 2368.59 | 844.41 | 2368.67 | 850.99 | 2369.77 | 853.56 | 2370.18 | 899.18 | 2370.51 |
| 904.06 | 2370.53 | 946.12 | 2371.13 | 958.12 | 2371.18 | 992.23 | 2371.46 | 1010.89 | 2371.65 |
| 1039.32 | 2371.75 | 1064.81 | 2372.11 | 1089.94 | 2372.44 | 1117.47 | 2372.42 | 1136.29 | 2372.51 |
| 1169.05 | 2372.64 | 1182.95 | 2372.67 | 1220.61 | 2372.85 | 1229.52 | 2372.84 | 1260.23 | 2373.21 |
| 1274.35 | 2373.39 | 1321.12 | 2374.26 | 1327.03 | 2374.39 | 1367.3 | 2375.18 | 1380.65 | 2375.53 |
| 1394.3 | 2375.7 | 1413.75 | 2376.33 | 1437.2 | 2376.74 | 1460.98 | 2376.95 | 1503.06 | 2377.14 |
| 1508.72 | 2377.22 | 1540.57 | 2377.51 | 1554.85 | 2377.78 | 1582.98 | 2378.22 | 1601.64 | 2378.04 |
| 1629.72 | 2377.76 | 1634.6 | 2377.74 | 1675.19 | 2377.52 | 1686.51 | 2377.76 | 1688.72 | 2377.8 |
| 1702.17 | 2378.11 | 1736.55 | 2378.26 | 1751.91 | 2377.08 | 1753.07 | 2377.15 | 1760.57 | 2376.19 |
| 1779.55 | 2381.2 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 775.35 | .035 | 803.24 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 775.35 | 803.24 | 264 | 264.15 | 262 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.27 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.27 | Reach Len. (ft) | 264.00 | 264.15 | 262.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 345.36 | 133.72 | 204.05 |
| E.G. Slope (ft/ft) | 0.000029 | Area (sq ft) | 345.36 | 133.72 | 204.05 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 123.50 | 84.50 | 62.00 |
| Top Width (ft) | 413.52 | Top Width (ft) | 219.87 | 27.89 | 165.76 |
| Vel Total (ft/s) | 0.40 | Avg. Vel. (ft/s) | 0.36 | 0.63 | 0.30 |
| Max Chl Dpth (ft) | 6.00 | Hydr. Depth (ft) | 1.57 | 4.79 | 1.23 |
| Conv. Total (cfs) | 50527.4 | Conv. (cfs) | 23112.5 | 15813.1 | 11601.8 |

| | | | | | |
|---|---|---|---|---|---|
| Length Wtd. (ft) | 263.51 | Wetted Per. (ft) | 219.90 | 28.76 | 165.90 |
| Min Ch El (ft) | 2365.27 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.31 | Stream Power (lb/ft s) | 0.00 | 0.01 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 20.76 | 17.86 | 22.57 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.66 | 7.00 | 19.48 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.25

INPUT
Description: Survey 10.1
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 757.08 | 2369.6 | 803.3 | 2369.33 | 811.98 | 2365.93 |
| 812.74 | 2365.41 | 814.22 | 2365.36 | 820.36 | 2366.1 | 825.49 | 2366.41 | 829.9 | 2368.41 |
| 872.13 | 2368.64 | 881.51 | 2370.62 | 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 |
| 1072.04 | 2372.22 | 1123.96 | 2373.08 | 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 |
| 1298.62 | 2373.46 | 1361.07 | 2374.59 | 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 |
| 1553.49 | 2377.76 | 1586.16 | 2377.71 | 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 |
| 1738.11 | 2376.81 | 1751.9 | 2377.19 | 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 803.3 | .035 | 829.9 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 803.3 | 829.9 | 44.28 | 46.7 | 45.58 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.25 | Reach Len. (ft) | 44.28 | 46.70 | 45.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 140.78 | 120.79 | 142.18 |
| E.G. Slope (ft/ft) | 0.000083 | Area (sq ft) | 140.78 | 120.79 | 142.18 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 59.14 | 123.81 | 87.04 |
| Top Width (ft) | 272.08 | Top Width (ft) | 156.07 | 26.60 | 89.41 |
| Vel Total (ft/s) | 0.67 | Avg. Vel. (ft/s) | 0.42 | 1.03 | 0.61 |
| Max Chl Dpth (ft) | 5.89 | Hydr. Depth (ft) | 0.90 | 4.54 | 1.59 |
| Conv. Total (cfs) | 29714.0 | Conv. (cfs) | 6508.8 | 13626.1 | 9579.1 |
| Length Wtd. (ft) | 45.97 | Wetted Per. (ft) | 156.10 | 27.89 | 89.63 |
| Min Ch El (ft) | 2365.36 | Shear (lb/sq ft) | 0.00 | 0.02 | 0.01 |
| Alpha | 1.43 | Stream Power (lb/ft s) | 0.00 | 0.02 | 0.01 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 19.28 | 17.09 | 21.53 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.52 | 6.83 | 18.71 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.2

INPUT
Description:
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 800.75 | 831.31 | 32 | 32 | 32 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.23 | Reach Len. (ft) | 32.00 | 32.00 | 32.00 |
| Crit W.S. (ft) | 2366.55 | Flow Area (sq ft) | 102.54 | 139.68 | 60.99 |
| E.G. Slope (ft/ft) | 0.000165 | Area (sq ft) | 102.54 | 139.68 | 60.99 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 50.13 | 189.25 | 30.62 |
| Top Width (ft) | 269.71 | Top Width (ft) | 152.20 | 30.56 | 86.95 |
| Vel Total (ft/s) | 0.89 | Avg. Vel. (ft/s) | 0.49 | 1.35 | 0.50 |
| Max Chl Dpth (ft) | 9.13 | Hydr. Depth (ft) | 0.67 | 4.57 | 0.70 |
| Conv. Total (cfs) | 21023.2 | Conv. (cfs) | 3903.1 | 14735.8 | 2384.2 |
| Length Wtd. (ft) | 32.00 | Wetted Per. (ft) | 152.21 | 35.66 | 86.97 |
| Min Ch El (ft) | 2362.10 | Shear (lb/sq ft) | 0.01 | 0.04 | 0.01 |
| Alpha | 1.71 | Stream Power (lb/ft s) | 0.00 | 0.05 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 19.16 | 16.95 | 21.42 |
| C & E Loss (ft) | | Cum SA (acres) | 13.36 | 6.80 | 18.62 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 10.01

INPUT
Description: culvert @ 10
Distance from Upstream XS = 4.7
Deck/Roadway Width = 25.4

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      53
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2381.1           53.01  2380.4           104.1 2380.43
   155.6  2379.9          206.27  2378.6          258.16  2378.2
  265.64 2378.39          314.02  2376.8          362.74 2375.47
  411.72 2374.53          461.22  2374.2          509.75 2373.41
  557.63 2372.49           602.3 2371.85          651.73 2371.19
  697.53  2370.8          743.16 2370.42             771 2370.47
  789.38 2370.51          800.75 2370.59          806.84 2370.64
  813.52 2370.69          813.72 2370.69          820.59 2370.74
  822.99 2370.76          824.41 2370.77           831.3 2370.82
  834.12 2370.84           877.1 2370.64          881.51 2370.62
  928.31  2371.4          976.45 2372.05         1023.74 2372.08
 1072.04 2372.22         1123.96 2373.08          1171.5    2373
 1219.36  2372.9         1267.12 2372.93         1298.62 2373.46
 1361.07 2374.59         1408.44  2375.6         1456.08 2377.02
 1504.52 2377.53         1553.49 2377.76         1586.16 2377.71
 1629.65  2378.2         1677.59 2377.16         1724.23 2376.52
 1738.11 2376.81          1751.9 2377.19         1804.11  2377.4
  1811.8 2375.53         1831.27 2380.73

Upstream Bridge Cross Section Data
Station Elevation Data     num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2381.1   53.01  2380.4   104.1 2380.43   155.6  2379.9  206.27  2378.6
  258.16  2378.2  265.64 2378.39  314.02  2376.8  362.74 2375.47  411.72 2374.53
  461.22  2374.2  509.75 2373.41  557.63 2372.49   602.3 2371.85  651.73 2371.19
  697.53  2370.8  743.16 2370.42     771    2370  800.75 2370.13  806.79 2369.08
  813.54 2365.88  817.33 2364.41  818.49 2362.78  820.62  2362.1  822.37 2362.57
  823.65 2363.85  824.35 2366.01  831.31 2369.67   877.1 2370.73  881.51 2370.62
  928.31  2371.4  976.45 2372.05 1023.74 2372.08 1072.04 2372.22 1123.96 2373.08
   1171.5    2373 1219.36  2372.9 1267.12 2372.93 1298.62 2373.46 1361.07 2374.59
 1408.44  2375.6 1456.08 2377.02 1504.52 2377.53 1553.49 2377.76 1586.16 2377.71
 1629.65  2378.2 1677.59 2377.16 1724.23 2376.52 1738.11 2376.81  1751.9 2377.19
 1804.11  2377.4  1811.8 2375.53 1831.27 2380.73

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  800.75    .035  831.31     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        800.75  831.31             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      53
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2381.1           53.01  2380.4           104.1 2380.43
   155.6  2379.9          206.27  2378.6          258.16  2378.2
  265.64 2378.39          314.02  2376.8          362.74 2375.47
  411.72 2374.53          461.22  2374.2          509.75 2373.41
  557.63 2372.49           602.3 2371.85          651.73 2371.19
  697.53  2370.8          743.16 2370.42             771 2370.47
  789.38 2370.51          800.75 2370.59          806.84 2370.64
  813.52 2370.69          813.72 2370.69          820.59 2370.74
  822.99 2370.76          824.41 2370.77           831.3 2370.82
  834.12 2370.84           877.1 2370.64          881.51 2370.62
  928.31  2371.4          976.45 2372.05         1023.74 2372.08
 1072.04 2372.22         1123.96 2373.08          1171.5    2373
 1219.36  2372.9         1267.12 2372.93         1298.62 2373.46
 1361.07 2374.59         1408.44  2375.6         1456.08 2377.02
 1504.52 2377.53         1553.49 2377.76         1586.16 2377.71
 1629.65  2378.2         1677.59 2377.16         1724.23 2376.52
 1738.11 2376.81          1751.9 2377.19         1804.11  2377.4
  1811.8 2375.53         1831.27 2380.73

Downstream Bridge Cross Section Data
Station Elevation Data     num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2381.1   53.01  2380.4   104.1 2380.43   155.6  2379.9  206.27  2378.6
  258.16  2378.2  265.64 2378.39  314.02  2376.8  362.74 2375.47  411.72 2374.53
  461.22  2374.2  509.75 2373.41  557.63 2372.49   602.3 2371.85  651.73 2371.19
  697.53  2370.8  743.16 2370.42     771    2370  800.75 2370.13  806.79 2369.08
  813.54 2365.88  817.33 2364.41  818.49 2362.78  820.62  2362.1  822.37 2362.57
  823.65 2363.85  824.35 2366.01  831.31 2369.67   877.1 2370.73  881.51 2370.62
  928.31  2371.4  976.45 2372.05 1023.74 2372.08 1072.04 2372.22 1123.96 2373.08
   1171.5    2373 1219.36  2372.9 1267.12 2372.93 1298.62 2373.46 1361.07 2374.59
 1408.44  2375.6 1456.08 2377.02 1504.52 2377.53 1553.49 2377.76 1586.16 2377.71
 1629.65  2378.2 1677.59 2377.16 1724.23 2376.52 1738.11 2376.81  1751.9 2377.19
 1804.11  2377.4  1811.8 2375.53 1831.27 2380.73

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  800.75    .035  831.31     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        800.75  831.31             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Sec 10 Culv     Circular       7
FHWA Chart # 55-  Circular Culvert
FHWA Scale # 2 - Rough tapered inlet throat
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                4.7    25.4     .014     .014        0                  .9                  1
Upstream   Elevation =  2362.6
           Centerline Station =  820.62
Downstream Elevation =  2362.4
           Centerline Station =  820.62

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Sec 10 Culv

  Q Culv Group (cfs)          50.12    Culv Full Len (ft)          25.40
  # Barrels                       1    Culv Vel US (ft/s)           1.30
  Q Barrel (cfs)              50.12    Culv Vel DS (ft/s)           1.30
  E.G. US. (ft)            2371.25    Culv Inv El Up (ft)       2362.60
  W.S. US. (ft)            2371.23    Culv Inv El Dn (ft)       2362.40
```

| | | | |
|---|---|---|---|
| E.G. DS (ft) | 2371.22 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2371.20 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.03 | Culv Entr Loss (ft) | 0.02 |
| Delta WS (ft) | 0.03 | Q Weir (cfs) | 219.88 |
| E.G. IC (ft) | 2369.38 | Weir Sta Lft (ft) | 647.60 |
| E.G. OC (ft) | 2371.25 | Weir Sta Rgt (ft) | 919.02 |
| Culvert Control | Outlet | Weir Submerg | 0.93 |
| Culv WS Inlet (ft) | 2369.60 | Weir Max Depth (ft) | 0.83 |
| Culv WS Outlet (ft) | 2369.40 | Weir Avg Depth (ft) | 0.51 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 138.02 |
| Culv Crt Depth (ft) | 1.80 | Min El Weir Flow (ft) | 2370.43 |

Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow. The reported inlet energy grade answer may not be valid.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.98

INPUT
Description:
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 800.75 | 831.31 | 82.04 | 79.2 | 80.8 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.22 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.20 | Reach Len. (ft) | 82.04 | 79.20 | 80.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 97.93 | 138.75 | 58.36 |
| E.G. Slope (ft/ft) | 0.000174 | Area (sq ft) | 97.93 | 138.75 | 58.36 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 48.16 | 192.20 | 29.64 |
| Top Width (ft) | 265.59 | Top Width (ft) | 149.92 | 30.56 | 85.12 |
| Vel Total (ft/s) | 0.92 | Avg. Vel. (ft/s) | 0.49 | 1.39 | 0.51 |
| Max Chl Dpth (ft) | 9.10 | Hydr. Depth (ft) | 0.65 | 4.54 | 0.69 |
| Conv. Total (cfs) | 20471.2 | Conv. (cfs) | 3651.7 | 14572.2 | 2247.3 |
| Length Wtd. (ft) | 80.35 | Wetted Per. (ft) | 149.92 | 35.66 | 85.14 |
| Min Ch El (ft) | 2362.10 | Shear (lb/sq ft) | 0.01 | 0.04 | 0.01 |
| Alpha | 1.72 | Stream Power (lb/ft s) | 0.00 | 0.06 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 19.09 | 16.85 | 21.38 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.25 | 6.78 | 18.55 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.9

INPUT
Description: Survey 10.3
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2380.1 | 53.01 | 2379.4 | 104.1 | 2379.43 | 155.6 | 2378.9 | 206.27 | 2377.6 |
| 258.16 | 2377.2 | 265.64 | 2377.39 | 314.02 | 2375.8 | 362.74 | 2374.47 | 411.72 | 2373.53 |
| 461.22 | 2373.2 | 509.75 | 2372.41 | 557.63 | 2371.49 | 602.3 | 2370.85 | 651.73 | 2370.19 |
| 697.53 | 2369.8 | 743.16 | 2369.42 | 749.27 | 2369.1 | 785.18 | 2368.84 | 808.33 | 2370.06 |
| 818.66 | 2366.81 | 821.37 | 2366.35 | 824.98 | 2365.7 | 829.32 | 2366.21 | 833.67 | 2367 |
| 843.97 | 2369.98 | 893.28 | 2370.68 | 928.31 | 2370.4 | 976.45 | 2371.05 | 1023.74 | 2371.08 |
| 1072.04 | 2371.22 | 1123.96 | 2372.08 | 1171.5 | 2372 | 1219.36 | 2371.9 | 1267.12 | 2371.93 |
| 1298.62 | 2372.46 | 1361.07 | 2373.59 | 1408.44 | 2374.6 | 1456.08 | 2376.02 | 1504.52 | 2376.53 |
| 1553.49 | 2376.76 | 1586.16 | 2376.71 | 1629.65 | 2377.2 | 1677.59 | 2376.16 | 1724.23 | 2375.52 |
| 1738.11 | 2375.81 | 1751.9 | 2376.19 | 1804.11 | 2376.4 | 1811.8 | 2374.53 | 1831.27 | 2379.73 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 808.33 | .035 | 843.97 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 808.33 | 843.97 | 422 | 424.1 | 428.5 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 676 | 2378 | F |
| 1052 | 1831.27 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.20 | Reach Len. (ft) | 422.00 | 424.10 | 428.50 |
| Crit W.S. (ft) | 2368.37 | Flow Area (sq ft) | 233.73 | 130.58 | 98.41 |
| E.G. Slope (ft/ft) | 0.000068 | Area (sq ft) | 299.07 | 130.58 | 98.72 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 139.31 | 106.32 | 24.38 |
| Top Width (ft) | 489.07 | Top Width (ft) | 230.76 | 35.64 | 222.68 |
| Vel Total (ft/s) | 0.58 | Avg. Vel. (ft/s) | 0.60 | 0.81 | 0.25 |
| Max Chl Dpth (ft) | 5.50 | Hydr. Depth (ft) | 1.77 | 3.66 | 0.47 |
| Conv. Total (cfs) | 32778.9 | Conv. (cfs) | 16912.6 | 12907.0 | 2959.2 |
| Length Wtd. (ft) | 423.91 | Wetted Per. (ft) | 132.37 | 36.76 | 208.04 |
| Min Ch El (ft) | 2365.70 | Shear (lb/sq ft) | 0.01 | 0.02 | 0.00 |
| Alpha | 1.32 | Stream Power (lb/ft s) | 0.00 | 0.01 | 0.00 |
| Frctn Loss (ft) | 0.02 | Cum Volume (acre-ft) | 18.71 | 16.60 | 21.23 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 12.89 | 6.72 | 18.27 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.45*

INPUT
Description:
Station Elevation Data num= 95

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.65 | 47.5 | 2381.26 | 53.55 | 2381.19 | 96 | 2380.99 | 105.16 | 2380.93 |
| 143.86 | 2380.48 | 157.18 | 2380.36 | 191.73 | 2379.8 | 208.37 | 2379.52 | 239.57 | 2379.28 |
| 260.78 | 2379.06 | 268.34 | 2379.1 | 286.65 | 2378.68 | 317.21 | 2377.35 | 334.23 | 2376.65 |
| 366.43 | 2375.39 | 368.61 | 2375.31 | 406.69 | 2373.79 | 415.9 | 2373.68 | 454.62 | 2373.44 |
| 465.91 | 2373.39 | 477.79 | 2373.27 | 514.93 | 2372.83 | 523.32 | 2372.72 | 563.3 | 2372.14 |
| 572.49 | 2372.03 | 608.42 | 2371.28 | 624.26 | 2370.96 | 658.35 | 2370.11 | 675.6 | 2369.72 |
| 704.62 | 2369.44 | 725.03 | 2369.24 | 750.71 | 2368.99 | 756.88 | 2368.79 | 773.4 | 2368.64 |
| 793.16 | 2368.69 | 816.55 | 2369.44 | 823.28 | 2367.03 | 826.27 | 2366.44 | 827.24 | 2366.32 |
| 828.82 | 2366 | 832.22 | 2365.3 | 836.47 | 2366.01 | 837.55 | 2366.22 | 840.73 | 2366.94 |
| 841.85 | 2367.26 | 850.81 | 2369.9 | 898.34 | 2369.23 | 900.36 | 2369.18 | 932.11 | 2369.16 |
| 950.19 | 2369.36 | 978.52 | 2370.01 | 998.86 | 2370.34 | 1013.41 | 2370.62 | 1024.11 | 2370.66 |
| 1062.28 | 2370.86 | 1070.67 | 2370.86 | 1114.48 | 2371.19 | 1120.72 | 2371.25 | 1166.18 | 2371.28 |
| 1166.54 | 2371.28 | 1212.68 | 2371.7 | 1216.63 | 2371.74 | 1258.72 | 2372.12 | 1266.62 | 2372.26 |
| 1289.08 | 2372.67 | 1314.46 | 2373.14 | 1349.29 | 2374.07 | 1368.11 | 2374.6 | 1394.95 | 2376.06 |
| 1399.38 | 2376.32 | 1408.21 | 2377.52 | 1440.87 | 2377.25 | 1449.34 | 2377.1 | 1487.57 | 2376.97 |
| 1500.59 | 2376.89 | 1534.77 | 2376.93 | 1566.27 | 2376.86 | 1571.28 | 2376.88 | 1608.19 | 2376.63 |
| 1609.43 | 2376.6 | 1642.92 | 2375.75 | 1650.76 | 2376.7 | 1654.41 | 2376.64 | 1675.48 | 2376.42 |
| 1689.91 | 2375.33 | 1699.37 | 2375.32 | 1709.99 | 2375.5 | 1712.75 | 2375.85 | 1718.65 | 2376.64 |
| 1726.04 | 2376.55 | 1746.35 | 2376.07 | 1776.37 | 2376.15 | 1783.78 | 2375.22 | 1802.55 | 2377.82 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 816.55 | .035 | 850.81 | .03 | 1314.46 | .032 | 1802.55 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 816.55 | 850.81 | 422 | 424.1 | 428.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.19 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.19 | Reach Len. (ft) | 422.00 | 424.10 | 428.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 338.22 | 136.31 | 286.36 |
| E.G. Slope (ft/ft) | 0.000026 | Area (sq ft) | 338.22 | 136.31 | 286.36 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 120.38 | 72.83 | 76.79 |
| Top Width (ft) | 501.71 | Top Width (ft) | 203.71 | 34.26 | 263.75 |
| Vel Total (ft/s) | 0.35 | Avg. Vel. (ft/s) | 0.36 | 0.53 | 0.27 |
| Max Chl Dpth (ft) | 5.89 | Hydr. Depth (ft) | 1.66 | 3.98 | 1.09 |
| Conv. Total (cfs) | 52676.6 | Conv. (cfs) | 23485.8 | 14208.5 | 14982.3 |
| Length Wtd. (ft) | 424.80 | Wetted Per. (ft) | 203.74 | 35.43 | 263.77 |
| Min Ch El (ft) | 2365.30 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.22 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 15.63 | 15.30 | 19.34 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.79 | 6.38 | 15.88 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9

INPUT
Description:
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2383.2 | 47.98 | 2383.04 | 96.97 | 2382.55 | 145.31 | 2381.92 | 193.66 | 2381.57 |
| 241.98 | 2381.2 | 289.53 | 2380.57 | 337.59 | 2377.96 | 372.32 | 2376.2 | 410.78 | 2373.88 |
| 459.19 | 2373.6 | 482.6 | 2373.54 | 528.58 | 2373.18 | 578.25 | 2372.71 | 630.54 | 2371.28 |
| 682.4 | 2369.4 | 732.32 | 2368.85 | 781.18 | 2368.3 | 824.76 | 2368.81 | 831.08 | 2366.25 |
| 834.79 | 2366 | 839.46 | 2364.91 | 844.68 | 2366.03 | 848.88 | 2367.18 | 857.65 | 2369.81 |
| 905.35 | 2367.7 | 953.32 | 2368.06 | 1000.17 | 2369.62 | 1014.17 | 2370.16 | 1061.22 | 2370.53 |
| 1111.47 | 2370.4 | 1161.24 | 2370.56 | 1209.8 | 2371.57 | 1257.92 | 2372.46 | 1303.98 | 2373.34 |
| 1355.62 | 2375.2 | 1385.72 | 2377.91 | 1394.22 | 2380.03 | 1433.82 | 2378.09 | 1483.15 | 2377.18 |
| 1551.2 | 2377 | 1587.93 | 2376.03 | 1620.16 | 2375.08 | 1627.71 | 2377.15 | 1651.51 | 2376.97 |
| 1665.4 | 2375 | 1684.73 | 2375.24 | 1693.06 | 2377.3 | 1719.73 | 2375.87 | 1773.83 | 2375.92 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .03 | 824.76 | .035 | 857.65 | .03 | 1303.98 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 824.76 | 857.65 | 262 | 261.5 | 261 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.19 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.19 | Reach Len. (ft) | 262.00 | 261.50 | 261.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 388.84 | 141.28 | 522.48 |
| E.G. Slope (ft/ft) | 0.000011 | Area (sq ft) | 388.84 | 141.28 | 522.48 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 102.63 | 51.36 | 116.01 |
| Top Width (ft) | 558.09 | Top Width (ft) | 191.59 | 32.89 | 333.62 |
| Vel Total (ft/s) | 0.26 | Avg. Vel. (ft/s) | 0.26 | 0.36 | 0.22 |
| Max Chl Dpth (ft) | 6.27 | Hydr. Depth (ft) | 2.03 | 4.30 | 1.57 |
| Conv. Total (cfs) | 81208.7 | Conv. (cfs) | 30868.1 | 15447.1 | 34893.5 |
| Length Wtd. (ft) | 261.46 | Wetted Per. (ft) | 191.63 | 34.18 | 333.71 |
| Min Ch El (ft) | 2364.91 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 12.10 | 13.95 | 15.36 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 8.87 | 6.05 | 12.94 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.775

INPUT

```
Description: Interpolated
Station Elevation Data     num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -58  2381.6  -30.21 2381.13   -1.83 2380.49   26.16 2379.78   54.17 2379.21
   82.15 2378.63   109.7 2377.93  137.53 2376.24  157.65 2375.07  179.92  2373.6
  207.96 2373.07  221.52 2372.85  248.15  2372.3  276.92 2371.66  307.21 2370.52
  337.25 2369.16  366.16 2368.48  402.92 2368.14  435.71 2368.35  442.43 2366.33
  445.81 2365.85  446.37 2365.81  451.33 2365.05  457.22 2365.66   457.3 2365.67
  461.96  2366.6  471.87 2368.71  511.97 2368.02  534.15 2368.32   552.3 2368.46
  591.69 2369.35  603.46 2369.65  643.01 2369.95  685.26 2370.01   727.1 2370.21
  767.93 2370.83  808.39 2371.39  847.11 2371.94  890.53 2372.99  915.83 2374.42
  922.98  2375.5  956.27 2374.63  997.75 2374.29 1054.96 2374.36 1085.84 2373.97
 1112.93 2373.57 1119.28 2374.62 1139.29 2374.59 1150.97 2373.64 1167.22 2373.81
 1174.22 2374.86 1196.65 2374.21 1242.13 2374.36

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     -58     .03  435.71    .035  471.87     .03  847.11    .032 1242.13    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        435.71  471.87            262.5   261.5     260             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2371.18    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035      0.030
  W.S. Elev (ft)           2371.18    Reach Len. (ft)            262.50     261.50     260.00
  Crit W.S. (ft)                      Flow Area (sq ft)          316.25     167.78     521.62
  E.G. Slope (ft/ft)      0.000011    Area (sq ft)               316.25     167.78     521.62
  Q Total (cfs)             270.00    Flow (cfs)                  86.90      64.82     118.28
  Top Width (ft)            503.71    Top Width (ft)             146.08      36.16     321.47
  Vel Total (ft/s)            0.27    Avg. Vel. (ft/s)            0.27       0.39       0.23
  Max Chl Dpth (ft)           6.13    Hydr. Depth (ft)            2.16       4.64       1.62
  Conv. Total (cfs)        81431.0    Conv. (cfs)               26207.8    19550.3    35673.0
  Length Wtd. (ft)          261.08    Wetted Per. (ft)           146.13      36.90     321.50
  Min Ch El (ft)           2365.05    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                       1.15    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)        9.98      13.02      12.23
  C & E Loss (ft)             0.00    Cum SA (acres)              7.86       5.85      10.97


CROSS SECTION


RIVER: Minnie Cr
REACH: Lower               RS: 8.55

INPUT
Description: Survey 8.11
Station Elevation Data     num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -116    2380       0  2368.1   46.67 2367.89   57.36 2365.66    63.2 2365.19
   69.85 2365.29   86.08  2367.6  136.57 2368.75  710.43  2372.8

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -116     .03   46.67    .035   86.08     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          46.67   86.08             48.5    51.7    52.1             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -116      -5    2378       F
     405  710.43    2378       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2371.18    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035      0.030
  W.S. Elev (ft)           2371.18    Reach Len. (ft)             48.50      51.70      52.10
  Crit W.S. (ft)           2367.20    Flow Area (sq ft)          162.68     196.99     549.24
  E.G. Slope (ft/ft)      0.000011    Area (sq ft)               194.76     196.99     569.44
  Q Total (cfs)             270.00    Flow (cfs)                  57.92      81.26     130.82
  Top Width (ft)            510.67    Top Width (ft)              76.68      39.41     394.58
  Vel Total (ft/s)            0.30    Avg. Vel. (ft/s)            0.36       0.41       0.24
  Max Chl Dpth (ft)           5.99    Hydr. Depth (ft)            3.15       5.00       1.72
  Conv. Total (cfs)        80667.5    Conv. (cfs)               17303.4    24279.4    39084.7
  Length Wtd. (ft)           51.42    Wetted Per. (ft)            51.70      39.82     318.94
  Min Ch El (ft)           2365.19    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                       1.20    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)        8.44      11.93       8.98
  C & E Loss (ft)             0.00    Cum SA (acres)              7.19       5.62       8.84


Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower               RS: 8.45

INPUT
Description: Survey 8.12
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -128.2    2380       0  2368.8   48.02 2367.94   54.59 2366.19   58.76  2365.3
   59.93 2363.46   60.92 2362.02   63.05  2361.3   65.18 2362.02   66.79 2364.36
   68.38 2365.28   78.65 2368.15   90.41 2368.61  106.29    2367  120.54 2367.02
   607.8 2372.21

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -128.2     .03   48.02    .035   78.65     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          48.02   78.65             22.15      22   22.15             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -128.2       0    2378       F
     360   607.8    2378       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2371.18    Element                    Left OB    Channel   Right OB
```

| | | | | | |
|---|---|---|---|---|---|
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.18 | Reach Len. (ft) | 22.15 | 22.00 | 22.15 |
| Crit W.S. (ft) | 2366.08 | Flow Area (sq ft) | 134.87 | 175.36 | 836.35 |
| E.G. Slope (ft/ft) | 0.000005 | Area (sq ft) | 167.26 | 175.36 | 957.75 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 29.72 | 48.89 | 191.39 |
| Top Width (ft) | 538.21 | Top Width (ft) | 75.25 | 30.63 | 432.33 |
| Vel Total (ft/s) | 0.24 | Avg. Vel. (ft/s) | 0.22 | 0.28 | 0.23 |
| Max Chl Dpth (ft) | 9.88 | Hydr. Depth (ft) | 2.81 | 5.73 | 2.97 |
| Conv. Total (cfs) | 120789.6 | Conv. (cfs) | 13297.3 | 21870.1 | 85622.2 |
| Length Wtd. (ft) | 22.00 | Wetted Per. (ft) | 48.03 | 34.83 | 281.45 |
| Min Ch El (ft) | 2361.30 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 8.24 | 11.71 | 8.06 |
| C & E Loss (ft) | | Cum SA (acres) | 7.10 | 5.58 | 8.34 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 8.3

INPUT
Description:
Distance from Upstream XS = 3
Deck/Roadway Width = 17
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 4

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 11.04 | 2368.5 | | 61.18 | 2369.66 | | 102.27 | 2367.23 | |
| 118.2 | 2366.97 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -128.2 | 2380 | 0 | 2368.8 | 48.02 | 2367.94 | 54.59 | 2366.19 | 58.76 | 2365.3 |
| 59.93 | 2363.46 | 60.92 | 2362.02 | 63.05 | 2361.3 | 65.18 | 2362.02 | 66.79 | 2364.36 |
| 68.38 | 2365.28 | 78.65 | 2368.15 | 90.41 | 2368.61 | 106.29 | 2367 | 120.54 | 2367.02 |
| 607.8 | 2372.21 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -128.2 | .03 | 48.02 | .035 | 78.65 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 48.02 | 78.65 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -128.2 | 0 | 2378 | F |
| 360 | 607.8 | 2378 | F |

Downstream Deck/Roadway Coordinates
num= 4

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 11.04 | 2368.5 | | 61.18 | 2369.66 | | 102.27 | 2367.23 | |
| 118.2 | 2366.97 | | | | | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -145.11 | 2380 | 0 | 2368.8 | 48.02 | 2367.94 | 54.59 | 2366.19 | 58.76 | 2365.3 |
| 59.93 | 2363.15 | 61.3 | 2361.87 | 63.05 | 2361.4 | 65.18 | 2362.12 | 66.79 | 2364.36 |
| 68.38 | 2365.28 | 78.65 | 2368.15 | 90.41 | 2368.61 | 106.29 | 2367 | 120.54 | 2367.02 |
| 564.33 | 2371.96 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -145.11 | .03 | 48.02 | .035 | 78.65 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 48.02 | 78.65 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -145.11 | 0 | 2378 | F |
| 360 | 564.33 | 2378 | F |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

| Culvert Name | Shape | Rise | Span |
|---|---|---|---|
| Culvert #1 | Circular | 7 | |

FHWA Chart # 55- Circular Culvert
FHWA Scale # 2 - Rough tapered inlet throat
Solution Criteria = Highest U.S. EG

| Culvert | Upstrm Dist | Length | Top n | Bottom n | Depth Blocked | Entrance Loss Coef | Exit Loss Coef |
|---|---|---|---|---|---|---|---|
| | 2.1 | 17 | .01 | .01 | 0 | .09 | 1 |

Upstream Elevation = 2361.8
Centerline Station = 63.05
Downstream Elevation = 2361.9
Centerline Station = 63.05

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 16.61 | Culv Full Len (ft) | 17.00 |
| # Barrels | 1 | Culv Vel US (ft/s) | 0.43 |
| Q Barrel (cfs) | 16.61 | Culv Vel DS (ft/s) | 0.43 |
| E.G. US. (ft) | 2371.18 | Culv Inv El Up (ft) | 2361.80 |
| W.S. US. (ft) | 2371.18 | Culv Inv El Dn (ft) | 2361.90 |
| E.G. DS (ft) | 2371.18 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2371.18 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.00 | Culv Entr Loss (ft) | 0.00 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 274.38 |
| E.G. IC (ft) | 2368.58 | Weir Sta Lft (ft) | 0.00 |
| E.G. OC (ft) | 2371.18 | Weir Sta Rgt (ft) | 360.00 |
| Culvert Control | Outlet | Weir Submerg | 1.00 |
| Culv WS Inlet (ft) | 2368.80 | Weir Max Depth (ft) | 4.17 |
| Culv WS Outlet (ft) | 2368.90 | Weir Avg Depth (ft) | 2.79 |

| | | | |
|---|---|---|---|
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 1002.62 |
| Culv Crt Depth (ft) | 1.02 | Min El Weir Flow (ft) | 2367.02 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.
Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow. The reported inlet energy grade answer may not be valid.
Warning: During the culvert outlet computations, the program could not balance the culvert/weir flow. The reported outlet energy grade answer may not be valid.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.28

INPUT
Description: Copy of Survey 8.12
Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -145.11 | 2380 | 0 | 2368.8 | 48.02 | 2367.94 | 54.59 | 2366.19 | 58.76 | 2365.3 |
| 59.93 | 2363.15 | 61.3 | 2361.87 | 63.05 | 2361.4 | 65.18 | 2362.12 | 66.79 | 2364.36 |
| 68.38 | 2365.28 | 78.65 | 2368.15 | 90.41 | 2368.61 | 106.29 | 2367 | 120.54 | 2367.02 |
| 564.33 | 2371.96 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -145.11 | .03 | 48.02 | .035 | 78.65 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 48.02 | 78.65 | | 197.16 | 191.3 | 182.4 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -145.11 | 0 | 2378 | F |
| 360 | 564.33 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.18 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.18 | Reach Len. (ft) | 197.16 | 191.30 | 182.40 |
| Crit W.S. (ft) | 2366.08 | Flow Area (sq ft) | 134.76 | 175.12 | 821.90 |
| E.G. Slope (ft/ft) | 0.000005 | Area (sq ft) | 171.34 | 175.12 | 921.72 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 30.30 | 49.91 | 189.79 |
| Top Width (ft) | 524.71 | Top Width (ft) | 78.81 | 30.63 | 415.28 |
| Vel Total (ft/s) | 0.24 | Avg. Vel. (ft/s) | 0.22 | 0.29 | 0.23 |
| Max Chl Dpth (ft) | 9.78 | Hydr. Depth (ft) | 2.81 | 5.72 | 2.92 |
| Conv. Total (cfs) | 118320.2 | Conv. (cfs) | 13278.0 | 21872.3 | 83169.9 |
| Length Wtd. (ft) | 187.36 | Wetted Per. (ft) | 48.03 | 34.71 | 281.46 |
| Min Ch El (ft) | 2361.40 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 8.16 | 11.62 | 7.59 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 7.06 | 5.56 | 8.13 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.25

INPUT
Description: Survey 8.1
Station Elevation Data num= 60

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | 47.93 | 2389.51 | 99 | 2389.17 | 148.46 | 2388.59 | 196.67 | 2387.83 |
| 244.2 | 2387 | 291.76 | 2386.07 | 341.39 | 2385.04 | 389.43 | 2384.02 | 438.38 | 2383.18 |
| 488.06 | 2382.6 | 537.1 | 2382.08 | 586.98 | 2381.24 | 637.1 | 2380.16 | 685.31 | 2378.52 |
| 733.57 | 2376.5 | 781.45 | 2374.71 | 831.09 | 2373.11 | 878.83 | 2372.15 | 891.07 | 2371.3 |
| 940.59 | 2370.58 | 951.73 | 2366.45 | 963.21 | 2365.11 | 975.79 | 2365.62 | 982.82 | 2367.3 |
| 994.03 | 2369.42 | 1025.2 | 2369.61 | 1065.24 | 2370.52 | 1112.07 | 2370.54 | 1158.87 | 2370.71 |
| 1206.43 | 2371.1 | 1254.01 | 2371.41 | 1301.13 | 2371.6 | 1348.53 | 2371.74 | 1395.59 | 2371.74 |
| 1442.42 | 2371.8 | 1490.67 | 2371.96 | 1537.98 | 2372.21 | 1585.53 | 2372.52 | 1634.36 | 2372.78 |
| 1660.28 | 2372.8 | 1708.05 | 2372.74 | 1754.51 | 2372.59 | 1802.09 | 2372.52 | 1848.64 | 2372.56 |
| 1895.83 | 2372.7 | 1943.3 | 2373.13 | 1990.67 | 2373.7 | 2037.58 | 2374.07 | 2084.64 | 2374.41 |
| 2131.79 | 2374.8 | 2180.34 | 2375.2 | 2226.79 | 2375.32 | 2274.54 | 2375.32 | 2320.76 | 2375.31 |
| 2367.93 | 2375.5 | 2414.72 | 2375.9 | 2465.94 | 2376.38 | 2512.79 | 2376.44 | 2559.71 | 2376.48 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 940.59 | .04 | 982.82 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 940.59 | 982.82 | | 61.5 | 59.7 | 62 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.17 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2371.16 | Reach Len. (ft) | 61.50 | 59.70 | 62.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 11.64 | 197.25 | 193.88 |
| E.G. Slope (ft/ft) | 0.000095 | Area (sq ft) | 11.64 | 197.25 | 193.88 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 2.47 | 196.56 | 70.97 |
| Top Width (ft) | 315.34 | Top Width (ft) | 40.02 | 42.23 | 233.10 |
| Vel Total (ft/s) | 0.67 | Avg. Vel. (ft/s) | 0.21 | 1.00 | 0.37 |
| Max Chl Dpth (ft) | 6.05 | Hydr. Depth (ft) | 0.29 | 4.67 | 0.83 |
| Conv. Total (cfs) | 27677.1 | Conv. (cfs) | 253.1 | 20148.6 | 7275.5 |
| Length Wtd. (ft) | 60.14 | Wetted Per. (ft) | 40.02 | 43.26 | 233.31 |
| Min Ch El (ft) | 2365.11 | Shear (lb/sq ft) | 0.00 | 0.03 | 0.00 |
| Alpha | 1.69 | Stream Power (lb/ft s) | 0.00 | 0.03 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 7.74 | 10.80 | 5.25 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.79 | 5.40 | 6.77 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.2

INPUT
Description:
Station Elevation Data num= 61

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | 47.93 | 2389.51 | 99 | 2389.17 | 148.46 | 2388.59 | 196.67 | 2387.83 |
| 244.2 | 2387 | 291.76 | 2386.07 | 341.39 | 2385.04 | 389.43 | 2384.02 | 438.38 | 2383.18 |
| 488.06 | 2382.6 | 537.1 | 2382.08 | 586.98 | 2381.24 | 637.1 | 2380.16 | 685.31 | 2378.52 |
| 733.57 | 2376.5 | 781.45 | 2374.71 | 831.09 | 2373.11 | 878.83 | 2372.15 | 910.64 | 2372.1 |
| 957.89 | 2370.1 | 971.03 | 2366.22 | 980.14 | 2365.37 | 981.6 | 2364.9 | 982.82 | 2365.1 |
| 992.75 | 2368.2 | 996.58 | 2369.56 | 1040.19 | 2370.04 | 1065.24 | 2370.52 | 1112.07 | 2370.54 |
| 1158.87 | 2370.71 | 1206.43 | 2371.1 | 1254.01 | 2371.41 | 1301.13 | 2371.6 | 1348.53 | 2371.74 |
| 1395.59 | 2371.74 | 1442.42 | 2371.8 | 1490.67 | 2371.96 | 1537.98 | 2372.21 | 1585.53 | 2372.52 |
| 1634.36 | 2372.78 | 1660.28 | 2372.8 | 1708.05 | 2372.74 | 1754.51 | 2372.59 | 1802.09 | 2372.52 |
| 1848.64 | 2372.56 | 1895.83 | 2372.7 | 1943.3 | 2373.13 | 1990.67 | 2373.7 | 2037.58 | 2374.07 |
| 2084.64 | 2374.41 | 2131.79 | 2374.8 | 2180.34 | 2375.2 | 2226.79 | 2375.32 | 2274.54 | 2375.32 |
| 2320.76 | 2375.31 | 2367.93 | 2375.5 | 2414.72 | 2375.9 | 2465.94 | 2376.38 | 2512.79 | 2376.44 |
| 2559.71 | 2376.48 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 957.89 | .035 | 1065.24 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 957.89 | 1065.24 | 52.61 | 52.7 | 52.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.17 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.15 | Reach Len. (ft) | 52.61 | 52.70 | 52.54 |
| Crit W.S. (ft) | 2367.68 | Flow Area (sq ft) | 13.06 | 238.57 | 65.69 |
| E.G. Slope (ft/ft) | 0.000194 | Area (sq ft) | 13.06 | 238.57 | 65.69 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 5.86 | 237.93 | 26.21 |
| Top Width (ft) | 281.29 | Top Width (ft) | 24.84 | 107.35 | 149.10 |
| Vel Total (ft/s) | 0.85 | Avg. Vel. (ft/s) | 0.45 | 1.00 | 0.40 |
| Max Chl Dpth (ft) | 6.25 | Hydr. Depth (ft) | 0.53 | 2.22 | 0.44 |
| Conv. Total (cfs) | 19404.8 | Conv. (cfs) | 421.2 | 17100.0 | 1883.6 |
| Length Wtd. (ft) | 52.70 | Wetted Per. (ft) | 24.86 | 108.75 | 149.10 |
| Min Ch El (ft) | 2364.90 | Shear (lb/sq ft) | 0.01 | 0.03 | 0.01 |
| Alpha | 1.24 | Stream Power (lb/ft s) | 0.00 | 0.03 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 7.72 | 10.50 | 5.07 |
| C & E Loss (ft) | | Cum SA (acres) | 6.75 | 5.30 | 6.50 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 8.01

INPUT
Description: culv@8
culv at section 8
Distance from Upstream XS = 4.3
Deck/Roadway Width = 45.9
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 55

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | | 47.93 | 2389.51 | | 99 | 2389.17 | |
| 148.46 | 2388.59 | | 196.67 | 2387.83 | | 244.2 | 2387 | |
| 291.76 | 2386.07 | | 341.39 | 2385.04 | | 389.43 | 2384.02 | |
| 438.38 | 2383.18 | | 488.06 | 2382.6 | | 537.1 | 2382.08 | |
| 586.98 | 2381.24 | | 637.1 | 2380.16 | | 685.31 | 2378.52 | |
| 733.57 | 2376.5 | | 781.45 | 2374.71 | | 831.09 | 2373.11 | |
| 878.83 | 2372.15 | | 927.21 | 2371.56 | | 973.31 | 2371.1 | |
| 1019.24 | 2370.74 | | 1065.24 | 2370.52 | | 1112.07 | 2370.54 | |
| 1158.87 | 2370.71 | | 1206.43 | 2371.1 | | 1254.01 | 2371.41 | |
| 1301.13 | 2371.6 | | 1348.53 | 2371.74 | | 1395.59 | 2371.74 | |
| 1442.42 | 2371.8 | | 1490.67 | 2371.96 | | 1537.98 | 2372.21 | |
| 1585.53 | 2372.52 | | 1634.36 | 2372.78 | | 1660.28 | 2372.8 | |
| 1708.05 | 2372.74 | | 1754.51 | 2372.59 | | 1802.09 | 2372.52 | |
| 1848.64 | 2372.56 | | 1895.83 | 2372.7 | | 1943.3 | 2373.13 | |
| 1990.67 | 2373.7 | | 2037.58 | 2374.07 | | 2084.64 | 2374.41 | |
| 2131.79 | 2374.8 | | 2180.34 | 2375.2 | | 2226.79 | 2375.32 | |
| 2274.54 | 2375.32 | | 2320.76 | 2375.31 | | 2367.93 | 2375.5 | |
| 2414.72 | 2375.9 | | 2465.94 | 2376.38 | | 2512.79 | 2376.44 | |
| 2559.71 | 2376.48 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 61

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | 47.93 | 2389.51 | 99 | 2389.17 | 148.46 | 2388.59 | 196.67 | 2387.83 |
| 244.2 | 2387 | 291.76 | 2386.07 | 341.39 | 2385.04 | 389.43 | 2384.02 | 438.38 | 2383.18 |
| 488.06 | 2382.6 | 537.1 | 2382.08 | 586.98 | 2381.24 | 637.1 | 2380.16 | 685.31 | 2378.52 |
| 733.57 | 2376.5 | 781.45 | 2374.71 | 831.09 | 2373.11 | 878.83 | 2372.15 | 910.64 | 2372.1 |
| 957.89 | 2370.1 | 971.03 | 2366.22 | 980.14 | 2365.37 | 981.6 | 2364.9 | 982.82 | 2365.1 |
| 992.75 | 2368.2 | 996.58 | 2369.56 | 1040.19 | 2370.04 | 1065.24 | 2370.52 | 1112.07 | 2370.54 |
| 1158.87 | 2370.71 | 1206.43 | 2371.1 | 1254.01 | 2371.41 | 1301.13 | 2371.6 | 1348.53 | 2371.74 |
| 1395.59 | 2371.74 | 1442.42 | 2371.8 | 1490.67 | 2371.96 | 1537.98 | 2372.21 | 1585.53 | 2372.52 |
| 1634.36 | 2372.78 | 1660.28 | 2372.8 | 1708.05 | 2372.74 | 1754.51 | 2372.59 | 1802.09 | 2372.52 |
| 1848.64 | 2372.56 | 1895.83 | 2372.7 | 1943.3 | 2373.13 | 1990.67 | 2373.7 | 2037.58 | 2374.07 |
| 2084.64 | 2374.41 | 2131.79 | 2374.8 | 2180.34 | 2375.2 | 2226.79 | 2375.32 | 2274.54 | 2375.32 |
| 2320.76 | 2375.31 | 2367.93 | 2375.5 | 2414.72 | 2375.9 | 2465.94 | 2376.38 | 2512.79 | 2376.44 |
| 2559.71 | 2376.48 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 957.89 | .035 | 1065.24 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 957.89 | 1065.24 | .1 | .3 |

Downstream Deck/Roadway Coordinates
num= 55

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | | 47.93 | 2389.51 | | 99 | 2389.17 | |
| 148.46 | 2388.59 | | 196.67 | 2387.83 | | 244.2 | 2387 | |
| 291.76 | 2386.07 | | 341.39 | 2385.04 | | 389.43 | 2384.02 | |
| 438.38 | 2383.18 | | 488.06 | 2382.6 | | 537.1 | 2382.08 | |
| 586.98 | 2381.24 | | 637.1 | 2380.16 | | 685.31 | 2378.52 | |
| 733.57 | 2376.5 | | 781.45 | 2374.71 | | 831.09 | 2373.11 | |
| 878.83 | 2372.15 | | 927.21 | 2371.56 | | 973.31 | 2371.1 | |
| 1019.24 | 2370.74 | | 1065.24 | 2370.52 | | 1112.07 | 2370.54 | |
| 1158.87 | 2370.71 | | 1206.43 | 2371.1 | | 1254.01 | 2371.41 | |

```
 1301.13  2371.6          1348.53 2371.74          1395.59 2371.74
 1442.42  2371.8          1490.67 2371.96          1537.98 2372.21
 1585.53 2372.52          1634.36 2372.78          1660.28  2372.8
 1708.05 2372.74          1754.51 2372.59          1802.09 2372.52
 1848.64 2372.56          1895.83  2372.7           1943.3 2373.13
 1990.67  2373.7          2037.58 2374.07          2084.64 2374.41
 2131.79  2374.8          2180.34  2375.2          2226.79 2375.32
 2274.54 2375.32          2320.76 2375.31          2367.93  2375.5
 2414.72  2375.9          2465.94 2376.38          2512.79 2376.44
 2559.71 2376.48

Downstream Bridge Cross Section Data
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      22  2389.4   69.93 2389.51     121 2389.17  170.46 2388.59  218.67 2387.83
   266.2    2387  313.76 2386.07  363.39 2385.04  411.43 2384.02  460.38 2383.18
  510.06  2382.6   559.1 2382.08  608.98 2381.24   659.1 2380.16  707.31 2378.52
  755.57  2376.5  803.45 2374.71  853.09 2373.11  900.83 2372.15  932.64  2372.1
  979.89  2370.1  993.03 2366.22 1002.14 2365.37 1004.31  2364.3 1005.31  2364.5
 1014.75  2368.2 1018.58 2369.56 1062.19 2370.04 1087.24 2370.52 1134.07 2370.54
 1180.87 2370.71 1228.43  2371.1 1276.01 2371.41 1323.13  2371.6 1370.53 2371.74
 1417.59 2371.74 1464.42  2371.8 1512.67 2371.96 1559.98 2372.21 1607.53 2372.52
 1656.36 2372.78 1682.28  2372.8 1730.05 2372.74 1776.51 2372.59 1824.09 2372.52
 1870.64 2372.56 1917.83  2372.7  1965.3 2373.13 2012.67  2373.7 2059.58 2374.07
 2106.64 2374.41 2153.79  2374.8 2202.34  2375.2 2248.79 2375.32 2296.54 2375.32
 2342.76 2375.31 2389.93  2375.5 2436.72  2375.9 2487.94 2376.38 2534.79 2376.44
 2581.71 2376.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      22     .03  979.89    .035 1087.24     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        979.89 1087.24             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@8          Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                4.3      46     .024     .024        0                .9                  1
Upstream   Elevation =  2365.2
           Centerline Station =  981.6
Downstream Elevation =  2364.7
           Centerline Station =  1004.31

CULVERT OUTPUT  Profile #PF 1  Culv Group:  culv@8

  Q Culv Group (cfs)          79.83   Culv Full Len (ft)          46.00
  # Barrels                       1   Culv Vel US (ft/s)           6.35
  Q Barrel (cfs)              79.83   Culv Vel DS (ft/s)           6.35
  E.G. US. (ft)             2371.17   Culv Inv El Up (ft)       2365.20
  W.S. US. (ft)             2371.15   Culv Inv El Dn (ft)       2364.70
  E.G. DS (ft)              2369.61   Culv Frctn Ls (ft)           0.48
  W.S. DS (ft)              2369.49   Culv Exit Loss (ft)          0.51
  Delta EG (ft)                1.56   Culv Entr Loss (ft)          0.56
  Delta WS (ft)                1.66   Q Weir (cfs)               188.13
  E.G. IC (ft)              2371.12   Weir Sta Lft (ft)          966.75
  E.G. OC (ft)              2371.17   Weir Sta Rgt (ft)         1216.48
  Culvert Control            Outlet   Weir Submerg                 0.00
  Culv WS Inlet (ft)        2369.20   Weir Max Depth (ft)          0.65
  Culv WS Outlet (ft)       2368.70   Weir Avg Depth (ft)          0.42
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)     103.90
  Culv Crt Depth (ft)          2.71   Min El Weir Flow (ft)     2370.53


CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 7.98

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      22  2389.4   69.93 2389.51     121 2389.17  170.46 2388.59  218.67 2387.83
   266.2    2387  313.76 2386.07  363.39 2385.04  411.43 2384.02  460.38 2383.18
  510.06  2382.6   559.1 2382.08  608.98 2381.24   659.1 2380.16  707.31 2378.52
  755.57  2376.5  803.45 2374.71  853.09 2373.11  900.83 2372.15  932.64  2372.1
  979.89  2370.1  993.03 2366.22 1002.14 2365.37 1004.31  2364.3 1005.31  2364.5
 1014.75  2368.2 1018.58 2369.56 1062.19 2370.04 1087.24 2370.52 1134.07 2370.54
 1180.87 2370.71 1228.43  2371.1 1276.01 2371.41 1323.13  2371.6 1370.53 2371.74
 1417.59 2371.74 1464.42  2371.8 1512.67 2371.96 1559.98 2372.21 1607.53 2372.52
 1656.36 2372.78 1682.28  2372.8 1730.05 2372.74 1776.51 2372.59 1824.09 2372.52
 1870.64 2372.56 1917.83  2372.7  1965.3 2373.13 2012.67  2373.7 2059.58 2374.07
 2106.64 2374.41 2153.79  2374.8 2202.34  2375.2 2248.79 2375.32 2296.54 2375.32
 2342.76 2375.31 2389.93  2375.5 2436.72  2375.9 2487.94 2376.38 2534.79 2376.44
 2581.71 2376.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      22     .03  979.89    .035 1087.24     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        979.89 1087.24            172.58   157.1  145.16             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)            2369.61   Element                   Left OB    Channel   Right OB
  Vel Head (ft)                0.12   Wt. n-Val.                           0.035
  W.S. Elev (ft)            2369.49   Reach Len. (ft)           172.58     157.10     145.16
  Crit W.S. (ft)                      Flow Area (sq ft)                     98.95
  E.G. Slope (ft/ft)       0.001158   Area (sq ft)                          98.95
  Q Total (cfs)              270.00   Flow (cfs)                           270.00
  Top Width (ft)              36.43   Top Width (ft)                        36.43
  Vel Total (ft/s)             2.73   Avg. Vel. (ft/s)                       2.73
```

| | | | | | | |
|---|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 5.19 | Hydr. Depth (ft) | | | 2.72 | |
| Conv. Total (cfs) | 7933.1 | Conv. (cfs) | | | 7933.1 | |
| Length Wtd. (ft) | 157.05 | Wetted Per. (ft) | | | 38.13 | |
| Min Ch El (ft) | 2364.30 | Shear (lb/sq ft) | | | 0.19 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | | 0.51 | |
| Frctn Loss (ft) | 0.24 | Cum Volume (acre-ft) | | 7.72 | 10.30 | 5.03 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | | 6.73 | 5.21 | 6.41 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.9

INPUT
Description: Survey 8.3
Station Elevation Data num= 55

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2388.4 | 47.93 | 2388.51 | 99 | 2388.17 | 148.46 | 2387.59 | 196.67 | 2386.83 |
| 244.2 | 2386 | 291.76 | 2385.07 | 341.39 | 2384.04 | 389.43 | 2383.02 | 438.38 | 2382.18 |
| 488.06 | 2381.6 | 537.1 | 2381.08 | 586.98 | 2380.24 | 637.1 | 2379.16 | 685.31 | 2377.52 |
| 733.57 | 2375.5 | 781.45 | 2373.71 | 831.09 | 2372.11 | 878.83 | 2371.15 | 927.21 | 2370.56 |
| 973.31 | 2370.09 | 1073.22 | 2369.83 | 1121.28 | 2369.22 | 1137.42 | 2365.2 | 1142.21 | 2365.13 |
| 1145.35 | 2365.77 | 1152.93 | 2368.8 | 1190.01 | 2369.66 | 1237.3 | 2370.1 | 1284.88 | 2370.41 |
| 1332 | 2370.6 | 1379.4 | 2370.74 | 1426.46 | 2370.74 | 1473.29 | 2370.8 | 1521.54 | 2370.96 |
| 1568.85 | 2371.21 | 1616.4 | 2371.52 | 1665.23 | 2371.78 | 1691.15 | 2371.8 | 1738.92 | 2371.74 |
| 1785.38 | 2371.59 | 1832.96 | 2371.52 | 1879.51 | 2371.56 | 1926.7 | 2371.7 | 1974.17 | 2372.13 |
| 2021.54 | 2372.7 | 2068.45 | 2373.07 | 2115.51 | 2373.41 | 2162.66 | 2373.8 | 2211.21 | 2374.2 |
| 2257.66 | 2374.32 | 2305.41 | 2374.32 | 2351.63 | 2374.31 | 2398.8 | 2374.5 | 2445.59 | 2374.9 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 1121.28 | .035 | 1152.93 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1121.28 | 1152.93 | 267 | 277.7 | 286 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2369.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.19 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2369.17 | Reach Len. (ft) | 267.00 | 277.70 | 286.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 76.76 | 2.93 |
| E.G. Slope (ft/ft) | 0.002154 | Area (sq ft) | | 76.76 | 2.93 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 267.81 | 2.19 |
| Top Width (ft) | 47.35 | Top Width (ft) | | 31.45 | 15.91 |
| Vel Total (ft/s) | 3.39 | Avg. Vel. (ft/s) | | 3.49 | 0.74 |
| Max Chl Dpth (ft) | 4.04 | Hydr. Depth (ft) | | 2.44 | 0.18 |
| Conv. Total (cfs) | 5817.2 | Conv. (cfs) | | 5770.1 | 47.1 |
| Length Wtd. (ft) | 277.82 | Wetted Per. (ft) | | 32.58 | 15.91 |
| Min Ch El (ft) | 2365.13 | Shear (lb/sq ft) | | 0.32 | 0.02 |
| Alpha | 1.05 | Stream Power (lb/ft s) | | 1.11 | 0.02 |
| Frctn Loss (ft) | 0.59 | Cum Volume (acre-ft) | 7.72 | 9.98 | 5.02 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.73 | 5.09 | 6.38 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.6

INPUT
Description: Interpolated
Station Elevation Data num= 107

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2384.07 | 21.36 | 2383.26 | 44.3 | 2383.34 | 57.64 | 2383.3 | 91.51 | 2382.96 |
| 112.86 | 2382.66 | 137.22 | 2382.39 | 170.76 | 2381.93 | 181.78 | 2381.75 | 225.72 | 2380.99 |
| 229.93 | 2380.91 | 269.68 | 2380.07 | 286.04 | 2379.71 | 315.55 | 2379 | 340.38 | 2378.39 |
| 359.95 | 2378.01 | 396.08 | 2377.42 | 405.2 | 2377.31 | 450.08 | 2376.91 | 451.12 | 2376.9 |
| 496.45 | 2376.53 | 504.67 | 2376.42 | 542.55 | 2376.02 | 560.03 | 2375.78 | 588.88 | 2375.37 |
| 619.57 | 2374.66 | 633.44 | 2374.34 | 676.23 | 2373.11 | 678.05 | 2373.06 | 722.3 | 2371.83 |
| 731.56 | 2371.61 | 768.18 | 2370.83 | 789.33 | 2370.57 | 812.31 | 2370.22 | 844.18 | 2369.93 |
| 857.03 | 2369.81 | 899.64 | 2369.48 | 903.24 | 2369.48 | 960.65 | 2369.3 | 991.99 | 2369.18 |
| 1015.45 | 2368.92 | 1036.41 | 2368.71 | 1045.34 | 2366.28 | 1051.97 | 2364.92 | 1056.58 | 2364.72 |
| 1057.75 | 2364.99 | 1061 | 2365.61 | 1064.94 | 2366.72 | 1071.66 | 2368.1 | 1105.9 | 2368.74 |
| 1123.59 | 2368.9 | 1136.06 | 2369.01 | 1149.57 | 2369.16 | 1161.8 | 2369.27 | 1193.51 | 2369.64 |
| 1231.82 | 2370.01 | 1237.03 | 2370.1 | 1271.87 | 2370.67 | 1280.8 | 2370.78 | 1324.26 | 2371.18 |
| 1329.06 | 2371.23 | 1367.51 | 2371.58 | 1388.88 | 2371.81 | 1399.47 | 2371.54 | 1412.07 | 2371.27 |
| 1436.28 | 2370.78 | 1455.76 | 2370.65 | 1495.56 | 2370.43 | 1499.67 | 2370.47 | 1544.77 | 2370.91 |
| 1553.74 | 2370.97 | 1568.7 | 2371.18 | 1612.63 | 2371.71 | 1612.82 | 2371.72 | 1625.46 | 2372.14 |
| 1655.72 | 2372.23 | 1658.67 | 2372.24 | 1686.95 | 2373.09 | 1699.66 | 2372.98 | 1722.92 | 2372.82 |
| 1742.65 | 2373.03 | 1770.61 | 2373.38 | 1786.23 | 2373.53 | 1826.36 | 2374.1 | 1830.07 | 2374.33 |
| 1837.71 | 2374.83 | 1848.99 | 2374.32 | 1860.36 | 2374.57 | 1873.82 | 2374.39 | 1904.45 | 2373.89 |
| 1917.14 | 2373.84 | 1960.6 | 2373.64 | 1961.52 | 2373.63 | 2004.14 | 2373.42 | 2019.55 | 2373.34 |
| 2048.98 | 2373.36 | 2078.41 | 2373.25 | 2091.87 | 2373.34 | 2135.97 | 2373.54 | 2138.79 | 2373.56 |
| 2178.65 | 2373.55 | 2184.09 | 2373.57 | 2222.22 | 2373.93 | 2236.1 | 2374.11 | 2247.09 | 2373.92 |
| 2257.08 | 2374.78 | 2265.43 | 2374.8 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 1036.41 | .035 | 1071.66 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1036.41 | 1071.66 | 277 | 277.7 | 274 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2368.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2368.59 | Reach Len. (ft) | 277.00 | 277.70 | 274.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 79.66 | 6.50 |
| E.G. Slope (ft/ft) | 0.002090 | Area (sq ft) | | 79.66 | 6.50 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 264.21 | 5.79 |
| Top Width (ft) | 61.20 | Top Width (ft) | | 34.82 | 26.38 |
| Vel Total (ft/s) | 3.13 | Avg. Vel. (ft/s) | | 3.32 | 0.89 |
| Max Chl Dpth (ft) | 3.87 | Hydr. Depth (ft) | | 2.29 | 0.25 |
| Conv. Total (cfs) | 5906.4 | Conv. (cfs) | | 5779.8 | 126.6 |
| Length Wtd. (ft) | 277.55 | Wetted Per. (ft) | | 35.65 | 26.38 |
| Min Ch El (ft) | 2364.72 | Shear (lb/sq ft) | | 0.29 | 0.03 |
| Alpha | 1.10 | Stream Power (lb/ft s) | | 0.97 | 0.03 |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 7.72 | 9.48 | 4.99 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.73 | 4.88 | 6.24 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.3

INPUT
Description: Interpolated
Station Elevation Data num= 107

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2379.73 | 19.61 | 2378.07 | 40.67 | 2378.17 | 52.92 | 2378.18 | 84.01 | 2377.74 |
| 103.62 | 2377.43 | 125.99 | 2377.2 | 156.77 | 2376.83 | 166.9 | 2376.67 | 207.23 | 2375.97 |
| 211.1 | 2375.9 | 247.59 | 2375.07 | 262.61 | 2374.71 | 289.71 | 2373.95 | 312.5 | 2373.3 |
| 330.48 | 2373 | 363.64 | 2372.5 | 372.02 | 2372.43 | 413.23 | 2372.21 | 414.18 | 2372.21 |
| 455.79 | 2371.97 | 463.35 | 2371.91 | 498.12 | 2371.8 | 514.17 | 2371.72 | 540.66 | 2371.58 |
| 568.84 | 2371.28 | 581.57 | 2371.16 | 620.86 | 2370.64 | 622.52 | 2370.61 | 663.15 | 2369.96 |
| 671.66 | 2369.84 | 705.28 | 2369.55 | 724.7 | 2369.48 | 745.79 | 2369.3 | 775.05 | 2369.13 |
| 786.85 | 2369.06 | 825.97 | 2368.88 | 829.27 | 2368.87 | 881.99 | 2368.67 | 910.76 | 2368.52 |
| 932.29 | 2368.32 | 951.54 | 2368.21 | 960.13 | 2365.65 | 966.51 | 2364.64 | 970.96 | 2364.3 |
| 972.46 | 2364.69 | 976.65 | 2365.44 | 981.73 | 2366.54 | 990.38 | 2367.4 | 1021.79 | 2367.82 |
| 1038.02 | 2367.95 | 1049.45 | 2368.05 | 1061.84 | 2368.22 | 1073.06 | 2368.36 | 1102.14 | 2368.87 |
| 1137.28 | 2369.45 | 1142.06 | 2369.6 | 1174.01 | 2370.64 | 1182.2 | 2370.81 | 1222.06 | 2371.62 |
| 1226.47 | 2371.71 | 1261.73 | 2372.36 | 1281.33 | 2372.75 | 1291.04 | 2372.17 | 1302.6 | 2371.58 |
| 1324.8 | 2370.45 | 1342.67 | 2370.09 | 1379.17 | 2369.36 | 1382.94 | 2369.42 | 1424.3 | 2370.05 |
| 1432.53 | 2370.16 | 1446.25 | 2370.55 | 1486.55 | 2371.68 | 1486.72 | 2371.69 | 1498.31 | 2372.59 |
| 1526.07 | 2372.87 | 1528.77 | 2372.9 | 1554.7 | 2374.65 | 1566.37 | 2374.44 | 1587.69 | 2374.09 |
| 1605.79 | 2374.51 | 1631.43 | 2375.11 | 1645.76 | 2375.37 | 1682.57 | 2376.11 | 1685.97 | 2376.54 |
| 1692.98 | 2377.43 | 1703.33 | 2376.26 | 1713.75 | 2376.61 | 1726.09 | 2376.08 | 1754.19 | 2374.81 |
| 1765.83 | 2374.6 | 1805.69 | 2373.86 | 1806.53 | 2373.85 | 1845.62 | 2373.03 | 1859.76 | 2372.74 |
| 1886.74 | 2372.51 | 1913.74 | 2372.23 | 1926.09 | 2372.36 | 1966.53 | 2372.77 | 1969.11 | 2372.79 |
| 2005.68 | 2372.8 | 2010.67 | 2372.8 | 2045.63 | 2373.37 | 2058.36 | 2373.6 | 2068.44 | 2373.12 |
| 2077.61 | 2374.74 | 2085.26 | 2374.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 951.54 | .035 | 990.38 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 951.54 | 990.38 | 279 | 277.7 | 271 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2368.18 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.14 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2368.04 | Reach Len. (ft) | 279.00 | 277.70 | 271.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 81.21 | 16.21 |
| E.G. Slope (ft/ft) | 0.002045 | Area (sq ft) | | 81.21 | 16.21 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 254.37 | 15.63 |
| Top Width (ft) | 95.62 | Top Width (ft) | | 38.25 | 57.37 |
| Vel Total (ft/s) | 2.77 | Avg. Vel. (ft/s) | | 3.13 | 0.96 |
| Max Chl Dpth (ft) | 3.74 | Hydr. Depth (ft) | | 2.12 | 0.28 |
| Conv. Total (cfs) | 5970.4 | Conv. (cfs) | | 5624.8 | 345.6 |
| Length Wtd. (ft) | 277.39 | Wetted Per. (ft) | | 38.97 | 57.37 |
| Min Ch El (ft) | 2364.30 | Shear (lb/sq ft) | | 0.27 | 0.04 |
| Alpha | 1.21 | Stream Power (lb/ft s) | | 0.83 | 0.03 |
| Frctn Loss (ft) | 0.86 | Cum Volume (acre-ft) | 7.72 | 8.97 | 4.92 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.73 | 4.65 | 5.98 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7

INPUT
Description:
Station Elevation Data num= 57

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2375.4 | 17.86 | 2372.88 | 48.2 | 2373.07 | 94.38 | 2372.19 | 142.79 | 2371.74 |
| 192.27 | 2370.9 | 239.19 | 2369.72 | 284.63 | 2368.22 | 331.21 | 2367.57 | 376.37 | 2367.51 |
| 422.02 | 2367.4 | 468.31 | 2367.67 | 518.1 | 2367.91 | 565.48 | 2368.17 | 611.75 | 2368.06 |
| 660.06 | 2368.4 | 705.92 | 2368.33 | 755.31 | 2368.27 | 803.32 | 2368.05 | 849.14 | 2367.73 |
| 866.67 | 2367.7 | 874.93 | 2365.02 | 885.33 | 2363.89 | 887.17 | 2364.38 | 898.52 | 2366.37 |
| 909.11 | 2366.7 | 952.44 | 2367.01 | 962.84 | 2367.09 | 984.32 | 2367.45 | 1042.74 | 2368.88 |
| 1076.15 | 2370.6 | 1123.87 | 2372.19 | 1173.78 | 2373.68 | 1182.61 | 2372.8 | 1213.32 | 2370.13 |
| 1262.78 | 2368.3 | 1311.32 | 2369.34 | 1360.46 | 2371.65 | 1371.16 | 2373.03 | 1398.87 | 2373.56 |
| 1422.46 | 2376.2 | 1452.47 | 2375.37 | 1492.26 | 2376.84 | 1538.78 | 2378.12 | 1548.25 | 2380.03 |
| 1557.66 | 2378.2 | 1567.14 | 2378.66 | 1603.93 | 2375.74 | 1651.54 | 2374.06 | 1699.96 | 2372.14 |
| 1749.07 | 2371.2 | 1799.44 | 2372.03 | 1837.24 | 2372.04 | 1880.63 | 2373.08 | 1889.8 | 2372.31 |
| 1898.14 | 2374.7 | 1905.1 | 2374.61 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 866.67 | .035 | 909.11 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 866.67 | 909.11 | 200 | 196.6 | 199 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 565 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2367.31 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.26 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2367.05 | Reach Len. (ft) | 200.00 | 196.60 | 199.00 |
| Crit W.S. (ft) | 2366.46 | Flow Area (sq ft) | | 63.15 | 8.53 |
| E.G. Slope (ft/ft) | 0.005311 | Area (sq ft) | | 63.15 | 8.53 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 260.33 | 9.67 |
| Top Width (ft) | 88.90 | Top Width (ft) | | 40.44 | 48.47 |
| Vel Total (ft/s) | 3.77 | Avg. Vel. (ft/s) | | 4.12 | 1.13 |
| Max Chl Dpth (ft) | 3.16 | Hydr. Depth (ft) | | 1.56 | 0.18 |
| Conv. Total (cfs) | 3704.9 | Conv. (cfs) | | 3572.2 | 132.8 |
| Length Wtd. (ft) | 196.66 | Wetted Per. (ft) | | 41.06 | 48.47 |
| Min Ch El (ft) | 2363.89 | Shear (lb/sq ft) | | 0.51 | 0.06 |
| Alpha | 1.16 | Stream Power (lb/ft s) | | 2.10 | 0.07 |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 7.72 | 8.51 | 4.84 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.73 | 4.39 | 5.65 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.8125*

INPUT
Description:
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -141.25 | 2372.62 | -124.77 | 2370.73 | -96.76 | 2370.86 | -54.14 | 2370.17 | -9.46 | 2369.81 |
| 36.2 | 2369.16 | 79.51 | 2368.26 | 121.45 | 2367.11 | 164.44 | 2366.6 | 206.12 | 2366.53 |
| 248.25 | 2366.43 | 290.97 | 2366.61 | 336.93 | 2366.77 | 380.66 | 2366.94 | 423.36 | 2366.84 |
| 467.95 | 2367.07 | 510.27 | 2367 | 555.86 | 2366.93 | 600.17 | 2366.74 | 612.56 | 2366.67 |
| 642.46 | 2366.31 | 658.64 | 2366.18 | 665.45 | 2363.92 | 668.92 | 2363.45 | 671.58 | 2363.1 |
| 674.02 | 2362.79 | 674.17 | 2362.92 | 675.92 | 2363.29 | 687.66 | 2364.96 | 690.83 | 2365.07 |
| 698.61 | 2365.76 | 734.21 | 2365.83 | 735.55 | 2365.84 | 744.41 | 2365.9 | 762.72 | 2366.19 |
| 772.38 | 2366.41 | 812.51 | 2367.35 | 840.99 | 2368.7 | 853.54 | 2369.1 | 881.66 | 2369.95 |
| 924.2 | 2371.1 | 931.72 | 2370.45 | 953.92 | 2368.77 | 957.9 | 2368.47 | 1000.05 | 2367.13 |
| 1041.42 | 2367.95 | 1054.61 | 2368.51 | 1083.31 | 2369.71 | 1092.43 | 2370.75 | 1116.04 | 2371.17 |
| 1136.15 | 2373.16 | 1156.99 | 2372.67 | 1161.73 | 2372.56 | 1195.64 | 2373.68 | 1235.29 | 2374.66 |
| 1243.36 | 2376.1 | 1251.38 | 2374.73 | 1259.46 | 2375.08 | 1267.97 | 2374.5 | 1290.82 | 2372.93 |
| 1331.4 | 2371.71 | 1345.17 | 2371.25 | 1372.67 | 2370.31 | 1414.53 | 2369.65 | 1447.53 | 2370.16 |
| 1457.46 | 2370.32 | 1489.67 | 2370.38 | 1526.66 | 2371.21 | 1534.47 | 2370.64 | 1541.58 | 2372.44 |
| 1547.51 | 2372.39 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -141.25 | .03 | 658.64 | .035 | 698.61 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 658.64 | 698.61 | 198 | 196.6 | 198 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -141.25 | 423.36 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2366.21 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2365.92 | Reach Len. (ft) | 198.00 | 196.60 | 198.00 |
| Crit W.S. (ft) | 2365.42 | Flow Area (sq ft) | | 61.40 | 5.09 |
| E.G. Slope (ft/ft) | 0.005831 | Area (sq ft) | | 61.40 | 5.09 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 265.63 | 4.37 |
| Top Width (ft) | 86.36 | Top Width (ft) | | 39.19 | 47.17 |
| Vel Total (ft/s) | 4.06 | Avg. Vel. (ft/s) | | 4.33 | 0.86 |
| Max Chl Dpth (ft) | 3.13 | Hydr. Depth (ft) | | 1.57 | 0.11 |
| Conv. Total (cfs) | 3535.8 | Conv. (cfs) | | 3478.5 | 57.2 |
| Length Wtd. (ft) | 196.63 | Wetted Per. (ft) | | 39.83 | 47.17 |
| Min Ch El (ft) | 2362.79 | Shear (lb/sq ft) | | 0.56 | 0.04 |
| Alpha | 1.12 | Stream Power (lb/ft s) | | 2.43 | 0.03 |
| Frctn Loss (ft) | 1.07 | Cum Volume (acre-ft) | 7.72 | 8.23 | 4.81 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 6.73 | 4.21 | 5.43 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.625*

INPUT
Description:
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -282.5 | 2369.85 | -267.39 | 2368.57 | -241.73 | 2368.64 | -202.67 | 2368.16 | -161.72 | 2367.89 |
| -119.86 | 2367.42 | -80.17 | 2366.79 | -41.74 | 2366 | -2.33 | 2365.63 | 35.87 | 2365.56 |
| 74.48 | 2365.46 | 113.64 | 2365.55 | 155.75 | 2365.63 | 195.83 | 2365.72 | 234.97 | 2365.62 |
| 275.84 | 2365.74 | 314.63 | 2365.67 | 356.41 | 2365.59 | 397.02 | 2365.44 | 408.37 | 2365.38 |
| 435.78 | 2364.89 | 450.6 | 2364.67 | 455.96 | 2362.83 | 458.7 | 2362.34 | 460.79 | 2361.99 |
| 462.71 | 2361.69 | 462.87 | 2361.91 | 464.68 | 2362.19 | 476.8 | 2363.54 | 480.08 | 2363.68 |
| 488.12 | 2364.82 | 517.54 | 2364.65 | 518.65 | 2364.66 | 525.98 | 2364.72 | 541.12 | 2364.93 |
| 549.1 | 2365.09 | 582.28 | 2365.83 | 605.82 | 2366.8 | 616.2 | 2367.1 | 639.45 | 2367.7 |
| 674.61 | 2368.52 | 680.84 | 2368.1 | 699.18 | 2367 | 702.48 | 2366.81 | 737.33 | 2365.97 |
| 771.53 | 2366.56 | 782.43 | 2366.94 | 806.15 | 2367.77 | 813.69 | 2368.48 | 833.22 | 2368.77 |
| 849.84 | 2370.12 | 867.07 | 2369.81 | 870.99 | 2369.74 | 899.03 | 2370.52 | 931.8 | 2371.21 |
| 938.48 | 2372.17 | 945.11 | 2371.27 | 951.79 | 2371.51 | 958.82 | 2371.12 | 977.71 | 2370.11 |
| 1011.26 | 2369.36 | 1022.64 | 2369.07 | 1045.38 | 2368.49 | 1079.98 | 2368.1 | 1107.27 | 2368.49 |
| 1115.47 | 2368.61 | 1142.11 | 2368.71 | 1172.68 | 2369.34 | 1179.14 | 2368.97 | 1185.02 | 2370.19 |
| 1189.93 | 2370.16 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -282.5 | .03 | 450.6 | .035 | 488.12 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 450.6 | 488.12 | 199 | 196.6 | 194 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2365.13 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.27 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2364.86 | Reach Len. (ft) | 199.00 | 196.60 | 194.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.26 | 62.49 | 6.01 |
| E.G. Slope (ft/ft) | 0.005131 | Area (sq ft) | 1.26 | 62.49 | 6.01 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 0.94 | 263.75 | 5.32 |
| Top Width (ft) | 98.71 | Top Width (ft) | 13.01 | 37.52 | 48.18 |
| Vel Total (ft/s) | 3.87 | Avg. Vel. (ft/s) | 0.75 | 4.22 | 0.89 |
| Max Chl Dpth (ft) | 3.17 | Hydr. Depth (ft) | 0.10 | 1.67 | 0.12 |
| Conv. Total (cfs) | 3769.4 | Conv. (cfs) | 13.1 | 3682.1 | 74.2 |
| Length Wtd. (ft) | 196.60 | Wetted Per. (ft) | 13.01 | 38.21 | 48.18 |
| Min Ch El (ft) | 2361.69 | Shear (lb/sq ft) | 0.03 | 0.52 | 0.04 |
| Alpha | 1.16 | Stream Power (lb/ft s) | 0.02 | 2.21 | 0.04 |
| Frctn Loss (ft) | 1.23 | Cum Volume (acre-ft) | 7.71 | 7.95 | 4.79 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.70 | 4.04 | 5.22 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr

REACH: Lower RS: 6.4375*

INPUT
Description:
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -423.75 | 2367.07 | -410.02 | 2366.42 | -386.69 | 2366.43 | -351.19 | 2366.14 | -313.97 | 2365.96 |
| -275.93 | 2365.69 | -239.85 | 2365.33 | -204.92 | 2364.89 | -169.11 | 2364.66 | -134.39 | 2364.58 |
| -99.29 | 2364.49 | -63.7 | 2364.5 | -25.42 | 2364.49 | 11.01 | 2364.49 | 46.58 | 2364.4 |
| 83.72 | 2364.42 | 118.98 | 2364.34 | 156.96 | 2364.25 | 193.87 | 2364.13 | 204.19 | 2364.09 |
| 229.09 | 2363.46 | 242.57 | 2363.15 | 246.48 | 2361.73 | 248.47 | 2361.23 | 250 | 2360.88 |
| 251.4 | 2360.59 | 251.56 | 2360.91 | 253.43 | 2361.1 | 265.95 | 2362.12 | 269.32 | 2362.29 |
| 277.62 | 2363.88 | 300.88 | 2363.48 | 301.76 | 2363.49 | 307.55 | 2363.53 | 319.51 | 2363.67 |
| 325.83 | 2363.77 | 352.05 | 2364.3 | 370.66 | 2364.91 | 378.86 | 2365.11 | 397.23 | 2365.46 |
| 425.03 | 2365.94 | 429.95 | 2365.74 | 444.45 | 2365.24 | 447.05 | 2365.15 | 474.6 | 2364.8 |
| 501.63 | 2365.17 | 510.25 | 2365.38 | 529 | 2365.84 | 534.96 | 2366.2 | 550.39 | 2366.38 |
| 563.53 | 2367.08 | 577.15 | 2366.96 | 580.25 | 2366.93 | 602.41 | 2367.36 | 628.32 | 2367.75 |
| 633.59 | 2368.25 | 638.83 | 2367.8 | 644.11 | 2367.93 | 649.67 | 2367.75 | 664.6 | 2367.3 |
| 691.12 | 2367.02 | 700.12 | 2366.9 | 718.09 | 2366.67 | 745.44 | 2366.56 | 767 | 2366.81 |
| 773.49 | 2366.91 | 794.54 | 2367.05 | 818.71 | 2367.46 | 823.82 | 2367.3 | 828.46 | 2367.93 |
| 832.34 | 2367.94 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -423.75 | .03 | 242.57 | .035 | 277.62 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 242.57 | 277.62 | 195 | 196.6 | 193 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2363.89 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.39 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2363.50 | Reach Len. (ft) | 195.00 | 196.60 | 193.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2.69 | 52.79 | 0.04 |
| E.G. Slope (ft/ft) | 0.007800 | Area (sq ft) | 2.69 | 52.79 | 0.04 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 3.71 | 266.28 | 0.01 |
| Top Width (ft) | 52.04 | Top Width (ft) | 15.13 | 33.08 | 3.84 |
| Vel Total (ft/s) | 4.86 | Avg. Vel. (ft/s) | 1.38 | 5.04 | 0.20 |
| Max Chl Dpth (ft) | 2.91 | Hydr. Depth (ft) | 0.18 | 1.60 | 0.01 |
| Conv. Total (cfs) | 3057.2 | Conv. (cfs) | 42.0 | 3015.1 | 0.1 |
| Length Wtd. (ft) | 196.42 | Wetted Per. (ft) | 15.13 | 33.82 | 3.84 |
| Min Ch El (ft) | 2360.59 | Shear (lb/sq ft) | 0.09 | 0.76 | 0.00 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.12 | 3.83 | 0.00 |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 7.70 | 7.69 | 4.77 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 6.64 | 3.88 | 5.10 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.25

INPUT
Description: add point -565 from section 5, and 141.52 to 474.75 from section 6 less 2 feet, Survey 6.10
Station Elevation Data num= 19

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -565 | 2364.3 | 0 | 2362.8 | 34.54 | 2361.63 | 38.25 | 2360.12 | 39.21 | 2359.77 |
| 40.09 | 2359.49 | 40.26 | 2359.9 | 58.57 | 2360.9 | 67.13 | 2362.94 | 84.22 | 2362.31 |
| 102.55 | 2362.45 | 141.52 | 2363.11 | 189.72 | 2363.47 | 238.07 | 2363.82 | 287.23 | 2364.1 |
| 340.52 | 2364.38 | 377.59 | 2364.73 | 426.74 | 2365.14 | 474.75 | 2365.71 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -565 | .03 | 34.54 | .035 | 67.13 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 34.54 | 67.13 | 70 | 67.9 | 60 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -565 | -56.8 | 2369 | F |
| 67.13 | 474.75 | 2369 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2363.24 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.10 | Wt. n-Val. | 0.030 | 0.035 | |
| W.S. Elev (ft) | 2363.13 | Reach Len. (ft) | 70.00 | 67.90 | 60.00 |
| Crit W.S. (ft) | 2362.07 | Flow Area (sq ft) | 46.25 | 75.50 | |
| E.G. Slope (ft/ft) | 0.001504 | Area (sq ft) | 52.43 | 75.50 | 36.20 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 56.44 | 213.56 | |
| Top Width (ft) | 269.53 | Top Width (ft) | 159.61 | 32.59 | 77.33 |
| Vel Total (ft/s) | 2.22 | Avg. Vel. (ft/s) | 1.22 | 2.83 | |
| Max Chl Dpth (ft) | 3.64 | Hydr. Depth (ft) | 0.51 | 2.32 | |
| Conv. Total (cfs) | 6961.8 | Conv. (cfs) | 1455.2 | 5506.6 | |
| Length Wtd. (ft) | 68.14 | Wetted Per. (ft) | 91.36 | 33.53 | |
| Min Ch El (ft) | 2359.49 | Shear (lb/sq ft) | 0.05 | 0.21 | |
| Alpha | 1.35 | Stream Power (lb/ft s) | 0.06 | 0.60 | |
| Frctn Loss (ft) | 0.11 | Cum Volume (acre-ft) | 7.58 | 7.40 | 4.69 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 6.25 | 3.73 | 4.92 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

LATERAL STRUCTURE

RIVER: Minnie Cr
REACH: Lower RS: 6.22

INPUT
Description:
Lateral structure position = Next ot left bank station
Distance from Upstream XS = .1
Deck/Roadway Width = 20
Weir Coefficient = 1.5
Weir Flow Reference = Energy Grade
Weir Embankment Coordinates num = 2

| Sta | Elev | Sta | Elev |
|---|---|---|---|
| 0 | 2362.8 | 67.7 | 2362.39 |

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 1 Lat Struct

| | | | |
|---|---|---|---|
| E.G. US. (ft) | 2363.24 | Weir Sta US (ft) | 0.00 |
| W.S. US. (ft) | 2363.13 | Weir Sta DS (ft) | 67.70 |
| E.G. DS (ft) | 2363.12 | Weir Max Depth (ft) | 0.73 |
| W.S. DS (ft) | 2362.89 | Weir Avg Depth (ft) | 0.58 |
| Q US (cfs) | 270.00 | Weir Submerg | 0.00 |
| Q Leaving Total (cfs) | 45.30 | Min El Weir Flow (ft) | 2362.39 |
| Q DS (cfs) | 224.73 | Wr Top Wdth (ft) | 67.70 |
| Perc Q Leaving | 16.77 | Q Gate Group (cfs) | |
| Q Weir (cfs) | 45.30 | Gate Open Ht (ft) | |
| Q Gates (cfs) | | Gate #Open | |
| Q Culv (cfs) | | Gate Area (sq ft) | |
| Q Lat RC (cfs) | | Gate Submerg | |
| Weir Flow Area (sq ft) | 39.31 | Gate Invert (ft) | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.2

INPUT
Description: add points 0 to 335.93 less 1 foot, and 494.24 to 874.75 from section 6 less 1 foot, survey 6.2
Station Elevation Data num= 27

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2358.6 | 47.07 | 2359.17 | 94.6 | 2359.72 | 143.16 | 2360.27 | 191.66 | 2360.82 |
| 240.34 | 2361.4 | 287.32 | 2361.83 | 335.93 | 2362.36 | 377.1 | 2361.7 | 419.12 | 2362.39 |
| 424.17 | 2359.81 | 433.48 | 2359.54 | 438.15 | 2359.03 | 439.38 | 2358.5 | 440.06 | 2359.19 |
| 442.98 | 2359.58 | 447.43 | 2362.95 | 448.2 | 2362.58 | 494.24 | 2363.69 | 541.52 | 2364.11 |
| 589.72 | 2364.47 | 638.07 | 2364.82 | 687.23 | 2365.1 | 740.52 | 2365.38 | 777.59 | 2365.73 |
| 826.74 | 2366.14 | 874.75 | 2366.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 419.12 | .035 | 447.43 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
419.12 447.43 23.8 24 23.8 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 424 | 2366.39 | T |
| 441 | 874.75 | 2366 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2363.12 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.23 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2362.89 | Reach Len. (ft) | 2.10 | 2.10 | 2.10 |
| Crit W.S. (ft) | 2361.20 | Flow Area (sq ft) | | 58.47 | |
| E.G. Slope (ft/ft) | 0.001636 | Area (sq ft) | 861.30 | 81.01 | 2.05 |
| Q Total (cfs) | 224.73 | Flow (cfs) | | 224.73 | |
| Top Width (ft) | 460.71 | Top Width (ft) | 419.12 | 28.23 | 13.36 |
| Vel Total (ft/s) | 3.84 | Avg. Vel. (ft/s) | | 3.84 | |
| Max Chl Dpth (ft) | 4.39 | Hydr. Depth (ft) | | 3.44 | |
| Conv. Total (cfs) | 5556.6 | Conv. (cfs) | | 5556.6 | |
| Length Wtd. (ft) | 2.10 | Wetted Per. (ft) | | 17.46 | |
| Min Ch El (ft) | 2358.50 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.31 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 6.85 | 7.28 | 4.67 |
| C & E Loss (ft) | | Cum SA (acres) | 5.78 | 3.69 | 4.86 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

RIVER: Minnie Cr
REACH: Lower RS: 6.01

INPUT
Description:
Distance from Upstream XS = 2.1
Deck/Roadway Width = 19.9
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 22

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2359.6 | | 47.07 | 2360.17 | | 94.6 | 2360.72 | |
| 143.16 | 2361.27 | | 191.66 | 2361.82 | | 240.34 | 2362.4 | |
| 287.32 | 2362.83 | | 335.93 | 2363.36 | | 384.06 | 2363.75 | |
| 424.68 | 2364.19 | 2361.63 | 432.68 | 2364.28 | 2361.63 | 440.68 | 2364.29 | 2361.63 |
| 445.01 | 2364.3 | | 494.24 | 2364.69 | | 541.52 | 2365.11 | |
| 589.72 | 2365.47 | | 638.07 | 2365.82 | | 687.23 | 2366.1 | |
| 740.52 | 2366.38 | | 777.59 | 2366.73 | | 826.74 | 2367.14 | |
| 874.75 | 2367.71 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 27

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2358.6 | 47.07 | 2359.17 | 94.6 | 2359.72 | 143.16 | 2360.27 | 191.66 | 2360.82 |
| 240.34 | 2361.4 | 287.32 | 2361.83 | 335.93 | 2362.36 | 377.1 | 2361.7 | 419.12 | 2362.39 |
| 424.17 | 2359.81 | 433.48 | 2359.54 | 438.15 | 2359.03 | 439.38 | 2358.5 | 440.06 | 2359.19 |
| 442.98 | 2359.58 | 447.43 | 2362.95 | 448.2 | 2362.58 | 494.24 | 2363.69 | 541.52 | 2364.11 |
| 589.72 | 2364.47 | 638.07 | 2364.82 | 687.23 | 2365.1 | 740.52 | 2365.38 | 777.59 | 2365.73 |
| 826.74 | 2366.14 | 874.75 | 2366.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 419.12 | .035 | 447.43 | .03 |

Bank Sta: Left Right Coeff Contr. Expan.
419.12 447.43 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 424 | 2366.39 | T |

```
     441  874.75    2366       F

 Downstream  Deck/Roadway Coordinates
     num=      22
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
        0  2359.6           47.07 2360.17            94.6 2360.72
   143.16 2361.27          191.66 2361.82          240.34  2362.4
   287.32 2362.83          335.93 2363.36          384.06 2363.75
   424.68 2364.19 2361.63  432.68 2364.28 2361.63  440.68 2364.29 2361.63
   445.01  2364.3          494.24 2364.69          541.52 2365.11
   589.72 2365.47          638.07 2365.82          687.23  2366.1
   740.52 2366.38          777.59 2366.73          826.74 2367.14
   874.75 2367.71

 Downstream Bridge Cross Section Data
 Station Elevation Data    num=      27
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0  2358.6   47.07 2359.17    94.6 2359.72  143.16 2360.27  191.66 2360.82
   240.34  2361.4  287.32 2361.83  335.93 2362.36   377.1  2362.7  419.12 2362.39
   424.17 2359.81  433.48 2359.54  438.15 2359.03  439.38  2358.5  440.06 2359.19
   442.98 2359.58  447.43 2362.95   448.2 2362.58  494.24 2363.69  541.52 2364.11
   589.72 2364.47  638.07 2364.82  687.23  2365.1  740.52 2365.38  777.59 2365.73
   826.74 2366.14  874.75 2366.71

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .03  419.12    .035  447.43     .03

 Bank Sta: Left   Right    Coeff Contr.   Expan.
         419.12  447.43           .1        .3
 Left Levee      Station=   377.1      Elevation=  2362.7

 Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .95
 Elevation at which weir flow begins         =
 Energy head used in spillway design         =
 Spillway height used in design              =
 Weir crest shape                            = Broad Crested

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
 Selected Low Flow Methods = Highest Energy Answer

 High Flow Method
        Pressure and Weir flow
            Submerged Inlet Cd          =
            Submerged Inlet + Outlet Cd =      .8
            Max Low Cord                =

 Additional Bridge Parameters
        Add Friction component to Momentum
        Do not add Weight component to Momentum
        Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
        Criteria to check for pressure flow = Upstream energy grade line

 BRIDGE OUTPUT  Profile #PF 1

   E.G. US. (ft)              2363.12    Element                  Inside BR US  Inside BR DS
   W.S. US. (ft)              2362.89    E.G. Elev (ft)             2363.12       2362.18
   Q Total (cfs)               224.73    W.S. Elev (ft)             2361.63       2361.46
   Q Bridge (cfs)              224.73    Crit W.S. (ft)             2361.27       2361.27
   Q Weir (cfs)                          Max Chl Dpth (ft)             3.13          2.96
   Weir Sta Lft (ft)                     Vel Total (ft/s)              6.39          6.92
   Weir Sta Rgt (ft)                     Flow Area (sq ft)            35.15         32.48
   Weir Submerg                          Froude # Chl                  0.76          0.86
   Weir Max Depth (ft)                   Specif Force (cu ft)         84.01         82.03
   Min El Weir Flow (ft)      2364.19    Hydr Depth (ft)           11633.34          2.03
   Min El Prs (ft)            2361.63    W.P. Total (ft)              35.86         20.32
   Delta EG (ft)                 1.23    Conv. Total (cfs)           1472.2        1885.1
   Delta WS (ft)                 1.42    Top Width (ft)                            16.00
   BR Open Area (sq ft)         35.15    Frctn Loss (ft)
   BR Open Vel (ft/s)            6.39    C & E Loss (ft)
   Coef of Q                             Shear Total (lb/sq ft)        1.43          1.42
   Br Sel Method            Press Only   Power Total (lb/ft s)         9.12          9.81

 Note:    The downstream water surface is below the minimum elevation for pressure flow.  The sluice
          gate equations were used for pressure flow.
 Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
          energy was used.
 Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
          energy was used.

 CROSS SECTION


 RIVER: Minnie Cr
 REACH: Lower              RS: 5.98

 INPUT
 Description: add 0 - 335.93 and 494.24 to 874.75 from section 6 less 1 feet,
              survey 6.2
 Station Elevation Data    num=      27
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0  2358.6   47.07 2359.17    94.6 2359.72  143.16 2360.27  191.66 2360.82
   240.34  2361.4  287.32 2361.83  335.93 2362.36   377.1  2362.7  419.12 2362.39
   424.17 2359.81  433.48 2359.54  438.15 2359.03  439.38  2358.5  440.06 2359.19
   442.98 2359.58  447.43 2362.95   448.2 2362.58  494.24 2363.69  541.52 2364.11
   589.72 2364.47  638.07 2364.82  687.23  2365.1  740.52 2365.38  777.59 2365.73
   826.74 2366.14  874.75 2366.71

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .03  419.12    .035  447.43     .03

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         419.12  447.43            96.89   108.5   113.2            .1        .3
 Left Levee      Station=   377.1      Elevation=  2362.7

 CROSS SECTION OUTPUT  Profile #PF 1

   E.G. Elev (ft)             2361.89    Element                    Left OB    Channel   Right OB
   Vel Head (ft)                 0.42    Wt. n-Val.                              0.035
   W.S. Elev (ft)             2361.46    Reach Len. (ft)             96.89     108.50     113.20
```

| | | | | | |
|---|---|---|---|---|---|
| Crit W.S. (ft) | 2361.05 | Flow Area (sq ft) | | 43.00 | |
| E.G. Slope (ft/ft) | 0.007755 | Area (sq ft) | | 43.00 | |
| Q Total (cfs) | 224.73 | Flow (cfs) | | 224.73 | |
| Top Width (ft) | 24.53 | Top Width (ft) | | 24.53 | |
| Vel Total (ft/s) | 5.23 | Avg. Vel. (ft/s) | | 5.23 | |
| Max Chl Dpth (ft) | 2.96 | Hydr. Depth (ft) | | 1.75 | |
| Conv. Total (cfs) | 2552.0 | Conv. (cfs) | | 2552.0 | |
| Length Wtd. (ft) | 107.19 | Wetted Per. (ft) | | 26.02 | |
| Min Ch El (ft) | 2358.50 | Shear (lb/sq ft) | | 0.80 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 4.18 | |
| Frctn Loss (ft) | 0.78 | Cum Volume (acre-ft) | 6.83 | 7.26 | 4.67 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 5.77 | 3.68 | 4.86 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 5.9

INPUT
Description: added point -507.27 from section 5 point 234 and -170 and -430
from 2 foot contour map, Survey 6.3
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -507.27 | 2360.28 | -430 | 2362 | -170 | 2362 | 0 | 2360.5 | 41.56 | 2360.06 |
| 46.58 | 2358.98 | 51.45 | 2358.73 | 52.14 | 2358.06 | 54.51 | 2357.5 | 55.82 | 2357.99 |
| 56.52 | 2359.03 | 62.86 | 2360.57 | 101 | 2362.75 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -507.27 | .03 | 41.56 | .035 | 62.86 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 41.56 | 62.86 | 704 | 706.3 | 705 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -507.27 | -36.44 | 2362 | F |

Left Levee Station= -170 Elevation= 2362

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2361.07 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | 0.030 | 0.035 | 0.035 |
| W.S. Elev (ft) | 2360.78 | Reach Len. (ft) | 704.00 | 706.30 | 705.00 |
| Crit W.S. (ft) | 2360.72 | Flow Area (sq ft) | 25.31 | 36.26 | 0.39 |
| E.G. Slope (ft/ft) | 0.006773 | Area (sq ft) | 25.31 | 36.26 | 0.39 |
| Q Total (cfs) | 224.73 | Flow (cfs) | 50.72 | 173.70 | 0.30 |
| Top Width (ft) | 98.43 | Top Width (ft) | 73.44 | 21.30 | 3.69 |
| Vel Total (ft/s) | 3.63 | Avg. Vel. (ft/s) | 2.00 | 4.79 | 0.78 |
| Max Chl Dpth (ft) | 3.28 | Hydr. Depth (ft) | 0.34 | 1.70 | 0.11 |
| Conv. Total (cfs) | 2730.7 | Conv. (cfs) | 616.4 | 2110.7 | 3.7 |
| Length Wtd. (ft) | 706.04 | Wetted Per. (ft) | 73.44 | 22.58 | 3.70 |
| Min Ch El (ft) | 2357.50 | Shear (lb/sq ft) | 0.15 | 0.68 | 0.04 |
| Alpha | 1.42 | Stream Power (lb/ft s) | 0.29 | 3.25 | 0.03 |
| Frctn Loss (ft) | 4.16 | Cum Volume (acre-ft) | 6.80 | 7.16 | 4.67 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 5.69 | 3.62 | 4.85 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 5

INPUT
Description: RR is 196.13 and 201.05
Station Elevation Data num= 57

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2362.3 | 52.47 | 2362.61 | 101.29 | 2362.58 | 139.24 | 2362.82 | 164.02 | 2364.07 |
| 170.56 | 2364.3 | 175.71 | 2363.58 | 189.14 | 2357.25 | 191.99 | 2357.16 | 193.43 | 2357.52 |
| 196.13 | 2358.2 | 201.05 | 2358.12 | 203.41 | 2357.41 | 208.95 | 2356.06 | 218.43 | 2355.5 |
| 222.52 | 2357.1 | 225.47 | 2356.21 | 248.57 | 2360.01 | 252.67 | 2360.02 | 299.78 | 2360.28 |
| 348.57 | 2361.3 | 396.19 | 2360.48 | 443.88 | 2360.2 | 489.52 | 2359.4 | 538.97 | 2359.1 |
| 586.56 | 2358.9 | 623.61 | 2359.3 | 631.58 | 2357.27 | 665.17 | 2356.41 | 711.1 | 2355.51 |
| 716.8 | 2354.7 | 717.56 | 2353.88 | 718.02 | 2353.58 | 718.85 | 2353.35 | 720.66 | 2353.51 |
| 721.17 | 2354 | 721.52 | 2354.58 | 723.91 | 2355.15 | 729.08 | 2357.49 | 752.87 | 2357.81 |
| 796.13 | 2359.4 | 809.84 | 2359.9 | 831.34 | 2359.95 | 852.73 | 2359.8 | 857.16 | 2359.45 |
| 897.59 | 2359.9 | 912.77 | 2359.94 | 921.15 | 2360.36 | 936.05 | 2359.57 | 948.07 | 2359.32 |
| 965.89 | 2359.2 | 1006.7 | 2360.02 | 1021.39 | 2366.07 | 1026.43 | 2365.91 | 1061.1 | 2366.19 |
| 1097.53 | 2365.4 | 1106.36 | 2365.26 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 711.1 | .035 | 729.08 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 631.58 | 729.08 | 225.5 | 233.78 | 238.83 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 348.57 | 2361.3 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2356.88 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.033 | |
| W.S. Elev (ft) | 2356.70 | Reach Len. (ft) | 225.50 | 233.78 | 238.83 |
| Crit W.S. (ft) | 2356.41 | Flow Area (sq ft) | | 65.91 | |
| E.G. Slope (ft/ft) | 0.005173 | Area (sq ft) | 12.53 | 65.91 | |
| Q Total (cfs) | 224.73 | Flow (cfs) | | 224.73 | |
| Top Width (ft) | 93.27 | Top Width (ft) | 19.78 | 73.49 | |
| Vel Total (ft/s) | 3.41 | Avg. Vel. (ft/s) | | 3.41 | |
| Max Chl Dpth (ft) | 3.35 | Hydr. Depth (ft) | | 0.90 | |
| Conv. Total (cfs) | 3124.5 | Conv. (cfs) | | 3124.5 | |
| Length Wtd. (ft) | 233.78 | Wetted Per. (ft) | | 74.97 | |
| Min Ch El (ft) | 2353.35 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.97 | |
| Frctn Loss (ft) | 1.25 | Cum Volume (acre-ft) | 6.49 | 6.33 | 4.66 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.94 | 2.86 | 4.82 |

```
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.875*

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  180.81 2361.13  240.77 2360.12  300.82 2359.55  358.29 2358.57  420.56 2357.98
  480.49 2357.48  505.07 2357.53  527.14 2357.56  533.98 2355.84   562.8 2354.98
   602.2 2354.03  607.09 2353.33  607.74 2352.64  608.14 2352.39  608.85  2352.2
  610.51 2352.34  610.98 2352.76   611.3 2353.24  613.49 2353.74  618.22 2355.73
  619.06 2355.75     640 2356.54  677.56  2357.9  689.46 2358.33  708.13 2358.39
   726.7 2358.28  730.54 2357.99  765.64  2358.4  778.82 2358.45  782.57 2358.63
  786.09 2358.81  799.03 2358.19  809.46 2358.01  824.93 2357.96  860.36 2358.74

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  180.81    .035  527.14    .035  607.09    .035     640    .038

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        533.98  618.22            225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  180.81294.65832360.083       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)          2355.63    Element                    Left OB    Channel   Right OB
  Vel Head (ft)              0.15    Wt. n-Val.                            0.035
  W.S. Elev (ft)          2355.48    Reach Len. (ft)            225.50     233.78     238.83
  Crit W.S. (ft)          2355.06    Flow Area (sq ft)                      72.00
  E.G. Slope (ft/ft)     0.005497    Area (sq ft)                           72.00
  Q Total (cfs)            224.73    Flow (cfs)                            224.73
  Top Width (ft)            71.61    Top Width (ft)                         71.61
  Vel Total (ft/s)           3.12    Avg. Vel. (ft/s)                        3.12
  Max Chl Dpth (ft)          3.28    Hydr. Depth (ft)                        1.01
  Conv. Total (cfs)        3031.2    Conv. (cfs)                           3031.2
  Length Wtd. (ft)         233.78    Wetted Per. (ft)                       72.91
  Min Ch El (ft)          2352.20    Shear (lb/sq ft)                        0.34
  Alpha                      1.00    Stream Power (lb/ft s)                  1.06
  Frctn Loss (ft)            1.31    Cum Volume (acre-ft)        6.46        5.96       4.66
  C & E Loss (ft)            0.00    Cum SA (acres)              4.89        2.47       4.82


Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or
         smaller than the smallest entered n value.
Note:    Manning's n values were composited to a single value in the main channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.75*

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   13.05 2360.96   85.35 2359.76  157.77 2358.91  227.07 2357.74  302.15 2356.86
  374.41 2356.07  404.05 2355.94  430.67 2355.83  436.38 2354.41  460.42 2353.54
  493.31 2352.55  497.39 2351.96  497.93  2351.4  498.26  2351.2  498.85 2351.04
  500.36 2351.18  500.78 2351.51  501.07 2351.91  503.06 2352.33  507.36 2353.98
  508.12    2354  527.14 2355.27  558.99  2356.4  569.08 2356.76  584.91 2356.83
  600.66 2356.76  603.92 2356.53  633.69  2356.9  644.87 2356.95  648.05  2357.1
  651.04 2357.26  662.01 2356.81  670.86  2356.7  683.98 2356.71  714.02 2357.46

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   13.05    .035  430.67    .035  497.39    .035  527.14    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        436.38  507.36            225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   13.05240.74672358.867       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)          2354.32    Element                    Left OB    Channel   Right OB
  Vel Head (ft)              0.17    Wt. n-Val.                            0.035      0.035
  W.S. Elev (ft)          2354.14    Reach Len. (ft)            225.50     233.78     238.83
  Crit W.S. (ft)          2353.73    Flow Area (sq ft)                      67.68       0.27
  E.G. Slope (ft/ft)     0.005751    Area (sq ft)                           67.68       0.27
  Q Total (cfs)            224.73    Flow (cfs)                            224.55       0.18
  Top Width (ft)            66.54    Top Width (ft)                         63.63       2.91
  Vel Total (ft/s)           3.31    Avg. Vel. (ft/s)                        3.32       0.66
  Max Chl Dpth (ft)          3.10    Hydr. Depth (ft)                        1.06       0.09
  Conv. Total (cfs)         2963.5    Conv. (cfs)                           2961.1        2.4
  Length Wtd. (ft)         233.78    Wetted Per. (ft)                       64.68       2.92
  Min Ch El (ft)          2351.04    Shear (lb/sq ft)                        0.38       0.03
  Alpha                      1.01    Stream Power (lb/ft s)                  1.25       0.02
  Frctn Loss (ft)            1.19    Cum Volume (acre-ft)        6.46        5.59       4.66
  C & E Loss (ft)            0.01    Cum SA (acres)              4.89        2.10       4.81


Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or
         smaller than the smallest entered n value.
Note:    Manning's n values were composited to a single value in the main channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION
```

RIVER: Minnie Cr
REACH: Lower RS: 4.625*

INPUT
Description:
Station Elevation Data num= 35

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -154.71 | 2360.79 | -70.07 | 2359.39 | 14.71 | 2358.26 | 95.84 | 2356.92 | 183.74 | 2355.74 |
| 268.34 | 2354.65 | 303.04 | 2354.36 | 334.2 | 2354.09 | 338.77 | 2352.98 | 358.05 | 2352.11 |
| 384.41 | 2351.07 | 387.68 | 2350.59 | 388.11 | 2350.17 | 388.38 | 2350.01 | 388.85 | 2349.89 |
| 390.21 | 2350.01 | 390.59 | 2350.27 | 390.85 | 2350.57 | 392.64 | 2350.92 | 396.5 | 2352.22 |
| 397.19 | 2352.25 | 414.27 | 2354 | 440.42 | 2354.9 | 448.7 | 2355.19 | 461.7 | 2355.26 |
| 474.63 | 2355.24 | 477.3 | 2355.08 | 501.74 | 2355.4 | 510.91 | 2355.46 | 513.53 | 2355.58 |
| 515.98 | 2355.71 | 524.98 | 2355.43 | 532.25 | 2355.39 | 543.02 | 2355.47 | 567.69 | 2356.19 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| -154.71 | .035 | 334.2 | .035 | 388.85 | .035 | 414.27 | .035 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
334.2 414.27 225.5 233.78 238.83 .1 .3
Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -154.71 | 186.835 | 2357.65 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2353.12 | Element | | | |
| Vel Head (ft) | 0.15 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2352.98 | Reach Len. (ft) | 225.50 | 233.78 | 238.83 |
| Crit W.S. (ft) | 2352.43 | Flow Area (sq ft) | | 73.48 | |
| E.G. Slope (ft/ft) | 0.004514 | Area (sq ft) | | 73.48 | |
| Q Total (cfs) | 224.73 | Flow (cfs) | | 224.73 | |
| Top Width (ft) | 65.39 | Top Width (ft) | | 65.39 | |
| Vel Total (ft/s) | 3.06 | Avg. Vel. (ft/s) | | 3.06 | |
| Max Chl Dpth (ft) | 3.09 | Hydr. Depth (ft) | | 1.12 | |
| Conv. Total (cfs) | 3345.1 | Conv. (cfs) | | 3345.1 | |
| Length Wtd. (ft) | 233.74 | Wetted Per. (ft) | | 66.20 | |
| Min Ch El (ft) | 2349.89 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.96 | |
| Frctn Loss (ft) | 0.31 | Cum Volume (acre-ft) | 6.46 | 5.21 | 4.66 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 4.89 | 1.76 | 4.81 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.5*

INPUT
Description:
Station Elevation Data num= 40

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -322.48 | 2360.62 | -225.48 | 2359.03 | -128.35 | 2357.62 | -35.39 | 2356.09 | 65.33 | 2354.62 |
| 162.27 | 2353.24 | 202.03 | 2352.77 | 237.73 | 2352.36 | 241.17 | 2351.55 | 255.68 | 2350.68 |
| 275.51 | 2349.58 | 277.97 | 2349.22 | 278.3 | 2348.93 | 278.5 | 2348.82 | 278.86 | 2348.73 |
| 280.06 | 2348.85 | 280.39 | 2349.03 | 280.63 | 2349.23 | 282.21 | 2349.51 | 285.64 | 2350.46 |
| 286.25 | 2350.5 | 301.4 | 2352.73 | 321.85 | 2353.4 | 328.32 | 2353.61 | 338.48 | 2353.7 |
| 348.59 | 2353.72 | 350.68 | 2353.62 | 369.79 | 2353.9 | 376.96 | 2353.97 | 379 | 2354.05 |
| 380.92 | 2354.16 | 387.96 | 2354.05 | 393.64 | 2354.09 | 402.06 | 2354.22 | 421.35 | 2354.91 |
| 428.29 | 2357.07 | 430.67 | 2357.07 | 447.05 | 2357.51 | 464.27 | 2357.62 | 468.44 | 2357.66 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -322.48 | .035 | 237.73 | .035 | 282.21 | .035 | 301.4 | .033 | 468.44 | .033 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
237.73 301.4 225.5 233.78 238.83 .1 .3
Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -322.48 | 132.92 | 332356.433 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.78 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.035 | 0.035 | 0.000 |
| W.S. Elev (ft) | 2352.74 | Reach Len. (ft) | 225.50 | 233.78 | 238.83 |
| Crit W.S. (ft) | 2351.14 | Flow Area (sq ft) | 6.16 | 129.47 | 0.00 |
| E.G. Slope (ft/ft) | 0.000621 | Area (sq ft) | 6.16 | 129.47 | 0.00 |
| Q Total (cfs) | 224.73 | Flow (cfs) | 2.14 | 222.59 | 0.00 |
| Top Width (ft) | 96.60 | Top Width (ft) | 32.74 | 63.67 | 0.19 |
| Vel Total (ft/s) | 1.66 | Avg. Vel. (ft/s) | 0.35 | 1.72 | 0.02 |
| Max Chl Dpth (ft) | 4.01 | Hydr. Depth (ft) | 0.19 | 2.03 | 0.00 |
| Conv. Total (cfs) | 9018.7 | Conv. (cfs) | 85.8 | 8932.9 | 0.0 |
| Length Wtd. (ft) | 232.64 | Wetted Per. (ft) | 32.75 | 64.44 | 0.19 |
| Min Ch El (ft) | 2348.73 | Shear (lb/sq ft) | 0.01 | 0.08 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.00 | 0.13 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 6.44 | 4.66 | 4.66 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 4.80 | 1.41 | 4.81 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.375*

INPUT
Description:
Station Elevation Data num= 60

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -548.33 | 2360.62 | -539.59 | 2360.67 | -531.45 | 2360.66 | -525.13 | 2360.7 | -521 | 2360.91 |
| -519.91 | 2360.95 | -519.05 | 2360.83 | -516.81 | 2359.78 | -516.34 | 2359.76 | -516.1 | 2359.82 |
| -515.65 | 2359.93 | -514.83 | 2359.92 | -514.43 | 2359.8 | -513.51 | 2359.58 | -511.93 | 2359.48 |
| -511.25 | 2359.75 | -510.76 | 2359.6 | -506.9 | 2360.24 | -506.22 | 2360.24 | -498.37 | 2360.28 |

```
 -490.24 2360.45  -380.9 2358.67  -271.4 2356.97 -166.61 2355.26  -53.08  2353.5
   56.19 2351.82  101.01 2351.19  141.26 2350.62  143.57 2350.11   153.3 2349.24
  166.61  2348.1  168.26 2347.84  168.48 2347.69  168.62 2347.63  168.86 2347.57
  169.91 2347.68   170.2 2347.78   170.4  2347.9  171.79 2348.09  174.78 2348.71
  175.31 2348.75  188.54 2351.46  203.27  2351.9  207.94 2352.04  215.27 2352.14
  222.56  2352.2  224.07 2352.16  237.84  2352.4  243.01 2352.47  244.48 2352.53
  245.86 2352.61  250.94 2352.67  255.04 2352.78  261.11 2352.98  275.01 2353.63
  280.01 2354.83  281.73 2354.86  293.54 2355.35  305.95 2355.67  308.96 2355.76

Manning's n Values        num=       5
    Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 -548.33     .03  141.26    .035  174.78    .035  188.54    .032  308.96    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        141.26  188.54            225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 -548.3379.01167    2360       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2352.73    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                  0.030      0.035      0.032
  W.S. Elev (ft)           2352.72    Reach Len. (ft)            225.50     233.78     238.83
  Crit W.S. (ft)           2349.92    Flow Area (sq ft)          103.20     163.72      36.67
  E.G. Slope (ft/ft)      0.000086    Area (sq ft)               153.60     163.72      36.67
  Q Total (cfs)             224.73    Flow (cfs)                  66.20     147.69      10.84
  Top Width (ft)            254.97    Top Width (ft)             143.49      47.28      64.20
  Vel Total (ft/s)            0.74    Avg. Vel. (ft/s)            0.64       0.90       0.30
  Max Chl Dpth (ft)           5.15    Hydr. Depth (ft)            1.66       3.46       0.57
  Conv. Total (cfs)        24303.8    Conv. (cfs)                7159.8    15971.9     1172.1
  Length Wtd. (ft)          231.36    Wetted Per. (ft)           62.25      47.92      64.22
  Min Ch El (ft)           2347.57    Shear (lb/sq ft)            0.01       0.02       0.00
  Alpha                       1.20    Stream Power (lb/ft s)      0.01       0.02       0.00
  Frctn Loss (ft)             0.02    Cum Volume (acre-ft)        6.03       3.88       4.56
  C & E Loss (ft)             0.00    Cum SA (acres)              4.35       1.11       4.63

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.25

INPUT
Description: -658 added from section 5 point 234, and 149.48 estimate from top
             of railroad and photo , copy of Survey 4.10
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -658 2360.28       0  2349.6   44.79 2348.89   58.86 2346.42   64.37    2347
   75.67 2350.19  109.96    2351  149.48 2353.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -658     .03   44.79    .035   75.67     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         44.79   75.67            47.12    52.1   51.65             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -658    25.1    2358       F
    75.4  149.48    2358       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2352.71    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.02    Wt. n-Val.                  0.030      0.035
  W.S. Elev (ft)           2352.69    Reach Len. (ft)             47.12      52.10      51.65
  Crit W.S. (ft)           2348.83    Flow Area (sq ft)           71.83     149.50
  E.G. Slope (ft/ft)      0.000072    Area (sq ft)               449.32     150.19      91.79
  Q Total (cfs)             224.73    Flow (cfs)                  71.66     153.07
  Top Width (ft)            323.97    Top Width (ft)             235.40      30.88      57.70
  Vel Total (ft/s)            1.02    Avg. Vel. (ft/s)            1.00       1.02
  Max Chl Dpth (ft)           6.27    Hydr. Depth (ft)            3.65       4.88
  Conv. Total (cfs)        26435.8    Conv. (cfs)                8429.6    18006.2
  Length Wtd. (ft)           51.08    Wetted Per. (ft)           19.69      31.29
  Min Ch El (ft)           2346.42    Shear (lb/sq ft)            0.02       0.02
  Alpha                       1.00    Stream Power (lb/ft s)      0.02       0.02
  Frctn Loss (ft)             0.01    Cum Volume (acre-ft)        4.47       3.03       4.21
  C & E Loss (ft)             0.00    Cum SA (acres)              3.37       0.90       4.29

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

LATERAL STRUCTURE


RIVER: Minnie Cr
REACH: Lower              RS: 4.22

INPUT
Description:
Lateral structure position     = Right overbank
Distance from Upstream XS =      .1
Deck/Roadway Width        =      20
Weir Coefficient          =     1.5
Weir Flow Reference       = Energy Grade
 Weir Embankment Coordinates     num =       3
     Sta    Elev     Sta    Elev     Sta    Elev
       0 2353.86      40    2352    51.5    2352

Weir crest shape                          = Broad Crested


LATERAL STRUCTURE OUTPUT  Profile #PF 1  Lat Struct

  E.G. US. (ft)            2352.71    Weir Sta US (ft)           24.81
  W.S. US. (ft)            2352.69    Weir Sta DS (ft)           51.50
  E.G. DS (ft)             2352.70    Weir Max Depth (ft)         0.70
  W.S. DS (ft)             2352.67    Weir Avg Depth (ft)         0.50
  Q US (cfs)                224.73    Weir Submerg                0.00
  Q Leaving Total (cfs)      15.57    Min El Weir Flow (ft)    2352.00
```

| | | | |
|---|---|---|---|
| Q DS (cfs) | 209.04 | Wr Top Wdth (ft) | 26.69 |
| Perc Q Leaving | 6.98 | Q Gate Group (cfs) | |
| Q Weir (cfs) | 15.57 | Gate Open Ht (ft) | |
| Q Gates (cfs) | | Gate #Open | |
| Q Culv (cfs) | | Gate Area (sq ft) | |
| Q Lat RC (cfs) | | Gate Submerg | |
| Weir Flow Area (sq ft) | 13.44 | Gate Invert (ft) | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.2

INPUT
Description: stations 0 to 426.44, and 575.43 to 900.78 taken from top of railroad
Station Elevation Data num= 29

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | 47.02 | 2355.63 | 95.07 | 2355.21 | 141.6 | 2354.76 | 187.98 | 2354.45 |
| 235.86 | 2354.1 | 282.32 | 2353.76 | 329.24 | 2353.51 | 376.4 | 2353.18 | 426.44 | 2352.82 |
| 466.15 | 2348.1 | 502.52 | 2349.06 | 513.84 | 2346.47 | 515.6 | 2346.2 | 516.41 | 2346.03 |
| 517.4 | 2346.4 | 518.05 | 2346.71 | 523.74 | 2346.87 | 526.64 | 2349.75 | 572.2 | 2350.21 |
| 575.43 | 2352 | 622.9 | 2351.86 | 669.54 | 2351.8 | 716.49 | 2351.32 | 763.87 | 2350.94 |
| 779.52 | 2351.01 | 820.44 | 2350.7 | 856.64 | 2350.4 | 900.78 | 2349.8 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 502.52 | .035 | 526.64 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
502.52 526.64 22.24 22 22.24 .1 .3
Ineffective Flow num= 4

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 426.44 | 506.3 | 2352 | T |
| 526 | 575.43 | 2352 | T |
| 0 | 426.43 | 2356 | F |
| 575.44 | 900.78 | 2356 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.70 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2352.67 | Reach Len. (ft) | 1.80 | 1.80 | 1.80 |
| Crit W.S. (ft) | 2348.53 | Flow Area (sq ft) | 37.30 | 114.08 | 32.74 |
| E.G. Slope (ft/ft) | 0.000183 | Area (sq ft) | 236.67 | 128.47 | 618.31 |
| Q Total (cfs) | 209.04 | Flow (cfs) | 15.68 | 176.65 | 16.71 |
| Top Width (ft) | 473.09 | Top Width (ft) | 74.82 | 24.12 | 374.14 |
| Vel Total (ft/s) | 1.14 | Avg. Vel. (ft/s) | 0.42 | 1.55 | 0.51 |
| Max Chl Dpth (ft) | 6.64 | Hydr. Depth (ft) | 0.50 | 4.73 | 0.67 |
| Conv. Total (cfs) | 15449.0 | Conv. (cfs) | 1158.6 | 13055.5 | 1234.9 |
| Length Wtd. (ft) | 1.80 | Wetted Per. (ft) | 75.11 | 25.78 | 49.27 |
| Min Ch El (ft) | 2346.03 | Shear (lb/sq ft) | 0.01 | 0.05 | 0.01 |
| Alpha | 1.60 | Stream Power (lb/ft s) | 0.00 | 0.08 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 4.10 | 2.87 | 3.79 |
| C & E Loss (ft) | | Cum SA (acres) | 3.20 | 0.87 | 4.04 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

RIVER: Minnie Cr
REACH: Lower RS: 4.01

INPUT
Description:
Distance from Upstream XS = 1.8
Deck/Roadway Width = 18.8
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 24

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | | 47.02 | 2355.63 | | 95.07 | 2355.21 | |
| 141.6 | 2354.76 | | 187.98 | 2354.45 | | 235.86 | 2354.1 | |
| 282.32 | 2353.76 | | 329.24 | 2353.51 | | 376.4 | 2353.18 | |
| 426.44 | 2352.82 | | 473.75 | 2352.5 | | 509.75 | 2352.44 | 2347.99 |
| 520.02 | 2352.43 | 2347.99 | 523.75 | 2352.36 | 2347.99 | 535.32 | 2352.24 | |
| 575.43 | 2352 | | 622.9 | 2351.86 | | 669.54 | 2351.8 | |
| 716.49 | 2351.32 | | 763.87 | 2350.94 | | 779.52 | 2351.01 | |
| 820.44 | 2350.7 | | 856.64 | 2350.4 | | 900.78 | 2349.8 | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 29

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | 47.02 | 2355.63 | 95.07 | 2355.21 | 141.6 | 2354.76 | 187.98 | 2354.45 |
| 235.86 | 2354.1 | 282.32 | 2353.76 | 329.24 | 2353.51 | 376.4 | 2353.18 | 426.44 | 2352.82 |
| 466.15 | 2348.1 | 502.52 | 2349.06 | 513.84 | 2346.47 | 515.6 | 2346.2 | 516.41 | 2346.03 |
| 517.4 | 2346.4 | 518.05 | 2346.71 | 523.74 | 2346.87 | 526.64 | 2349.75 | 572.2 | 2350.21 |
| 575.43 | 2352 | 622.9 | 2351.86 | 669.54 | 2351.8 | 716.49 | 2351.32 | 763.87 | 2350.94 |
| 779.52 | 2351.01 | 820.44 | 2350.7 | 856.64 | 2350.4 | 900.78 | 2349.8 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 502.52 | .035 | 526.64 | .03 |

Bank Sta: Left Right Coeff Contr. Expan.
502.52 526.64 .1 .3
Ineffective Flow num= 4

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 426.44 | 506.3 | 2352 | T |
| 526 | 575.43 | 2352 | T |
| 0 | 426.43 | 2356 | F |
| 575.44 | 900.78 | 2356 | F |

Downstream Deck/Roadway Coordinates
num= 24

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | | 47.02 | 2355.63 | | 95.07 | 2355.21 | |
| 141.6 | 2354.76 | | 187.98 | 2354.45 | | 235.86 | 2354.1 | |

```
  282.32 2353.76          329.24 2353.51          376.4 2353.18
  426.44 2352.82          473.75  2352.5         509.75 2352.44 2347.99
  520.02 2352.43 2347.99  523.75 2352.36 2347.99  535.32 2352.24
  575.43    2352           622.9 2351.86          669.54  2351.8
  716.49 2351.32          763.87 2350.94          779.52 2351.01
  820.44  2350.7          856.64  2350.4          900.78  2349.8

Downstream Bridge Cross Section Data
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2356.2   47.02 2355.63   95.07 2355.21   141.6 2354.76  187.98 2354.45
  235.86  2354.1  282.32 2353.76  329.24 2353.51   376.4 2353.18  426.44 2352.82
  466.15  2348.1  502.52 2349.06  513.84 2346.47   515.6  2346.2  516.41 2346.03
   517.4  2346.4  518.05 2346.71  523.74 2346.87  526.64 2349.75   572.2 2350.21
  575.43    2352   622.9 2351.86  669.54  2351.8  716.49 2351.32  763.87 2350.94
  779.52 2351.01  820.44  2350.7  856.64  2350.4  900.78  2349.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  502.52    .035  526.64     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        502.52  526.64          .1        .3
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
  426.44   506.3    2352       T
     526  575.43    2352       T
       0  426.43    2354       F
  575.44  900.78    2354       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1

  E.G. US. (ft)              2352.70    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)              2352.67    E.G. Elev (ft)             2352.70       2352.70
  Q Total (cfs)               209.04    W.S. Elev (ft)             2352.67       2352.67
  Q Bridge (cfs)              136.31    Crit W.S. (ft)             2352.64       2352.67
  Q Weir (cfs)                 72.73    Max Chl Dpth (ft)             6.64          6.64
  Weir Sta Lft (ft)           443.76    Vel Total (ft/s)              3.63          3.66
  Weir Sta Rgt (ft)           575.44    Flow Area (sq ft)            57.51         57.07
  Weir Submerg                  0.00    Froude # Chl                  0.26          0.26
  Weir Max Depth (ft)           0.70    Specif Force (cu ft)        131.24        131.22
  Min El Weir Flow (ft)       2352.01   Hydr Depth (ft)               0.45          0.45
  Min El Prs (ft)             2347.99   W.P. Total (ft)             156.94        156.44
  Delta EG (ft)                 1.26    Conv. Total (cfs)
  Delta WS (ft)                 1.32    Top Width (ft)              452.29        451.79
  BR Open Area (sq ft)         18.27    Frctn Loss (ft)
  BR Open Vel (ft/s)            7.46    C & E Loss (ft)
  Coef of Q                             Shear Total (lb/sq ft)
  Br Sel Method            Press/Weir   Power Total (lb/ft s)

Note:    The downstream water surface is above the minimum elevation required for orifice flow.  The
         orifice flow equation was used for pressure flow.
Note:    For the cross section inside the bridge at the upstream end, the water surface and energy have
         been projected from the upstream cross section.  The selected bridge modeling method does
         not compute answers inside the bridge.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.
Note:    For the cross section inside the bridge at the downstream end, the water surface is based on
         critical depth over the weir.  The energy has been projected.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 3.98

INPUT
Description: stations 0 to 426.44, and 575.43 to 900.78 taken from top of
             railroad, survey 4.2
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2356.2   47.02 2355.63   95.07 2355.21   141.6 2354.76  187.98 2354.45
  235.86  2354.1  282.32 2353.76  329.24 2353.51   376.4 2353.18  426.44 2352.82
  466.15  2348.1  502.52 2349.06  513.84 2346.47   515.6  2346.2  516.41 2346.03
   517.4  2346.4  518.05 2346.71  523.74 2346.87  526.64 2349.75   572.2 2350.21
  575.43    2352   622.9 2351.86  669.54  2351.8  716.49 2351.32  763.87 2350.94
  779.52 2351.01  820.44  2350.7  856.64  2350.4  900.78  2349.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  502.52    .035  526.64     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        502.52  526.64            38.55    34.2   36.87            .1        .3
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
  426.44   506.3    2352       T
     526  575.43    2352       T
```

```
     0  426.43    2354       F
575.44  900.78    2354       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2351.45    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.09    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2351.35    Reach Len. (ft)             38.55     34.20     36.87
  Crit W.S. (ft)           2348.53    Flow Area (sq ft)                     85.14
  E.G. Slope (ft/ft)      0.000517    Area (sq ft)               145.32     96.67    184.86
  Q Total (cfs)             209.04    Flow (cfs)                            209.04
  Top Width (ft)            322.91    Top Width (ft)              63.73     24.12    235.06
  Vel Total (ft/s)            2.46    Avg. Vel. (ft/s)                       2.46
  Max Chl Dpth (ft)           5.32    Hydr. Depth (ft)                       4.32
  Conv. Total (cfs)         9191.0    Conv. (cfs)                           9191.0
  Length Wtd. (ft)            34.84   Wetted Per. (ft)                      21.00
  Min Ch El (ft)           2346.03    Shear (lb/sq ft)                       0.13
  Alpha                       1.00    Stream Power (lb/ft s)                 0.32
  Frctn Loss (ft)             0.02    Cum Volume (acre-ft)         4.09      2.85      3.53
  C & E Loss (ft)             0.01    Cum SA (acres)               3.17      0.86      3.85


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 3.55

INPUT
Description: added point -325.77 from quad, 120 from section 4.0 point 246, and
             218.5 from section 3 point 5024, Survey 3.12
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -325.77    2360       0  2350.7   29.25 2349.32   33.49 2347.33   35.59  2346.2
   37.93  2346.2   39.82  2346.2    40.4 2346.49   48.92    2349   71.41 2349.29
     120    2352   218.5 2351.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -325.77     .03   29.25    .035   48.92     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          29.25   48.92             30.9    30.9    30.9            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -325.77    15.6    2355       F
    62.6   218.5    2355       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2351.42    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.06    Wt. n-Val.                  0.030     0.035     0.030
  W.S. Elev (ft)           2351.36    Reach Len. (ft)             30.90     30.90     30.90
  Crit W.S. (ft)           2349.30    Flow Area (sq ft)           23.44     78.04     31.07
  E.G. Slope (ft/ft)      0.000426    Area (sq ft)                47.08     78.04     88.19
  Q Total (cfs)             254.31    Flow (cfs)                  34.36    165.05     54.90
  Top Width (ft)            131.61    Top Width (ft)              52.35     19.67     59.59
  Vel Total (ft/s)            1.92    Avg. Vel. (ft/s)             1.47      2.11      1.77
  Max Chl Dpth (ft)           5.16    Hydr. Depth (ft)             1.72      3.97      2.27
  Conv. Total (cfs)        12315.0    Conv. (cfs)                1663.8    7992.5    2658.7
  Length Wtd. (ft)            30.90   Wetted Per. (ft)            13.67     20.83     13.68
  Min Ch El (ft)           2346.20    Shear (lb/sq ft)             0.05      0.10      0.06
  Alpha                       1.05    Stream Power (lb/ft s)       0.07      0.21      0.11
  Frctn Loss (ft)                     Cum Volume (acre-ft)         4.00      2.78      3.41
  C & E Loss (ft)                     Cum SA (acres)               3.12      0.84      3.73


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CULVERT


RIVER: Minnie Cr
REACH: Lower              RS: 3.5

INPUT
Description:
Distance from Upstream XS =     2.3
Deck/Roadway Width        =    27.7
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2350.2           37.26 2349.38           70.42 2350.29
     120    2352

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -325.77    2360       0  2350.7   29.25 2349.32   33.49 2347.33   35.59  2346.2
   37.93  2346.2   39.82  2346.2    40.4 2346.49   48.92    2349   71.41 2349.29
     120    2352   218.5 2351.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -325.77     .03   29.25    .035   48.92     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          29.25   48.92            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -325.77    15.6    2355       F
    62.6   218.5    2355       F

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2350.2           37.26 2349.38           70.42 2350.29
     110    2352

Downstream Bridge Cross Section Data
Station Elevation Data    num=      12
```

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 -334.12     2360       -2   2350.7    27.25 2349.32    31.49 2347.33    33.59   2345.8
   35.93   2345.8    37.82   2345.8     38.4 2346.49    46.92     2349    69.41 2349.29
     110     2352   201.49     2352

Manning's n Values          num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 -334.12     .035    27.25      .04    46.92     .035

Bank Sta: Left    Right     Coeff Contr.    Expan.
          27.25    46.92            .1        .3
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 -334.12      3.2                F
    70.9   201.49                F

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  2

Culvert Name      Shape      Rise    Span
culv@3.5        Circular     2.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 2.3    27.7     .024     .024        0                  .9                 1
Upstream    Elevation =  2346.2
            Centerline Station =  36.9
Downstream Elevation =  2345.8
            Centerline Station =  37.2

Culvert Name      Shape      Rise    Span
culv@3.5a       Circular     2.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 2.3    27.7     .024     .024        0                  .9                 1
Upstream    Elevation =  2346.2
            Centerline Station =  39.5
Downstream Elevation =  2345.8
            Centerline Station =  34.6

CULVERT OUTPUT  Profile #PF 1  Culv Group:  culv@3.5

  Q Culv Group (cfs)          7.50    Culv Full Len (ft)         27.70
  # Barrels                      1    Culv Vel US (ft/s)          1.53
  Q Barrel (cfs)              7.50    Culv Vel DS (ft/s)          1.53
  E.G. US. (ft)           2351.42    Culv Inv El Up (ft)      2346.20
  W.S. US. (ft)           2351.36    Culv Inv El Dn (ft)      2345.80
  E.G. DS (ft)            2351.36    Culv Frctn Ls (ft)          0.03
  W.S. DS (ft)            2351.32    Culv Exit Loss (ft)
  Delta EG (ft)              0.06    Culv Entr Loss (ft)         0.03
  Delta WS (ft)              0.04    Q Weir (cfs)              239.31
  E.G. IC (ft)            2347.51    Weir Sta Lft (ft)          15.60
  E.G. OC (ft)            2351.42    Weir Sta Rgt (ft)          62.60
  Culvert Control          Outlet    Weir Submerg                0.93
  Culv WS Inlet (ft)      2348.70    Weir Max Depth (ft)         2.06
  Culv WS Outlet (ft)     2348.30    Weir Avg Depth (ft)         1.75
  Culv Nml Depth (ft)                Weir Flow Area (sq ft)     82.48
  Culv Crt Depth (ft)         0.91   Min El Weir Flow (ft)    2349.39


CULVERT OUTPUT  Profile #PF 1  Culv Group:  culv@3.5a

  Q Culv Group (cfs)          7.50    Culv Full Len (ft)         27.70
  # Barrels                      1    Culv Vel US (ft/s)          1.53
  Q Barrel (cfs)              7.50    Culv Vel DS (ft/s)          1.53
  E.G. US. (ft)           2351.42    Culv Inv El Up (ft)      2346.20
  W.S. US. (ft)           2351.36    Culv Inv El Dn (ft)      2345.80
  E.G. DS (ft)            2351.36    Culv Frctn Ls (ft)          0.03
  W.S. DS (ft)            2351.32    Culv Exit Loss (ft)
  Delta EG (ft)              0.06    Culv Entr Loss (ft)         0.03
  Delta WS (ft)              0.04    Q Weir (cfs)              239.31
  E.G. IC (ft)            2347.51    Weir Sta Lft (ft)          15.60
  E.G. OC (ft)            2351.42    Weir Sta Rgt (ft)          62.60
  Culvert Control          Outlet    Weir Submerg                0.93
  Culv WS Inlet (ft)      2348.70    Weir Max Depth (ft)         2.06
  Culv WS Outlet (ft)     2348.30    Weir Avg Depth (ft)         1.75
  Culv Nml Depth (ft)                Weir Flow Area (sq ft)     82.48
  Culv Crt Depth (ft)         0.91   Min El Weir Flow (ft)    2349.39


CROSS SECTION


RIVER: Minnie Cr
REACH: Lower                RS: 3.4

INPUT
Description: added point -334.12 quad, 110 from section 4 point 246, and 201.49
             from section 3 point 5023,  Survey 3.12
Station Elevation Data     num=       12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 -334.12     2360       -2   2350.7    27.25 2349.32    31.49 2347.33    33.59   2345.8
   35.93   2345.8    37.82   2345.8     38.4 2346.49    46.92     2349    69.41 2349.29
     110     2352   201.49     2352

Manning's n Values          num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 -334.12     .035    27.25      .04    46.92     .035

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          27.25    46.92              48.57    62.9      74              .1        .3
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 -334.12      3.2                F
    70.9   201.49                F

CROSS SECTION OUTPUT  Profile #PF 1
```

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2351.36 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2351.32 | Reach Len. (ft) | 48.57 | 62.90 | 74.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 34.35 | 79.41 | 51.76 |
| E.G. Slope (ft/ft) | 0.000407 | Area (sq ft) | 44.96 | 79.41 | 79.55 |
| Q Total (cfs) | 254.31 | Flow (cfs) | 37.27 | 143.04 | 74.00 |
| Top Width (ft) | 123.74 | Top Width (ft) | 51.24 | 19.67 | 52.83 |
| Vel Total (ft/s) | 1.54 | Avg. Vel. (ft/s) | 1.08 | 1.80 | 1.43 |
| Max Chl Dpth (ft) | 5.52 | Hydr. Depth (ft) | 1.43 | 4.04 | 2.16 |
| Conv. Total (cfs) | 12611.7 | Conv. (cfs) | 1848.3 | 7093.5 | 3669.9 |
| Length Wtd. (ft) | 62.52 | Wetted Per. (ft) | 24.08 | 21.30 | 23.99 |
| Min Ch El (ft) | 2345.80 | Shear (lb/sq ft) | 0.04 | 0.09 | 0.05 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.04 | 0.17 | 0.08 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 3.97 | 2.73 | 3.35 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 3.08 | 0.83 | 3.69 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.35

INPUT
Description: added point -306.66 from quad, Survey 3.13
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -306.66 | 2360 | 0 | 2350.5 | 42.31 | 2349.55 | 57.55 | 2345.96 | 67.17 | 2344.56 |
| 77.29 | 2346.66 | 82.29 | 2352.8 | 87.44 | 2354.06 | 106.97 | 2355.09 | 123.68 | 2355.16 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -306.66 | .035 | 42.31 | .04 | 87.44 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 42.31 | 87.44 | 280.87 | 255.2 | 240.99 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -306.66 | -49.1 | 2353 | F |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 87.44 | 123.68 | 2358 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2351.34 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.035 | 0.040 | |
| W.S. Elev (ft) | 2351.31 | Reach Len. (ft) | 280.87 | 255.20 | 240.99 |
| Crit W.S. (ft) | 2347.16 | Flow Area (sq ft) | 65.25 | 179.03 | |
| E.G. Slope (ft/ft) | 0.000158 | Area (sq ft) | 65.25 | 179.03 | |
| Q Total (cfs) | 254.31 | Flow (cfs) | 33.65 | 220.66 | |
| Top Width (ft) | 107.36 | Top Width (ft) | 68.59 | 38.77 | |
| Vel Total (ft/s) | 1.04 | Avg. Vel. (ft/s) | 0.52 | 1.23 | |
| Max Chl Dpth (ft) | 6.75 | Hydr. Depth (ft) | 0.95 | 4.62 | |
| Conv. Total (cfs) | 20241.9 | Conv. (cfs) | 2678.5 | 17563.4 | |
| Length Wtd. (ft) | 257.58 | Wetted Per. (ft) | 68.62 | 41.72 | |
| Min Ch El (ft) | 2344.56 | Shear (lb/sq ft) | 0.01 | 0.04 | |
| Alpha | 1.25 | Stream Power (lb/ft s) | 0.00 | 0.05 | |
| Frctn Loss (ft) | 0.02 | Cum Volume (acre-ft) | 3.91 | 2.54 | 3.29 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 3.01 | 0.79 | 3.64 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.25

INPUT
Description: added points 284.19 to 471.45 (taken from road profile and adjusted higher to account for hill visible in photo), 595.33 taken from section 3.2, 600 estimated by photo, and 737.89 from end of section 3.35, Added House, Survey 3.1
Station Elevation Data num= 17

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 284.19 | 2351.92 | 378.4 | 2351.54 | 471.45 | 2351.34 | 503.54 | 2347.6 | 519.73 | 2347.11 |
| 525.37 | 2344.83 | 546.29 | 2342.21 | 554.06 | 2338.87 | 555.09 | 2338.5 | 556.26 | 2338.84 |
| 561.66 | 2340.99 | 570.76 | 2341.73 | 578.76 | 2346.01 | 585.33 | 2346.6 | 595.33 | 2347.77 |
| 605 | 2351.5 | 737.89 | 2355.16 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 284.19 | .035 | 546.29 | .04 | 561.66 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 546.29 | 561.66 | 31.12 | 31.3 | 34.75 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 565 | 600 | 2354 | T |
| 300 | 544 | 2350 | T |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 607.89 | 687.89 | 2358 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2351.32 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2351.30 | Reach Len. (ft) | 31.12 | 31.30 | 34.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 93.63 | 172.83 | 37.84 |
| E.G. Slope (ft/ft) | 0.000041 | Area (sq ft) | 315.31 | 172.83 | 239.95 |
| Q Total (cfs) | 254.31 | Flow (cfs) | 29.44 | 196.23 | 28.64 |
| Top Width (ft) | 132.67 | Top Width (ft) | 74.48 | 15.37 | 42.82 |
| Vel Total (ft/s) | 0.84 | Avg. Vel. (ft/s) | 0.31 | 1.14 | 0.76 |
| Max Chl Dpth (ft) | 12.80 | Hydr. Depth (ft) | 1.26 | 11.24 | 4.84 |
| Conv. Total (cfs) | 39702.1 | Conv. (cfs) | 4595.9 | 30634.4 | 4471.8 |
| Length Wtd. (ft) | 31.48 | Wetted Per. (ft) | 75.31 | 16.58 | 8.15 |
| Min Ch El (ft) | 2338.50 | Shear (lb/sq ft) | 0.00 | 0.03 | 0.01 |
| Alpha | 1.53 | Stream Power (lb/ft s) | 0.00 | 0.03 | 0.01 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.68 | 1.51 | 2.62 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 2.55 | 0.63 | 3.52 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.2

INPUT
Description: added points 284.19 to 471.45 (taken from road profile and adjusted higher to account for hill visible in photo), 600 estimated by photo, and points 632.15 and 667.54, Added House Survey 3.2

Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 284.19 | 2351.92 | 378.4 | 2351.54 | 471.45 | 2351.34 | 503.89 | 2348.8 | 517.5 | 2347.8 |
| 526.21 | 2344.25 | 539.98 | 2343.46 | 545.32 | 2337.94 | 546.27 | 2337.86 | 546.78 | 2337.9 |
| 552.55 | 2341.58 | 563.57 | 2342.2 | 590.65 | 2347.77 | 600 | 2351.5 | 632.15 | 2352.6 |
| 667.54 | 2353.81 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 284.19 | .035 | 539.98 | .04 | 552.55 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 539.98 | 552.55 | 84.32 | 84.3 | 84.32 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 491.9 | 539.9 | 2350.3 | T |
| 552.6 | 600 | 2355 | T |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 600.65 | 667.54 | 2358 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|---|
| E.G. Elev (ft) | 2351.31 | Element | | | | |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.035 | 0.040 | 0.000 |
| W.S. Elev (ft) | 2351.28 | Reach Len. (ft) | | 84.32 | 84.30 | 84.32 |
| Crit W.S. (ft) | 2342.11 | Flow Area (sq ft) | | 62.50 | 142.57 | 0.48 |
| E.G. Slope (ft/ft) | 0.000101 | Area (sq ft) | | 227.52 | 142.57 | 289.16 |
| Q Total (cfs) | 254.31 | Flow (cfs) | | 25.02 | 228.36 | 0.94 |
| Top Width (ft) | 127.16 | Top Width (ft) | | 67.70 | 12.57 | 46.89 |
| Vel Total (ft/s) | 1.24 | Avg. Vel. (ft/s) | | 0.40 | 1.60 | 1.93 |
| Max Chl Dpth (ft) | 13.42 | Hydr. Depth (ft) | | 0.92 | 11.34 | 9.69 |
| Conv. Total (cfs) | 25361.6 | Conv. (cfs) | | 2495.0 | 22773.2 | 93.4 |
| Length Wtd. (ft) | 84.30 | Wetted Per. (ft) | | 68.55 | 15.99 | 0.05 |
| Min Ch El (ft) | 2337.86 | Shear (lb/sq ft) | | 0.01 | 0.06 | 0.06 |
| Alpha | 1.52 | Stream Power (lb/ft s) | | 0.00 | 0.09 | 0.12 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | 2.49 | 1.40 | 2.41 |
| C & E Loss (ft) | | Cum SA (acres) | | 2.50 | 0.62 | 3.49 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 3.01

INPUT
Description:
Distance from Upstream XS = 2.8
Deck/Roadway Width = 81.4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 40

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2354.3 | | 48.18 | 2353.58 | | 95.29 | 2353.03 | |
| 141.79 | 2352.4 | | 188.78 | 2351.8 | | 235.3 | 2351.29 | |
| 284.19 | 2350.92 | | 330.32 | 2350.54 | | 378.4 | 2350.25 | |
| 422.82 | 2350.2 | | 471.12 | 2350.34 | | 491.8 | 2350.49 | |
| 491.85 | 2350.49 | | 522.8 | 2350.72 | | 522.85 | 2354.72 | |
| 536.38 | 2354.82 | | 585.57 | 2355.29 | | 590.8 | 2355.32 | |
| 590.85 | 2351.32 | | 592.4 | 2351.34 | | 592.5 | 2351.34 | |
| 592.6 | 2351.34 | | 632.95 | 2351.6 | | 667.54 | 2351.81 | |
| 715.52 | 2352.03 | | 764.59 | 2352.19 | | 811.88 | 2352.29 | |
| 861.07 | 2352.4 | | 909.19 | 2352.34 | | 957.99 | 2352 | |
| 1006.23 | 2351.53 | | 1054.01 | 2351.3 | | 1102.53 | 2351.17 | |
| 1149.56 | 2349.8 | | 1172.16 | 2350.02 | | 1195.65 | 2350.43 | |
| 1242.87 | 2351.6 | | 1289.3 | 2352.84 | | 1337.21 | 2354.65 | |
| 1381.7 | 2355.22 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 284.19 | 2351.92 | 378.4 | 2351.54 | 471.45 | 2351.34 | 503.89 | 2348.8 | 517.5 | 2347.8 |
| 526.21 | 2344.25 | 539.98 | 2343.46 | 545.32 | 2337.94 | 546.27 | 2337.86 | 546.78 | 2337.9 |
| 552.55 | 2341.58 | 563.57 | 2342.2 | 590.65 | 2347.77 | 600 | 2351.5 | 632.15 | 2352.6 |
| 667.54 | 2353.81 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 284.19 | .035 | 539.98 | .04 | 552.55 | .035 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 539.98 | 552.55 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 491.9 | 539.9 | 2350.3 | T |
| 552.6 | 600 | 2355 | T |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 600.65 | 667.54 | 2358 |

Downstream Deck/Roadway Coordinates
num= 40

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2354.3 | | 48.18 | 2353.58 | | 95.29 | 2353.03 | |
| 141.79 | 2352.4 | | 188.78 | 2351.8 | | 235.3 | 2351.29 | |
| 284.19 | 2350.92 | | 330.32 | 2350.54 | | 378.4 | 2350.25 | |
| 422.82 | 2350.2 | | 471.12 | 2350.34 | | 491.8 | 2350.49 | |
| 491.85 | 2354.49 | | 522.8 | 2354.72 | | 522.85 | 2354.72 | |
| 536.38 | 2354.82 | | 585.57 | 2355.29 | | 590.8 | 2355.32 | |
| 590.85 | 2355.32 | | 592.4 | 2355.34 | | 592.5 | 2351.34 | |
| 592.6 | 2351.34 | | 632.95 | 2351.6 | | 667.54 | 2351.81 | |
| 715.52 | 2352.03 | | 764.59 | 2352.19 | | 811.88 | 2352.29 | |

```
  861.07  2352.4          909.19 2352.34          957.99    2352
 1006.23 2351.53         1054.01  2351.3         1102.53 2351.17
 1149.56  2349.8         1172.16 2350.02         1195.65 2350.43
 1242.87  2351.6          1289.3 2352.84         1337.21 2354.65
  1381.7 2355.22

Downstream Bridge Cross Section Data
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2354.3   48.18 2353.58   95.29 2353.03  141.79  2352.4  188.78  2351.8
   235.3 2351.29  284.19 2350.92  330.32 2350.54   378.4 2350.25  422.82  2350.2
  471.12 2350.34   491.8 2350.49   505.3  2347.8  514.01 2344.25  527.78 2343.46
  533.12    2336  534.07    2336  534.58    2336  540.35 2341.58  551.37  2342.2
  578.45 2347.77   592.5 2351.34   592.6 2351.34  632.95  2351.6  667.54 2351.81
  715.52 2352.03  764.59 2352.19  811.88 2352.29  861.07  2352.4  909.19 2352.34
  957.99    2352 1006.23 2351.53 1054.01  2351.3 1102.53 2351.17 1149.56  2349.8
 1172.16 2350.02 1195.65 2350.43 1242.87  2351.6  1289.3 2352.84 1337.21 2354.65
  1381.7 2355.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  527.78     .03  540.35     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        527.78  540.35            .1        .3
Right Levee     Station=  861.07      Elevation=  2352.4

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              2.8    81.4     .024     .024        0                  .9                 1
Upstream   Elevation =  2338
           Centerline Station =  546.3
Downstream Elevation =  2336.3
           Centerline Station =  534.1

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1

  Q Culv Group (cfs)        181.18    Culv Full Len (ft)         81.40
  # Barrels                      1    Culv Vel US (ft/s)         14.42
  Q Barrel (cfs)            181.18    Culv Vel DS (ft/s)         14.42
  E.G. US. (ft)            2351.31    Culv Inv El Up (ft)      2338.00
  W.S. US. (ft)            2351.28    Culv Inv El Dn (ft)      2336.30
  E.G. DS (ft)             2342.16    Culv Frctn Ls (ft)          4.41
  W.S. DS (ft)             2340.77    Culv Exit Loss (ft)         1.83
  Delta EG (ft)               9.15    Culv Entr Loss (ft)         2.90
  Delta WS (ft)              10.51    Q Weir (cfs)               73.13
  E.G. IC (ft)             2351.27    Weir Sta Lft (ft)         471.91
  E.G. OC (ft)             2351.31    Weir Sta Rgt (ft)         522.81
  Culvert Control            Inlet    Weir Submerg                0.00
  Culv WS Inlet (ft)       2342.00    Weir Max Depth (ft)         0.88
  Culv WS Outlet (ft)      2340.30    Weir Avg Depth (ft)         0.67
  Culv Nml Depth (ft)         4.00    Weir Flow Area (sq ft)     33.93
  Culv Crt Depth (ft)         4.00    Min El Weir Flow (ft)    2350.44


Warning: During the supercritical analysis, the program could not balance the energy equation during the
         forewater calculations inside of the culvert.  The program assumed critical depth at the outlet
         and continued on.
Note:    The normal depth exceeds the height of the culvert.  The program assumes that the normal
         depth is equal to the height of the culvert.
Note:    Culvert critical depth exceeds the height of the culvert.
Note:    During the supercritical calculations a hydraulic jump occurred inside of the culvert.
Note:    The culvert inlet is submerged and the culvert flows full over part or all of its length.  Therefore,
         the culvert inlet equations are not valid and the supercritical result has been discarded.  The
         outlet answer will be used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 2.98

INPUT
Description: added 0 to 491.8 and 592.5 to 1381.7 from top of road, Survey 3.2
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2354.3   48.18 2353.58   95.29 2353.03  141.79  2352.4  188.78  2351.8
   235.3 2351.29  284.19 2350.92  330.32 2350.54   378.4 2350.25  422.82  2350.2
  471.12 2350.34   491.8 2350.49   505.3  2347.8  514.01 2344.25  527.78 2343.46
  533.12    2336  534.07    2336  534.58    2336  540.35 2341.58  551.37  2342.2
  578.45 2347.77   592.5 2351.34   592.6 2351.34  632.95  2351.6  667.54 2351.81
  715.52 2352.03  764.59 2352.19  811.88 2352.29  861.07  2352.4  909.19 2352.34
  957.99    2352 1006.23 2351.53 1054.01  2351.3 1102.53 2351.17 1149.56  2349.8
 1172.16 2350.02 1195.65 2350.43 1242.87  2351.6  1289.3 2352.84 1337.21 2354.65
  1381.7 2355.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  527.78     .03  540.35     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        527.78  540.35             88.83    86.9   82.46             .1        .3
Right Levee     Station=  861.07      Elevation=  2352.4

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2342.16    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.40    Wt. n-Val.                            0.030
  W.S. Elev (ft)           2340.77    Reach Len. (ft)            88.83      86.90      82.46
  Crit W.S. (ft)           2340.77    Flow Area (sq ft)                     26.82
  E.G. Slope (ft/ft)      0.015661    Area (sq ft)                          26.82
  Q Total (cfs)             254.31    Flow (cfs)                           254.31
  Top Width (ft)              9.80    Top Width (ft)                         9.80
  Vel Total (ft/s)            9.48    Avg. Vel. (ft/s)                       9.48
```

| | | | | | |
|---|---|---|---|---|---|
| Max Chl Dpth (ft) | 4.76 | Hydr. Depth (ft) | | 2.74 | |
| Conv. Total (cfs) | 2032.2 | Conv. (cfs) | | 2032.2 | |
| Length Wtd. (ft) | 86.69 | Wetted Per. (ft) | | 14.17 | |
| Min Ch El (ft) | 2336.00 | Shear (lb/sq ft) | | 1.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 17.54 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 2.27 | 1.23 | 2.13 |
| C & E Loss (ft) | 0.26 | Cum SA (acres) | 2.44 | 0.59 | 3.44 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.9

INPUT
Description: Survey 3.30
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2340.6 | 6.1 | 2339.08 | 23.47 | 2336.47 | 42.65 | 2336 | 44.42 | 2335.45 |
| 45.87 | 2336 | 58.17 | 2336.34 | 63.39 | 2337.96 | 91.67 | 2339.74 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 42.65 | .03 | 45.87 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 42.65 | 45.87 | 468 | 424.05 | 409 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2337.97 | Element | | | |
| Vel Head (ft) | 0.54 | Wt. n-Val. | 0.035 | 0.030 | 0.040 |
| W.S. Elev (ft) | 2337.42 | Reach Len. (ft) | 468.00 | 424.05 | 409.00 |
| Crit W.S. (ft) | 2337.42 | Flow Area (sq ft) | 25.79 | 5.46 | 17.29 |
| E.G. Slope (ft/ft) | 0.015789 | Area (sq ft) | 25.79 | 5.46 | 17.29 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 138.25 | 46.63 | 85.12 |
| Top Width (ft) | 44.52 | Top Width (ft) | 25.52 | 3.22 | 15.79 |
| Vel Total (ft/s) | 5.56 | Avg. Vel. (ft/s) | 5.36 | 8.53 | 4.92 |
| Max Chl Dpth (ft) | 1.97 | Hydr. Depth (ft) | 1.01 | 1.70 | 1.10 |
| Conv. Total (cfs) | 2148.7 | Conv. (cfs) | 1100.2 | 371.1 | 677.4 |
| Length Wtd. (ft) | 432.40 | Wetted Per. (ft) | 25.59 | 3.40 | 15.96 |
| Min Ch El (ft) | 2335.45 | Shear (lb/sq ft) | 0.99 | 1.58 | 1.07 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 5.32 | 13.50 | 5.26 |
| Frctn Loss (ft) | 4.73 | Cum Volume (acre-ft) | 2.24 | 1.20 | 2.12 |
| C & E Loss (ft) | 0.09 | Cum SA (acres) | 2.41 | 0.58 | 3.43 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.575

INPUT
Description: Interpolated
Station Elevation Data num= 44

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2336.65 | 20.6 | 2337.02 | 28.51 | 2337.19 | 37.48 | 2337.32 | 40.41 | 2337.34 |
| 40.49 | 2337.34 | 155.48 | 2337.62 | 171.94 | 2335.05 | 195.84 | 2334.35 | 222.21 | 2333.39 |
| 246.74 | 2332.27 | 256.87 | 2332.2 | 280.46 | 2332.04 | 282.54 | 2331.77 | 283.39 | 2330.76 |
| 284.2 | 2330.46 | 285.65 | 2330.4 | 286.77 | 2330.04 | 287.61 | 2330.66 | 289.14 | 2331.77 |
| 311.7 | 2331.99 | 355.13 | 2331.94 | 362.46 | 2332.07 | 380.62 | 2332.82 | 393.57 | 2333.45 |
| 403.91 | 2333.73 | 408.91 | 2333.77 | 432.31 | 2334.75 | 436.82 | 2334.95 | 440.21 | 2336.54 |
| 464.56 | 2337.6 | 472.7 | 2337.41 | 510.3 | 2337.08 | 525.16 | 2336.77 | 547.76 | 2335.21 |
| 562.15 | 2334.68 | 571.82 | 2334.28 | 594.29 | 2334.33 | 618.49 | 2333.37 | 635.2 | 2332.7 |
| 645.49 | 2332.46 | 671.78 | 2331.57 | 683.67 | 2331 | 710.4 | 2332.32 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 282.54 | .03 | 289.14 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 282.54 | 289.14 | 444.23 | 424.05 | 418.83 | .1 | .3 |

Right Levee Station= 464.56 Elevation= 2337.6

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2332.87 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.032 | 0.030 | 0.035 |
| W.S. Elev (ft) | 2332.62 | Reach Len. (ft) | 444.23 | 424.05 | 418.83 |
| Crit W.S. (ft) | 2332.62 | Flow Area (sq ft) | 18.62 | 12.72 | 53.51 |
| E.G. Slope (ft/ft) | 0.008024 | Area (sq ft) | 18.62 | 12.72 | 53.51 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 43.98 | 78.50 | 147.52 |
| Top Width (ft) | 136.81 | Top Width (ft) | 43.52 | 6.60 | 86.69 |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | 2.36 | 6.17 | 2.76 |
| Max Chl Dpth (ft) | 2.58 | Hydr. Depth (ft) | 0.43 | 1.93 | 0.62 |
| Conv. Total (cfs) | 3014.2 | Conv. (cfs) | 491.0 | 876.4 | 1646.8 |
| Length Wtd. (ft) | 423.04 | Wetted Per. (ft) | 43.54 | 7.75 | 86.71 |
| Min Ch El (ft) | 2330.04 | Shear (lb/sq ft) | 0.21 | 0.82 | 0.31 |
| Alpha | 1.59 | Stream Power (lb/ft s) | 0.51 | 5.08 | 0.85 |
| Frctn Loss (ft) | 2.23 | Cum Volume (acre-ft) | 2.00 | 1.11 | 1.78 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 2.04 | 0.53 | 2.95 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.25

INPUT
Description: Survey 2.10
Station Elevation Data num= 44

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | 38.09 | 2334.21 | 52.72 | 2334.85 | 69.3 | 2335.44 | 74.86 | 2335.6 |
| 101.38 | 2346.1 | 131.72 | 2346.15 | 176.4 | 2347.52 | 204.44 | 2345.62 | 249.18 | 2345.16 |
| 317.93 | 2333.7 | 362.12 | 2332.37 | 410.87 | 2330.55 | 456.24 | 2328.41 | 474.96 | 2328.3 |
| 518.59 | 2328.08 | 522.43 | 2327.54 | 523.77 | 2325.64 | 525.05 | 2325.13 | 527.35 | 2325.2 |
| 529.12 | 2324.62 | 530.28 | 2325.68 | 532.4 | 2327.53 | 573.74 | 2327.87 | 653.31 | 2327.58 |
| 700.03 | 2328.36 | 742.7 | 2329.4 | 751.86 | 2329.42 | 794.74 | 2331.13 | 802.99 | 2331.48 |
| 809.2 | 2334.62 | 853.83 | 2336.5 | 868.73 | 2336.03 | 937.62 | 2334.96 | 964.86 | 2334.19 |
| 1006.27 | 2330.84 | 1050.34 | 2328.8 | 1091.52 | 2328.86 | 1135.85 | 2326.9 | 1166.47 | 2325.54 |
| 1185.33 | 2325.04 | 1233.5 | 2323.2 | 1255.29 | 2322.05 | 1304.26 | 2324.65 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 522.43 | .03 | 532.4 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
522.43 532.4 44.48 44.5 46.03 .1 .3
Right Levee Station= 853.83 Elevation= 2336.5

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2328.45 | Element | | | |
| Vel Head (ft) | 0.21 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2328.24 | Reach Len. (ft) | 44.48 | 44.50 | 46.03 |
| Crit W.S. (ft) | 2328.24 | Flow Area (sq ft) | 4.03 | 25.84 | 75.63 |
| E.G. Slope (ft/ft) | 0.003725 | Area (sq ft) | 4.03 | 25.84 | 75.63 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 2.90 | 128.47 | 138.63 |
| Top Width (ft) | 204.83 | Top Width (ft) | 34.69 | 9.97 | 160.17 |
| Vel Total (ft/s) | 2.56 | Avg. Vel. (ft/s) | 0.72 | 4.97 | 1.83 |
| Max Chl Dpth (ft) | 6.19 | Hydr. Depth (ft) | 0.12 | 2.59 | 0.47 |
| Conv. Total (cfs) | 4423.6 | Conv. (cfs) | 47.5 | 2104.8 | 2271.3 |
| Length Wtd. (ft) | 45.41 | Wetted Per. (ft) | 34.72 | 12.25 | 160.18 |
| Min Ch El (ft) | 2324.62 | Shear (lb/sq ft) | 0.03 | 0.49 | 0.11 |
| Alpha | 2.06 | Stream Power (lb/ft s) | 0.02 | 2.44 | 0.20 |
| Frctn Loss (ft) | 0.11 | Cum Volume (acre-ft) | 1.89 | 0.93 | 1.16 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 1.64 | 0.45 | 1.76 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.2

INPUT
Description:
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | 38.09 | 2334.21 | 52.72 | 2334.85 | 69.3 | 2335.44 | 74.86 | 2335.6 |
| 101.38 | 2346.1 | 131.72 | 2346.15 | 176.4 | 2347.52 | 204.44 | 2345.62 | 249.18 | 2345.16 |
| 317.93 | 2333.7 | 362.12 | 2332.37 | 410.87 | 2330.55 | 456.24 | 2328.41 | 478.2 | 2328.3 |
| 522.01 | 2327.44 | 525.44 | 2324.28 | 526.71 | 2323.74 | 528.22 | 2324.14 | 532.94 | 2327.9 |
| 583.78 | 2326.81 | 605.5 | 2326.65 | 653.31 | 2327.08 | 700.03 | 2327.86 | 742.7 | 2328.9 |
| 751.86 | 2328.92 | 794.74 | 2330.63 | 802.99 | 2330.98 | 809.2 | 2334.12 | 853.83 | 2336 |
| 868.73 | 2335.53 | 937.62 | 2334.46 | 964.86 | 2333.69 | 1006.27 | 2330.34 | 1050.34 | 2328.3 |
| 1091.52 | 2328.36 | 1135.85 | 2326.4 | 1166.47 | 2325.04 | 1185.33 | 2324.54 | 1233.5 | 2322.8 |
| 1255.29 | 2321.55 | 1304.26 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 522.01 | .03 | 532.94 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
522.01 532.94 25.7 26.3 25.71 .1 .3
Right Levee Station= 853.83 Elevation= 2336

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2327.92 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2327.85 | Reach Len. (ft) | 25.70 | 26.30 | 25.71 |
| Crit W.S. (ft) | 2327.49 | Flow Area (sq ft) | 4.20 | 26.20 | 113.77 |
| E.G. Slope (ft/ft) | 0.001722 | Area (sq ft) | 4.20 | 26.20 | 113.77 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 2.98 | 83.59 | 183.43 |
| Top Width (ft) | 195.31 | Top Width (ft) | 20.69 | 10.86 | 163.75 |
| Vel Total (ft/s) | 1.87 | Avg. Vel. (ft/s) | 0.71 | 3.19 | 1.61 |
| Max Chl Dpth (ft) | 6.30 | Hydr. Depth (ft) | 0.20 | 2.41 | 0.69 |
| Conv. Total (cfs) | 6506.5 | Conv. (cfs) | 71.9 | 2014.3 | 4420.3 |
| Length Wtd. (ft) | 26.30 | Wetted Per. (ft) | 20.70 | 13.55 | 163.77 |
| Min Ch El (ft) | 2323.74 | Shear (lb/sq ft) | 0.02 | 0.21 | 0.07 |
| Alpha | 1.40 | Stream Power (lb/ft s) | 0.02 | 0.66 | 0.12 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.88 | 0.90 | 1.06 |
| C & E Loss (ft) | | Cum SA (acres) | 1.61 | 0.44 | 1.59 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

```
RIVER: Minnie Cr
REACH: Lower              RS: 2.01

INPUT
Description:
Distance from Upstream XS =     1.5
Deck/Roadway Width        =    23.3
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      38
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2332.7           38.09 2334.21           52.72 2334.85
    69.3 2335.44           74.86  2335.6          101.38  2346.1
  131.72 2346.15           176.4 2347.52          204.44 2345.62
  249.18 2345.16          317.93  2333.7          362.12 2332.37
  410.87 2330.55          456.24 2328.41          486.09 2327.59
  523.21  2328.6          551.58 2328.24           605.5 2326.65
  653.31 2327.08          700.03 2327.86           742.7  2328.9
  751.86 2328.92          794.74 2330.63          802.99 2330.98
   809.2 2334.12          853.83    2336          868.73 2335.53
  937.62 2334.46          964.86 2333.69         1006.27 2330.34
 1050.34  2328.3         1091.52 2328.36         1135.85  2326.4
 1166.47 2325.04         1185.33 2324.54          1233.5  2322.8
 1255.29 2321.55         1304.26 2324.15

Upstream Bridge Cross Section Data
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2332.7   38.09 2334.21   52.72 2334.85    69.3 2335.44   74.86  2335.6
  101.38  2346.1  131.72 2346.15   176.4 2347.52  204.44 2345.62  249.18 2345.16
  317.93  2333.7  362.12 2332.37  410.87 2330.55  456.24 2328.41   478.2  2328.3
  522.01 2327.44  525.44 2324.28  526.71 2323.74  528.22 2324.14  532.94  2327.9
  583.78 2326.81   605.5 2326.65  653.31 2327.08  700.03 2327.86   742.7  2328.9
  751.86 2328.92  794.74 2330.63  802.99 2330.98   809.2 2334.12  853.83    2336
  868.73 2335.53  937.62 2334.46  964.86 2333.69 1006.27 2330.34 1050.34  2328.3
 1091.52 2328.36 1135.85  2326.4 1166.47 2325.04 1185.33 2324.54  1233.5  2322.8
 1255.29 2321.55 1304.26 2324.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  522.01     .03  532.94     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        522.01  532.94          .1          .3
Right Levee     Station=  853.83      Elevation=    2336

Downstream  Deck/Roadway Coordinates
    num=      38
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2332.7           38.09 2334.21           52.72 2334.85
    69.3 2335.44           74.86  2335.6          101.38  2346.1
  131.72 2346.15           176.4 2347.52          204.44 2345.62
  249.18 2345.16          317.93  2333.7          362.12 2332.37
  410.87 2330.55          456.24 2328.41          486.09 2327.59
  523.21  2328.6          551.58 2328.24           605.5 2326.65
  653.31 2327.08          700.03 2327.86           742.7  2328.9
  751.86 2328.92          794.74 2330.63          802.99 2330.98
   809.2 2334.12          853.83    2336          868.73 2335.53
  937.62 2334.46          964.86 2333.69         1006.27 2330.34
 1050.34  2328.3         1091.52 2328.36         1135.85  2326.4
 1166.47 2325.04         1185.33 2324.54          1233.5  2322.8
 1255.29 2321.55         1304.26 2324.15

Downstream Bridge Cross Section Data
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -3.61  2332.7   34.48 2334.21   49.11 2334.85   65.69 2335.44   71.25  2335.6
   97.77  2346.1  128.11 2346.15  172.79 2347.52  200.83 2345.62  245.57 2345.16
  314.32  2333.7  358.51 2332.37  407.26 2330.55  452.63 2328.41  474.59  2328.3
   518.4 2327.44  520.83 2323.52   523.1  2322.8  524.61 2323.14  529.33  2327.9
  580.17 2326.81  601.89 2326.65   649.7 2327.08  696.42 2327.86  739.09  2328.9
  748.25 2328.92  791.13 2330.63  799.38 2330.98  805.59 2334.12  850.22    2336
  865.12 2335.53  934.01 2334.46  961.25 2333.69 1002.66 2330.34 1046.73  2328.3
 1087.91 2328.36 1132.24  2326.4 1162.86 2325.04 1181.72 2324.54 1229.89  2322.8
 1251.68 2321.55 1300.65 2324.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -3.61     .03   518.4     .03  529.33     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
         518.4  529.33          .1          .3
Right Levee     Station=  850.22      Elevation=    2336

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@2          Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 1.5    23.3     .024     .024        0                   .9                 1
Upstream   Elevation =  2324
           Centerline Station =  526.7
Downstream Elevation =  2323
           Centerline Station =  523.1

CULVERT OUTPUT  Profile #PF 1  Culv Group:  culv@2

  Q Culv Group (cfs)          40.30    Culv Full Len (ft)          23.30
  # Barrels                       1    Culv Vel US (ft/s)          3.21
  Q Barrel (cfs)              40.30    Culv Vel DS (ft/s)          3.21
  E.G. US. (ft)             2327.93    Culv Inv El Up (ft)       2324.00
  W.S. US. (ft)             2327.85    Culv Inv El Dn (ft)       2323.00
  E.G. DS (ft)              2327.72    Culv Frctn Ls (ft)           0.44
  W.S. DS (ft)              2327.44    Culv Exit Loss (ft)
  Delta EG (ft)                0.21    Culv Entr Loss (ft)          0.14
```

| | | | |
|---|---|---|---|
| Delta WS (ft) | 0.41 | Q Weir (cfs) | 229.70 |
| E.G. IC (ft) | 2327.88 | Weir Sta Lft (ft) | 497.39 |
| E.G. OC (ft) | 2327.93 | Weir Sta Rgt (ft) | 702.65 |
| Culvert Control | Outlet | Weir Submerg | 0.38 |
| Culv WS Inlet (ft) | 2328.00 | Weir Max Depth (ft) | 1.27 |
| Culv WS Outlet (ft) | 2327.00 | Weir Avg Depth (ft) | 0.70 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 99.43 |
| Culv Crt Depth (ft) | 1.89 | Min El Weir Flow (ft) | 2326.69 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.98

INPUT
Description:
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -3.61 | 2332.7 | 34.48 | 2334.21 | 49.11 | 2334.85 | 65.69 | 2335.44 | 71.25 | 2335.6 |
| 97.77 | 2346.1 | 128.11 | 2346.15 | 172.79 | 2347.52 | 200.83 | 2345.62 | 245.57 | 2345.16 |
| 314.32 | 2333.7 | 358.51 | 2332.37 | 407.26 | 2330.55 | 452.63 | 2328.41 | 474.59 | 2328.3 |
| 518.4 | 2327.44 | 520.83 | 2323.52 | 523.1 | 2322.8 | 524.61 | 2323.14 | 529.33 | 2327.9 |
| 580.17 | 2326.81 | 601.89 | 2326.65 | 649.7 | 2327.08 | 696.42 | 2327.86 | 739.09 | 2328.9 |
| 748.25 | 2328.92 | 791.13 | 2330.63 | 799.38 | 2330.98 | 805.59 | 2334.12 | 850.22 | 2336 |
| 865.12 | 2335.53 | 934.01 | 2334.46 | 961.25 | 2333.69 | 1002.66 | 2330.34 | 1046.73 | 2328.3 |
| 1087.91 | 2328.36 | 1132.24 | 2326.4 | 1162.86 | 2325.04 | 1181.72 | 2324.54 | 1229.89 | 2322.8 |
| 1251.68 | 2321.55 | 1300.65 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -3.61 | .03 | 518.4 | .03 | 529.33 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 518.4 | 529.33 | 94.92 | 93.4 | 91 | .1 | .3 |

Right Levee Station= 850.22 Elevation= 2336

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2327.72 | Element | | | |
| Vel Head (ft) | 0.29 | Wt. n-Val. | | 0.030 | 0.030 |
| W.S. Elev (ft) | 2327.44 | Reach Len. (ft) | 94.92 | 93.40 | 91.00 |
| Crit W.S. (ft) | 2327.44 | Flow Area (sq ft) | | 30.37 | 55.72 |
| E.G. Slope (ft/ft) | 0.004326 | Area (sq ft) | | 30.37 | 55.72 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 161.27 | 108.73 |
| Top Width (ft) | 130.65 | Top Width (ft) | | 10.47 | 120.18 |
| Vel Total (ft/s) | 3.14 | Avg. Vel. (ft/s) | | 5.31 | 1.95 |
| Max Chl Dpth (ft) | 5.89 | Hydr. Depth (ft) | | 2.90 | 0.46 |
| Conv. Total (cfs) | 4105.0 | Conv. (cfs) | | 2451.9 | 1653.0 |
| Length Wtd. (ft) | 92.28 | Wetted Per. (ft) | | 14.59 | 120.19 |
| Min Ch El (ft) | 2322.80 | Shear (lb/sq ft) | | 0.56 | 0.13 |
| Alpha | 1.87 | Stream Power (lb/ft s) | | 2.99 | 0.24 |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 1.88 | 0.88 | 1.01 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.61 | 0.44 | 1.51 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.9

INPUT
Description: Survey 2.30
sta -88.73 = quad contour 2330
Station Elevation Data num= 23

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -88.73 | 2330 | 0 | 2325.3 | 48.44 | 2325.12 | 52.73 | 2324 | 53.38 | 2323.51 |
| 53.63 | 2322.76 | 55.43 | 2322.8 | 55.67 | 2323.5 | 57.35 | 2323.58 | 58.97 | 2324.84 |
| 65.29 | 2324.85 | 90.2 | 2324.4 | 132.64 | 2325.15 | 180.45 | 2325.58 | 227.17 | 2326.36 |
| 269.84 | 2327.4 | 279 | 2327.42 | 321.88 | 2329.13 | 330.13 | 2329.48 | 336.34 | 2332.62 |
| 380.97 | 2334.5 | 395.87 | 2334.03 | 464.76 | 2332.96 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -88.73 | .03 | 48.44 | .03 | 58.97 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 48.44 | 58.97 | 606 | 611.7 | 613 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2325.69 | Element | | | |
| Vel Head (ft) | 0.25 | Wt. n-Val. | 0.030 | 0.030 | 0.035 |
| W.S. Elev (ft) | 2325.44 | Reach Len. (ft) | 606.00 | 611.70 | 613.00 |
| Crit W.S. (ft) | 2325.44 | Flow Area (sq ft) | 11.44 | 15.99 | 57.22 |
| E.G. Slope (ft/ft) | 0.009566 | Area (sq ft) | 11.44 | 15.99 | 57.22 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 20.44 | 92.24 | 157.33 |
| Top Width (ft) | 167.83 | Top Width (ft) | 51.13 | 10.53 | 106.18 |
| Vel Total (ft/s) | 3.19 | Avg. Vel. (ft/s) | 1.79 | 5.77 | 2.75 |
| Max Chl Dpth (ft) | 2.68 | Hydr. Depth (ft) | 0.22 | 1.52 | 0.54 |
| Conv. Total (cfs) | 2760.5 | Conv. (cfs) | 208.9 | 943.1 | 1608.5 |
| Length Wtd. (ft) | 610.18 | Wetted Per. (ft) | 51.13 | 12.31 | 106.19 |
| Min Ch El (ft) | 2322.76 | Shear (lb/sq ft) | 0.13 | 0.78 | 0.32 |
| Alpha | 1.57 | Stream Power (lb/ft s) | 0.24 | 4.47 | 0.88 |
| Frctn Loss (ft) | 6.01 | Cum Volume (acre-ft) | 1.87 | 0.83 | 0.89 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 1.55 | 0.41 | 1.27 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.575

INPUT
Description: Interpolated
Station Elevation Data num= 30

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -170.48 | 2325 | -65.49 | 2315.76 | -46.73 | 2314.43 | -16.49 | 2313.62 | 7.99 | 2309.41 |
| 12.5 | 2309.31 | 55.08 | 2309.56 | 57.9 | 2308.84 | 58.33 | 2308.57 | 58.5 | 2308.19 |
| 61.36 | 2308.36 | 61.53 | 2308.52 | 61.75 | 2308.73 | 64.42 | 2308.86 | 67.01 | 2309.57 |
| 75.3 | 2309.97 | 102.62 | 2311.06 | 108 | 2311.31 | 163.71 | 2314.62 | 219.71 | 2317.77 |
| 226.47 | 2317.88 | 287.81 | 2319.08 | 343.82 | 2320.33 | 355.84 | 2320.5 | 412.13 | 2322.1 |
| 422.96 | 2322.41 | 431.12 | 2324.09 | 489.7 | 2325.8 | 509.26 | 2325.83 | 599.7 | 2326.48 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -170.48 | .03 | 55.08 | .03 | 67.01 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 55.08 | 67.01 | 607.5 | 611.7 | 612.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2310.58 | Element | | | |
| Vel Head (ft) | 0.36 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2310.22 | Reach Len. (ft) | 607.50 | 611.70 | 612.49 |
| Crit W.S. (ft) | 2310.22 | Flow Area (sq ft) | 39.11 | 16.44 | 4.48 |
| E.G. Slope (ft/ft) | 0.010159 | Area (sq ft) | 39.11 | 16.44 | 4.48 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 161.75 | 98.02 | 10.23 |
| Top Width (ft) | 78.23 | Top Width (ft) | 51.79 | 11.93 | 14.51 |
| Vel Total (ft/s) | 4.50 | Avg. Vel. (ft/s) | 4.14 | 5.96 | 2.28 |
| Max Chl Dpth (ft) | 2.03 | Hydr. Depth (ft) | 0.76 | 1.38 | 0.31 |
| Conv. Total (cfs) | 2678.8 | Conv. (cfs) | 1604.7 | 972.5 | 101.5 |
| Length Wtd. (ft) | 609.07 | Wetted Per. (ft) | 51.86 | 12.60 | 14.52 |
| Min Ch El (ft) | 2308.19 | Shear (lb/sq ft) | 0.48 | 0.83 | 0.20 |
| Alpha | 1.15 | Stream Power (lb/ft s) | 1.98 | 4.94 | 0.45 |
| Frctn Loss (ft) | 0.30 | Cum Volume (acre-ft) | 1.52 | 0.60 | 0.46 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 0.84 | 0.26 | 0.42 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.25

INPUT
Description: Survey 1.10
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -132.79 | 2310 | -26.07 | 2300 | 0 | 2300.2 | 21.11 | 2293.25 | 61.72 | 2293.99 |
| 63.36 | 2293.62 | 67.52 | 2293.94 | 75.04 | 2294.3 | 119.14 | 2297.65 | 264.12 | 2310 |
| 734.63 | 2320 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -132.79 | .03 | 61.72 | .03 | 75.04 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 61.72 | 75.04 | 57.9 | 49.4 | 45.74 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -132.79 | 21.29 | 2305 | F |
| 95.47 | 734.63 | 2305 | F |

CROSS SECTION OUTPUT Profile #PF 1

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2296.95 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2296.93 | Reach Len. (ft) | 57.90 | 49.40 | 45.74 |
| Crit W.S. (ft) | 2294.65 | Flow Area (sq ft) | 133.56 | 39.29 | 37.78 |
| E.G. Slope (ft/ft) | 0.000158 | Area (sq ft) | 154.73 | 39.29 | 45.36 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 184.45 | 50.17 | 35.37 |
| Top Width (ft) | 99.65 | Top Width (ft) | 51.77 | 13.32 | 34.56 |
| Vel Total (ft/s) | 1.28 | Avg. Vel. (ft/s) | 1.38 | 1.28 | 0.94 |
| Max Chl Dpth (ft) | 3.68 | Hydr. Depth (ft) | 3.30 | 2.95 | 1.85 |
| Conv. Total (cfs) | 21476.1 | Conv. (cfs) | 14671.7 | 3990.9 | 2813.5 |
| Length Wtd. (ft) | 52.06 | Wetted Per. (ft) | 40.44 | 13.38 | 20.49 |
| Min Ch El (ft) | 2293.62 | Shear (lb/sq ft) | 0.03 | 0.03 | 0.02 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.05 | 0.04 | 0.02 |
| Frctn Loss (ft) | 0.02 | Cum Volume (acre-ft) | 0.17 | 0.21 | 0.11 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.11 | 0.08 | 0.07 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.2

INPUT
Description:
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 560.19 | 2310 | 662.29 | 2300.5 | 707.75 | 2294.45 | 714.38 | 2292.4 | 718.46 | 2292.21 |
| 729.83 | 2292.11 | 732.53 | 2293.58 | 749.55 | 2293.35 | 791.92 | 2299.97 | 929.02 | 2300 |
| 1408.42 | 2310 | | | | | | | | |

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        707.75  732.53               75      75      75             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2309       F
   730.1 1408.42   2309       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2296.89    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.46    Wt. n-Val.                          0.030
  W.S. Elev (ft)           2296.43    Reach Len. (ft)            9.30      9.30       9.30
  Crit W.S. (ft)           2294.74    Flow Area (sq ft)                   49.49
  E.G. Slope (ft/ft)      0.001761    Area (sq ft)              14.68     94.90      80.69
  Q Total (cfs)             270.00    Flow (cfs)                         270.00
  Top Width (ft)             76.34    Top Width (ft)            14.85     24.78      36.71
  Vel Total (ft/s)            5.46    Avg. Vel. (ft/s)                    5.46
  Max Chl Dpth (ft)           4.32    Hydr. Depth (ft)                    4.27
  Conv. Total (cfs)         6433.3    Conv. (cfs)                        6433.3
  Length Wtd. (ft)            9.30    Wetted Per. (ft)                   11.64
  Min Ch El (ft)           2292.11    Shear (lb/sq ft)                    0.47
  Alpha                       1.00    Stream Power (lb/ft s)              2.55
  Frctn Loss (ft)             0.04    Cum Volume (acre-ft)       0.05      0.14       0.04
  C & E Loss (ft)             0.07    Cum SA (acres)             0.07      0.06       0.04


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

BRIDGE


RIVER: Minnie Cr
REACH: Lower                RS: 1.01

INPUT
Description: added point 1408.42
Distance from Upstream XS =      9.3
Deck/Roadway Width        =     64.4
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       30
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    2309            47.06 2309.29            98.95 2309.72
  149.94 2310.11           201.14 2310.52           249.36  2310.9
  297.46 2311.26           345.68 2311.64           395.87 2311.97
  450.01 2312.29           496.25  2312.6           544.33 2312.82
  591.88 2313.05           640.89 2313.34           688.37  2313.6
   718.8 2313.88  2296.7    729.8 2313.98  2296.6    735.5    2314
  782.79 2314.36           830.66 2314.77           879.14    2315
  927.23 2315.23           973.72  2315.5           1021.4 2315.73
 1069.77 2316.05          1115.06 2316.34           1161.2  2316.5
  1208.2  2316.6          1255.32  2316.8          1408.42 2317.29

Upstream Bridge Cross Section Data
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  560.19    2310  662.29  2300.5  707.75 2294.45  714.38  2292.4  718.46 2292.21
  729.83 2292.11  732.53 2293.58  749.55 2293.35  791.92 2299.97  929.02    2300
 1408.42    2310

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        707.75  732.53            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2309       F
   730.1 1408.42   2309       F

Downstream  Deck/Roadway Coordinates
    num=       30
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    2309            47.06 2309.29            98.95 2309.72
  149.94 2310.11           201.14 2310.52           249.36  2310.9
  297.46 2311.26           345.68 2311.64           395.87 2311.97
  450.01 2312.29           496.25  2312.6           544.33 2312.82
  591.88 2313.05           640.89 2313.34           688.37  2313.6
   718.8 2313.88  2294.1    729.8 2313.98  2294.2    735.5    2314
  782.79 2314.36           830.66 2314.77           879.14    2315
  927.23 2315.23           973.72  2315.5           1021.4 2315.73
 1069.77 2316.05          1115.06 2316.34           1161.2  2316.5
  1208.2  2316.6          1255.32  2316.8          1408.42 2317.29

Downstream Bridge Cross Section Data
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  560.19  2308.5  662.29    2299  707.75 2292.95  714.38  2290.9  718.73 2290.61
  729.84 2290.71  732.53 2292.08  749.55 2291.85  791.92 2298.47  929.02  2298.5
 1408.42  2308.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        707.75  732.53            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2300       F
   730.1 1408.42   2300       F

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =    .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
```

```
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   724.3    Downstream=   724.4
Upstream     num=       2
    Width   Elev    Width   Elev
        2    2292       2 2296.64
Downstream     num=       2
    Width   Elev    Width   Elev
        2  2290.5       2 2294.14

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1

  E.G. US. (ft)                2296.89    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                2296.43    E.G. Elev (ft)               2296.78       2295.21
  Q Total (cfs)                 270.00    W.S. Elev (ft)               2295.63       2293.66
  Q Bridge (cfs)                270.00    Crit W.S. (ft)               2295.18       2293.66
  Q Weir (cfs)                            Max Chl Dpth (ft)              3.52          3.05
  Weir Sta Lft (ft)                       Vel Total (ft/s)               8.62          9.98
  Weir Sta Rgt (ft)                       Flow Area (sq ft)             31.32         27.07
  Weir Submerg                            Froude # Chl                   0.82          1.01
  Weir Max Depth (ft)                     Specif Force (cu ft)         126.64        124.28
  Min El Weir Flow (ft)        2312.91    Hydr Depth (ft)                3.48          3.01
  Min El Prs (ft)              2296.70    W.P. Total (ft)               22.92         21.04
  Delta EG (ft)                   2.38    Conv. Total (cfs)            1909.7        1585.8
  Delta WS (ft)                   3.20    Top Width (ft)                 9.01          9.00
  BR Open Area (sq ft)           31.50    Frctn Loss (ft)                1.54          0.02
  BR Open Vel (ft/s)              9.98    C & E Loss (ft)                0.04          0.08
  Coef of Q                               Shear Total (lb/sq ft)         1.70          2.33
  Br Sel Method            Energy only    Power Total (lb/ft s)         14.70         23.22


Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note:    Momentum answer is not valid if the water surface is above the low chord or if there is weir
         flow.  The momentum answer has been disregarded.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.
Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
         is not a valid subcritical answer.  The program defaulted to critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 0.98

INPUT
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  560.19  2308.5  662.29    2299  707.75 2292.95  714.38  2290.9  718.73 2290.61
  729.84 2290.71  732.53 2292.08  749.55 2291.85  791.92 2298.47  929.02  2298.5
 1408.42  2308.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        707.75  732.53            97.91   103.9  110.99             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2300       F
   730.1 1408.42    2300       F

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)            2294.51    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                1.28    Wt. n-Val.                            0.030
  W.S. Elev (ft)            2293.23    Reach Len. (ft)             97.91     103.90     110.99
  Crit W.S. (ft)            2293.23    Flow Area (sq ft)                      29.77
  E.G. Slope (ft/ft)       0.009574    Area (sq ft)                 0.29      52.87      27.58
  Q Total (cfs)              270.00    Flow (cfs)                            270.00
  Top Width (ft)              52.72    Top Width (ft)               2.09      24.78      25.84
  Vel Total (ft/s)             9.07    Avg. Vel. (ft/s)                       9.07
  Max Chl Dpth (ft)            2.62    Hydr. Depth (ft)                       2.57
  Conv. Total (cfs)          2759.4    Conv. (cfs)                           2759.4
  Length Wtd. (ft)           101.89    Wetted Per. (ft)                      11.63
  Min Ch El (ft)            2290.61    Shear (lb/sq ft)                       1.53
  Alpha                        1.00    Stream Power (lb/ft s)                13.87
  Frctn Loss (ft)              1.09    Cum Volume (acre-ft)         0.05       0.08       0.04
  C & E Loss (ft)              0.26    Cum SA (acres)               0.07       0.04       0.03


Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
```

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 0.9

INPUT
Description: Survey 1.3
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -86.79 | 2293 | -37.9 | 2290 | 0 | 2288.4 | 36.99 | 2288.2 | 39.87 | 2286.94 |
| 40.89 | 2286.93 | 42.15 | 2287.44 | 47.01 | 2290 | 84.41 | 2288.73 | 152.64 | 2300 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -86.79 | .035 | 36.99 | .03 | 47.01 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 36.99 | 47.01 | 0 | 0 | 0 | .1 | .3 |

Right Levee Station= 47.01 Elevation= 2290

CROSS SECTION OUTPUT Profile #PF 1

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2289.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.40 | Wt. n-Val. | 0.035 | 0.030 | |
| W.S. Elev (ft) | 2289.28 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 2289.28 | Flow Area (sq ft) | 45.67 | 13.21 | |
| E.G. Slope (ft/ft) | 0.011949 | Area (sq ft) | 45.67 | 13.21 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | 180.81 | 89.19 | |
| Top Width (ft) | 66.60 | Top Width (ft) | 57.94 | 8.66 | |
| Vel Total (ft/s) | 4.59 | Avg. Vel. (ft/s) | 3.96 | 6.75 | |
| Max Chl Dpth (ft) | 2.35 | Hydr. Depth (ft) | 0.79 | 1.52 | |
| Conv. Total (cfs) | 2470.0 | Conv. (cfs) | 1654.1 | 815.9 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | 57.95 | 9.48 | |
| Min Ch El (ft) | 2286.93 | Shear (lb/sq ft) | 0.59 | 1.04 | |
| Alpha | 1.22 | Stream Power (lb/ft s) | 2.33 | 7.02 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

SUMMARY OF MANNING'S N VALUES

River:Minnie Cr

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 |
|---|---|---|---|---|---|---|
| Lower | 15 | .04 | .035 | .03 | .035 | |
| Lower | 14.75* | .03 | .035 | .037 | .037 | |
| Lower | 14.5* | .03 | .035 | .038 | .038 | |
| Lower | 14.25 | .03 | .035 | .04 | | |
| Lower | 14.2 | .03 | .035 | .04 | | |
| Lower | 14.01 | Culvert | | | | |
| Lower | 13.98 | .03 | .035 | .04 | | |
| Lower | 13.9 | .04 | .035 | .045 | | |
| Lower | 13.25 | .04 | .035 | .04 | | |
| Lower | 13.2 | .035 | .035 | .04 | | |
| Lower | 13.01 | Culvert | | | | |
| Lower | 12.98 | .04 | .035 | .04 | | |
| Lower | 12.9 | .04 | .04 | .045 | | |
| Lower | 12 | .03 | .035 | .045 | .04 | |
| Lower | 11.6666 | .03 | .033 | .042 | .037 | .037 |
| Lower | 11.3333 | .03 | .032 | .038 | .033 | .033 |
| Lower | 11 | .03 | .035 | .03 | | |
| Lower | 10.8125* | .03 | .035 | .03 | | |
| Lower | 10.625* | .03 | .035 | .03 | | |
| Lower | 10.4375* | .03 | .035 | .03 | | |
| Lower | 10.25 | .03 | .035 | .03 | | |
| Lower | 10.2 | .03 | .035 | .03 | | |
| Lower | 10.01 | Culvert | | | | |
| Lower | 9.98 | .03 | .035 | .03 | | |
| Lower | 9.9 | .03 | .035 | .03 | | |
| Lower | 9.45* | .03 | .035 | .03 | .032 | .032 |
| Lower | 9 | .03 | .035 | .03 | .035 | |
| Lower | 8.775 | .03 | .035 | .03 | .032 | .032 |
| Lower | 8.55 | .03 | .035 | .03 | | |
| Lower | 8.45 | .03 | .035 | .03 | | |
| Lower | 8.3 | Culvert | | | | |
| Lower | 8.28 | .03 | .035 | .03 | | |
| Lower | 8.25 | .03 | .04 | .035 | | |
| Lower | 8.2 | .03 | .035 | .03 | | |
| Lower | 8.01 | Culvert | | | | |
| Lower | 7.98 | .03 | .035 | .03 | | |
| Lower | 7.9 | .03 | .035 | .03 | | |
| Lower | 7.6 | .03 | .035 | .03 | | |
| Lower | 7.3 | .03 | .035 | .03 | | |
| Lower | 7 | .03 | .035 | .03 | | |
| Lower | 6.8125* | .03 | .035 | .03 | | |
| Lower | 6.625* | .03 | .035 | .03 | | |
| Lower | 6.4375* | .03 | .035 | .03 | | |
| Lower | 6.25 | .03 | .035 | .03 | | |
| Lower | 6.22 | Lat Struct | | | | |
| Lower | 6.2 | .03 | .035 | .03 | | |
| Lower | 6.01 | Bridge | | | | |
| Lower | 5.98 | .03 | .035 | .03 | | |
| Lower | 5.9 | .03 | .035 | .035 | | |
| Lower | 5 | .03 | .035 | .04 | | |
| Lower | 4.875* | .035 | .035 | .035 | .038 | |
| Lower | 4.75* | .035 | .035 | .035 | .037 | |
| Lower | 4.625* | .035 | .035 | .035 | .035 | |
| Lower | 4.5* | .035 | .035 | .035 | .033 | .033 |
| Lower | 4.375* | .03 | .035 | .035 | .032 | .032 |
| Lower | 4.25 | .03 | .035 | .03 | | |
| Lower | 4.22 | Lat Struct | | | | |
| Lower | 4.2 | .03 | .035 | .03 | | |
| Lower | 4.01 | Bridge | | | | |
| Lower | 3.98 | .03 | .035 | .03 | | |
| Lower | 3.55 | .03 | .035 | .03 | | |
| Lower | 3.5 | Culvert | | | | |
| Lower | 3.4 | .035 | .04 | .035 | | |
| Lower | 3.35 | .035 | .04 | .035 | | |

| | | | | |
|---|---|---|---|---|
| Lower | 3.25 | .035 | .04 | .035 |
| Lower | 3.2 | .035 | .04 | .035 |
| Lower | 3.01 | Culvert | | |
| Lower | 2.98 | .04 | .03 | .04 |
| Lower | 2.9 | .035 | .03 | .04 |
| Lower | 2.575 | .032 | .03 | .035 |
| Lower | 2.25 | .03 | .03 | .03 |
| Lower | 2.2 | .03 | .03 | .03 |
| Lower | 2.01 | Culvert | | |
| Lower | 1.98 | .03 | .03 | .03 |
| Lower | 1.9 | .03 | .03 | .035 |
| Lower | 1.575 | .03 | .03 | .03 |
| Lower | 1.25 | .03 | .03 | .03 |
| Lower | 1.2 | .03 | .03 | .03 |
| Lower | 1.01 | Bridge | | |
| Lower | 0.98 | .03 | .03 | .03 |
| Lower | 0.9 | .035 | .03 | .04 |

SUMMARY OF REACH LENGTHS

River: Minnie Cr

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Lower | 15 | 100 | 144.9 | 150.67 |
| Lower | 14.75* | 120 | 144.9 | 150.67 |
| Lower | 14.5* | 70 | 144.9 | 150.67 |
| Lower | 14.25 | 49.82 | 50.9 | 50.52 |
| Lower | 14.2 | 43 | 44 | 43.28 |
| Lower | 14.01 | Culvert | | |
| Lower | 13.98 | 91.58 | 80 | 73.15 |
| Lower | 13.9 | 35.2 | 45.1 | 51.9 |
| Lower | 13.25 | 45.81 | 48.1 | 46.76 |
| Lower | 13.2 | 136.18 | 136 | 136.18 |
| Lower | 13.01 | Culvert | | |
| Lower | 12.98 | 62.62 | 61.2 | 58.67 |
| Lower | 12.9 | 818.6 | 818.6 | 818.6 |
| Lower | 12 | 228 | 277.63 | 266 |
| Lower | 11.6666 | 265 | 277.63 | 317 |
| Lower | 11.3333 | 274 | 277.63 | 292 |
| Lower | 11 | 265 | 264.15 | 260 |
| Lower | 10.8125* | 265 | 264.15 | 258 |
| Lower | 10.625* | 265 | 264.15 | 263 |
| Lower | 10.4375* | 264 | 264.15 | 262 |
| Lower | 10.25 | 44.28 | 46.7 | 45.58 |
| Lower | 10.2 | 32 | 32 | 32 |
| Lower | 10.01 | Culvert | | |
| Lower | 9.98 | 82.04 | 79.2 | 80.8 |
| Lower | 9.9 | 422 | 424.1 | 428.5 |
| Lower | 9.45* | 422 | 424.1 | 428.5 |
| Lower | 9 | 262 | 261.5 | 261 |
| Lower | 8.775 | 262.5 | 261.5 | 260 |
| Lower | 8.55 | 48.5 | 51.7 | 52.1 |
| Lower | 8.45 | 22.15 | 22 | 22.15 |
| Lower | 8.3 | Culvert | | |
| Lower | 8.28 | 197.16 | 191.3 | 182.4 |
| Lower | 8.25 | 61.5 | 59.7 | 62 |
| Lower | 8.2 | 52.61 | 52.7 | 52.54 |
| Lower | 8.01 | Culvert | | |
| Lower | 7.98 | 172.58 | 157.1 | 145.16 |
| Lower | 7.9 | 267 | 277.7 | 286 |
| Lower | 7.6 | 277 | 277.7 | 274 |
| Lower | 7.3 | 279 | 277.7 | 271 |
| Lower | 7 | 200 | 196.6 | 199 |
| Lower | 6.8125* | 198 | 196.6 | 198 |
| Lower | 6.625* | 199 | 196.6 | 194 |
| Lower | 6.4375* | 195 | 196.6 | 193 |
| Lower | 6.25 | 70 | 67.9 | 60 |
| Lower | 6.22 | Lat Struct | | |
| Lower | 6.2 | 23.8 | 24 | 23.8 |
| Lower | 6.01 | Bridge | | |
| Lower | 5.98 | 96.89 | 108.5 | 113.2 |
| Lower | 5.9 | 704 | 706.3 | 705 |
| Lower | 5 | 225.5 | 233.78 | 238.83 |
| Lower | 4.875* | 225.5 | 233.78 | 238.83 |
| Lower | 4.75* | 225.5 | 233.78 | 238.83 |
| Lower | 4.625* | 225.5 | 233.78 | 238.83 |
| Lower | 4.5* | 225.5 | 233.78 | 238.83 |
| Lower | 4.375* | 225.5 | 233.78 | 238.83 |
| Lower | 4.25 | 47.12 | 52.1 | 51.65 |
| Lower | 4.22 | Lat Struct | | |
| Lower | 4.2 | 22.24 | 22 | 22.24 |
| Lower | 4.01 | Bridge | | |
| Lower | 3.98 | 38.55 | 34.2 | 36.87 |
| Lower | 3.55 | 30.9 | 30.9 | 30.9 |
| Lower | 3.5 | Culvert | | |
| Lower | 3.4 | 48.57 | 62.9 | 74 |
| Lower | 3.35 | 280.87 | 255.2 | 240.99 |
| Lower | 3.25 | 31.12 | 31.3 | 34.75 |
| Lower | 3.2 | 84.32 | 84.3 | 84.32 |
| Lower | 3.01 | Culvert | | |
| Lower | 2.98 | 88.83 | 86.9 | 82.46 |
| Lower | 2.9 | 468 | 424.05 | 409 |
| Lower | 2.575 | 444.23 | 424.05 | 418.83 |
| Lower | 2.25 | 44.48 | 44.5 | 46.03 |
| Lower | 2.2 | 25.7 | 26.3 | 25.71 |
| Lower | 2.01 | Culvert | | |
| Lower | 1.98 | 94.92 | 93.4 | 91 |
| Lower | 1.9 | 606 | 611.7 | 613 |
| Lower | 1.575 | 607.5 | 611.7 | 612.49 |
| Lower | 1.25 | 57.9 | 49.4 | 45.74 |
| Lower | 1.2 | 75 | 75 | 75 |
| Lower | 1.01 | Bridge | | |
| Lower | 0.98 | 97.91 | 103.9 | 110.99 |
| Lower | 0.9 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Minnie Cr

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Lower | 15 | | .1 | .3 |
| Lower | 14.75* | | .1 | .3 |
| Lower | 14.5* | | .1 | .3 |
| Lower | 14.25 | | .1 | .3 |
| Lower | 14.2 | | .1 | .3 |
| Lower | 14.01 | Culvert | | |
| Lower | 13.98 | | .1 | .3 |
| Lower | 13.9 | | .1 | .3 |
| Lower | 13.25 | | .1 | .3 |
| Lower | 13.2 | | .1 | .3 |
| Lower | 13.01 | Culvert | | |
| Lower | 12.98 | | .1 | .3 |
| Lower | 12.9 | | .1 | .3 |
| Lower | 12 | | .1 | .3 |
| Lower | 11.6666 | | .1 | .3 |
| Lower | 11.3333 | | .1 | .3 |
| Lower | 11 | | .1 | .3 |
| Lower | 10.8125* | | .1 | .3 |
| Lower | 10.625* | | .1 | .3 |
| Lower | 10.4375* | | .1 | .3 |
| Lower | 10.25 | | .1 | .3 |
| Lower | 10.2 | | .1 | .3 |
| Lower | 10.01 | Culvert | | |
| Lower | 9.98 | | .1 | .3 |
| Lower | 9.9 | | .1 | .3 |
| Lower | 9.45* | | .1 | .3 |
| Lower | 9 | | .1 | .3 |
| Lower | 8.775 | | .1 | .3 |
| Lower | 8.55 | | .1 | .3 |
| Lower | 8.45 | | .1 | .3 |
| Lower | 8.3 | Culvert | | |
| Lower | 8.28 | | .1 | .3 |
| Lower | 8.25 | | .1 | .3 |
| Lower | 8.2 | | .1 | .3 |
| Lower | 8.01 | Culvert | | |
| Lower | 7.98 | | .1 | .3 |
| Lower | 7.9 | | .1 | .3 |
| Lower | 7.6 | | .1 | .3 |
| Lower | 7.3 | | .1 | .3 |
| Lower | 7 | | .1 | .3 |
| Lower | 6.8125* | | .1 | .3 |
| Lower | 6.625* | | .1 | .3 |
| Lower | 6.4375* | | .1 | .3 |
| Lower | 6.25 | | .1 | .3 |
| Lower | 6.22 | Lat Struct | | |
| Lower | 6.2 | | .1 | .3 |
| Lower | 6.01 | Bridge | | |
| Lower | 5.98 | | .1 | .3 |
| Lower | 5.9 | | .1 | .3 |
| Lower | 5 | | .1 | .3 |
| Lower | 4.875* | | .1 | .3 |
| Lower | 4.75* | | .1 | .3 |
| Lower | 4.625* | | .1 | .3 |
| Lower | 4.5* | | .1 | .3 |
| Lower | 4.375* | | .1 | .3 |
| Lower | 4.25 | | .1 | .3 |
| Lower | 4.22 | Lat Struct | | |
| Lower | 4.2 | | .1 | .3 |
| Lower | 4.01 | Bridge | | |
| Lower | 3.98 | | .1 | .3 |
| Lower | 3.55 | | .1 | .3 |
| Lower | 3.5 | Culvert | | |
| Lower | 3.4 | | .1 | .3 |
| Lower | 3.35 | | .1 | .3 |
| Lower | 3.25 | | .1 | .3 |
| Lower | 3.2 | | .1 | .3 |
| Lower | 3.01 | Culvert | | |
| Lower | 2.98 | | .1 | .3 |
| Lower | 2.9 | | .1 | .3 |
| Lower | 2.575 | | .1 | .3 |
| Lower | 2.25 | | .1 | .3 |
| Lower | 2.2 | | .1 | .3 |
| Lower | 2.01 | Culvert | | |
| Lower | 1.98 | | .1 | .3 |
| Lower | 1.9 | | .1 | .3 |
| Lower | 1.575 | | .1 | .3 |
| Lower | 1.25 | | .1 | .3 |
| Lower | 1.2 | | .1 | .3 |
| Lower | 1.01 | Bridge | | |
| Lower | 0.98 | | .1 | .3 |
| Lower | 0.9 | | .1 | .3 |

Profile Output Table - Floodway Data

| Reach | River Sta | Profile | Cum Ch Len (ft) | Top Wdth Act (ft) | Area (sq ft) | Vel Chnl (ft/s) | W.S. Elev (ft) | W.S. Elev (ft) | W.S. Elev (ft) | Length Chnl (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Lower | 0.9 | PF 1 | | 66.60 | 58.87 | 6.75 | 2289.28 | 2289.28 | 2289.28 | |
| Lower | 0.98 | PF 1 | 103.90 | 11.60 | 80.75 | 9.07 | 2293.23 | 2293.23 | 2293.23 | 103.90 |
| Lower | 1.01 | | Bridge | | | | | | | |
| Lower | 1.2 | PF 1 | 178.90 | 11.60 | 190.26 | 5.46 | 2296.43 | 2296.43 | 2296.43 | 9.30 |
| Lower | 1.25 | PF 1 | 228.30 | 74.18 | 239.38 | 1.28 | 2296.93 | 2296.93 | 2296.93 | 49.40 |
| Lower | 1.575 | PF 1 | 840.00 | 78.23 | 60.03 | 5.96 | 2310.22 | 2310.22 | 2310.22 | 611.70 |
| Lower | 1.9 | PF 1 | 1451.70 | 167.83 | 84.65 | 5.77 | 2325.44 | 2325.44 | 2325.44 | 611.70 |
| Lower | 1.98 | PF 1 | 1545.10 | 130.65 | 86.09 | 5.31 | 2327.44 | 2327.44 | 2327.44 | 93.40 |
| Lower | 2.01 | | Culvert | | | | | | | |
| Lower | 2.2 | PF 1 | 1571.40 | 195.31 | 144.18 | 3.19 | 2327.85 | 2327.85 | 2327.85 | 26.30 |
| Lower | 2.25 | PF 1 | 1615.90 | 204.83 | 105.50 | 4.97 | 2328.24 | 2328.24 | 2328.24 | 44.50 |
| Lower | 2.575 | PF 1 | 2039.95 | 136.81 | 84.85 | 6.17 | 2332.62 | 2332.62 | 2332.62 | 424.05 |
| Lower | 2.9 | PF 1 | 2464.00 | 44.52 | 48.54 | 8.53 | 2337.42 | 2337.42 | 2337.42 | 424.05 |
| Lower | 2.98 | PF 1 | 2550.90 | 9.80 | 26.82 | 9.48 | 2340.77 | 2340.77 | 2340.77 | 86.90 |
| Lower | 3.01 | | Culvert | | | | | | | |
| Lower | 3.2 | PF 1 | 2635.20 | 80.32 | 659.24 | 1.60 | 2351.28 | 2351.28 | 2351.28 | 84.30 |
| Lower | 3.25 | PF 1 | 2666.50 | 97.67 | 728.09 | 1.14 | 2351.30 | 2351.30 | 2351.30 | 31.30 |
| Lower | 3.35 | PF 1 | 2921.70 | 107.36 | 244.28 | 1.23 | 2351.31 | 2351.31 | 2351.31 | 255.20 |
| Lower | 3.4 | PF 1 | 2984.60 | 67.70 | 203.92 | 1.80 | 2351.32 | 2351.32 | 2351.32 | 62.90 |
| Lower | 3.5 | | Culvert | | | | | | | |
| Lower | 3.55 | PF 1 | 3015.50 | 47.00 | 213.31 | 2.11 | 2351.36 | 2351.36 | 2351.36 | 30.90 |
| Lower | 3.98 | PF 1 | 3049.70 | 19.70 | 426.85 | 2.46 | 2351.35 | 2351.35 | 2351.35 | 34.20 |
| Lower | 4.01 | | Bridge | | | | | | | |
| Lower | 4.2 | PF 1 | 3071.70 | 147.75 | 983.45 | 1.55 | 2352.67 | 2352.67 | 2352.67 | 1.80 |
| Lower | 4.22 | | Lat Struct | | | | | | | |
| Lower | 4.25 | PF 1 | 3123.80 | 50.30 | 691.30 | 1.02 | 2352.69 | 2352.69 | 2352.69 | 52.10 |
| Lower | 4.375* | PF 1 | 3357.58 | 173.73 | 353.99 | 0.90 | 2352.72 | 2352.72 | 2352.72 | 233.78 |
| Lower | 4.5* | PF 1 | 3591.36 | 96.60 | 135.63 | 1.72 | 2352.74 | 2352.74 | 2352.74 | 233.78 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Lower | 4.625* | PF 1 | 3825.14 | 65.39 | 73.48 | 3.06 | 2352.98 | 2352.98 | 2352.98 | 233.78 |
| Lower | 4.75* | PF 1 | 4058.92 | 66.54 | 67.95 | 3.32 | 2354.14 | 2354.14 | 2354.14 | 233.78 |
| Lower | 4.875* | PF 1 | 4292.70 | 71.61 | 72.00 | 3.12 | 2355.48 | 2355.48 | 2355.48 | 233.78 |
| Lower | 5 | PF 1 | 4526.48 | 73.49 | 78.44 | 3.41 | 2356.70 | 2356.70 | 2356.70 | 233.78 |
| Lower | 5.9 | PF 1 | 5232.78 | 98.43 | 61.96 | 4.79 | 2360.78 | 2360.78 | 2360.78 | 706.30 |
| Lower | 5.98 | PF 1 | 5341.28 | 24.53 | 43.00 | 5.23 | 2361.46 | 2361.46 | 2361.46 | 108.50 |
| Lower | 6.01 | | Bridge | | | | | | | |
| Lower | 6.2 | PF 1 | 5365.28 | 17.00 | 944.36 | 3.84 | 2362.89 | 2362.89 | 2362.89 | 2.10 |
| Lower | 6.22 | | Lat Struct | | | | | | | |
| Lower | 6.25 | PF 1 | 5433.18 | 123.93 | 164.14 | 2.83 | 2363.13 | 2363.13 | 2363.13 | 67.90 |
| Lower | 6.4375* | PF 1 | 5629.78 | 52.04 | 55.51 | 5.04 | 2363.50 | 2363.50 | 2363.50 | 196.60 |
| Lower | 6.625* | PF 1 | 5826.38 | 98.71 | 69.75 | 4.22 | 2364.86 | 2364.86 | 2364.86 | 196.60 |
| Lower | 6.8125* | PF 1 | 6022.98 | 86.36 | 66.49 | 4.33 | 2365.92 | 2365.92 | 2365.92 | 196.60 |
| Lower | 7 | PF 1 | 6219.58 | 88.90 | 71.68 | 4.12 | 2367.05 | 2367.05 | 2367.05 | 196.60 |
| Lower | 7.3 | PF 1 | 6497.28 | 95.62 | 97.41 | 3.13 | 2368.04 | 2368.04 | 2368.04 | 277.70 |
| Lower | 7.6 | PF 1 | 6774.98 | 61.20 | 86.16 | 3.32 | 2368.59 | 2368.59 | 2368.59 | 277.70 |
| Lower | 7.9 | PF 1 | 7052.68 | 47.35 | 79.69 | 3.49 | 2369.17 | 2369.17 | 2369.17 | 277.70 |
| Lower | 7.98 | PF 1 | 7209.78 | 36.43 | 98.95 | 2.73 | 2369.49 | 2369.49 | 2369.49 | 157.10 |
| Lower | 8.01 | | Culvert | | | | | | | |
| Lower | 8.2 | PF 1 | 7262.48 | 281.29 | 317.32 | 1.00 | 2371.15 | 2371.15 | 2371.15 | 52.70 |
| Lower | 8.25 | PF 1 | 7322.18 | 315.34 | 402.77 | 1.00 | 2371.16 | 2371.16 | 2371.16 | 59.70 |
| Lower | 8.28 | PF 1 | 7513.48 | 360.00 | 1268.18 | 0.29 | 2371.18 | 2371.18 | 2371.18 | 191.30 |
| Lower | 8.3 | | Culvert | | | | | | | |
| Lower | 8.45 | PF 1 | 7535.48 | 360.00 | 1300.37 | 0.28 | 2371.18 | 2371.18 | 2371.18 | 22.00 |
| Lower | 8.55 | PF 1 | 7587.18 | 410.00 | 961.19 | 0.41 | 2371.18 | 2371.18 | 2371.18 | 51.70 |
| Lower | 8.775 | PF 1 | 7848.68 | 503.71 | 1005.65 | 0.39 | 2371.18 | 2371.18 | 2371.18 | 261.50 |
| Lower | 9 | PF 1 | 8110.18 | 558.09 | 1052.59 | 0.36 | 2371.19 | 2371.19 | 2371.19 | 261.50 |
| Lower | 9.45* | PF 1 | 8534.28 | 501.71 | 760.89 | 0.53 | 2371.19 | 2371.19 | 2371.19 | 424.10 |
| Lower | 9.9 | PF 1 | 8958.38 | 376.00 | 528.37 | 0.81 | 2371.20 | 2371.20 | 2371.20 | 424.10 |
| Lower | 9.98 | PF 1 | 9037.58 | 265.59 | 295.04 | 1.39 | 2371.20 | 2371.20 | 2371.20 | 79.20 |
| Lower | 10.01 | | Culvert | | | | | | | |
| Lower | 10.2 | PF 1 | 9069.58 | 269.71 | 303.21 | 1.35 | 2371.23 | 2371.23 | 2371.23 | 32.00 |
| Lower | 10.25 | PF 1 | 9116.28 | 272.08 | 403.75 | 1.03 | 2371.25 | 2371.25 | 2371.25 | 46.70 |
| Lower | 10.4375* | PF 1 | 9380.43 | 413.52 | 683.13 | 0.63 | 2371.27 | 2371.27 | 2371.27 | 264.15 |
| Lower | 10.625* | PF 1 | 9644.58 | 500.59 | 1049.48 | 0.37 | 2371.28 | 2371.28 | 2371.28 | 264.15 |
| Lower | 10.8125* | PF 1 | 9908.73 | 581.99 | 1439.55 | 0.25 | 2371.28 | 2371.28 | 2371.28 | 264.15 |
| Lower | 11 | PF 1 | 10172.88 | 600.94 | 1845.77 | 0.17 | 2371.28 | 2371.28 | 2371.28 | 264.15 |
| Lower | 11.3333 | PF 1 | 10450.51 | 614.25 | 2175.38 | 0.14 | 2371.28 | 2371.28 | 2371.28 | 277.63 |
| Lower | 11.6666 | PF 1 | 10728.14 | 636.00 | 2545.08 | 0.11 | 2371.28 | 2371.28 | 2371.28 | 277.63 |
| Lower | 12 | PF 1 | 11005.77 | 644.26 | 2934.62 | 0.09 | 2371.28 | 2371.28 | 2371.28 | 277.63 |
| Lower | 12.9 | PF 1 | 11824.37 | 27.26 | 3088.17 | 3.05 | 2371.18 | 2371.18 | 2371.18 | 818.60 |
| Lower | 12.98 | PF 1 | 11885.57 | 24.37 | 87.71 | 3.08 | 2371.26 | 2371.26 | 2371.26 | 61.20 |
| Lower | 13.01 | | Culvert | | | | | | | |
| Lower | 13.2 | PF 1 | 12021.57 | 33.85 | 1655.98 | 0.79 | 2379.77 | 2379.77 | 2379.77 | 136.00 |
| Lower | 13.25 | PF 1 | 12069.67 | 82.00 | 1686.59 | 0.49 | 2379.78 | 2379.78 | 2379.78 | 48.10 |
| Lower | 13.9 | PF 1 | 12114.77 | 128.00 | 1369.96 | 0.39 | 2379.78 | 2379.78 | 2379.78 | 45.10 |
| Lower | 13.98 | PF 1 | 12194.77 | 209.00 | 9087.75 | 0.26 | 2379.78 | 2379.78 | 2379.78 | 80.00 |
| Lower | 14.01 | | Culvert | | | | | | | |
| Lower | 14.2 | PF 1 | 12238.77 | 34.00 | 693.08 | 0.82 | 2379.83 | 2379.83 | 2379.83 | 44.00 |
| Lower | 14.25 | PF 1 | 12289.67 | 77.00 | 3079.24 | 0.38 | 2379.83 | 2379.83 | 2379.83 | 50.90 |
| Lower | 14.5* | PF 1 | 12434.57 | 233.00 | 3745.15 | 0.13 | 2379.84 | 2379.84 | 2379.84 | 144.90 |
| Lower | 14.75* | PF 1 | 12579.47 | 383.00 | 4847.63 | 0.07 | 2379.84 | 2379.84 | 2379.84 | 144.90 |
| Lower | 15 | PF 1 | 12724.37 | 546.00 | 6961.38 | 0.05 | 2379.84 | 2379.84 | 2379.84 | 144.90 |

```
                    HEC-RAS Version 3.1.3 May 2005
                     U.S. Army Corp of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX


PROJECT DATA
Project Title: Minnie Creek Special Study
Project File : Minnie.prj
Run Date and Time: 2/1/2007 1:08:38 PM

Project in English units

Project Description:
MINNIE CREEK 2006
THIS FILE CREATED AUGUST 2006
SECTIONS SURVEYED BY ROGERS
SURVEYING AUGUST 2006
DATUM NAD27, NGVD29
REDUCTION INCLUDED REDUCTION OF GR
CARDS.
SECTION 0.90 IS DOWNSTREAM THE RAILROAD CROSSING SOUTHEAST OF
CHENEY
DATA REDUCTION/UNSTEADY FLOW MODELING - T. SCHWARZ
STEADY FLOW
MODELING - G. SLACK



PLAN DATA

Plan Title: Minnie Floodway Plan3
Plan File : C:\Minnie Creek\Combined model 1-12-07\Minnie.p07

           Geometry Title: Minnie
           Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g01

           Flow Title    : Flow Data
           Flow File     : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Plan Description:
Note:  This is floodway plan
PF1 - Not used
PF2 - floodway
PF3 - Not
used
PF4 - Not used
PF3 - Not used
PF4 - Not used
Not mapped upstream of
Highway 904 bridge.  See unsteady flow file for this area as it is backed up
from highway and rail road embankments with undersized culverts.
Note: The
result is the same if you turn the lateral weir flow optimizer off (as in this
plan) or delete the lateral weirs out of the geometry.


Plan Summary Information:
Number of:  Cross Sections =   68    Multiple Openings  =    0
            Culverts       =    8    Inline Structures  =    0
            Bridges        =    3    Lateral Structures =    2

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = False
   Left Offset      =        0
   Right Offset     =        0

River = Minnie Cr        Reach = Lower
RS       Profile          Method  Value1  Value2
12       PF 2                  1  509.59  762.76
11.6666  PF 2                  1  523.22  727.15
11.3333  PF 2                  1  560.86  753.41
11       PF 2                  1  640.49  774.25
10.8125*PF 2                   1  690.34     775
10.625*  PF 2                  1  721.57   792.6
10.4375*PF 2                   1  770.35     820
10.25    PF 2                  1     798     839
10.2     PF 2                  1   800.7     838
9.98     PF 2                  1   800.7     838
9.9      PF 2                  1  808.33  843.97
9.45*    PF 2                  1  816.55  850.81
9        PF 2                  1  824.76  857.65
8.775    PF 2                  1  435.71  471.87
8.55     PF 2                  1   46.67   86.08
8.45     PF 2                  1   48.02   78.65
8.28     PF 2                  1   48.02   78.65
8.25     PF 2                  1  940.59  982.82
8.2      PF 2                  1  957.89 1065.24
7.98     PF 2                  1  979.89 1087.24
```

| | | | | |
|---|---|---|---|---|
| 7.9 | PF 2 | 1 | 1121.28 | 1152.93 |
| 7.6 | PF 2 | 1 | 1036.41 | 1071.66 |
| 7.3 | PF 2 | 1 | 951.54 | 990.38 |
| 7 | PF 2 | 1 | 866.67 | 909.11 |
| 6.8125* | PF 2 | 1 | 658.64 | 698.61 |
| 6.625* | PF 2 | 1 | 450.6 | 488.12 |
| 6.4375* | PF 2 | 1 | 242.57 | 277.63 |
| 6.25 | PF 2 | 1 | 34 | 67.13 |
| 6.2 | PF 2 | 1 | 419.12 | 447.43 |
| 5.98 | PF 2 | 1 | 419.12 | 447.43 |
| 5.9 | PF 2 | 1 | 41.56 | 62.86 |
| 5 | PF 2 | 1 | 631.58 | 729.08 |
| 4.875* | PF 2 | 1 | 533.98 | 618.22 |
| 4.625* | PF 2 | 1 | 334 | 414 |
| 4.5* | PF 2 | 1 | 234 | 305 |
| 4.375* | PF 2 | 1 | 140 | 190 |
| 4.25 | PF 2 | 1 | 32.59 | 75.67 |
| 4.2 | PF 2 | 1 | 496.52 | 532.64 |
| 3.98 | PF 2 | 1 | 502.52 | 540.64 |
| 3.55 | PF 2 | 1 | 27.84 | 64.92 |
| 3.4 | PF 2 | 1 | 26.15 | 60.92 |
| 3.35 | PF 2 | 1 | 42.31 | 87.44 |
| 3.25 | PF 2 | 1 | 519.73 | 578.76 |
| 3.2 | PF 2 | 1 | 508 | 667 |
| 2.98 | PF 2 | 1 | 450 | 667 |
| 2.9 | PF 2 | 1 | 34.58 | 49.5 |
| 2.575 | PF 2 | 1 | 272 | 304 |
| 2.25 | PF 2 | 1 | 520 | 581 |
| 2.2 | PF 2 | 1 | 520 | 596 |
| 1.98 | PF 2 | 1 | 468.4 | 608.33 |
| 1.9 | PF 2 | 1 | 48.44 | 89 |
| 1.575 | PF 2 | 1 | 55.05 | 70 |
| 1.25 | PF 2 | 1 | 59.72 | 75.04 |
| 1.2 | PF 2 | 1 | 719.75 | 732.53 |
| 0.98 | PF 2 | 1 | 707.75 | 732.53 |
| 0.9 | PF 2 | 1 | 31.42 | 47.01 |

FLOW DATA

Flow Title: Flow Data
Flow File : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Flow Data (cfs)

| River | Reach | RS | PF 1 | PF 2 | PF 3 | PF 4 |
|---|---|---|---|---|---|---|
| Minnie Cr | Lower | 15 | 270 | 270 | 125 | 220 |
| Minnie Cr | Lower | 12 | 270 | 270 | 125 | 220 |

Boundary Conditions

| River | Reach | Profile | Upstream | Downstream |
|---|---|---|---|---|
| Minnie Cr | Lower | PF 1 | | Critical |
| Minnie Cr | Lower | PF 2 | | Critical |
| Minnie Cr | Lower | PF 3 | | Critical |
| Minnie Cr | Lower | PF 4 | | Critical |

GEOMETRY DATA

Geometry Title: Minnie
Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g01

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 15

INPUT
Description:
Station Elevation Data num= 85

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2382.4 | 45.85 | 2379.2 | 86.98 | 2375.87 | 109.34 | 2374.35 | 141.96 | 2372.69 |
| 209.68 | 2366.7 | 246.52 | 2366 | 284.87 | 2365.44 | 313.99 | 2364.54 | 355.62 | 2364.39 |
| 390.07 | 2364.3 | 407.7 | 2363.95 | 442.83 | 2363.73 | 479.54 | 2364.98 | 509.4 | 2366.23 |
| 535.33 | 2368.1 | 547.07 | 2370.76 | 555.77 | 2371.74 | 567.17 | 2373.69 | 578.9 | 2377.77 |
| 580.14 | 2380.9 | 586.46 | 2383.37 | 600.47 | 2384.69 | 606.79 | 2384.06 | 616.18 | 2385.33 |
| 639.64 | 2385.8 | 665.27 | 2385.02 | 675.52 | 2383.39 | 684.67 | 2385.46 | 717.31 | 2384.95 |
| 725.19 | 2388.3 | 740.12 | 2386.04 | 756.24 | 2385.74 | 757.89 | 2382.4 | 774.13 | 2382.2 |
| 784.13 | 2389.3 | 805.49 | 2389.04 | 818.09 | 2386.13 | 827.42 | 2385.42 | 857.01 | 2380.04 |
| 870 | 2377.3 | 877.69 | 2373.8 | 885.29 | 2373.69 | 889.03 | 2374.61 | 891.9 | 2375.6 |
| 897.44 | 2375.6 | 898.83 | 2374.89 | 905.75 | 2372.88 | 919.09 | 2373.06 | 937.94 | 2369.52 |
| 945.66 | 2370.3 | 951.7 | 2369.63 | 972.24 | 2368.79 | 1014.61 | 2368.18 | 1023.75 | 2367.17 |
| 1037.11 | 2367.3 | 1081.61 | 2367.89 | 1131.16 | 2368.36 | 1172.55 | 2368.06 | 1215.45 | 2368.04 |
| 1254.31 | 2368.4 | 1271.54 | 2366.97 | 1286.12 | 2367.99 | 1314.83 | 2368.06 | 1357.71 | 2367.96 |
| 1400.64 | 2369 | 1434.98 | 2371.03 | 1472.14 | 2373.31 | 1518.28 | 2374.88 | 1564.48 | 2377.4 |
| 1608.6 | 2380.1 | 1629.19 | 2386.22 | 1644.75 | 2387.47 | 1649.7 | 2386.63 | 1688.21 | 2388 |
| 1734.65 | 2388.4 | 1801.7 | 2388.82 | 1828.94 | 2388.26 | 1838.98 | 2388.08 | 1875.82 | 2389.8 |
| 1923.05 | 2390 | 1966.28 | 2389.53 | 2012.84 | 2390.8 | 2057.11 | 2389.48 | 2106.38 | 2388.91 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 284.87 | .035 | 509.4 | .03 | 1254.31 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1254.31 | 1286.12 | 100 | 144.9 | 150.67 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1004 | 2385 | F |
| 1550 | 2106.38 | 2385 | F |

Left Levee Station= 784.13 Elevation= 2389.3

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.035 |
| W.S. Elev (ft) | 2380.41 | Reach Len. (ft) | 100.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | 2368.20 | Flow Area (sq ft) | 3109.05 | 407.75 | 2501.73 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 4359.22 | 407.75 | 2624.39 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 159.72 | 18.30 | 91.97 |
| Top Width (ft) | 754.66 | Top Width (ft) | 399.33 | 31.81 | 323.52 |

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 0.04 | Avg. Vel. (ft/s) | 0.05 | 0.04 | 0.04 |
| Max Chl Dpth (ft) | 16.68 | Hydr. Depth (ft) | 12.42 | 12.82 | 9.48 |
| Conv. Total (cfs) | 1395898.0 | Conv. (cfs) | 825769.6 | 94624.9 | 475503.6 |
| Length Wtd. (ft) | 121.30 | Wetted Per. (ft) | 250.38 | 31.90 | 264.10 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 81.95 | 62.43 | 36.50 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 15.06 | 12.99 | 7.87 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 14.75*

INPUT
Description:
Station Elevation Data num= 35

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 811.62 | 2368.5 | 862.43 | 2369.01 | 919.01 | 2369.44 | 966.27 | 2369.35 | 1015.25 | 2369.44 |
| 1023.62 | 2369.51 | 1059.63 | 2369.46 | 1074.23 | 2367.18 | 1077.69 | 2366.97 | 1078.57 | 2367.01 |
| 1098.33 | 2370.09 | 1120.22 | 2369.95 | 1152.91 | 2369.6 | 1175.32 | 2369.88 | 1185.63 | 2370.15 |
| 1211.81 | 2371.62 | 1240.14 | 2373.26 | 1275.32 | 2374.47 | 1310.54 | 2376.3 | 1344.17 | 2378.25 |
| 1359.87 | 2382.4 | 1371.73 | 2383.29 | 1375.51 | 2382.75 | 1404.86 | 2383.79 | 1440.27 | 2384.21 |
| 1440.9 | 2384.22 | 1491.38 | 2384.74 | 1512.15 | 2384.47 | 1519.8 | 2384.39 | 1547.89 | 2385.67 |
| 1583.89 | 2385.98 | 1616.85 | 2385.83 | 1652.35 | 2386.85 | 1686.1 | 2386.14 | 1723.66 | 2385.94 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 811.62 | .03 | 1059.63 | .035 | 1098.33 | .037 | 1723.66 | .037 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1059.63 | 1098.33 | 120 | 144.9 | 150.67 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 811.62 | 887 | 2385 | F |
| 1270 | 1723.66 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.037 |
| W.S. Elev (ft) | 2380.41 | Reach Len. (ft) | 120.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | 2369.63 | Flow Area (sq ft) | 1899.92 | 468.78 | 1594.56 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2769.85 | 468.78 | 1917.81 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 147.44 | 33.00 | 89.56 |
| Top Width (ft) | 540.72 | Top Width (ft) | 248.01 | 38.70 | 254.01 |
| Vel Total (ft/s) | 0.07 | Avg. Vel. (ft/s) | 0.08 | 0.07 | 0.06 |
| Max Chl Dpth (ft) | 13.44 | Hydr. Depth (ft) | 11.01 | 12.11 | 9.29 |
| Conv. Total (cfs) | 852660.4 | Conv. (cfs) | 465606.9 | 104214.5 | 282839.0 |
| Length Wtd. (ft) | 133.73 | Wetted Per. (ft) | 172.63 | 39.12 | 171.78 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 73.77 | 60.98 | 28.65 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 14.32 | 12.87 | 6.88 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 14.5*

INPUT
Description:
Station Elevation Data num= 34

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 643.25 | 2370.12 | 706.86 | 2370.53 | 759.99 | 2370.64 | 815.06 | 2370.84 | 824.47 | 2370.9 |
| 864.94 | 2370.51 | 880.22 | 2367.12 | 883.83 | 2366.97 | 884.97 | 2367.01 | 910.54 | 2372.2 |
| 925.6 | 2371.84 | 948.1 | 2371.25 | 963.53 | 2371.1 | 970.63 | 2371.3 | 988.65 | 2372.21 |
| 1008.15 | 2373.22 | 1032.36 | 2374.06 | 1056.6 | 2375.21 | 1079.75 | 2376.41 | 1090.55 | 2378.59 |
| 1098.71 | 2379.11 | 1101.31 | 2378.86 | 1121.52 | 2379.58 | 1145.89 | 2380.03 | 1146.32 | 2380.04 |
| 1181.07 | 2380.67 | 1195.36 | 2380.68 | 1200.63 | 2380.7 | 1219.96 | 2381.55 | 1244.74 | 2381.97 |
| 1267.42 | 2382.13 | 1291.85 | 2382.9 | 1315.08 | 2382.79 | 1340.93 | 2382.97 | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 643.25 | .03 | 864.94 | .035 | 910.54 | .038 | 1340.93 | .038 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 864.94 | 910.54 | 70 | 144.9 | 150.67 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 643.25 | 762 | 2385 | F |
| 995 | 1340.93 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.038 |
| W.S. Elev (ft) | 2380.41 | Reach Len. (ft) | 70.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | 2369.51 | Flow Area (sq ft) | 995.32 | 516.95 | 740.60 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2178.33 | 516.95 | 1340.41 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 132.43 | 64.71 | 72.86 |
| Top Width (ft) | 523.42 | Top Width (ft) | 221.69 | 45.60 | 256.13 |
| Vel Total (ft/s) | 0.12 | Avg. Vel. (ft/s) | 0.13 | 0.13 | 0.10 |
| Max Chl Dpth (ft) | 13.44 | Hydr. Depth (ft) | 9.67 | 11.34 | 8.77 |
| Conv. Total (cfs) | 456170.2 | Conv. (cfs) | 223743.2 | 109327.7 | 123099.3 |
| Length Wtd. (ft) | 118.24 | Wetted Per. (ft) | 102.94 | 46.50 | 84.51 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 66.95 | 59.34 | 23.01 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.67 | 12.73 | 5.99 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 14.25

INPUT
Description: Survey 14.1
end point of survey deleted and point 470 created by linear interpolation.

Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 470 | 2371.48 | 625.31 | 2372.3 | 670.26 | 2371.57 | 686.21 | 2367.06 | 689.98 | 2366.97 |
| 691.38 | 2367.01 | 722.75 | 2374.3 | 751.74 | 2372.31 | 851.74 | 2375.85 | 958.21 | 2380 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 470 | .03 | 670.26 | .035 | 722.75 | .04 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
670.26 722.75 49.82 50.9 50.52 .1 .3

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 470 | 650 | 2385 | F |
| 727 | 958.21 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2380.41 | Reach Len. (ft) | 49.82 | 50.90 | 50.52 |
| Crit W.S. (ft) | 2369.57 | Flow Area (sq ft) | 175.70 | 552.11 | 26.57 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 1703.58 | 552.11 | 1102.83 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 65.87 | 198.13 | 6.00 |
| Top Width (ft) | 488.21 | Top Width (ft) | 200.26 | 52.49 | 235.46 |
| Vel Total (ft/s) | 0.36 | Avg. Vel. (ft/s) | 0.37 | 0.36 | 0.23 |
| Max Chl Dpth (ft) | 13.44 | Hydr. Depth (ft) | 8.67 | 10.52 | 6.25 |
| Conv. Total (cfs) | 150557.9 | Conv. (cfs) | 36731.4 | 110481.2 | 3345.3 |
| Length Wtd. (ft) | 50.74 | Wetted Per. (ft) | 20.26 | 53.95 | 4.26 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 63.83 | 57.56 | 18.79 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 13.33 | 12.57 | 5.14 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 14.2

INPUT
Description: Survey 14.2
Reduced data to width of max water surface without floodway encroachments. This was so that the floodway width could be obtained. Encroachments made on the privious wider cross section created erroneous results.
-200 = RR x-sec extended 200' on grade

Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 653.41 | 2373.97 | 689.47 | 2373.25 | 704.82 | 2366.74 | 706.07 | 2366.51 | 707.43 | 2366.36 |
| 719.64 | 2372.9 | 744.6 | 2374.02 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 653.41 | .03 | 689.47 | .035 | 719.64 | .04 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
689.47 719.64 43 44 43.28 .1 .3

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 653.41 | 688 | 2385 | F |
| 722 | 744.6 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.41 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2380.40 | Reach Len. (ft) | 43.00 | 44.00 | 43.28 |
| Crit W.S. (ft) | 2369.99 | Flow Area (sq ft) | 10.49 | 327.40 | 17.57 |
| E.G. Slope (ft/ft) | 0.000016 | Area (sq ft) | 244.81 | 327.40 | 173.20 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 7.60 | 252.58 | 9.82 |
| Top Width (ft) | 91.19 | Top Width (ft) | 36.06 | 30.17 | 24.96 |
| Vel Total (ft/s) | 0.76 | Avg. Vel. (ft/s) | 0.72 | 0.77 | 0.56 |
| Max Chl Dpth (ft) | 14.04 | Hydr. Depth (ft) | 7.13 | 10.85 | 7.45 |
| Conv. Total (cfs) | 68377.4 | Conv. (cfs) | 1924.8 | 63965.2 | 2487.5 |
| Length Wtd. (ft) | 44.00 | Wetted Per. (ft) | 1.47 | 33.16 | 2.36 |
| Min Ch El (ft) | 2366.36 | Shear (lb/sq ft) | 0.01 | 0.01 | 0.01 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.01 | 0.01 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 62.72 | 57.04 | 18.05 |
| C & E Loss (ft) | | Cum SA (acres) | 13.19 | 12.52 | 4.99 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 14.01

INPUT
Description:
Distance from Upstream XS = 2
Deck/Roadway Width = 40.5

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -200 2375.28                 0 2375.32           44.99 2375.33
   92.51 2375.38            139.18 2375.48          188.77 2375.55
  234.46  2375.6            283.59  2375.7          330.27 2375.77
  378.75 2375.83            425.79 2375.94          473.19    2376
  520.84  2376.2            568.13 2376.27          615.45  2376.3
  662.56 2376.34            709.56  2376.4          754.64 2376.41
  782.31 2376.78            799.87 2376.67          808.75 2376.77
  826.65  2376.7            847.68 2376.71          856.34 2376.87
  871.28 2377.07            894.13 2377.01          903.97    2377
  951.07 2377.14            987.52 2377.25         1029.32 2377.37
 1034.24 2377.38           1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97           1226.53  2378.2         1276.96 2378.67
    1324     2379          1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87           1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5           1726.47  2380.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  653.41 2373.97  689.47 2373.25  704.82 2366.74  706.07 2366.51  707.43 2366.36
  719.64  2372.9   744.6 2374.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  653.41     .03  689.47    .035  719.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        689.47  719.64          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  653.41     688    2385        F
     722   744.6    2385        F

Downstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -200 2375.28                 0 2375.32           44.99 2375.33
   92.51 2375.38            139.18 2375.48          188.77 2375.55
  234.46  2375.6            283.59  2375.7          330.27 2375.77
  378.75 2375.83            425.79 2375.94          473.19    2376
  520.84  2376.2            568.13 2376.27          615.45  2376.3
  662.56 2376.34            709.56  2376.4          754.64 2376.41
  782.31 2376.78            799.87 2376.67          808.75 2376.77
  826.65  2376.7            847.68 2376.71          856.34 2376.87
  871.28 2377.07            894.13 2377.01          903.97    2377
  951.07 2377.14            987.52 2377.25         1029.32 2377.37
 1034.24 2377.38           1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97           1226.53  2378.2         1276.96 2378.67
    1324     2379          1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87           1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5           1726.47  2380.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -435.46 2380.04       7  2373.3   51.99 2373.33   99.51 2373.38  146.18 2373.48
  195.77 2373.55  241.46  2373.6  290.59  2373.7  337.27 2373.77  385.75 2373.83
  432.79 2373.94  480.19    2374  527.84  2374.2  575.13 2374.27  622.45  2374.3
  648.61  2374.2  696.47 2373.25  711.82 2366.74  713.07 2366.51  714.43 2366.36
  726.64  2372.9  756.85 2374.25  761.64 2374.41  789.31 2374.78  806.87 2374.67
  815.75 2374.77  833.65  2374.7  854.68 2374.71  863.34 2374.87  878.28 2375.07
  901.13 2375.01  910.97    2375  958.07 2375.14  994.52 2375.25 1036.32 2375.37
 1041.24 2375.38 1088.42  2375.4 1136.26 2375.78 1183.62 2375.97 1233.53  2376.2
 1283.96 2376.67    1331    2377 1377.05 2377.34 1423.97 2377.59 1472.43 2377.87
 1518.88 2378.11 1565.69  2378.3 1612.16  2378.5 1726.47    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -435.46     .03  696.47    .035  726.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        696.47  726.64          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -435.46     607    2385        F
     816 1726.47    2385        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
culv@14          Circular     3.2
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  2    40.5     .011     .011        0                  .5                  1
Upstream   Elevation =  2367.4
           Centerline Station =  705.8
Downstream Elevation =  2366.8
           Centerline Station =  713.7

CULVERT OUTPUT  Profile #PF 2  Culv Group:  culv@14

  Q Culv Group (cfs)          7.04    Culv Full Len (ft)         40.50
  # Barrels                      1    Culv Vel US (ft/s)          0.87
  Q Barrel (cfs)              7.04    Culv Vel DS (ft/s)          0.87
  E.G. US. (ft)            2380.41    Culv Inv El Up (ft)      2367.40
  W.S. US. (ft)            2380.40    Culv Inv El Dn (ft)      2366.80
  E.G. DS (ft)             2380.39    Culv Frctn Ls (ft)          0.00
  W.S. DS (ft)             2380.39    Culv Exit Loss (ft)         0.01
  Delta EG (ft)               0.02    Culv Entr Loss (ft)         0.01
  Delta WS (ft)               0.01    Q Weir (cfs)              262.96
  E.G. IC (ft)             2380.40    Weir Sta Lft (ft)         688.00
  E.G. OC (ft)             2380.41    Weir Sta Rgt (ft)         722.00
  Culvert Control           Outlet    Weir Submerg                0.99
  Culv WS Inlet (ft)       2370.60    Weir Max Depth (ft)         4.04
```

| | | | |
|---|---|---|---|
| Culv WS Outlet (ft) | 2370.00 | Weir Avg Depth (ft) | 4.02 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 136.74 |
| Culv Crt Depth (ft) | 0.82 | Min El Weir Flow (ft) | 2376.38 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.
Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow. The reported inlet energy grade answer may not be valid.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 13.98

INPUT
Description: -435.46 = point # 892 on section 15
Station Elevation Data num= 49

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -435.46 | 2380.04 | 7 | 2373.3 | 51.99 | 2373.33 | 99.51 | 2373.38 | 146.18 | 2373.48 |
| 195.77 | 2373.55 | 241.46 | 2373.6 | 290.59 | 2373.7 | 337.27 | 2373.77 | 385.75 | 2373.83 |
| 432.79 | 2373.94 | 480.19 | 2374 | 527.84 | 2374.2 | 575.13 | 2374.27 | 622.45 | 2374.3 |
| 648.61 | 2374.2 | 696.47 | 2373.25 | 711.82 | 2366.74 | 713.07 | 2366.51 | 714.43 | 2366.36 |
| 726.64 | 2372.9 | 756.85 | 2374.25 | 761.64 | 2374.41 | 789.31 | 2374.78 | 806.87 | 2374.67 |
| 815.75 | 2374.77 | 833.65 | 2374.7 | 854.68 | 2374.71 | 863.34 | 2374.87 | 878.28 | 2375.07 |
| 901.13 | 2375.01 | 910.97 | 2375 | 958.07 | 2375.14 | 994.52 | 2375.25 | 1036.32 | 2375.37 |
| 1041.24 | 2375.38 | 1088.42 | 2375.4 | 1136.26 | 2375.78 | 1183.62 | 2375.97 | 1233.53 | 2376.2 |
| 1283.96 | 2376.67 | 1331 | 2377 | 1377.05 | 2377.34 | 1423.97 | 2377.59 | 1472.43 | 2377.87 |
| 1518.88 | 2378.11 | 1565.69 | 2378.3 | 1612.16 | 2378.5 | 1726.47 | 2380 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -435.46 | .03 | 696.47 | .035 | 726.64 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 696.47 | 726.64 | 91.58 | 80 | 73.15 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -435.46 | 607 | 2385 | F |
| 816 | 1726.47 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2380.39 | Reach Len. (ft) | 91.58 | 80.00 | 73.15 |
| Crit W.S. (ft) | 2370.00 | Flow Area (sq ft) | 573.59 | 327.07 | 546.31 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 6204.20 | 327.07 | 3857.33 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 115.22 | 75.05 | 79.73 |
| Top Width (ft) | 2161.93 | Top Width (ft) | 1131.93 | 30.17 | 999.83 |
| Vel Total (ft/s) | 0.19 | Avg. Vel. (ft/s) | 0.20 | 0.23 | 0.15 |
| Max Chl Dpth (ft) | 14.03 | Hydr. Depth (ft) | 6.41 | 10.84 | 6.11 |
| Conv. Total (cfs) | 229730.0 | Conv. (cfs) | 98038.2 | 63857.3 | 67834.5 |
| Length Wtd. (ft) | 81.80 | Wetted Per. (ft) | 89.48 | 33.16 | 89.40 |
| Min Ch El (ft) | 2366.36 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.10 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 59.53 | 56.71 | 16.05 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 12.62 | 12.49 | 4.48 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 13.9

INPUT
Description: Survey 14.3
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -489.62 | 2386.13 | -175.09 | 2380 | 0 | 2374.5 | 27.65 | 2375.82 | 39.43 | 2374.49 |
| 59.56 | 2367.32 | 63.82 | 2366.93 | 66.64 | 2367 | 74.66 | 2370.43 | 78.26 | 2370.63 |
| 92.6 | 2373.98 | 131.29 | 2375.49 | 155.75 | 2380 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -489.62 | .04 | 39.43 | .035 | 92.6 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 39.43 | 92.6 | 35.2 | 45.1 | 51.9 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -489.62 | 2 | 2385 | F |
| 130 | 155.75 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.39 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.040 | 0.035 | 0.045 |
| W.S. Elev (ft) | 2380.39 | Reach Len. (ft) | 35.20 | 45.10 | 51.90 |
| Crit W.S. (ft) | 2369.72 | Flow Area (sq ft) | 194.47 | 530.20 | 212.32 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 759.19 | 530.20 | 283.28 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 40.21 | 188.34 | 41.45 |
| Top Width (ft) | 350.68 | Top Width (ft) | 234.36 | 53.17 | 63.15 |
| Vel Total (ft/s) | 0.29 | Avg. Vel. (ft/s) | 0.21 | 0.36 | 0.20 |
| Max Chl Dpth (ft) | 13.46 | Hydr. Depth (ft) | 5.20 | 9.97 | 5.68 |
| Conv. Total (cfs) | 145245.6 | Conv. (cfs) | 21630.7 | 101316.0 | 22298.9 |
| Length Wtd. (ft) | 44.42 | Wetted Per. (ft) | 37.53 | 55.52 | 37.43 |
| Min Ch El (ft) | 2366.93 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.21 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 52.21 | 55.93 | 12.57 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 11.18 | 12.41 | 3.59 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 13.25

INPUT
Description: Survey 13.1
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 32.92 | 2389.25 | 324.35 | 2380 | 541.99 | 2373.5 | 569.03 | 2374.12 | 589.95 | 2370.64 |
| 602.58 | 2367.39 | 606.53 | 2366.71 | 608.7 | 2367 | 617.89 | 2372.08 | 669.28 | 2375.78 |
| 722.24 | 2380 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 32.92 | .04 | 589.95 | .035 | 617.89 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 589.95 | 617.89 | 45.81 | 48.1 | 46.76 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 32.92 | 562 | 2385 | F |
| 644 | 722.24 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.39 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.040 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2380.39 | Reach Len. (ft) | 45.81 | 48.10 | 46.76 |
| Crit W.S. (ft) | 2369.84 | Flow Area (sq ft) | 212.09 | 325.32 | 192.32 |
| E.G. Slope (ft/ft) | 0.000005 | Area (sq ft) | 1138.91 | 325.32 | 463.93 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 65.12 | 146.69 | 58.19 |
| Top Width (ft) | 410.04 | Top Width (ft) | 277.75 | 27.94 | 104.35 |
| Vel Total (ft/s) | 0.37 | Avg. Vel. (ft/s) | 0.31 | 0.45 | 0.30 |
| Max Chl Dpth (ft) | 13.68 | Hydr. Depth (ft) | 7.59 | 11.64 | 7.37 |
| Conv. Total (cfs) | 125276.9 | Conv. (cfs) | 30216.6 | 68061.1 | 26999.3 |
| Length Wtd. (ft) | 47.68 | Wetted Per. (ft) | 28.24 | 29.74 | 26.18 |
| Min Ch El (ft) | 2366.71 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 51.45 | 55.48 | 12.12 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.97 | 12.37 | 3.49 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 13.2

INPUT
Description: Survey 13.2
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.55 | 2386.04 | 283.21 | 2380 | 526.11 | 2373.7 | 586.88 | 2373.56 | 603.27 | 2366 |
| 605.2 | 2365.6 | 607.08 | 2366 | 620.73 | 2375 | 658.9 | 2376.32 | 702.61 | 2380 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.55 | .035 | 586.88 | .035 | 620.73 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 586.88 | 620.73 | 136.18 | 136 | 136.18 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 8.55 | 586.88 | 2385 | F |
| 620.73 | 702.61 | 2385 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2380.39 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2380.38 | Reach Len. (ft) | 136.18 | 136.00 | 136.18 |
| Crit W.S. (ft) | 2369.27 | Flow Area (sq ft) | | 364.10 | |
| E.G. Slope (ft/ft) | 0.000015 | Area (sq ft) | 1270.49 | 364.10 | 277.09 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 436.62 | Top Width (ft) | 320.89 | 33.85 | 81.88 |
| Vel Total (ft/s) | 0.74 | Avg. Vel. (ft/s) | | 0.74 | |
| Max Chl Dpth (ft) | 14.78 | Hydr. Depth (ft) | | 10.76 | |
| Conv. Total (cfs) | 69377.3 | Conv. (cfs) | | 69377.3 | |
| Length Wtd. (ft) | 136.00 | Wetted Per. (ft) | | 38.29 | |
| Min Ch El (ft) | 2365.60 | Shear (lb/sq ft) | | 0.01 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 50.18 | 55.10 | 11.73 |
| C & E Loss (ft) | | Cum SA (acres) | 10.66 | 12.33 | 3.39 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 13.01

INPUT
Description:
Distance from Upstream XS = .2
Deck/Roadway Width = 134.2
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 25

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 8.12 | 2384.66 | | 48.84 | 2384.46 | | 98.68 | 2384 | |
| 146.46 | 2383.67 | | 196.58 | 2383.2 | | 244.93 | 2382.78 | |
| 293.89 | 2382.31 | | 344.44 | 2381.7 | | 393.51 | 2381.16 | |
| 444.16 | 2380.8 | | 493.71 | 2380.57 | | 543.54 | 2380.38 | |
| 591.6 | 2380.19 | | 624.5 | 2380.24 | | 668.9 | 2380.5 | |
| 717.31 | 2380.75 | | 746.6 | 2380.94 | | 795.8 | 2381.05 | |
| 845.73 | 2381.1 | | 894.9 | 2381.08 | | 939.79 | 2380.87 | |
| 988.28 | 2380.7 | | 1037.77 | 2380.7 | | 1087.36 | 2380.53 | |
| 1136.9 | 2380.13 | | | | | | | |

```
Upstream Bridge Cross Section Data
Station Elevation Data     num=       10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.55 2386.04  283.21    2380  526.11  2373.7  586.88 2373.56  603.27    2366
   605.2  2365.6  607.08    2366  620.73    2375   658.9 2376.32  702.61    2380

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8.55    .035  586.88    .035  620.73     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        586.88  620.73            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.55  586.88    2385       F
  620.73  702.61    2385       F

Downstream  Deck/Roadway Coordinates
    num=       25
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8.12 2384.66           48.84 2384.46           98.68    2384
  146.46 2383.67          196.58  2383.2          244.93 2382.78
  293.89 2382.31          344.44  2381.7          393.51 2381.16
  444.16  2380.8          493.71 2380.57          543.54 2380.38
   591.6 2380.19           624.5 2380.24           668.9  2380.5
  717.31 2380.75           746.6 2380.94           795.8 2381.05
  845.73  2381.1           894.9 2381.08          939.79 2380.87
  988.28  2380.7         1037.77  2380.7         1087.36 2380.53
  1136.9 2380.13

Downstream Bridge Cross Section Data
Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        568.48  602.33            .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@13        Circular     4.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              .2   134.2     .011     .011        0                   .5                  1
Upstream   Elevation =  2365.7
           Centerline Station =  605.2
Downstream Elevation =  2364.9
           Centerline Station =  586.8

CULVERT OUTPUT  Profile #PF 2  Culv Group:  culv@13

  Q Culv Group (cfs)        264.07    Culv Full Len (ft)        134.20
  # Barrels                      1    Culv Vel US (ft/s)         16.60
  Q Barrel (cfs)            264.07    Culv Vel DS (ft/s)         16.60
  E.G. US. (ft)            2380.39    Culv Inv El Up (ft)      2365.70
  W.S. US. (ft)            2380.38    Culv Inv El Dn (ft)      2364.90
  E.G. DS (ft)             2372.32    Culv Frctn Ls (ft)         1.73
  W.S. DS (ft)             2372.23    Culv Exit Loss (ft)        4.19
  Delta EG (ft)               8.07    Culv Entr Loss (ft)        2.14
  Delta WS (ft)               8.15    Q Weir (cfs)               5.93
  E.G. IC (ft)             2377.93    Weir Sta Lft (ft)        586.88
  E.G. OC (ft)             2380.39    Weir Sta Rgt (ft)        620.73
  Culvert Control            Inlet    Weir Submerg               0.00
  Culv WS Inlet (ft)       2370.20    Weir Max Depth (ft)        0.19
  Culv WS Outlet (ft)      2369.40    Weir Avg Depth (ft)        0.17
  Culv Nml Depth (ft)         4.50    Weir Flow Area (sq ft)     5.61
  Culv Crt Depth (ft)         4.50    Min El Weir Flow (ft)    2380.20


Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
         The reported inlet energy grade answer may not be valid.
Note:    The normal depth exceeds the height of the culvert.  The program assumes that the normal
         depth is equal to the height of the culvert.
Note:    Culvert critical depth exceeds the height of the culvert.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 12.98

INPUT
Description: Copy of Section 13.2
Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        568.48  602.33             62.62    61.2   58.67             .1       .3

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)            2372.32    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.09    Wt. n-Val.                            0.035
  W.S. Elev (ft)            2372.23    Reach Len. (ft)             62.62     61.20      58.67
  Crit W.S. (ft)                       Flow Area (sq ft)                    113.01
```

| | | | | | |
|---|---|---|---|---|---|
| E.G. Slope (ft/ft) | 0.000579 | Area (sq ft) | | 113.01 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 27.57 | Top Width (ft) | | 27.57 | |
| Vel Total (ft/s) | 2.39 | Avg. Vel. (ft/s) | | 2.39 | |
| Max Chl Dpth (ft) | 7.43 | Hydr. Depth (ft) | | 4.10 | |
| Conv. Total (cfs) | 11221.0 | Conv. (cfs) | | 11221.0 | |
| Length Wtd. (ft) | 61.20 | Wetted Per. (ft) | | 31.60 | |
| Min Ch El (ft) | 2364.80 | Shear (lb/sq ft) | | 0.13 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.31 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 48.19 | 54.36 | 11.29 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 10.16 | 12.24 | 3.26 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 12.9

INPUT
Description: Survey 13.3
Station Elevation Data num= 14

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -468.15 | 2380 | -80.78 | 2366.23 | 532.9 | 2368 | 552.85 | 2368.71 | 576.34 | 2370.05 |
| 587.39 | 2366.87 | 592.08 | 2366.51 | 596.24 | 2367 | 603.6 | 2370.22 | 617.72 | 2372.01 |
| 630.09 | 2368.24 | 635.91 | 2369.38 | 646.49 | 2369.3 | 665.33 | 2372.79 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -468.15 | .04 | 576.34 | .04 | 603.6 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 576.34 | 603.6 | 818.6 | 818.6 | 818.6 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -468.15 | 576.34 | 2378 | F |
| 603.6 | 665.33 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.29 | Element | | | |
| Vel Head (ft) | 0.08 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2372.20 | Reach Len. (ft) | 818.60 | 818.60 | 818.60 |
| Crit W.S. (ft) | 2369.20 | Flow Area (sq ft) | | 116.27 | |
| E.G. Slope (ft/ft) | 0.000597 | Area (sq ft) | 3765.60 | 116.27 | 113.73 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 910.90 | Top Width (ft) | 825.09 | 27.26 | 58.55 |
| Vel Total (ft/s) | 2.32 | Avg. Vel. (ft/s) | | 2.32 | |
| Max Chl Dpth (ft) | 5.97 | Hydr. Depth (ft) | | 4.27 | |
| Conv. Total (cfs) | 11046.7 | Conv. (cfs) | | 11046.7 | |
| Length Wtd. (ft) | 818.60 | Wetted Per. (ft) | | 28.42 | |
| Min Ch El (ft) | 2366.51 | Shear (lb/sq ft) | | 0.15 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.35 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 45.49 | 54.20 | 11.22 |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 9.56 | 12.20 | 3.22 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 12

INPUT
Description: 1249.98 and 1255.07 are top of RR, 1116.95 is CL highway
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2379.9 | 47.55 | 2379.07 | 94 | 2377.06 | 140.31 | 2374.86 | 187.41 | 2373.28 |
| 233.81 | 2371.6 | 284.12 | 2369.41 | 323.37 | 2367.36 | 371.16 | 2367.06 | 373.58 | 2367.66 |
| 384.85 | 2366.1 | 405.4 | 2365.71 | 425.17 | 2366.41 | 468.96 | 2366.15 | 509.59 | 2366.19 |
| 540.18 | 2364.9 | 585.74 | 2365.55 | 629.75 | 2365.09 | 675.89 | 2364.97 | 712.82 | 2365.28 |
| 760.76 | 2366.2 | 805.89 | 2367.01 | 853.18 | 2369.26 | 896.29 | 2371.96 | 974.5 | 2374.12 |
| 993.89 | 2374.4 | 1021.16 | 2375.34 | 1042.11 | 2374.76 | 1059.08 | 2375.3 | 1078.5 | 2374.92 |
| 1093.1 | 2379.5 | 1116.95 | 2379.66 | 1140.44 | 2378.7 | 1141.76 | 2378.66 | 1153.56 | 2374.3 |
| 1162.05 | 2372.7 | 1176.15 | 2372.07 | 1187.7 | 2375.04 | 1198.19 | 2375.37 | 1211.35 | 2373.23 |
| 1224.72 | 2373.5 | 1236.39 | 2376.08 | 1241.8 | 2376.18 | 1247.43 | 2378.43 | 1249.98 | 2379.22 |
| 1255.07 | 2379.2 | 1257.36 | 2378.36 | 1265.8 | 2375.7 | 1311.36 | 2375.03 | 1356.65 | 2375.05 |
| 1406.17 | 2375.4 | 1458.19 | 2376.76 | 1514.73 | 2379.99 | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .03 | 371.16 | .035 | 540.18 | .045 | 760.76 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 509.59 | 760.76 | 228 | 277.63 | 266 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.26 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.044 | 0.040 |
| W.S. Elev (ft) | 2372.25 | Reach Len. (ft) | 228.00 | 277.63 | 266.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 1739.60 | 12.07 |
| E.G. Slope (ft/ft) | 0.000002 | Area (sq ft) | | 1739.60 | 12.07 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 269.25 | 0.75 |
| Top Width (ft) | 253.17 | Top Width (ft) | | 251.17 | 2.00 |
| Vel Total (ft/s) | 0.15 | Avg. Vel. (ft/s) | | 0.15 | 0.06 |
| Max Chl Dpth (ft) | 7.35 | Hydr. Depth (ft) | | 6.93 | 6.04 |
| Conv. Total (cfs) | 212664.5 | Conv. (cfs) | | 212075.4 | 589.1 |
| Length Wtd. (ft) | 270.13 | Wetted Per. (ft) | | 257.28 | 8.02 |
| Min Ch El (ft) | 2364.90 | Shear (lb/sq ft) | | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 10.11 | 36.76 | 10.03 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.81 | 9.58 | 2.65 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11.6666

INPUT
Description: Interpolated

Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2380.5 | 41.11 | 2379.84 | 53.21 | 2379.58 | 80.43 | 2378.58 | 105.18 | 2377.64 |
| 121.34 | 2376.99 | 157 | 2375.65 | 159.84 | 2375.57 | 200.82 | 2374.36 | 209.71 | 2374.1 |
| 240.43 | 2373.12 | 261.63 | 2372.44 | 280.84 | 2371.75 | 317.93 | 2370.65 | 322.2 | 2370.5 |
| 361.85 | 2368.68 | 365.01 | 2368.62 | 400.39 | 2367.66 | 415.32 | 2367.42 | 418.03 | 2367.78 |
| 430.64 | 2366.58 | 440.65 | 2366.34 | 453.64 | 2366.12 | 475.76 | 2366.47 | 480.18 | 2366.43 |
| 514.66 | 2366.08 | 524.76 | 2365.98 | 554.92 | 2365.79 | 570.22 | 2366.39 | 583.46 | 2365.53 |
| 595.47 | 2364.94 | 631.58 | 2365.85 | 662.77 | 2366.33 | 675.15 | 2366.35 | 676.56 | 2366.36 |
| 720.83 | 2365.93 | 726.55 | 2365.92 | 757.39 | 2366.26 | 777.48 | 2366.63 | 804.85 | 2367.28 |
| 827.19 | 2367.8 | 849.53 | 2368.11 | 877.98 | 2369.08 | 896.34 | 2369.68 | 927.59 | 2371.02 |
| 939.02 | 2371.6 | 976.18 | 2372.58 | 1016.45 | 2373.57 | 1024.75 | 2373.7 | 1035.65 | 2373.79 |
| 1062.65 | 2374.38 | 1075.38 | 2374.12 | 1083.39 | 2374.02 | 1100.19 | 2374.5 | 1119.41 | 2374.38 |
| 1125 | 2375.59 | 1133.87 | 2377.51 | 1157.48 | 2377.72 | 1175.51 | 2377.31 | 1180.73 | 2377.09 |
| 1182.04 | 2377.04 | 1188.37 | 2375.37 | 1193.72 | 2374.11 | 1202.13 | 2373.16 | 1216.09 | 2372.92 |
| 1227.52 | 2375.06 | 1228.78 | 2375.1 | 1237.91 | 2375.31 | 1250.93 | 2373.9 | 1264.17 | 2374.09 |
| 1275.72 | 2375.83 | 1281.08 | 2375.9 | 1286.65 | 2377.41 | 1289.18 | 2377.94 | 1290.83 | 2377.94 |
| 1294.22 | 2377.98 | 1296.49 | 2377.45 | 1304.84 | 2375.8 | 1339.61 | 2375.96 | 1349.95 | 2375.96 |
| 1383.69 | 2376.3 | 1394.78 | 2376.41 | 1414.74 | 2376.69 | 1443.81 | 2377.04 | 1463.63 | 2377.54 |
| 1495.31 | 2378.16 | 1510.78 | 2378.79 | 1525.25 | 2377.7 | 1551.28 | 2380.86 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 415.32 | .033 | 570.22 | .042 | 631.58 | .037 | 1551.28 | .037 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 570.22 | 675.15 | 265 | 277.63 | 317 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.033 | 0.040 | 0.037 |
| W.S. Elev (ft) | 2372.25 | Reach Len. (ft) | 265.00 | 277.63 | 317.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 296.02 | 680.72 | 318.73 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 296.02 | 680.72 | 318.73 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 66.56 | 140.22 | 63.21 |
| Top Width (ft) | 203.93 | Top Width (ft) | 47.00 | 104.93 | 52.00 |
| Vel Total (ft/s) | 0.21 | Avg. Vel. (ft/s) | 0.22 | 0.21 | 0.20 |
| Max Chl Dpth (ft) | 7.31 | Hydr. Depth (ft) | 6.30 | 6.49 | 6.13 |
| Conv. Total (cfs) | 169622.3 | Conv. (cfs) | 41817.8 | 88093.2 | 39711.3 |
| Length Wtd. (ft) | 284.02 | Wetted Per. (ft) | 53.27 | 104.99 | 58.33 |
| Min Ch El (ft) | 2364.94 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 9.33 | 29.05 | 9.02 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.69 | 8.45 | 2.49 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11.3333

INPUT
Description:
Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 45.48 | 2380.42 | 58.87 | 2380.09 | 88.98 | 2379.14 | 116.37 | 2378.22 |
| 134.25 | 2377.6 | 173.7 | 2376.44 | 176.83 | 2376.36 | 222.18 | 2375.18 | 232.01 | 2374.91 |
| 265.99 | 2373.95 | 289.45 | 2373.29 | 310.71 | 2372.64 | 351.73 | 2371.89 | 356.46 | 2371.79 |
| 400.32 | 2370.01 | 403.82 | 2369.91 | 442.97 | 2368.18 | 459.48 | 2367.77 | 462.48 | 2367.9 |
| 476.43 | 2367.06 | 487.5 | 2366.74 | 501.87 | 2366.53 | 526.35 | 2366.52 | 531.24 | 2366.47 |
| 569.38 | 2365.96 | 580.56 | 2365.81 | 613.92 | 2365.41 | 630.86 | 2366.6 | 641.29 | 2365.54 |
| 650.75 | 2364.97 | 677.41 | 2366.15 | 708.29 | 2367.45 | 720.54 | 2367.61 | 721.95 | 2367.63 |
| 765.76 | 2366.89 | 771.43 | 2366.82 | 801.95 | 2367.24 | 821.85 | 2367.59 | 848.94 | 2368.37 |
| 871.05 | 2368.99 | 893.16 | 2369.22 | 921.33 | 2369.78 | 939.51 | 2370.1 | 970.44 | 2370.81 |
| 981.76 | 2371.24 | 1018.54 | 2372.17 | 1058.4 | 2373.02 | 1066.62 | 2373.16 | 1077.41 | 2373.18 |
| 1104.13 | 2373.41 | 1116.73 | 2373.25 | 1124.66 | 2373.29 | 1141.29 | 2373.7 | 1160.33 | 2373.83 |
| 1165.85 | 2374.5 | 1174.63 | 2375.52 | 1198.01 | 2375.79 | 1215.85 | 2375.71 | 1221.03 | 2375.47 |
| 1222.32 | 2375.42 | 1228.58 | 2374.44 | 1233.89 | 2373.92 | 1242.21 | 2373.61 | 1256.02 | 2373.78 |
| 1267.34 | 2375.07 | 1268.59 | 2375.12 | 1277.62 | 2375.24 | 1290.52 | 2374.56 | 1303.62 | 2374.68 |
| 1315.06 | 2375.57 | 1320.36 | 2375.62 | 1325.88 | 2376.39 | 1328.38 | 2376.66 | 1330.01 | 2376.66 |
| 1333.37 | 2376.75 | 1335.61 | 2376.54 | 1343.88 | 2375.89 | 1378.3 | 2376.73 | 1388.53 | 2376.88 |
| 1421.94 | 2377.55 | 1432.92 | 2377.76 | 1452.67 | 2378.19 | 1481.45 | 2378.68 | 1501.07 | 2379.15 |
| 1532.43 | 2379.56 | 1547.74 | 2379.92 | 1562.06 | 2376.92 | 1587.84 | 2381.73 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 459.48 | .032 | 630.86 | .038 | 677.41 | .033 | 1587.84 | .033 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 630.86 | 677.41 | 274 | 277.63 | 292 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.25 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.032 | 0.038 | 0.033 |
| W.S. Elev (ft) | 2372.25 | Reach Len. (ft) | 274.00 | 277.63 | 292.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 451.74 | 309.10 | 386.54 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 451.74 | 309.10 | 386.54 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 115.49 | 71.69 | 82.82 |
| Top Width (ft) | 192.55 | Top Width (ft) | 70.00 | 46.55 | 76.00 |
| Vel Total (ft/s) | 0.24 | Avg. Vel. (ft/s) | 0.26 | 0.23 | 0.21 |
| Max Chl Dpth (ft) | 7.28 | Hydr. Depth (ft) | 6.45 | 6.64 | 5.09 |
| Conv. Total (cfs) | 160595.0 | Conv. (cfs) | 68695.3 | 42641.0 | 49258.7 |
| Length Wtd. (ft) | 279.87 | Wetted Per. (ft) | 76.22 | 46.65 | 81.19 |
| Min Ch El (ft) | 2364.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 7.06 | 25.89 | 6.46 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 1.33 | 7.97 | 2.02 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 11

INPUT
Description:
Station Elevation Data num= 41

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.7 | 49.85 | 2381 | 97.53 | 2379.7 | 147.15 | 2378.21 | 193.83 | 2377.15 |
| 243.53 | 2376 | 291.56 | 2374.78 | 340.57 | 2373.54 | 390.72 | 2373.08 | 442.63 | 2371.19 |
| 485.54 | 2368.7 | 534.36 | 2367.15 | 582.3 | 2366.51 | 624.11 | 2365.84 | 672.93 | 2365.03 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 691.49 | 2366.8 | 699.12 | 2365.55 | 706.04 | 2365.01 | 723.25 | 2366.45 | 753.81 | 2368.56 |
| 767.33 | 2368.9 | 816.31 | 2367.72 | 866.21 | 2368.55 | 914.91 | 2370.19 | 964.68 | 2370.48 |
| 1013.29 | 2370.6 | 1060.9 | 2371.76 | 1108.49 | 2372.62 | 1158.09 | 2372.39 | 1206.71 | 2373.4 |
| 1256.2 | 2374.1 | 1268.8 | 2373.51 | 1308.4 | 2375.14 | 1369.19 | 2375.38 | 1416.99 | 2377.5 |
| 1460.18 | 2378.8 | 1490.6 | 2379.69 | 1538.51 | 2380.76 | 1584.7 | 2381.06 | 1598.88 | 2376.13 |
| 1624.39 | 2382.6 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 691.49 | .035 | 723.25 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 691.49 | 723.25 | 265 | 264.15 | 260 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.25 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2372.25 | Reach Len. (ft) | 265.00 | 264.15 | 260.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 343.06 | 206.79 | 216.36 |
| E.G. Slope (ft/ft) | 0.000006 | Area (sq ft) | 343.06 | 206.79 | 216.36 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 133.08 | 72.83 | 64.09 |
| Top Width (ft) | 133.76 | Top Width (ft) | 51.00 | 31.76 | 51.00 |
| Vel Total (ft/s) | 0.35 | Avg. Vel. (ft/s) | 0.39 | 0.35 | 0.30 |
| Max Chl Dpth (ft) | 7.24 | Hydr. Depth (ft) | 6.73 | 6.51 | 4.24 |
| Conv. Total (cfs) | 113053.4 | Conv. (cfs) | 55721.5 | 30495.8 | 26836.1 |
| Length Wtd. (ft) | 263.55 | Wetted Per. (ft) | 57.77 | 31.94 | 54.60 |
| Min Ch El (ft) | 2365.01 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 4.56 | 24.25 | 4.44 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.95 | 7.72 | 1.60 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.8125*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.55 | 47.48 | 2380.89 | 51.87 | 2380.85 | 93.23 | 2380.04 | 101.47 | 2379.86 |
| 139.36 | 2378.93 | 153.1 | 2378.53 | 184.74 | 2377.79 | 201.67 | 2377.48 | 231.21 | 2376.92 |
| 237.91 | 2376.86 | 253.37 | 2376.46 | 281.24 | 2375.69 | 303.35 | 2375.12 | 324.87 | 2374.56 |
| 354.34 | 2373.86 | 368.74 | 2373.69 | 406.51 | 2373.37 | 413.07 | 2373.19 | 456.54 | 2371.85 |
| 460.52 | 2371.72 | 499.42 | 2369.89 | 505.17 | 2369.62 | 539.43 | 2368.7 | 555.96 | 2368.26 |
| 583.7 | 2367.89 | 605.84 | 2367.63 | 624.71 | 2367.36 | 649.34 | 2367.02 | 665.58 | 2366.79 |
| 678.05 | 2366.44 | 700.13 | 2366.14 | 719.44 | 2367.43 | 726.6 | 2365.93 | 730.29 | 2365.41 |
| 731.24 | 2365.23 | 733.08 | 2365.1 | 739.67 | 2365.71 | 745.18 | 2366.14 | 749.91 | 2366.94 |
| 781.32 | 2368.57 | 788.97 | 2368.72 | 795.22 | 2369.19 | 797.65 | 2369.29 | 840.93 | 2368.72 |
| 845.56 | 2368.66 | 885.46 | 2369.29 | 896.85 | 2369.43 | 929.2 | 2370.23 | 946.9 | 2370.68 |
| 973.88 | 2370.81 | 998.06 | 2371.02 | 1021.9 | 2371.17 | 1048.02 | 2371.21 | 1065.87 | 2371.52 |
| 1096.95 | 2372.05 | 1110.14 | 2372.22 | 1145.86 | 2372.7 | 1154.31 | 2372.67 | 1183.45 | 2372.7 |
| 1196.84 | 2372.72 | 1241.21 | 2373.61 | 1246.82 | 2373.73 | 1285.02 | 2374.34 | 1297.68 | 2374.58 |
| 1310.63 | 2374.24 | 1329.09 | 2374.94 | 1351.33 | 2375.67 | 1373.89 | 2375.8 | 1413.81 | 2375.97 |
| 1419.18 | 2376.15 | 1449.4 | 2377.11 | 1462.94 | 2377.59 | 1489.63 | 2378.26 | 1507.33 | 2378.55 |
| 1533.97 | 2378.96 | 1538.6 | 2379.04 | 1577.11 | 2379.52 | 1587.84 | 2379.76 | 1589.94 | 2379.78 |
| 1602.7 | 2379.94 | 1635.32 | 2380.13 | 1649.89 | 2376.45 | 1650.99 | 2376.65 | 1658.1 | 2377.5 |
| 1676.11 | 2382.13 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 719.44 | .035 | 749.91 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 719.44 | 749.91 | 265 | 264.15 | 258 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.25 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2372.24 | Reach Len. (ft) | 265.00 | 264.15 | 258.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 164.53 | 190.57 | 116.75 |
| E.G. Slope (ft/ft) | 0.000017 | Area (sq ft) | 164.53 | 190.57 | 116.75 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 95.25 | 113.84 | 60.91 |
| Top Width (ft) | 84.66 | Top Width (ft) | 29.10 | 30.47 | 25.09 |
| Vel Total (ft/s) | 0.57 | Avg. Vel. (ft/s) | 0.58 | 0.60 | 0.52 |
| Max Chl Dpth (ft) | 7.14 | Hydr. Depth (ft) | 5.65 | 6.25 | 4.65 |
| Conv. Total (cfs) | 64679.9 | Conv. (cfs) | 22817.7 | 27270.9 | 14591.2 |
| Length Wtd. (ft) | 263.20 | Wetted Per. (ft) | 35.12 | 30.80 | 29.13 |
| Min Ch El (ft) | 2365.10 | Shear (lb/sq ft) | 0.01 | 0.01 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 3.01 | 23.04 | 3.44 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.71 | 7.53 | 1.37 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.625*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.4 | 49.32 | 2380.73 | 53.88 | 2380.7 | 96.86 | 2380.17 | 105.42 | 2380.02 |
| 144.77 | 2379.25 | 159.05 | 2378.86 | 191.91 | 2378.06 | 209.5 | 2377.8 | 240.19 | 2377.35 |
| 247.15 | 2377.37 | 263.22 | 2376.91 | 292.17 | 2376.06 | 315.13 | 2375.45 | 337.5 | 2374.86 |
| 368.1 | 2374.19 | 383.07 | 2373.97 | 422.31 | 2373.66 | 429.12 | 2373.53 | 474.27 | 2372.37 |
| 478.42 | 2372.26 | 518.82 | 2370.76 | 524.79 | 2370.55 | 560.38 | 2369.75 | 577.56 | 2369.38 |
| 606.37 | 2368.99 | 629.38 | 2368.74 | 648.99 | 2368.51 | 674.57 | 2368.21 | 691.44 | 2368 |
| 704.39 | 2367.49 | 727.33 | 2367.24 | 747.4 | 2368.06 | 754.07 | 2366.32 | 757.52 | 2365.59 |
| 758.4 | 2365.29 | 760.13 | 2365.19 | 766.57 | 2365.84 | 771.95 | 2366.23 | 776.58 | 2367.43 |
| 808.83 | 2368.58 | 816.69 | 2368.69 | 823.11 | 2369.48 | 825.6 | 2369.73 | 870.06 | 2369.61 |
| 874.81 | 2369.59 | 915.79 | 2370.21 | 927.49 | 2370.3 | 960.71 | 2370.85 | 978.89 | 2371.16 |
| 1006.6 | 2371.28 | 1031.43 | 2371.57 | 1055.92 | 2371.81 | 1082.74 | 2371.82 | 1101.08 | 2372.01 |
| 1133 | 2372.34 | 1146.54 | 2372.45 | 1183.24 | 2372.77 | 1191.91 | 2372.76 | 1221.84 | 2372.96 |
| 1235.6 | 2373.06 | 1281.16 | 2373.94 | 1286.92 | 2374.06 | 1326.16 | 2374.76 | 1339.16 | 2375.05 |
| 1352.46 | 2374.97 | 1371.42 | 2375.63 | 1394.27 | 2376.21 | 1417.43 | 2376.38 | 1458.44 | 2376.56 |
| 1463.95 | 2376.69 | 1494.99 | 2377.31 | 1508.9 | 2377.69 | 1536.3 | 2378.24 | 1554.49 | 2378.29 |
| 1581.84 | 2378.36 | 1586.6 | 2378.39 | 1626.15 | 2378.52 | 1637.17 | 2378.76 | 1639.33 | 2378.79 |
| 1652.43 | 2379.02 | 1685.93 | 2379.2 | 1700.9 | 2376.76 | 1702.03 | 2376.9 | 1709.33 | 2376.84 |

1727.83 2381.67

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 747.4 | .035 | 776.58 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 747.4 | 776.58 | 265 | 264.15 | 263 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.24 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2372.23 | Reach Len. (ft) | 265.00 | 264.15 | 263.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 120.60 | 175.04 | 72.39 |
| E.G. Slope (ft/ft) | 0.000032 | Area (sq ft) | 120.60 | 175.04 | 72.39 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 84.47 | 137.86 | 47.68 |
| Top Width (ft) | 71.03 | Top Width (ft) | 25.83 | 29.18 | 16.02 |
| Vel Total (ft/s) | 0.73 | Avg. Vel. (ft/s) | 0.70 | 0.79 | 0.66 |
| Max Chl Dpth (ft) | 7.04 | Hydr. Depth (ft) | 4.67 | 6.00 | 4.52 |
| Conv. Total (cfs) | 47452.9 | Conv. (cfs) | 14845.3 | 24228.3 | 8379.3 |
| Length Wtd. (ft) | 264.06 | Wetted Per. (ft) | 30.78 | 29.73 | 20.26 |
| Min Ch El (ft) | 2365.19 | Shear (lb/sq ft) | 0.01 | 0.01 | 0.01 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.01 | 0.01 | 0.00 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 2.15 | 21.93 | 2.88 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.54 | 7.35 | 1.25 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.4375*

INPUT
Description:
Station Elevation Data num= 86

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.25 | 51.17 | 2380.56 | 55.9 | 2380.55 | 100.48 | 2380.3 | 109.36 | 2380.18 |
| 150.19 | 2379.58 | 164.99 | 2379.18 | 199.09 | 2378.33 | 217.34 | 2378.13 | 249.18 | 2377.77 |
| 256.4 | 2377.88 | 273.06 | 2377.37 | 303.09 | 2376.43 | 326.92 | 2375.79 | 350.12 | 2375.17 |
| 381.87 | 2374.51 | 397.39 | 2374.25 | 438.1 | 2373.96 | 445.17 | 2373.86 | 492.01 | 2372.89 |
| 496.31 | 2372.79 | 538.23 | 2371.62 | 544.42 | 2371.47 | 581.34 | 2370.8 | 599.16 | 2370.49 |
| 629.05 | 2370.09 | 652.92 | 2369.86 | 673.26 | 2369.65 | 699.8 | 2369.39 | 717.3 | 2369.21 |
| 730.74 | 2368.55 | 754.54 | 2368.35 | 775.35 | 2368.7 | 781.55 | 2366.7 | 784.75 | 2365.76 |
| 785.57 | 2365.35 | 787.17 | 2365.27 | 793.46 | 2365.97 | 798.72 | 2366.32 | 803.24 | 2367.92 |
| 836.35 | 2368.59 | 844.41 | 2368.67 | 850.99 | 2369.77 | 853.56 | 2370.18 | 899.18 | 2370.51 |
| 904.06 | 2370.53 | 946.12 | 2371.13 | 958.12 | 2371.18 | 992.23 | 2371.46 | 1010.89 | 2371.65 |
| 1039.32 | 2371.75 | 1064.81 | 2372.11 | 1089.94 | 2372.44 | 1117.47 | 2372.42 | 1136.29 | 2372.51 |
| 1169.05 | 2372.64 | 1182.95 | 2372.67 | 1220.61 | 2372.85 | 1229.52 | 2372.84 | 1260.23 | 2373.21 |
| 1274.35 | 2373.39 | 1321.12 | 2374.26 | 1327.03 | 2374.39 | 1367.3 | 2375.18 | 1380.65 | 2375.53 |
| 1394.3 | 2375.7 | 1413.75 | 2376.33 | 1437.2 | 2376.74 | 1460.98 | 2376.95 | 1503.06 | 2377.14 |
| 1508.72 | 2377.22 | 1540.57 | 2377.51 | 1554.85 | 2377.78 | 1582.98 | 2378.22 | 1601.64 | 2378.04 |
| 1629.72 | 2377.76 | 1634.6 | 2377.74 | 1675.19 | 2377.52 | 1686.51 | 2377.76 | 1688.72 | 2377.8 |
| 1702.17 | 2378.11 | 1736.55 | 2378.26 | 1751.91 | 2377.08 | 1753.07 | 2377.15 | 1760.57 | 2376.19 |
| 1779.55 | 2381.2 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 775.35 | .035 | 803.24 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 775.35 | 803.24 | 264 | 264.15 | 262 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2372.21 | Reach Len. (ft) | 264.00 | 264.15 | 262.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 17.76 | 159.95 | 69.06 |
| E.G. Slope (ft/ft) | 0.000079 | Area (sq ft) | 17.76 | 159.95 | 69.06 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 12.68 | 189.46 | 67.85 |
| Top Width (ft) | 49.65 | Top Width (ft) | 5.00 | 27.89 | 16.76 |
| Vel Total (ft/s) | 1.09 | Avg. Vel. (ft/s) | 0.71 | 1.18 | 0.98 |
| Max Chl Dpth (ft) | 6.94 | Hydr. Depth (ft) | 3.55 | 5.73 | 4.12 |
| Conv. Total (cfs) | 30373.5 | Conv. (cfs) | 1427.0 | 21313.6 | 7632.9 |
| Length Wtd. (ft) | 263.72 | Wetted Per. (ft) | 8.59 | 28.76 | 20.71 |
| Min Ch El (ft) | 2365.27 | Shear (lb/sq ft) | 0.01 | 0.03 | 0.02 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.01 | 0.03 | 0.02 |
| Frctn Loss (ft) | 0.03 | Cum Volume (acre-ft) | 1.72 | 20.92 | 2.46 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.45 | 7.17 | 1.15 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.25

INPUT
Description: Survey 10.1
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 757.08 | 2369.6 | 803.3 | 2369.33 | 811.98 | 2365.93 |
| 812.74 | 2365.41 | 814.22 | 2365.36 | 820.36 | 2366.1 | 825.49 | 2366.41 | 829.9 | 2368.41 |
| 872.13 | 2368.64 | 881.51 | 2370.62 | 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 |
| 1072.04 | 2372.22 | 1123.96 | 2373.08 | 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 |
| 1298.62 | 2373.46 | 1361.07 | 2374.59 | 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 |
| 1553.49 | 2377.76 | 1586.16 | 2377.71 | 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 |
| 1738.11 | 2376.81 | 1751.9 | 2377.19 | 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 803.3 | .035 | 829.9 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 803.3 | 829.9 | 44.28 | 46.7 | 45.58 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.20 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 2372.17 | Reach Len. (ft) | 44.28 | 46.70 | 45.58 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 14.96 | 145.24 | 33.98 |
| E.G. Slope (ft/ft) | 0.000139 | Area (sq ft) | 14.96 | 145.24 | 33.98 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 13.17 | 218.75 | 38.09 |
| Top Width (ft) | 41.00 | Top Width (ft) | 5.30 | 26.60 | 9.10 |
| Vel Total (ft/s) | 1.39 | Avg. Vel. (ft/s) | 0.88 | 1.51 | 1.12 |
| Max Chl Dpth (ft) | 6.81 | Hydr. Depth (ft) | 2.82 | 5.46 | 3.73 |
| Conv. Total (cfs) | 22865.8 | Conv. (cfs) | 1115.2 | 18525.1 | 3225.5 |
| Length Wtd. (ft) | 46.53 | Wetted Per. (ft) | 8.11 | 27.89 | 12.81 |
| Min Ch El (ft) | 2365.36 | Shear (lb/sq ft) | 0.02 | 0.05 | 0.02 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.01 | 0.07 | 0.03 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.63 | 19.99 | 2.15 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.42 | 7.01 | 1.07 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 10.2

INPUT
Description:
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 800.75 | 831.31 | 32 | 32 | 32 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.19 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2372.16 | Reach Len. (ft) | 32.00 | 32.00 | 32.00 |
| Crit W.S. (ft) | 2366.55 | Flow Area (sq ft) | 0.10 | 167.99 | 16.13 |
| E.G. Slope (ft/ft) | 0.000162 | Area (sq ft) | 0.10 | 167.99 | 16.13 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 0.01 | 255.02 | 14.97 |
| Top Width (ft) | 37.30 | Top Width (ft) | 0.05 | 30.56 | 6.69 |
| Vel Total (ft/s) | 1.47 | Avg. Vel. (ft/s) | 0.08 | 1.52 | 0.93 |
| Max Chl Dpth (ft) | 10.06 | Hydr. Depth (ft) | 2.03 | 5.50 | 2.41 |
| Conv. Total (cfs) | 21221.2 | Conv. (cfs) | 0.7 | 20043.5 | 1177.0 |
| Length Wtd. (ft) | 32.00 | Wetted Per. (ft) | 2.08 | 35.66 | 9.03 |
| Min Ch El (ft) | 2362.10 | Shear (lb/sq ft) | 0.00 | 0.05 | 0.02 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.00 | 0.07 | 0.02 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.62 | 19.82 | 2.12 |
| C & E Loss (ft) | | Cum SA (acres) | 0.41 | 6.98 | 1.06 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 10.01

INPUT
Description: culvert @ 10
Distance from Upstream XS = 4.7
Deck/Roadway Width = 25.4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 53

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | | 53.01 | 2380.4 | | 104.1 | 2380.43 | |
| 155.6 | 2379.9 | | 206.27 | 2378.6 | | 258.16 | 2378.2 | |
| 265.64 | 2378.39 | | 314.02 | 2376.8 | | 362.74 | 2375.47 | |
| 411.72 | 2374.53 | | 461.22 | 2374.2 | | 509.75 | 2373.41 | |
| 557.63 | 2372.49 | | 602.3 | 2371.85 | | 651.73 | 2371.19 | |
| 697.53 | 2370.8 | | 743.16 | 2370.42 | | 771 | 2370.47 | |
| 789.38 | 2370.51 | | 800.75 | 2370.59 | | 806.84 | 2370.64 | |
| 813.52 | 2370.69 | | 813.72 | 2370.69 | | 820.59 | 2370.74 | |
| 822.99 | 2370.76 | | 824.41 | 2370.77 | | 831.3 | 2370.82 | |
| 834.12 | 2370.84 | | 877.1 | 2370.64 | | 881.51 | 2370.62 | |
| 928.31 | 2371.4 | | 976.45 | 2372.05 | | 1023.74 | 2372.08 | |
| 1072.04 | 2372.22 | | 1123.96 | 2373.08 | | 1171.5 | 2373 | |
| 1219.36 | 2372.9 | | 1267.12 | 2372.93 | | 1298.62 | 2373.46 | |
| 1361.07 | 2374.59 | | 1408.44 | 2375.6 | | 1456.08 | 2377.02 | |
| 1504.52 | 2377.53 | | 1553.49 | 2377.76 | | 1586.16 | 2377.71 | |
| 1629.65 | 2378.2 | | 1677.59 | 2377.16 | | 1724.23 | 2376.52 | |
| 1738.11 | 2376.81 | | 1751.9 | 2377.19 | | 1804.11 | 2377.4 | |
| 1811.8 | 2375.53 | | 1831.27 | 2380.73 | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 800.75 | 831.31 | .1 | .3 |

Downstream Deck/Roadway Coordinates
num= 53

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | | 53.01 | 2380.4 | | 104.1 | 2380.43 | |
| 155.6 | 2379.9 | | 206.27 | 2378.6 | | 258.16 | 2378.2 | |
| 265.64 | 2378.39 | | 314.02 | 2376.8 | | 362.74 | 2375.47 | |
| 411.72 | 2374.53 | | 461.22 | 2374.2 | | 509.75 | 2373.41 | |
| 557.63 | 2372.49 | | 602.3 | 2371.85 | | 651.73 | 2371.19 | |
| 697.53 | 2370.8 | | 743.16 | 2370.42 | | 771 | 2370.47 | |
| 789.38 | 2370.51 | | 800.75 | 2370.59 | | 806.84 | 2370.64 | |
| 813.52 | 2370.69 | | 813.72 | 2370.69 | | 820.59 | 2370.74 | |
| 822.99 | 2370.76 | | 824.41 | 2370.77 | | 831.3 | 2370.82 | |
| 834.12 | 2370.84 | | 877.1 | 2370.64 | | 881.51 | 2370.62 | |
| 928.31 | 2371.4 | | 976.45 | 2372.05 | | 1023.74 | 2372.08 | |
| 1072.04 | 2372.22 | | 1123.96 | 2373.08 | | 1171.5 | 2373 | |
| 1219.36 | 2372.9 | | 1267.12 | 2372.93 | | 1298.62 | 2373.46 | |
| 1361.07 | 2374.59 | | 1408.44 | 2375.6 | | 1456.08 | 2377.02 | |
| 1504.52 | 2377.53 | | 1553.49 | 2377.76 | | 1586.16 | 2377.71 | |
| 1629.65 | 2378.2 | | 1677.59 | 2377.16 | | 1724.23 | 2376.52 | |
| 1738.11 | 2376.81 | | 1751.9 | 2377.19 | | 1804.11 | 2377.4 | |
| 1811.8 | 2375.53 | | 1831.27 | 2380.73 | | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 800.75 | 831.31 | .1 | .3 |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

| Culvert Name | Shape | Rise | Span |
|---|---|---|---|
| Sec 10 Culv | Circular | 7 | |

FHWA Chart # 55- Circular Culvert
FHWA Scale # 2 - Rough tapered inlet throat
Solution Criteria = Highest U.S. EG

| Culvert | Upstrm Dist | Length | Top n | Bottom n | Depth Blocked | Entrance Loss Coef | Exit Loss Coef |
|---|---|---|---|---|---|---|---|
| | 4.7 | 25.4 | .014 | .014 | 0 | .9 | 1 |

Upstream Elevation = 2362.6
Centerline Station = 820.62
Downstream Elevation = 2362.4
Centerline Station = 820.62

CULVERT OUTPUT Profile #PF 2 Culv Group: Sec 10 Culv

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 101.30 | Culv Full Len (ft) | 25.40 |
| # Barrels | 1 | Culv Vel US (ft/s) | 2.63 |
| Q Barrel (cfs) | 101.30 | Culv Vel DS (ft/s) | 2.63 |
| E.G. US. (ft) | 2372.19 | Culv Inv El Up (ft) | 2362.60 |
| W.S. US. (ft) | 2372.16 | Culv Inv El Dn (ft) | 2362.40 |
| E.G. DS (ft) | 2372.02 | Culv Frctn Ls (ft) | 0.01 |
| W.S. DS (ft) | 2371.98 | Culv Exit Loss (ft) | 0.07 |
| Delta EG (ft) | 0.17 | Culv Entr Loss (ft) | 0.10 |
| Delta WS (ft) | 0.18 | Q Weir (cfs) | 168.70 |
| E.G. IC (ft) | 2369.38 | Weir Sta Lft (ft) | 800.70 |
| E.G. OC (ft) | 2372.19 | Weir Sta Rgt (ft) | 838.00 |
| Culvert Control | Outlet | Weir Submerg | 0.85 |
| Culv WS Inlet (ft) | 2369.60 | Weir Max Depth (ft) | 1.61 |
| Culv WS Outlet (ft) | 2369.40 | Weir Avg Depth (ft) | 1.47 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 54.77 |
| Culv Crt Depth (ft) | 2.59 | Min El Weir Flow (ft) | 2370.60 |

Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
The reported inlet energy grade answer may not be valid.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.98

INPUT
Description:
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.1 | 53.01 | 2380.4 | 104.1 | 2380.43 | 155.6 | 2379.9 | 206.27 | 2378.6 |
| 258.16 | 2378.2 | 265.64 | 2378.39 | 314.02 | 2376.8 | 362.74 | 2375.47 | 411.72 | 2374.53 |
| 461.22 | 2374.2 | 509.75 | 2373.41 | 557.63 | 2372.49 | 602.3 | 2371.85 | 651.73 | 2371.19 |
| 697.53 | 2370.8 | 743.16 | 2370.42 | 771 | 2370 | 800.75 | 2370.13 | 806.79 | 2369.08 |
| 813.54 | 2365.88 | 817.33 | 2364.41 | 818.49 | 2362.78 | 820.62 | 2362.1 | 822.37 | 2362.57 |
| 823.65 | 2363.85 | 824.35 | 2366.01 | 831.31 | 2369.67 | 877.1 | 2370.73 | 881.51 | 2370.62 |
| 928.31 | 2371.4 | 976.45 | 2372.05 | 1023.74 | 2372.08 | 1072.04 | 2372.22 | 1123.96 | 2373.08 |
| 1171.5 | 2373 | 1219.36 | 2372.9 | 1267.12 | 2372.93 | 1298.62 | 2373.46 | 1361.07 | 2374.59 |
| 1408.44 | 2375.6 | 1456.08 | 2377.02 | 1504.52 | 2377.53 | 1553.49 | 2377.76 | 1586.16 | 2377.71 |
| 1629.65 | 2378.2 | 1677.59 | 2377.16 | 1724.23 | 2376.52 | 1738.11 | 2376.81 | 1751.9 | 2377.19 |
| 1804.11 | 2377.4 | 1811.8 | 2375.53 | 1831.27 | 2380.73 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 800.75 | .035 | 831.31 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 800.75 | 831.31 | 82.04 | 79.2 | 80.8 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.02 | Element | | | |
| Vel Head (ft) | 0.04 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2371.98 | Reach Len. (ft) | 82.04 | 79.20 | 80.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.09 | 162.58 | 14.95 |
| E.G. Slope (ft/ft) | 0.000182 | Area (sq ft) | 0.09 | 162.58 | 14.95 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 0.01 | 255.83 | 14.16 |
| Top Width (ft) | 37.30 | Top Width (ft) | 0.05 | 30.56 | 6.69 |
| Vel Total (ft/s) | 1.52 | Avg. Vel. (ft/s) | 0.09 | 1.57 | 0.95 |
| Max Chl Dpth (ft) | 9.88 | Hydr. Depth (ft) | 1.85 | 5.32 | 2.23 |
| Conv. Total (cfs) | 20030.4 | Conv. (cfs) | 0.6 | 18979.5 | 1050.3 |
| Length Wtd. (ft) | 79.24 | Wetted Per. (ft) | 1.90 | 35.66 | 8.85 |
| Min Ch El (ft) | 2362.10 | Shear (lb/sq ft) | 0.00 | 0.05 | 0.02 |
| Alpha | 1.04 | Stream Power (lb/ft s) | 0.00 | 0.08 | 0.02 |
| Frctn Loss (ft) | 0.02 | Cum Volume (acre-ft) | 1.62 | 19.70 | 2.11 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 6.96 | 1.06 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.9

INPUT
Description: Survey 10.3
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2380.1 | 53.01 | 2379.4 | 104.1 | 2379.43 | 155.6 | 2378.9 | 206.27 | 2377.6 |
| 258.16 | 2377.2 | 265.64 | 2377.39 | 314.02 | 2375.8 | 362.74 | 2374.47 | 411.72 | 2373.53 |
| 461.22 | 2373.2 | 509.75 | 2372.41 | 557.63 | 2371.49 | 602.3 | 2370.85 | 651.73 | 2370.19 |
| 697.53 | 2369.8 | 743.16 | 2369.42 | 749.27 | 2369.1 | 785.18 | 2368.84 | 808.33 | 2370.06 |
| 818.66 | 2366.81 | 821.37 | 2366.35 | 824.98 | 2365.7 | 829.32 | 2366.21 | 833.67 | 2367 |
| 843.97 | 2369.98 | 893.28 | 2370.68 | 928.31 | 2370.4 | 976.45 | 2371.05 | 1023.74 | 2371.08 |
| 1072.04 | 2371.22 | 1123.96 | 2372.08 | 1171.5 | 2372 | 1219.36 | 2371.9 | 1267.12 | 2371.93 |
| 1298.62 | 2372.46 | 1361.07 | 2373.59 | 1408.44 | 2374.6 | 1456.08 | 2376.02 | 1504.52 | 2376.53 |
| 1553.49 | 2376.76 | 1586.16 | 2376.71 | 1629.65 | 2377.2 | 1677.59 | 2376.16 | 1724.23 | 2375.52 |
| 1738.11 | 2375.81 | 1751.9 | 2376.19 | 1804.11 | 2376.4 | 1811.8 | 2374.53 | 1831.27 | 2379.73 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 808.33 | .035 | 843.97 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 808.33 | 843.97 | 422 | 424.1 | 428.5 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 676 | 2378 | F |
| 1052 | 1831.27 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.00 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.96 | Reach Len. (ft) | 422.00 | 424.10 | 428.50 |
| Crit W.S. (ft) | 2368.36 | Flow Area (sq ft) | | 157.35 | |
| E.G. Slope (ft/ft) | 0.000269 | Area (sq ft) | | 157.35 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 35.64 | Top Width (ft) | | 35.64 | |
| Vel Total (ft/s) | 1.72 | Avg. Vel. (ft/s) | | 1.72 | |
| Max Chl Dpth (ft) | 6.26 | Hydr. Depth (ft) | | 4.41 | |
| Conv. Total (cfs) | 16473.9 | Conv. (cfs) | | 16473.9 | |
| Length Wtd. (ft) | 424.10 | Wetted Per. (ft) | | 40.63 | |
| Min Ch El (ft) | 2365.70 | Shear (lb/sq ft) | | 0.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.11 | |
| Frctn Loss (ft) | 0.11 | Cum Volume (acre-ft) | 1.62 | 19.41 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 6.90 | 1.05 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9.45*

INPUT
Description:
Station Elevation Data num= 95

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2381.65 | 47.5 | 2381.26 | 53.55 | 2381.19 | 96 | 2380.99 | 105.16 | 2380.93 |
| 143.86 | 2380.48 | 157.18 | 2380.36 | 191.73 | 2379.8 | 208.37 | 2379.52 | 239.57 | 2379.28 |
| 260.78 | 2379.06 | 268.34 | 2379.1 | 286.65 | 2378.68 | 317.21 | 2377.35 | 334.23 | 2376.65 |
| 366.43 | 2375.39 | 368.61 | 2375.31 | 406.69 | 2373.79 | 415.9 | 2373.68 | 454.62 | 2373.44 |
| 465.91 | 2373.39 | 477.79 | 2373.27 | 514.93 | 2372.83 | 523.32 | 2372.72 | 563.3 | 2372.14 |
| 572.49 | 2372.03 | 608.42 | 2371.28 | 624.26 | 2370.96 | 658.35 | 2370.11 | 675.6 | 2369.72 |
| 704.62 | 2369.44 | 725.03 | 2369.24 | 750.71 | 2368.99 | 756.88 | 2368.79 | 773.4 | 2368.64 |
| 793.16 | 2368.69 | 816.55 | 2369.44 | 823.28 | 2367.03 | 826.27 | 2366.44 | 827.24 | 2366.32 |
| 828.82 | 2366 | 832.22 | 2365.3 | 836.47 | 2366.01 | 837.55 | 2366.22 | 840.73 | 2366.94 |
| 841.85 | 2367.26 | 850.81 | 2369.9 | 898.34 | 2369.23 | 900.36 | 2369.18 | 932.11 | 2369.16 |
| 950.19 | 2369.36 | 978.52 | 2370.01 | 998.86 | 2370.34 | 1013.41 | 2370.62 | 1024.11 | 2370.66 |
| 1062.28 | 2370.86 | 1070.67 | 2370.86 | 1114.48 | 2371.19 | 1120.72 | 2371.25 | 1166.18 | 2371.28 |
| 1166.54 | 2371.28 | 1212.68 | 2371.7 | 1216.63 | 2371.74 | 1258.72 | 2372.12 | 1266.62 | 2372.26 |
| 1289.08 | 2372.67 | 1314.46 | 2373.14 | 1349.29 | 2374.07 | 1368.11 | 2374.6 | 1394.95 | 2376.06 |
| 1399.38 | 2376.32 | 1408.21 | 2377.52 | 1440.87 | 2377.25 | 1449.34 | 2377.1 | 1487.57 | 2376.97 |
| 1500.59 | 2376.89 | 1534.77 | 2376.93 | 1566.27 | 2376.86 | 1571.28 | 2376.88 | 1608.19 | 2376.63 |
| 1609.43 | 2376.6 | 1642.92 | 2375.75 | 1650.76 | 2376.7 | 1654.41 | 2376.64 | 1675.48 | 2376.42 |
| 1689.91 | 2375.33 | 1699.37 | 2375.32 | 1709.99 | 2375.5 | 1712.75 | 2375.85 | 1718.65 | 2376.64 |
| 1726.04 | 2376.55 | 1746.35 | 2376.07 | 1776.37 | 2376.15 | 1783.78 | 2375.22 | 1802.55 | 2377.82 |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| 0 | .03 | 816.55 | .035 | 850.81 | .03 | 1314.46 | .032 | 1802.55 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 816.55 | 850.81 | 422 | 424.1 | 428.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.89 | Element | | | |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.85 | Reach Len. (ft) | 422.00 | 424.10 | 428.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 158.74 | |
| E.G. Slope (ft/ft) | 0.000254 | Area (sq ft) | | 158.74 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |

| | | | | | |
|---|---|---|---|---|---|
| Top Width (ft) | 34.26 | Top Width (ft) | | 34.26 | |
| Vel Total (ft/s) | 1.70 | Avg. Vel. (ft/s) | | 1.70 | |
| Max Chl Dpth (ft) | 6.55 | Hydr. Depth (ft) | | 4.63 | |
| Conv. Total (cfs) | 16953.3 | Conv. (cfs) | | 16953.3 | |
| Length Wtd. (ft) | 424.10 | Wetted Per. (ft) | | 39.78 | |
| Min Ch El (ft) | 2365.30 | Shear (lb/sq ft) | | 0.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.11 | |
| Frctn Loss (ft) | 0.11 | Cum Volume (acre-ft) | 1.62 | 17.87 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 6.56 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 9

INPUT
Description:
Station Elevation Data num= 50

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2383.2 | 47.98 | 2383.04 | 96.97 | 2382.55 | 145.31 | 2381.92 | 193.66 | 2381.57 |
| 241.98 | 2381.2 | 289.53 | 2380.57 | 337.59 | 2377.96 | 372.32 | 2376.2 | 410.78 | 2373.88 |
| 459.19 | 2373.6 | 482.6 | 2373.54 | 528.58 | 2373.18 | 578.25 | 2372.71 | 630.54 | 2371.28 |
| 682.4 | 2369.4 | 732.32 | 2368.85 | 781.18 | 2368.3 | 824.76 | 2368.81 | 831.08 | 2366.25 |
| 834.79 | 2366 | 839.46 | 2364.91 | 844.68 | 2366.03 | 848.88 | 2367.18 | 857.65 | 2369.81 |
| 905.35 | 2367.7 | 953.32 | 2368.06 | 1000.17 | 2369.62 | 1014.17 | 2370.16 | 1061.22 | 2370.53 |
| 1111.47 | 2370.4 | 1161.24 | 2370.56 | 1209.8 | 2371.57 | 1257.92 | 2372.46 | 1303.98 | 2373.34 |
| 1355.62 | 2375.2 | 1385.72 | 2377.91 | 1394.22 | 2380.03 | 1433.82 | 2378.09 | 1483.15 | 2377.18 |
| 1551.2 | 2377 | 1587.93 | 2376.03 | 1620.16 | 2375.08 | 1627.71 | 2377.15 | 1651.51 | 2376.97 |
| 1665.4 | 2375 | 1684.73 | 2375.24 | 1693.06 | 2377.3 | 1719.73 | 2375.87 | 1773.83 | 2375.92 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .03 | 824.76 | .035 | 857.65 | .03 | 1303.98 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 824.76 | 857.65 | 262 | 261.5 | 261 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.79 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.04 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.74 | Reach Len. (ft) | 262.00 | 261.50 | 261.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 159.55 | |
| E.G. Slope (ft/ft) | 0.000243 | Area (sq ft) | | 159.55 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 32.89 | Top Width (ft) | | 32.89 | |
| Vel Total (ft/s) | 1.69 | Avg. Vel. (ft/s) | | 1.69 | |
| Max Chl Dpth (ft) | 6.83 | Hydr. Depth (ft) | | 4.85 | |
| Conv. Total (cfs) | 17314.5 | Conv. (cfs) | | 17314.5 | |
| Length Wtd. (ft) | 261.50 | Wetted Per. (ft) | | 39.04 | |
| Min Ch El (ft) | 2364.91 | Shear (lb/sq ft) | | 0.06 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.10 | |
| Frctn Loss (ft) | 0.05 | Cum Volume (acre-ft) | 1.62 | 16.32 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 6.23 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.775

INPUT
Description: Interpolated
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -58 | 2381.6 | -30.21 | 2381.13 | -1.83 | 2380.49 | 26.16 | 2379.78 | 54.17 | 2379.21 |
| 82.15 | 2378.63 | 109.7 | 2377.93 | 137.53 | 2376.24 | 157.65 | 2375.07 | 179.92 | 2373.6 |
| 207.96 | 2373.07 | 221.52 | 2372.85 | 248.15 | 2372.3 | 276.92 | 2371.66 | 307.21 | 2370.52 |
| 337.25 | 2369.16 | 366.16 | 2368.48 | 402.92 | 2368.14 | 435.71 | 2368.35 | 442.43 | 2366.33 |
| 445.81 | 2365.85 | 446.37 | 2365.81 | 451.33 | 2365.05 | 457.22 | 2365.66 | 457.3 | 2365.67 |
| 461.96 | 2366.6 | 471.87 | 2368.71 | 511.97 | 2368.02 | 534.15 | 2368.32 | 552.3 | 2368.46 |
| 591.69 | 2369.35 | 603.46 | 2369.65 | 643.01 | 2369.95 | 685.26 | 2370.01 | 727.1 | 2370.21 |
| 767.93 | 2370.83 | 808.39 | 2371.39 | 847.11 | 2371.94 | 890.53 | 2372.99 | 915.83 | 2374.42 |
| 922.98 | 2375.5 | 956.27 | 2374.63 | 997.75 | 2374.29 | 1054.96 | 2374.36 | 1085.84 | 2373.97 |
| 1112.93 | 2373.57 | 1119.28 | 2374.62 | 1139.29 | 2374.59 | 1150.97 | 2373.64 | 1167.22 | 2373.81 |
| 1174.22 | 2374.86 | 1196.65 | 2374.21 | 1242.13 | 2374.36 | | | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -58 | .03 | 435.71 | .035 | 471.87 | .03 | 847.11 | .032 | 1242.13 | .032 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 435.71 | 471.87 | 262.5 | 261.5 | 260 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.73 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.03 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.70 | Reach Len. (ft) | 262.50 | 261.50 | 260.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 186.39 | |
| E.G. Slope (ft/ft) | 0.000166 | Area (sq ft) | | 186.39 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 36.16 | Top Width (ft) | | 36.16 | |
| Vel Total (ft/s) | 1.45 | Avg. Vel. (ft/s) | | 1.45 | |
| Max Chl Dpth (ft) | 6.65 | Hydr. Depth (ft) | | 5.15 | |
| Conv. Total (cfs) | 20963.4 | Conv. (cfs) | | 20963.4 | |
| Length Wtd. (ft) | 261.50 | Wetted Per. (ft) | | 43.23 | |
| Min Ch El (ft) | 2365.05 | Shear (lb/sq ft) | | 0.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.06 | |
| Frctn Loss (ft) | 0.04 | Cum Volume (acre-ft) | 1.62 | 15.29 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 6.02 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.55

INPUT
Description: Survey 8.11
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -116 | 2380 | 0 | 2368.1 | 46.67 | 2367.89 | 57.36 | 2365.66 | 63.2 | 2365.19 |
| 69.85 | 2365.29 | 86.08 | 2367.6 | 136.57 | 2368.75 | 710.43 | 2372.8 | | |

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -116     .03   46.67    .035   86.08     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          46.67   86.08             48.5    51.7    52.1            .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
    -116      -5    2378       F
     405  710.43    2378       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2371.69    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.02    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2371.67    Reach Len. (ft)             48.50     51.70      52.10
  Crit W.S. (ft)           2367.21    Flow Area (sq ft)                    216.22
  E.G. Slope (ft/ft)      0.000115    Area (sq ft)                         216.22
  Q Total (cfs)             270.00    Flow (cfs)                           270.00
  Top Width (ft)             39.41    Top Width (ft)                        39.41
  Vel Total (ft/s)            1.25    Avg. Vel. (ft/s)                       1.25
  Max Chl Dpth (ft)           6.48    Hydr. Depth (ft)                       5.49
  Conv. Total (cfs)        25154.7    Conv. (cfs)                         25154.7
  Length Wtd. (ft)           51.70    Wetted Per. (ft)                      47.67
  Min Ch El (ft)           2365.19    Shear (lb/sq ft)                       0.03
  Alpha                       1.00    Stream Power (lb/ft s)                 0.04
  Frctn Loss (ft)             0.01    Cum Volume (acre-ft)         1.62     14.08       2.10
  C & E Loss (ft)             0.00    Cum SA (acres)               0.41      5.79       1.05

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 8.45

INPUT
Description: Survey 8.12
Station Elevation Data      num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -128.2    2380       0  2368.8   48.02 2367.94   54.59 2366.19   58.76  2365.3
   59.93 2363.46   60.92 2362.02   63.05  2361.3   65.18 2362.02   66.79 2364.36
   68.38 2365.28   78.65 2368.15   90.41 2368.61  106.29    2367  120.54 2367.02
   607.8 2372.21

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -128.2     .03   48.02    .035   78.65     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          48.02   78.65            22.15      22   22.15            .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
  -128.2       0    2378       F
     360   607.8    2378       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2371.68    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.03    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2371.65    Reach Len. (ft)             22.15     22.00      22.15
  Crit W.S. (ft)           2366.08    Flow Area (sq ft)                    189.85
  E.G. Slope (ft/ft)      0.000150    Area (sq ft)                         189.85
  Q Total (cfs)             270.00    Flow (cfs)                           270.00
  Top Width (ft)             30.63    Top Width (ft)                        30.63
  Vel Total (ft/s)            1.42    Avg. Vel. (ft/s)                       1.42
  Max Chl Dpth (ft)          10.35    Hydr. Depth (ft)                       6.20
  Conv. Total (cfs)        22020.4    Conv. (cfs)                         22020.4
  Length Wtd. (ft)           22.00    Wetted Per. (ft)                      42.04
  Min Ch El (ft)           2361.30    Shear (lb/sq ft)                       0.04
  Alpha                       1.00    Stream Power (lb/ft s)                 0.06
  Frctn Loss (ft)                     Cum Volume (acre-ft)         1.62     13.84       2.10
  C & E Loss (ft)                     Cum SA (acres)               0.41      5.75       1.05

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CULVERT


RIVER: Minnie Cr
REACH: Lower              RS: 8.3

INPUT
Description:
Distance from Upstream XS =       3
Deck/Roadway Width        =      17
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   11.04  2368.5           61.18 2369.66          102.27 2367.23
   118.2 2366.97

Upstream Bridge Cross Section Data
Station Elevation Data      num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -128.2    2380       0  2368.8   48.02 2367.94   54.59 2366.19   58.76  2365.3
   59.93 2363.46   60.92 2362.02   63.05  2361.3   65.18 2362.02   66.79 2364.36
   68.38 2365.28   78.65 2368.15   90.41 2368.61  106.29    2367  120.54 2367.02
   607.8 2372.21

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -128.2     .03   48.02    .035   78.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          48.02   78.65            .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
  -128.2       0    2378       F
     360   607.8    2378       F
```

```
Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   11.04  2368.5           61.18 2369.66          102.27 2367.23
   118.2 2366.97

Downstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -145.11    2380       0  2368.8   48.02 2367.94   54.59 2366.19   58.76  2365.3
   59.93 2363.15    61.3 2361.87   63.05  2361.4   65.18 2362.12   66.79 2364.36
   68.38 2365.28   78.65 2368.15   90.41 2368.61  106.29    2367  120.54 2367.02
  564.33 2371.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -145.11     .03   48.02    .035   78.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          48.02   78.65          .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -145.11       0    2378       F
     360  564.33    2378       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular      7
FHWA Chart # 55-  Circular Culvert
FHWA Scale # 2 - Rough tapered inlet throat
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               2.1      17      .01      .01        0                .09                 1
Upstream   Elevation =  2361.8
           Centerline Station =  63.05
Downstream Elevation =  2361.9
           Centerline Station =  63.05

CULVERT OUTPUT  Profile #PF 2  Culv Group:  Culvert #1

  Q Culv Group (cfs)         89.23    Culv Full Len (ft)         17.00
  # Barrels                      1    Culv Vel US (ft/s)          2.32
  Q Barrel (cfs)             89.23    Culv Vel DS (ft/s)          2.32
  E.G. US. (ft)           2371.68    Culv Inv El Up (ft)      2361.80
  W.S. US. (ft)           2371.65    Culv Inv El Dn (ft)      2361.90
  E.G. DS (ft)            2371.62    Culv Frctn Ls (ft)          0.00
  W.S. DS (ft)            2371.59    Culv Exit Loss (ft)         0.05
  Delta EG (ft)              0.06    Culv Entr Loss (ft)         0.01
  Delta WS (ft)              0.06    Q Weir (cfs)              180.77
  E.G. IC (ft)            2368.58    Weir Sta Lft (ft)          48.02
  E.G. OC (ft)            2371.68    Weir Sta Rgt (ft)          78.65
  Culvert Control          Outlet    Weir Submerg                0.97
  Culv WS Inlet (ft)      2368.80    Weir Max Depth (ft)         3.05
  Culv WS Outlet (ft)     2368.90    Weir Avg Depth (ft)         2.37
  Culv Nml Depth (ft)                Weir Flow Area (sq ft)     72.73
  Culv Crt Depth (ft)        2.42    Min El Weir Flow (ft)    2368.64


Warning: The weir over culvert is submerged.
Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
         The reported inlet energy grade answer may not be valid.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 8.28

INPUT
Description: Copy of Survey 8.12
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -145.11    2380       0  2368.8   48.02 2367.94   54.59 2366.19   58.76  2365.3
   59.93 2363.15    61.3 2361.87   63.05  2361.4   65.18 2362.12   66.79 2364.36
   68.38 2365.28   78.65 2368.15   90.41 2368.61  106.29    2367  120.54 2367.02
  564.33 2371.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -145.11     .03   48.02    .035   78.65     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          48.02   78.65           197.16   191.3   182.4          .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -145.11       0    2378       F
     360  564.33    2378       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)          2371.62    Element                   Left OB    Channel   Right OB
  Vel Head (ft)              0.03    Wt. n-Val.                            0.035
  W.S. Elev (ft)          2371.59    Reach Len. (ft)           197.16     191.30     182.40
  Crit W.S. (ft)          2366.07    Flow Area (sq ft)                    187.81
  E.G. Slope (ft/ft)     0.000155    Area (sq ft)                         187.81
  Q Total (cfs)            270.00    Flow (cfs)                           270.00
  Top Width (ft)            30.63    Top Width (ft)                        30.63
  Vel Total (ft/s)           1.44    Avg. Vel. (ft/s)                       1.44
  Max Chl Dpth (ft)         10.19    Hydr. Depth (ft)                       6.13
  Conv. Total (cfs)        21712.1   Conv. (cfs)                         21712.1
  Length Wtd. (ft)          191.30   Wetted Per. (ft)                      41.80
  Min Ch El (ft)          2361.40    Shear (lb/sq ft)                       0.04
  Alpha                      1.00    Stream Power (lb/ft s)                 0.06
  Frctn Loss (ft)            0.03    Cum Volume (acre-ft)        1.62       13.74       2.10
  C & E Loss (ft)            0.00    Cum SA (acres)              0.41        5.74       1.05


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.
```

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.25

INPUT
Description: Survey 8.1
Station Elevation Data num= 60

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | 47.93 | 2389.51 | 99 | 2389.17 | 148.46 | 2388.59 | 196.67 | 2387.83 |
| 244.2 | 2387 | 291.76 | 2386.07 | 341.39 | 2385.04 | 389.43 | 2384.02 | 438.38 | 2383.18 |
| 488.06 | 2382.6 | 537.1 | 2382.08 | 586.98 | 2381.24 | 637.1 | 2380.16 | 685.31 | 2378.52 |
| 733.57 | 2376.5 | 781.45 | 2374.71 | 831.09 | 2373.11 | 878.83 | 2372.15 | 891.07 | 2371.3 |
| 940.59 | 2370.58 | 951.73 | 2366.45 | 963.21 | 2365.11 | 975.79 | 2365.62 | 982.82 | 2367.3 |
| 994.03 | 2369.42 | 1025.2 | 2369.61 | 1065.24 | 2370.52 | 1112.07 | 2370.54 | 1158.87 | 2370.71 |
| 1206.43 | 2371.1 | 1254.01 | 2371.41 | 1301.13 | 2371.6 | 1348.53 | 2371.74 | 1395.59 | 2371.74 |
| 1442.42 | 2371.8 | 1490.67 | 2371.96 | 1537.98 | 2372.21 | 1585.53 | 2372.52 | 1634.36 | 2372.78 |
| 1660.28 | 2372.8 | 1708.05 | 2372.74 | 1754.51 | 2372.59 | 1802.09 | 2372.52 | 1848.64 | 2372.56 |
| 1895.83 | 2372.7 | 1943.3 | 2373.13 | 1990.67 | 2373.7 | 2037.58 | 2374.07 | 2084.64 | 2374.41 |
| 2131.79 | 2374.8 | 2180.34 | 2375.2 | 2226.79 | 2375.32 | 2274.54 | 2375.32 | 2320.76 | 2375.31 |
| 2367.93 | 2375.5 | 2414.72 | 2375.9 | 2465.94 | 2376.38 | 2512.79 | 2376.44 | 2559.71 | 2376.48 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 940.59 | .04 | 982.82 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 940.59 | 982.82 | 61.5 | 59.7 | 62 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.59 | Element | | | |
| Vel Head (ft) | 0.02 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2371.57 | Reach Len. (ft) | 61.50 | 59.70 | 62.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 214.31 | |
| E.G. Slope (ft/ft) | 0.000159 | Area (sq ft) | | 214.31 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 42.23 | Top Width (ft) | | 42.23 | |
| Vel Total (ft/s) | 1.26 | Avg. Vel. (ft/s) | | 1.26 | |
| Max Chl Dpth (ft) | 6.46 | Hydr. Depth (ft) | | 5.07 | |
| Conv. Total (cfs) | 21435.0 | Conv. (cfs) | | 21435.0 | |
| Length Wtd. (ft) | 59.70 | Wetted Per. (ft) | | 48.51 | |
| Min Ch El (ft) | 2365.11 | Shear (lb/sq ft) | | 0.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.06 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.62 | 12.86 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 5.58 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 8.2

INPUT
Description:
Station Elevation Data num= 61

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | 47.93 | 2389.51 | 99 | 2389.17 | 148.46 | 2388.59 | 196.67 | 2387.83 |
| 244.2 | 2387 | 291.76 | 2386.07 | 341.39 | 2385.04 | 389.43 | 2384.02 | 438.38 | 2383.18 |
| 488.06 | 2382.6 | 537.1 | 2382.08 | 586.98 | 2381.24 | 637.1 | 2380.16 | 685.31 | 2378.52 |
| 733.57 | 2376.5 | 781.45 | 2374.71 | 831.09 | 2373.11 | 878.83 | 2372.15 | 910.64 | 2372.1 |
| 957.89 | 2370.1 | 971.03 | 2366.22 | 980.14 | 2365.37 | 981.6 | 2364.9 | 982.82 | 2365.1 |
| 992.75 | 2368.2 | 996.58 | 2369.56 | 1040.19 | 2370.04 | 1065.24 | 2370.52 | 1112.07 | 2370.54 |
| 1158.87 | 2370.71 | 1206.43 | 2371.1 | 1254.01 | 2371.41 | 1301.13 | 2371.6 | 1348.53 | 2371.74 |
| 1395.59 | 2371.74 | 1442.42 | 2371.8 | 1490.67 | 2371.96 | 1537.98 | 2372.21 | 1585.53 | 2372.52 |
| 1634.36 | 2372.78 | 1660.28 | 2372.8 | 1708.05 | 2372.74 | 1754.51 | 2372.59 | 1802.09 | 2372.52 |
| 1848.64 | 2372.56 | 1895.83 | 2372.7 | 1943.3 | 2373.13 | 1990.67 | 2373.7 | 2037.58 | 2374.07 |
| 2084.64 | 2374.41 | 2131.79 | 2374.8 | 2180.34 | 2375.2 | 2226.79 | 2375.32 | 2274.54 | 2375.32 |
| 2320.76 | 2375.31 | 2367.93 | 2375.5 | 2414.72 | 2375.9 | 2465.94 | 2376.38 | 2512.79 | 2376.44 |
| 2559.71 | 2376.48 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 957.89 | .035 | 1065.24 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 957.89 | 1065.24 | 52.61 | 52.7 | 52.54 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.58 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.56 | Reach Len. (ft) | 52.61 | 52.70 | 52.54 |
| Crit W.S. (ft) | 2367.68 | Flow Area (sq ft) | | 282.86 | |
| E.G. Slope (ft/ft) | 0.000146 | Area (sq ft) | | 282.86 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 107.35 | Top Width (ft) | | 107.35 | |
| Vel Total (ft/s) | 0.95 | Avg. Vel. (ft/s) | | 0.95 | |
| Max Chl Dpth (ft) | 6.66 | Hydr. Depth (ft) | | 2.63 | |
| Conv. Total (cfs) | 22369.6 | Conv. (cfs) | | 22369.6 | |
| Length Wtd. (ft) | 52.70 | Wetted Per. (ft) | | 111.26 | |
| Min Ch El (ft) | 2364.90 | Shear (lb/sq ft) | | 0.02 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.02 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.62 | 12.52 | 2.10 |
| C & E Loss (ft) | | Cum SA (acres) | 0.41 | 5.48 | 1.05 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 8.01

INPUT
Description: culv@8
culv at section 8
Distance from Upstream XS = 4.3
Deck/Roadway Width = 45.9
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 55

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2389.4 | | 47.93 | 2389.51 | | 99 | 2389.17 | |
| 148.46 | 2388.59 | | 196.67 | 2387.83 | | 244.2 | 2387 | |
| 291.76 | 2386.07 | | 341.39 | 2385.04 | | 389.43 | 2384.02 | |

```
  438.38 2383.18          488.06  2382.6          537.1 2382.08
  586.98 2381.24           637.1 2380.16         685.31 2378.52
  733.57  2376.5          781.45 2374.71         831.09 2373.11
  878.83 2372.15          927.21 2371.56         973.31  2371.1
 1019.24 2370.74         1065.24 2370.52        1112.07 2370.54
 1158.87 2370.71         1206.43  2371.1        1254.01 2371.41
 1301.13  2371.6         1348.53 2371.74        1395.59 2371.74
 1442.42  2371.8         1490.67 2371.96        1537.98 2372.21
 1585.53 2372.52         1634.36 2372.78        1660.28  2372.8
 1708.05 2372.74         1754.51 2372.59        1802.09 2372.52
 1848.64 2372.56         1895.83  2372.7         1943.3 2373.13
 1990.67  2373.7         2037.58 2374.07        2084.64 2374.41
 2131.79  2374.8         2180.34  2375.2        2226.79 2375.32
 2274.54 2375.32         2320.76 2375.31        2367.93  2375.5
 2414.72  2375.9         2465.94 2376.38        2512.79 2376.44
 2559.71 2376.48

Upstream Bridge Cross Section Data
Station Elevation Data     num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2389.4   47.93 2389.51      99 2389.17  148.46 2388.59  196.67 2387.83
   244.2    2387  291.76 2386.07  341.39 2385.04  389.43 2384.02  438.38 2383.18
  488.06  2382.6   537.1 2382.08  586.98 2381.24   637.1 2380.16  685.31 2378.52
  733.57  2376.5  781.45 2374.71  831.09 2373.11  878.83 2372.15  910.64  2372.1
  957.89  2370.1  971.03 2366.22  980.14 2365.37   981.6  2364.9  982.82  2365.1
  992.75  2368.2  996.58 2369.56 1040.19 2370.04 1065.24 2370.52 1112.07 2370.54
 1158.87 2370.71 1206.43  2371.1 1254.01 2371.41 1301.13  2371.6 1348.53 2371.74
 1395.59 2371.74 1442.42  2371.8 1490.67 2371.96 1537.98 2372.21 1585.53 2372.52
 1634.36 2372.78 1660.28  2372.8 1708.05 2372.74 1754.51 2372.59 1802.09 2372.52
 1848.64 2372.56 1895.83  2372.7  1943.3 2373.13 1990.67  2373.7 2037.58 2374.07
 2084.64 2374.41 2131.79  2374.8 2180.34  2375.2 2226.79 2375.32 2274.54 2375.32
 2320.76 2375.31 2367.93  2375.5 2414.72  2375.9 2465.94 2376.38 2512.79 2376.44
 2559.71 2376.48

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  957.89    .035 1065.24     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        957.89 1065.24             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      55
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2389.4           47.93 2389.51              99 2389.17
  148.46 2388.59          196.67 2387.83           244.2    2387
  291.76 2386.07          341.39 2385.04          389.43 2384.02
  438.38 2383.18          488.06  2382.6           537.1 2382.08
  586.98 2381.24           637.1 2380.16          685.31 2378.52
  733.57  2376.5          781.45 2374.71          831.09 2373.11
  878.83 2372.15          927.21 2371.56          973.31  2371.1
 1019.24 2370.74         1065.24 2370.52         1112.07 2370.54
 1158.87 2370.71         1206.43  2371.1         1254.01 2371.41
 1301.13  2371.6         1348.53 2371.74         1395.59 2371.74
 1442.42  2371.8         1490.67 2371.96         1537.98 2372.21
 1585.53 2372.52         1634.36 2372.78         1660.28  2372.8
 1708.05 2372.74         1754.51 2372.59         1802.09 2372.52
 1848.64 2372.56         1895.83  2372.7          1943.3 2373.13
 1990.67  2373.7         2037.58 2374.07         2084.64 2374.41
 2131.79  2374.8         2180.34  2375.2         2226.79 2375.32
 2274.54 2375.32         2320.76 2375.31         2367.93  2375.5
 2414.72  2375.9         2465.94 2376.38         2512.79 2376.44
 2559.71 2376.48

Downstream Bridge Cross Section Data
Station Elevation Data     num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      22  2389.4   69.93 2389.51     121 2389.17  170.46 2388.59  218.67 2387.83
   266.2    2387  313.76 2386.07  363.39 2385.04  411.43 2384.02  460.38 2383.18
  510.06  2382.6   559.1 2382.08  608.98 2381.24   659.1 2380.16  707.31 2378.52
  755.57  2376.5  803.45 2374.71  853.09 2373.11  900.83 2372.15  932.64  2372.1
  979.89  2370.1  993.03 2366.22 1002.14 2365.37 1004.31  2364.3 1005.31  2364.5
 1014.75  2368.2 1018.58 2369.56 1062.19 2370.04 1087.24 2370.52 1134.07 2370.54
 1180.87 2370.71 1228.43  2371.1 1276.01 2371.41 1323.13  2371.6 1370.53 2371.74
 1417.59 2371.74 1464.42  2371.8 1512.67 2371.96 1559.98 2372.21 1607.53 2372.52
 1656.36 2372.78 1682.28  2372.8 1730.05 2372.74 1776.51 2372.59 1824.09 2372.52
 1870.64 2372.56 1917.83  2372.7  1965.3 2373.13 2012.67  2373.7 2059.58 2374.07
 2106.64 2374.41 2153.79  2374.8 2202.34  2375.2 2248.79 2375.32 2296.54 2375.32
 2342.76 2375.31 2389.93  2375.5 2436.72  2375.9 2487.94 2376.38 2534.79 2376.44
 2581.71 2376.48

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      22     .03  979.89    .035 1087.24     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        979.89 1087.24             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@8          Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               4.3      46     .024     .024        0                  .9                  1
Upstream   Elevation =  2365.2
           Centerline Station =  981.6
Downstream Elevation =  2364.7
           Centerline Station =  1004.31

CULVERT OUTPUT  Profile #PF 2  Culv Group:  culv@8

  Q Culv Group (cfs)         88.09    Culv Full Len (ft)         46.00
  # Barrels                      1    Culv Vel US (ft/s)          7.01
  Q Barrel (cfs)             88.09    Culv Vel DS (ft/s)          7.01
  E.G. US. (ft)            2371.58    Culv Inv El Up (ft)      2365.20
  W.S. US. (ft)            2371.56    Culv Inv El Dn (ft)      2364.70
  E.G. DS (ft)             2369.65    Culv Frctn Ls (ft)          0.59
```

| | | | |
|---|---|---|---|
| W.S. DS (ft) | 2369.54 | Culv Exit Loss (ft) | 0.65 |
| Delta EG (ft) | 1.93 | Culv Entr Loss (ft) | 0.69 |
| Delta WS (ft) | 2.03 | Q Weir (cfs) | 181.91 |
| E.G. IC (ft) | 2371.51 | Weir Sta Lft (ft) | 957.89 |
| E.G. OC (ft) | 2371.58 | Weir Sta Rgt (ft) | 1065.24 |
| Culvert Control | Outlet | Weir Submerg | 0.00 |
| Culv WS Inlet (ft) | 2369.20 | Weir Max Depth (ft) | 1.05 |
| Culv WS Outlet (ft) | 2368.70 | Weir Avg Depth (ft) | 0.74 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 79.29 |
| Culv Crt Depth (ft) | 2.85 | Min El Weir Flow (ft) | 2370.53 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.98

INPUT
Description:
Station Elevation Data num= 61

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 22 | 2389.4 | 69.93 | 2389.51 | 121 | 2389.17 | 170.46 | 2388.59 | 218.67 | 2387.83 |
| 266.2 | 2387 | 313.76 | 2386.07 | 363.39 | 2385.04 | 411.43 | 2384.02 | 460.38 | 2383.18 |
| 510.06 | 2382.6 | 559.1 | 2382.08 | 608.98 | 2381.24 | 659.1 | 2380.16 | 707.31 | 2378.52 |
| 755.57 | 2376.5 | 803.45 | 2374.71 | 853.09 | 2373.11 | 900.83 | 2372.15 | 932.64 | 2372.1 |
| 979.89 | 2370.1 | 993.03 | 2366.22 | 1002.14 | 2365.37 | 1004.31 | 2364.3 | 1005.31 | 2364.5 |
| 1014.75 | 2368.2 | 1018.58 | 2369.56 | 1062.19 | 2370.04 | 1087.24 | 2370.52 | 1134.07 | 2370.54 |
| 1180.87 | 2370.71 | 1228.43 | 2371.1 | 1276.01 | 2371.41 | 1323.13 | 2371.6 | 1370.53 | 2371.74 |
| 1417.59 | 2371.74 | 1464.42 | 2371.8 | 1512.67 | 2371.96 | 1559.98 | 2372.21 | 1607.53 | 2372.52 |
| 1656.36 | 2372.78 | 1682.28 | 2372.8 | 1730.05 | 2372.74 | 1776.51 | 2372.59 | 1824.09 | 2372.52 |
| 1870.64 | 2372.56 | 1917.83 | 2372.7 | 1965.3 | 2373.13 | 2012.67 | 2373.7 | 2059.58 | 2374.07 |
| 2106.64 | 2374.41 | 2153.79 | 2374.8 | 2202.34 | 2375.2 | 2248.79 | 2375.32 | 2296.54 | 2375.32 |
| 2342.76 | 2375.31 | 2389.93 | 2375.5 | 2436.72 | 2375.9 | 2487.94 | 2376.38 | 2534.79 | 2376.44 |
| 2581.71 | 2376.48 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 22 | .03 | 979.89 | .035 | 1087.24 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 979.89 | 1087.24 | 172.58 | 157.1 | 145.16 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2369.65 | Element | | | |
| Vel Head (ft) | 0.11 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2369.54 | Reach Len. (ft) | 172.58 | 157.10 | 145.16 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 100.73 | |
| E.G. Slope (ft/ft) | 0.001104 | Area (sq ft) | | 100.73 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 36.73 | Top Width (ft) | | 36.73 | |
| Vel Total (ft/s) | 2.68 | Avg. Vel. (ft/s) | | 2.68 | |
| Max Chl Dpth (ft) | 5.24 | Hydr. Depth (ft) | | 2.74 | |
| Conv. Total (cfs) | 8127.1 | Conv. (cfs) | | 8127.1 | |
| Length Wtd. (ft) | 157.10 | Wetted Per. (ft) | | 38.45 | |
| Min Ch El (ft) | 2364.30 | Shear (lb/sq ft) | | 0.18 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.48 | |
| Frctn Loss (ft) | 0.23 | Cum Volume (acre-ft) | 1.62 | 12.29 | 2.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 5.39 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.9

INPUT
Description: Survey 8.3
Station Elevation Data num= 55

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2388.4 | 47.93 | 2388.51 | 99 | 2388.17 | 148.46 | 2387.59 | 196.67 | 2386.83 |
| 244.2 | 2386 | 291.76 | 2385.07 | 341.39 | 2384.04 | 389.43 | 2383.02 | 438.38 | 2382.18 |
| 488.06 | 2381.6 | 537.1 | 2381.08 | 586.98 | 2380.24 | 637.1 | 2379.16 | 685.31 | 2377.52 |
| 733.57 | 2375.5 | 781.45 | 2373.71 | 831.09 | 2372.11 | 878.83 | 2371.15 | 927.21 | 2370.56 |
| 973.31 | 2370.09 | 1073.22 | 2369.83 | 1121.28 | 2369.22 | 1137.42 | 2365.2 | 1142.21 | 2365.13 |
| 1145.35 | 2365.77 | 1152.93 | 2368.8 | 1190.01 | 2369.66 | 1237.3 | 2370.1 | 1284.88 | 2370.41 |
| 1332 | 2370.6 | 1379.4 | 2370.74 | 1426.46 | 2370.74 | 1473.29 | 2370.8 | 1521.54 | 2370.96 |
| 1568.85 | 2371.21 | 1616.4 | 2371.52 | 1665.23 | 2371.78 | 1691.15 | 2371.8 | 1738.92 | 2371.74 |
| 1785.38 | 2371.59 | 1832.96 | 2371.52 | 1879.51 | 2371.56 | 1926.7 | 2371.7 | 1974.17 | 2372.13 |
| 2021.54 | 2372.7 | 2068.45 | 2373.07 | 2115.51 | 2373.41 | 2162.66 | 2373.8 | 2211.21 | 2374.2 |
| 2257.66 | 2374.32 | 2305.41 | 2374.32 | 2351.63 | 2374.31 | 2398.8 | 2374.5 | 2445.59 | 2374.9 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 1121.28 | .035 | 1152.93 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1121.28 | 1152.93 | 267 | 277.7 | 286 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2369.41 | Element | | | |
| Vel Head (ft) | 0.18 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2369.23 | Reach Len. (ft) | 267.00 | 277.70 | 286.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 78.63 | |
| E.G. Slope (ft/ft) | 0.002074 | Area (sq ft) | | 78.63 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 31.65 | Top Width (ft) | | 31.65 | |
| Vel Total (ft/s) | 3.43 | Avg. Vel. (ft/s) | | 3.43 | |
| Max Chl Dpth (ft) | 4.10 | Hydr. Depth (ft) | | 2.48 | |
| Conv. Total (cfs) | 5928.3 | Conv. (cfs) | | 5928.3 | |
| Length Wtd. (ft) | 277.70 | Wetted Per. (ft) | | 33.23 | |
| Min Ch El (ft) | 2365.13 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.05 | |
| Frctn Loss (ft) | 0.57 | Cum Volume (acre-ft) | 1.62 | 11.96 | 2.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 5.27 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.6

INPUT
Description: Interpolated

Station Elevation Data num= 107

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2384.07 | 21.36 | 2383.26 | 44.3 | 2383.34 | 57.64 | 2383.3 | 91.51 | 2382.96 |
| 112.86 | 2382.66 | 137.22 | 2382.39 | 170.76 | 2381.93 | 181.78 | 2381.75 | 225.72 | 2380.99 |
| 229.93 | 2380.91 | 269.68 | 2380.07 | 286.04 | 2379.71 | 315.55 | 2379 | 340.38 | 2378.39 |
| 359.95 | 2378.01 | 396.08 | 2377.42 | 405.2 | 2377.31 | 450.08 | 2376.91 | 451.12 | 2376.9 |
| 496.45 | 2376.53 | 504.67 | 2376.42 | 542.55 | 2376.02 | 560.03 | 2375.78 | 588.88 | 2375.37 |
| 619.57 | 2374.66 | 633.44 | 2374.34 | 676.23 | 2373.11 | 678.05 | 2373.06 | 722.3 | 2371.83 |
| 731.56 | 2371.61 | 768.18 | 2370.83 | 789.33 | 2370.57 | 812.31 | 2370.22 | 844.18 | 2369.93 |
| 857.03 | 2369.81 | 899.64 | 2369.48 | 903.24 | 2369.48 | 960.65 | 2369.3 | 991.99 | 2369.18 |
| 1015.45 | 2368.92 | 1036.41 | 2368.71 | 1045.34 | 2366.28 | 1051.97 | 2364.92 | 1056.58 | 2364.72 |
| 1057.75 | 2364.99 | 1061 | 2365.61 | 1064.94 | 2366.72 | 1071.66 | 2368.1 | 1105.9 | 2368.74 |
| 1123.59 | 2368.9 | 1136.06 | 2369.01 | 1149.57 | 2369.16 | 1161.8 | 2369.27 | 1193.51 | 2369.64 |
| 1231.82 | 2370.01 | 1237.03 | 2370.1 | 1271.87 | 2370.67 | 1280.8 | 2370.78 | 1324.26 | 2371.18 |
| 1329.06 | 2371.23 | 1367.51 | 2371.58 | 1388.88 | 2371.81 | 1399.47 | 2371.54 | 1412.07 | 2371.27 |
| 1436.28 | 2370.78 | 1455.76 | 2370.65 | 1495.56 | 2370.43 | 1499.67 | 2370.47 | 1544.77 | 2370.91 |
| 1553.74 | 2370.97 | 1568.7 | 2371.18 | 1612.63 | 2371.71 | 1612.82 | 2371.72 | 1625.46 | 2372.14 |
| 1655.72 | 2372.23 | 1658.67 | 2372.24 | 1686.95 | 2373.09 | 1699.66 | 2372.98 | 1722.92 | 2372.82 |
| 1742.65 | 2373.03 | 1770.61 | 2373.38 | 1786.23 | 2373.53 | 1826.36 | 2374.1 | 1830.07 | 2374.33 |
| 1837.71 | 2374.83 | 1848.99 | 2374.32 | 1860.36 | 2374.57 | 1873.82 | 2374.39 | 1904.45 | 2373.89 |
| 1917.14 | 2373.84 | 1960.6 | 2373.64 | 1961.52 | 2373.63 | 2004.14 | 2373.42 | 2019.55 | 2373.34 |
| 2048.98 | 2373.36 | 2078.41 | 2373.25 | 2091.87 | 2373.34 | 2135.97 | 2373.54 | 2138.79 | 2373.56 |
| 2178.65 | 2373.55 | 2184.09 | 2373.57 | 2222.22 | 2373.93 | 2236.1 | 2374.11 | 2247.09 | 2373.92 |
| 2257.08 | 2374.78 | 2265.43 | 2374.8 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 1036.41 | .035 | 1071.66 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1036.41 | 1071.66 | 277 | 277.7 | 274 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2368.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.17 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2368.67 | Reach Len. (ft) | 277.00 | 277.70 | 274.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 82.50 | |
| E.G. Slope (ft/ft) | 0.002006 | Area (sq ft) | | 82.50 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 35.12 | Top Width (ft) | | 35.12 | |
| Vel Total (ft/s) | 3.27 | Avg. Vel. (ft/s) | | 3.27 | |
| Max Chl Dpth (ft) | 3.95 | Hydr. Depth (ft) | | 2.35 | |
| Conv. Total (cfs) | 6028.5 | Conv. (cfs) | | 6028.5 | |
| Length Wtd. (ft) | 277.70 | Wetted Per. (ft) | | 36.54 | |
| Min Ch El (ft) | 2364.72 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.93 | |
| Frctn Loss (ft) | 0.58 | Cum Volume (acre-ft) | 1.62 | 11.45 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 5.05 | 1.05 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7.3

INPUT
Description: Interpolated
Station Elevation Data num= 107

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2379.73 | 19.61 | 2378.07 | 40.67 | 2378.17 | 52.92 | 2378.18 | 84.01 | 2377.74 |
| 103.62 | 2377.43 | 125.99 | 2377.2 | 156.77 | 2376.83 | 166.9 | 2376.67 | 207.23 | 2375.97 |
| 211.1 | 2375.9 | 247.59 | 2375.07 | 262.61 | 2374.71 | 289.71 | 2373.95 | 312.5 | 2373.3 |
| 330.48 | 2373 | 363.64 | 2372.5 | 372.02 | 2372.43 | 413.23 | 2372.21 | 414.18 | 2372.21 |
| 455.79 | 2371.97 | 463.35 | 2371.91 | 498.12 | 2371.8 | 514.17 | 2371.72 | 540.66 | 2371.58 |
| 568.84 | 2371.28 | 581.57 | 2371.16 | 620.86 | 2370.64 | 622.52 | 2370.61 | 663.15 | 2369.96 |
| 671.66 | 2369.84 | 705.28 | 2369.55 | 724.7 | 2369.48 | 745.79 | 2369.3 | 775.05 | 2369.13 |
| 786.85 | 2369.06 | 825.97 | 2368.88 | 829.27 | 2368.87 | 881.99 | 2368.67 | 910.76 | 2368.52 |
| 932.29 | 2368.32 | 951.54 | 2368.21 | 960.13 | 2365.65 | 966.51 | 2364.64 | 970.96 | 2364.3 |
| 972.46 | 2364.69 | 976.65 | 2365.44 | 981.73 | 2366.54 | 990.38 | 2367.4 | 1021.79 | 2367.82 |
| 1038.02 | 2367.95 | 1049.45 | 2368.05 | 1061.84 | 2368.22 | 1073.06 | 2368.36 | 1102.14 | 2368.87 |
| 1137.28 | 2369.45 | 1142.06 | 2369.6 | 1174.01 | 2370.64 | 1182.2 | 2370.81 | 1222.06 | 2371.62 |
| 1226.47 | 2371.71 | 1261.73 | 2372.36 | 1281.33 | 2372.75 | 1291.04 | 2372.17 | 1302.6 | 2371.58 |
| 1324.8 | 2370.45 | 1342.67 | 2370.09 | 1379.17 | 2369.36 | 1382.94 | 2369.42 | 1424.3 | 2370.05 |
| 1432.53 | 2370.16 | 1446.25 | 2370.55 | 1486.55 | 2371.68 | 1486.72 | 2371.69 | 1498.31 | 2372.59 |
| 1526.07 | 2372.87 | 1528.77 | 2372.9 | 1554.7 | 2374.65 | 1566.37 | 2374.44 | 1587.69 | 2374.09 |
| 1605.79 | 2374.51 | 1631.43 | 2375.11 | 1645.76 | 2375.37 | 1682.57 | 2376.11 | 1685.97 | 2376.54 |
| 1692.98 | 2377.43 | 1703.33 | 2376.26 | 1713.75 | 2376.61 | 1726.09 | 2376.08 | 1754.19 | 2374.81 |
| 1765.83 | 2374.6 | 1805.69 | 2373.86 | 1806.53 | 2373.85 | 1845.62 | 2373.03 | 1859.76 | 2372.74 |
| 1886.74 | 2372.51 | 1913.74 | 2372.23 | 1926.09 | 2372.36 | 1966.53 | 2372.77 | 1969.11 | 2372.79 |
| 2005.68 | 2372.8 | 2010.67 | 2372.8 | 2045.63 | 2373.37 | 2058.36 | 2373.6 | 2068.44 | 2373.12 |
| 2077.61 | 2374.74 | 2085.26 | 2374.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 951.54 | .035 | 990.38 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 951.54 | 990.38 | 279 | 277.7 | 271 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2368.26 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2368.10 | Reach Len. (ft) | 279.00 | 277.70 | 271.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 83.74 | |
| E.G. Slope (ft/ft) | 0.002147 | Area (sq ft) | | 83.74 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 38.47 | Top Width (ft) | | 38.47 | |
| Vel Total (ft/s) | 3.22 | Avg. Vel. (ft/s) | | 3.22 | |
| Max Chl Dpth (ft) | 3.80 | Hydr. Depth (ft) | | 2.18 | |
| Conv. Total (cfs) | 5827.2 | Conv. (cfs) | | 5827.2 | |
| Length Wtd. (ft) | 277.70 | Wetted Per. (ft) | | 39.90 | |
| Min Ch El (ft) | 2364.30 | Shear (lb/sq ft) | | 0.28 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.91 | |
| Frctn Loss (ft) | 0.91 | Cum Volume (acre-ft) | 1.62 | 10.92 | 2.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 4.82 | 1.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 7

INPUT
Description:
Station Elevation Data num= 57

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2375.4 | 17.86 | 2372.88 | 48.2 | 2373.07 | 94.38 | 2372.19 | 142.79 | 2371.74 |
| 192.27 | 2370.9 | 239.19 | 2369.72 | 284.63 | 2368.22 | 331.21 | 2367.57 | 376.37 | 2367.51 |
| 422.02 | 2367.4 | 468.31 | 2367.67 | 518.1 | 2367.91 | 565.48 | 2368.17 | 611.75 | 2368.06 |
| 660.06 | 2368.4 | 705.92 | 2368.33 | 755.31 | 2368.27 | 803.32 | 2368.05 | 849.14 | 2367.73 |
| 866.67 | 2367.7 | 874.93 | 2365.02 | 885.33 | 2363.89 | 887.17 | 2364.38 | 898.52 | 2366.37 |
| 909.11 | 2366.7 | 952.44 | 2367.01 | 962.84 | 2367.09 | 984.32 | 2367.45 | 1042.74 | 2368.88 |
| 1076.15 | 2370.6 | 1123.87 | 2372.19 | 1173.78 | 2373.68 | 1182.61 | 2372.8 | 1213.32 | 2370.13 |
| 1262.78 | 2368.3 | 1311.32 | 2369.34 | 1360.46 | 2371.65 | 1371.16 | 2373.03 | 1398.87 | 2373.56 |
| 1422.46 | 2376.2 | 1452.47 | 2375.37 | 1492.26 | 2376.84 | 1538.78 | 2378.12 | 1548.25 | 2380.03 |
| 1557.66 | 2378.2 | 1567.14 | 2378.66 | 1603.93 | 2375.74 | 1651.54 | 2374.06 | 1699.96 | 2372.14 |
| 1749.07 | 2371.2 | 1799.44 | 2372.03 | 1837.24 | 2372.04 | 1880.63 | 2373.08 | 1889.8 | 2372.31 |
| 1898.14 | 2374.7 | 1905.1 | 2374.61 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 866.67 | .035 | 909.11 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 866.67 | 909.11 | 200 | 196.6 | 199 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 565 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2367.35 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2367.07 | Reach Len. (ft) | 200.00 | 196.60 | 199.00 |
| Crit W.S. (ft) | 2366.47 | Flow Area (sq ft) | | 63.95 | |
| E.G. Slope (ft/ft) | 0.005555 | Area (sq ft) | | 63.95 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 40.50 | Top Width (ft) | | 40.50 | |
| Vel Total (ft/s) | 4.22 | Avg. Vel. (ft/s) | | 4.22 | |
| Max Chl Dpth (ft) | 3.18 | Hydr. Depth (ft) | | 1.58 | |
| Conv. Total (cfs) | 3622.5 | Conv. (cfs) | | 3622.5 | |
| Length Wtd. (ft) | 196.60 | Wetted Per. (ft) | | 41.49 | |
| Min Ch El (ft) | 2363.89 | Shear (lb/sq ft) | | 0.53 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.26 | |
| Frctn Loss (ft) | 1.09 | Cum Volume (acre-ft) | 1.62 | 10.45 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 4.57 | 1.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.8125*

INPUT
Description:
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -141.25 | 2372.62 | -124.77 | 2370.73 | -96.76 | 2370.86 | -54.14 | 2370.17 | -9.46 | 2369.81 |
| 36.2 | 2369.16 | 79.51 | 2368.26 | 121.45 | 2367.11 | 164.44 | 2366.6 | 206.12 | 2366.53 |
| 248.25 | 2366.43 | 290.97 | 2366.61 | 336.93 | 2366.77 | 380.66 | 2366.94 | 423.36 | 2366.84 |
| 467.95 | 2367.07 | 510.27 | 2367 | 555.86 | 2366.93 | 600.17 | 2366.74 | 612.56 | 2366.67 |
| 642.46 | 2366.31 | 658.64 | 2366.18 | 665.45 | 2363.92 | 668.92 | 2363.45 | 671.58 | 2363.1 |
| 674.02 | 2362.79 | 674.17 | 2362.92 | 675.92 | 2363.29 | 687.66 | 2364.96 | 690.83 | 2365.07 |
| 698.61 | 2365.76 | 734.21 | 2365.83 | 735.55 | 2365.84 | 744.41 | 2365.9 | 762.72 | 2366.19 |
| 772.38 | 2366.41 | 812.51 | 2367.35 | 840.99 | 2368.7 | 853.54 | 2369.1 | 881.66 | 2369.95 |
| 924.2 | 2371.1 | 931.72 | 2370.45 | 953.92 | 2368.77 | 957.9 | 2368.47 | 1000.05 | 2367.13 |
| 1041.42 | 2367.95 | 1054.61 | 2368.51 | 1083.31 | 2369.71 | 1092.43 | 2370.75 | 1116.04 | 2371.17 |
| 1136.15 | 2373.16 | 1156.99 | 2372.67 | 1161.73 | 2372.56 | 1195.64 | 2373.68 | 1235.29 | 2374.66 |
| 1243.36 | 2376.1 | 1251.38 | 2374.73 | 1259.46 | 2375.08 | 1267.97 | 2374.5 | 1290.82 | 2372.93 |
| 1331.4 | 2371.71 | 1345.17 | 2371.25 | 1372.67 | 2370.31 | 1414.53 | 2369.65 | 1447.53 | 2370.16 |
| 1457.46 | 2370.32 | 1489.67 | 2370.38 | 1526.66 | 2371.21 | 1534.47 | 2370.64 | 1541.58 | 2372.44 |
| 1547.51 | 2372.39 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -141.25 | .03 | 658.64 | .035 | 698.61 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 658.64 | 698.61 | 198 | 196.6 | 198 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -141.25 | 423.36 | 2378 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2366.25 | Element | | | |
| Vel Head (ft) | 0.28 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2365.97 | Reach Len. (ft) | 198.00 | 196.60 | 198.00 |
| Crit W.S. (ft) | 2365.42 | Flow Area (sq ft) | | 63.10 | |
| E.G. Slope (ft/ft) | 0.005562 | Area (sq ft) | | 63.10 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 39.32 | Top Width (ft) | | 39.32 | |
| Vel Total (ft/s) | 4.28 | Avg. Vel. (ft/s) | | 4.28 | |
| Max Chl Dpth (ft) | 3.18 | Hydr. Depth (ft) | | 1.60 | |
| Conv. Total (cfs) | 3620.3 | Conv. (cfs) | | 3620.3 | |
| Length Wtd. (ft) | 196.60 | Wetted Per. (ft) | | 40.17 | |
| Min Ch El (ft) | 2362.79 | Shear (lb/sq ft) | | 0.55 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.33 | |
| Frctn Loss (ft) | 1.12 | Cum Volume (acre-ft) | 1.62 | 10.16 | 2.10 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.41 | 4.39 | 1.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 6.625*

```
INPUT
Description:
Station Elevation Data     num=      71
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  -282.5 2369.85 -267.39 2368.57 -241.73 2368.64 -202.67 2368.16 -161.72 2367.89
 -119.86 2367.42  -80.17 2366.79  -41.74     2366   -2.33 2365.63   35.87 2365.56
   74.48 2365.46  113.64 2365.55  155.75 2365.63  195.83 2365.72  234.97 2365.62
  275.84 2365.74  314.63 2365.67  356.41 2365.59  397.02 2365.44  408.37 2365.38
  435.78 2364.89   450.6 2364.67  455.96 2362.83   458.7 2362.34  460.79 2361.99
  462.71 2361.69  462.87 2361.91  464.68 2362.19   476.8 2363.54  480.08 2363.68
  488.12 2364.82  517.54 2364.65  518.65 2364.66  525.98 2364.72  541.12 2364.93
   549.1 2365.09  582.28 2365.83  605.82  2366.8   616.2  2367.1  639.45  2367.7
  674.61 2368.52  680.84  2368.1  699.18    2367  702.48 2366.81  737.33 2365.97
  771.53 2366.56  782.43 2366.94  806.15 2367.77  813.69 2368.48  833.22 2368.77
  849.84 2370.12  867.07 2369.81  870.99 2369.74  899.03 2370.52   931.8 2371.21
  938.48 2372.17  945.11 2371.27  951.79 2371.51  958.82 2371.12  977.71 2370.11
 1011.26 2369.36 1022.64 2369.07 1045.38 2368.49 1079.98  2368.1 1107.27 2368.49
 1115.47 2368.61 1142.11 2368.71 1172.68 2369.34 1179.14 2368.97 1185.02 2370.19
 1189.93 2370.16

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
  -282.5     .03    450.6    .035   488.12     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         450.6  488.12              199   196.6     194             .1       .3

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2365.13    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.30    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2364.83    Reach Len. (ft)            199.00     196.60     194.00
  Crit W.S. (ft)                      Flow Area (sq ft)                     61.16
  E.G. Slope (ft/ft)      0.005810    Area (sq ft)                          61.16
  Q Total (cfs)             270.00    Flow (cfs)                           270.00
  Top Width (ft)             37.52    Top Width (ft)                        37.52
  Vel Total (ft/s)            4.41    Avg. Vel. (ft/s)                       4.41
  Max Chl Dpth (ft)           3.14    Hydr. Depth (ft)                       1.63
  Conv. Total (cfs)         3542.4    Conv. (cfs)                          3542.4
  Length Wtd. (ft)           196.60   Wetted Per. (ft)                      38.38
  Min Ch El (ft)           2361.69    Shear (lb/sq ft)                       0.58
  Alpha                       1.00    Stream Power (lb/ft s)                 2.55
  Frctn Loss (ft)             0.97    Cum Volume (acre-ft)        1.62       9.88       2.10
  C & E Loss (ft)             0.01    Cum SA (acres)              0.41       4.21       1.05


CROSS SECTION


RIVER: Minnie Cr
REACH: Lower               RS: 6.4375*

INPUT
Description:
Station Elevation Data     num=      71
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 -423.75 2367.07 -410.02 2366.42 -386.69 2366.43 -351.19 2366.14 -313.97 2365.96
 -275.93 2365.69 -239.85 2365.33 -204.92 2364.89 -169.11 2364.66 -134.39 2364.58
  -99.29 2364.49   -63.7  2364.5  -25.42 2364.49   11.01 2364.49   46.58  2364.4
   83.72 2364.42  118.98 2364.34  156.96 2364.25  193.87 2364.13  204.19 2364.09
  229.09 2363.46  242.57 2363.15  246.48 2361.73  248.47 2361.23     250 2360.88
   251.4 2360.59  251.56 2360.91  253.43  2361.1  265.95 2362.12  269.32 2362.29
  277.62 2363.88  300.88 2363.48  301.76 2363.49  307.55 2363.53  319.51 2363.67
  325.83 2363.77  352.05  2364.3  370.66 2364.91  378.86 2365.11  397.23 2365.46
  425.03 2365.94  429.95 2365.74  444.45 2365.24  447.05 2365.15   474.6  2364.8
  501.63 2365.17  510.25 2365.38     529 2365.84  534.96  2366.2  550.39 2366.38
  563.53 2367.08  577.15 2366.96  580.25 2366.93  602.41 2367.36  628.32 2367.75
  633.59 2368.25  638.83  2367.8  644.11 2367.93  649.67 2367.75   664.6  2367.3
  691.12 2367.02  700.12  2366.9  718.09 2366.67  745.44 2366.56     767 2366.81
  773.49 2366.91  794.54 2367.05  818.71 2367.46  823.82  2367.3  828.46 2367.93
  832.34 2367.94

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 -423.75     .03   242.57    .035  277.62     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         242.57  277.62              195   196.6     193             .1       .3

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2364.15    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.26    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2363.89    Reach Len. (ft)            195.00     196.60     193.00
  Crit W.S. (ft)                      Flow Area (sq ft)                     65.90
  E.G. Slope (ft/ft)      0.004248    Area (sq ft)                          65.90       0.00
  Q Total (cfs)             270.00    Flow (cfs)                           270.00
  Top Width (ft)             35.06    Top Width (ft)                        35.05       0.01
  Vel Total (ft/s)            4.10    Avg. Vel. (ft/s)                       4.10
  Max Chl Dpth (ft)           3.30    Hydr. Depth (ft)                       1.88
  Conv. Total (cfs)         4142.8    Conv. (cfs)                          4142.8
  Length Wtd. (ft)           196.60   Wetted Per. (ft)                      36.57
  Min Ch El (ft)           2360.59    Shear (lb/sq ft)                       0.48
  Alpha                       1.00    Stream Power (lb/ft s)                 1.96
  Frctn Loss (ft)             0.46    Cum Volume (acre-ft)        1.62       9.59       2.10
  C & E Loss (ft)             0.03    Cum SA (acres)              0.41       4.05       1.05


Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower               RS: 6.25

INPUT
Description: add point -565 from section 5, and 141.52 to 474.75 from section 6
             less 2 feet, Survey 6.10
Station Elevation Data     num=      19
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    -565  2364.3        0  2362.8    34.54 2361.63   38.25 2360.12   39.21 2359.77
   40.09 2359.49    40.26  2359.9    58.57  2360.9   67.13 2362.94   84.22 2362.31
  102.55 2362.45   141.52 2363.11   189.72 2363.47  238.07 2363.82  287.23  2364.1
  340.52 2364.38   377.59 2364.73   426.74 2365.14  474.75 2365.71

Manning's n Values         num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
    -565     .03   34.54    .035   67.13     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.54   67.13             70    67.9      60             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -565   -56.8    2369       F
   67.13  474.75    2369       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2363.65    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.15    Wt. n-Val.                0.030      0.035
  W.S. Elev (ft)           2363.51    Reach Len. (ft)           70.00      67.90      60.00
  Crit W.S. (ft)           2362.01    Flow Area (sq ft)          1.01      87.72
  E.G. Slope (ft/ft)      0.001479    Area (sq ft)               1.01      87.72
  Q Total (cfs)             270.00    Flow (cfs)                 1.08     268.92
  Top Width (ft)             33.13    Top Width (ft)             0.54      32.59
  Vel Total (ft/s)            3.04    Avg. Vel. (ft/s)           1.07       3.07
  Max Chl Dpth (ft)           4.02    Hydr. Depth (ft)           1.87       2.69
  Conv. Total (cfs)         7020.4    Conv. (cfs)                28.0     6992.4
  Length Wtd. (ft)           67.90    Wetted Per. (ft)           2.40      34.10
  Min Ch El (ft)          2359.49    Shear (lb/sq ft)           0.04       0.24
  Alpha                       1.01    Stream Power (lb/ft s)     0.04       0.73
  Frctn Loss (ft)             0.11    Cum Volume (acre-ft)       1.62       9.25       2.10
  C & E Loss (ft)             0.01    Cum SA (acres)             0.41       3.90       1.05

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

LATERAL STRUCTURE


RIVER: Minnie Cr
REACH: Lower              RS: 6.22

INPUT
Description:
Lateral structure position     = Next ot left bank station
Distance from Upstream XS =      .1
Deck/Roadway Width        =     20
Weir Coefficient          =    1.5
Weir Flow Reference       = Energy Grade
 Weir Embankment Coordinates    num =       2
     Sta    Elev     Sta    Elev
       0  2362.8    67.7 2362.39

Weir crest shape                          = Broad Crested


LATERAL STRUCTURE OUTPUT  Profile #PF 2  Lat Struct

  E.G. US. (ft)            2363.65    Weir Sta US (ft)           0.00
  W.S. US. (ft)            2363.51    Weir Sta DS (ft)          67.70
  E.G. DS (ft)             2363.53    Weir Max Depth (ft)        1.14
  W.S. DS (ft)             2363.27    Weir Avg Depth (ft)        1.00
  Q US (cfs)                270.00    Weir Submerg               0.00
  Q Leaving Total (cfs)     101.54    Min El Weir Flow (ft)   2362.39
  Q DS (cfs)                270.00    Wr Top Wdth (ft)          67.70
  Perc Q Leaving             37.61    Q Gate Group (cfs)
  Q Weir (cfs)              101.54    Gate Open Ht (ft)
  Q Gates (cfs)                       Gate #Open
  Q Culv (cfs)                        Gate Area (sq ft)
  Q Lat RC (cfs)                      Gate Submerg
  Weir Flow Area (sq ft)     67.57    Gate Invert (ft)

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 6.2

INPUT
Description: add points 0 to 335.93 less 1 foot, and 494.24 to 874.75 from
             section 6 less 1 foot, survey 6.2
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2358.6   47.07 2359.17    94.6 2359.72  143.16 2360.27  191.66 2360.82
  240.34  2361.4  287.32 2361.83  335.93 2362.36   377.1  2361.7  419.12 2362.39
  424.17 2359.81  433.48 2359.54  438.15 2359.03  439.38  2358.5  440.06 2359.19
  442.98 2359.58  447.43 2362.95   448.2 2362.58  494.24 2363.69  541.52 2364.11
  589.72 2364.47  638.07 2364.82  687.23  2365.1  740.52 2365.38  777.59 2365.73
  826.74 2366.14  874.75 2366.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  419.12    .035  447.43     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         419.12  447.43            23.8      24    23.8             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     424 2366.39       T
     441  874.75    2366       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2363.53    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.27    Wt. n-Val.                          0.035
  W.S. Elev (ft)           2363.27    Reach Len. (ft)           2.10       2.10       2.10
  Crit W.S. (ft)           2361.43    Flow Area (sq ft)                   64.90
  E.G. Slope (ft/ft)      0.001668    Area (sq ft)                        91.70
  Q Total (cfs)             270.00    Flow (cfs)                         270.00
  Top Width (ft)             28.31    Top Width (ft)                      28.31
  Vel Total (ft/s)            4.16    Avg. Vel. (ft/s)                     4.16
  Max Chl Dpth (ft)           4.76    Hydr. Depth (ft)                     3.82
  Conv. Total (cfs)         6611.0    Conv. (cfs)                        6611.0
  Length Wtd. (ft)           2.10     Wetted Per. (ft)                    17.46
  Min Ch El (ft)          2358.50     Shear (lb/sq ft)                     0.39
  Alpha                       1.00    Stream Power (lb/ft s)               1.61
```

| | | | | |
|---|---|---|---|---|
| Frctn Loss (ft) | Cum Volume (acre-ft) | 1.61 | 9.11 | 2.10 |
| C & E Loss (ft) | Cum SA (acres) | 0.41 | 3.85 | 1.05 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

RIVER: Minnie Cr
REACH: Lower RS: 6.01

INPUT
Description:
Distance from Upstream XS = 2.1
Deck/Roadway Width = 19.9
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 22

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2359.6 | | 47.07 | 2360.17 | | 94.6 | 2360.72 | |
| 143.16 | 2361.27 | | 191.66 | 2361.82 | | 240.34 | 2362.4 | |
| 287.32 | 2362.83 | | 335.93 | 2363.36 | | 384.06 | 2363.75 | |
| 424.68 | 2364.19 | 2361.63 | 432.68 | 2364.28 | 2361.63 | 440.68 | 2364.29 | 2361.63 |
| 445.01 | 2364.3 | | 494.24 | 2364.69 | | 541.52 | 2365.11 | |
| 589.72 | 2365.47 | | 638.07 | 2365.82 | | 687.23 | 2366.1 | |
| 740.52 | 2366.38 | | 777.59 | 2366.73 | | 826.74 | 2367.14 | |
| 874.75 | 2367.71 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 27

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2358.6 | 47.07 | 2359.17 | 94.6 | 2359.72 | 143.16 | 2360.27 | 191.66 | 2360.82 |
| 240.34 | 2361.4 | 287.32 | 2361.83 | 335.93 | 2362.36 | 377.1 | 2361.7 | 419.12 | 2362.39 |
| 424.17 | 2359.81 | 433.48 | 2359.54 | 438.15 | 2359.03 | 439.38 | 2358.5 | 440.06 | 2359.19 |
| 442.98 | 2359.58 | 447.43 | 2362.95 | 448.2 | 2362.58 | 494.24 | 2363.69 | 541.52 | 2364.11 |
| 589.72 | 2364.47 | 638.07 | 2364.82 | 687.23 | 2365.1 | 740.52 | 2365.38 | 777.59 | 2365.73 |
| 826.74 | 2366.14 | 874.75 | 2366.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 419.12 | .035 | 447.43 | .03 |

Bank Sta: Left Right Coeff Contr. Expan.
419.12 447.43 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 424 | 2366.39 | T |
| 441 | 874.75 | 2366 | F |

Downstream Deck/Roadway Coordinates
num= 22

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2359.6 | | 47.07 | 2360.17 | | 94.6 | 2360.72 | |
| 143.16 | 2361.27 | | 191.66 | 2361.82 | | 240.34 | 2362.4 | |
| 287.32 | 2362.83 | | 335.93 | 2363.36 | | 384.06 | 2363.75 | |
| 424.68 | 2364.19 | 2361.63 | 432.68 | 2364.28 | 2361.63 | 440.68 | 2364.29 | 2361.63 |
| 445.01 | 2364.3 | | 494.24 | 2364.69 | | 541.52 | 2365.11 | |
| 589.72 | 2365.47 | | 638.07 | 2365.82 | | 687.23 | 2366.1 | |
| 740.52 | 2366.38 | | 777.59 | 2366.73 | | 826.74 | 2367.14 | |
| 874.75 | 2367.71 | | | | | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 27

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2358.6 | 47.07 | 2359.17 | 94.6 | 2359.72 | 143.16 | 2360.27 | 191.66 | 2360.82 |
| 240.34 | 2361.4 | 287.32 | 2361.83 | 335.93 | 2362.36 | 377.1 | 2362.7 | 419.12 | 2362.39 |
| 424.17 | 2359.81 | 433.48 | 2359.54 | 438.15 | 2359.03 | 439.38 | 2358.5 | 440.06 | 2359.19 |
| 442.98 | 2359.58 | 447.43 | 2362.95 | 448.2 | 2362.58 | 494.24 | 2363.69 | 541.52 | 2364.11 |
| 589.72 | 2364.47 | 638.07 | 2364.82 | 687.23 | 2365.1 | 740.52 | 2365.38 | 777.59 | 2365.73 |
| 826.74 | 2366.14 | 874.75 | 2366.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 419.12 | .035 | 447.43 | .03 |

Bank Sta: Left Right Coeff Contr. Expan.
419.12 447.43 .1 .3
Left Levee Station= 377.1 Elevation= 2362.7

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #PF 2

| | | | Inside BR US | Inside BR DS |
|---|---|---|---|---|
| E.G. US. (ft) | 2363.53 | Element | | |
| W.S. US. (ft) | 2363.27 | E.G. Elev (ft) | 2363.53 | 2362.42 |
| Q Total (cfs) | 270.00 | W.S. Elev (ft) | 2361.63 | 2361.63 |
| Q Bridge (cfs) | 270.00 | Crit W.S. (ft) | 2361.51 | 2361.50 |
| Q Weir (cfs) | | Max Chl Dpth (ft) | 3.13 | 3.13 |
| Weir Sta Lft (ft) | | Vel Total (ft/s) | 7.68 | 7.68 |
| Weir Sta Rgt (ft) | | Flow Area (sq ft) | 35.15 | 35.15 |
| Weir Submerg | | Froude # Chl | 0.91 | 0.91 |

| | | | | |
|---|---|---|---|---|
| Weir Max Depth (ft) | | Specif Force (cu ft) | 103.80 | 103.80 |
| Min El Weir Flow (ft) | 2364.19 | Hydr Depth (ft) | 11633.34 | 11633.34 |
| Min El Prs (ft) | 2361.63 | W.P. Total (ft) | 35.86 | 35.86 |
| Delta EG (ft) | 1.11 | Conv. Total (cfs) | 1472.2 | 1472.2 |
| Delta WS (ft) | 1.16 | Top Width (ft) | | |
| BR Open Area (sq ft) | 35.15 | Frctn Loss (ft) | | |
| BR Open Vel (ft/s) | 7.68 | C & E Loss (ft) | | |
| Coef of Q | | Shear Total (lb/sq ft) | 2.06 | 2.06 |
| Br Sel Method | Press Only | Power Total (lb/ft s) | 15.81 | 15.81 |

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 5.98

INPUT
Description: add 0 - 335.93 and 494.24 to 874.75 from section 6 less 1 feet, survey 6.2
Station Elevation Data num= 27

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2358.6 | 47.07 | 2359.17 | 94.6 | 2359.72 | 143.16 | 2360.27 | 191.66 | 2360.82 |
| 240.34 | 2361.4 | 287.32 | 2361.83 | 335.93 | 2362.36 | 377.1 | 2362.7 | 419.12 | 2362.39 |
| 424.17 | 2359.81 | 433.48 | 2359.54 | 438.15 | 2359.03 | 439.38 | 2358.5 | 440.06 | 2359.19 |
| 442.98 | 2359.58 | 447.43 | 2362.95 | 448.2 | 2362.58 | 494.24 | 2363.69 | 541.52 | 2364.11 |
| 589.72 | 2364.47 | 638.07 | 2364.82 | 687.23 | 2365.1 | 740.52 | 2365.38 | 777.59 | 2365.73 |
| 826.74 | 2366.14 | 874.75 | 2366.71 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 419.12 | .035 | 447.43 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 419.12 | 447.43 | 96.89 | 108.5 | 113.2 | .1 | .3 |

Left Levee Station= 377.1 Elevation= 2362.7

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2362.42 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.32 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2362.10 | Reach Len. (ft) | 96.89 | 108.50 | 113.20 |
| Crit W.S. (ft) | 2361.25 | Flow Area (sq ft) | | 59.34 | |
| E.G. Slope (ft/ft) | 0.004317 | Area (sq ft) | | 59.34 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 26.63 | Top Width (ft) | | 26.63 | |
| Vel Total (ft/s) | 4.55 | Avg. Vel. (ft/s) | | 4.55 | |
| Max Chl Dpth (ft) | 3.60 | Hydr. Depth (ft) | | 2.23 | |
| Conv. Total (cfs) | 4109.5 | Conv. (cfs) | | 4109.5 | |
| Length Wtd. (ft) | 108.50 | Wetted Per. (ft) | | 28.48 | |
| Min Ch El (ft) | 2358.50 | Shear (lb/sq ft) | | 0.56 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 2.55 | |
| Frctn Loss (ft) | 0.64 | Cum Volume (acre-ft) | 1.61 | 9.09 | 2.10 |
| C & E Loss (ft) | 0.02 | Cum SA (acres) | 0.41 | 3.85 | 1.05 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 5.9

INPUT
Description: added point -507.27 from section 5 point 234 and -170 and -430 from 2 foot contour map, Survey 6.3
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -507.27 | 2360.28 | -430 | 2362 | -170 | 2362 | 0 | 2360.5 | 41.56 | 2360.06 |
| 46.58 | 2358.98 | 51.45 | 2358.73 | 52.14 | 2358.06 | 54.51 | 2357.5 | 55.82 | 2357.99 |
| 56.52 | 2359.03 | 62.86 | 2360.57 | 101 | 2362.75 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -507.27 | .03 | 41.56 | .035 | 62.86 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 41.56 | 62.86 | 704 | 706.3 | 705 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -507.27 | -36.44 | 2362 | F |

Left Levee Station= -170 Elevation= 2362

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2361.76 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.55 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2361.22 | Reach Len. (ft) | 704.00 | 706.30 | 705.00 |
| Crit W.S. (ft) | 2360.78 | Flow Area (sq ft) | | 45.57 | |
| E.G. Slope (ft/ft) | 0.008465 | Area (sq ft) | | 45.57 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 21.30 | Top Width (ft) | | 21.30 | |
| Vel Total (ft/s) | 5.93 | Avg. Vel. (ft/s) | | 5.93 | |
| Max Chl Dpth (ft) | 3.72 | Hydr. Depth (ft) | | 2.14 | |
| Conv. Total (cfs) | 2934.5 | Conv. (cfs) | | 2934.5 | |
| Length Wtd. (ft) | 706.30 | Wetted Per. (ft) | | 24.39 | |
| Min Ch El (ft) | 2357.50 | Shear (lb/sq ft) | | 0.99 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 5.85 | |
| Frctn Loss (ft) | 4.62 | Cum Volume (acre-ft) | 1.61 | 8.96 | 2.10 |
| C & E Loss (ft) | 0.10 | Cum SA (acres) | 0.41 | 3.79 | 1.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 5

INPUT
Description: RR is 196.13 and 201.05
Station Elevation Data num= 57

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2362.3 | 52.47 | 2362.61 | 101.29 | 2362.58 | 139.24 | 2362.82 | 164.02 | 2364.07 |
| 170.56 | 2364.3 | 175.71 | 2363.58 | 189.14 | 2357.25 | 191.99 | 2357.16 | 193.43 | 2357.52 |
| 196.13 | 2358.2 | 201.05 | 2358.12 | 203.41 | 2357.41 | 208.95 | 2356.06 | 218.43 | 2355.5 |
| 222.52 | 2357.1 | 225.47 | 2356.21 | 248.57 | 2360.01 | 252.67 | 2360.02 | 299.78 | 2360.28 |
| 348.57 | 2361.3 | 396.19 | 2360.48 | 443.88 | 2360.2 | 489.52 | 2359.4 | 538.97 | 2359.1 |
| 586.56 | 2358.9 | 623.61 | 2359.3 | 631.58 | 2357.27 | 665.17 | 2356.41 | 711.1 | 2355.51 |
| 716.8 | 2354.7 | 717.56 | 2353.88 | 718.02 | 2353.58 | 718.85 | 2353.35 | 720.66 | 2353.51 |
| 721.17 | 2354 | 721.52 | 2354.58 | 723.91 | 2355.15 | 729.08 | 2357.49 | 752.87 | 2357.81 |
| 796.13 | 2359.4 | 809.84 | 2359.9 | 831.34 | 2359.95 | 852.73 | 2359.8 | 857.16 | 2359.45 |
| 897.59 | 2359.9 | 912.77 | 2359.94 | 921.15 | 2360.36 | 936.05 | 2359.57 | 948.07 | 2359.32 |
| 965.89 | 2359.2 | 1006.7 | 2360.02 | 1021.39 | 2366.07 | 1026.43 | 2365.91 | 1061.1 | 2366.19 |
| 1097.53 | 2365.4 | 1106.36 | 2365.26 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 711.1 | .035 | 729.08 | .04 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
631.58 729.08 225.5 233.78 238.83 .1 .3
Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 348.57 | 2361.3 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2357.03 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.20 | Wt. n-Val. | | 0.033 | |
| W.S. Elev (ft) | 2356.83 | Reach Len. (ft) | 225.50 | 233.78 | 238.83 |
| Crit W.S. (ft) | 2356.53 | Flow Area (sq ft) | | 76.07 | |
| E.G. Slope (ft/ft) | 0.005213 | Area (sq ft) | | 76.07 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 78.99 | Top Width (ft) | | 78.99 | |
| Vel Total (ft/s) | 3.55 | Avg. Vel. (ft/s) | | 3.55 | |
| Max Chl Dpth (ft) | 3.48 | Hydr. Depth (ft) | | 0.96 | |
| Conv. Total (cfs) | 3739.5 | Conv. (cfs) | | 3739.5 | |
| Length Wtd. (ft) | 233.78 | Wetted Per. (ft) | | 80.50 | |
| Min Ch El (ft) | 2353.35 | Shear (lb/sq ft) | | 0.31 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.09 | |
| Frctn Loss (ft) | 1.21 | Cum Volume (acre-ft) | 1.61 | 7.97 | 2.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 2.97 | 1.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.875*

INPUT
Description:
Station Elevation Data num= 35

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 180.81 | 2361.13 | 240.77 | 2360.12 | 300.82 | 2359.55 | 358.29 | 2358.57 | 420.56 | 2357.98 |
| 480.49 | 2357.48 | 505.07 | 2357.53 | 527.14 | 2357.56 | 533.98 | 2355.84 | 562.8 | 2354.98 |
| 602.2 | 2354.03 | 607.09 | 2353.33 | 607.74 | 2352.64 | 608.14 | 2352.39 | 608.85 | 2352.2 |
| 610.51 | 2352.34 | 610.98 | 2352.76 | 611.3 | 2353.24 | 613.49 | 2353.74 | 618.22 | 2355.73 |
| 619.06 | 2355.75 | 640 | 2356.54 | 677.56 | 2357.9 | 689.46 | 2358.33 | 708.13 | 2358.39 |
| 726.7 | 2358.28 | 730.54 | 2357.99 | 765.64 | 2358.4 | 778.82 | 2358.45 | 782.57 | 2358.63 |
| 786.09 | 2358.81 | 799.03 | 2358.19 | 809.46 | 2358.01 | 824.93 | 2357.96 | 860.36 | 2358.74 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 180.81 | .035 | 527.14 | .035 | 607.09 | .035 | 640 | .038 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
533.98 618.22 225.5 233.78 238.83 .1 .3
Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 180.81 | 294.65 | 832360.083 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2355.81 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.16 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2355.65 | Reach Len. (ft) | 225.50 | 233.78 | 238.83 |
| Crit W.S. (ft) | 2355.18 | Flow Area (sq ft) | | 84.86 | |
| E.G. Slope (ft/ft) | 0.005117 | Area (sq ft) | | 84.86 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 77.79 | Top Width (ft) | | 77.79 | |
| Vel Total (ft/s) | 3.18 | Avg. Vel. (ft/s) | | 3.18 | |
| Max Chl Dpth (ft) | 3.45 | Hydr. Depth (ft) | | 1.09 | |
| Conv. Total (cfs) | 3774.6 | Conv. (cfs) | | 3774.6 | |
| Length Wtd. (ft) | 233.78 | Wetted Per. (ft) | | 79.12 | |
| Min Ch El (ft) | 2352.20 | Shear (lb/sq ft) | | 0.34 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 1.09 | |
| Frctn Loss (ft) | 1.36 | Cum Volume (acre-ft) | 1.61 | 7.54 | 2.10 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.41 | 2.55 | 1.05 |

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or smaller than the smallest entered n value.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.75*

```
INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   13.05 2360.96   85.35 2359.76  157.77 2358.91  227.07 2357.74  302.15 2356.86
  374.41 2356.07  404.05 2355.94  430.67 2355.83  436.38 2354.41  460.42 2353.54
  493.31 2352.55  497.39 2351.96  497.93  2351.4  498.26  2351.2  498.85 2351.04
  500.36 2351.18  500.78 2351.51  501.07 2351.91  503.06 2352.33  507.36 2353.98
  508.12    2354  527.14 2355.27  558.99  2356.4  569.08 2356.76  584.91 2356.83
  600.66 2356.76  603.92 2356.53  633.69  2356.9  644.87 2356.95  648.05  2357.1
  651.04 2357.26  662.01 2356.81  670.86  2356.7  683.98 2356.71  714.02 2357.46

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   13.05    .035  430.67    .035  497.39    .035  527.14    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        436.38  507.36            225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   13.05240.74672358.867       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2354.44    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.21    Wt. n-Val.                            0.035      0.035
  W.S. Elev (ft)           2354.23    Reach Len. (ft)            225.50    233.78     238.83
  Crit W.S. (ft)           2353.85    Flow Area (sq ft)                     73.10       0.57
  E.G. Slope (ft/ft)      0.006712    Area (sq ft)                          73.10       0.57
  Q Total (cfs)             270.00    Flow (cfs)                           269.48       0.52
  Top Width (ft)             70.11    Top Width (ft)                        65.94       4.17
  Vel Total (ft/s)            3.67    Avg. Vel. (ft/s)                       3.69       0.92
  Max Chl Dpth (ft)           3.19    Hydr. Depth (ft)                       1.11       0.14
  Conv. Total (cfs)         3295.5    Conv. (cfs)                          3289.2        6.4
  Length Wtd. (ft)          233.78    Wetted Per. (ft)                      67.00       4.18
  Min Ch El (ft)           2351.04    Shear (lb/sq ft)                       0.46       0.06
  Alpha                       1.01    Stream Power (lb/ft s)                 1.69       0.05
  Frctn Loss (ft)             0.53    Cum Volume (acre-ft)        1.61       7.11       2.09
  C & E Loss (ft)             0.04    Cum SA (acres)              0.41       2.17       1.04

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The composite Mannings n value for the channel was larger than the largest entered n value or
         smaller than the smallest entered n value.
Note:    Manning's n values were composited to a single value in the main channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.625*

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -154.71 2360.79  -70.07 2359.39   14.71 2358.26   95.84 2356.92  183.74 2355.74
  268.34 2354.65  303.04 2354.36   334.2 2354.09  338.77 2352.98  358.05 2352.11
  384.41 2351.07  387.68 2350.59  388.11 2350.17  388.38 2350.01  388.85 2349.89
  390.21 2350.01  390.59 2350.27  390.85 2350.57  392.64 2350.92   396.5 2352.22
  397.19 2352.25  414.27    2354  440.42  2354.9   448.7 2355.19   461.7 2355.26
  474.63 2355.24   477.3 2355.08  501.74  2355.4  510.91 2355.46  513.53 2355.58
  515.98 2355.71  524.98 2355.43  532.25 2355.39  543.02 2355.47  567.69 2356.19

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 -154.71    .035   334.2    .035  388.85    .035  414.27    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         334.2  414.27            225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 -154.71 186.835 2357.65       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2353.87    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.06    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2353.80    Reach Len. (ft)            225.50    233.78     238.83
  Crit W.S. (ft)           2352.56    Flow Area (sq ft)                    132.20
  E.G. Slope (ft/ft)      0.001129    Area (sq ft)                         132.20
  Q Total (cfs)             270.00    Flow (cfs)                           270.00
  Top Width (ft)             76.92    Top Width (ft)                        76.92
  Vel Total (ft/s)            2.04    Avg. Vel. (ft/s)                       2.04
  Max Chl Dpth (ft)           3.91    Hydr. Depth (ft)                       1.72
  Conv. Total (cfs)         8035.8    Conv. (cfs)                          8035.8
  Length Wtd. (ft)          233.75    Wetted Per. (ft)                      77.87
  Min Ch El (ft)           2349.89    Shear (lb/sq ft)                       0.12
  Alpha                       1.00    Stream Power (lb/ft s)                 0.24
  Frctn Loss (ft)             0.11    Cum Volume (acre-ft)        1.61       6.56       2.09
  C & E Loss (ft)             0.01    Cum SA (acres)              0.41       1.78       1.03

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.5*

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -322.48 2360.62 -225.48 2359.03 -128.35 2357.62  -35.39 2356.09   65.33 2354.62
  162.27 2353.24  202.03 2352.77  237.73 2352.36  241.17 2351.55  255.68 2350.68
  275.51 2349.58  277.97 2349.22   278.3 2348.93   278.5 2348.82  278.86 2348.73
  280.06 2348.85  280.39 2349.03  280.63 2349.23  282.21 2349.51  285.64 2350.46
  286.25  2350.5   301.4 2352.73  321.85  2353.4  328.32 2353.61  338.48  2353.7
  348.59 2353.72  350.68 2353.62  369.79  2353.9  376.96 2353.97     379 2354.05
  380.92 2354.16  387.96 2354.05  393.64 2354.09  402.06 2354.22  421.35 2354.91
```

```
  428.29 2357.07  430.67 2357.07  447.05 2357.51  464.27 2357.62  468.44 2357.66

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 -322.48    .035  237.73    .035  282.21    .035   301.4    .033  468.44    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        237.73   301.4             225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 -322.48132.92332356.433       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2353.75    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.03    Wt. n-Val.                  0.035      0.035      0.033
  W.S. Elev (ft)           2353.72    Reach Len. (ft)            225.50     233.78     238.83
  Crit W.S. (ft)           2351.28    Flow Area (sq ft)            4.99     192.07       3.35
  E.G. Slope (ft/ft)      0.000241    Area (sq ft)                 4.99     192.07       3.35
  Q Total (cfs)             270.00    Flow (cfs)                   3.27     264.80       1.93
  Top Width (ft)             71.00    Top Width (ft)               3.73      63.67       3.60
  Vel Total (ft/s)            1.35    Avg. Vel. (ft/s)             0.65       1.38       0.58
  Max Chl Dpth (ft)           4.99    Hydr. Depth (ft)             1.34       3.02       0.93
  Conv. Total (cfs)        17382.0    Conv. (cfs)                 210.3    17047.4      124.3
  Length Wtd. (ft)          233.73    Wetted Per. (ft)             5.05      64.44       4.47
  Min Ch El (ft)           2348.73    Shear (lb/sq ft)             0.01       0.04       0.01
  Alpha                       1.03    Stream Power (lb/ft s)       0.01       0.06       0.01
  Frctn Loss (ft)             0.04    Cum Volume (acre-ft)         1.60       5.69       2.08
  C & E Loss (ft)             0.00    Cum SA (acres)               0.40       1.41       1.02

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.375*

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -548.33 2360.62 -539.59 2360.67 -531.45 2360.66 -525.13  2360.7    -521 2360.91
 -519.91 2360.95 -519.05 2360.83 -516.81 2359.78 -516.34 2359.76  -516.1 2359.82
 -515.65 2359.93 -514.83 2359.92 -514.43  2359.8 -513.51 2359.58 -511.93 2359.48
 -511.25 2359.75 -510.76  2359.6  -506.9 2360.24 -506.22 2360.24 -498.37 2360.28
 -490.24 2360.45  -380.9 2358.67  -271.4 2356.97 -166.61 2355.26  -53.08  2353.5
   56.19 2351.82  101.01 2351.19  141.26 2350.62  143.57 2350.11   153.3 2349.24
  166.61  2348.1  168.26 2347.84  168.48 2347.69  168.62 2347.63  168.86 2347.57
  169.91 2347.68   170.2 2347.78   170.4  2347.9  171.79 2348.09  174.78 2348.71
  175.31 2348.75  188.54 2351.46  203.27  2351.9  207.94 2352.04  215.27 2352.14
  222.56  2352.2  224.07 2352.16  237.84  2352.4  243.01 2352.47  244.48 2352.53
  245.86 2352.61  250.94 2352.67  255.04 2352.78  261.11 2352.98  275.01 2353.63
  280.01 2354.83  281.73 2354.86  293.54 2355.35  305.95 2355.67  308.96 2355.76

Manning's n Values          num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 -548.33     .03  141.26    .035  174.78    .035  188.54    .032  308.96    .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        141.26  188.54             225.5  233.78  238.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 -548.3379.01167    2360       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2353.71    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.02    Wt. n-Val.                  0.030      0.035      0.032
  W.S. Elev (ft)           2353.68    Reach Len. (ft)            225.50     233.78     238.83
  Crit W.S. (ft)           2350.08    Flow Area (sq ft)            3.85     209.33       3.21
  E.G. Slope (ft/ft)      0.000124    Area (sq ft)                 3.85     209.33       3.21
  Q Total (cfs)             270.00    Flow (cfs)                   1.97     266.50       1.53
  Top Width (ft)             50.00    Top Width (ft)               1.26      47.28       1.46
  Vel Total (ft/s)            1.25    Avg. Vel. (ft/s)             0.51       1.27       0.48
  Max Chl Dpth (ft)           6.11    Hydr. Depth (ft)             3.05       4.43       2.20
  Conv. Total (cfs)        24253.1    Conv. (cfs)                 176.8    23939.0      137.3
  Length Wtd. (ft)          232.90    Wetted Per. (ft)             4.31      47.92       3.64
  Min Ch El (ft)           2347.57    Shear (lb/sq ft)             0.01       0.03       0.01
  Alpha                       1.03    Stream Power (lb/ft s)       0.00       0.04       0.00
  Frctn Loss (ft)             0.02    Cum Volume (acre-ft)         1.58       4.62       2.06
  C & E Loss (ft)             0.00    Cum SA (acres)               0.39       1.11       1.01

Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: Minnie Cr
REACH: Lower              RS: 4.25

INPUT
Description: -658 added from section 5 point 234, and 149.48 estimate from top
             of railroad and photo , copy of Survey 4.10
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -658 2360.28       0  2349.6   44.79 2348.89   58.86 2346.42   64.37    2347
   75.67 2350.19  109.96    2351  149.48 2353.86

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -658     .03   44.79    .035   75.67     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         44.79   75.67             47.12    52.1   51.65             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -658    25.1    2358       F
    75.4  149.48    2358       F

CROSS SECTION OUTPUT  Profile #PF 2

  E.G. Elev (ft)           2353.68    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.02    Wt. n-Val.                  0.030      0.035
```

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 2353.66 | Reach Len. (ft) | 47.12 | 52.10 | 51.65 |
| Crit W.S. (ft) | 2349.13 | Flow Area (sq ft) | 57.06 | 179.18 | |
| E.G. Slope (ft/ft) | 0.000077 | Area (sq ft) | 57.06 | 180.12 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | 56.13 | 213.87 | |
| Top Width (ft) | 43.08 | Top Width (ft) | 12.20 | 30.88 | |
| Vel Total (ft/s) | 1.14 | Avg. Vel. (ft/s) | 0.98 | 1.19 | |
| Max Chl Dpth (ft) | 7.24 | Hydr. Depth (ft) | 4.68 | 5.85 | |
| Conv. Total (cfs) | 30739.1 | Conv. (cfs) | 6389.9 | 24349.3 | |
| Length Wtd. (ft) | 51.52 | Wetted Per. (ft) | 16.78 | 31.29 | |
| Min Ch El (ft) | 2346.42 | Shear (lb/sq ft) | 0.02 | 0.03 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.02 | 0.03 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.42 | 3.57 | 2.06 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.36 | 0.90 | 1.00 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

LATERAL STRUCTURE

RIVER: Minnie Cr
REACH: Lower RS: 4.22

INPUT
Description:
Lateral structure position = Right overbank
Distance from Upstream XS = .1
Deck/Roadway Width = 20
Weir Coefficient = 1.5
Weir Flow Reference = Energy Grade
Weir Embankment Coordinates num = 3

| Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|
| 0 | 2353.86 | 40 | 2352 | 51.5 | 2352 |

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #PF 2 Lat Struct

| | | | |
|---|---|---|---|
| E.G. US. (ft) | 2353.68 | Weir Sta US (ft) | 3.80 |
| W.S. US. (ft) | 2353.66 | Weir Sta DS (ft) | 51.50 |
| E.G. DS (ft) | 2353.68 | Weir Max Depth (ft) | 1.68 |
| W.S. DS (ft) | 2353.62 | Weir Avg Depth (ft) | 1.04 |
| Q US (cfs) | 270.00 | Weir Submerg | 0.00 |
| Q Leaving Total (cfs) | 84.57 | Min El Weir Flow (ft) | 2352.00 |
| Q DS (cfs) | 270.00 | Wr Top Wdth (ft) | 47.70 |
| Perc Q Leaving | 31.32 | Q Gate Group (cfs) | |
| Q Weir (cfs) | 84.57 | Gate Open Ht (ft) | |
| Q Gates (cfs) | | Gate #Open | |
| Q Culv (cfs) | | Gate Area (sq ft) | |
| Q Lat RC (cfs) | | Gate Submerg | |
| Weir Flow Area (sq ft) | 49.62 | Gate Invert (ft) | |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 4.2

INPUT
Description: stations 0 to 426.44, and 575.43 to 900.78 taken from top of railroad
Station Elevation Data num= 29

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | 47.02 | 2355.63 | 95.07 | 2355.21 | 141.6 | 2354.76 | 187.98 | 2354.45 |
| 235.86 | 2354.1 | 282.32 | 2353.76 | 329.24 | 2353.51 | 376.4 | 2353.18 | 426.44 | 2352.82 |
| 466.15 | 2348.1 | 502.52 | 2349.06 | 513.84 | 2346.47 | 515.6 | 2346.2 | 516.41 | 2346.03 |
| 517.4 | 2346.4 | 518.05 | 2346.71 | 523.74 | 2346.87 | 526.64 | 2349.75 | 572.2 | 2350.21 |
| 575.43 | 2352 | 622.9 | 2351.86 | 669.54 | 2351.8 | 716.49 | 2351.32 | 763.87 | 2350.94 |
| 779.52 | 2351.01 | 820.44 | 2350.7 | 856.64 | 2350.4 | 900.78 | 2349.8 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 502.52 | .035 | 526.64 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 502.52 | 526.64 | 22.24 | 22 | 22.24 | .1 | .3 |

Ineffective Flow num= 4

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 426.44 | 506.3 | 2352 | T |
| 526 | 575.43 | 2352 | T |
| 0 | 426.43 | 2356 | F |
| 575.44 | 900.78 | 2356 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2353.68 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2353.62 | Reach Len. (ft) | 1.80 | 1.80 | 1.80 |
| Crit W.S. (ft) | 2348.84 | Flow Area (sq ft) | 9.74 | 137.03 | 9.74 |
| E.G. Slope (ft/ft) | 0.000210 | Area (sq ft) | 27.85 | 151.43 | 23.05 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 6.54 | 256.51 | 6.94 |
| Top Width (ft) | 36.12 | Top Width (ft) | 6.00 | 24.12 | 6.00 |
| Vel Total (ft/s) | 1.73 | Avg. Vel. (ft/s) | 0.67 | 1.87 | 0.71 |
| Max Chl Dpth (ft) | 7.59 | Hydr. Depth (ft) | 1.62 | 5.68 | 1.62 |
| Conv. Total (cfs) | 18652.9 | Conv. (cfs) | 452.1 | 17721.1 | 479.7 |
| Length Wtd. (ft) | 1.80 | Wetted Per. (ft) | 10.72 | 25.78 | 9.81 |
| Min Ch El (ft) | 2346.03 | Shear (lb/sq ft) | 0.01 | 0.07 | 0.01 |
| Alpha | 1.13 | Stream Power (lb/ft s) | 0.01 | 0.13 | 0.01 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.38 | 3.37 | 2.04 |
| C & E Loss (ft) | | Cum SA (acres) | 0.35 | 0.87 | 1.00 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

```
RIVER: Minnie Cr
REACH: Lower              RS: 4.01

INPUT
Description:
Distance from Upstream XS =     1.8
Deck/Roadway Width        =    18.8
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      24
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2356.2            47.02 2355.63           95.07 2355.21
   141.6 2354.76           187.98 2354.45          235.86  2354.1
  282.32 2353.76           329.24 2353.51           376.4 2353.18
  426.44 2352.82           473.75  2352.5          509.75 2352.44 2347.99
  520.02 2352.43 2347.99   523.75 2352.36 2347.99  535.32 2352.24
  575.43    2352            622.9 2351.86          669.54  2351.8
  716.49 2351.32           763.87 2350.94          779.52 2351.01
  820.44  2350.7           856.64  2350.4          900.78  2349.8

Upstream Bridge Cross Section Data
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2356.2   47.02 2355.63   95.07 2355.21   141.6 2354.76  187.98 2354.45
  235.86  2354.1  282.32 2353.76  329.24 2353.51   376.4 2353.18  426.44 2352.82
  466.15  2348.1  502.52 2349.06  513.84 2346.47   515.6  2346.2  516.41 2346.03
   517.4  2346.4  518.05 2346.71  523.74 2346.87  526.64 2349.75   572.2 2350.21
  575.43    2352   622.9 2351.86  669.54  2351.8  716.49 2351.32  763.87 2350.94
  779.52 2351.01  820.44  2350.7  856.64  2350.4  900.78  2349.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  502.52    .035  526.64     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        502.52  526.64          .1        .3
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
  426.44   506.3    2352       T
     526  575.43    2352       T
       0  426.43    2356       F
  575.44  900.78    2356       F

Downstream  Deck/Roadway Coordinates
    num=      24
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  2356.2            47.02 2355.63           95.07 2355.21
   141.6 2354.76           187.98 2354.45          235.86  2354.1
  282.32 2353.76           329.24 2353.51           376.4 2353.18
  426.44 2352.82           473.75  2352.5          509.75 2352.44 2347.99
  520.02 2352.43 2347.99   523.75 2352.36 2347.99  535.32 2352.24
  575.43    2352            622.9 2351.86          669.54  2351.8
  716.49 2351.32           763.87 2350.94          779.52 2351.01
  820.44  2350.7           856.64  2350.4          900.78  2349.8

Downstream Bridge Cross Section Data
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2356.2   47.02 2355.63   95.07 2355.21   141.6 2354.76  187.98 2354.45
  235.86  2354.1  282.32 2353.76  329.24 2353.51   376.4 2353.18  426.44 2352.82
  466.15  2348.1  502.52 2349.06  513.84 2346.47   515.6  2346.2  516.41 2346.03
   517.4  2346.4  518.05 2346.71  523.74 2346.87  526.64 2349.75   572.2 2350.21
  575.43    2352   622.9 2351.86  669.54  2351.8  716.49 2351.32  763.87 2350.94
  779.52 2351.01  820.44  2350.7  856.64  2350.4  900.78  2349.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  502.52    .035  526.64     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        502.52  526.64          .1        .3
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
  426.44   506.3    2352       T
     526  575.43    2352       T
       0  426.43    2354       F
  575.44  900.78    2354       F

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =    .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 2

  E.G. US. (ft)              2353.68    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)              2353.62    E.G. Elev (ft)             2353.68       2353.65
  Q Total (cfs)               270.00    W.S. Elev (ft)             2353.62       2353.12
  Q Bridge (cfs)              136.44    Crit W.S. (ft)             2353.11       2353.04
  Q Weir (cfs)                133.56    Max Chl Dpth (ft)             7.59          7.09
  Weir Sta Lft (ft)           496.52    Vel Total (ft/s)              4.35          5.74
  Weir Sta Rgt (ft)           532.64    Flow Area (sq ft)            62.04         47.04
  Weir Submerg                  0.00    Froude # Chl                  0.29          0.40
  Weir Max Depth (ft)           1.41    Specif Force (cu ft)        179.11        166.38
  Min El Weir Flow (ft)      2352.28    Hydr Depth (ft)               1.72          1.23
  Min El Prs (ft)            2347.99    W.P. Total (ft)              68.62         69.68
```

| | | | | |
|---|---|---|---|---|
| Delta EG (ft) | 1.26 | Conv. Total (cfs) | | |
| Delta WS (ft) | 1.31 | Top Width (ft) | 36.12 | 38.12 |
| BR Open Area (sq ft) | 18.27 | Frctn Loss (ft) | | |
| BR Open Vel (ft/s) | 7.47 | C & E Loss (ft) | | |
| Coef of Q | | Shear Total (lb/sq ft) | | |
| Br Sel Method | Press/Weir | Power Total (lb/ft s) | | |

Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was used for pressure flow.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.98

INPUT
Description: stations 0 to 426.44, and 575.43 to 900.78 taken from top of railroad, survey 4.2
Station Elevation Data num= 29

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2356.2 | 47.02 | 2355.63 | 95.07 | 2355.21 | 141.6 | 2354.76 | 187.98 | 2354.45 |
| 235.86 | 2354.1 | 282.32 | 2353.76 | 329.24 | 2353.51 | 376.4 | 2353.18 | 426.44 | 2352.82 |
| 466.15 | 2348.1 | 502.52 | 2349.06 | 513.84 | 2346.47 | 515.6 | 2346.2 | 516.41 | 2346.03 |
| 517.4 | 2346.4 | 518.05 | 2346.71 | 523.74 | 2346.87 | 526.64 | 2349.75 | 572.2 | 2350.21 |
| 575.43 | 2352 | 622.9 | 2351.86 | 669.54 | 2351.8 | 716.49 | 2351.32 | 763.87 | 2350.94 |
| 779.52 | 2351.01 | 820.44 | 2350.7 | 856.64 | 2350.4 | 900.78 | 2349.8 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 502.52 | .035 | 526.64 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 502.52 | 526.64 | 38.55 | 34.2 | 36.87 | .1 | .3 |

Ineffective Flow num= 4

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 426.44 | 506.3 | 2352 | T |
| 526 | 575.43 | 2352 | T |
| 0 | 426.43 | 2354 | F |
| 575.44 | 900.78 | 2354 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.41 | Element | | | |
| Vel Head (ft) | 0.10 | Wt. n-Val. | | 0.035 | 0.030 |
| W.S. Elev (ft) | 2352.32 | Reach Len. (ft) | 38.55 | 34.20 | 36.87 |
| Crit W.S. (ft) | 2348.82 | Flow Area (sq ft) | | 105.50 | 4.41 |
| E.G. Slope (ft/ft) | 0.000640 | Area (sq ft) | | 119.89 | 34.92 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 267.70 | 2.30 |
| Top Width (ft) | 38.12 | Top Width (ft) | | 24.12 | 14.00 |
| Vel Total (ft/s) | 2.46 | Avg. Vel. (ft/s) | | 2.54 | 0.52 |
| Max Chl Dpth (ft) | 6.28 | Hydr. Depth (ft) | | 4.37 | 0.31 |
| Conv. Total (cfs) | 10676.8 | Conv. (cfs) | | 10586.0 | 90.9 |
| Length Wtd. (ft) | 34.63 | Wetted Per. (ft) | | 29.03 | 16.42 |
| Min Ch El (ft) | 2346.03 | Shear (lb/sq ft) | | 0.15 | 0.01 |
| Alpha | 1.06 | Stream Power (lb/ft s) | | 0.37 | 0.01 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.37 | 3.35 | 2.04 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.34 | 0.85 | 0.99 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.55

INPUT
Description: added point -325.77 from quad, 120 from section 4.0 point 246, and 218.5 from section 3 point 5024, Survey 3.12
Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -325.77 | 2360 | 0 | 2350.7 | 29.25 | 2349.32 | 33.49 | 2347.33 | 35.59 | 2346.2 |
| 37.93 | 2346.2 | 39.82 | 2346.2 | 40.4 | 2346.49 | 48.92 | 2349 | 71.41 | 2349.29 |
| 120 | 2352 | 218.5 | 2351.77 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -325.77 | .03 | 29.25 | .035 | 48.92 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 29.25 | 48.92 | 30.9 | 30.9 | 30.9 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -325.77 | 15.6 | 2355 | F |
| 62.6 | 218.5 | 2355 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.39 | Element | | | |
| Vel Head (ft) | 0.05 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2352.33 | Reach Len. (ft) | 30.90 | 30.90 | 30.90 |
| Crit W.S. (ft) | 2349.38 | Flow Area (sq ft) | 4.20 | 97.17 | 44.37 |
| E.G. Slope (ft/ft) | 0.000267 | Area (sq ft) | 4.20 | 97.17 | 51.66 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 3.31 | 188.06 | 78.63 |
| Top Width (ft) | 37.08 | Top Width (ft) | 1.41 | 19.67 | 16.00 |
| Vel Total (ft/s) | 1.85 | Avg. Vel. (ft/s) | 0.79 | 1.94 | 1.77 |
| Max Chl Dpth (ft) | 6.13 | Hydr. Depth (ft) | 2.98 | 4.94 | 3.24 |
| Conv. Total (cfs) | 16537.4 | Conv. (cfs) | 203.0 | 11518.3 | 4816.0 |
| Length Wtd. (ft) | 30.90 | Wetted Per. (ft) | 4.36 | 20.83 | 13.68 |
| Min Ch El (ft) | 2346.20 | Shear (lb/sq ft) | 0.02 | 0.08 | 0.05 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.01 | 0.15 | 0.10 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 1.37 | 3.26 | 2.00 |
| C & E Loss (ft) | | Cum SA (acres) | 0.34 | 0.84 | 0.98 |

```
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         energy was used.

CULVERT


RIVER: Minnie Cr
REACH: Lower              RS: 3.5

INPUT
Description:
Distance from Upstream XS =     2.3
Deck/Roadway Width        =    27.7
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        4
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2350.2            37.26 2349.38            70.42 2350.29
     120    2352

Upstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -325.77    2360       0  2350.7   29.25 2349.32   33.49 2347.33   35.59  2346.2
   37.93  2346.2   39.82  2346.2    40.4 2346.49   48.92    2349   71.41 2349.29
     120    2352   218.5 2351.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -325.77     .03   29.25    .035   48.92     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
         29.25   48.92            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -325.77    15.6    2355       F
    62.6   218.5    2355       F

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2350.2            37.26 2349.38            70.42 2350.29
     110    2352

Downstream Bridge Cross Section Data
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -334.12    2360      -2  2350.7   27.25 2349.32   31.49 2347.33   33.59  2345.8
   35.93  2345.8   37.82  2345.8    38.4 2346.49   46.92    2349   69.41 2349.29
     110    2352  201.49    2352

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -334.12    .035   27.25     .04   46.92    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         27.25   46.92            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -334.12     3.2                F
    70.9  201.49                F

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =    .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  2

Culvert Name     Shape      Rise    Span
culv@3.5       Circular     2.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                2.3    27.7     .024     .024        0                .9                 1
Upstream   Elevation =  2346.2
           Centerline Station =  36.9
Downstream Elevation =  2345.8
           Centerline Station =  37.2

Culvert Name     Shape      Rise    Span
culv@3.5a      Circular     2.5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                2.3    27.7     .024     .024        0                .9                 1
Upstream   Elevation =  2346.2
           Centerline Station =  39.5
Downstream Elevation =  2345.8
           Centerline Station =  34.6

CULVERT OUTPUT  Profile #PF 2  Culv Group:  culv@3.5

  Q Culv Group (cfs)          7.34    Culv Full Len (ft)        27.70
  # Barrels                      1    Culv Vel US (ft/s)         1.49
  Q Barrel (cfs)              7.34    Culv Vel DS (ft/s)         1.49
  E.G. US. (ft)           2352.39    Culv Inv El Up (ft)     2346.20
  W.S. US. (ft)           2352.33    Culv Inv El Dn (ft)     2345.80
  E.G. DS (ft)            2352.33    Culv Frctn Ls (ft)         0.03
  W.S. DS (ft)            2352.27    Culv Exit Loss (ft)
  Delta EG (ft)              0.06    Culv Entr Loss (ft)        0.03
  Delta WS (ft)              0.06    Q Weir (cfs)             255.33
  E.G. IC (ft)            2347.49    Weir Sta Lft (ft)         27.84
  E.G. OC (ft)            2352.39    Weir Sta Rgt (ft)         62.60
  Culvert Control          Outlet    Weir Submerg               0.97
  Culv WS Inlet (ft)      2348.70    Weir Max Depth (ft)        3.00
  Culv WS Outlet (ft)     2348.30    Weir Avg Depth (ft)        2.72
  Culv Nml Depth (ft)                Weir Flow Area (sq ft)    94.61
  Culv Crt Depth (ft)        0.90    Min El Weir Flow (ft)   2349.39
```

Warning: The weir over culvert is submerged.

CULVERT OUTPUT Profile #PF 2 Culv Group: culv@3.5a

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 7.34 | Culv Full Len (ft) | 27.70 |
| # Barrels | 1 | Culv Vel US (ft/s) | 1.49 |
| Q Barrel (cfs) | 7.34 | Culv Vel DS (ft/s) | 1.49 |
| E.G. US. (ft) | 2352.39 | Culv Inv El Up (ft) | 2346.20 |
| W.S. US. (ft) | 2352.33 | Culv Inv El Dn (ft) | 2345.80 |
| E.G. DS (ft) | 2352.33 | Culv Frctn Ls (ft) | 0.03 |
| W.S. DS (ft) | 2352.27 | Culv Exit Loss (ft) | |
| Delta EG (ft) | 0.06 | Culv Entr Loss (ft) | 0.03 |
| Delta WS (ft) | 0.06 | Q Weir (cfs) | 255.33 |
| E.G. IC (ft) | 2347.49 | Weir Sta Lft (ft) | 27.84 |
| E.G. OC (ft) | 2352.39 | Weir Sta Rgt (ft) | 62.60 |
| Culvert Control | Outlet | Weir Submerg | 0.97 |
| Culv WS Inlet (ft) | 2348.70 | Weir Max Depth (ft) | 3.00 |
| Culv WS Outlet (ft) | 2348.30 | Weir Avg Depth (ft) | 2.72 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 94.61 |
| Culv Crt Depth (ft) | 0.90 | Min El Weir Flow (ft) | 2349.39 |

Warning: The weir over culvert is submerged.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.4

INPUT
Description: added point -334.12 quad, 110 from section 4 point 246, and 201.49 from section 3 point 5023, Survey 3.12

Station Elevation Data num= 12

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -334.12 | 2360 | -2 | 2350.7 | 27.25 | 2349.32 | 31.49 | 2347.33 | 33.59 | 2345.8 |
| 35.93 | 2345.8 | 37.82 | 2345.8 | 38.4 | 2346.49 | 46.92 | 2349 | 69.41 | 2349.29 |
| 110 | 2352 | 201.49 | 2352 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -334.12 | .035 | 27.25 | .04 | 46.92 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 27.25 | 46.92 | 48.57 | 62.9 | 74 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -334.12 | 3.2 | | F |
| 70.9 | 201.49 | | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.33 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2352.27 | Reach Len. (ft) | 48.57 | 62.90 | 74.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3.22 | 98.17 | 44.51 |
| E.G. Slope (ft/ft) | 0.000383 | Area (sq ft) | 3.22 | 98.17 | 44.51 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 2.31 | 197.69 | 70.00 |
| Top Width (ft) | 34.77 | Top Width (ft) | 1.10 | 19.67 | 14.00 |
| Vel Total (ft/s) | 1.85 | Avg. Vel. (ft/s) | 0.72 | 2.01 | 1.57 |
| Max Chl Dpth (ft) | 6.47 | Hydr. Depth (ft) | 2.92 | 4.99 | 3.18 |
| Conv. Total (cfs) | 13795.2 | Conv. (cfs) | 118.1 | 10100.6 | 3576.5 |
| Length Wtd. (ft) | 64.28 | Wetted Per. (ft) | 4.00 | 21.30 | 17.09 |
| Min Ch El (ft) | 2345.80 | Shear (lb/sq ft) | 0.02 | 0.11 | 0.06 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.01 | 0.22 | 0.10 |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.37 | 3.19 | 1.97 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.34 | 0.82 | 0.97 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.35

INPUT
Description: added point -306.66 from quad, Survey 3.13

Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -306.66 | 2360 | 0 | 2350.5 | 42.31 | 2349.55 | 57.55 | 2345.96 | 67.17 | 2344.56 |
| 77.29 | 2346.66 | 82.29 | 2352.8 | 87.44 | 2354.06 | 106.97 | 2355.09 | 123.68 | 2355.16 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -306.66 | .035 | 42.31 | .04 | 87.44 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 42.31 | 87.44 | 280.87 | 255.2 | 240.99 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -306.66 | -49.1 | 2353 | F |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 87.44 | 123.68 | 2358 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.30 | Element | | | |
| Vel Head (ft) | 0.02 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2352.28 | Reach Len. (ft) | 280.87 | 255.20 | 240.99 |
| Crit W.S. (ft) | 2347.24 | Flow Area (sq ft) | | 216.76 | |
| E.G. Slope (ft/ft) | 0.000141 | Area (sq ft) | | 216.76 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 39.55 | Top Width (ft) | | 39.55 | |
| Vel Total (ft/s) | 1.25 | Avg. Vel. (ft/s) | | 1.25 | |
| Max Chl Dpth (ft) | 7.72 | Hydr. Depth (ft) | | 5.48 | |
| Conv. Total (cfs) | 22735.6 | Conv. (cfs) | | 22735.6 | |
| Length Wtd. (ft) | 255.61 | Wetted Per. (ft) | | 45.69 | |
| Min Ch El (ft) | 2344.56 | Shear (lb/sq ft) | | 0.04 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.05 | |
| Frctn Loss (ft) | 0.01 | Cum Volume (acre-ft) | 1.37 | 2.97 | 1.93 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.34 | 0.78 | 0.96 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.25

INPUT
Description: added points 284.19 to 471.45 (taken from road profile and adjusted higher to account for hill visible in photo), 595.33 taken from section 3.2, 600 estimated by photo, and 737.89 from end of section 3.35, Added House, Survey 3.1

Station Elevation Data num= 17

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 284.19 | 2351.92 | 378.4 | 2351.54 | 471.45 | 2351.34 | 503.54 | 2347.6 | 519.73 | 2347.11 |
| 525.37 | 2344.83 | 546.29 | 2342.21 | 554.06 | 2338.87 | 555.09 | 2338.5 | 556.26 | 2338.84 |
| 561.66 | 2340.99 | 570.76 | 2341.73 | 578.76 | 2346.01 | 585.33 | 2346.6 | 595.33 | 2347.77 |
| 605 | 2351.5 | 737.89 | 2355.16 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 284.19 | .035 | 546.29 | .04 | 561.66 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 546.29 | 561.66 | 31.12 | 31.3 | 34.75 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 565 | 600 | 2354 | T |
| 300 | 544 | 2350 | T |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 607.89 | 687.89 | 2358 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.29 | Element | | | |
| Vel Head (ft) | 0.02 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2352.27 | Reach Len. (ft) | 31.12 | 31.30 | 34.75 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 77.78 | 187.75 | 37.22 |
| E.G. Slope (ft/ft) | 0.000030 | Area (sq ft) | 218.56 | 187.75 | 166.47 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 32.70 | 193.93 | 43.38 |
| Top Width (ft) | 59.03 | Top Width (ft) | 26.56 | 15.37 | 17.10 |
| Vel Total (ft/s) | 0.89 | Avg. Vel. (ft/s) | 0.42 | 1.03 | 1.17 |
| Max Chl Dpth (ft) | 13.77 | Hydr. Depth (ft) | 2.93 | 12.22 | 11.14 |
| Conv. Total (cfs) | 48961.2 | Conv. (cfs) | 5928.9 | 35166.4 | 7865.9 |
| Length Wtd. (ft) | 31.56 | Wetted Per. (ft) | 32.33 | 16.58 | 3.35 |
| Min Ch El (ft) | 2338.50 | Shear (lb/sq ft) | 0.00 | 0.02 | 0.02 |
| Alpha | 1.26 | Stream Power (lb/ft s) | 0.00 | 0.02 | 0.02 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 0.66 | 1.78 | 1.47 |
| C & E Loss (ft) | 0.00 | Cum SA (acres) | 0.26 | 0.62 | 0.91 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 3.2

INPUT
Description: added points 284.19 to 471.45 (taken from road profile and adjusted higher to account for hill visible in photo), 600 estimated by photo, and points 632.15 and 667.54, Added House Survey 3.2

Station Elevation Data num= 16

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 284.19 | 2351.92 | 378.4 | 2351.54 | 471.45 | 2351.34 | 503.89 | 2348.8 | 517.5 | 2347.8 |
| 526.21 | 2344.25 | 539.98 | 2343.46 | 545.32 | 2337.94 | 546.27 | 2337.86 | 546.78 | 2337.9 |
| 552.55 | 2341.58 | 563.57 | 2342.2 | 590.65 | 2347.77 | 600 | 2351.5 | 632.15 | 2352.6 |
| 667.54 | 2353.81 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 284.19 | .035 | 539.98 | .04 | 552.55 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 539.98 | 552.55 | 84.32 | 84.3 | 84.32 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 491.9 | 539.9 | 2350.3 | T |
| 552.6 | 600 | 2355 | T |

Blocked Obstructions num= 1

| Sta L | Sta R | Elev |
|---|---|---|
| 600.65 | 667.54 | 2358 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2352.28 | Element | | | |
| Vel Head (ft) | 0.03 | Wt. n-Val. | 0.035 | 0.040 | 0.035 |
| W.S. Elev (ft) | 2352.25 | Reach Len. (ft) | 84.32 | 84.30 | 84.32 |
| Crit W.S. (ft) | 2342.20 | Flow Area (sq ft) | 62.90 | 154.82 | 1.01 |
| E.G. Slope (ft/ft) | 0.000081 | Area (sq ft) | 208.77 | 154.82 | 335.82 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 34.56 | 235.13 | 0.31 |
| Top Width (ft) | 92.65 | Top Width (ft) | 31.98 | 12.57 | 48.10 |
| Vel Total (ft/s) | 1.23 | Avg. Vel. (ft/s) | 0.55 | 1.52 | 0.30 |
| Max Chl Dpth (ft) | 14.39 | Hydr. Depth (ft) | 1.97 | 12.32 | 1.45 |
| Conv. Total (cfs) | 30001.4 | Conv. (cfs) | 3839.9 | 26127.2 | 34.2 |
| Length Wtd. (ft) | 84.30 | Wetted Per. (ft) | 36.48 | 15.99 | 1.43 |
| Min Ch El (ft) | 2337.86 | Shear (lb/sq ft) | 0.01 | 0.05 | 0.00 |
| Alpha | 1.34 | Stream Power (lb/ft s) | 0.00 | 0.07 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 0.51 | 1.66 | 1.27 |
| C & E Loss (ft) | | Cum SA (acres) | 0.24 | 0.61 | 0.89 |

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 3.01

INPUT
Description:
Distance from Upstream XS = 2.8

```
Deck/Roadway Width          =    81.4
Weir Coefficient            =     2.6
Upstream  Deck/Roadway Coordinates
    num=       40
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2354.3            48.18 2353.58            95.29 2353.03
  141.79  2352.4           188.78  2351.8            235.3 2351.29
  284.19 2350.92           330.32 2350.54            378.4 2350.25
  422.82  2350.2           471.12 2350.34            491.8 2350.49
  491.85 2350.49            522.8 2350.72           522.85 2354.72
  536.38 2354.82           585.57 2355.29            590.8 2355.32
  590.85 2351.32            592.4 2351.34            592.5 2351.34
   592.6 2351.34           632.95  2351.6           667.54 2351.81
  715.52 2352.03           764.59 2352.19           811.88 2352.29
  861.07  2352.4           909.19 2352.34           957.99    2352
 1006.23 2351.53          1054.01  2351.3          1102.53 2351.17
 1149.56  2349.8          1172.16 2350.02          1195.65 2350.43
 1242.87  2351.6           1289.3 2352.84          1337.21 2354.65
  1381.7 2355.22

Upstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  284.19 2351.92   378.4 2351.54  471.45 2351.34  503.89  2348.8   517.5  2347.8
  526.21 2344.25  539.98 2343.46  545.32 2337.94  546.27 2337.86  546.78  2337.9
  552.55 2341.58  563.57  2342.2  590.65 2347.77     600  2351.5  632.15  2352.6
  667.54 2353.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  284.19    .035  539.98     .04  552.55    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
       539.98  552.55          .1          .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   491.9   539.9  2350.3       T
   552.6     600    2355       T
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  600.65  667.54    2358

Downstream  Deck/Roadway Coordinates
    num=       40
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0  2354.3            48.18 2353.58            95.29 2353.03
  141.79  2352.4           188.78  2351.8            235.3 2351.29
  284.19 2350.92           330.32 2350.54            378.4 2350.25
  422.82  2350.2           471.12 2350.34            491.8 2350.49
  491.85 2354.49            522.8 2354.72           522.85 2354.72
  536.38 2354.82           585.57 2355.29            590.8 2355.32
  590.85 2355.32            592.4 2355.34            592.5 2351.34
   592.6 2351.34           632.95  2351.6           667.54 2351.81
  715.52 2352.03           764.59 2352.19           811.88 2352.29
  861.07  2352.4           909.19 2352.34           957.99    2352
 1006.23 2351.53          1054.01  2351.3          1102.53 2351.17
 1149.56  2349.8          1172.16 2350.02          1195.65 2350.43
 1242.87  2351.6           1289.3 2352.84          1337.21 2354.65
  1381.7 2355.22

Downstream Bridge Cross Section Data
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2354.3   48.18 2353.58   95.29 2353.03  141.79  2352.4  188.78  2351.8
   235.3 2351.29  284.19 2350.92  330.32 2350.54   378.4 2350.25  422.82  2350.2
  471.12 2350.34   491.8 2350.49   505.3  2347.8  514.01 2344.25  527.78 2343.46
  533.12    2336  534.07    2336  534.58    2336  540.35 2341.58  551.37  2342.2
  578.45 2347.77   592.5 2351.34   592.6 2351.34  632.95  2351.6  667.54 2351.81
  715.52 2352.03  764.59 2352.19  811.88 2352.29  861.07  2352.4  909.19 2352.34
  957.99    2352 1006.23 2351.53 1054.01  2351.3 1102.53 2351.17 1149.56  2349.8
 1172.16 2350.02 1195.65 2350.43 1242.87  2351.6  1289.3 2352.84 1337.21 2354.65
  1381.7 2355.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  527.78     .03  540.35     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
       527.78  540.35          .1          .3
Right Levee     Station=  861.07      Elevation=  2352.4

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1      Circular       4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                2.8    81.4     .024     .024        0                  .9                 1
Upstream   Elevation =  2338
           Centerline Station =  546.3
Downstream Elevation =  2336.3
           Centerline Station =  534.1

CULVERT OUTPUT  Profile #PF 2  Culv Group:  Culvert #1

  Q Culv Group (cfs)        188.03    Culv Full Len (ft)         81.40
  # Barrels                      1    Culv Vel US (ft/s)         14.96
  Q Barrel (cfs)            188.03    Culv Vel DS (ft/s)         14.96
  E.G. US. (ft)            2352.28    Culv Inv El Up (ft)      2338.00
  W.S. US. (ft)            2352.25    Culv Inv El Dn (ft)      2336.30
  E.G. DS (ft)             2342.33    Culv Frctn Ls (ft)          4.75
  W.S. DS (ft)             2340.92    Culv Exit Loss (ft)         2.07
  Delta EG (ft)               9.95    Culv Entr Loss (ft)         3.13
  Delta WS (ft)              11.33    Q Weir (cfs)               81.97
  E.G. IC (ft)             2352.35    Weir Sta Lft (ft)         508.00
  E.G. OC (ft)             2352.28    Weir Sta Rgt (ft)         600.65
  Culvert Control            Inlet    Weir Submerg                0.00
  Culv WS Inlet (ft)       2342.00    Weir Max Depth (ft)         1.69
```

| | | | |
|---|---|---|---|
| Culv WS Outlet (ft) | 2340.30 | Weir Avg Depth (ft) | 1.60 |
| Culv Nml Depth (ft) | 4.00 | Weir Flow Area (sq ft) | 24.79 |
| Culv Crt Depth (ft) | 4.00 | Min El Weir Flow (ft) | 2350.62 |

Warning: During the supercritical analysis, the program could not balance the energy equation during the forewater calculations inside of the culvert. The program assumed critical depth at the outlet and continued on.
Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
Note: Culvert critical depth exceeds the height of the culvert.
Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.
Note: The culvert inlet is submerged and the culvert flows full over part or all of its length. Therefore, the culvert inlet equations are not valid and the supercritical result has been discarded. The outlet answer will be used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.98

INPUT
Description: added 0 to 491.8 and 592.5 to 1381.7 from top of road, Survey 3.2
Station Elevation Data num= 41

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2354.3 | 48.18 | 2353.58 | 95.29 | 2353.03 | 141.79 | 2352.4 | 188.78 | 2351.8 |
| 235.3 | 2351.29 | 284.19 | 2350.92 | 330.32 | 2350.54 | 378.4 | 2350.25 | 422.82 | 2350.2 |
| 471.12 | 2350.34 | 491.8 | 2350.49 | 505.3 | 2347.8 | 514.01 | 2344.25 | 527.78 | 2343.46 |
| 533.12 | 2336 | 534.07 | 2336 | 534.58 | 2336 | 540.35 | 2341.58 | 551.37 | 2342.2 |
| 578.45 | 2347.77 | 592.5 | 2351.34 | 592.6 | 2351.34 | 632.95 | 2351.6 | 667.54 | 2351.81 |
| 715.52 | 2352.03 | 764.59 | 2352.19 | 811.88 | 2352.29 | 861.07 | 2352.4 | 909.19 | 2352.34 |
| 957.99 | 2352 | 1006.23 | 2351.53 | 1054.01 | 2351.3 | 1102.53 | 2351.17 | 1149.56 | 2349.8 |
| 1172.16 | 2350.02 | 1195.65 | 2350.43 | 1242.87 | 2351.6 | 1289.3 | 2352.84 | 1337.21 | 2354.65 |
| 1381.7 | 2355.22 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .04 | 527.78 | .03 | 540.35 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 527.78 | 540.35 | 88.83 | 86.9 | 82.46 | .1 | .3 |

Right Levee Station= 861.07 Elevation= 2352.4

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2342.33 | Element | | | |
| Vel Head (ft) | 1.41 | Wt. n-Val. | | 0.030 | |
| W.S. Elev (ft) | 2340.92 | Reach Len. (ft) | 88.83 | 86.90 | 82.46 |
| Crit W.S. (ft) | 2340.92 | Flow Area (sq ft) | | 28.38 | |
| E.G. Slope (ft/ft) | 0.015204 | Area (sq ft) | | 28.38 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 10.07 | Top Width (ft) | | 10.07 | |
| Vel Total (ft/s) | 9.52 | Avg. Vel. (ft/s) | | 9.52 | |
| Max Chl Dpth (ft) | 4.92 | Hydr. Depth (ft) | | 2.82 | |
| Conv. Total (cfs) | 2189.7 | Conv. (cfs) | | 2189.7 | |
| Length Wtd. (ft) | 87.00 | Wetted Per. (ft) | | 14.59 | |
| Min Ch El (ft) | 2336.00 | Shear (lb/sq ft) | | 1.85 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 17.56 | |
| Frctn Loss (ft) | 1.32 | Cum Volume (acre-ft) | 0.31 | 1.48 | 0.94 |
| C & E Loss (ft) | 0.07 | Cum SA (acres) | 0.20 | 0.59 | 0.84 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.9

INPUT
Description: Survey 3.30
Station Elevation Data num= 9

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2340.6 | 6.1 | 2339.08 | 23.47 | 2336.47 | 42.65 | 2336 | 44.42 | 2335.45 |
| 45.87 | 2336 | 58.17 | 2336.34 | 63.39 | 2337.96 | 91.67 | 2339.74 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .035 | 42.65 | .03 | 45.87 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 42.65 | 45.87 | 468 | 424.05 | 409 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2339.44 | Element | | | |
| Vel Head (ft) | 1.16 | Wt. n-Val. | 0.035 | 0.030 | 0.040 |
| W.S. Elev (ft) | 2338.28 | Reach Len. (ft) | 468.00 | 424.05 | 409.00 |
| Crit W.S. (ft) | 2338.28 | Flow Area (sq ft) | 17.60 | 8.23 | 8.09 |
| E.G. Slope (ft/ft) | 0.015249 | Area (sq ft) | 17.60 | 8.23 | 8.09 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 133.11 | 90.59 | 46.30 |
| Top Width (ft) | 14.92 | Top Width (ft) | 8.07 | 3.22 | 3.63 |
| Vel Total (ft/s) | 7.96 | Avg. Vel. (ft/s) | 7.56 | 11.01 | 5.72 |
| Max Chl Dpth (ft) | 2.83 | Hydr. Depth (ft) | 2.18 | 2.55 | 2.23 |
| Conv. Total (cfs) | 2186.5 | Conv. (cfs) | 1078.0 | 733.6 | 374.9 |
| Length Wtd. (ft) | 435.37 | Wetted Per. (ft) | 10.15 | 3.40 | 5.81 |
| Min Ch El (ft) | 2335.45 | Shear (lb/sq ft) | 1.65 | 2.30 | 1.33 |
| Alpha | 1.18 | Stream Power (lb/ft s) | 12.48 | 25.33 | 7.58 |
| Frctn Loss (ft) | 5.22 | Cum Volume (acre-ft) | 0.29 | 1.44 | 0.93 |
| C & E Loss (ft) | 0.16 | Cum SA (acres) | 0.20 | 0.57 | 0.84 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.575

INPUT
Description: Interpolated
Station Elevation Data num= 44

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2336.65 | 20.6 | 2337.02 | 28.51 | 2337.19 | 37.48 | 2337.32 | 40.41 | 2337.34 |
| 40.49 | 2337.34 | 155.48 | 2337.62 | 171.94 | 2335.05 | 195.84 | 2334.35 | 222.21 | 2333.39 |
| 246.74 | 2332.27 | 256.87 | 2332.2 | 280.46 | 2332.04 | 282.54 | 2331.77 | 283.39 | 2330.76 |
| 284.2 | 2330.46 | 285.65 | 2330.4 | 286.77 | 2330.04 | 287.61 | 2330.66 | 289.14 | 2331.77 |
| 311.7 | 2331.99 | 355.13 | 2331.94 | 362.46 | 2332.07 | 380.62 | 2332.82 | 393.57 | 2333.45 |
| 403.91 | 2333.73 | 408.91 | 2333.77 | 432.31 | 2334.75 | 436.82 | 2334.95 | 440.21 | 2336.54 |
| 464.56 | 2337.6 | 472.7 | 2337.41 | 510.3 | 2337.08 | 525.16 | 2336.77 | 547.76 | 2335.21 |
| 562.15 | 2334.68 | 571.82 | 2334.28 | 594.29 | 2334.33 | 618.49 | 2333.37 | 635.2 | 2332.7 |
| 645.49 | 2332.46 | 671.78 | 2331.57 | 683.67 | 2331 | 710.4 | 2332.32 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .032 | 282.54 | .03 | 289.14 | .035 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
282.54 289.14 444.23 424.05 418.83 .1 .3
Right Levee Station= 464.56 Elevation= 2337.6

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2333.77 | Element | | | |
| Vel Head (ft) | 0.64 | Wt. n-Val. | 0.032 | 0.030 | 0.035 |
| W.S. Elev (ft) | 2333.13 | Reach Len. (ft) | 444.23 | 424.05 | 418.83 |
| Crit W.S. (ft) | 2333.13 | Flow Area (sq ft) | 11.55 | 16.08 | 19.16 |
| E.G. Slope (ft/ft) | 0.009675 | Area (sq ft) | 11.55 | 16.08 | 19.16 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 52.59 | 127.46 | 89.94 |
| Top Width (ft) | 32.00 | Top Width (ft) | 10.54 | 6.60 | 14.86 |
| Vel Total (ft/s) | 5.77 | Avg. Vel. (ft/s) | 4.56 | 7.93 | 4.69 |
| Max Chl Dpth (ft) | 3.09 | Hydr. Depth (ft) | 1.10 | 2.44 | 1.29 |
| Conv. Total (cfs) | 2744.9 | Conv. (cfs) | 534.7 | 1295.9 | 914.4 |
| Length Wtd. (ft) | 424.12 | Wetted Per. (ft) | 11.59 | 7.75 | 16.08 |
| Min Ch El (ft) | 2330.04 | Shear (lb/sq ft) | 0.60 | 1.25 | 0.72 |
| Alpha | 1.23 | Stream Power (lb/ft s) | 2.74 | 9.94 | 3.38 |
| Frctn Loss (ft) | 1.75 | Cum Volume (acre-ft) | 0.13 | 1.33 | 0.81 |
| C & E Loss (ft) | 0.13 | Cum SA (acres) | 0.10 | 0.53 | 0.75 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.25

INPUT
Description: Survey 2.10
Station Elevation Data num= 44

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | 38.09 | 2334.21 | 52.72 | 2334.85 | 69.3 | 2335.44 | 74.86 | 2335.6 |
| 101.38 | 2346.1 | 131.72 | 2346.15 | 176.4 | 2347.52 | 204.44 | 2345.62 | 249.18 | 2345.16 |
| 317.93 | 2333.7 | 362.12 | 2332.37 | 410.87 | 2330.55 | 456.24 | 2328.41 | 474.96 | 2328.3 |
| 518.59 | 2328.08 | 522.43 | 2327.54 | 523.77 | 2325.64 | 525.05 | 2325.13 | 527.35 | 2325.2 |
| 529.12 | 2324.62 | 530.28 | 2325.68 | 532.4 | 2327.53 | 573.74 | 2327.87 | 653.31 | 2327.58 |
| 700.03 | 2328.36 | 742.7 | 2329.4 | 751.86 | 2329.42 | 794.74 | 2331.13 | 802.99 | 2331.48 |
| 809.2 | 2334.62 | 853.83 | 2336.5 | 868.73 | 2336.03 | 937.62 | 2334.96 | 964.86 | 2334.19 |
| 1006.27 | 2330.84 | 1050.34 | 2328.8 | 1091.52 | 2328.86 | 1135.85 | 2326.9 | 1166.47 | 2325.54 |
| 1185.33 | 2325.04 | 1233.5 | 2323.2 | 1255.29 | 2322.05 | 1304.26 | 2324.65 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 522.43 | .03 | 532.4 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
522.43 532.4 44.48 44.5 46.03 .1 .3
Right Levee Station= 853.83 Elevation= 2336.5

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2328.99 | Element | | | |
| Vel Head (ft) | 0.20 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2328.79 | Reach Len. (ft) | 44.48 | 44.50 | 46.03 |
| Crit W.S. (ft) | 2328.42 | Flow Area (sq ft) | 2.62 | 31.35 | 51.74 |
| E.G. Slope (ft/ft) | 0.002282 | Area (sq ft) | 2.62 | 31.35 | 51.74 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 5.24 | 138.75 | 126.00 |
| Top Width (ft) | 61.00 | Top Width (ft) | 2.43 | 9.97 | 48.60 |
| Vel Total (ft/s) | 3.15 | Avg. Vel. (ft/s) | 2.00 | 4.43 | 2.44 |
| Max Chl Dpth (ft) | 4.17 | Hydr. Depth (ft) | 1.08 | 3.14 | 1.06 |
| Conv. Total (cfs) | 5652.0 | Conv. (cfs) | 109.8 | 2904.6 | 2637.7 |
| Length Wtd. (ft) | 45.35 | Wetted Per. (ft) | 3.36 | 12.25 | 49.55 |
| Min Ch El (ft) | 2324.62 | Shear (lb/sq ft) | 0.11 | 0.36 | 0.15 |
| Alpha | 1.30 | Stream Power (lb/ft s) | 0.22 | 1.61 | 0.36 |
| Frctn Loss (ft) | 0.05 | Cum Volume (acre-ft) | 0.06 | 1.10 | 0.47 |
| C & E Loss (ft) | 0.04 | Cum SA (acres) | 0.03 | 0.45 | 0.44 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 2.2

INPUT
Description:
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | 38.09 | 2334.21 | 52.72 | 2334.85 | 69.3 | 2335.44 | 74.86 | 2335.6 |
| 101.38 | 2346.1 | 131.72 | 2346.15 | 176.4 | 2347.52 | 204.44 | 2345.62 | 249.18 | 2345.16 |
| 317.93 | 2333.7 | 362.12 | 2332.37 | 410.87 | 2330.55 | 456.24 | 2328.41 | 478.2 | 2328.3 |
| 522.01 | 2327.44 | 525.44 | 2324.28 | 526.71 | 2323.74 | 528.22 | 2324.14 | 532.94 | 2327.9 |
| 583.78 | 2326.81 | 605.5 | 2326.65 | 653.31 | 2327.08 | 700.03 | 2327.86 | 742.7 | 2328.9 |
| 751.86 | 2328.92 | 794.74 | 2330.63 | 802.99 | 2330.98 | 809.2 | 2334.12 | 853.83 | 2336 |
| 868.73 | 2335.53 | 937.62 | 2334.46 | 964.86 | 2333.69 | 1006.27 | 2330.34 | 1050.34 | 2328.3 |
| 1091.52 | 2328.36 | 1135.85 | 2326.4 | 1166.47 | 2325.04 | 1185.33 | 2324.54 | 1233.5 | 2322.8 |
| 1255.29 | 2321.55 | 1304.26 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 522.01 | .03 | 532.94 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
522.01 532.94 25.7 26.3 25.71 .1 .3
Right Levee Station= 853.83 Elevation= 2336

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2328.90 | Element | | | |
| Vel Head (ft) | 0.06 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2328.83 | Reach Len. (ft) | 25.70 | 26.30 | 25.71 |
| Crit W.S. (ft) | 2327.83 | Flow Area (sq ft) | 2.76 | 36.97 | 100.29 |
| E.G. Slope (ft/ft) | 0.000687 | Area (sq ft) | 2.76 | 36.97 | 100.29 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 3.14 | 93.31 | 173.56 |
| Top Width (ft) | 76.00 | Top Width (ft) | 2.01 | 10.93 | 63.06 |
| Vel Total (ft/s) | 1.93 | Avg. Vel. (ft/s) | 1.14 | 2.52 | 1.73 |
| Max Chl Dpth (ft) | 5.09 | Hydr. Depth (ft) | 1.37 | 3.38 | 1.59 |
| Conv. Total (cfs) | 10299.3 | Conv. (cfs) | 119.6 | 3559.3 | 6620.4 |
| Length Wtd. (ft) | 26.30 | Wetted Per. (ft) | 3.36 | 13.64 | 65.18 |
| Min Ch El (ft) | 2323.74 | Shear (lb/sq ft) | 0.04 | 0.12 | 0.07 |
| Alpha | 1.11 | Stream Power (lb/ft s) | 0.04 | 0.29 | 0.11 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 0.06 | 1.06 | 0.39 |
| C & E Loss (ft) | | Cum SA (acres) | 0.03 | 0.44 | 0.38 |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CULVERT

RIVER: Minnie Cr
REACH: Lower RS: 2.01

INPUT
Description:
Distance from Upstream XS = 1.5
Deck/Roadway Width = 23.3
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 38

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | | 38.09 | 2334.21 | | 52.72 | 2334.85 | |
| 69.3 | 2335.44 | | 74.86 | 2335.6 | | 101.38 | 2346.1 | |
| 131.72 | 2346.15 | | 176.4 | 2347.52 | | 204.44 | 2345.62 | |
| 249.18 | 2345.16 | | 317.93 | 2333.7 | | 362.12 | 2332.37 | |
| 410.87 | 2330.55 | | 456.24 | 2328.41 | | 486.09 | 2327.59 | |
| 523.21 | 2328.6 | | 551.58 | 2328.24 | | 605.5 | 2326.65 | |
| 653.31 | 2327.08 | | 700.03 | 2327.86 | | 742.7 | 2328.9 | |
| 751.86 | 2328.92 | | 794.74 | 2330.63 | | 802.99 | 2330.98 | |
| 809.2 | 2334.12 | | 853.83 | 2336 | | 868.73 | 2335.53 | |
| 937.62 | 2334.46 | | 964.86 | 2333.69 | | 1006.27 | 2330.34 | |
| 1050.34 | 2328.3 | | 1091.52 | 2328.36 | | 1135.85 | 2326.4 | |
| 1166.47 | 2325.04 | | 1185.33 | 2324.54 | | 1233.5 | 2322.8 | |
| 1255.29 | 2321.55 | | 1304.26 | 2324.15 | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | 38.09 | 2334.21 | 52.72 | 2334.85 | 69.3 | 2335.44 | 74.86 | 2335.6 |
| 101.38 | 2346.1 | 131.72 | 2346.15 | 176.4 | 2347.52 | 204.44 | 2345.62 | 249.18 | 2345.16 |
| 317.93 | 2333.7 | 362.12 | 2332.37 | 410.87 | 2330.55 | 456.24 | 2328.41 | 478.2 | 2328.3 |
| 522.01 | 2327.44 | 525.44 | 2324.28 | 526.71 | 2323.74 | 528.22 | 2324.14 | 532.94 | 2327.9 |
| 583.78 | 2326.81 | 605.5 | 2326.65 | 653.31 | 2327.08 | 700.03 | 2327.86 | 742.7 | 2328.9 |
| 751.86 | 2328.92 | 794.74 | 2330.63 | 802.99 | 2330.98 | 809.2 | 2334.12 | 853.83 | 2336 |
| 868.73 | 2335.53 | 937.62 | 2334.46 | 964.86 | 2333.69 | 1006.27 | 2330.34 | 1050.34 | 2328.3 |
| 1091.52 | 2328.36 | 1135.85 | 2326.4 | 1166.47 | 2325.04 | 1185.33 | 2324.54 | 1233.5 | 2322.8 |
| 1255.29 | 2321.55 | 1304.26 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 522.01 | .03 | 532.94 | .03 |

Bank Sta: Left Right Coeff Contr. Expan.
522.01 532.94 .1 .3
Right Levee Station= 853.83 Elevation= 2336

Downstream Deck/Roadway Coordinates
num= 38

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2332.7 | | 38.09 | 2334.21 | | 52.72 | 2334.85 | |
| 69.3 | 2335.44 | | 74.86 | 2335.6 | | 101.38 | 2346.1 | |
| 131.72 | 2346.15 | | 176.4 | 2347.52 | | 204.44 | 2345.62 | |
| 249.18 | 2345.16 | | 317.93 | 2333.7 | | 362.12 | 2332.37 | |
| 410.87 | 2330.55 | | 456.24 | 2328.41 | | 486.09 | 2327.59 | |
| 523.21 | 2328.6 | | 551.58 | 2328.24 | | 605.5 | 2326.65 | |
| 653.31 | 2327.08 | | 700.03 | 2327.86 | | 742.7 | 2328.9 | |
| 751.86 | 2328.92 | | 794.74 | 2330.63 | | 802.99 | 2330.98 | |
| 809.2 | 2334.12 | | 853.83 | 2336 | | 868.73 | 2335.53 | |
| 937.62 | 2334.46 | | 964.86 | 2333.69 | | 1006.27 | 2330.34 | |
| 1050.34 | 2328.3 | | 1091.52 | 2328.36 | | 1135.85 | 2326.4 | |
| 1166.47 | 2325.04 | | 1185.33 | 2324.54 | | 1233.5 | 2322.8 | |
| 1255.29 | 2321.55 | | 1304.26 | 2324.15 | | | | |

Downstream Bridge Cross Section Data

Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -3.61 | 2332.7 | 34.48 | 2334.21 | 49.11 | 2334.85 | 65.69 | 2335.44 | 71.25 | 2335.6 |
| 97.77 | 2346.1 | 128.11 | 2346.15 | 172.79 | 2347.52 | 200.83 | 2345.62 | 245.57 | 2345.16 |
| 314.32 | 2333.7 | 358.51 | 2332.37 | 407.26 | 2330.55 | 452.63 | 2328.41 | 474.59 | 2328.3 |
| 518.4 | 2327.44 | 520.83 | 2323.52 | 523.1 | 2322.8 | 524.61 | 2323.14 | 529.33 | 2327.9 |
| 580.17 | 2326.81 | 601.89 | 2326.65 | 649.7 | 2327.08 | 696.42 | 2327.86 | 739.09 | 2328.9 |
| 748.25 | 2328.92 | 791.13 | 2330.63 | 799.38 | 2330.98 | 805.59 | 2334.12 | 850.22 | 2336 |
| 865.12 | 2335.53 | 934.01 | 2334.46 | 961.25 | 2333.69 | 1002.66 | 2330.34 | 1046.73 | 2328.3 |
| 1087.91 | 2328.36 | 1132.24 | 2326.4 | 1162.86 | 2325.04 | 1181.72 | 2324.54 | 1229.89 | 2322.8 |
| 1251.68 | 2321.55 | 1300.65 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -3.61 | .03 | 518.4 | .03 | 529.33 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 518.4 | 529.33 | .1 | .3 |

Right Levee Station= 850.22 Elevation= 2336

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

| Culvert Name | Shape | Rise | Span |
|---|---|---|---|
| culv@2 | Circular | 4 | |

FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG

| Culvert | Upstrm Dist | Length | Top n | Bottom n | Depth Blocked | Entrance Loss Coef | Exit Loss Coef |
|---|---|---|---|---|---|---|---|
| | 1.5 | 23.3 | .024 | .024 | 0 | .9 | 1 |

Upstream Elevation = 2324
Centerline Station = 526.7
Downstream Elevation = 2323
Centerline Station = 523.1

CULVERT OUTPUT Profile #PF 2 Culv Group: culv@2

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 78.43 | Culv Full Len (ft) | 23.30 |
| # Barrels | 1 | Culv Vel US (ft/s) | 6.24 |
| Q Barrel (cfs) | 78.43 | Culv Vel DS (ft/s) | 6.24 |
| E.G. US. (ft) | 2328.90 | Culv Inv El Up (ft) | 2324.00 |
| W.S. US. (ft) | 2328.83 | Culv Inv El Dn (ft) | 2323.00 |
| E.G. DS (ft) | 2327.93 | Culv Frctn Ls (ft) | 0.49 |
| W.S. DS (ft) | 2327.51 | Culv Exit Loss (ft) | 0.19 |
| Delta EG (ft) | 0.97 | Culv Entr Loss (ft) | 0.54 |
| Delta WS (ft) | 1.32 | Q Weir (cfs) | 191.57 |
| E.G. IC (ft) | 2328.84 | Weir Sta Lft (ft) | 520.00 |
| E.G. OC (ft) | 2328.90 | Weir Sta Rgt (ft) | 596.00 |
| Culvert Control | Outlet | Weir Submerg | 0.00 |
| Culv WS Inlet (ft) | 2328.00 | Weir Max Depth (ft) | 1.94 |
| Culv WS Outlet (ft) | 2327.00 | Weir Avg Depth (ft) | 0.93 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 70.75 |
| Culv Crt Depth (ft) | 2.68 | Min El Weir Flow (ft) | 2326.94 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.98

INPUT
Description:
Station Elevation Data num= 42

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -3.61 | 2332.7 | 34.48 | 2334.21 | 49.11 | 2334.85 | 65.69 | 2335.44 | 71.25 | 2335.6 |
| 97.77 | 2346.1 | 128.11 | 2346.15 | 172.79 | 2347.52 | 200.83 | 2345.62 | 245.57 | 2345.16 |
| 314.32 | 2333.7 | 358.51 | 2332.37 | 407.26 | 2330.55 | 452.63 | 2328.41 | 474.59 | 2328.3 |
| 518.4 | 2327.44 | 520.83 | 2323.52 | 523.1 | 2322.8 | 524.61 | 2323.14 | 529.33 | 2327.9 |
| 580.17 | 2326.81 | 601.89 | 2326.65 | 649.7 | 2327.08 | 696.42 | 2327.86 | 739.09 | 2328.9 |
| 748.25 | 2328.92 | 791.13 | 2330.63 | 799.38 | 2330.98 | 805.59 | 2334.12 | 850.22 | 2336 |
| 865.12 | 2335.53 | 934.01 | 2334.46 | 961.25 | 2333.69 | 1002.66 | 2330.34 | 1046.73 | 2328.3 |
| 1087.91 | 2328.36 | 1132.24 | 2326.4 | 1162.86 | 2325.04 | 1181.72 | 2324.54 | 1229.89 | 2322.8 |
| 1251.68 | 2321.55 | 1300.65 | 2324.15 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -3.61 | .03 | 518.4 | .03 | 529.33 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 518.4 | 529.33 | 94.92 | 93.4 | 91 | .1 | .3 |

Right Levee Station= 850.22 Elevation= 2336

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2327.93 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.42 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2327.51 | Reach Len. (ft) | 94.92 | 93.40 | 91.00 |
| Crit W.S. (ft) | 2327.51 | Flow Area (sq ft) | 0.13 | 31.14 | 33.78 |
| E.G. Slope (ft/ft) | 0.005426 | Area (sq ft) | 0.13 | 31.14 | 33.78 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 0.05 | 187.44 | 82.51 |
| Top Width (ft) | 75.02 | Top Width (ft) | 3.62 | 10.54 | 60.86 |
| Vel Total (ft/s) | 4.15 | Avg. Vel. (ft/s) | 0.39 | 6.02 | 2.44 |
| Max Chl Dpth (ft) | 4.71 | Hydr. Depth (ft) | 0.04 | 2.95 | 0.56 |
| Conv. Total (cfs) | 3665.6 | Conv. (cfs) | 0.7 | 2544.7 | 1120.2 |
| Length Wtd. (ft) | 92.41 | Wetted Per. (ft) | 3.62 | 14.70 | 61.67 |
| Min Ch El (ft) | 2322.80 | Shear (lb/sq ft) | 0.01 | 0.72 | 0.19 |
| Alpha | 1.57 | Stream Power (lb/ft s) | 0.00 | 4.32 | 0.45 |
| Frctn Loss (ft) | 0.72 | Cum Volume (acre-ft) | 0.06 | 1.04 | 0.35 |
| C & E Loss (ft) | 0.01 | Cum SA (acres) | 0.03 | 0.43 | 0.35 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there

is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.9

INPUT
Description: Survey 2.30
sta -88.73 = quad contour 2330
Station Elevation Data num= 23

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -88.73 | 2330 | 0 | 2325.3 | 48.44 | 2325.12 | 52.73 | 2324 | 53.38 | 2323.51 |
| 53.63 | 2322.76 | 55.43 | 2322.8 | 55.67 | 2323.5 | 57.35 | 2323.58 | 58.97 | 2324.84 |
| 65.29 | 2324.85 | 90.2 | 2324.4 | 132.64 | 2325.15 | 180.45 | 2325.58 | 227.17 | 2326.36 |
| 269.84 | 2327.4 | 279 | 2327.42 | 321.88 | 2329.13 | 330.13 | 2329.48 | 336.34 | 2332.62 |
| 380.97 | 2334.5 | 395.87 | 2334.03 | 464.76 | 2332.96 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -88.73 | .03 | 48.44 | .03 | 58.97 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 48.44 | 58.97 | 606 | 611.7 | 613 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2326.23 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.54 | Wt. n-Val. | | 0.030 | 0.035 |
| W.S. Elev (ft) | 2325.69 | Reach Len. (ft) | 606.00 | 611.70 | 613.00 |
| Crit W.S. (ft) | 2325.69 | Flow Area (sq ft) | | 18.58 | 30.29 |
| E.G. Slope (ft/ft) | 0.012312 | Area (sq ft) | | 18.58 | 30.29 |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 130.42 | 139.58 |
| Top Width (ft) | 40.56 | Top Width (ft) | | 10.53 | 30.03 |
| Vel Total (ft/s) | 5.52 | Avg. Vel. (ft/s) | | 7.02 | 4.61 |
| Max Chl Dpth (ft) | 2.93 | Hydr. Depth (ft) | | 1.76 | 1.01 |
| Conv. Total (cfs) | 2433.3 | Conv. (cfs) | | 1175.3 | 1258.0 |
| Length Wtd. (ft) | 612.09 | Wetted Per. (ft) | | 12.88 | 31.30 |
| Min Ch El (ft) | 2322.76 | Shear (lb/sq ft) | | 1.11 | 0.74 |
| Alpha | 1.14 | Stream Power (lb/ft s) | | 7.78 | 3.43 |
| Frctn Loss (ft) | 6.95 | Cum Volume (acre-ft) | 0.06 | 0.99 | 0.28 |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.02 | 0.41 | 0.25 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.575

INPUT
Description: Interpolated
Station Elevation Data num= 30

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -170.48 | 2325 | -65.49 | 2315.76 | -46.73 | 2314.43 | -16.49 | 2313.62 | 7.99 | 2309.41 |
| 12.5 | 2309.31 | 55.08 | 2309.56 | 57.9 | 2308.84 | 58.33 | 2308.57 | 58.5 | 2308.19 |
| 61.36 | 2308.36 | 61.53 | 2308.52 | 61.75 | 2308.73 | 64.42 | 2308.86 | 67.01 | 2309.57 |
| 75.3 | 2309.97 | 102.62 | 2311.06 | 108 | 2311.31 | 163.71 | 2314.62 | 219.71 | 2317.77 |
| 226.47 | 2317.88 | 287.81 | 2319.08 | 343.82 | 2320.33 | 355.84 | 2320.5 | 412.13 | 2322.1 |
| 422.96 | 2322.41 | 431.12 | 2324.09 | 489.7 | 2325.8 | 509.26 | 2325.83 | 599.7 | 2326.48 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -170.48 | .03 | 55.08 | .03 | 67.01 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 55.08 | 67.01 | 607.5 | 611.7 | 612.49 | .1 | .3 |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2312.31 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 1.11 | Wt. n-Val. | 0.030 | 0.030 | 0.030 |
| W.S. Elev (ft) | 2311.21 | Reach Len. (ft) | 607.50 | 611.70 | 612.49 |
| Crit W.S. (ft) | 2311.21 | Flow Area (sq ft) | 0.05 | 28.23 | 4.68 |
| E.G. Slope (ft/ft) | 0.010515 | Area (sq ft) | 0.05 | 28.23 | 4.68 |
| Q Total (cfs) | 270.00 | Flow (cfs) | 0.02 | 245.55 | 24.42 |
| Top Width (ft) | 14.95 | Top Width (ft) | 0.03 | 11.93 | 2.99 |
| Vel Total (ft/s) | 8.19 | Avg. Vel. (ft/s) | 0.48 | 8.70 | 5.22 |
| Max Chl Dpth (ft) | 3.02 | Hydr. Depth (ft) | 1.65 | 2.37 | 1.56 |
| Conv. Total (cfs) | 2633.1 | Conv. (cfs) | 0.2 | 2394.7 | 238.2 |
| Length Wtd. (ft) | 611.56 | Wetted Per. (ft) | 1.68 | 12.60 | 4.49 |
| Min Ch El (ft) | 2308.19 | Shear (lb/sq ft) | 0.02 | 1.47 | 0.68 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.01 | 12.80 | 3.57 |
| Frctn Loss (ft) | 4.48 | Cum Volume (acre-ft) | 0.06 | 0.66 | 0.03 |
| C & E Loss (ft) | 0.15 | Cum SA (acres) | 0.02 | 0.25 | 0.02 |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Minnie Cr

REACH: Lower RS: 1.25

INPUT
Description: Survey 1.10
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -132.79 | 2310 | -26.07 | 2300 | 0 | 2300.2 | 21.11 | 2293.25 | 61.72 | 2293.99 |
| 63.36 | 2293.62 | 67.52 | 2293.94 | 75.04 | 2294.3 | 119.14 | 2297.65 | 264.12 | 2310 |
| 734.63 | 2320 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -132.79 | .03 | 61.72 | .03 | 75.04 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 61.72 | 75.04 | 57.9 | 49.4 | 45.74 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -132.79 | 21.29 | 2305 | F |
| 95.47 | 734.63 | 2305 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2297.45 | Element | | | |
| Vel Head (ft) | 0.62 | Wt. n-Val. | 0.030 | 0.030 | |
| W.S. Elev (ft) | 2296.83 | Reach Len. (ft) | 57.90 | 49.40 | 45.74 |
| Crit W.S. (ft) | 2296.13 | Flow Area (sq ft) | 5.71 | 38.00 | |
| E.G. Slope (ft/ft) | 0.005389 | Area (sq ft) | 5.71 | 38.00 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | 23.09 | 246.91 | |
| Top Width (ft) | 15.32 | Top Width (ft) | 2.00 | 13.32 | |
| Vel Total (ft/s) | 6.18 | Avg. Vel. (ft/s) | 4.04 | 6.50 | |
| Max Chl Dpth (ft) | 3.21 | Hydr. Depth (ft) | 2.86 | 2.85 | |
| Conv. Total (cfs) | 3678.0 | Conv. (cfs) | 314.5 | 3363.5 | |
| Length Wtd. (ft) | 49.76 | Wetted Per. (ft) | 4.87 | 15.91 | |
| Min Ch El (ft) | 2293.62 | Shear (lb/sq ft) | 0.39 | 0.80 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 1.59 | 5.22 | |
| Frctn Loss (ft) | 0.19 | Cum Volume (acre-ft) | 0.02 | 0.19 | |
| C & E Loss (ft) | 0.03 | Cum SA (acres) | 0.01 | 0.07 | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 1.2

INPUT
Description:
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 560.19 | 2310 | 662.29 | 2300.5 | 707.75 | 2294.45 | 714.38 | 2292.4 | 718.46 | 2292.21 |
| 729.83 | 2292.11 | 732.53 | 2293.58 | 749.55 | 2293.35 | 791.92 | 2299.97 | 929.02 | 2300 |
| 1408.42 | 2310 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 560.19 | .03 | 707.75 | .03 | 732.53 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 707.75 | 732.53 | 75 | 75 | 75 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 560.19 | 718.5 | 2309 | F |
| 730.1 | 1408.42 | 2309 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2297.22 | Element | | | |
| Vel Head (ft) | 0.51 | Wt. n-Val. | | 0.030 | |
| W.S. Elev (ft) | 2296.72 | Reach Len. (ft) | 9.30 | 9.30 | 9.30 |
| Crit W.S. (ft) | 2294.94 | Flow Area (sq ft) | | 47.21 | |
| E.G. Slope (ft/ft) | 0.002866 | Area (sq ft) | | 56.44 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 12.78 | Top Width (ft) | | 12.78 | |
| Vel Total (ft/s) | 5.72 | Avg. Vel. (ft/s) | | 5.72 | |
| Max Chl Dpth (ft) | 4.61 | Hydr. Depth (ft) | | 4.56 | |
| Conv. Total (cfs) | 5043.1 | Conv. (cfs) | | 5043.1 | |
| Length Wtd. (ft) | 9.30 | Wetted Per. (ft) | | 14.91 | |
| Min Ch El (ft) | 2292.11 | Shear (lb/sq ft) | | 0.57 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 3.24 | |
| Frctn Loss (ft) | 0.06 | Cum Volume (acre-ft) | 0.01 | 0.14 | |
| C & E Loss (ft) | 0.11 | Cum SA (acres) | 0.01 | 0.06 | |

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE

RIVER: Minnie Cr
REACH: Lower RS: 1.01

INPUT
Description: added point 1408.42
Distance from Upstream XS = 9.3
Deck/Roadway Width = 64.4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 30

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 0 | 2309 | | 47.06 | 2309.29 | | 98.95 | 2309.72 | |
| 149.94 | 2310.11 | | 201.14 | 2310.52 | | 249.36 | 2310.9 | |
| 297.46 | 2311.26 | | 345.68 | 2311.64 | | 395.87 | 2311.97 | |
| 450.01 | 2312.29 | | 496.25 | 2312.6 | | 544.33 | 2312.82 | |
| 591.88 | 2313.05 | | 640.89 | 2313.34 | | 688.37 | 2313.6 | |
| 718.8 | 2313.88 | 2296.7 | 729.8 | 2313.98 | 2296.6 | 735.5 | 2314 | |
| 782.79 | 2314.36 | | 830.66 | 2314.77 | | 879.14 | 2315 | |
| 927.23 | 2315.23 | | 973.72 | 2315.5 | | 1021.4 | 2315.73 | |
| 1069.77 | 2316.05 | | 1115.06 | 2316.34 | | 1161.2 | 2316.5 | |
| 1208.2 | 2316.6 | | 1255.32 | 2316.8 | | 1408.42 | 2317.29 | |

```
Upstream Bridge Cross Section Data
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  560.19    2310  662.29  2300.5  707.75 2294.45  714.38  2292.4  718.46 2292.21
  729.83 2292.11  732.53 2293.58  749.55 2293.35  791.92 2299.97  929.02    2300
 1408.42    2310

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        707.75  732.53          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2309       F
   730.1 1408.42    2309       F

Downstream  Deck/Roadway Coordinates
    num=      30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    2309           47.06 2309.29           98.95 2309.72
  149.94 2310.11          201.14 2310.52          249.36  2310.9
  297.46 2311.26          345.68 2311.64          395.87 2311.97
  450.01 2312.29          496.25  2312.6          544.33 2312.82
  591.88 2313.05          640.89 2313.34          688.37  2313.6
   718.8 2313.88  2294.1   729.8 2313.98  2294.2   735.5    2314
  782.79 2314.36          830.66 2314.77          879.14    2315
  927.23 2315.23          973.72  2315.5          1021.4 2315.73
 1069.77 2316.05         1115.06 2316.34          1161.2  2316.5
  1208.2  2316.6         1255.32  2316.8         1408.42 2317.29

Downstream Bridge Cross Section Data
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  560.19  2308.5  662.29    2299  707.75 2292.95  714.38  2290.9  718.73 2290.61
  729.84 2290.71  732.53 2292.08  749.55 2291.85  791.92 2298.47  929.02  2298.5
 1408.42  2308.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  560.19     .03  707.75     .03  732.53     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        707.75  732.53          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  560.19   718.5    2300       F
   730.1 1408.42    2300       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   724.3    Downstream=   724.4
Upstream     num=       2
    Width   Elev    Width   Elev
        2   2292        2 2296.64
Downstream     num=       2
    Width   Elev    Width   Elev
        2  2290.5        2 2294.14

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 2

  E.G. US. (ft)              2297.22    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)              2296.72    E.G. Elev (ft)              2297.06       2295.21
  Q Total (cfs)               270.00    W.S. Elev (ft)              2295.44       2293.66
  Q Bridge (cfs)              270.00    Crit W.S. (ft)              2295.44       2293.66
  Q Weir (cfs)                          Max Chl Dpth (ft)              3.33          3.05
  Weir Sta Lft (ft)                     Vel Total (ft/s)              10.20          9.98
  Weir Sta Rgt (ft)                     Flow Area (sq ft)             26.47         27.07
  Weir Submerg                          Froude # Chl                   0.99          1.01
  Weir Max Depth (ft)                   Specif Force (cu ft)         129.03        124.28
  Min El Weir Flow (ft)      2313.90    Hydr Depth (ft)                3.29          3.01
  Min El Prs (ft)            2296.70    W.P. Total (ft)               17.93         21.04
  Delta EG (ft)                 2.72    Conv. Total (cfs)            1699.3        1585.8
  Delta WS (ft)                 3.49    Top Width (ft)                 8.05          9.00
  BR Open Area (sq ft)         31.50    Frctn Loss (ft)                1.74          0.02
  BR Open Vel (ft/s)           10.20    C & E Loss (ft)                0.02          0.08
  Coef of Q                             Shear Total (lb/sq ft)         2.33          2.33
  Br Sel Method           Energy only   Power Total (lb/ft s)         23.73         23.22


Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
Note:    Momentum answer is not valid if the water surface is above the low chord or if there is weir
         flow.  The momentum answer has been disregarded.
Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
         section.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
         is not a valid subcritical answer.  The program defaulted to critical depth.
```

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 0.98

INPUT
Description:
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 560.19 | 2308.5 | 662.29 | 2299 | 707.75 | 2292.95 | 714.38 | 2290.9 | 718.73 | 2290.61 |
| 729.84 | 2290.71 | 732.53 | 2292.08 | 749.55 | 2291.85 | 791.92 | 2298.47 | 929.02 | 2298.5 |
| 1408.42 | 2308.5 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 560.19 | .03 | 707.75 | .03 | 732.53 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
707.75 732.53 97.91 103.9 110.99 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 560.19 | 718.5 | 2300 | F |
| 730.1 | 1408.42 | 2300 | F |

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2294.51 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 1.28 | Wt. n-Val. | | 0.030 | |
| W.S. Elev (ft) | 2293.22 | Reach Len. (ft) | 97.91 | 103.90 | 110.99 |
| Crit W.S. (ft) | 2293.22 | Flow Area (sq ft) | | 29.70 | |
| E.G. Slope (ft/ft) | 0.009654 | Area (sq ft) | | 52.71 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | | 270.00 | |
| Top Width (ft) | 24.78 | Top Width (ft) | | 24.78 | |
| Vel Total (ft/s) | 9.09 | Avg. Vel. (ft/s) | | 9.09 | |
| Max Chl Dpth (ft) | 2.61 | Hydr. Depth (ft) | | 2.56 | |
| Conv. Total (cfs) | 2748.0 | Conv. (cfs) | | 2748.0 | |
| Length Wtd. (ft) | 103.11 | Wetted Per. (ft) | | 11.63 | |
| Min Ch El (ft) | 2290.61 | Shear (lb/sq ft) | | 1.54 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 13.99 | |
| Frctn Loss (ft) | 1.15 | Cum Volume (acre-ft) | 0.01 | 0.09 | |
| C & E Loss (ft) | 0.06 | Cum SA (acres) | 0.01 | 0.04 | |

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Minnie Cr
REACH: Lower RS: 0.9

INPUT
Description: Survey 1.3
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -86.79 | 2293 | -37.9 | 2290 | 0 | 2288.4 | 36.99 | 2288.2 | 39.87 | 2286.94 |
| 40.89 | 2286.93 | 42.15 | 2287.44 | 47.01 | 2290 | 84.41 | 2288.73 | 152.64 | 2300 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -86.79 | .035 | 36.99 | .03 | 47.01 | .04 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.99 47.01 0 0 0 .1 .3
Right Levee Station= 47.01 Elevation= 2290

CROSS SECTION OUTPUT Profile #PF 2

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2291.31 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 1.08 | Wt. n-Val. | 0.035 | 0.030 | |
| W.S. Elev (ft) | 2290.24 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 2290.24 | Flow Area (sq ft) | 11.26 | 22.27 | |
| E.G. Slope (ft/ft) | 0.013079 | Area (sq ft) | 11.26 | 22.27 | |
| Q Total (cfs) | 270.00 | Flow (cfs) | 71.21 | 198.79 | |
| Top Width (ft) | 15.59 | Top Width (ft) | 5.57 | 10.02 | |
| Vel Total (ft/s) | 8.05 | Avg. Vel. (ft/s) | 6.32 | 8.93 | |
| Max Chl Dpth (ft) | 3.31 | Hydr. Depth (ft) | 2.02 | 2.22 | |
| Conv. Total (cfs) | 2360.9 | Conv. (cfs) | 622.7 | 1738.2 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | 7.58 | 11.25 | |
| Min Ch El (ft) | 2286.93 | Shear (lb/sq ft) | 1.21 | 1.62 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 7.67 | 14.42 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Warning: The cross section had to be extended vertically during the critical depth calculations.

SUMMARY OF MANNING'S N VALUES

River:Minnie Cr

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 |
|---|---|---|---|---|---|---|
| Lower | 15 | .04 | .035 | .03 | .035 | |
| Lower | 14.75* | .03 | .035 | .037 | .037 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lower | 14.5* | .03 | .035 | .038 | .038 | |
| Lower | 14.25 | .03 | .035 | .04 | | |
| Lower | 14.2 | .03 | .035 | .04 | | |
| Lower | 14.01 | Culvert | | | | |
| Lower | 13.98 | .03 | .035 | .04 | | |
| Lower | 13.9 | .04 | .035 | .045 | | |
| Lower | 13.25 | .04 | .035 | .04 | | |
| Lower | 13.2 | .035 | .035 | .04 | | |
| Lower | 13.01 | Culvert | | | | |
| Lower | 12.98 | .04 | .035 | .04 | | |
| Lower | 12.9 | .04 | .04 | .045 | | |
| Lower | 12 | .03 | .035 | .045 | .04 | |
| Lower | 11.6666 | .03 | .033 | .042 | .037 | .037 |
| Lower | 11.3333 | .03 | .032 | .038 | .033 | .033 |
| Lower | 11 | .03 | .035 | .03 | | |
| Lower | 10.8125* | .03 | .035 | .03 | | |
| Lower | 10.625* | .03 | .035 | .03 | | |
| Lower | 10.4375* | .03 | .035 | .03 | | |
| Lower | 10.25 | .03 | .035 | .03 | | |
| Lower | 10.2 | .03 | .035 | .03 | | |
| Lower | 10.01 | Culvert | | | | |
| Lower | 9.98 | .03 | .035 | .03 | | |
| Lower | 9.9 | .03 | .035 | .03 | | |
| Lower | 9.45* | .03 | .035 | .03 | .032 | .032 |
| Lower | 9 | .03 | .035 | .03 | .035 | |
| Lower | 8.775 | .03 | .035 | .03 | .032 | .032 |
| Lower | 8.55 | .03 | .035 | .03 | | |
| Lower | 8.45 | .03 | .035 | .03 | | |
| Lower | 8.3 | Culvert | | | | |
| Lower | 8.28 | .03 | .035 | .03 | | |
| Lower | 8.25 | .03 | .04 | .035 | | |
| Lower | 8.2 | .03 | .035 | .03 | | |
| Lower | 8.01 | Culvert | | | | |
| Lower | 7.98 | .03 | .035 | .03 | | |
| Lower | 7.9 | .03 | .035 | .03 | | |
| Lower | 7.6 | .03 | .035 | .03 | | |
| Lower | 7.3 | .03 | .035 | .03 | | |
| Lower | 7 | .03 | .035 | .03 | | |
| Lower | 6.8125* | .03 | .035 | .03 | | |
| Lower | 6.625* | .03 | .035 | .03 | | |
| Lower | 6.4375* | .03 | .035 | .03 | | |
| Lower | 6.25 | .03 | .035 | .03 | | |
| Lower | 6.22 | Lat Struct | | | | |
| Lower | 6.2 | .03 | .035 | .03 | | |
| Lower | 6.01 | Bridge | | | | |
| Lower | 5.98 | .03 | .035 | .03 | | |
| Lower | 5.9 | .03 | .035 | .035 | | |
| Lower | 5 | .03 | .035 | .04 | | |
| Lower | 4.875* | .035 | .035 | .035 | .038 | |
| Lower | 4.75* | .035 | .035 | .035 | .037 | |
| Lower | 4.625* | .035 | .035 | .035 | .035 | |
| Lower | 4.5* | .035 | .035 | .035 | .033 | .033 |
| Lower | 4.375* | .03 | .035 | .035 | .032 | .032 |
| Lower | 4.25 | .03 | .035 | .03 | | |
| Lower | 4.22 | Lat Struct | | | | |
| Lower | 4.2 | .03 | .035 | .03 | | |
| Lower | 4.01 | Bridge | | | | |
| Lower | 3.98 | .03 | .035 | .03 | | |
| Lower | 3.55 | .03 | .035 | .03 | | |
| Lower | 3.5 | Culvert | | | | |
| Lower | 3.4 | .035 | .04 | .035 | | |
| Lower | 3.35 | .035 | .04 | .035 | | |
| Lower | 3.25 | .035 | .04 | .035 | | |
| Lower | 3.2 | .035 | .04 | .035 | | |
| Lower | 3.01 | Culvert | | | | |
| Lower | 2.98 | .04 | .03 | .04 | | |
| Lower | 2.9 | .035 | .03 | .04 | | |
| Lower | 2.575 | .032 | .03 | .035 | | |
| Lower | 2.25 | .03 | .03 | .03 | | |
| Lower | 2.2 | .03 | .03 | .03 | | |
| Lower | 2.01 | Culvert | | | | |
| Lower | 1.98 | .03 | .03 | .03 | | |
| Lower | 1.9 | .03 | .03 | .035 | | |
| Lower | 1.575 | .03 | .03 | .03 | | |
| Lower | 1.25 | .03 | .03 | .03 | | |
| Lower | 1.2 | .03 | .03 | .03 | | |
| Lower | 1.01 | Bridge | | | | |
| Lower | 0.98 | .03 | .03 | .03 | | |
| Lower | 0.9 | .035 | .03 | .04 | | |

SUMMARY OF REACH LENGTHS

River: Minnie Cr

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Lower | 15 | 100 | 144.9 | 150.67 |
| Lower | 14.75* | 120 | 144.9 | 150.67 |
| Lower | 14.5* | 70 | 144.9 | 150.67 |
| Lower | 14.25 | 49.82 | 50.9 | 50.52 |
| Lower | 14.2 | 43 | 44 | 43.28 |
| Lower | 14.01 | Culvert | | |
| Lower | 13.98 | 91.58 | 80 | 73.15 |
| Lower | 13.9 | 35.2 | 45.1 | 51.9 |
| Lower | 13.25 | 45.81 | 48.1 | 46.76 |
| Lower | 13.2 | 136.18 | 136 | 136.18 |
| Lower | 13.01 | Culvert | | |
| Lower | 12.98 | 62.62 | 61.2 | 58.67 |
| Lower | 12.9 | 818.6 | 818.6 | 818.6 |
| Lower | 12 | 228 | 277.63 | 266 |
| Lower | 11.6666 | 265 | 277.63 | 317 |
| Lower | 11.3333 | 274 | 277.63 | 292 |
| Lower | 11 | 265 | 264.15 | 260 |
| Lower | 10.8125* | 265 | 264.15 | 258 |
| Lower | 10.625* | 265 | 264.15 | 263 |
| Lower | 10.4375* | 264 | 264.15 | 262 |
| Lower | 10.25 | 44.28 | 46.7 | 45.58 |
| Lower | 10.2 | 32 | 32 | 32 |
| Lower | 10.01 | Culvert | | |
| Lower | 9.98 | 82.04 | 79.2 | 80.8 |
| Lower | 9.9 | 422 | 424.1 | 428.5 |
| Lower | 9.45* | 422 | 424.1 | 428.5 |
| Lower | 9 | 262 | 261.5 | 261 |
| Lower | 8.775 | 262.5 | 261.5 | 260 |
| Lower | 8.55 | 48.5 | 51.7 | 52.1 |

| | | | | | |
|---|---|---|---|---|---|
| Lower | 8.45 | | 22.15 | 22 | 22.15 |
| Lower | 8.3 | Culvert | | | |
| Lower | 8.28 | | 197.16 | 191.3 | 182.4 |
| Lower | 8.25 | | 61.5 | 59.7 | 62 |
| Lower | 8.2 | | 52.61 | 52.7 | 52.54 |
| Lower | 8.01 | Culvert | | | |
| Lower | 7.98 | | 172.58 | 157.1 | 145.16 |
| Lower | 7.9 | | 267 | 277.7 | 286 |
| Lower | 7.6 | | 277 | 277.7 | 274 |
| Lower | 7.3 | | 279 | 277.7 | 271 |
| Lower | 7 | | 200 | 196.6 | 199 |
| Lower | 6.8125* | | 198 | 196.6 | 198 |
| Lower | 6.625* | | 199 | 196.6 | 194 |
| Lower | 6.4375* | | 195 | 196.6 | 193 |
| Lower | 6.25 | | 70 | 67.9 | 60 |
| Lower | 6.22 | Lat Struct | | | |
| Lower | 6.2 | | 23.8 | 24 | 23.8 |
| Lower | 6.01 | Bridge | | | |
| Lower | 5.98 | | 96.89 | 108.5 | 113.2 |
| Lower | 5.9 | | 704 | 706.3 | 705 |
| Lower | 5 | | 225.5 | 233.78 | 238.83 |
| Lower | 4.875* | | 225.5 | 233.78 | 238.83 |
| Lower | 4.75* | | 225.5 | 233.78 | 238.83 |
| Lower | 4.625* | | 225.5 | 233.78 | 238.83 |
| Lower | 4.5* | | 225.5 | 233.78 | 238.83 |
| Lower | 4.375* | | 225.5 | 233.78 | 238.83 |
| Lower | 4.25 | | 47.12 | 52.1 | 51.65 |
| Lower | 4.22 | Lat Struct | | | |
| Lower | 4.2 | | 22.24 | 22 | 22.24 |
| Lower | 4.01 | Bridge | | | |
| Lower | 3.98 | | 38.55 | 34.2 | 36.87 |
| Lower | 3.55 | | 30.9 | 30.9 | 30.9 |
| Lower | 3.5 | Culvert | | | |
| Lower | 3.4 | | 48.57 | 62.9 | 74 |
| Lower | 3.35 | | 280.87 | 255.2 | 240.99 |
| Lower | 3.25 | | 31.12 | 31.3 | 34.75 |
| Lower | 3.2 | | 84.32 | 84.3 | 84.32 |
| Lower | 3.01 | Culvert | | | |
| Lower | 2.98 | | 88.83 | 86.9 | 82.46 |
| Lower | 2.9 | | 468 | 424.05 | 409 |
| Lower | 2.575 | | 444.23 | 424.05 | 418.83 |
| Lower | 2.25 | | 44.48 | 44.5 | 46.03 |
| Lower | 2.2 | | 25.7 | 26.3 | 25.71 |
| Lower | 2.01 | Culvert | | | |
| Lower | 1.98 | | 94.92 | 93.4 | 91 |
| Lower | 1.9 | | 606 | 611.7 | 613 |
| Lower | 1.575 | | 607.5 | 611.7 | 612.49 |
| Lower | 1.25 | | 57.9 | 49.4 | 45.74 |
| Lower | 1.2 | | 75 | 75 | 75 |
| Lower | 1.01 | Bridge | | | |
| Lower | 0.98 | | 97.91 | 103.9 | 110.99 |
| Lower | 0.9 | | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Minnie Cr

| Reach | River Sta. | | Contr. | Expan. |
|---|---|---|---|---|
| Lower | 15 | | .1 | .3 |
| Lower | 14.75* | | .1 | .3 |
| Lower | 14.5* | | .1 | .3 |
| Lower | 14.25 | | .1 | .3 |
| Lower | 14.2 | | .1 | .3 |
| Lower | 14.01 | Culvert | | |
| Lower | 13.98 | | .1 | .3 |
| Lower | 13.9 | | .1 | .3 |
| Lower | 13.25 | | .1 | .3 |
| Lower | 13.2 | | .1 | .3 |
| Lower | 13.01 | Culvert | | |
| Lower | 12.98 | | .1 | .3 |
| Lower | 12.9 | | .1 | .3 |
| Lower | 12 | | .1 | .3 |
| Lower | 11.6666 | | .1 | .3 |
| Lower | 11.3333 | | .1 | .3 |
| Lower | 11 | | .1 | .3 |
| Lower | 10.8125* | | .1 | .3 |
| Lower | 10.625* | | .1 | .3 |
| Lower | 10.4375* | | .1 | .3 |
| Lower | 10.25 | | .1 | .3 |
| Lower | 10.2 | | .1 | .3 |
| Lower | 10.01 | Culvert | | |
| Lower | 9.98 | | .1 | .3 |
| Lower | 9.9 | | .1 | .3 |
| Lower | 9.45* | | .1 | .3 |
| Lower | 9 | | .1 | .3 |
| Lower | 8.775 | | .1 | .3 |
| Lower | 8.55 | | .1 | .3 |
| Lower | 8.45 | | .1 | .3 |
| Lower | 8.3 | Culvert | | |
| Lower | 8.28 | | .1 | .3 |
| Lower | 8.25 | | .1 | .3 |
| Lower | 8.2 | | .1 | .3 |
| Lower | 8.01 | Culvert | | |
| Lower | 7.98 | | .1 | .3 |
| Lower | 7.9 | | .1 | .3 |
| Lower | 7.6 | | .1 | .3 |
| Lower | 7.3 | | .1 | .3 |
| Lower | 7 | | .1 | .3 |
| Lower | 6.8125* | | .1 | .3 |
| Lower | 6.625* | | .1 | .3 |
| Lower | 6.4375* | | .1 | .3 |
| Lower | 6.25 | | .1 | .3 |
| Lower | 6.22 | Lat Struct | | |
| Lower | 6.2 | | .1 | .3 |
| Lower | 6.01 | Bridge | | |
| Lower | 5.98 | | .1 | .3 |
| Lower | 5.9 | | .1 | .3 |
| Lower | 5 | | .1 | .3 |
| Lower | 4.875* | | .1 | .3 |
| Lower | 4.75* | | .1 | .3 |
| Lower | 4.625* | | .1 | .3 |
| Lower | 4.5* | | .1 | .3 |
| Lower | 4.375* | | .1 | .3 |
| Lower | 4.25 | | .1 | .3 |

| | | | | |
|---|---|---|---|---|
| Lower | 4.22 | Lat Struct | | |
| Lower | 4.2 | | .1 | .3 |
| Lower | 4.01 | Bridge | | |
| Lower | 3.98 | | .1 | .3 |
| Lower | 3.55 | | .1 | .3 |
| Lower | 3.5 | Culvert | | |
| Lower | 3.4 | | .1 | .3 |
| Lower | 3.35 | | .1 | .3 |
| Lower | 3.25 | | .1 | .3 |
| Lower | 3.2 | | .1 | .3 |
| Lower | 3.01 | Culvert | | |
| Lower | 2.98 | | .1 | .3 |
| Lower | 2.9 | | .1 | .3 |
| Lower | 2.575 | | .1 | .3 |
| Lower | 2.25 | | .1 | .3 |
| Lower | 2.2 | | .1 | .3 |
| Lower | 2.01 | Culvert | | |
| Lower | 1.98 | | .1 | .3 |
| Lower | 1.9 | | .1 | .3 |
| Lower | 1.575 | | .1 | .3 |
| Lower | 1.25 | | .1 | .3 |
| Lower | 1.2 | | .1 | .3 |
| Lower | 1.01 | Bridge | | |
| Lower | 0.98 | | .1 | .3 |
| Lower | 0.9 | | .1 | .3 |

Profile Output Table - Floodway Data

| Reach | River Sta | Profile | Cum Ch Len (ft) | Top Wdth Act (ft) | Area (sq ft) | Vel Chnl (ft/s) | W.S. Elev (ft) | W.S. Elev (ft) | W.S. Elev (ft) | Length Chnl (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Lower | 0.9 | PF 2 | | 15.59 | 33.53 | 8.93 | 2290.24 | 2290.24 | 2290.24 | |
| Lower | 0.98 | PF 2 | 103.90 | 11.60 | 52.71 | 9.09 | 2293.22 | 2293.22 | 2293.22 | 103.90 |
| Lower | 1.01 | | Bridge | | | | | | | |
| Lower | 1.2 | PF 2 | 178.90 | 10.35 | 56.44 | 5.72 | 2296.72 | 2296.72 | 2296.72 | 9.30 |
| Lower | 1.25 | PF 2 | 228.30 | 15.32 | 43.72 | 6.50 | 2296.83 | 2296.83 | 2296.83 | 49.40 |
| Lower | 1.575 | PF 2 | 840.00 | 14.95 | 32.96 | 8.70 | 2311.21 | 2311.21 | 2311.21 | 611.70 |
| Lower | 1.9 | PF 2 | 1451.70 | 40.56 | 48.87 | 7.02 | 2325.69 | 2325.69 | 2325.69 | 611.70 |
| Lower | 1.98 | PF 2 | 1545.10 | 75.02 | 65.05 | 6.02 | 2327.51 | 2327.51 | 2327.51 | 93.40 |
| Lower | 2.01 | | Culvert | | | | | | | |
| Lower | 2.2 | PF 2 | 1571.40 | 76.00 | 140.01 | 2.52 | 2328.83 | 2328.83 | 2328.83 | 26.30 |
| Lower | 2.25 | PF 2 | 1615.90 | 61.00 | 85.70 | 4.43 | 2328.79 | 2328.79 | 2328.79 | 44.50 |
| Lower | 2.575 | PF 2 | 2039.95 | 32.00 | 46.78 | 7.93 | 2333.13 | 2333.13 | 2333.13 | 424.05 |
| Lower | 2.9 | PF 2 | 2464.00 | 14.92 | 33.92 | 11.01 | 2338.28 | 2338.28 | 2338.28 | 424.05 |
| Lower | 2.98 | PF 2 | 2550.90 | 10.07 | 28.38 | 9.52 | 2340.92 | 2340.92 | 2340.92 | 86.90 |
| Lower | 3.01 | | Culvert | | | | | | | |
| Lower | 3.2 | PF 2 | 2635.20 | 45.25 | 699.41 | 1.52 | 2352.25 | 2352.25 | 2352.25 | 84.30 |
| Lower | 3.25 | PF 2 | 2666.50 | 45.27 | 572.77 | 1.03 | 2352.27 | 2352.27 | 2352.27 | 31.30 |
| Lower | 3.35 | PF 2 | 2921.70 | 39.55 | 216.76 | 1.25 | 2352.28 | 2352.28 | 2352.28 | 255.20 |
| Lower | 3.4 | PF 2 | 2984.60 | 34.77 | 145.89 | 2.01 | 2352.27 | 2352.27 | 2352.27 | 62.90 |
| Lower | 3.5 | | Culvert | | | | | | | |
| Lower | 3.55 | PF 2 | 3015.50 | 34.76 | 153.03 | 1.94 | 2352.33 | 2352.33 | 2352.33 | 30.90 |
| Lower | 3.98 | PF 2 | 3049.70 | 38.12 | 154.81 | 2.54 | 2352.32 | 2352.32 | 2352.32 | 34.20 |
| Lower | 4.01 | | Bridge | | | | | | | |
| Lower | 4.2 | PF 2 | 3071.70 | 36.12 | 202.33 | 1.87 | 2353.62 | 2353.62 | 2353.62 | 1.80 |
| Lower | 4.22 | | Lat Struct | | | | | | | |
| Lower | 4.25 | PF 2 | 3123.80 | 42.81 | 237.18 | 1.19 | 2353.66 | 2353.66 | 2353.66 | 52.10 |
| Lower | 4.375* | PF 2 | 3357.58 | 50.00 | 216.39 | 1.27 | 2353.68 | 2353.68 | 2353.68 | 233.78 |
| Lower | 4.5* | PF 2 | 3591.36 | 71.00 | 200.41 | 1.38 | 2353.72 | 2353.72 | 2353.72 | 233.78 |
| Lower | 4.625* | PF 2 | 3825.14 | 76.92 | 132.20 | 2.04 | 2353.80 | 2353.80 | 2353.80 | 233.78 |
| Lower | 4.75* | PF 2 | 4058.92 | 70.11 | 73.67 | 3.69 | 2354.23 | 2354.23 | 2354.23 | 233.78 |
| Lower | 4.875* | PF 2 | 4292.70 | 77.79 | 84.86 | 3.18 | 2355.65 | 2355.65 | 2355.65 | 233.78 |
| Lower | 5 | PF 2 | 4526.48 | 78.99 | 76.07 | 3.55 | 2356.83 | 2356.83 | 2356.83 | 233.78 |
| Lower | 5.9 | PF 2 | 5232.78 | 21.30 | 45.57 | 5.93 | 2361.22 | 2361.22 | 2361.22 | 706.30 |
| Lower | 5.98 | PF 2 | 5341.28 | 26.63 | 59.34 | 4.55 | 2362.10 | 2362.10 | 2362.10 | 108.50 |
| Lower | 6.01 | | Bridge | | | | | | | |
| Lower | 6.2 | PF 2 | 5365.28 | 17.00 | 91.70 | 4.16 | 2363.27 | 2363.27 | 2363.27 | 2.10 |
| Lower | 6.22 | | Lat Struct | | | | | | | |
| Lower | 6.25 | PF 2 | 5433.18 | 33.13 | 88.73 | 3.07 | 2363.51 | 2363.51 | 2363.51 | 67.90 |
| Lower | 6.4375* | PF 2 | 5629.78 | 35.06 | 65.90 | 4.10 | 2363.89 | 2363.89 | 2363.89 | 196.60 |
| Lower | 6.625* | PF 2 | 5826.38 | 37.52 | 61.16 | 4.41 | 2364.83 | 2364.83 | 2364.83 | 196.60 |
| Lower | 6.8125* | PF 2 | 6022.98 | 39.32 | 63.10 | 4.28 | 2365.97 | 2365.97 | 2365.97 | 196.60 |
| Lower | 7 | PF 2 | 6219.58 | 40.50 | 63.95 | 4.22 | 2367.07 | 2367.07 | 2367.07 | 196.60 |
| Lower | 7.3 | PF 2 | 6497.28 | 38.47 | 83.74 | 3.22 | 2368.10 | 2368.10 | 2368.10 | 277.70 |
| Lower | 7.6 | PF 2 | 6774.98 | 35.12 | 82.50 | 3.27 | 2368.67 | 2368.67 | 2368.67 | 277.70 |
| Lower | 7.9 | PF 2 | 7052.68 | 31.65 | 78.63 | 3.43 | 2369.23 | 2369.23 | 2369.23 | 277.70 |
| Lower | 7.98 | PF 2 | 7209.78 | 36.73 | 100.73 | 2.68 | 2369.54 | 2369.54 | 2369.54 | 157.10 |
| Lower | 8.01 | | Culvert | | | | | | | |
| Lower | 8.2 | PF 2 | 7262.48 | 107.35 | 282.86 | 0.95 | 2371.56 | 2371.56 | 2371.56 | 52.70 |
| Lower | 8.25 | PF 2 | 7322.18 | 42.23 | 214.31 | 1.26 | 2371.57 | 2371.57 | 2371.57 | 59.70 |
| Lower | 8.28 | PF 2 | 7513.48 | 30.63 | 187.81 | 1.44 | 2371.59 | 2371.59 | 2371.59 | 191.30 |
| Lower | 8.3 | | Culvert | | | | | | | |
| Lower | 8.45 | PF 2 | 7535.48 | 30.63 | 189.85 | 1.42 | 2371.65 | 2371.65 | 2371.65 | 22.00 |
| Lower | 8.55 | PF 2 | 7587.18 | 39.41 | 216.22 | 1.25 | 2371.67 | 2371.67 | 2371.67 | 51.70 |
| Lower | 8.775 | PF 2 | 7848.68 | 36.16 | 186.39 | 1.45 | 2371.70 | 2371.70 | 2371.70 | 261.50 |
| Lower | 9 | PF 2 | 8110.18 | 32.89 | 159.55 | 1.69 | 2371.74 | 2371.74 | 2371.74 | 261.50 |
| Lower | 9.45* | PF 2 | 8534.28 | 34.26 | 158.74 | 1.70 | 2371.85 | 2371.85 | 2371.85 | 424.10 |
| Lower | 9.9 | PF 2 | 8958.38 | 35.64 | 157.35 | 1.72 | 2371.96 | 2371.96 | 2371.96 | 424.10 |
| Lower | 9.98 | PF 2 | 9037.58 | 37.30 | 177.63 | 1.57 | 2371.98 | 2371.98 | 2371.98 | 79.20 |
| Lower | 10.01 | | Culvert | | | | | | | |
| Lower | 10.2 | PF 2 | 9069.58 | 37.30 | 184.23 | 1.52 | 2372.16 | 2372.16 | 2372.16 | 32.00 |
| Lower | 10.25 | PF 2 | 9116.28 | 41.00 | 194.18 | 1.51 | 2372.17 | 2372.17 | 2372.17 | 46.70 |
| Lower | 10.4375* | PF 2 | 9380.43 | 49.65 | 246.76 | 1.18 | 2372.21 | 2372.21 | 2372.21 | 264.15 |
| Lower | 10.625* | PF 2 | 9644.58 | 71.03 | 368.02 | 0.79 | 2372.23 | 2372.23 | 2372.23 | 264.15 |
| Lower | 10.8125* | PF 2 | 9908.73 | 84.66 | 471.84 | 0.60 | 2372.24 | 2372.24 | 2372.24 | 264.15 |
| Lower | 11 | PF 2 | 10172.88 | 133.76 | 766.21 | 0.35 | 2372.25 | 2372.25 | 2372.25 | 264.15 |
| Lower | 11.3333 | PF 2 | 10450.51 | 192.55 | 1147.38 | 0.23 | 2372.25 | 2372.25 | 2372.25 | 277.63 |
| Lower | 11.6666 | PF 2 | 10728.14 | 203.93 | 1295.47 | 0.21 | 2372.25 | 2372.25 | 2372.25 | 277.63 |
| Lower | 12 | PF 2 | 11005.77 | 253.17 | 1751.68 | 0.15 | 2372.25 | 2372.25 | 2372.25 | 277.63 |
| Lower | 12.9 | PF 2 | 11824.37 | 27.26 | 3995.60 | 2.32 | 2372.20 | 2372.20 | 2372.20 | 818.60 |
| Lower | 12.98 | PF 2 | 11885.57 | 27.57 | 113.01 | 2.39 | 2372.23 | 2372.23 | 2372.23 | 61.20 |
| Lower | 13.01 | | Culvert | | | | | | | |
| Lower | 13.2 | PF 2 | 12021.57 | 33.85 | 1911.68 | 0.74 | 2380.38 | 2380.38 | 2380.38 | 136.00 |
| Lower | 13.25 | PF 2 | 12069.67 | 82.00 | 1928.17 | 0.45 | 2380.39 | 2380.39 | 2380.39 | 48.10 |
| Lower | 13.9 | PF 2 | 12114.77 | 128.00 | 1572.67 | 0.36 | 2380.39 | 2380.39 | 2380.39 | 45.10 |
| Lower | 13.98 | PF 2 | 12194.77 | 209.00 | 10388.60 | 0.23 | 2380.39 | 2380.39 | 2380.39 | 80.00 |
| Lower | 14.01 | | Culvert | | | | | | | |
| Lower | 14.2 | PF 2 | 12238.77 | 34.00 | 745.40 | 0.77 | 2380.40 | 2380.40 | 2380.40 | 44.00 |
| Lower | 14.25 | PF 2 | 12289.67 | 77.00 | 3358.52 | 0.36 | 2380.41 | 2380.41 | 2380.41 | 50.90 |
| Lower | 14.5* | PF 2 | 12434.57 | 233.00 | 4035.70 | 0.13 | 2380.41 | 2380.41 | 2380.41 | 144.90 |
| Lower | 14.75* | PF 2 | 12579.47 | 383.00 | 5156.45 | 0.07 | 2380.41 | 2380.41 | 2380.41 | 144.90 |
| Lower | 15 | PF 2 | 12724.37 | 546.00 | 7391.36 | 0.04 | 2380.41 | 2380.41 | 2380.41 | 144.90 |

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                    HEC-RAS Version 3.1.3 May 2005
                     U.S. Army Corp of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X       X    X       X   X     X  X    X
          X     X  X       X            X   X    X    X   X
          XXXXXXX  XXXX    X       XXX  XXXX    XXXXXX    XXXX
          X     X  X       X            X  X     X    X        X
          X     X  X       X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX


PROJECT DATA
Project Title: Minnie Creek Special Study
Project File : Minnie.prj
Run Date and Time: 2/1/2007 1:05:12 PM

Project in English units

Project Description:
MINNIE CREEK 2006
THIS FILE CREATED AUGUST 2006
SECTIONS SURVEYED BY ROGERS
SURVEYING AUGUST 2006
DATUM NAD27, NGVD29
REDUCTION INCLUDED REDUCTION OF GR
CARDS.
SECTION 0.90 IS DOWNSTREAM THE RAILROAD CROSSING SOUTHEAST OF
CHENEY
DATA REDUCTION/UNSTEADY FLOW MODELING - T. SCHWARZ
STEADY FLOW
MODELING - G. SLACK


PLAN DATA

Plan Title: Unstready Flow
Plan File : C:\Minnie Creek\Combined model 1-12-07\Minnie.p08

          Geometry Title: Minnie Unsteady test2
          Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g11

          Flow Title    : Flow Data
          Flow File     : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Plan Summary Information:
Number of:  Cross Sections =   32    Multiple Openings  =    0
            Culverts       =    3    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    1

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow


GEOMETRY DATA

Geometry Title: Minnie Unsteady test2
Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g11

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 23

INPUT
Description: Survey 23
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2386.4   38.06 2382.53   48.04 2379.52   57.57 2376.49    61.8 2376.95
   87.43  2377.4   93.51 2378.77   95.79 2379.38  100.76 2379.35  102.74 2378.68
  110.04  2376.5  146.41 2376.11  179.49 2375.73  230.11 2375.22  282.64 2374.72
  334.12  2374.4  385.98 2374.22  437.02 2373.91  489.22 2373.61  540.21 2373.91
  593.07  2373.9  644.66 2374.11  694.89 2373.68     745 2373.09  768.63 2371.99
  816.34  2371.9  866.85 2372.02  911.51 2375.38  945.72  2376.9  983.82 2379.74
 1033.94  2380.7 1061.88 2377.85 1108.57 2375.91 1113.79 2373.87 1125.34 2373.77
 1135.24  2373.6 1157.32 2373.19 1184.75  2372.9 1238.23 2373.44 1288.89 2373.61
 1342.03  2374.6 1392.95 2375.95 1420.85 2376.81 1446.53 2378.46 1457.18 2379.49
 1504.64  2382.8 1554.63 2386.58 1604.25  2390.6 1633.99 2393.64 1682.81 2400.66
 1713.32  2404.3 1730.63  2407.8 1744.08 2415.76 1773.78 2417.23 1782.39 2417.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03 1108.57    .035 1288.89     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       1108.57 1288.89           333.75   243.9  279.24              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1280 1782.39    2380       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035
```

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 333.75 | 243.90 | 279.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 354.18 | 118.62 | |
| E.G. Slope (ft/ft) | 0.000010 | Area (sq ft) | 354.18 | 122.70 | 5.29 |
| Q Total (cfs) | 73.80 | Flow (cfs) | 60.89 | 12.91 | |
| Top Width (ft) | 659.63 | Top Width (ft) | 460.24 | 175.57 | 23.82 |
| Vel Total (ft/s) | 0.16 | Avg. Vel. (ft/s) | 0.17 | 0.11 | |
| Max Chl Dpth (ft) | 2.15 | Hydr. Depth (ft) | 0.77 | 0.71 | |
| Conv. Total (cfs) | 22934.1 | Conv. (cfs) | 18920.8 | 4013.3 | |
| Length Wtd. (ft) | 311.03 | Wetted Per. (ft) | 460.35 | 166.73 | |
| Min Ch El (ft) | 2372.90 | Shear (lb/sq ft) | 0.00 | 0.00 | |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.00 | 0.00 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 251.54 | 346.89 | 232.30 |
| C & E Loss (ft) | | Cum SA (acres) | 79.11 | 96.93 | 86.23 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 22.75*

INPUT
Description:
Station Elevation Data num= 106

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2386.88 | 31.67 | 2383.76 | 39.98 | 2381.45 | 47.91 | 2379.12 | 51.43 | 2379.45 |
| 72.76 | 2379.64 | 77.82 | 2380.63 | 79.72 | 2381.08 | 83.85 | 2381.03 | 85.5 | 2380.52 |
| 91.58 | 2378.84 | 118.68 | 2378.4 | 121.84 | 2378.35 | 149.37 | 2377.92 | 191.5 | 2377.32 |
| 235.21 | 2376.72 | 240.06 | 2376.67 | 278.06 | 2376.26 | 321.21 | 2375.89 | 351.73 | 2375.57 |
| 363.69 | 2375.16 | 366.08 | 2375.08 | 396.3 | 2375.01 | 407.13 | 2374.84 | 434.19 | 2374.7 |
| 445.68 | 2374.37 | 449.56 | 2374.39 | 455.4 | 2374.38 | 470.89 | 2374.76 | 475.74 | 2374.95 |
| 488.27 | 2374.96 | 492.42 | 2374.85 | 493.55 | 2374.81 | 506.9 | 2374.38 | 536.49 | 2374.86 |
| 560.29 | 2373.15 | 583.81 | 2373.01 | 592.94 | 2372.87 | 615.27 | 2372.67 | 635.55 | 2372.5 |
| 649.26 | 2372.23 | 663.46 | 2371.73 | 675.82 | 2371.42 | 696.23 | 2371.19 | 713.61 | 2371.05 |
| 729.45 | 2370.91 | 771.67 | 2371.08 | 783.58 | 2371.9 | 809 | 2373.63 | 822.54 | 2374.17 |
| 837.59 | 2374.73 | 858.78 | 2376.09 | 869.44 | 2376.87 | 911.33 | 2377.84 | 934.68 | 2375.85 |
| 973.71 | 2374.63 | 978.52 | 2372.98 | 989.15 | 2372.65 | 998.27 | 2372.27 | 1018.61 | 2372.16 |
| 1020.26 | 2371.64 | 1043.87 | 2371.62 | 1063.47 | 2371.98 | 1073.18 | 2371.95 | 1085.46 | 2372.03 |
| 1101.26 | 2372.14 | 1104.63 | 2372.3 | 1119.81 | 2374.66 | 1125.62 | 2374.6 | 1134.69 | 2374.47 |
| 1154.43 | 2374.44 | 1165.25 | 2374.42 | 1196.14 | 2374.56 | 1203.05 | 2374.87 | 1209.41 | 2374.42 |
| 1228.08 | 2374.1 | 1246.49 | 2374.41 | 1255.96 | 2374.53 | 1268.04 | 2374.57 | 1284.28 | 2374.58 |
| 1331.03 | 2374.92 | 1337.2 | 2375.05 | 1366.2 | 2375.73 | 1372.58 | 2376.04 | 1392.89 | 2377.1 |
| 1402.31 | 2377.82 | 1403.96 | 2377.94 | 1447.52 | 2380.28 | 1453.28 | 2380.58 | 1491.63 | 2382.79 |
| 1505.24 | 2383.59 | 1539.03 | 2385.71 | 1556.81 | 2386.92 | 1586.99 | 2389.44 | 1587.71 | 2389.52 |
| 1617.53 | 2393.38 | 1638.45 | 2396.32 | 1658.95 | 2398.84 | 1670.16 | 2400.2 | 1683.24 | 2402.58 |
| 1684.39 | 2404.05 | 1688.15 | 2404.66 | 1702.13 | 2410.87 | 1713.52 | 2411.47 | 1733 | 2412.6 |
| 1741.95 | 2413.1 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 973.71 | .038 | 1119.81 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 973.71 | 1119.81 | 333.75 | 243.9 | 279.24 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1119.8 | 2371.91 | T |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.038 | |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 333.75 | 243.90 | 279.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 440.46 | 254.62 | |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 530.44 | 264.29 | |
| Q Total (cfs) | 75.16 | Flow (cfs) | 50.41 | 24.75 | |
| Top Width (ft) | 412.35 | Top Width (ft) | 271.85 | 140.50 | |
| Vel Total (ft/s) | 0.11 | Avg. Vel. (ft/s) | 0.11 | 0.10 | |
| Max Chl Dpth (ft) | 3.14 | Hydr. Depth (ft) | 1.62 | 1.81 | |
| Conv. Total (cfs) | 44855.1 | Conv. (cfs) | 30084.7 | 14770.4 | |
| Length Wtd. (ft) | 274.31 | Wetted Per. (ft) | 272.00 | 140.92 | |
| Min Ch El (ft) | 2371.62 | Shear (lb/sq ft) | 0.00 | 0.00 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 248.15 | 345.80 | 232.28 |
| C & E Loss (ft) | | Cum SA (acres) | 76.30 | 96.05 | 86.15 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 22.5*

INPUT
Description:
Station Elevation Data num= 106

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2387.35 | 25.29 | 2384.99 | 31.92 | 2383.38 | 38.25 | 2381.76 | 41.06 | 2381.94 |
| 58.09 | 2381.88 | 62.13 | 2382.5 | 63.64 | 2382.78 | 66.95 | 2382.71 | 68.26 | 2382.35 |
| 73.11 | 2381.18 | 94.75 | 2380.65 | 97.28 | 2380.59 | 119.25 | 2380.12 | 152.89 | 2379.42 |
| 187.79 | 2378.72 | 191.66 | 2378.65 | 221.99 | 2374.11 | 256.45 | 2373.57 | 280.81 | 2373.14 |
| 290.36 | 2373.42 | 292.27 | 2373.28 | 316.39 | 2373.04 | 325.04 | 2372.87 | 346.64 | 2373.09 |
| 355.81 | 2372.66 | 358.92 | 2372.86 | 363.57 | 2373.04 | 375.94 | 2372.61 | 379.82 | 2372.8 |
| 389.82 | 2373.02 | 393.14 | 2372.8 | 394.04 | 2372.72 | 404.69 | 2372.79 | 428.32 | 2372.62 |
| 454.74 | 2372.36 | 480.86 | 2372.38 | 491 | 2372.46 | 515.79 | 2372.3 | 538.3 | 2371.96 |
| 553.53 | 2371.77 | 569.29 | 2371.35 | 583.02 | 2370.85 | 605.67 | 2370.43 | 624.97 | 2370.17 |
| 642.55 | 2369.92 | 676.48 | 2370.13 | 686.05 | 2370.71 | 706.48 | 2371.87 | 717.37 | 2372.24 |
| 729.46 | 2372.56 | 746.49 | 2372.4 | 755.05 | 2372 | 788.72 | 2371.99 | 807.49 | 2371.85 |
| 838.85 | 2372.35 | 843.24 | 2372.28 | 852.97 | 2372.12 | 861.3 | 2371.95 | 879.89 | 2371.54 |
| 881.4 | 2371.51 | 902.98 | 2370.33 | 929.37 | 2370.93 | 942.43 | 2370.8 | 958.97 | 2370.89 |
| 980.23 | 2374.11 | 984.75 | 2374.31 | 1005.19 | 2374.93 | 1013 | 2374.76 | 1025.21 | 2374.48 |
| 1051.77 | 2374.38 | 1066.35 | 2374.21 | 1107.91 | 2374.23 | 1117.22 | 2374.23 | 1125.77 | 2374.15 |
| 1150.9 | 2374.21 | 1175.67 | 2374.68 | 1188.41 | 2374.8 | 1204.68 | 2374.74 | 1226.54 | 2374.56 |
| 1275.05 | 2374.21 | 1281.46 | 2374.24 | 1311.55 | 2374.65 | 1318.17 | 2374.87 | 1339.25 | 2375.74 |
| 1349.02 | 2376.3 | 1350.73 | 2376.39 | 1395.94 | 2378.14 | 1401.92 | 2378.37 | 1441.73 | 2380 |
| 1455.84 | 2380.6 | 1490.91 | 2382.21 | 1509.36 | 2383.25 | 1540.69 | 2385.32 | 1541.44 | 2385.39 |
| 1572.38 | 2389 | 1594.09 | 2391.98 | 1615.37 | 2394.66 | 1627 | 2396.11 | 1640.58 | 2398.31 |
| 1641.77 | 2401.03 | 1645.67 | 2401.53 | 1660.18 | 2405.98 | 1672 | 2406.63 | 1692.21 | 2407.97 |
| 1701.5 | 2408.57 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

```
       0     .03  221.99     .04  980.23     .03

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        221.99  980.23           333.75   243.9  279.24             .1       .3
 Ineffective Flow     num=       2
    Sta L   Sta R    Elev  Permanent
      500    1066 2371.91       T
      200     490    2378       F

 CROSS SECTION OUTPUT  Profile #Max WS

   E.G. Elev (ft)           2374.05    Element                    Left OB    Channel   Right OB
   Vel Head (ft)               0.00    Wt. n-Val.                            0.040
   W.S. Elev (ft)           2374.05    Reach Len. (ft)            333.75     243.90     279.24
   Crit W.S. (ft)                      Flow Area (sq ft)                     972.95
   E.G. Slope (ft/ft)      0.000002    Area (sq ft)                         1566.70
   Q Total (cfs)              73.79    Flow (cfs)                             73.79
   Top Width (ft)            754.15    Top Width (ft)                        754.15
   Vel Total (ft/s)            0.08    Avg. Vel. (ft/s)                        0.08
   Max Chl Dpth (ft)           4.13    Hydr. Depth (ft)                        1.99
   Conv. Total (cfs)        57080.1    Conv. (cfs)                          57080.1
   Length Wtd. (ft)          243.90    Wetted Per. (ft)                      490.24
   Min Ch El (ft)           2369.92    Shear (lb/sq ft)                        0.00
   Alpha                       1.00    Stream Power (lb/ft s)                  0.00
   Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       246.12     340.68     232.28
   C & E Loss (ft)                     Cum SA (acres)              75.26      93.55      86.15

 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
          0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

 CROSS SECTION


 RIVER: Minnie Cr
 REACH: Upper              RS: 22.25*

 INPUT
 Description:
 Station Elevation Data     num=      100
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0 2387.82    18.9 2386.22   23.86 2385.31   28.59 2384.39   30.69 2384.44
    43.42 2384.12   46.44 2384.36   47.57 2384.48   50.04 2384.39   51.02 2384.19
    54.65 2383.52   70.82 2382.89   72.71 2382.83   89.14 2382.31  114.27 2381.53
   140.36 2380.72  143.25 2380.64  165.93 2379.97  191.68 2379.24  209.89 2378.71
   217.03 2377.67  218.45 2377.47  236.49 2377.67  242.95 2377.31   259.1 2376.49
   265.95 2375.34  268.27 2375.33  271.75 2373.31     281 2373.46  283.89 2373.55
   291.37 2373.57  293.85 2373.75  294.52 2373.63  302.49 2373.21   349.2 2371.58
    377.9 2371.74  389.05 2371.75   416.3 2371.72  441.06 2371.32  457.79 2371.11
   475.12 2370.78  490.21 2370.28  515.12 2369.66  536.33 2369.29  555.66 2368.92
    581.3 2369.19  588.53 2369.52  603.97 2370.12  612.19 2370.31  621.33 2370.39
    634.2  2370.7  640.67 2371.13  666.11 2372.13  680.29 2371.84  703.99 2372.07
   707.97 2371.49  716.78  2371.3  724.33 2371.12  741.18 2370.71  742.55 2370.68
    762.1 2369.05  795.26 2369.88  811.69 2369.65  832.47 2369.75  859.19 2369.86
   864.88 2370.31  890.56 2371.19  900.39 2370.92  915.74 2370.49  949.12 2370.31
   967.44 2371.41 1019.69  2371.4 1031.38 2371.39 1042.13 2371.39 1073.72  2371.2
  1104.86 2371.95 1120.87 2372.08 1141.31  2371.9 1168.79 2374.55 1295.74 2374.78
  1297.51 2374.83 1344.37 2376.01 1350.57 2376.15 1391.82  2377.2 1406.45 2377.62
   1442.8  2378.7 1461.92 2379.57 1494.38 2381.19 1495.16 2381.27 1527.23 2384.61
  1549.74 2387.64 1571.78 2390.49 1583.84 2392.01 1597.91 2394.05 1599.15 2398.02
  1603.19 2398.39 1618.23 2401.09 1630.48  2401.8 1651.43 2403.34 1661.06 2404.05

 Manning's n Values         num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .03  268.27    .043 1168.79     .03

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        268.27 1168.79           333.75   243.9  279.24             .1       .3
 Ineffective Flow     num=       1
    Sta L   Sta R    Elev  Permanent
        0  1168.7 2371.91       T

 CROSS SECTION OUTPUT  Profile #Max WS

   E.G. Elev (ft)           2374.05    Element                    Left OB    Channel   Right OB
   Vel Head (ft)               0.00    Wt. n-Val.                            0.043
   W.S. Elev (ft)           2374.05    Reach Len. (ft)            333.75     243.90     279.24
   Crit W.S. (ft)                      Flow Area (sq ft)                    1797.90
   E.G. Slope (ft/ft)      0.000001    Area (sq ft)                         2712.72
   Q Total (cfs)              73.78    Flow (cfs)                             73.78
   Top Width (ft)            893.15    Top Width (ft)                        893.15
   Vel Total (ft/s)            0.04    Avg. Vel. (ft/s)                        0.04
   Max Chl Dpth (ft)           5.13    Hydr. Depth (ft)                        2.01
   Conv. Total (cfs)        98999.7    Conv. (cfs)                          98999.7
   Length Wtd. (ft)          246.18    Wetted Per. (ft)                      893.83
   Min Ch El (ft)           2368.92    Shear (lb/sq ft)                        0.00
   Alpha                       1.00    Stream Power (lb/ft s)                  0.00
   Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       246.12     328.70     232.28
   C & E Loss (ft)                     Cum SA (acres)              75.26      88.93      86.15

 CROSS SECTION


 RIVER: Minnie Cr
 REACH: Upper              RS: 22

 INPUT
 Description: Lake
 Station Elevation Data     num=       58
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0 2388.3    46.89 2385.14   94.85 2382.62  138.97 2380.28  144.64 2378.66
   156.58    2379  171.55 2377.38  176.09 2375.83  179.93 2375.78  186.05 2377.31
   187.97  2378.1  192.92 2378.13  194.56  2377.7  200.28 2375.62  211.97 2377.13
   243.65  2370.8  274.95 2372.41  316.82 2371.15  343.81 2370.68  380.95  2370.2
   424.56  2368.9  447.69 2368.41  468.77 2367.93  491.01 2368.33  507.02 2368.38
   521.91    2368  569.13 2370.79  603.69 2369.85  621.22 2367.77  661.16 2368.83
   680.94  2368.5  705.97 2368.61  738.16 2368.72  745.01 2369.31  775.94 2370.45
   806.26  2369.5  846.47 2369.25  868.53  2370.7  931.46 2370.67  958.49 2370.62
   996.54  2370.3 1034.04 2371.22 1053.33 2371.35 1077.95 2371.07 1111.04 2371.53
  1163.09  2372.3 1209.35 2372.53 1242.45 2373.26 1292.79 2373.87 1341.91  2374.4
  1394.68  2375.2 1448.08 2377.07 1482.08 2380.23  1528.2 2386.31 1555.25 2389.78
  1556.53    2395 1588.96 2396.96 1620.61 2399.52

 Manning's n Values         num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .03  274.95    .045 1111.04     .03
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       274.95 1111.04              2241  2146.6    2331          .1          .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
     200 1111.04 2371.91       T
 1111.05    1400    2380       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.045      0.000
  W.S. Elev (ft)           2374.05    Reach Len. (ft)        2241.00    2146.60    2331.00
  Crit W.S. (ft)                      Flow Area (sq ft)        76.65    1780.51       0.03
  E.G. Slope (ft/ft)      0.000001    Area (sq ft)            103.06    3501.04     251.29
  Q Total (cfs)              73.76    Flow (cfs)                3.74      70.02       0.00
  Top Width (ft)           1082.28    Top Width (ft)           47.58     836.09     198.61
  Vel Total (ft/s)            0.04    Avg. Vel. (ft/s)          0.05       0.04       0.07
  Max Chl Dpth (ft)           6.28    Hydr. Depth (ft)          1.61       2.13       2.52
  Conv. Total (cfs)       102477.9    Conv. (cfs)            5191.7    97283.9        2.3
  Length Wtd. (ft)         2150.67    Wetted Per. (ft)         47.94     836.52       0.01
  Min Ch El (ft)           2367.77    Shear (lb/sq ft)          0.00       0.00       0.00
  Alpha                       1.01    Stream Power (lb/ft s)    0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)    245.72     311.30     231.48
  C & E Loss (ft)                     Cum SA (acres)           75.08      84.09      85.51


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 21

INPUT
Description: Lake
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2386.3    20.7 2384.51   70.22 2381.45  119.02 2379.89  167.42 2378.91
  218.57  2378.7  270.56 2379.08  288.89 2378.91  296.68 2381.11  306.47 2375.44
  310.03  2377.8  318.28 2377.56  322.13 2377.67  326.72 2377.64  328.29 2377.03
  331.85  2376.4  349.38 2376.87  362.62 2372.58  367.78 2373.43  372.84 2372.83
  420.84  2372.3  458.08 2371.26   506.9 2370.48  542.78 2370.38  573.95 2370.21
  597.69    2369  646.17 2369.11  668.29 2368.41  724.81 2368.58  757.76 2368.16
  790.85  2368.2  829.92 2368.43   874.2 2368.95   909.1 2368.61  948.28 2370.64
  982.34    2371 1021.35 2370.25 1034.23 2370.48 1058.25 2370.58 1089.79 2371.05
 1112.98  2370.4 1140.93 2369.84  1160.7 2369.41 1199.33 2370.22 1233.71 2369.98
 1262.39  2370.4 1292.65 2370.43 1322.78 2371.31 1371.36 2373.93 1401.52 2375.95
    1429  2376.5 1468.63  2379.6 1515.43 2382.49 1540.85 2385.11 1585.35 2389.31
 1629.98    2392 1675.48 2395.93 1721.18 2399.89 1757.28 2412.89 1773.63 2421.26
 1777.62  2421.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035  372.84    .045 1322.78     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        372.84 1322.78              473  459.55   487.5          .1          .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
     420 1777.62 2371.91       T

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.035      0.045      0.050
  W.S. Elev (ft)           2374.05    Reach Len. (ft)         473.00     459.55     487.50
  Crit W.S. (ft)                      Flow Area (sq ft)        13.40    1995.22      55.06
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)             13.40    3905.75      69.63
  Q Total (cfs)              73.57    Flow (cfs)                0.35      72.06       1.16
  Top Width (ft)           1015.09    Top Width (ft)           14.76     949.94      50.39
  Vel Total (ft/s)            0.04    Avg. Vel. (ft/s)          0.03       0.04       0.02
  Max Chl Dpth (ft)           5.89    Hydr. Depth (ft)          0.91       2.10       1.09
  Conv. Total (cfs)       110297.9    Conv. (cfs)             525.2   108038.5     1734.1
  Length Wtd. (ft)         459.86    Wetted Per. (ft)         15.10     950.13      50.46
  Min Ch El (ft)           2368.16    Shear (lb/sq ft)          0.00       0.00       0.00
  Alpha                       1.01    Stream Power (lb/ft s)    0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)    242.73     128.80     222.89
  C & E Loss (ft)                     Cum SA (acres)           73.48      40.09      78.85


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 20.75*

INPUT
Description:
Station Elevation Data    num=      88
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -45.88 2384.73  -19.66 2383.16   43.05 2380.32   66.63 2379.67   71.16 2379.11
   75.22 2379.55   87.07 2378.64    94.4 2378.69  104.85 2378.45  157.74 2377.58
  166.14 2377.21  169.78 2377.08  175.22 2376.94  205.22 2376.68     222  2376.6
  230.91 2376.57  244.62 2376.61   260.2 2376.57  275.23 2376.72  296.75 2376.96
  300.83 2376.97  318.28 2376.86  319.96 2376.86  329.83  2378.6  330.31 2378.44
  342.22 2376.05  426.27 2373.55  464.52 2372.81  494.19 2371.75   520.4 2371.12
   533.1 2370.92  561.69 2370.84  586.52  2370.7  605.44 2369.78  644.07 2369.85
   661.7 2369.32  706.73 2369.42  732.99  2369.1  761.08 2369.16  794.24 2369.37
  831.83  2369.8  842.46 2369.72  861.45 2369.56  894.71  2371.1  923.62 2371.38
  948.88 2370.96  956.73 2370.83  967.66    2371  988.05 2371.08 1014.83 2371.45
 1034.51 2370.96 1058.23 2370.55 1058.69 2370.54 1075.02 2370.23 1107.81 2370.85
 1136.99 2370.68 1161.33    2371    1171 2371.01 1186.07 2371.03 1187.02 2371.06
 1212.59 2372.36 1233.21 2374.61 1306.06 2376.47 1325.86 2376.77  1342.5  2377.7
 1368.12 2379.17  1383.4 2379.87 1385.34 2379.62 1387.94 2380.06 1417.52 2381.26
 1418.03 2381.28 1445.13 2383.19    1471 2384.87 1492.58 2386.03 1496.84 2386.15
 1538.08 2388.39 1540.18 2388.49 1564.64 2390.21  1588.7 2393.35 1596.92 2394.42
 1626.22 2398.65 1637.43 2399.22 1669.15 2406.94 1675.92 2408.81 1681.48 2410.94
 1684.56 2412.55 1693.36 2415.65 1697.61 2415.94

Manning's n Values        num=       8
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  -45.88    .034   75.22    .031  426.27    .034  494.19    .045 1161.33    .032
 1212.59     .05 1564.64     .05 1697.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        426.27 1212.59              473  459.55   487.5          .1          .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
     464 1697.61 2371.91       T
```

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.031 | 0.043 | 0.050 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 4.22 | 1615.91 | 13.10 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 4.22 | 2705.85 | 13.10 |
| Q Total (cfs) | 73.53 | Flow (cfs) | 0.07 | 73.18 | 0.28 |
| Top Width (ft) | 818.66 | Top Width (ft) | 16.84 | 786.32 | 15.50 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.02 | 0.05 | 0.02 |
| Max Chl Dpth (ft) | 4.95 | Hydr. Depth (ft) | 0.25 | 2.06 | 0.85 |
| Conv. Total (cfs) | 90694.8 | Conv. (cfs) | 80.3 | 90267.7 | 346.8 |
| Length Wtd. (ft) | 459.63 | Wetted Per. (ft) | 16.85 | 786.49 | 15.59 |
| Min Ch El (ft) | 2369.10 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 242.63 | 93.92 | 222.43 |
| C & E Loss (ft) | | Cum SA (acres) | 73.30 | 30.93 | 78.48 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20.5*

INPUT
Description:
Station Elevation Data num= 83

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -91.75 | 2383.15 | -60.02 | 2381.8 | 15.88 | 2379.18 | 44.42 | 2378.48 | 49.9 | 2377.48 |
| 54.81 | 2378.45 | 69.16 | 2376.93 | 78.02 | 2377.23 | 90.67 | 2377.01 | 154.7 | 2376.12 |
| 164.86 | 2375.5 | 169.27 | 2375.25 | 175.84 | 2374.99 | 212.15 | 2374.57 | 232.47 | 2374.47 |
| 243.25 | 2374.43 | 259.84 | 2374.44 | 278.7 | 2374.28 | 296.89 | 2374.49 | 322.94 | 2374.84 |
| 327.88 | 2374.88 | 348.99 | 2374.79 | 479.71 | 2374.27 | 508.2 | 2373.31 | 530.31 | 2372.25 |
| 549.83 | 2371.51 | 559.29 | 2371.37 | 580.59 | 2371.29 | 599.1 | 2371.19 | 613.19 | 2370.57 |
| 641.97 | 2370.59 | 655.1 | 2370.22 | 688.66 | 2369.27 | 708.22 | 2369.23 | 731.31 | 2370.12 |
| 758.56 | 2370.31 | 789.45 | 2370.65 | 798.19 | 2370.61 | 813.8 | 2370.52 | 841.14 | 2371.55 |
| 864.9 | 2371.75 | 885.66 | 2371.48 | 892.11 | 2371.4 | 901.1 | 2371.52 | 917.86 | 2371.59 |
| 939.86 | 2371.84 | 956.04 | 2371.53 | 975.54 | 2371.26 | 975.92 | 2371.26 | 989.33 | 2371.06 |
| 1016.28 | 2371.48 | 1040.27 | 2371.37 | 1060.27 | 2371.6 | 1068.22 | 2371.61 | 1080.61 | 2371.64 |
| 1081.38 | 2371.69 | 1102.41 | 2373.41 | 1201.69 | 2376.81 | 1222.72 | 2377.04 | 1240.4 | 2377.68 |
| 1267.61 | 2378.74 | 1283.84 | 2379.25 | 1285.9 | 2378.65 | 1288.66 | 2379.37 | 1320.08 | 2380.05 |
| 1320.62 | 2380.06 | 1349.41 | 2381.28 | 1376.9 | 2382.33 | 1399.82 | 2382.74 | 1404.34 | 2382.76 |
| 1448.15 | 2384.89 | 1450.37 | 2384.99 | 1476.35 | 2386.44 | 1501.91 | 2390.77 | 1510.65 | 2392.25 |
| 1541.77 | 2398.31 | 1553.68 | 2398.55 | 1587.38 | 2403.27 | 1594.57 | 2404.73 | 1600.47 | 2406.31 |
| 1603.74 | 2408.07 | 1613.09 | 2410.03 | 1617.6 | 2410.18 | | | | |

Manning's n Values num= 8

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -91.75 | .032 | 54.81 | .032 | 479.71 | .032 | 530.31 | .045 | 1068.22 | .035 |
| 1102.41 | .05 | 1476.35 | .05 | 1617.6 | .05 | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 479.71 | 1102.41 | 473 | 459.55 | 487.5 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -91.75 | 1102.4 | 2371.91 | T |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.044 | 0.050 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 1241.49 | 5.98 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | | 1769.28 | 5.98 |
| Q Total (cfs) | 73.50 | Flow (cfs) | | 73.41 | 0.09 |
| Top Width (ft) | 634.86 | Top Width (ft) | | 616.17 | 18.69 |
| Vel Total (ft/s) | 0.06 | Avg. Vel. (ft/s) | | 0.06 | 0.02 |
| Max Chl Dpth (ft) | 4.82 | Hydr. Depth (ft) | | 2.01 | 0.32 |
| Conv. Total (cfs) | 67812.1 | Conv. (cfs) | | 67729.0 | 83.2 |
| Length Wtd. (ft) | 459.57 | Wetted Per. (ft) | | 616.39 | 18.70 |
| Min Ch El (ft) | 2369.23 | Shear (lb/sq ft) | | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 242.61 | 70.32 | 222.32 |
| C & E Loss (ft) | | Cum SA (acres) | 73.21 | 23.53 | 78.29 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20.25*

INPUT
Description:
Station Elevation Data num= 80

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -137.62 | 2381.57 | -100.38 | 2380.45 | -11.29 | 2378.05 | 22.21 | 2377.29 | 28.64 | 2375.85 |
| 34.41 | 2377.36 | 51.25 | 2375.23 | 61.65 | 2375.77 | 76.5 | 2375.57 | 151.65 | 2374.66 |
| 163.57 | 2373.8 | 168.75 | 2373.43 | 176.47 | 2373.05 | 219.09 | 2372.07 | 242.94 | 2371.34 |
| 255.6 | 2370.3 | 275.07 | 2370.07 | 297.21 | 2369.6 | 318.56 | 2370.05 | 349.13 | 2370.72 |
| 354.93 | 2371.39 | 379.71 | 2371.73 | 579.27 | 2371.89 | 585.49 | 2371.81 | 599.5 | 2371.75 |
| 611.67 | 2371.68 | 620.94 | 2371.35 | 639.87 | 2371.33 | 648.51 | 2371.13 | 670.58 | 2371.11 |
| 683.45 | 2370.97 | 701.53 | 2371.08 | 722.88 | 2371.25 | 747.08 | 2371.5 | 753.93 | 2371.51 |
| 766.15 | 2371.47 | 787.56 | 2372.01 | 806.18 | 2372.13 | 822.44 | 2372.01 | 827.49 | 2371.98 |
| 834.53 | 2372.04 | 847.66 | 2372.09 | 864.9 | 2372.24 | 877.57 | 2372.09 | 892.84 | 2373.5 |
| 893.14 | 2373.47 | 903.65 | 2373.38 | 924.76 | 2373.61 | 943.54 | 2373.57 | 959.22 | 2373.69 |
| 965.44 | 2373.7 | 975.14 | 2373.74 | 975.75 | 2373.82 | 992.22 | 2374.45 | 1097.32 | 2377.15 |
| 1119.58 | 2377.3 | 1138.29 | 2377.66 | 1167.1 | 2378.3 | 1184.28 | 2378.63 | 1186.46 | 2377.67 |
| 1189.39 | 2378.69 | 1222.65 | 2378.85 | 1223.22 | 2378.85 | 1253.7 | 2379.36 | 1282.79 | 2379.8 |
| 1307.05 | 2379.46 | 1311.84 | 2379.36 | 1358.21 | 2381.4 | 1360.57 | 2381.48 | 1388.07 | 2382.67 |
| 1415.13 | 2388.19 | 1424.37 | 2390.07 | 1457.32 | 2397.98 | 1469.92 | 2397.88 | 1505.6 | 2399.61 |
| 1513.21 | 2400.64 | 1519.46 | 2401.69 | 1522.92 | 2403.58 | 1532.81 | 2404.42 | 1537.6 | 2404.42 |

Manning's n Values num= 7

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -137.62 | .031 | 34.41 | .045 | 579.27 | .03 | 965.44 | .037 | 992.22 | .05 |
| 1388.07 | .05 | 1537.6 | .05 | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 163.57 | 892.84 | 473 | 459.55 | 487.5 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 100 | 892.8 | 2371.91 | T |
| 893 | 1000 | 2378 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.045 | 0.037 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.43 | 1481.05 | 0.09 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 0.43 | 1816.85 | 39.95 |
| Q Total (cfs) | 73.47 | Flow (cfs) | 0.00 | 73.46 | 0.00 |
| Top Width (ft) | 821.66 | Top Width (ft) | 3.47 | 729.27 | 88.92 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.01 | 0.05 | 0.03 |
| Max Chl Dpth (ft) | 4.45 | Hydr. Depth (ft) | 0.13 | 2.03 | 0.56 |
| Conv. Total (cfs) | 95422.3 | Conv. (cfs) | 3.6 | 95415.8 | 3.0 |
| Length Wtd. (ft) | 459.69 | Wetted Per. (ft) | 3.47 | 729.50 | 0.16 |
| Min Ch El (ft) | 2369.60 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 242.61 | 51.40 | 222.07 |
| C & E Loss (ft) | | Cum SA (acres) | 73.19 | 16.43 | 77.69 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20

INPUT
Description: -183.5 = quad contour 2380
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -183.5 | 2380 | 0 | 2376.1 | 7.38 | 2374.22 | 14 | 2376.27 | 33.34 | 2373.53 |
| 45.28 | 2374.31 | 148.6 | 2373.2 | 168.24 | 2371.61 | 177.1 | 2371.1 | 226.03 | 2370.36 |
| 253.41 | 2370.21 | 290.29 | 2370.1 | 315.71 | 2369.69 | 340.22 | 2370.02 | 381.98 | 2370.71 |
| 410.43 | 2370.66 | 430.06 | 2371.1 | 458.56 | 2381.05 | 490.36 | 2393.49 | 524.49 | 2396.32 |
| 548.43 | 2393.18 | 550.91 | 2389.3 | 574.07 | 2382.31 | 586.57 | 2375.72 | 608.7 | 2372.28 |
| 658.68 | 2371.91 | 709.66 | 2372.4 | 759.22 | 2372.54 | 810.36 | 2372.69 | 862.66 | 2372.8 |
| 869.68 | 2372.85 | 882.03 | 2375.5 | 906.5 | 2381.4 | 909.21 | 2388.27 | 924.57 | 2391.89 |
| 962.23 | 2393.86 | 976.34 | 2385.2 | 992.95 | 2377.49 | 1036.19 | 2377.64 | 1084.72 | 2378.01 |
| 1087.02 | 2376.7 | 1090.11 | 2378 | 1125.21 | 2377.64 | 1188.68 | 2377.27 | 1219.34 | 2375.96 |
| 1268.28 | 2377.9 | 1299.79 | 2378.9 | 1338.1 | 2387.9 | 1372.87 | 2397.65 | 1423.82 | 2395.94 |
| 1438.45 | 2397.07 | 1442.1 | 2399.1 | 1457.59 | 2398.66 | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -183.5 | .03 | 14 | .045 | 458.56 | .035 | 608.7 | .03 | 862.66 | .04 |
| 1299.79 | .05 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 148.6 | 869.68 | 891 | 901.5 | 1024 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -183.5 | 600 | 2372.91 | T |
| 962.23 | 1457.59 | 2393.86 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.045 | 0.034 | 0.040 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 891.00 | 901.50 | 1024.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 36.57 | 755.28 | 3.35 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 36.57 | 1430.53 | 3.35 |
| Q Total (cfs) | 73.45 | Flow (cfs) | 1.18 | 72.11 | 0.15 |
| Top Width (ft) | 658.49 | Top Width (ft) | 90.64 | 562.27 | 5.59 |
| Vel Total (ft/s) | 0.09 | Avg. Vel. (ft/s) | 0.03 | 0.10 | 0.05 |
| Max Chl Dpth (ft) | 4.36 | Hydr. Depth (ft) | 0.40 | 1.34 | 0.60 |
| Conv. Total (cfs) | 41338.3 | Conv. (cfs) | 666.2 | 40585.0 | 87.2 |
| Length Wtd. (ft) | 934.96 | Wetted Per. (ft) | 90.70 | 563.01 | 5.72 |
| Min Ch El (ft) | 2369.69 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 242.41 | 34.27 | 221.82 |
| C & E Loss (ft) | | Cum SA (acres) | 72.68 | 9.62 | 77.16 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 19

INPUT
Description: Survey 19
Station Elevation Data num= 51

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2398.9 | 18.33 | 2393.42 | 59.49 | 2388.85 | 98.51 | 2387.54 | 146.57 | 2382.84 |
| 198.38 | 2378.5 | 227.92 | 2378.85 | 232.47 | 2380.64 | 256.83 | 2377.69 | 266.89 | 2372.98 |
| 275.04 | 2375.6 | 277.56 | 2376.14 | 282.47 | 2376.12 | 284.89 | 2375.66 | 292.53 | 2373.43 |
| 301.27 | 2376.2 | 306.49 | 2374.96 | 321.94 | 2373.25 | 327.37 | 2374.63 | 329.6 | 2374.12 |
| 377.61 | 2372.9 | 426.28 | 2372.45 | 476.08 | 2371.71 | 525.16 | 2371.92 | 573.21 | 2371.91 |
| 622.05 | 2372.7 | 644.07 | 2372.23 | 649.81 | 2370.39 | 651.15 | 2370.12 | 652.3 | 2370.34 |
| 661.13 | 2372.5 | 704.51 | 2373.2 | 755.21 | 2372.22 | 805.51 | 2372.07 | 853.9 | 2372.37 |
| 900.42 | 2371.8 | 949.2 | 2371.98 | 995.83 | 2372.17 | 1044.25 | 2372.49 | 1091.87 | 2372.53 |
| 1142.46 | 2373.5 | 1151.7 | 2374.07 | 1212.42 | 2373.55 | 1261.91 | 2373.87 | 1312.21 | 2374.34 |
| 1362.76 | 2374.7 | 1413.18 | 2375.22 | 1463.27 | 2375.67 | 1499 | 2377.03 | 1508.55 | 2378 |
| 1553.81 | 2379.1 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 644.07 | .035 | 661.13 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 644.07 | 661.13 | 828.4 | 847.3 | 759 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 622.05 | 2372.7 | F |
| 1340 | 1553.81 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 828.40 | 847.30 | 759.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 530.94 | 48.38 | 836.03 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 530.94 | 48.38 | 836.03 |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 73.37 | Flow (cfs) | 27.88 | 3.05 | 42.44 |
| Top Width (ft) | 965.33 | Top Width (ft) | 331.60 | 17.06 | 616.67 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.05 | 0.06 | 0.05 |
| Max Chl Dpth (ft) | 3.93 | Hydr. Depth (ft) | 1.60 | 2.84 | 1.36 |
| Conv. Total (cfs) | 96740.8 | Conv. (cfs) | 36763.8 | 4022.0 | 55955.0 |
| Length Wtd. (ft) | 785.18 | Wetted Per. (ft) | 332.36 | 17.66 | 616.72 |
| Min Ch El (ft) | 2370.12 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 236.60 | 18.97 | 211.96 |
| C & E Loss (ft) | | Cum SA (acres) | 68.36 | 3.62 | 69.85 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 18.25

INPUT
Description: Survey 18.1 (skewed 20 degrees)
Sta 103.19 - 295.41 = Copy of Sec
19 points 1048, 1052, 1053, 1055, 1056, 1058, 1059, 1063, 1064,
1065. These were adj. for slope vert. with the valley and/or RR
Grade
Sta. 9.33 & 21.83 = Copy of Sec. 18 point 809 + Hwy slope.
21.83 has 0.6' vert. rise for road crown as observed in sect.
15.
Sta. 465.61 (795) to the right end are copies of Sect. 18
road profile. The vert. is -1.5' and the horizontal stations
adjusted -85.21' to line them up with the road surveyed points.

Station Elevation Data num= 67

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.77 | 2385.4 | 20.51 | 2384.8 | 96.97 | 2381.78 | 147.85 | 2376.62 | 157.25 | 2372.48 |
| 167.28 | 2375.64 | 171.87 | 2375.61 | 181.37 | 2372.92 | 189.7 | 2375.71 | 216.24 | 2373.06 |
| 241.89 | 2371.87 | 277.6 | 2371.39 | 313.3 | 2370.9 | 361.51 | 2371.14 | 365.37 | 2370.14 |
| 369.11 | 2369.13 | 371.83 | 2369.49 | 378.78 | 2371.3 | 424.61 | 2371.45 | 437.53 | 2371.11 |
| 481.74 | 2371.2 | 525.96 | 2371.26 | 570.22 | 2371.4 | 614.42 | 2371.54 | 658.6 | 2371.74 |
| 704.38 | 2372.1 | 750.49 | 2372.38 | 795.63 | 2372.56 | 840.29 | 2372.78 | 884.93 | 2372.96 |
| 929.82 | 2373.2 | 972.91 | 2373.35 | 1017.17 | 2373.53 | 1061.41 | 2373.72 | 1104.83 | 2373.94 |
| 1148.14 | 2374.2 | 1190.99 | 2374.57 | 1235.03 | 2374.79 | 1277.77 | 2375.08 | 1322.93 | 2375.46 |
| 1366.82 | 2375.8 | 1410.76 | 2376.18 | 1455.83 | 2376.45 | 1500.39 | 2376.71 | 1545.05 | 2376.88 |
| 1590.27 | 2377.2 | 1635.29 | 2377.65 | 1679.22 | 2378.11 | 1723.36 | 2378.58 | 1767.97 | 2379.08 |
| 1812.52 | 2379.6 | 1856.48 | 2380.18 | 1899.69 | 2380.48 | 1943.08 | 2380.95 | 1987.52 | 2381.54 |
| 2034.57 | 2382.3 | 2080.09 | 2383.31 | 2125.77 | 2384.1 | 2172.83 | 2385.11 | 2222.35 | 2386.67 |
| 2271.99 | 2389.3 | 2319.65 | 2393.12 | 2367.41 | 2397.9 | 2414.17 | 2403.16 | 2447.03 | 2406.33 |
| 2486.32 | 2409.1 | 2528.07 | 2410.64 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.77 | .03 | 361.51 | .035 | 378.78 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 361.51 | 378.78 | 330 | 85.7 | 76.3 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 960 | 2528.07 | 2385 | F |

Skew Angle = 20

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 330.00 | 85.70 | 76.30 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 392.15 | 67.92 | 1184.50 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 392.15 | 67.92 | 1249.72 |
| Q Total (cfs) | 73.30 | Flow (cfs) | 18.73 | 3.79 | 50.78 |
| Top Width (ft) | 932.21 | Top Width (ft) | 171.03 | 17.27 | 743.90 |
| Vel Total (ft/s) | 0.04 | Avg. Vel. (ft/s) | 0.05 | 0.06 | 0.04 |
| Max Chl Dpth (ft) | 4.92 | Hydr. Depth (ft) | 2.29 | 3.93 | 2.04 |
| Conv. Total (cfs) | 136139.9 | Conv. (cfs) | 34789.9 | 7044.7 | 94305.3 |
| Length Wtd. (ft) | 150.11 | Wetted Per. (ft) | 172.03 | 17.79 | 581.23 |
| Min Ch El (ft) | 2369.13 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 227.82 | 17.84 | 193.79 |
| C & E Loss (ft) | | Cum SA (acres) | 63.59 | 3.29 | 57.99 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 18.2

INPUT
Description: (skewed 20 degrees)
ADD 25.4 FEET TO EACH STATION
sta -258.37 =
quad contour 2400
sta - 126.45 = quad contour 2380
sta -47.34 =
toe of fill, copy of sta 34.16
sta -30 = edge pavement + slope
from 18, copy of sta 0
sta -15 = cl rd + slope from 18, + 0.6'
crown as observed @ 15
sta 0 = copy of 18 sta 809 + road
slope
sta 34.16 - 133.96 = copy from 18
sta 161.69 - 363.76 =
copy of section 18 -1.5' vertical
sta 504.2 - end copy of 18 -2'
vertical

Station Elevation Data num= 75

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -217.39 | 2400 | -93.42 | 2380 | -19.09 | 2377.26 | -2.79 | 2379 | 11.3 | 2379.6 |
| 25.4 | 2379 | 57.5 | 2377.26 | 102.36 | 2375.63 | 145.8 | 2375.45 | 151.28 | 2375.23 |
| 177.34 | 2372.6 | 194.4 | 2371.83 | 236.46 | 2370.66 | 279.96 | 2370.61 | 323.09 | 2370.82 |
| 367.22 | 2371.1 | 373.42 | 2370.7 | 412.59 | 2369.98 | 415.45 | 2368.83 | 416.78 | 2366.2 |
| 418.29 | 2366.2 | 427.68 | 2366.2 | 430.03 | 2367.48 | 434.26 | 2367.66 | 441.44 | 2370.2 |
| 479.27 | 2370.63 | 499.19 | 2370.71 | 543 | 2370.61 | 587.23 | 2370.7 | 631.43 | 2370.76 |
| 675.7 | 2370.9 | 719.89 | 2371.04 | 764.07 | 2371.24 | 809.86 | 2371.6 | 855.96 | 2371.88 |
| 901.1 | 2372.06 | 945.76 | 2372.28 | 990.4 | 2372.46 | 1034.92 | 2372.7 | 1078.38 | 2372.85 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1122.64 | 2373.03 | 1166.88 | 2373.22 | 1210.3 | 2373.44 | 1253.62 | 2373.7 | 1296.47 | 2374.07 |
| 1340.5 | 2374.29 | 1383.25 | 2374.58 | 1428.4 | 2374.96 | 1472.29 | 2375.3 | 1516.23 | 2375.68 |
| 1561.3 | 2375.95 | 1605.86 | 2376.21 | 1650.52 | 2376.38 | 1695.74 | 2376.7 | 1740.76 | 2377.15 |
| 1784.69 | 2377.61 | 1828.83 | 2378.08 | 1873.44 | 2378.59 | 1917.99 | 2379.1 | 1961.96 | 2379.58 |
| 2005.16 | 2379.98 | 2048.55 | 2380.45 | 2093 | 2381.04 | 2140.04 | 2381.8 | 2185.56 | 2382.81 |
| 2231.24 | 2383.6 | 2278.3 | 2384.61 | 2327.82 | 2386.17 | 2377.46 | 2388.8 | 2425.12 | 2392.62 |
| 2472.88 | 2397.4 | 2519.65 | 2402.66 | 2552.51 | 2405.83 | 2591.8 | 2408.6 | 2633.55 | 2410.14 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -217.39 | .03 | 412.59 | .035 | 441.44 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 412.59 | 441.44 | 44.3 | 52.9 | 53 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -217.39 | 181.09 | 2385 | F |
| 895 | 2633.55 | 2385 | F |

Skew Angle = 20

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 44.30 | 52.90 | 53.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 736.46 | 188.57 | 1364.78 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 752.57 | 188.57 | 1804.85 |
| Q Total (cfs) | 73.28 | Flow (cfs) | 23.48 | 7.86 | 41.94 |
| Top Width (ft) | 1130.81 | Top Width (ft) | 249.59 | 28.85 | 852.37 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.03 | 0.04 | 0.03 |
| Max Chl Dpth (ft) | 7.85 | Hydr. Depth (ft) | 3.18 | 6.54 | 3.01 |
| Conv. Total (cfs) | 246201.1 | Conv. (cfs) | 78890.0 | 26420.1 | 140891.0 |
| Length Wtd. (ft) | 52.90 | Wetted Per. (ft) | 231.55 | 31.46 | 453.57 |
| Min Ch El (ft) | 2366.20 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 223.49 | 17.58 | 191.11 |
| C & E Loss (ft) | | Cum SA (acres) | 61.99 | 3.24 | 56.60 |

CULVERT

RIVER: Minnie Cr
REACH: Upper RS: 18.01

INPUT
Description: 3 culverts Jensen Rd (BRIDGE SKEWED 20 DEGREES)
Distance from Upstream XS = 4.45
Deck/Roadway Width = 46.7
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew = 20
Upstream Deck/Roadway Coordinates
num= 64

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 25.4 | 2378.6 | | 57.5 | 2377.26 | | 102.361 | 2375.63 | |
| 145.803 | 2375.45 | | 151.281 | 2375.23 | | 177.339 | 2374.1 | |
| 194.404 | 2373.33 | | 236.455 | 2372.16 | | 279.963 | 2372.11 | |
| 323.085 | 2372.32 | | 367.223 | 2372.6 | | 381.543 | 2372.66 | |
| 381.572 | 2372.66 | | 411.933 | 2372.77 | | 411.99 | 2375.77 | |
| 416.65 | 2375.77 | | 416.688 | 2375.77 | | 453.28 | 2375.77 | |
| 453.336 | 2372.77 | | 455.601 | 2372.77 | | 499.193 | 2372.71 | |
| 543.002 | 2372.61 | | 587.233 | 2372.7 | | 631.427 | 2372.76 | |
| 675.696 | 2372.9 | | 719.889 | 2373.04 | | 764.074 | 2373.24 | |
| 809.855 | 2373.6 | | 855.957 | 2373.88 | | 901.1 | 2374.06 | |
| 945.763 | 2374.28 | | 990.4 | 2374.46 | | 1034.921 | 2374.7 | |
| 1078.382 | 2374.85 | | 1122.641 | 2375.03 | | 1166.882 | 2375.22 | |
| 1210.305 | 2375.44 | | 1253.616 | 2375.7 | | 1296.466 | 2376.07 | |
| 1340.5 | 2376.29 | | 1383.246 | 2376.58 | | 1428.399 | 2376.96 | |
| 1472.292 | 2377.3 | | 1516.232 | 2377.68 | | 1561.299 | 2377.95 | |
| 1605.86 | 2378.21 | | 1650.523 | 2378.38 | | 1695.741 | 2378.7 | |
| 1740.762 | 2379.15 | | 1784.692 | 2379.61 | | 1828.83 | 2380.08 | |
| 1873.437 | 2380.59 | | 2140.037 | 2383.8 | | 2185.556 | 2384.81 | |
| 2231.244 | 2385.6 | | 2278.304 | 2386.61 | | 2327.816 | 2388.17 | |
| 2377.46 | 2390.8 | | 2425.121 | 2394.62 | | 2472.877 | 2399.4 | |
| 2519.645 | 2404.66 | | 2552.506 | 2407.83 | | 2591.796 | 2410.6 | |
| 2633.545 | 2412.14 | | | | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 75

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -217.39 | 2400 | -93.42 | 2380 | -19.09 | 2377.26 | -2.79 | 2379 | 11.3 | 2379.6 |
| 25.4 | 2379 | 57.5 | 2377.26 | 102.36 | 2375.63 | 145.8 | 2375.45 | 151.28 | 2375.23 |
| 177.34 | 2372.6 | 194.4 | 2371.83 | 236.46 | 2370.66 | 279.96 | 2370.61 | 323.09 | 2370.82 |
| 367.22 | 2371.1 | 373.42 | 2370.7 | 412.59 | 2369.98 | 415.45 | 2368.83 | 416.78 | 2366.2 |
| 418.29 | 2366.2 | 427.68 | 2366.2 | 430.03 | 2367.48 | 434.26 | 2367.66 | 441.44 | 2370.2 |
| 479.27 | 2370.63 | 499.19 | 2370.71 | 543 | 2370.61 | 587.23 | 2370.7 | 631.43 | 2370.76 |
| 675.7 | 2370.9 | 719.89 | 2371.04 | 764.07 | 2371.24 | 809.86 | 2371.6 | 855.96 | 2371.88 |
| 901.1 | 2372.06 | 945.76 | 2372.28 | 990.4 | 2372.46 | 1034.92 | 2372.7 | 1078.38 | 2372.85 |
| 1122.64 | 2373.03 | 1166.88 | 2373.22 | 1210.3 | 2373.44 | 1253.62 | 2373.7 | 1296.47 | 2374.07 |
| 1340.5 | 2374.29 | 1383.25 | 2374.58 | 1428.4 | 2374.96 | 1472.29 | 2375.3 | 1516.23 | 2375.68 |
| 1561.3 | 2375.95 | 1605.86 | 2376.21 | 1650.52 | 2376.38 | 1695.74 | 2376.7 | 1740.76 | 2377.15 |
| 1784.69 | 2377.61 | 1828.83 | 2378.08 | 1873.44 | 2378.59 | 1917.99 | 2379.1 | 1961.96 | 2379.58 |
| 2005.16 | 2379.98 | 2048.55 | 2380.45 | 2093 | 2381.04 | 2140.04 | 2381.8 | 2185.56 | 2382.81 |
| 2231.24 | 2383.6 | 2278.3 | 2384.61 | 2327.82 | 2386.17 | 2377.46 | 2388.8 | 2425.12 | 2392.62 |
| 2472.88 | 2397.4 | 2519.65 | 2402.66 | 2552.51 | 2405.83 | 2591.8 | 2408.6 | 2633.55 | 2410.14 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -217.39 | .03 | 412.59 | .035 | 441.44 | .03 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 412.59 | 441.44 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -217.39 | 181.09 | 2385 | F |
| 895 | 2633.55 | 2385 | F |

Skew Angle = 20

Downstream Deck/Roadway Coordinates
num= 64

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 23.8 | 2378.6 | | 55.9 | 2377.26 | | 100.761 | 2375.63 | |
| 144.203 | 2375.45 | | 149.681 | 2375.23 | | 175.739 | 2374.1 | |
| 192.804 | 2373.33 | | 234.855 | 2372.16 | | 278.363 | 2372.11 | |
| 321.485 | 2372.32 | | 365.623 | 2372.6 | | 379.943 | 2372.66 | |
| 379.972 | 2375.66 | | 410.333 | 2375.77 | | 410.39 | 2375.77 | |
| 415.05 | 2375.77 | | 415.088 | 2372.77 | | 451.68 | 2372.77 | |
| 451.736 | 2372.77 | | 454.001 | 2372.77 | | 497.593 | 2372.71 | |

```
 541.402 2372.61          585.633  2372.7          629.827 2372.76
 674.096  2372.9          718.289 2373.04          762.474 2373.24
 808.255  2373.6          854.357 2373.88            899.5 2374.06
 944.163 2374.28            988.8 2374.46         1033.321  2374.7
1076.782 2374.85         1121.041 2375.03         1165.282 2375.22
1208.705 2375.44         1252.016  2375.7         1294.866 2376.07
  1338.9 2376.29         1381.646 2376.58         1426.799 2376.96
1470.692  2377.3         1514.632 2377.68         1559.699 2377.95
 1604.26 2378.21         1648.923 2378.38         1694.141  2378.7
1739.162 2379.15         1783.092 2379.61          1827.23 2380.08
1871.837 2380.59         2138.437  2383.8         2183.956 2384.81
2229.644  2385.6         2276.704 2386.61         2326.216 2388.17
 2375.86  2390.8         2423.521 2394.62         2471.277  2399.4
2518.045 2404.66         2550.906 2407.83         2590.196  2410.6
2631.945 2412.14

Downstream Bridge Cross Section Data
Station Elevation Data    num=      71
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
  -32.58 2378.56  -18.49 2379.16   -4.39 2378.56   27.71 2377.26   72.57 2375.63
  116.01 2375.45  121.49 2375.23  147.55  2372.6  164.61 2371.83  206.66 2370.66
  250.17 2370.61  293.29 2370.82  337.43  2371.1  343.62  2370.7   382.8 2369.98
  387.46 2368.11  388.33  2365.6  399.36  2365.6  401.65 2367.66  404.47 2367.66
  411.65  2370.2  449.48 2370.63   469.4 2370.71  513.21 2370.61  557.44  2370.7
  601.64 2370.76   645.9  2371.4   690.1 2371.54  734.28 2371.74  780.07  2372.1
  826.17 2372.38  871.31 2372.56  915.97 2372.78  960.61 2373.46 1005.13  2373.7
 1048.59 2373.85 1092.85 2374.03 1137.09 2374.22 1180.51 2373.94 1223.82  2374.2
 1266.67 2374.57 1310.71 2374.79 1353.46 2375.08 1398.61 2375.46  1442.5 2375.82
 1486.44 2376.18 1531.51 2376.45 1576.07 2376.71 1620.73 2376.88 1665.95 2377.21
 1710.97 2377.65  1754.9 2378.11 1799.04 2378.08 1843.65 2378.59  1888.2  2379.1
 1932.16 2379.58 1975.37 2379.98 2018.76 2380.45 2063.21 2381.04 2110.25  2382.8
 2155.77 2383.81 2201.45  2384.6 2248.51 2385.61 2298.03 2387.17 2347.67  2389.8
 2395.33 2393.62 2443.09  2398.4 2489.85 2403.66 2522.72 2406.83    2562  2409.6
 2603.75 2411.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -32.58     .03   382.8    .035  411.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          382.8  411.65          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -32.58  176.01    2385        F
     875 2603.75    2385        F
Skew Angle = 20

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  3

Culvert Name     Shape      Rise    Span
culv@18cmp      Circular       5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .023     .023        0                  .5                 1
Upstream   Elevation =  2366.7
           Centerline Station =  418.1
Downstream Elevation =  2366.4
           Centerline Station =  389.9

Culvert Name     Shape      Rise    Span
culv@18conc     Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .011     .011        0                  .5                 1
Upstream   Elevation =  2366.9
           Centerline Station =  423.1
Downstream Elevation =  2366.6
           Centerline Station =  394.9

Culvert Name     Shape      Rise    Span
culv@18conc2    Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .011     .011        0                  .5                 1
Upstream   Elevation =  2366.8
           Centerline Station =  428.1
Downstream Elevation =  2366.5
           Centerline Station =  399.5

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@18cmp

  Q Culv Group (cfs)          2.79    Culv Full Len (ft)         46.70
  # Barrels                      1    Culv Vel US (ft/s)          0.14
  Q Barrel (cfs)              2.79    Culv Vel DS (ft/s)          0.14
  E.G. US. (ft)            2374.05    Culv Inv El Up (ft)      2366.70
  W.S. US. (ft)            2374.05    Culv Inv El Dn (ft)      2366.40
  E.G. DS (ft)             2374.05    Culv Frctn Ls (ft)          0.00
  W.S. DS (ft)             2374.05    Culv Exit Loss (ft)         0.00
  Delta EG (ft)               0.00    Culv Entr Loss (ft)         0.00
  Delta WS (ft)               0.00    Q Weir (cfs)               62.91
  E.G. IC (ft)             2367.29    Weir Sta Lft (ft)         181.09
  E.G. OC (ft)             2374.05    Weir Sta Rgt (ft)         895.00
  Culvert Control           Outlet    Weir Submerg                1.00
  Culv WS Inlet (ft)       2371.70    Weir Max Depth (ft)         1.94
  Culv WS Outlet (ft)      2371.40    Weir Avg Depth (ft)         1.16
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)    780.55
  Culv Crt Depth (ft)         0.45    Min El Weir Flow (ft)    2372.12


Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not
         get a balance of energy within the specified tolerance and number of trials.  The program used
         the solution with the minimum error.
Warning: The weir over culvert is submerged.
```

CULVERT OUTPUT Profile #Max WS Culv Group: culv@18conc

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 1.87 | Culv Full Len (ft) | 46.70 |
| # Barrels | 1 | Culv Vel US (ft/s) | 0.15 |
| Q Barrel (cfs) | 1.87 | Culv Vel DS (ft/s) | 0.15 |
| E.G. US. (ft) | 2374.05 | Culv Inv El Up (ft) | 2366.90 |
| W.S. US. (ft) | 2374.05 | Culv Inv El Dn (ft) | 2366.60 |
| E.G. DS (ft) | 2374.05 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2374.05 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.00 | Culv Entr Loss (ft) | 0.00 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 62.91 |
| E.G. IC (ft) | 2367.41 | Weir Sta Lft (ft) | 181.09 |
| E.G. OC (ft) | 2374.05 | Weir Sta Rgt (ft) | 895.00 |
| Culvert Control | Outlet | Weir Submerg | 1.00 |
| Culv WS Inlet (ft) | 2370.90 | Weir Max Depth (ft) | 1.94 |
| Culv WS Outlet (ft) | 2370.60 | Weir Avg Depth (ft) | 1.16 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 780.55 |
| Culv Crt Depth (ft) | 0.39 | Min El Weir Flow (ft) | 2372.12 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.

CULVERT OUTPUT Profile #Max WS Culv Group: culv@18conc2

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 1.89 | Culv Full Len (ft) | 46.70 |
| # Barrels | 1 | Culv Vel US (ft/s) | 0.15 |
| Q Barrel (cfs) | 1.89 | Culv Vel DS (ft/s) | 0.15 |
| E.G. US. (ft) | 2374.05 | Culv Inv El Up (ft) | 2366.80 |
| W.S. US. (ft) | 2374.05 | Culv Inv El Dn (ft) | 2366.50 |
| E.G. DS (ft) | 2374.05 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2374.05 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.00 | Culv Entr Loss (ft) | 0.00 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 62.91 |
| E.G. IC (ft) | 2367.32 | Weir Sta Lft (ft) | 181.09 |
| E.G. OC (ft) | 2374.05 | Weir Sta Rgt (ft) | 895.00 |
| Culvert Control | Outlet | Weir Submerg | 1.00 |
| Culv WS Inlet (ft) | 2370.80 | Weir Max Depth (ft) | 1.94 |
| Culv WS Outlet (ft) | 2370.50 | Weir Avg Depth (ft) | 1.16 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 780.55 |
| Culv Crt Depth (ft) | 0.39 | Min El Weir Flow (ft) | 2372.12 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17.98

INPUT
Description: (skewed 20 degrees)
ADD 23.8 FEET TO EACH STATION
Copy of
18.2
This section a copy of 18.2. Adjusted -30' horiz. for
culvert
sta -60 = edge pavement copy of sta -30
sta -45 = cl
road +0.6' crown observed from 15
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -32.58 | 2378.56 | -18.49 | 2379.16 | -4.39 | 2378.56 | 27.71 | 2377.26 | 72.57 | 2375.63 |
| 116.01 | 2375.45 | 121.49 | 2375.23 | 147.55 | 2372.6 | 164.61 | 2371.83 | 206.66 | 2370.66 |
| 250.17 | 2370.61 | 293.29 | 2370.82 | 337.43 | 2371.1 | 343.62 | 2370.7 | 382.8 | 2369.98 |
| 387.46 | 2368.11 | 388.33 | 2365.6 | 399.36 | 2365.6 | 401.65 | 2367.66 | 404.47 | 2367.66 |
| 411.65 | 2370.2 | 449.48 | 2370.63 | 469.4 | 2370.71 | 513.21 | 2370.61 | 557.44 | 2370.7 |
| 601.64 | 2370.76 | 645.9 | 2371.4 | 690.1 | 2371.54 | 734.28 | 2371.74 | 780.07 | 2372.1 |
| 826.17 | 2372.38 | 871.31 | 2372.56 | 915.97 | 2372.78 | 960.61 | 2373.46 | 1005.13 | 2373.7 |
| 1048.59 | 2373.85 | 1092.85 | 2374.03 | 1137.09 | 2374.22 | 1180.51 | 2373.94 | 1223.82 | 2374.2 |
| 1266.67 | 2374.57 | 1310.71 | 2374.79 | 1353.46 | 2375.08 | 1398.61 | 2375.46 | 1442.5 | 2375.82 |
| 1486.44 | 2376.18 | 1531.51 | 2376.45 | 1576.07 | 2376.71 | 1620.73 | 2376.88 | 1665.95 | 2377.21 |
| 1710.97 | 2377.65 | 1754.9 | 2378.11 | 1799.04 | 2378.08 | 1843.65 | 2378.59 | 1888.2 | 2379.1 |
| 1932.16 | 2379.58 | 1975.37 | 2379.98 | 2018.76 | 2380.45 | 2063.21 | 2381.04 | 2110.25 | 2382.8 |
| 2155.77 | 2383.81 | 2201.45 | 2384.6 | 2248.51 | 2385.61 | 2298.03 | 2387.17 | 2347.67 | 2389.8 |
| 2395.33 | 2393.62 | 2443.09 | 2398.4 | 2489.85 | 2403.66 | 2522.72 | 2406.83 | 2562 | 2409.6 |
| 2603.75 | 2411.14 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -32.58 | .03 | 382.8 | .035 | 411.65 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 382.8 | 411.65 | 88.4 | 116.9 | 116.8 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -32.58 | 176.01 | 2385 | F |
| 875 | 2603.75 | 2385 | F |

Skew Angle = 20

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 88.40 | 116.90 | 116.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 683.42 | 194.41 | 1257.64 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 752.03 | 194.41 | 1393.75 |
| Q Total (cfs) | 72.49 | Flow (cfs) | 24.34 | 8.87 | 39.28 |
| Top Width (ft) | 996.85 | Top Width (ft) | 249.57 | 28.85 | 718.43 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.04 | 0.05 | 0.03 |
| Max Chl Dpth (ft) | 8.44 | Hydr. Depth (ft) | 3.30 | 6.74 | 2.71 |
| Conv. Total (cfs) | 223654.7 | Conv. (cfs) | 75096.3 | 27353.7 | 121204.7 |
| Length Wtd. (ft) | 107.56 | Wetted Per. (ft) | 206.82 | 32.22 | 463.36 |
| Min Ch El (ft) | 2365.60 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 222.72 | 17.35 | 189.16 |
| C & E Loss (ft) | | Cum SA (acres) | 61.74 | 3.21 | 55.64 |

Warning: Divided flow computed for this cross-section.

LATERAL STRUCTURE

```
RIVER: Minnie Cr
REACH: Upper              RS: 17.97

INPUT
Description:
Lateral structure position      = Left overbank
Distance from Upstream XS =       .1
Deck/Roadway Width        =      30
Weir Coefficient          =     1.1
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2379.2      90  2379.2  1088.5  2377.4  2132.1  2377.7  3393.2 2385.18

Weir crest shape                          = Broad Crested


LATERAL STRUCTURE OUTPUT  Profile #Max WS  Lat Struct

  E.G. US. (ft)            2374.05    Weir Sta US (ft)
  W.S. US. (ft)            2374.05    Weir Sta DS (ft)
  E.G. DS (ft)             2374.05    Weir Max Depth (ft)
  W.S. DS (ft)             2374.05    Weir Avg Depth (ft)
  Q US (cfs)                 72.49    Weir Submerg
  Q Leaving Total (cfs)       0.00    Min El Weir Flow (ft)    2377.40
  Q DS (cfs)                 72.23    Wr Top Wdth (ft)
  Perc Q Leaving              0.00    Q Gate Group (cfs)
  Q Weir (cfs)                        Gate Open Ht (ft)
  Q Gates (cfs)                       Gate #Open
  Q Culv (cfs)                        Gate Area (sq ft)
  Q Lat RC (cfs)                      Gate Submerg
  Weir Flow Area (sq ft)              Gate Invert (ft)


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 17.9

INPUT
Description: Skew 20 degrees. add 12 feet to all stations
Survey 18.3
sta -15
            = 809 +0.6' vert rise as observed at 15.
sta 0 = copy of sec 18
            point 809 - slope.
sta 25.38 - 314.74 = copy of section 18 - 2'
            vertical.
sta 516.19 to right end copy of section 18 -2' vertical.
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      12  2378.4   35.85 2375.26   84.55 2373.63  130.87  2375.4  136.92 2375.23
  164.12  2372.1  181.46 2371.33  223.16 2371.16  265.72 2370.11  307.76 2370.32
  322.01  2370.3  365.24 2370.33  371.58 2369.22  379.53 2370.39     425  2370.4
   453.2 2370.71  497.06 2370.61  541.29  2370.7  585.48 2370.76  629.75  2370.9
  673.95 2371.04  718.13 2371.24  763.91  2371.6  810.02 2371.88  855.16 2372.06
  899.82 2372.28  944.46 2372.46  988.98  2372.7 1032.44 2372.85  1076.7 2373.03
 1120.85 2373.22 1164.36 2373.44 1207.67  2373.7 1250.52 2374.07 1294.56 2374.29
 1337.31 2374.58 1382.46 2374.96 1426.35  2375.3 1470.29 2375.68 1515.36 2375.95
 1559.92 2376.21 1604.58 2376.38  1649.8  2376.7 1694.82 2377.15 1738.75 2377.61
 1782.89 2378.08 1827.49 2378.59 1872.05  2379.1 1916.02 2379.58 1959.22 2379.98
 2002.61 2380.45 2047.06 2381.04  2094.1  2381.8 2139.61 2382.81  2185.3  2383.6
 2232.36 2384.61 2281.88 2386.17 2331.52  2388.8 2379.18 2392.62 2426.94  2397.4
  2473.7 2402.66 2506.56 2405.83 2545.85  2408.6  2587.6 2410.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      12     .03  365.24    .035  379.53     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        365.24  379.53           332.83  397.43  395.67             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     910  2587.6    2385        F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 1111.44 1205.41    2390    1243 1289.98    2390
Skew Angle = 20

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.030
  W.S. Elev (ft)           2374.05    Reach Len. (ft)          332.83     397.43     395.67
  Crit W.S. (ft)                      Flow Area (sq ft)        699.01      60.78    1537.45
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)             699.01      60.78    1804.02
  Q Total (cfs)              72.48    Flow (cfs)                22.87       2.06      47.55
  Top Width (ft)           1025.07    Top Width (ft)           241.28      14.29     769.50
  Vel Total (ft/s)            0.03    Avg. Vel. (ft/s)           0.03       0.03       0.03
  Max Chl Dpth (ft)           4.82    Hydr. Depth (ft)           2.90       4.25       2.90
  Conv. Total (cfs)       235981.9    Conv. (cfs)            74467.8     6716.8   154797.3
  Length Wtd. (ft)          375.21    Wetted Per. (ft)         241.44      14.47     530.48
  Min Ch El (ft)           2369.22    Shear (lb/sq ft)           0.00       0.00       0.00
  Alpha                       1.00    Stream Power (lb/ft s)     0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)     221.25      17.01     184.88
  C & E Loss (ft)                     Cum SA (acres)            61.24       3.15      53.64


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 17.6*

INPUT
Description: skew 13 degrees, add 13 ft fo all stations
Interpolated
```

Station Elevation Data num= 117

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.94 | 2378.07 | 16.85 | 2377.38 | 25.03 | 2375.53 | 42.81 | 2374.4 | 57.97 | 2374.12 |
| 65.33 | 2373.66 | 79.38 | 2373.75 | 83.27 | 2374.2 | 84.76 | 2374.39 | 87.85 | 2374.31 |
| 88.87 | 2374.1 | 93.56 | 2373.39 | 111.96 | 2372.86 | 117.82 | 2372.89 | 134.93 | 2373.26 |
| 158.34 | 2373.71 | 171.89 | 2373.81 | 177.72 | 2373.89 | 186.31 | 2373.75 | 194.7 | 2373.27 |
| 224.93 | 2371.5 | 233.26 | 2371.29 | 249.54 | 2370.95 | 264.04 | 2370.92 | 295.1 | 2370.67 |
| 308.75 | 2370.53 | 326.52 | 2370.17 | 357.9 | 2369.67 | 369.18 | 2369.54 | 389.2 | 2369.59 |
| 420.21 | 2369.66 | 428.87 | 2369.69 | 449.11 | 2369.68 | 452.23 | 2369.68 | 485.19 | 2369.77 |
| 510.48 | 2369.96 | 516.9 | 2368.99 | 518.4 | 2368.79 | 521.93 | 2369.23 | 526.16 | 2369.9 |
| 566.76 | 2369.99 | 591.93 | 2370.25 | 599.75 | 2370.25 | 631.09 | 2370.16 | 670.57 | 2370.17 |
| 672.82 | 2370.17 | 710.03 | 2370.28 | 747.42 | 2370.43 | 749.55 | 2370.43 | 789 | 2370.4 |
| 816.7 | 2370.4 | 828.45 | 2370.43 | 869.32 | 2370.64 | 888.8 | 2370.71 | 910.47 | 2370.82 |
| 950.77 | 2370.94 | 960.93 | 2370.98 | 990.65 | 2371.12 | 1030.5 | 2371.27 | 1034.07 | 2371.29 |
| 1070.25 | 2371.43 | 1105.74 | 2371.51 | 1109.05 | 2371.52 | 1148.56 | 2371.68 | 1178.98 | 2371.8 |
| 1187.97 | 2371.83 | 1226.82 | 2372 | 1249.62 | 2372.12 | 1265.48 | 2372.21 | 1303.74 | 2372.5 |
| 1321.22 | 2372.59 | 1343.05 | 2372.67 | 1381.21 | 2372.88 | 1395.05 | 2372.97 | 1421.52 | 2373.15 |
| 1460.71 | 2373.38 | 1467.64 | 2373.43 | 1499.94 | 2373.67 | 1539.9 | 2373.88 | 1540.17 | 2373.88 |
| 1579.95 | 2374.07 | 1614.05 | 2374.17 | 1619.82 | 2374.19 | 1660.19 | 2374.42 | 1683.7 | 2374.6 |
| 1700.39 | 2374.75 | 1739.6 | 2375.12 | 1754.58 | 2375.26 | 1779.01 | 2375.54 | 1818.83 | 2376.01 |
| 1828.31 | 2376.12 | 1858.6 | 2376.51 | 1897.85 | 2377 | 1899.21 | 2377.01 | 1936.43 | 2377.43 |
| 1972.65 | 2377.87 | 1975.16 | 2377.9 | 2014.83 | 2378.52 | 2042.47 | 2379.01 | 2056.83 | 2379.27 |
| 2097.47 | 2380.18 | 2113.52 | 2380.48 | 2138.26 | 2380.95 | 2180.27 | 2381.88 | 2185.51 | 2382.04 |
| 2224.47 | 2383.39 | 2267.36 | 2385.56 | 2268.79 | 2385.62 | 2311.34 | 2388.5 | 2334.89 | 2390.44 |
| 2353.97 | 2391.99 | 2395.72 | 2395.77 | 2402.95 | 2396.33 | 2425.06 | 2397.82 | 2431.64 | 2398.13 |
| 2460.14 | 2400.02 | 2497.41 | 2401.55 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.94 | .03 | 510.48 | .035 | 526.16 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 510.48 | 526.16 | 332.83 | 397.43 | 395.67 | .1 | .3 |

Skew Angle = 13

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 332.83 | 397.43 | 395.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1245.33 | 73.79 | 2621.27 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 1245.33 | 73.79 | 2621.27 |
| Q Total (cfs) | 72.45 | Flow (cfs) | 24.43 | 1.69 | 46.33 |
| Top Width (ft) | 1508.21 | Top Width (ft) | 444.00 | 15.68 | 1048.53 |
| Vel Total (ft/s) | 0.02 | Avg. Vel. (ft/s) | 0.02 | 0.02 | 0.02 |
| Max Chl Dpth (ft) | 5.25 | Hydr. Depth (ft) | 2.80 | 4.71 | 2.50 |
| Conv. Total (cfs) | 373968.8 | Conv. (cfs) | 126082.8 | 8736.8 | 239149.2 |
| Length Wtd. (ft) | 373.50 | Wetted Per. (ft) | 444.18 | 15.85 | 1048.54 |
| Min Ch El (ft) | 2368.79 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 213.82 | 16.40 | 164.78 |
| C & E Loss (ft) | | Cum SA (acres) | 58.62 | 3.02 | 45.39 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17.3*

INPUT
Description: skew 6 degrees
Interpolated
Station Elevation Data num= 117

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -8.284 | 2377.73 | 1.969 | 2377.09 | 12.571 | 2374.16 | 35.594 | 2373.53 | 55.256 | 2373.35 |
| 64.803 | 2372.59 | 83.003 | 2373.09 | 88.045 | 2374.1 | 89.984 | 2374.52 | 93.982 | 2374.43 |
| 95.305 | 2374.02 | 101.372 | 2372.71 | 125.22 | 2372.09 | 132.828 | 2372 | 154.996 | 2372.26 |
| 185.319 | 2372.53 | 202.882 | 2372.37 | 210.441 | 2372.38 | 221.579 | 2372.27 | 232.45 | 2372 |
| 271.624 | 2370.91 | 282.424 | 2370.75 | 303.518 | 2370.57 | 322.315 | 2370.55 | 362.573 | 2370.15 |
| 380.265 | 2369.9 | 403.289 | 2369.48 | 443.945 | 2369.04 | 458.574 | 2368.97 | 484.531 | 2368.99 |
| 524.71 | 2369.04 | 535.928 | 2369.05 | 562.163 | 2369.06 | 566.191 | 2369.06 | 608.916 | 2369.22 |
| 641.705 | 2369.58 | 649.343 | 2368.54 | 651.143 | 2368.35 | 654.525 | 2368.72 | 658.582 | 2369.41 |
| 693.321 | 2369.58 | 714.862 | 2369.79 | 721.556 | 2369.82 | 748.378 | 2369.71 | 782.172 | 2369.64 |
| 784.101 | 2369.63 | 815.946 | 2369.79 | 847.939 | 2369.98 | 849.769 | 2369.97 | 883.533 | 2369.75 |
| 907.243 | 2369.61 | 917.297 | 2369.62 | 952.275 | 2369.68 | 968.943 | 2369.7 | 987.501 | 2369.75 |
| 1021.991 | 2369.82 | 1030.683 | 2369.85 | 1056.113 | 2369.95 | 1090.225 | 2370.08 | 1093.278 | 2370.09 |
| 1124.237 | 2370.15 | 1154.62 | 2370.19 | 1157.444 | 2370.21 | 1191.268 | 2370.32 | 1217.295 | 2370.43 |
| 1224.992 | 2370.45 | 1258.249 | 2370.57 | 1277.762 | 2370.64 | 1291.337 | 2370.72 | 1324.077 | 2370.93 |
| 1339.044 | 2371 | 1357.721 | 2371.06 | 1390.381 | 2371.18 | 1402.226 | 2371.24 | 1424.881 | 2371.33 |
| 1458.417 | 2371.47 | 1464.354 | 2371.5 | 1491.992 | 2371.66 | 1526.203 | 2371.82 | 1526.432 | 2371.82 |
| 1560.474 | 2371.93 | 1589.664 | 2371.99 | 1594.607 | 2372 | 1629.156 | 2372.14 | 1649.275 | 2372.24 |
| 1663.547 | 2372.35 | 1697.112 | 2372.62 | 1709.931 | 2372.73 | 1730.836 | 2372.99 | 1764.928 | 2373.43 |
| 1773.034 | 2373.54 | 1798.961 | 2373.92 | 1832.556 | 2374.42 | 1833.719 | 2374.43 | 1865.574 | 2374.87 |
| 1896.583 | 2375.32 | 1898.721 | 2375.36 | 1932.684 | 2376 | 1956.324 | 2376.48 | 1968.626 | 2376.74 |
| 2003.405 | 2377.55 | 2017.139 | 2377.84 | 2038.312 | 2378.3 | 2074.274 | 2379.16 | 2078.76 | 2379.29 |
| 2112.106 | 2380.6 | 2148.814 | 2382.4 | 2150.037 | 2382.45 | 2186.448 | 2384.37 | 2206.605 | 2385.61 |
| 2222.936 | 2386.58 | 2258.669 | 2388.87 | 2264.845 | 2389.23 | 2283.781 | 2389.81 | 2289.409 | 2389.92 |
| 2313.795 | 2391.44 | 2345.699 | 2392.96 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -8.284 | .03 | 641.705 | .035 | 658.582 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 641.705 | 658.582 | 332.83 | 397.43 | 395.67 | .1 | .3 |

Skew Angle = 6

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 332.83 | 397.43 | 395.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2046.81 | 86.99 | 3658.60 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2046.81 | 86.99 | 3658.60 |
| Q Total (cfs) | 72.42 | Flow (cfs) | 26.77 | 1.24 | 44.42 |
| Top Width (ft) | 1783.13 | Top Width (ft) | 617.48 | 16.88 | 1148.78 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.01 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 5.69 | Hydr. Depth (ft) | 3.31 | 5.15 | 3.18 |
| Conv. Total (cfs) | 639585.4 | Conv. (cfs) | 236377.6 | 10951.8 | 392256.0 |
| Length Wtd. (ft) | 371.61 | Wetted Per. (ft) | 617.80 | 17.04 | 1148.80 |
| Min Ch El (ft) | 2368.35 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 201.25 | 15.66 | 136.26 |

| | | | | |
|---|---|---|---|---|
| C & E Loss (ft) | Cum SA (acres) | 54.57 | 2.87 | 35.41 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17

INPUT
Description: -12,5 = center road + 0.6' vertical observed from 15
Station Elevation Data num= 58

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.4 | 0 | 2376.8 | 12.93 | 2372.79 | 64.96 | 2372.57 | 76.6 | 2371.52 |
| 98.79 | 2372.44 | 104.94 | 2374 | 107.3 | 2374.64 | 112.18 | 2374.54 | 113.79 | 2373.95 |
| 121.19 | 2372.04 | 159.53 | 2371.1 | 186.56 | 2371.27 | 223.53 | 2371.36 | 244.94 | 2370.93 |
| 280.98 | 2370.72 | 341.9 | 2370.2 | 390.53 | 2370.18 | 439.61 | 2369.62 | 489.25 | 2368.8 |
| 538.82 | 2368.4 | 588.29 | 2368.4 | 637.27 | 2368.41 | 687.85 | 2368.44 | 739.93 | 2368.67 |
| 779.9 | 2369.21 | 788.69 | 2368.1 | 790.76 | 2367.92 | 793.94 | 2368.2 | 797.75 | 2368.92 |
| 848.88 | 2369.38 | 899.66 | 2369.1 | 951.49 | 2369.52 | 999.63 | 2368.83 | 1049.73 | 2368.68 |
| 1099.85 | 2368.71 | 1150.67 | 2368.9 | 1200.47 | 2368.86 | 1251.36 | 2369.05 | 1300.45 | 2369.17 |
| 1350.2 | 2369.42 | 1401.5 | 2369.5 | 1451.94 | 2369.56 | 1502.15 | 2369.75 | 1553.67 | 2369.81 |
| 1602.07 | 2369.88 | 1651.32 | 2370.2 | 1702.55 | 2370.95 | 1751.82 | 2371.85 | 1802.85 | 2372.77 |
| 1851.36 | 2373.95 | 1900.73 | 2375.2 | 1950.76 | 2376.53 | 2007.63 | 2379.24 | 2054.55 | 2380.79 |
| 2101.84 | 2382.12 | 2121.78 | 2381.7 | 2167.48 | 2384.37 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -12.5 | .03 | 779.9 | .035 | 797.75 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 779.9 | 797.75 | 521.8 | 598.55 | 598 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 521.80 | 598.55 | 598.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3055.69 | 99.80 | 4502.01 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 3055.69 | 99.80 | 4502.01 |
| Q Total (cfs) | 72.39 | Flow (cfs) | 28.73 | 0.97 | 42.69 |
| Top Width (ft) | 1837.80 | Top Width (ft) | 762.59 | 17.85 | 1057.36 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.01 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 6.13 | Hydr. Depth (ft) | 4.01 | 5.59 | 4.26 |
| Conv. Total (cfs) | 993257.4 | Conv. (cfs) | 394225.5 | 13269.1 | 585762.9 |
| Length Wtd. (ft) | 563.21 | Wetted Per. (ft) | 763.34 | 18.01 | 1057.41 |
| Min Ch El (ft) | 2367.92 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 181.75 | 14.81 | 99.20 |
| C & E Loss (ft) | | Cum SA (acres) | 49.29 | 2.71 | 25.39 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 16.5*

INPUT
Description: Interpolated
Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.55 | -1.74 | 2377.03 | 2.4 | 2376.28 | 11.71 | 2373.57 | 17.82 | 2372.83 |
| 48.05 | 2373.07 | 59.21 | 2372.73 | 64.07 | 2373.39 | 65.9 | 2373.71 | 70.44 | 2373.64 |
| 71.96 | 2373.29 | 78.81 | 2372.25 | 79.85 | 2372.25 | 91.7 | 2371.78 | 93.73 | 2371.46 |
| 96.36 | 2371.21 | 114.25 | 2373.03 | 120.19 | 2373.06 | 127.52 | 2373.74 | 130.33 | 2374.03 |
| 136.15 | 2373.9 | 138.07 | 2373.58 | 146.74 | 2372.53 | 146.89 | 2372.51 | 188.99 | 2371.99 |
| 192.61 | 2371.95 | 224.83 | 2371.99 | 232.16 | 2371.98 | 268.91 | 2371.94 | 275.23 | 2371.88 |
| 294.44 | 2371.61 | 317.47 | 2371.43 | 337.41 | 2371.29 | 360.15 | 2371.1 | 402.79 | 2370.92 |
| 410.04 | 2370.84 | 445.23 | 2370.61 | 468.02 | 2370.65 | 486.97 | 2370.6 | 526.54 | 2370.29 |
| 528.38 | 2370.27 | 570.76 | 2370.17 | 585.72 | 2370.09 | 612.62 | 2370.04 | 644.82 | 2369.89 |
| 654.09 | 2369.88 | 696.39 | 2369.85 | 703.8 | 2369.71 | 738.86 | 2369.03 | 762.15 | 2369.08 |
| 762.2 | 2369.08 | 778.69 | 2368.81 | 820.5 | 2368.51 | 822.51 | 2368.52 | 862.11 | 2368.69 |
| 884.6 | 2368.71 | 905.28 | 2368.8 | 932.26 | 2369.21 | 941.15 | 2367.94 | 943.25 | 2367.67 |
| 946.34 | 2367.94 | 949.68 | 2368.42 | 951.55 | 2368.47 | 961.51 | 2368.94 | 999.7 | 2369.06 |
| 1037.63 | 2368.8 | 1040.28 | 2368.81 | 1076.35 | 2368.95 | 1112.31 | 2368.54 | 1113.98 | 2368.54 |
| 1149.74 | 2368.53 | 1187.18 | 2368.62 | 1188.31 | 2368.62 | 1225.14 | 2368.87 | 1262.35 | 2369.01 |
| 1266.79 | 2369.04 | 1300.36 | 2369.38 | 1337.03 | 2369.71 | 1341.39 | 2369.76 | 1374.2 | 2370.58 |
| 1412.52 | 2371.44 | 1417.49 | 2371.55 | 1450.2 | 2371.92 | 1481.36 | 2372.31 | 1487.71 | 2372.4 |
| 1526.19 | 2372.85 | 1550.63 | 2373.14 | 1562.35 | 2373.21 | 1599.14 | 2373.54 | 1613.46 | 2373.74 |
| 1637.41 | 2374.37 | 1674.22 | 2375.43 | 1685.38 | 2375.75 | 1712.34 | 2376.47 | 1748.57 | 2377.59 |
| 1785.46 | 2378.34 | 1822.83 | 2379.12 | 1826.78 | 2379.26 | 1865.31 | 2380.49 | 1900.36 | 2381.26 |
| 1904.96 | 2381.34 | 1935.69 | 2381.95 | 1950.59 | 2381.76 | 1984.72 | 2383.14 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | .03 | 932.26 | .035 | 961.51 | .03 | 1266.79 | .04 | 1984.72 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 932.26 | 961.51 | 521.8 | 598.55 | 598 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.032 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 521.80 | 598.55 | 598.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3086.60 | 164.26 | 2473.38 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 3086.60 | 164.26 | 2473.38 |
| Q Total (cfs) | 72.34 | Flow (cfs) | 37.36 | 2.40 | 32.58 |
| Top Width (ft) | 1614.97 | Top Width (ft) | 922.18 | 29.25 | 663.54 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.01 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 6.38 | Hydr. Depth (ft) | 3.35 | 5.62 | 3.73 |
| Conv. Total (cfs) | 662034.5 | Conv. (cfs) | 341931.0 | 21949.9 | 298153.6 |
| Length Wtd. (ft) | 556.47 | Wetted Per. (ft) | 922.80 | 29.42 | 663.59 |
| Min Ch El (ft) | 2367.67 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 144.96 | 13.00 | 51.32 |
| C & E Loss (ft) | | Cum SA (acres) | 39.20 | 2.38 | 13.58 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 16

INPUT
Description: sta -12.5 = center road +0.6' verical observed from 15
Station Elevation Data num= 52

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.7 | 0 | 2377.1 | 15.62 | 2372.76 | 57.82 | 2373.46 | 70.77 | 2372.82 |
| 76.42 | 2374.16 | 78.54 | 2374.8 | 83.81 | 2374.67 | 85.58 | 2373.98 | 93.53 | 2371.93 |
| 108.5 | 2371.88 | 113.92 | 2370.8 | 134.69 | 2373.83 | 172.42 | 2372.99 | 221.48 | 2372.8 |
| 271.62 | 2372.68 | 321.63 | 2372.5 | 370.68 | 2372.04 | 420.24 | 2371.65 | 469.76 | 2371.58 |
| 519.05 | 2371.03 | 567.52 | 2371.2 | 615.6 | 2370.95 | 664.82 | 2371.33 | 713.43 | 2371.46 |
| 761.59 | 2371.36 | 810.71 | 2371.3 | 860.03 | 2369.66 | 887.07 | 2369.76 | 906.28 | 2369.2 |
| 954.83 | 2368.59 | 1003.15 | 2368.8 | 1053.29 | 2368.69 | 1084.61 | 2369.22 | 1095.74 | 2367.43 |
| 1100.74 | 2367.86 | 1106.13 | 2368.7 | 1125.26 | 2368.97 | 1177.36 | 2368.49 | 1226.1 | 2368.25 |
| 1275.26 | 2368.53 | 1327.16 | 2369.2 | 1376.5 | 2370.32 | 1426.83 | 2373.6 | 1469.07 | 2374.91 |
| 1514.88 | 2376.43 | 1556.43 | 2377 | 1604 | 2379.39 | 1645.79 | 2381.24 | 1697.51 | 2381.74 |
| 1749.22 | 2381.72 | 1801.97 | 2381.9 | | | | | | |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| -12.5 | .03 | 1084.61 | .035 | 1125.26 | .03 | 1327.16 | .05 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1084.61 | 1125.26 | 681.4 | 708.3 | 710.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.032 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 681.40 | 708.30 | 710.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2949.90 | 226.40 | 1419.88 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2949.90 | 226.40 | 1419.88 |
| Q Total (cfs) | 72.29 | Flow (cfs) | 41.50 | 4.25 | 26.53 |
| Top Width (ft) | 1420.70 | Top Width (ft) | 1064.14 | 40.65 | 315.92 |
| Vel Total (ft/s) | 0.02 | Avg. Vel. (ft/s) | 0.01 | 0.02 | 0.02 |
| Max Chl Dpth (ft) | 6.61 | Hydr. Depth (ft) | 2.77 | 5.57 | 4.49 |
| Conv. Total (cfs) | 511220.2 | Conv. (cfs) | 293491.5 | 30088.4 | 187640.3 |
| Length Wtd. (ft) | 688.41 | Wetted Per. (ft) | 1065.14 | 40.88 | 316.05 |
| Min Ch El (ft) | 2367.43 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.06 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 108.81 | 10.31 | 24.59 |
| C & E Loss (ft) | | Cum SA (acres) | 27.31 | 1.90 | 6.85 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 15.5*

INPUT
Description:
Station Elevation Data num= 89

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 446.69 | 2380.01 | 451.86 | 2379.78 | 452.5 | 2379.68 | 463.44 | 2378.21 | 468.24 | 2377.41 |
| 475.43 | 2376.02 | 479.69 | 2374.26 | 483.9 | 2374.2 | 485.97 | 2374.65 | 487.56 | 2375.14 |
| 490.62 | 2375.14 | 491.83 | 2374.63 | 493.27 | 2374.16 | 497.22 | 2373.11 | 506.43 | 2372.38 |
| 507.37 | 2372.38 | 511.05 | 2371.86 | 525.14 | 2373.42 | 531.81 | 2373.34 | 550.73 | 2372.09 |
| 567.66 | 2371.21 | 582.35 | 2371.55 | 584.01 | 2371.5 | 593.84 | 2371.2 | 618.02 | 2370.9 |
| 632.91 | 2370.7 | 651.94 | 2370.57 | 685.21 | 2370.22 | 713.5 | 2369.95 | 718.82 | 2369.76 |
| 730.89 | 2369.4 | 752.41 | 2369.43 | 756.3 | 2369.41 | 785.84 | 2369.27 | 818.72 | 2369.47 |
| 840.95 | 2369.46 | 851.33 | 2369.45 | 884.72 | 2369.72 | 917.69 | 2369.87 | 935.21 | 2369.88 |
| 950.36 | 2369.83 | 983.68 | 2369.74 | 1013.94 | 2368.94 | 1017.13 | 2368.86 | 1035.47 | 2368.91 |
| 1048.5 | 2368.63 | 1081.43 | 2368.32 | 1095.54 | 2368.36 | 1114.21 | 2368.47 | 1148.22 | 2368.49 |
| 1169.46 | 2368.81 | 1205.69 | 2368.48 | 1231.89 | 2368.41 | 1263.32 | 2368.23 | 1271.02 | 2368.21 |
| 1310.19 | 2368.64 | 1317.23 | 2368.85 | 1371.6 | 2368.81 | 1385.78 | 2367.2 | 1389.51 | 2367.5 |
| 1393.54 | 2368.01 | 1407.83 | 2368.48 | 1417.54 | 2371.97 | 1429 | 2372.38 | 1459.69 | 2373.61 |
| 1483.58 | 2374.66 | 1499.95 | 2375.69 | 1518.74 | 2379.31 | 1532.94 | 2380.35 | 1537.46 | 2380.06 |
| 1539.25 | 2380.15 | 1572.6 | 2381.27 | 1585.97 | 2381.52 | 1614.97 | 2382.09 | 1636.63 | 2382.49 |
| 1676.16 | 2382.87 | 1682.59 | 2382.84 | 1701.01 | 2383.05 | 1710.17 | 2383.17 | 1735.21 | 2384.38 |
| 1743.79 | 2384.77 | 1781.43 | 2385.61 | 1786.89 | 2385.64 | 1826.33 | 2385.58 | 1838.64 | 2385.82 |
| 1868.82 | 2386.26 | 1895.83 | 2385.82 | 1909.22 | 2385.62 | 1954.17 | 2385.4 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 446.69 | .03 | 1371.6 | .035 | 1407.83 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1371.6 | 1407.83 | 681.4 | 708.3 | 710.5 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.035 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 681.40 | 708.30 | 710.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 3907.73 | 218.85 | 92.90 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 3907.73 | 218.85 | 92.90 |
| Q Total (cfs) | 72.25 | Flow (cfs) | 67.62 | 3.97 | 0.66 |
| Top Width (ft) | 975.88 | Top Width (ft) | 877.90 | 36.23 | 61.75 |
| Vel Total (ft/s) | 0.02 | Avg. Vel. (ft/s) | 0.02 | 0.02 | 0.01 |
| Max Chl Dpth (ft) | 6.84 | Hydr. Depth (ft) | 4.45 | 6.04 | 1.50 |
| Conv. Total (cfs) | 559466.3 | Conv. (cfs) | 523588.9 | 30735.7 | 5141.7 |
| Length Wtd. (ft) | 687.15 | Wetted Per. (ft) | 878.29 | 36.37 | 62.40 |
| Min Ch El (ft) | 2367.20 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 55.17 | 6.69 | 12.25 |
| C & E Loss (ft) | | Cum SA (acres) | 12.12 | 1.28 | 3.77 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 15

INPUT
Description:
Station Elevation Data num= 85

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 2382.4 | 45.85 | 2379.2 | 86.98 | 2375.87 | 109.34 | 2374.35 | 141.96 | 2372.69 |
| 209.68 | 2366.7 | 246.52 | 2366 | 284.87 | 2365.44 | 313.99 | 2364.54 | 355.62 | 2364.39 |
| 390.07 | 2364.3 | 407.7 | 2363.95 | 442.83 | 2363.73 | 479.54 | 2364.98 | 509.4 | 2366.23 |
| 535.33 | 2368.1 | 547.07 | 2370.76 | 555.77 | 2371.74 | 567.17 | 2373.69 | 578.9 | 2377.77 |
| 580.14 | 2380.9 | 586.46 | 2383.37 | 600.47 | 2384.69 | 606.79 | 2384.06 | 616.18 | 2385.33 |
| 639.64 | 2385.8 | 665.27 | 2385.02 | 675.52 | 2383.39 | 684.67 | 2385.46 | 717.31 | 2384.95 |
| 725.19 | 2388.3 | 740.12 | 2386.04 | 756.24 | 2385.74 | 757.89 | 2382.4 | 774.13 | 2382.2 |
| 784.13 | 2389.3 | 805.49 | 2389.04 | 818.09 | 2386.13 | 827.42 | 2385.42 | 857.01 | 2380.04 |
| 870 | 2377.3 | 877.69 | 2373.8 | 885.29 | 2373.69 | 889.03 | 2374.61 | 891.9 | 2375.6 |
| 897.44 | 2375.6 | 898.83 | 2374.89 | 905.75 | 2372.88 | 919.09 | 2373.06 | 937.94 | 2369.52 |
| 945.66 | 2370.3 | 951.7 | 2369.63 | 972.24 | 2368.79 | 1014.61 | 2368.18 | 1023.75 | 2367.17 |
| 1037.11 | 2367.3 | 1081.61 | 2367.89 | 1131.16 | 2368.36 | 1172.55 | 2368.06 | 1215.45 | 2368.04 |
| 1254.31 | 2368.4 | 1271.54 | 2366.97 | 1286.12 | 2367.99 | 1314.83 | 2368.06 | 1357.71 | 2367.96 |
| 1400.64 | 2369 | 1434.98 | 2371.03 | 1472.14 | 2373.31 | 1518.28 | 2374.88 | 1564.48 | 2377.4 |
| 1608.6 | 2380.1 | 1629.19 | 2386.22 | 1644.75 | 2387.47 | 1649.7 | 2386.63 | 1688.21 | 2388 |
| 1734.65 | 2388.4 | 1801.7 | 2388.82 | 1828.94 | 2388.26 | 1838.98 | 2388.08 | 1875.82 | 2389.8 |
| 1923.05 | 2390 | 1966.28 | 2389.53 | 2012.84 | 2390.8 | 2057.11 | 2389.48 | 2106.38 | 2388.91 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 0 | .04 | 284.87 | .035 | 509.4 | .03 | 1254.31 | .035 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1254.31 | 1286.12 | 100 | 144.9 | 150.67 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1004 | 2385 | F |
| 1550 | 2106.38 | 2385 | F |

Left Levee Station= 784.13 Elevation= 2389.3

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.035 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 100.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1516.02 | 205.30 | 886.50 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 1917.25 | 205.30 | 886.50 |
| Q Total (cfs) | 72.23 | Flow (cfs) | 47.59 | 5.75 | 18.89 |
| Top Width (ft) | 601.58 | Top Width (ft) | 362.15 | 31.81 | 207.62 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.03 | 0.03 | 0.02 |
| Max Chl Dpth (ft) | 10.31 | Hydr. Depth (ft) | 6.06 | 6.45 | 4.27 |
| Conv. Total (cfs) | 378611.5 | Conv. (cfs) | 249450.8 | 30153.3 | 99007.5 |
| Length Wtd. (ft) | 117.99 | Wetted Per. (ft) | 250.38 | 31.90 | 207.77 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.08 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 9.61 | 3.24 | 4.27 |
| C & E Loss (ft) | | Cum SA (acres) | 2.42 | 0.73 | 1.58 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 14.75*

INPUT
Description:
Station Elevation Data num= 35

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 811.62 | 2368.5 | 862.43 | 2369.01 | 919.01 | 2369.44 | 966.27 | 2369.35 | 1015.25 | 2369.44 |
| 1023.62 | 2369.51 | 1059.63 | 2369.46 | 1074.23 | 2367.18 | 1077.69 | 2366.97 | 1078.57 | 2367.01 |
| 1098.33 | 2370.09 | 1120.22 | 2369.95 | 1152.91 | 2369.6 | 1175.32 | 2369.88 | 1185.63 | 2370.15 |
| 1211.81 | 2371.62 | 1240.14 | 2373.26 | 1275.32 | 2374.47 | 1310.54 | 2376.3 | 1344.17 | 2378.25 |
| 1359.87 | 2382.4 | 1371.73 | 2383.29 | 1375.51 | 2382.75 | 1404.86 | 2383.79 | 1440.27 | 2384.21 |
| 1440.9 | 2384.22 | 1491.38 | 2384.74 | 1512.15 | 2384.47 | 1519.8 | 2384.39 | 1547.89 | 2385.67 |
| 1583.89 | 2385.98 | 1616.85 | 2385.83 | 1652.35 | 2386.85 | 1686.1 | 2386.14 | 1723.66 | 2385.94 |

Manning's n Values num= 4

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|
| 811.62 | .03 | 1059.63 | .035 | 1098.33 | .037 | 1723.66 | .037 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 1059.63 | 1098.33 | 120 | 144.9 | 150.67 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 811.62 | 887 | 2385 | F |
| 1270 | 1723.66 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.037 |
| W.S. Elev (ft) | 2374.05 | Reach Len. (ft) | 120.00 | 144.90 | 150.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 801.26 | 222.49 | 502.86 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 1191.45 | 222.49 | 502.86 |
| Q Total (cfs) | 72.24 | Flow (cfs) | 43.59 | 11.88 | 16.77 |
| Top Width (ft) | 451.34 | Top Width (ft) | 248.01 | 38.70 | 164.63 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.05 | 0.05 | 0.03 |
| Max Chl Dpth (ft) | 7.07 | Hydr. Depth (ft) | 4.64 | 5.75 | 3.05 |
| Conv. Total (cfs) | 183017.6 | Conv. (cfs) | 110428.5 | 30094.2 | 42494.9 |
| Length Wtd. (ft) | 132.71 | Wetted Per. (ft) | 172.63 | 39.12 | 164.74 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.12 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 6.04 | 2.53 | 1.86 |
| C & E Loss (ft) | | Cum SA (acres) | 1.72 | 0.61 | 0.93 |

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 14.5*

INPUT
Description:
Station Elevation Data num= 34

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 643.25 | 2370.12 | 706.86 | 2370.53 | 759.99 | 2370.64 | 815.06 | 2370.84 | 824.47 | 2370.9 |
| 864.94 | 2370.51 | 880.22 | 2367.12 | 883.83 | 2366.97 | 884.97 | 2367.01 | 910.54 | 2372.2 |
| 925.6 | 2371.84 | 948.1 | 2371.25 | 963.53 | 2371.1 | 970.63 | 2371.3 | 988.65 | 2372.21 |

```
 1008.15 2373.22 1032.36 2374.06  1056.6 2375.21 1079.75 2376.41 1090.55 2378.59
 1098.71 2379.11 1101.31 2378.86 1121.52 2379.58 1145.89 2380.03 1146.32 2380.04
 1181.07 2380.67 1195.36 2380.68 1200.63  2380.7 1219.96 2381.55 1244.74 2381.97
 1267.42 2382.13 1291.85  2382.9 1315.08 2382.79 1340.93 2382.97

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  643.25     .03  864.94    .035  910.54    .038 1340.93    .038

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        864.94  910.54              70   144.9  150.67             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  643.25     762    2385       F
     995 1340.93    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.038
  W.S. Elev (ft)           2374.05    Reach Len. (ft)           70.00     144.90     150.67
  Crit W.S. (ft)                      Flow Area (sq ft)        340.21     226.75     203.10
  E.G. Slope (ft/ft)      0.000001    Area (sq ft)             767.49     226.75     228.23
  Q Total (cfs)              72.23    Flow (cfs)                34.04      25.21      12.97
  Top Width (ft)            388.67    Top Width (ft)           221.69      45.60     121.38
  Vel Total (ft/s)            0.09    Avg. Vel. (ft/s)           0.10       0.11       0.06
  Max Chl Dpth (ft)           7.07    Hydr. Depth (ft)           3.30       4.97       2.40
  Conv. Total (cfs)        79320.5    Conv. (cfs)             37387.2    27684.5    14248.9
  Length Wtd. (ft)          122.33    Wetted Per. (ft)         102.94      46.50      84.51
  Min Ch El (ft)           2366.97    Shear (lb/sq ft)           0.00       0.00       0.00
  Alpha                       1.11    Stream Power (lb/ft s)     0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       3.34       1.78       0.60
  C & E Loss (ft)                     Cum SA (acres)             1.07       0.47       0.44

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 14.25

INPUT
Description: Survey 14.1
end point of survey deleted and point 470 created by
             linear interpolation.
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     470 2371.48  625.31  2372.3  670.26 2371.57  686.21 2367.06  689.98 2366.97
  691.38 2367.01  722.75  2374.3  751.74 2372.31  851.74 2375.85  958.21    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     470     .03  670.26    .035  722.75     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        670.26  722.75              49.82    50.9   50.52             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     470     650    2385       F
     727  958.21    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2374.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.040
  W.S. Elev (ft)           2374.04    Reach Len. (ft)           49.82      50.90      50.52
  Crit W.S. (ft)                      Flow Area (sq ft)         46.79     218.25       0.01
  E.G. Slope (ft/ft)      0.000007    Area (sq ft)             429.32     218.25      64.36
  Q Total (cfs)              72.22    Flow (cfs)                10.48      61.75       0.00
  Top Width (ft)            325.89    Top Width (ft)           200.26      51.39      74.24
  Vel Total (ft/s)            0.27    Avg. Vel. (ft/s)           0.22       0.28       0.01
  Max Chl Dpth (ft)           7.07    Hydr. Depth (ft)           2.31       4.25       0.02
  Conv. Total (cfs)        27907.3    Conv. (cfs)              4048.4    23858.8        0.0
  Length Wtd. (ft)           50.82    Wetted Per. (ft)          20.26      52.82       0.52
  Min Ch El (ft)           2366.97    Shear (lb/sq ft)           0.00       0.00       0.00
  Alpha                       1.02    Stream Power (lb/ft s)     0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       2.38       1.04       0.09
  C & E Loss (ft)                     Cum SA (acres)             0.73       0.31       0.10

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 14.2

INPUT
Description: Survey 14.2
Reduced data to width of max water surface without
             floodway encroachments.  This was so that the floodway width could
             be obtained.  Encroachments made on the privious wider cross
             section created erroneous results.
-200 = RR x-sec extended 200'
             on grade
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  653.41 2373.97  689.47 2373.25  704.82 2366.74  706.07 2366.51  707.43 2366.36
  719.64  2372.9   744.6 2374.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  653.41     .03  689.47    .035  719.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        689.47  719.64              43      44   43.28             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  653.41     688    2385       F
     722   744.6    2385       F
```

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2374.04 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2374.04 | Reach Len. (ft) | 43.00 | 44.00 | 43.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1.14 | 135.55 | 2.57 |
| E.G. Slope (ft/ft) | 0.000024 | Area (sq ft) | 15.51 | 135.55 | 14.48 |
| Q Total (cfs) | 72.22 | Flow (cfs) | 0.23 | 71.50 | 0.49 |
| Top Width (ft) | 91.19 | Top Width (ft) | 36.06 | 30.17 | 24.96 |
| Vel Total (ft/s) | 0.52 | Avg. Vel. (ft/s) | 0.20 | 0.53 | 0.19 |
| Max Chl Dpth (ft) | 7.68 | Hydr. Depth (ft) | 0.78 | 4.49 | 1.09 |
| Conv. Total (cfs) | 14859.6 | Conv. (cfs) | 47.6 | 14711.2 | 100.7 |
| Length Wtd. (ft) | 44.00 | Wetted Per. (ft) | 1.47 | 33.16 | 2.36 |
| Min Ch El (ft) | 2366.36 | Shear (lb/sq ft) | 0.00 | 0.01 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 2.13 | 0.84 | 0.05 |
| C & E Loss (ft) | | Cum SA (acres) | 0.60 | 0.26 | 0.04 |

CULVERT

RIVER: Minnie Cr
REACH: Upper RS: 14.01

INPUT
Description:
Distance from Upstream XS = 2
Deck/Roadway Width = 40.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 44

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -200 | 2375.28 | | 0 | 2375.32 | | 44.99 | 2375.33 | |
| 92.51 | 2375.38 | | 139.18 | 2375.48 | | 188.77 | 2375.55 | |
| 234.46 | 2375.6 | | 283.59 | 2375.7 | | 330.27 | 2375.77 | |
| 378.75 | 2375.83 | | 425.79 | 2375.94 | | 473.19 | 2376 | |
| 520.84 | 2376.2 | | 568.13 | 2376.27 | | 615.45 | 2376.3 | |
| 662.56 | 2376.34 | | 709.56 | 2376.4 | | 754.64 | 2376.41 | |
| 782.31 | 2376.78 | | 799.87 | 2376.67 | | 808.75 | 2376.77 | |
| 826.65 | 2376.7 | | 847.68 | 2376.71 | | 856.34 | 2376.87 | |
| 871.28 | 2377.07 | | 894.13 | 2377.01 | | 903.97 | 2377 | |
| 951.07 | 2377.14 | | 987.52 | 2377.25 | | 1029.32 | 2377.37 | |
| 1034.24 | 2377.38 | | 1081.42 | 2377.4 | | 1129.26 | 2377.78 | |
| 1176.62 | 2377.97 | | 1226.53 | 2378.2 | | 1276.96 | 2378.67 | |
| 1324 | 2379 | | 1370.05 | 2379.34 | | 1416.97 | 2379.59 | |
| 1465.43 | 2379.87 | | 1511.88 | 2380.11 | | 1558.69 | 2380.3 | |
| 1605.16 | 2380.5 | | 1726.47 | 2380.5 | | | | |

Upstream Bridge Cross Section Data
Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 653.41 | 2373.97 | 689.47 | 2373.25 | 704.82 | 2366.74 | 706.07 | 2366.51 | 707.43 | 2366.36 |
| 719.64 | 2372.9 | 744.6 | 2374.02 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 653.41 | .03 | 689.47 | .035 | 719.64 | .04 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 689.47 | 719.64 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 653.41 | 688 | 2385 | F |
| 722 | 744.6 | 2385 | F |

Downstream Deck/Roadway Coordinates
num= 44

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| -200 | 2375.28 | | 0 | 2375.32 | | 44.99 | 2375.33 | |
| 92.51 | 2375.38 | | 139.18 | 2375.48 | | 188.77 | 2375.55 | |
| 234.46 | 2375.6 | | 283.59 | 2375.7 | | 330.27 | 2375.77 | |
| 378.75 | 2375.83 | | 425.79 | 2375.94 | | 473.19 | 2376 | |
| 520.84 | 2376.2 | | 568.13 | 2376.27 | | 615.45 | 2376.3 | |
| 662.56 | 2376.34 | | 709.56 | 2376.4 | | 754.64 | 2376.41 | |
| 782.31 | 2376.78 | | 799.87 | 2376.67 | | 808.75 | 2376.77 | |
| 826.65 | 2376.7 | | 847.68 | 2376.71 | | 856.34 | 2376.87 | |
| 871.28 | 2377.07 | | 894.13 | 2377.01 | | 903.97 | 2377 | |
| 951.07 | 2377.14 | | 987.52 | 2377.25 | | 1029.32 | 2377.37 | |
| 1034.24 | 2377.38 | | 1081.42 | 2377.4 | | 1129.26 | 2377.78 | |
| 1176.62 | 2377.97 | | 1226.53 | 2378.2 | | 1276.96 | 2378.67 | |
| 1324 | 2379 | | 1370.05 | 2379.34 | | 1416.97 | 2379.59 | |
| 1465.43 | 2379.87 | | 1511.88 | 2380.11 | | 1558.69 | 2380.3 | |
| 1605.16 | 2380.5 | | 1726.47 | 2380.5 | | | | |

Downstream Bridge Cross Section Data
Station Elevation Data num= 49

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -435.46 | 2380.04 | 7 | 2373.3 | 51.99 | 2373.33 | 99.51 | 2373.38 | 146.18 | 2373.48 |
| 195.77 | 2373.55 | 241.46 | 2373.6 | 290.59 | 2373.7 | 337.27 | 2373.77 | 385.75 | 2373.83 |
| 432.79 | 2373.94 | 480.19 | 2374 | 527.84 | 2374.2 | 575.13 | 2374.27 | 622.45 | 2374.3 |
| 648.61 | 2374.2 | 696.47 | 2373.25 | 711.82 | 2366.74 | 713.07 | 2366.51 | 714.43 | 2366.36 |
| 726.64 | 2372.9 | 756.85 | 2374.25 | 761.64 | 2374.41 | 789.31 | 2374.78 | 806.87 | 2374.67 |
| 815.75 | 2374.77 | 833.65 | 2374.7 | 854.68 | 2374.71 | 863.34 | 2374.87 | 878.28 | 2375.07 |
| 901.13 | 2375.01 | 910.97 | 2375 | 958.07 | 2375.14 | 994.52 | 2375.25 | 1036.32 | 2375.37 |
| 1041.24 | 2375.38 | 1088.42 | 2375.4 | 1136.26 | 2375.78 | 1183.62 | 2375.97 | 1233.53 | 2376.2 |
| 1283.96 | 2376.67 | 1331 | 2377 | 1377.05 | 2377.34 | 1423.97 | 2377.59 | 1472.43 | 2377.87 |
| 1518.88 | 2378.11 | 1565.69 | 2378.3 | 1612.16 | 2378.5 | 1726.47 | 2380 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -435.46 | .03 | 696.47 | .035 | 726.64 | .04 |

| Bank Sta: Left | Right | Coeff Contr. | Expan. |
|---|---|---|---|
| 696.47 | 726.64 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -435.46 | 607 | 2385 | F |
| 816 | 1726.47 | 2385 | F |

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

```
Number of Culverts =  1

Culvert Name      Shape      Rise    Span
culv@14          Circular     3.2
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  2    40.5     .011     .011        0                  .5                 1
Upstream   Elevation =  2367.4
           Centerline Station =  705.8
Downstream Elevation =  2366.8
           Centerline Station =  713.7

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@14

  Q Culv Group (cfs)          72.22    Culv Full Len (ft)          40.50
  # Barrels                       1    Culv Vel US (ft/s)           8.98
  Q Barrel (cfs)              72.22    Culv Vel DS (ft/s)           8.98
  E.G. US. (ft)            2373.95    Culv Inv El Up (ft)       2367.40
  W.S. US. (ft)            2374.04    Culv Inv El Dn (ft)       2366.80
  E.G. DS (ft)             2371.85    Culv Frctn Ls (ft)           0.24
  W.S. DS (ft)             2371.83    Culv Exit Loss (ft)          1.24
  Delta EG (ft)               2.10    Culv Entr Loss (ft)          0.63
  Delta WS (ft)               2.21    Q Weir (cfs)
  E.G. IC (ft)             2372.14    Weir Sta Lft (ft)
  E.G. OC (ft)             2373.95    Weir Sta Rgt (ft)
  Culvert Control           Outlet    Weir Submerg
  Culv WS Inlet (ft)       2370.60    Weir Max Depth (ft)
  Culv WS Outlet (ft)      2370.00    Weir Avg Depth (ft)
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)
  Culv Crt Depth (ft)         2.70    Min El Weir Flow (ft)    2376.38


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 13.98

INPUT
Description: -435.46 = point # 892 on section 15
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -435.46 2380.04       7 2373.3   51.99 2373.33   99.51 2373.38  146.18 2373.48
  195.77 2373.55  241.46 2373.6  290.59  2373.7  337.27 2373.77  385.75 2373.83
  432.79 2373.94  480.19    2374  527.84  2374.2  575.13 2374.27  622.45  2374.3
  648.61  2374.2  696.47 2373.25  711.82 2366.74  713.07 2366.51  714.43 2366.36
  726.64  2372.9  756.85 2374.25  761.64 2374.41  789.31 2374.78  806.87 2374.67
  815.75 2374.77  833.65  2374.7  854.68 2374.71  863.34 2374.87  878.28 2375.07
  901.13 2375.01  910.97    2375  958.07 2375.14  994.52 2375.25 1036.32 2375.37
 1041.24 2375.38 1088.42  2375.4 1136.26 2375.78 1183.62 2375.97 1233.53  2376.2
 1283.96 2376.67    1331    2377 1377.05 2377.34 1423.97 2377.59 1472.43 2377.87
 1518.88 2378.11 1565.69  2378.3 1612.16  2378.5 1726.47    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -435.46     .03  696.47    .035  726.64     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         696.47  726.64            91.58      80   73.15             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -435.46     607    2385       F
     816 1726.47    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2371.85    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.02    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2371.83    Reach Len. (ft)             91.58     80.00     73.15
  Crit W.S. (ft)                      Flow Area (sq ft)                     72.39
  E.G. Slope (ft/ft)      0.000150    Area (sq ft)                          72.39
  Q Total (cfs)              72.22    Flow (cfs)                            72.22
  Top Width (ft)             24.84    Top Width (ft)                        24.84
  Vel Total (ft/s)            1.00    Avg. Vel. (ft/s)                       1.00
  Max Chl Dpth (ft)           5.47    Hydr. Depth (ft)                       2.91
  Conv. Total (cfs)         5891.8    Conv. (cfs)                          5891.8
  Length Wtd. (ft)           80.00    Wetted Per. (ft)                      27.27
  Min Ch El (ft)           2366.36    Shear (lb/sq ft)                       0.02
  Alpha                       1.00    Stream Power (lb/ft s)                 0.02
  Frctn Loss (ft)             0.01    Cum Volume (acre-ft)        2.12       0.73      0.04
  C & E Loss (ft)                     Cum SA (acres)              0.58       0.23      0.03


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 13.9

INPUT
Description: Survey 14.3
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -489.62 2386.13 -175.09    2380       0  2374.5   27.65 2375.82   39.43 2374.49
   59.56 2367.32   63.82 2366.93   66.64    2367   74.66 2370.43   78.26 2370.63
    92.6 2373.98  131.29 2375.49  155.75    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -489.62     .04   39.43    .035    92.6    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          39.43   92.6             35.2    45.1    51.9             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -489.62       2    2385       F
     130  155.75    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2371.84    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2371.83    Reach Len. (ft)             35.20     45.10     51.90
  Crit W.S. (ft)                      Flow Area (sq ft)                     95.06
  E.G. Slope (ft/ft)      0.000095    Area (sq ft)                          95.06
```

| | | | | | | |
|---|---|---|---|---|---|---|
| Q Total (cfs) | 72.22 | Flow (cfs) | | 72.22 | | |
| Top Width (ft) | 36.50 | Top Width (ft) | | 36.50 | | |
| Vel Total (ft/s) | 0.76 | Avg. Vel. (ft/s) | | 0.76 | | |
| Max Chl Dpth (ft) | 4.90 | Hydr. Depth (ft) | | 2.60 | | |
| Conv. Total (cfs) | 7418.7 | Conv. (cfs) | | 7418.7 | | |
| Length Wtd. (ft) | 45.03 | Wetted Per. (ft) | | 38.14 | | |
| Min Ch El (ft) | 2366.93 | Shear (lb/sq ft) | | 0.01 | | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.12 | 0.58 | 0.04 | |
| C & E Loss (ft) | | Cum SA (acres) | 0.58 | 0.18 | 0.03 | |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 13.25

INPUT
Description: Survey 13.1
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 32.92 | 2389.25 | 324.35 | 2380 | 541.99 | 2373.5 | 569.03 | 2374.12 | 589.95 | 2370.64 |
| 602.58 | 2367.39 | 606.53 | 2366.71 | 608.7 | 2367 | 617.89 | 2372.08 | 669.28 | 2375.78 |
| 722.24 | 2380 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 32.92 | .04 | 589.95 | .035 | 617.89 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 589.95 | 617.89 | 45.81 | 48.1 | 46.76 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 32.92 | 562 | 2385 | F |
| 644 | 722.24 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.83 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | 0.040 | 0.035 | |
| W.S. Elev (ft) | 2371.82 | Reach Len. (ft) | 45.81 | 48.10 | 46.76 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 4.21 | 86.17 | |
| E.G. Slope (ft/ft) | 0.000090 | Area (sq ft) | 4.21 | 86.17 | |
| Q Total (cfs) | 72.22 | Flow (cfs) | 1.03 | 71.19 | |
| Top Width (ft) | 34.59 | Top Width (ft) | 7.12 | 27.48 | |
| Vel Total (ft/s) | 0.80 | Avg. Vel. (ft/s) | 0.25 | 0.83 | |
| Max Chl Dpth (ft) | 5.11 | Hydr. Depth (ft) | 0.59 | 3.14 | |
| Conv. Total (cfs) | 7633.9 | Conv. (cfs) | 109.4 | 7524.5 | |
| Length Wtd. (ft) | 48.08 | Wetted Per. (ft) | 7.22 | 29.21 | |
| Min Ch El (ft) | 2366.71 | Shear (lb/sq ft) | 0.00 | 0.02 | |
| Alpha | 1.05 | Stream Power (lb/ft s) | 0.00 | 0.01 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.12 | 0.49 | 0.04 |
| C & E Loss (ft) | | Cum SA (acres) | 0.58 | 0.14 | 0.03 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 13.2

INPUT
Description: Survey 13.2
Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.55 | 2386.04 | 283.21 | 2380 | 526.11 | 2373.7 | 586.88 | 2374.56 | 603.27 | 2366 |
| 605.2 | 2365.6 | 607.08 | 2366 | 620.73 | 2375 | 658.9 | 2376.32 | 702.61 | 2380 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.55 | .035 | 586.88 | .035 | 620.73 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 586.88 | 620.73 | 136.18 | 136 | 136.18 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 8.55 | 586.88 | 2385 | F |
| 620.73 | 702.61 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.83 | Element | | | |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2371.82 | Reach Len. (ft) | 136.18 | 136.00 | 136.18 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 85.32 | |
| E.G. Slope (ft/ft) | 0.000092 | Area (sq ft) | | 85.32 | |
| Q Total (cfs) | 72.22 | Flow (cfs) | | 72.22 | |
| Top Width (ft) | 25.25 | Top Width (ft) | | 25.25 | |
| Vel Total (ft/s) | 0.85 | Avg. Vel. (ft/s) | | 0.85 | |
| Max Chl Dpth (ft) | 6.22 | Hydr. Depth (ft) | | 3.38 | |
| Conv. Total (cfs) | 7548.7 | Conv. (cfs) | | 7548.7 | |
| Length Wtd. (ft) | 136.00 | Wetted Per. (ft) | | 28.36 | |
| Min Ch El (ft) | 2365.60 | Shear (lb/sq ft) | | 0.02 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 2.12 | 0.39 | 0.04 |
| C & E Loss (ft) | | Cum SA (acres) | 0.57 | 0.11 | 0.03 |

CULVERT

RIVER: Minnie Cr
REACH: Upper RS: 13.01

INPUT
Description:
Distance from Upstream XS = .2
Deck/Roadway Width = 134.2
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 25

| Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord | Sta | Hi Cord | Lo Cord |
|---|---|---|---|---|---|---|---|---|
| 8.12 | 2384.66 | | 48.84 | 2384.46 | | 98.68 | 2384 | |
| 146.46 | 2383.67 | | 196.58 | 2383.2 | | 244.93 | 2382.78 | |
| 293.89 | 2382.31 | | 344.44 | 2381.7 | | 393.51 | 2381.16 | |
| 444.16 | 2380.8 | | 493.71 | 2380.57 | | 543.54 | 2380.38 | |
| 591.6 | 2380.19 | | 624.5 | 2380.24 | | 668.9 | 2380.5 | |

```
  717.31 2380.75          746.6 2380.94          795.8 2381.05
  845.73  2381.1          894.9 2381.08         939.79 2380.87
  988.28  2380.7        1037.77  2380.7        1087.36 2380.53
  1136.9 2380.13

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.55 2386.04  283.21    2380  526.11  2373.7  586.88 2373.56  603.27    2366
   605.2  2365.6  607.08    2366  620.73    2375   658.9 2376.32  702.61    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8.55    .035  586.88    .035  620.73     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        586.88  620.73            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.55  586.88    2385       F
  620.73  702.61    2385       F

Downstream  Deck/Roadway Coordinates
    num=      25
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8.12 2384.66          48.84 2384.46          98.68    2384
  146.46 2383.67         196.58  2383.2         244.93 2382.78
  293.89 2382.31         344.44  2381.7         393.51 2381.16
  444.16  2380.8         493.71 2380.57         543.54 2380.38
   591.6 2380.19          624.5 2380.24          668.9  2380.5
  717.31 2380.75          746.6 2380.94          795.8 2381.05
  845.73  2381.1          894.9 2381.08         939.79 2380.87
  988.28  2380.7        1037.77  2380.7        1087.36 2380.53
  1136.9 2380.13

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        568.48  602.33            .1       .3

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@13         Circular     4.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              .2   134.2     .011     .011        0                  .5                  1
Upstream   Elevation =  2365.7
           Centerline Station =  605.2
Downstream Elevation =  2364.9
           Centerline Station =  586.8

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@13

  Q Culv Group (cfs)         72.22    Culv Full Len (ft)        134.20
  # Barrels                      1    Culv Vel US (ft/s)          4.54
  Q Barrel (cfs)             72.22    Culv Vel DS (ft/s)          4.54
  E.G. US. (ft)            2371.81    Culv Inv El Up (ft)      2365.70
  W.S. US. (ft)            2371.82    Culv Inv El Dn (ft)      2364.90
  E.G. DS (ft)             2371.21    Culv Frctn Ls (ft)          0.13
  W.S. DS (ft)             2371.20    Culv Exit Loss (ft)         0.31
  Delta EG (ft)               0.60    Culv Entr Loss (ft)         0.16
  Delta WS (ft)               0.62    Q Weir (cfs)
  E.G. IC (ft)             2369.26    Weir Sta Lft (ft)
  E.G. OC (ft)             2371.81    Weir Sta Rgt (ft)
  Culvert Control           Outlet    Weir Submerg
  Culv WS Inlet (ft)       2370.20    Weir Max Depth (ft)
  Culv WS Outlet (ft)      2369.40    Weir Avg Depth (ft)
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)
  Culv Crt Depth (ft)         2.48    Min El Weir Flow (ft)    2380.20


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 12.98

INPUT
Description: Copy of Section 13.2
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        568.48  602.33             62.62    61.2   58.67             .1       .3

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2371.21    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2371.20    Reach Len. (ft)             62.62     61.20     58.67
  Crit W.S. (ft)                      Flow Area (sq ft)                     86.16
  E.G. Slope (ft/ft)      0.000082    Area (sq ft)                          86.16
  Q Total (cfs)              70.79    Flow (cfs)                            70.79
```

| | | | | | | |
|---|---|---|---|---|---|---|
| Top Width (ft) | 24.16 | Top Width (ft) | | 24.16 | | |
| Vel Total (ft/s) | 0.82 | Avg. Vel. (ft/s) | | 0.82 | | |
| Max Chl Dpth (ft) | 6.40 | Hydr. Depth (ft) | | 3.57 | | |
| Conv. Total (cfs) | 7814.5 | Conv. (cfs) | | 7814.5 | | |
| Length Wtd. (ft) | 61.20 | Wetted Per. (ft) | | 27.59 | | |
| Min Ch El (ft) | 2364.80 | Shear (lb/sq ft) | | 0.02 | | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.12 | 0.12 | 0.04 | |
| C & E Loss (ft) | | Cum SA (acres) | 0.57 | 0.04 | 0.03 | |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 12.9

INPUT
Description: Survey 13.3
Station Elevation Data num= 14

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -468.15 | 2380 | -80.78 | 2366.23 | 532.9 | 2368 | 552.85 | 2368.71 | 576.34 | 2370.05 |
| 587.39 | 2366.87 | 592.08 | 2366.51 | 596.24 | 2367 | 603.6 | 2370.22 | 617.72 | 2372.01 |
| 630.09 | 2368.24 | 635.91 | 2369.38 | 646.49 | 2369.3 | 665.33 | 2372.79 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -468.15 | .04 | 576.34 | .04 | 603.6 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 576.34 | 603.6 | 0 | 0 | 0 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -468.15 | 576.34 | 2378 | F |
| 603.6 | 665.33 | 2378 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2371.19 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2371.19 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 2367.25 | Flow Area (sq ft) | | 88.71 | |
| E.G. Slope (ft/ft) | 0.000008 | Area (sq ft) | 2945.82 | 88.71 | 61.05 |
| Q Total (cfs) | 19.47 | Flow (cfs) | | 19.47 | |
| Top Width (ft) | 867.84 | Top Width (ft) | 796.65 | 27.26 | 43.93 |
| Vel Total (ft/s) | 0.22 | Avg. Vel. (ft/s) | | 0.22 | |
| Max Chl Dpth (ft) | 4.96 | Hydr. Depth (ft) | | 3.25 | |
| Conv. Total (cfs) | 7037.3 | Conv. (cfs) | | 7037.3 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 28.42 | |
| Min Ch El (ft) | 2366.51 | Shear (lb/sq ft) | | 0.00 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.00 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Minnie Cr

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 | n6 | n7 | n8 |
|---|---|---|---|---|---|---|---|---|---|
| Upper | 23 | .03 | .035 | .03 | | | | | |
| Upper | 22.75* | .03 | .038 | .03 | | | | | |
| Upper | 22.5* | .03 | .04 | .03 | | | | | |
| Upper | 22.25* | .03 | .043 | .03 | | | | | |
| Upper | 22 | .03 | .045 | .03 | | | | | |
| Upper | 21 | .035 | .045 | .05 | | | | | |
| Upper | 20.75* | .034 | .031 | .034 | .045 | .032 | .05 | .05 | .05 |
| Upper | 20.5* | .032 | .032 | .032 | .045 | .035 | .05 | .05 | .05 |
| Upper | 20.25* | .031 | .045 | .03 | .037 | .05 | .05 | .05 | |
| Upper | 20 | .03 | .045 | .035 | .03 | .04 | .05 | | |
| Upper | 19 | .03 | .035 | .03 | | | | | |
| Upper | 18.25 | .03 | .035 | .03 | | | | | |
| Upper | 18.2 | .03 | .035 | .03 | | | | | |
| Upper | 18.01 | Culvert | | | | | | | |
| Upper | 17.98 | .03 | .035 | .03 | | | | | |
| Upper | 17.97 | Lat Struct | | | | | | | |
| Upper | 17.9 | .03 | .035 | .03 | | | | | |
| Upper | 17.6* | .03 | .035 | .03 | | | | | |
| Upper | 17.3* | .03 | .035 | .03 | | | | | |
| Upper | 17 | .03 | .035 | .03 | | | | | |
| Upper | 16.5* | .03 | .035 | .03 | .04 | .04 | | | |
| Upper | 16 | .03 | .035 | .03 | .05 | | | | |
| Upper | 15.5* | .03 | .035 | .035 | | | | | |
| Upper | 15 | .04 | .035 | .03 | .035 | | | | |
| Upper | 14.75* | .03 | .035 | .037 | .037 | | | | |
| Upper | 14.5* | .03 | .035 | .038 | .038 | | | | |
| Upper | 14.25 | .03 | .035 | .04 | | | | | |
| Upper | 14.2 | .03 | .035 | .04 | | | | | |
| Upper | 14.01 | Culvert | | | | | | | |
| Upper | 13.98 | .03 | .035 | .04 | | | | | |
| Upper | 13.9 | .04 | .035 | .045 | | | | | |
| Upper | 13.25 | .04 | .035 | .04 | | | | | |
| Upper | 13.2 | .035 | .035 | .04 | | | | | |
| Upper | 13.01 | Culvert | | | | | | | |
| Upper | 12.98 | .04 | .035 | .04 | | | | | |
| Upper | 12.9 | .04 | .04 | .045 | | | | | |

SUMMARY OF REACH LENGTHS

River: Minnie Cr

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Upper | 23 | 333.75 | 243.9 | 279.24 |
| Upper | 22.75* | 333.75 | 243.9 | 279.24 |
| Upper | 22.5* | 333.75 | 243.9 | 279.24 |
| Upper | 22.25* | 333.75 | 243.9 | 279.24 |
| Upper | 22 | 2241 | 2146.6 | 2331 |

| | | | | | |
|---|---|---|---|---|---|
| Upper | 21 | | 473 | 459.55 | 487.5 |
| Upper | 20.75* | | 473 | 459.55 | 487.5 |
| Upper | 20.5* | | 473 | 459.55 | 487.5 |
| Upper | 20.25* | | 473 | 459.55 | 487.5 |
| Upper | 20 | | 891 | 901.5 | 1024 |
| Upper | 19 | | 828.4 | 847.3 | 759 |
| Upper | 18.25 | | 330 | 85.7 | 76.3 |
| Upper | 18.2 | | 44.3 | 52.9 | 53 |
| Upper | 18.01 | Culvert | | | |
| Upper | 17.98 | | 88.4 | 116.9 | 116.8 |
| Upper | 17.97 | Lat Struct | | | |
| Upper | 17.9 | | 332.83 | 397.43 | 395.67 |
| Upper | 17.6* | | 332.83 | 397.43 | 395.67 |
| Upper | 17.3* | | 332.83 | 397.43 | 395.67 |
| Upper | 17 | | 521.8 | 598.55 | 598 |
| Upper | 16.5* | | 521.8 | 598.55 | 598 |
| Upper | 16 | | 681.4 | 708.3 | 710.5 |
| Upper | 15.5* | | 681.4 | 708.3 | 710.5 |
| Upper | 15 | | 100 | 144.9 | 150.67 |
| Upper | 14.75* | | 120 | 144.9 | 150.67 |
| Upper | 14.5* | | 70 | 144.9 | 150.67 |
| Upper | 14.25 | | 49.82 | 50.9 | 50.52 |
| Upper | 14.2 | | 43 | 44 | 43.28 |
| Upper | 14.01 | Culvert | | | |
| Upper | 13.98 | | 91.58 | 80 | 73.15 |
| Upper | 13.9 | | 35.2 | 45.1 | 51.9 |
| Upper | 13.25 | | 45.81 | 48.1 | 46.76 |
| Upper | 13.2 | | 136.18 | 136 | 136.18 |
| Upper | 13.01 | Culvert | | | |
| Upper | 12.98 | | 62.62 | 61.2 | 58.67 |
| Upper | 12.9 | | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Minnie Cr

| Reach | River Sta. | | Contr. | Expan. |
|---|---|---|---|---|
| Upper | 23 | | .1 | .3 |
| Upper | 22.75* | | .1 | .3 |
| Upper | 22.5* | | .1 | .3 |
| Upper | 22.25* | | .1 | .3 |
| Upper | 22 | | .1 | .3 |
| Upper | 21 | | .1 | .3 |
| Upper | 20.75* | | .1 | .3 |
| Upper | 20.5* | | .1 | .3 |
| Upper | 20.25* | | .1 | .3 |
| Upper | 20 | | .1 | .3 |
| Upper | 19 | | .1 | .3 |
| Upper | 18.25 | | .1 | .3 |
| Upper | 18.2 | | .1 | .3 |
| Upper | 18.01 | Culvert | | |
| Upper | 17.98 | | .1 | .3 |
| Upper | 17.97 | Lat Struct | | |
| Upper | 17.9 | | .1 | .3 |
| Upper | 17.6* | | .1 | .3 |
| Upper | 17.3* | | .1 | .3 |
| Upper | 17 | | .1 | .3 |
| Upper | 16.5* | | .1 | .3 |
| Upper | 16 | | .1 | .3 |
| Upper | 15.5* | | .1 | .3 |
| Upper | 15 | | .1 | .3 |
| Upper | 14.75* | | .1 | .3 |
| Upper | 14.5* | | .1 | .3 |
| Upper | 14.25 | | .1 | .3 |
| Upper | 14.2 | | .1 | .3 |
| Upper | 14.01 | Culvert | | |
| Upper | 13.98 | | .1 | .3 |
| Upper | 13.9 | | .1 | .3 |
| Upper | 13.25 | | .1 | .3 |
| Upper | 13.2 | | .1 | .3 |
| Upper | 13.01 | Culvert | | |
| Upper | 12.98 | | .1 | .3 |
| Upper | 12.9 | | .1 | .3 |

Profile Output Table - Floodway Data

| Reach | River Sta | Profile | Cum Ch Len (ft) | Top Wdth Act (ft) | Area (sq ft) | Vel Chnl (ft/s) | W.S. Elev (ft) | W.S. Elev (ft) | W.S. Elev (ft) | Length Chnl (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Upper | 12.9 | Max WS | | 27.26 | 3095.58 | 0.22 | 2371.19 | 2371.19 | 2371.19 | |
| Upper | 12.98 | Max WS | 61.20 | 24.16 | 86.16 | 0.82 | 2371.20 | 2371.20 | 2371.20 | 61.20 |
| Upper | 13.01 | | Culvert | | | | | | | |
| Upper | 13.2 | Max WS | 197.20 | 25.25 | 85.32 | 0.85 | 2371.82 | 2371.82 | 2371.82 | 136.00 |
| Upper | 13.25 | Max WS | 245.30 | 34.59 | 90.38 | 0.83 | 2371.82 | 2371.82 | 2371.82 | 48.10 |
| Upper | 13.9 | Max WS | 290.40 | 36.50 | 95.06 | 0.76 | 2371.83 | 2371.83 | 2371.83 | 45.10 |
| Upper | 13.98 | Max WS | 370.40 | 24.84 | 72.39 | 1.00 | 2371.83 | 2371.83 | 2371.83 | 80.00 |
| Upper | 14.01 | | Culvert | | | | | | | |
| Upper | 14.2 | Max WS | 414.40 | 34.00 | 165.54 | 0.53 | 2374.04 | 2374.04 | 2374.04 | 44.00 |
| Upper | 14.25 | Max WS | 465.30 | 72.17 | 711.93 | 0.28 | 2374.04 | 2374.04 | 2374.04 | 50.90 |
| Upper | 14.5* | Max WS | 610.20 | 233.00 | 1222.48 | 0.11 | 2374.05 | 2374.05 | 2374.05 | 144.90 |
| Upper | 14.75* | Max WS | 755.10 | 375.96 | 1916.80 | 0.05 | 2374.05 | 2374.05 | 2374.05 | 144.90 |
| Upper | 15 | Max WS | 900.00 | 489.74 | 3009.06 | 0.03 | 2374.05 | 2374.05 | 2374.05 | 144.90 |
| Upper | 15.5* | Max WS | 1608.30 | 975.88 | 4219.48 | 0.02 | 2374.05 | 2374.05 | 2374.05 | 708.30 |
| Upper | 16 | Max WS | 2316.60 | 1420.70 | 4596.18 | 0.02 | 2374.05 | 2374.05 | 2374.05 | 708.30 |
| Upper | 16.5* | Max WS | 2915.15 | 1614.97 | 5724.24 | 0.01 | 2374.05 | 2374.05 | 2374.05 | 598.55 |
| Upper | 17 | Max WS | 3513.70 | 1837.80 | 7657.50 | 0.01 | 2374.05 | 2374.05 | 2374.05 | 598.55 |
| Upper | 17.3* | Max WS | 3911.13 | 1783.13 | 5792.40 | 0.01 | 2374.05 | 2374.05 | 2374.05 | 397.43 |
| Upper | 17.6* | Max WS | 4308.56 | 1508.21 | 3940.39 | 0.02 | 2374.05 | 2374.05 | 2374.05 | 397.43 |
| Upper | 17.9 | Max WS | 4705.99 | 786.04 | 2563.82 | 0.03 | 2374.05 | 2374.05 | 2374.05 | 397.43 |
| Upper | 17.97 | | Lat Struct | | | | | | | |
| Upper | 17.98 | Max WS | 4822.89 | 698.99 | 2340.20 | 0.05 | 2374.05 | 2374.05 | 2374.05 | 116.90 |
| Upper | 18.01 | | Culvert | | | | | | | |
| Upper | 18.2 | Max WS | 4875.79 | 713.91 | 2746.00 | 0.04 | 2374.05 | 2374.05 | 2374.05 | 52.90 |
| Upper | 18.25 | Max WS | 4961.49 | 769.52 | 1709.79 | 0.06 | 2374.05 | 2374.05 | 2374.05 | 85.70 |
| Upper | 19 | Max WS | 5808.79 | 965.33 | 1415.35 | 0.06 | 2374.05 | 2374.05 | 2374.05 | 847.30 |
| Upper | 20 | Max WS | 6710.29 | 658.49 | 1470.45 | 0.10 | 2374.05 | 2374.05 | 2374.05 | 901.50 |
| Upper | 20.25* | Max WS | 7169.84 | 732.90 | 1857.23 | 0.05 | 2374.05 | 2374.05 | 2374.05 | 459.55 |
| Upper | 20.5* | Max WS | 7629.39 | 634.86 | 1775.27 | 0.06 | 2374.05 | 2374.05 | 2374.05 | 459.55 |
| Upper | 20.75* | Max WS | 8088.94 | 818.66 | 2723.17 | 0.05 | 2374.05 | 2374.05 | 2374.05 | 459.55 |
| Upper | 21 | Max WS | 8548.49 | 1015.09 | 3988.78 | 0.04 | 2374.05 | 2374.05 | 2374.05 | 459.55 |
| Upper | 22 | Max WS | 10695.09 | 883.68 | 3855.39 | 0.04 | 2374.05 | 2374.05 | 2374.05 | 2146.60 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Upper | 22.25* | Max WS | 10938.99 | 893.15 | 2712.72 | 0.04 | 2374.05 | 2374.05 | 2374.05 | 243.90 |
| Upper | 22.5* | Max WS | 11182.89 | 489.85 | 1566.70 | 0.08 | 2374.05 | 2374.05 | 2374.05 | 243.90 |
| Upper | 22.75* | Max WS | 11426.79 | 412.35 | 794.74 | 0.10 | 2374.05 | 2374.05 | 2374.05 | 243.90 |
| Upper | 23 | Max WS | 11670.69 | 626.92 | 482.16 | 0.11 | 2374.05 | 2374.05 | 2374.05 | 243.90 |

```
                    HEC-RAS Version 3.1.3 May 2005
                     U.S. Army Corp of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California


          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X       X    X       X   X     X  X    X
          X     X  X       X            X   X    X    X   X
          XXXXXXX  XXXX    X       XXX  XXXX     XXXXXX    XXXX
          X     X  X       X            X  X     X    X        X
          X     X  X       X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX       X    X   X    X   XXXXX


PROJECT DATA
Project Title: Minnie Creek Special Study
Project File : Minnie.prj
Run Date and Time: 2/1/2007 1:07:02 PM

Project in English units

Project Description:
MINNIE CREEK 2006
THIS FILE CREATED AUGUST 2006
SECTIONS SURVEYED BY ROGERS
SURVEYING AUGUST 2006
DATUM NAD27, NGVD29
REDUCTION INCLUDED REDUCTION OF GR
CARDS.
SECTION 0.90 IS DOWNSTREAM THE RAILROAD CROSSING SOUTHEAST OF
CHENEY
DATA REDUCTION/UNSTEADY FLOW MODELING - T. SCHWARZ
STEADY FLOW
MODELING - G. SLACK


PLAN DATA

Plan Title: Unstready Flow Floodway
Plan File : C:\Minnie Creek\Combined model 1-12-07\Minnie.p09

           Geometry Title: Minnie Unsteady test2
           Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g11

           Flow Title    : Flow Data
           Flow File     : C:\Minnie Creek\Combined model 1-12-07\Minnie.f01

Plan Summary Information:
Number of:  Cross Sections =   32    Multiple Openings  =    0
            Culverts       =    3    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    1

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow


GEOMETRY DATA

Geometry Title: Minnie Unsteady test2
Geometry File : C:\Minnie Creek\Combined model 1-12-07\Minnie.g11

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 23

INPUT
Description: Survey 23
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2386.4   38.06 2382.53   48.04 2379.52   57.57 2376.49    61.8 2376.95
   87.43  2377.4   93.51 2378.77   95.79 2379.38  100.76 2379.35  102.74 2378.68
  110.04  2376.5  146.41 2376.11  179.49 2375.73  230.11 2375.22  282.64 2374.72
  334.12  2374.4  385.98 2374.22  437.02 2373.91  489.22 2373.61  540.21 2373.91
  593.07  2373.9  644.66 2374.11  694.89 2373.68     745 2373.09  768.63 2371.99
  816.34  2371.9  866.85 2372.02  911.51 2375.38  945.72  2376.9  983.82 2379.74
 1033.94  2380.7 1061.88 2377.85 1108.57 2375.91 1113.79 2373.87 1125.34 2373.77
 1135.24  2373.6 1157.32 2373.19 1184.75  2372.9 1238.23 2373.44 1288.89 2373.61
 1342.03  2374.6 1392.95 2375.95 1420.85 2376.81 1446.53 2378.46 1457.18 2379.49
 1504.64  2382.8 1554.63 2386.58 1604.25  2390.6 1633.99 2393.64 1682.81 2400.66
 1713.32  2404.3 1730.63  2407.8 1744.08 2415.76 1773.78 2417.23 1782.39 2417.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03 1108.57    .035 1288.89     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1108.57 1288.89           333.75   243.9  279.24              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1280 1782.39    2380       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035
```

| | | | | | |
|---|---|---|---|---|---|
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 333.75 | 243.90 | 279.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 551.55 | 286.58 | |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 551.55 | 299.55 | 28.44 |
| Q Total (cfs) | 73.80 | Flow (cfs) | 53.81 | 19.99 | |
| Top Width (ft) | 448.47 | Top Width (ft) | 247.18 | 178.13 | 23.16 |
| Vel Total (ft/s) | 0.09 | Avg. Vel. (ft/s) | 0.10 | 0.07 | |
| Max Chl Dpth (ft) | 3.15 | Hydr. Depth (ft) | 2.23 | 1.69 | |
| Conv. Total (cfs) | 63764.4 | Conv. (cfs) | 46495.6 | 17268.9 | |
| Length Wtd. (ft) | 307.32 | Wetted Per. (ft) | 248.40 | 169.47 | |
| Min Ch El (ft) | 2372.90 | Shear (lb/sq ft) | 0.00 | 0.00 | |
| Alpha | 1.07 | Stream Power (lb/ft s) | 0.00 | 0.00 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 230.86 | 444.32 | 220.23 |
| C & E Loss (ft) | | Cum SA (acres) | 47.69 | 97.28 | 47.98 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 22.75*

INPUT
Description:
Station Elevation Data num= 106

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2386.88 | 31.67 | 2383.76 | 39.98 | 2381.45 | 47.91 | 2379.12 | 51.43 | 2379.45 |
| 72.76 | 2379.64 | 77.82 | 2380.63 | 79.72 | 2381.08 | 83.85 | 2381.03 | 85.5 | 2380.52 |
| 91.58 | 2378.84 | 118.68 | 2378.4 | 121.84 | 2378.35 | 149.37 | 2377.92 | 191.5 | 2377.32 |
| 235.21 | 2376.72 | 240.06 | 2376.67 | 278.06 | 2376.26 | 321.21 | 2375.89 | 351.73 | 2375.57 |
| 363.69 | 2375.16 | 366.08 | 2375.08 | 396.3 | 2375.01 | 407.13 | 2374.84 | 434.19 | 2374.7 |
| 445.68 | 2374.37 | 449.56 | 2374.39 | 455.4 | 2374.38 | 470.89 | 2374.76 | 475.74 | 2374.95 |
| 488.27 | 2374.96 | 492.42 | 2374.85 | 493.55 | 2374.81 | 506.9 | 2374.38 | 536.49 | 2374.86 |
| 560.29 | 2373.15 | 583.81 | 2373.01 | 592.94 | 2372.87 | 615.27 | 2372.67 | 635.55 | 2372.5 |
| 649.26 | 2372.23 | 663.46 | 2371.73 | 675.82 | 2371.42 | 696.23 | 2371.19 | 713.61 | 2371.05 |
| 729.45 | 2370.91 | 771.67 | 2371.08 | 783.58 | 2371.9 | 809 | 2373.63 | 822.54 | 2374.17 |
| 837.59 | 2374.73 | 858.78 | 2376.09 | 869.44 | 2376.87 | 911.33 | 2377.84 | 934.68 | 2375.85 |
| 973.71 | 2374.63 | 978.52 | 2372.98 | 989.15 | 2372.65 | 998.27 | 2372.27 | 1018.61 | 2372.16 |
| 1020.26 | 2371.64 | 1043.87 | 2371.62 | 1063.47 | 2371.98 | 1073.18 | 2371.95 | 1085.46 | 2372.03 |
| 1101.26 | 2372.14 | 1104.63 | 2372.3 | 1119.81 | 2374.66 | 1125.62 | 2374.6 | 1134.69 | 2374.47 |
| 1154.43 | 2374.44 | 1165.25 | 2374.42 | 1196.14 | 2374.56 | 1203.05 | 2374.87 | 1209.41 | 2374.42 |
| 1228.08 | 2374.1 | 1246.49 | 2374.41 | 1255.96 | 2374.53 | 1268.04 | 2374.57 | 1284.28 | 2374.58 |
| 1331.03 | 2374.92 | 1337.2 | 2375.05 | 1366.2 | 2375.73 | 1372.58 | 2376.04 | 1392.89 | 2377.1 |
| 1402.31 | 2377.82 | 1403.96 | 2377.94 | 1447.52 | 2380.28 | 1453.28 | 2380.58 | 1491.63 | 2382.79 |
| 1505.24 | 2383.59 | 1539.03 | 2385.71 | 1556.81 | 2386.92 | 1586.99 | 2389.44 | 1587.71 | 2389.52 |
| 1617.53 | 2393.38 | 1638.45 | 2396.32 | 1658.95 | 2398.84 | 1670.16 | 2400.2 | 1683.24 | 2402.58 |
| 1684.39 | 2404.05 | 1688.15 | 2404.66 | 1702.13 | 2410.87 | 1713.52 | 2411.47 | 1733 | 2412.6 |
| 1741.95 | 2413.1 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 973.71 | .038 | 1119.81 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 973.71 | 1119.81 | 333.75 | 243.9 | 279.24 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 1119.8 | 2371.91 | T |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.038 | |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 333.75 | 243.90 | 279.24 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 728.15 | 399.33 | |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 818.13 | 409.00 | |
| Q Total (cfs) | 73.78 | Flow (cfs) | 50.36 | 23.42 | |
| Top Width (ft) | 454.30 | Top Width (ft) | 308.20 | 146.10 | |
| Vel Total (ft/s) | 0.07 | Avg. Vel. (ft/s) | 0.07 | 0.06 | |
| Max Chl Dpth (ft) | 4.14 | Hydr. Depth (ft) | 2.36 | 2.73 | |
| Conv. Total (cfs) | 95759.4 | Conv. (cfs) | 65365.5 | 30393.9 | |
| Length Wtd. (ft) | 274.57 | Wetted Per. (ft) | 309.40 | 147.05 | |
| Min Ch El (ft) | 2371.62 | Shear (lb/sq ft) | 0.00 | 0.00 | |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 225.61 | 442.34 | 220.14 |
| C & E Loss (ft) | | Cum SA (acres) | 45.57 | 96.38 | 47.91 |

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 22.5*

INPUT
Description:
Station Elevation Data num= 106

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2387.35 | 25.29 | 2384.99 | 31.92 | 2383.38 | 38.25 | 2381.76 | 41.06 | 2381.94 |
| 58.09 | 2381.88 | 62.13 | 2382.5 | 63.64 | 2382.78 | 66.95 | 2382.71 | 68.26 | 2382.35 |
| 73.11 | 2381.18 | 94.75 | 2380.65 | 97.28 | 2380.59 | 119.25 | 2380.12 | 152.89 | 2379.42 |
| 187.79 | 2378.72 | 191.66 | 2378.65 | 221.99 | 2374.11 | 256.45 | 2373.57 | 280.81 | 2373.14 |
| 290.36 | 2373.42 | 292.27 | 2373.28 | 316.39 | 2373.04 | 325.04 | 2372.87 | 346.64 | 2373.09 |
| 355.81 | 2372.66 | 358.92 | 2372.86 | 363.57 | 2373.04 | 375.94 | 2372.61 | 379.82 | 2372.8 |
| 389.82 | 2373.02 | 393.14 | 2372.8 | 394.04 | 2372.72 | 404.69 | 2372.79 | 428.32 | 2372.62 |
| 454.74 | 2372.36 | 480.86 | 2372.38 | 491 | 2372.46 | 515.79 | 2372.3 | 538.3 | 2371.96 |
| 553.53 | 2371.77 | 569.29 | 2371.35 | 583.02 | 2370.85 | 605.67 | 2370.43 | 624.97 | 2370.17 |
| 642.55 | 2369.92 | 676.48 | 2370.13 | 686.05 | 2370.71 | 706.48 | 2371.87 | 717.37 | 2372.24 |
| 729.46 | 2372.56 | 746.49 | 2372.4 | 755.05 | 2372 | 788.72 | 2371.99 | 807.49 | 2371.85 |
| 838.85 | 2372.35 | 843.24 | 2372.28 | 852.97 | 2372.12 | 861.3 | 2371.95 | 879.89 | 2371.54 |
| 881.4 | 2371.51 | 902.98 | 2370.33 | 929.37 | 2370.93 | 942.43 | 2370.8 | 958.97 | 2370.89 |
| 980.23 | 2374.11 | 984.75 | 2374.31 | 1005.19 | 2374.93 | 1013 | 2374.76 | 1025.21 | 2374.48 |
| 1051.77 | 2374.38 | 1066.35 | 2374.21 | 1107.91 | 2374.23 | 1117.22 | 2374.23 | 1125.77 | 2374.15 |
| 1150.9 | 2374.21 | 1175.67 | 2374.68 | 1188.41 | 2374.8 | 1204.68 | 2374.74 | 1226.54 | 2374.56 |
| 1275.05 | 2374.21 | 1281.46 | 2374.24 | 1311.55 | 2374.65 | 1318.17 | 2374.87 | 1339.25 | 2375.74 |
| 1349.02 | 2376.3 | 1350.73 | 2376.39 | 1395.94 | 2378.14 | 1401.92 | 2378.37 | 1441.73 | 2380 |
| 1455.84 | 2380.6 | 1490.91 | 2382.21 | 1509.36 | 2383.25 | 1540.69 | 2385.32 | 1541.44 | 2385.39 |
| 1572.38 | 2389 | 1594.09 | 2391.98 | 1615.37 | 2394.66 | 1627 | 2396.11 | 1640.58 | 2398.31 |
| 1641.77 | 2401.03 | 1645.67 | 2401.53 | 1660.18 | 2405.98 | 1672 | 2406.63 | 1692.21 | 2407.97 |
| 1701.5 | 2408.57 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

```
       0     .03  221.99     .04  980.23     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        221.99  980.23           333.75   243.9  279.24             .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
     500    1066 2371.91        T
     200     490    2378        F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                            0.040
  W.S. Elev (ft)           2375.05    Reach Len. (ft)            333.75    243.90     279.24
  Crit W.S. (ft)                      Flow Area (sq ft)                   1463.93
  E.G. Slope (ft/ft)       0.000000   Area (sq ft)                        2326.30
  Q Total (cfs)              73.77    Flow (cfs)                            73.77
  Top Width (ft)            758.24    Top Width (ft)                       758.24
  Vel Total (ft/s)            0.05    Avg. Vel. (ft/s)                      0.05
  Max Chl Dpth (ft)           5.13    Hydr. Depth (ft)                      2.99
  Conv. Total (cfs)        112568.1   Conv. (cfs)                        112568.1
  Length Wtd. (ft)          243.90    Wetted Per. (ft)                     491.57
  Min Ch El (ft)           2369.92    Shear (lb/sq ft)                      0.00
  Alpha                       1.00    Stream Power (lb/ft s)                0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       222.47    434.68     220.14
  C & E Loss (ft)                     Cum SA (acres)              44.39     93.84      47.91

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 22.25*

INPUT
Description:
Station Elevation Data    num=      100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2387.82    18.9 2386.22   23.86 2385.31   28.59 2384.39   30.69 2384.44
   43.42 2384.12   46.44 2384.36   47.57 2384.48   50.04 2384.39   51.02 2384.19
   54.65 2383.52   70.82 2382.89   72.71 2382.83   89.14 2382.31  114.27 2381.53
  140.36 2380.72  143.25 2380.64  165.93 2379.97  191.68 2379.24  209.89 2378.71
  217.03 2377.67  218.45 2377.47  236.49 2377.67  242.95 2377.31   259.1 2376.49
  265.95 2375.34  268.27 2375.33  271.75 2373.31     281 2373.46  283.89 2373.55
  291.37 2373.57  293.85 2373.75  294.52 2373.63  302.49 2373.21   349.2 2371.58
   377.9 2371.74  389.05 2371.75   416.3 2371.72  441.06 2371.32  457.79 2371.11
  475.12 2370.78  490.21 2370.28  515.12 2369.66  536.33 2369.29  555.66 2368.92
   581.3 2369.19  588.53 2369.52  603.97 2370.12  612.19 2370.31  621.33 2370.39
   634.2  2370.7  640.67 2371.13  666.11 2372.13  680.29 2371.84  703.99 2372.07
  707.97 2371.49  716.78  2371.3  724.33 2371.12  741.18 2370.71  742.55 2370.68
   762.1 2369.05  795.26 2369.88  811.69 2369.65  832.47 2369.75  859.19 2369.86
  864.88 2370.31  890.56 2371.19  900.39 2370.92  915.74 2370.49  949.12 2370.31
  967.44 2371.41 1019.69  2371.4 1031.38 2371.39 1042.13 2371.39 1073.72  2371.2
 1104.86 2371.95 1120.87 2372.08 1141.31  2371.9 1168.79 2374.55 1295.74 2374.78
 1297.51 2374.83 1344.37 2376.01 1350.57 2376.15 1391.82  2377.2 1406.45 2377.62
  1442.8  2378.7 1461.92 2379.57 1494.38 2381.19 1495.16 2381.27 1527.23 2384.61
 1549.74 2387.64 1571.78 2390.49 1583.84 2392.01 1597.91 2394.05 1599.15 2398.02
 1603.19 2398.39 1618.23 2401.09 1630.48  2401.8 1651.43 2403.34 1661.06 2404.05

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  268.27    .043 1168.79     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        268.27 1168.79           333.75   243.9  279.24             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
       0  1168.7 2371.91        T

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                           0.043      0.030
  W.S. Elev (ft)           2375.05    Reach Len. (ft)            333.75    243.90     279.24
  Crit W.S. (ft)                      Flow Area (sq ft)                   2697.53       0.01
  E.G. Slope (ft/ft)       0.000000   Area (sq ft)                        3612.37       0.01
  Q Total (cfs)              73.75    Flow (cfs)                            73.75       0.00
  Top Width (ft)            900.05    Top Width (ft)                       900.04       0.01
  Vel Total (ft/s)            0.03    Avg. Vel. (ft/s)                      0.03       0.00
  Max Chl Dpth (ft)           6.13    Hydr. Depth (ft)                      3.00       0.50
  Conv. Total (cfs)        193634.6   Conv. (cfs)                        193634.5        0.0
  Length Wtd. (ft)          243.92    Wetted Per. (ft)                     901.02       0.51
  Min Ch El (ft)           2368.92    Shear (lb/sq ft)                      0.00       0.00
  Alpha                       1.00    Stream Power (lb/ft s)                0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       222.47    418.05     220.14
  C & E Loss (ft)                     Cum SA (acres)              44.39     89.20      47.91

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 22

INPUT
Description: Lake
Station Elevation Data    num=       58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2388.3   46.89 2385.14   94.85 2382.62  138.97 2380.28  144.64 2378.66
  156.58    2379  171.55 2377.38  176.09 2375.83  179.93 2375.78  186.05 2377.31
  187.97  2378.1  192.92 2378.13  194.56  2377.7  200.28 2375.62  211.97 2377.13
  243.65  2370.8  274.95 2372.41  316.82 2371.15  343.81 2370.68  380.95  2370.2
  424.56  2368.9  447.69 2368.41  468.77 2367.93  491.01 2368.33  507.02 2368.38
  521.91    2368  569.13 2370.79  603.69 2369.85  621.22 2367.77  661.16 2368.83
  680.94  2368.5  705.97 2368.61  738.16 2368.72  745.01 2369.31  775.94 2370.45
  806.26  2369.5  846.47 2369.25  868.53  2370.7  931.46 2370.67  958.49 2370.62
  996.54  2370.3 1034.04 2371.22 1053.33 2371.35 1077.95 2371.07 1111.04 2371.53
 1163.09  2372.3 1209.35 2372.53 1242.45 2373.26 1292.79 2373.87 1341.91  2374.4
 1394.68  2375.2 1448.08 2377.07 1482.08 2380.23  1528.2 2386.31 1555.25 2389.78
 1556.53    2395 1588.96 2396.96 1620.61 2399.52

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03  274.95    .045 1111.04     .03
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        274.95 1111.04             2241  2146.6    2331              .1       .3
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
     200 1111.04 2371.91        T
 1111.05    1400    2380        F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.045      0.000
  W.S. Elev (ft)           2375.05    Reach Len. (ft)          2241.00    2146.60    2331.00
  Crit W.S. (ft)                      Flow Area (sq ft)           2.54    2618.24       0.04
  E.G. Slope (ft/ft)       0.000000   Area (sq ft)                2.54    4338.76     129.15
  Q Total (cfs)              73.72    Flow (cfs)                  0.04      73.68       0.00
  Top Width (ft)            877.05    Top Width (ft)              0.95     836.09      40.01
  Vel Total (ft/s)            0.03    Avg. Vel. (ft/s)            0.02       0.03       0.05
  Max Chl Dpth (ft)           7.28    Hydr. Depth (ft)            2.67       3.13       3.52
  Conv. Total (cfs)       185092.1    Conv. (cfs)                98.6   184989.5        4.0
  Length Wtd. (ft)         2147.02    Wetted Per. (ft)            3.64     836.52       0.01
  Min Ch El (ft)           2367.77    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                       1.00    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)      222.46     395.79     219.72
  C & E Loss (ft)                     Cum SA (acres)             44.38      84.34      47.78


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 21

INPUT
Description: Lake
Station Elevation Data     num=      61
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0   2386.3     20.7  2384.51    70.22  2381.45   119.02  2379.89   167.42  2378.91
  218.57   2378.7   270.56  2379.08   288.89  2378.91   296.68  2381.11   306.47  2375.44
  310.03   2377.8   318.28  2377.56   322.13  2377.67   326.72  2377.64   328.29  2377.03
  331.85   2376.4   349.38  2376.87   362.62  2372.58   367.78  2373.43   372.84  2372.83
  420.84   2372.3   458.08  2371.26    506.9  2370.48   542.78  2370.38   573.95  2370.21
  597.69     2369   646.17  2369.11   668.29  2368.41   724.81  2368.58   757.76  2368.16
  790.85   2368.2   829.92  2368.43    874.2  2368.95    909.1  2368.61   948.28  2370.64
  982.34     2371  1021.35  2370.25  1034.23  2370.48  1058.25  2370.58  1089.79  2371.05
 1112.98   2370.4  1140.93  2369.84   1160.7  2369.41  1199.33  2370.22  1233.71  2369.98
 1262.39   2370.4  1292.65  2370.43  1322.78  2371.31  1371.36  2373.93  1401.52  2375.95
    1429   2376.5  1468.63   2379.6  1515.43  2382.49  1540.85  2385.11  1585.35  2389.31
 1629.98     2392  1675.48  2395.93  1721.18  2399.89  1757.28  2412.89  1773.63  2421.26
 1777.62   2421.7

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .035   372.84    .045  1322.78     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        372.84 1322.78             473  459.55   487.5              .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
     420 1777.62 2371.91        T

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.035      0.045      0.050
  W.S. Elev (ft)           2375.05    Reach Len. (ft)           473.00     459.55     487.50
  Crit W.S. (ft)                      Flow Area (sq ft)          29.75    2947.94       0.06
  E.G. Slope (ft/ft)       0.000000   Area (sq ft)               29.75    4858.48       0.07
  Q Total (cfs)              73.47    Flow (cfs)                  0.61      72.86       0.00
  Top Width (ft)            967.82    Top Width (ft)             17.85     949.94       0.02
  Vel Total (ft/s)            0.02    Avg. Vel. (ft/s)            0.02       0.02       0.00
  Max Chl Dpth (ft)           6.89    Hydr. Depth (ft)            1.67       3.10       3.14
  Conv. Total (cfs)       208817.6    Conv. (cfs)               1743.2   207074.3        0.1
  Length Wtd. (ft)         459.61     Wetted Per. (ft)           18.35     950.13       3.76
  Min Ch El (ft)           2368.16    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                       1.00    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)      221.63     169.18     216.27
  C & E Loss (ft)                     Cum SA (acres)             43.90      40.33      46.71


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 20.75*

INPUT
Description:
Station Elevation Data     num=      88
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  -45.88  2384.73   -19.66  2383.16    43.05  2380.32    66.63  2379.67    71.16  2379.11
   75.22  2379.55    87.07  2378.64     94.4  2378.69   104.85  2378.45   157.74  2377.58
  166.14  2377.21   169.78  2377.08   175.22  2376.94   205.22  2376.68      222  2376.6
  230.91  2376.57   244.62  2376.61    260.2  2376.57   275.23  2376.72   296.75  2376.96
  300.83  2376.97   318.28  2376.86   319.96  2376.86   329.83  2378.6    330.31  2378.44
  342.22  2376.05   426.27  2373.55   464.52  2372.81   494.19  2371.75    520.4  2371.12
   533.1  2370.92   561.69  2370.84   586.52   2370.7   605.44  2369.78   644.07  2369.85
   661.7  2369.32   706.73  2369.42   732.99   2369.1   761.08  2369.16   794.24  2369.37
  831.83   2369.8   842.46  2369.72   861.45  2369.56   894.71   2371.1   923.62  2371.38
  948.88  2370.96   956.73  2370.83   967.66     2371   988.05  2371.08  1014.83  2371.45
 1034.51  2370.96  1058.23  2370.55  1058.69  2370.54  1075.02  2370.23  1107.81  2370.85
 1136.99  2370.68  1161.33     2371     1171  2371.01  1186.07  2371.03  1187.02  2371.06
 1212.59  2372.36  1233.21  2374.61  1306.06  2376.47  1325.86  2376.77   1342.5   2377.7
 1368.12  2379.17   1383.4  2379.87  1385.34  2379.62  1387.94  2380.06  1417.52  2381.26
 1418.03  2381.28  1445.13  2383.19     1471  2384.87  1492.58  2386.03  1496.84  2386.15
 1538.08  2388.39  1540.18  2388.49  1564.64  2390.21   1588.7  2393.35  1596.92  2394.42
 1626.22  2398.65  1637.43  2399.22  1669.15  2406.94  1675.92  2408.81  1681.48  2410.94
 1684.56  2412.55  1693.36  2415.65  1697.61  2415.94

Manning's n Values         num=       8
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
  -45.88    .034    75.22    .031   426.27    .034   494.19    .045  1161.33    .032
 1212.59     .05  1564.64     .05  1697.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        426.27 1212.59             473  459.55   487.5              .1       .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
     464 1697.61 2371.91        T
```

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.031 | 0.043 | 0.050 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.11 | 2404.53 | 0.03 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 0.11 | 3494.47 | 0.03 |
| Q Total (cfs) | 73.42 | Flow (cfs) | 0.00 | 73.42 | 0.00 |
| Top Width (ft) | 786.40 | Top Width (ft) | 0.07 | 786.32 | 0.01 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.00 | 0.03 | 0.00 |
| Max Chl Dpth (ft) | 5.95 | Hydr. Depth (ft) | 1.50 | 3.06 | 2.69 |
| Conv. Total (cfs) | 175051.6 | Conv. (cfs) | 0.8 | 175050.7 | 0.0 |
| Length Wtd. (ft) | 459.63 | Wetted Per. (ft) | 1.57 | 786.49 | 2.70 |
| Min Ch El (ft) | 2369.10 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 221.47 | 125.12 | 216.27 |
| C & E Loss (ft) | | Cum SA (acres) | 43.80 | 31.18 | 46.71 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20.5*

INPUT
Description:
Station Elevation Data num= 83

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -91.75 | 2383.15 | -60.02 | 2381.8 | 15.88 | 2379.18 | 44.42 | 2378.48 | 49.9 | 2377.48 |
| 54.81 | 2378.45 | 69.16 | 2376.93 | 78.02 | 2377.23 | 90.67 | 2377.01 | 154.7 | 2376.12 |
| 164.86 | 2375.5 | 169.27 | 2375.25 | 175.84 | 2374.99 | 212.15 | 2374.57 | 232.47 | 2374.47 |
| 243.25 | 2374.43 | 259.84 | 2374.44 | 278.7 | 2374.28 | 296.89 | 2374.49 | 322.94 | 2374.84 |
| 327.88 | 2374.88 | 348.99 | 2374.79 | 479.71 | 2374.27 | 508.2 | 2373.31 | 530.31 | 2372.25 |
| 549.83 | 2371.51 | 559.29 | 2371.37 | 580.59 | 2371.29 | 599.1 | 2371.19 | 613.19 | 2370.57 |
| 641.97 | 2370.59 | 655.1 | 2370.22 | 688.66 | 2369.27 | 708.22 | 2369.23 | 731.31 | 2370.12 |
| 758.56 | 2370.31 | 789.45 | 2370.65 | 798.19 | 2370.61 | 813.8 | 2370.52 | 841.14 | 2371.55 |
| 864.9 | 2371.75 | 885.66 | 2371.48 | 892.11 | 2371.4 | 901.1 | 2371.52 | 917.86 | 2371.59 |
| 939.86 | 2371.84 | 956.04 | 2371.53 | 975.54 | 2371.26 | 975.92 | 2371.26 | 989.33 | 2371.06 |
| 1016.28 | 2371.48 | 1040.27 | 2371.37 | 1060.27 | 2371.6 | 1068.22 | 2371.61 | 1080.61 | 2371.64 |
| 1081.38 | 2371.69 | 1102.41 | 2373.41 | 1201.69 | 2376.81 | 1222.72 | 2377.04 | 1240.4 | 2377.68 |
| 1267.61 | 2378.74 | 1283.84 | 2379.25 | 1285.9 | 2378.65 | 1288.66 | 2379.37 | 1320.08 | 2380.05 |
| 1320.62 | 2380.06 | 1349.41 | 2381.28 | 1376.9 | 2382.33 | 1399.82 | 2382.74 | 1404.34 | 2382.76 |
| 1448.15 | 2384.89 | 1450.37 | 2384.99 | 1476.35 | 2386.44 | 1501.91 | 2390.77 | 1510.65 | 2392.25 |
| 1541.77 | 2398.31 | 1553.68 | 2398.55 | 1587.38 | 2403.27 | 1594.57 | 2404.73 | 1600.47 | 2406.31 |
| 1603.74 | 2408.07 | 1613.09 | 2410.03 | 1617.6 | 2410.18 | | | | |

Manning's n Values num= 8

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -91.75 | .032 | 54.81 | .032 | 479.71 | .032 | 530.31 | .045 | 1068.22 | .035 |
| 1102.41 | .05 | 1476.35 | .05 | 1617.6 | .05 | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 479.71 | 1102.41 | 473 | 459.55 | 487.5 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -91.75 | 1102.4 | 2371.91 | T |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.044 | 0.050 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 1865.29 | 20.70 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | | 2393.09 | 20.70 |
| Q Total (cfs) | 73.38 | Flow (cfs) | | 72.98 | 0.40 |
| Top Width (ft) | 637.62 | Top Width (ft) | | 622.70 | 14.92 |
| Vel Total (ft/s) | 0.04 | Avg. Vel. (ft/s) | | 0.04 | 0.02 |
| Max Chl Dpth (ft) | 5.82 | Hydr. Depth (ft) | | 3.00 | 1.39 |
| Conv. Total (cfs) | 133265.4 | Conv. (cfs) | | 132536.7 | 728.7 |
| Length Wtd. (ft) | 459.63 | Wetted Per. (ft) | | 623.70 | 16.06 |
| Min Ch El (ft) | 2369.23 | Shear (lb/sq ft) | | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 221.47 | 94.06 | 216.15 |
| C & E Loss (ft) | | Cum SA (acres) | 43.80 | 23.74 | 46.63 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20.25*

INPUT
Description:
Station Elevation Data num= 80

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -137.62 | 2381.57 | -100.38 | 2380.45 | -11.29 | 2378.05 | 22.21 | 2377.29 | 28.64 | 2375.85 |
| 34.41 | 2377.36 | 51.25 | 2375.23 | 61.65 | 2375.77 | 76.5 | 2375.57 | 151.65 | 2374.66 |
| 163.57 | 2373.8 | 168.75 | 2373.43 | 176.47 | 2373.05 | 219.09 | 2372.07 | 242.94 | 2371.34 |
| 255.6 | 2370.3 | 275.07 | 2370.07 | 297.21 | 2369.6 | 318.56 | 2370.05 | 349.13 | 2370.72 |
| 354.93 | 2371.39 | 379.71 | 2371.73 | 579.27 | 2371.89 | 585.49 | 2371.81 | 599.5 | 2371.75 |
| 611.67 | 2371.68 | 620.94 | 2371.35 | 639.87 | 2371.33 | 648.51 | 2371.13 | 670.58 | 2371.11 |
| 683.45 | 2370.97 | 701.53 | 2371.08 | 722.88 | 2371.25 | 747.08 | 2371.5 | 753.93 | 2371.51 |
| 766.15 | 2371.47 | 787.56 | 2372.01 | 806.18 | 2372.13 | 822.44 | 2372.01 | 827.49 | 2371.98 |
| 834.53 | 2372.04 | 847.66 | 2372.09 | 864.9 | 2372.24 | 877.57 | 2372.09 | 892.84 | 2373.5 |
| 893.14 | 2373.47 | 903.65 | 2373.38 | 924.76 | 2373.61 | 943.54 | 2373.57 | 959.22 | 2373.69 |
| 965.44 | 2373.7 | 975.14 | 2373.74 | 975.75 | 2373.82 | 992.22 | 2374.45 | 1097.32 | 2377.15 |
| 1119.58 | 2377.3 | 1138.29 | 2377.66 | 1167.1 | 2378.3 | 1184.28 | 2378.63 | 1186.46 | 2377.67 |
| 1189.39 | 2378.69 | 1222.65 | 2378.85 | 1223.22 | 2378.85 | 1253.7 | 2379.36 | 1282.79 | 2379.8 |
| 1307.05 | 2379.46 | 1311.84 | 2379.36 | 1358.21 | 2381.4 | 1360.57 | 2381.48 | 1388.07 | 2382.67 |
| 1415.13 | 2388.19 | 1424.37 | 2390.07 | 1457.32 | 2397.98 | 1469.92 | 2397.88 | 1505.6 | 2399.61 |
| 1513.21 | 2400.64 | 1519.46 | 2401.69 | 1522.92 | 2403.58 | 1532.81 | 2404.42 | 1537.6 | 2404.42 |

Manning's n Values num= 7

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -137.62 | .031 | 34.41 | .045 | 579.27 | .03 | 965.44 | .037 | 992.22 | .05 |
| 1388.07 | .05 | 1537.6 | .05 | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 163.57 | 892.84 | 473 | 459.55 | 487.5 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 100 | 892.8 | 2371.91 | T |
| 893 | 1000 | 2378 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.045 | 0.037 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 473.00 | 459.55 | 487.50 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 0.09 | 2212.45 | 0.09 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 0.09 | 2548.25 | 0.09 |
| Q Total (cfs) | 73.34 | Flow (cfs) | 0.00 | 73.34 | 0.00 |
| Top Width (ft) | 729.40 | Top Width (ft) | 0.07 | 729.27 | 0.06 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.00 | 0.03 | 0.00 |
| Max Chl Dpth (ft) | 5.45 | Hydr. Depth (ft) | 1.25 | 3.03 | 1.56 |
| Conv. Total (cfs) | 186170.3 | Conv. (cfs) | 0.5 | 186169.1 | 0.7 |
| Length Wtd. (ft) | 459.86 | Wetted Per. (ft) | 1.32 | 729.50 | 1.62 |
| Min Ch El (ft) | 2369.60 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 221.47 | 68.00 | 216.03 |
| C & E Loss (ft) | | Cum SA (acres) | 43.80 | 16.61 | 46.54 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 20

INPUT
Description: -183.5 = quad contour 2380
Station Elevation Data num= 53

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -183.5 | 2380 | 0 | 2376.1 | 7.38 | 2374.22 | 14 | 2376.27 | 33.34 | 2373.53 |
| 45.28 | 2374.31 | 148.6 | 2373.2 | 168.24 | 2371.61 | 177.1 | 2371.1 | 226.03 | 2370.36 |
| 253.41 | 2370.21 | 290.29 | 2370.1 | 315.71 | 2369.69 | 340.22 | 2370.02 | 381.98 | 2370.71 |
| 410.43 | 2370.66 | 430.06 | 2371.1 | 458.56 | 2381.05 | 490.36 | 2393.49 | 524.49 | 2396.32 |
| 548.43 | 2393.18 | 550.91 | 2389.3 | 574.07 | 2382.31 | 586.57 | 2375.72 | 608.7 | 2372.28 |
| 658.68 | 2371.91 | 709.66 | 2372.4 | 759.22 | 2372.54 | 810.36 | 2372.69 | 862.66 | 2372.8 |
| 869.68 | 2372.85 | 882.03 | 2375.5 | 906.5 | 2381.4 | 909.21 | 2388.27 | 924.57 | 2391.89 |
| 962.23 | 2393.86 | 976.34 | 2385.2 | 992.95 | 2377.49 | 1036.19 | 2377.64 | 1084.72 | 2378.01 |
| 1087.02 | 2376.7 | 1090.11 | 2378 | 1125.21 | 2377.64 | 1188.68 | 2377.27 | 1219.34 | 2375.96 |
| 1268.28 | 2377.9 | 1299.79 | 2378.9 | 1338.1 | 2387.9 | 1372.87 | 2397.65 | 1423.82 | 2395.94 |
| 1438.45 | 2397.07 | 1442.1 | 2399.1 | 1457.59 | 2398.66 | | | | |

Manning's n Values num= 6

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -183.5 | .03 | 14 | .045 | 458.56 | .035 | 608.7 | .03 | 862.66 | .04 |
| 1299.79 | .05 | | | | | | | | |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 148.6 | 869.68 | 891 | 901.5 | 1024 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -183.5 | 600 | 2372.91 | T |
| 962.23 | 1457.59 | 2393.86 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.045 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 891.00 | 901.50 | 1024.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 90.14 | 1321.83 | 8.68 |
| E.G. Slope (ft/ft) | 0.000001 | Area (sq ft) | 90.14 | 1999.68 | 8.68 |
| Q Total (cfs) | 73.29 | Flow (cfs) | 2.79 | 70.22 | 0.28 |
| Top Width (ft) | 635.52 | Top Width (ft) | 58.60 | 571.60 | 5.32 |
| Vel Total (ft/s) | 0.05 | Avg. Vel. (ft/s) | 0.03 | 0.05 | 0.03 |
| Max Chl Dpth (ft) | 5.36 | Hydr. Depth (ft) | 1.54 | 2.31 | 1.63 |
| Conv. Total (cfs) | 102811.4 | Conv. (cfs) | 3911.8 | 98508.5 | 391.1 |
| Length Wtd. (ft) | 935.09 | Wetted Per. (ft) | 59.83 | 572.59 | 6.50 |
| Min Ch El (ft) | 2369.69 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 220.98 | 44.01 | 215.98 |
| C & E Loss (ft) | | Cum SA (acres) | 43.48 | 9.75 | 46.51 |

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 19

INPUT
Description: Survey 19
Station Elevation Data num= 51

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2398.9 | 18.33 | 2393.42 | 59.49 | 2388.85 | 98.51 | 2387.54 | 146.57 | 2382.84 |
| 198.38 | 2378.5 | 227.92 | 2378.85 | 232.47 | 2380.64 | 256.83 | 2377.69 | 266.89 | 2372.98 |
| 275.04 | 2375.6 | 277.56 | 2376.14 | 282.47 | 2376.12 | 284.89 | 2375.66 | 292.53 | 2373.43 |
| 301.27 | 2376.2 | 306.49 | 2374.96 | 321.94 | 2373.25 | 327.37 | 2374.63 | 329.6 | 2374.12 |
| 377.61 | 2372.9 | 426.28 | 2372.45 | 476.08 | 2371.71 | 525.16 | 2371.92 | 573.21 | 2371.91 |
| 622.05 | 2372.7 | 644.07 | 2372.23 | 649.81 | 2370.39 | 651.15 | 2370.12 | 652.3 | 2370.34 |
| 661.13 | 2372.5 | 704.51 | 2373.2 | 755.21 | 2372.22 | 805.51 | 2372.07 | 853.9 | 2372.37 |
| 900.42 | 2371.8 | 949.2 | 2371.98 | 995.83 | 2372.17 | 1044.25 | 2372.49 | 1091.87 | 2372.53 |
| 1142.46 | 2373.5 | 1151.7 | 2374.07 | 1212.42 | 2373.55 | 1261.91 | 2373.87 | 1312.21 | 2374.34 |
| 1362.76 | 2374.7 | 1413.18 | 2375.22 | 1463.27 | 2375.67 | 1499 | 2377.03 | 1508.55 | 2378 |
| 1553.81 | 2379.1 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 0 | .03 | 644.07 | .035 | 661.13 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 644.07 | 661.13 | 828.4 | 847.3 | 759 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 0 | 622.05 | 2372.7 | F |
| 1340 | 1553.81 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 828.40 | 847.30 | 759.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 725.87 | 65.54 | 1139.20 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 725.87 | 65.54 | 1139.20 |

| | | | | | |
|---|---|---|---|---|---|
| Q Total (cfs) | 73.20 | Flow (cfs) | 28.09 | 2.57 | 42.53 |
| Top Width (ft) | 680.00 | Top Width (ft) | 249.07 | 17.06 | 413.87 |
| Vel Total (ft/s) | 0.04 | Avg. Vel. (ft/s) | 0.04 | 0.04 | 0.04 |
| Max Chl Dpth (ft) | 4.93 | Hydr. Depth (ft) | 2.91 | 3.84 | 2.75 |
| Conv. Total (cfs) | 189938.1 | Conv. (cfs) | 72899.3 | 6670.7 | 110368.1 |
| Length Wtd. (ft) | 784.34 | Wetted Per. (ft) | 251.40 | 17.66 | 416.43 |
| Min Ch El (ft) | 2370.12 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 212.64 | 22.63 | 202.49 |
| C & E Loss (ft) | | Cum SA (acres) | 40.33 | 3.66 | 41.59 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 18.25

INPUT
Description: Survey 18.1 (skewed 20 degrees)
Sta 103.19 - 295.41 = Copy of Sec
19 points 1048, 1052, 1053, 1055, 1056, 1058, 1059, 1063, 1064,
1065. These were adj. for slope vert. with the valley and/or RR
Grade
Sta. 9.33 & 21.83 = Copy of Sec. 18 point 809 + Hwy slope.
21.83 has 0.6' vert. rise for road crown as observed in sect.
15.
Sta. 465.61 (795) to the right end are copies of Sect. 18
road profile. The vert. is -1.5' and the horizontal stations
adjusted -85.21' to line them up with the road surveyed points.

Station Elevation Data num= 67

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 8.77 | 2385.4 | 20.51 | 2384.8 | 96.97 | 2381.78 | 147.85 | 2376.62 | 157.25 | 2372.48 |
| 167.28 | 2375.64 | 171.87 | 2375.61 | 181.37 | 2372.92 | 189.7 | 2375.71 | 216.24 | 2373.06 |
| 241.89 | 2371.87 | 277.6 | 2371.39 | 313.3 | 2370.9 | 361.51 | 2371.14 | 365.37 | 2370.14 |
| 369.11 | 2369.13 | 371.83 | 2369.49 | 378.78 | 2371.3 | 424.61 | 2371.45 | 437.53 | 2371.11 |
| 481.74 | 2371.2 | 525.96 | 2371.26 | 570.22 | 2371.4 | 614.42 | 2371.54 | 658.6 | 2371.74 |
| 704.38 | 2372.1 | 750.49 | 2372.38 | 795.63 | 2372.56 | 840.29 | 2372.78 | 884.93 | 2372.96 |
| 929.82 | 2373.2 | 972.91 | 2373.35 | 1017.17 | 2373.53 | 1061.41 | 2373.72 | 1104.83 | 2373.94 |
| 1148.14 | 2374.2 | 1190.99 | 2374.57 | 1235.03 | 2374.79 | 1277.77 | 2375.08 | 1322.93 | 2375.46 |
| 1366.82 | 2375.8 | 1410.76 | 2376.18 | 1455.83 | 2376.45 | 1500.39 | 2376.71 | 1545.05 | 2376.88 |
| 1590.27 | 2377.2 | 1635.29 | 2377.65 | 1679.22 | 2378.11 | 1723.36 | 2378.58 | 1767.97 | 2379.08 |
| 1812.52 | 2379.6 | 1856.48 | 2380.18 | 1899.69 | 2380.48 | 1943.08 | 2380.95 | 1987.52 | 2381.54 |
| 2034.57 | 2382.3 | 2080.09 | 2383.31 | 2125.77 | 2384.1 | 2172.83 | 2385.11 | 2222.35 | 2386.67 |
| 2271.99 | 2389.3 | 2319.65 | 2393.12 | 2367.41 | 2397.9 | 2414.17 | 2403.16 | 2447.03 | 2406.33 |
| 2486.32 | 2409.1 | 2528.07 | 2410.64 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.77 | .03 | 361.51 | .035 | 378.78 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 361.51 | 378.78 | 330 | 85.7 | 76.3 | .1 | .3 |

Ineffective Flow num= 1

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 960 | 2528.07 | 2385 | F |

Skew Angle = 20

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 330.00 | 85.70 | 76.30 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 538.66 | 85.29 | 1605.24 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 538.66 | 85.29 | 1605.24 |
| Q Total (cfs) | 73.12 | Flow (cfs) | 18.13 | 3.08 | 51.91 |
| Top Width (ft) | 670.00 | Top Width (ft) | 156.51 | 17.27 | 496.22 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.03 | 0.04 | 0.03 |
| Max Chl Dpth (ft) | 5.92 | Hydr. Depth (ft) | 3.44 | 4.94 | 3.23 |
| Conv. Total (cfs) | 244279.4 | Conv. (cfs) | 60571.0 | 10296.9 | 173411.5 |
| Length Wtd. (ft) | 147.10 | Wetted Per. (ft) | 157.47 | 17.79 | 498.36 |
| Min Ch El (ft) | 2369.13 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 200.61 | 21.17 | 178.58 |
| C & E Loss (ft) | | Cum SA (acres) | 36.48 | 3.32 | 33.66 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 18.2

INPUT
Description: (skewed 20 degrees)
ADD 25.4 FEET TO EACH STATION
sta -258.37 =
quad contour 2400
sta - 126.45 = quad contour 2380
sta -47.34 =
toe of fill, copy of sta 34.16
sta -30 = edge pavement + slope
from 18, copy of sta 0
sta -15 = cl rd + slope from 18, + 0.6'
crown as observed @ 15
sta 0 = copy of 18 sta 809 + road
slope
sta 34.16 - 133.96 = copy from 18
sta 161.69 - 363.76 =
copy of section 18 -1.5' vertical
sta 504.2 - end copy of 18 -2'
vertical

Station Elevation Data num= 75

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -217.39 | 2400 | -93.42 | 2380 | -19.09 | 2377.26 | -2.79 | 2379 | 11.3 | 2379.6 |
| 25.4 | 2379 | 57.5 | 2377.26 | 102.36 | 2375.63 | 145.8 | 2375.45 | 151.28 | 2375.23 |
| 177.34 | 2372.6 | 194.4 | 2371.83 | 236.46 | 2370.66 | 279.96 | 2370.61 | 323.09 | 2370.82 |
| 367.22 | 2371.1 | 373.42 | 2370.7 | 412.59 | 2369.98 | 415.45 | 2368.83 | 416.78 | 2366.2 |
| 418.29 | 2366.2 | 427.68 | 2366.2 | 430.03 | 2367.48 | 434.26 | 2367.66 | 441.44 | 2370.2 |
| 479.27 | 2370.63 | 499.19 | 2370.71 | 543 | 2370.61 | 587.23 | 2370.7 | 631.43 | 2370.76 |
| 675.7 | 2370.9 | 719.89 | 2371.04 | 764.07 | 2371.24 | 809.86 | 2371.6 | 855.96 | 2371.88 |
| 901.1 | 2372.06 | 945.76 | 2372.28 | 990.4 | 2372.46 | 1034.92 | 2372.7 | 1078.38 | 2372.85 |
| 1122.64 | 2373.03 | 1166.88 | 2373.22 | 1210.3 | 2373.44 | 1253.62 | 2373.7 | 1296.47 | 2374.07 |
| 1340.5 | 2374.29 | 1383.25 | 2374.58 | 1428.4 | 2374.96 | 1472.29 | 2375.3 | 1516.23 | 2375.68 |
| 1561.3 | 2375.95 | 1605.86 | 2376.21 | 1650.52 | 2376.38 | 1695.74 | 2376.7 | 1740.76 | 2377.15 |

```
 1784.69 2377.61 1828.83 2378.08 1873.44 2378.59 1917.99  2379.1 1961.96 2379.58
 2005.16 2379.98 2048.55 2380.45    2093 2381.04 2140.04  2381.8 2185.56 2382.81
 2231.24  2383.6  2278.3 2384.61 2327.82 2386.17 2377.46  2388.8 2425.12 2392.62
 2472.88  2397.4 2519.65 2402.66 2552.51 2405.83  2591.8  2408.6 2633.55 2410.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -217.39     .03  412.59    .035  441.44     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        412.59  441.44             44.3    52.9      53             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -217.39  181.09    2385       F
     895 2633.55    2385       F
Skew Angle = 20

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035      0.030
  W.S. Elev (ft)           2375.05    Reach Len. (ft)            44.30      52.90      53.00
  Crit W.S. (ft)                      Flow Area (sq ft)         858.12     217.59    1759.85
  E.G. Slope (ft/ft)       0.000000   Area (sq ft)              858.12     217.59    1759.85
  Q Total (cfs)              73.10    Flow (cfs)                 22.31       6.70      44.09
  Top Width (ft)            660.00    Top Width (ft)            197.59      28.85     433.56
  Vel Total (ft/s)            0.03    Avg. Vel. (ft/s)            0.03       0.03       0.03
  Max Chl Dpth (ft)           8.85    Hydr. Depth (ft)            4.34       7.54       4.06
  Conv. Total (cfs)       365990.4    Conv. (cfs)            111701.3    33538.1   220750.9
  Length Wtd. (ft)           52.90    Wetted Per. (ft)          201.42      31.46     436.66
  Min Ch El (ft)          2366.20    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                      1.01    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)                    Cum Volume (acre-ft)      195.32      20.87     175.63
  C & E Loss (ft)                    Cum SA (acres)             35.14       3.28      32.84


CULVERT


RIVER: Minnie Cr
REACH: Upper              RS: 18.01

INPUT
Description: 3 culverts Jensen Rd (BRIDGE SKEWED 20 DEGREES)
Distance from Upstream XS =    4.45
Deck/Roadway Width        =    46.7
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =      20
Upstream  Deck/Roadway Coordinates
    num=      64
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    25.4  2378.6            57.5 2377.26         102.361 2375.63
 145.803 2375.45         151.281 2375.23         177.339  2374.1
 194.404 2373.33         236.455 2372.16         279.963 2372.11
 323.085 2372.32         367.223  2372.6         381.543 2372.66
 381.572 2372.66         411.933 2372.77          411.99 2375.77
  416.65 2375.77         416.688 2375.77          453.28 2375.77
 453.336 2372.77         455.601 2372.77         499.193 2372.71
 543.002 2372.61         587.233  2372.7         631.427 2372.76
 675.696  2372.9         719.889 2373.04         764.074 2373.24
 809.855  2373.6         855.957 2373.88           901.1 2374.06
 945.763 2374.28           990.4 2374.46        1034.921  2374.7
1078.382 2374.85        1122.641 2375.03        1166.882 2375.22
1210.305 2375.44        1253.616  2375.7        1296.466 2376.07
  1340.5 2376.29        1383.246 2376.58        1428.399 2376.96
1472.292  2377.3        1516.232 2377.68        1561.299 2377.95
 1605.86 2378.21        1650.523 2378.38        1695.741  2378.7
1740.762 2379.15        1784.692 2379.61         1828.83 2380.08
1873.437 2380.59        2140.037  2383.8        2185.556 2384.81
2231.244  2385.6        2278.304 2386.61        2327.816 2388.17
 2377.46  2390.8        2425.121 2394.62        2472.877  2399.4
2519.645 2404.66        2552.506 2407.83        2591.796  2410.6
2633.545 2412.14

Upstream Bridge Cross Section Data
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -217.39    2400  -93.42    2380  -19.09 2377.26   -2.79    2379    11.3  2379.6
    25.4    2379    57.5 2377.26  102.36 2375.63   145.8 2375.45  151.28 2375.23
  177.34  2372.6   194.4 2371.83  236.46 2370.66  279.96 2370.61  323.09 2370.82
  367.22  2371.1  373.42  2370.7  412.59 2369.98  415.45 2368.83  416.78  2366.2
  418.29  2366.2  427.68  2366.2  430.03 2367.48  434.26 2367.66  441.44  2370.2
  479.27 2370.63  499.19 2370.71     543 2370.61  587.23  2370.7  631.43 2370.76
   675.7  2370.9  719.89 2371.04  764.07 2371.24  809.86  2371.6  855.96 2371.88
   901.1 2372.06  945.76 2372.28   990.4 2372.46 1034.92  2372.7 1078.38 2372.85
 1122.64 2373.03 1166.88 2373.22  1210.3 2373.44 1253.62  2373.7 1296.47 2374.07
  1340.5 2374.29 1383.25 2374.58  1428.4 2374.96 1472.29  2375.3 1516.23 2375.68
  1561.3 2375.95 1605.86 2376.21 1650.52 2376.38 1695.74  2376.7 1740.76 2377.15
 1784.69 2377.61 1828.83 2378.08 1873.44 2378.59 1917.99  2379.1 1961.96 2379.58
 2005.16 2379.98 2048.55 2380.45    2093 2381.04 2140.04  2381.8 2185.56 2382.81
 2231.24  2383.6  2278.3 2384.61 2327.82 2386.17 2377.46  2388.8 2425.12 2392.62
 2472.88  2397.4 2519.65 2402.66 2552.51 2405.83  2591.8  2408.6 2633.55 2410.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -217.39     .03  412.59    .035  441.44     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
        412.59  441.44             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -217.39  181.09    2385       F
     895 2633.55    2385       F
Skew Angle = 20

Downstream  Deck/Roadway Coordinates
    num=      64
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    23.8  2378.6            55.9 2377.26         100.761 2375.63
 144.203 2375.45         149.681 2375.23         175.739  2374.1
 192.804 2373.33         234.855 2372.16         278.363 2372.11
 321.485 2372.32         365.623  2372.6         379.943 2372.66
 379.972 2375.66         410.333 2375.77          410.39 2375.77
  415.05 2375.77         415.088 2372.77          451.68 2372.77
 451.736 2372.77         454.001 2372.77         497.593 2372.71
 541.402 2372.61         585.633  2372.7         629.827 2372.76
 674.096  2372.9         718.289 2373.04         762.474 2373.24
 808.255  2373.6         854.357 2373.88           899.5 2374.06
```

```
 944.163 2374.28          988.8 2374.46        1033.321  2374.7
1076.782 2374.85        1121.041 2375.03        1165.282 2375.22
1208.705 2375.44        1252.016  2375.7        1294.866 2376.07
  1338.9 2376.29        1381.646 2376.58        1426.799 2376.96
1470.692  2377.3        1514.632 2377.68        1559.699 2377.95
 1604.26 2378.21        1648.923 2378.38        1694.141  2378.7
1739.162 2379.15        1783.092 2379.61         1827.23 2380.08
1871.837 2380.59        2138.437  2383.8        2183.956 2384.81
2229.644  2385.6        2276.704 2386.61        2326.216 2388.17
 2375.86  2390.8        2423.521 2394.62        2471.277  2399.4
2518.045 2404.66        2550.906 2407.83        2590.196  2410.6
2631.945 2412.14

Downstream Bridge Cross Section Data
Station Elevation Data    num=      71
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
  -32.58 2378.56  -18.49 2379.16   -4.39 2378.56   27.71 2377.26   72.57 2375.63
  116.01 2375.45  121.49 2375.23  147.55  2372.6  164.61 2371.83  206.66 2370.66
  250.17 2370.61  293.29 2370.82  337.43  2371.1  343.62  2370.7   382.8 2369.98
  387.46 2368.11  388.33  2365.6  399.36  2365.6  401.65 2367.66  404.47 2367.66
  411.65  2370.2  449.48 2370.63   469.4 2370.71  513.21 2370.61  557.44  2370.7
  601.64 2370.76   645.9  2371.4   690.1 2371.54  734.28 2371.74  780.07  2372.1
  826.17 2372.38  871.31 2372.56  915.97 2372.78  960.61 2373.46 1005.13  2373.7
 1048.59 2373.85 1092.85 2374.03 1137.09 2374.22 1180.51 2373.94 1223.82  2374.2
 1266.67 2374.57 1310.71 2374.79 1353.46 2375.08 1398.61 2375.46  1442.5 2375.82
 1486.44 2376.18 1531.51 2376.45 1576.07 2376.71 1620.73 2376.88 1665.95 2377.21
 1710.97 2377.65  1754.9 2378.11 1799.04 2378.08 1843.65 2378.59  1888.2  2379.1
 1932.16 2379.58 1975.37 2379.98 2018.76 2380.45 2063.21 2381.04 2110.25  2382.8
 2155.77 2383.81 2201.45  2384.6 2248.51 2385.61 2298.03 2387.17 2347.67  2389.8
 2395.33 2393.62 2443.09  2398.4 2489.85 2403.66 2522.72 2406.83    2562  2409.6
 2603.75 2411.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -32.58     .03   382.8    .035  411.65     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          382.8  411.65          .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  -32.58  176.01    2385       F
     875 2603.75    2385       F
Skew Angle = 20

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  3

Culvert Name     Shape      Rise    Span
culv@18cmp      Circular       5
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .023     .023        0                   .5                 1
Upstream   Elevation =  2366.7
           Centerline Station =  418.1
Downstream Elevation =  2366.4
           Centerline Station =  389.9

Culvert Name     Shape      Rise    Span
culv@18conc     Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .011     .011        0                   .5                 1
Upstream   Elevation =  2366.9
           Centerline Station =  423.1
Downstream Elevation =  2366.6
           Centerline Station =  394.9

Culvert Name     Shape      Rise    Span
culv@18conc2    Circular       4
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 4.4    46.7     .011     .011        0                   .5                 1
Upstream   Elevation =  2366.8
           Centerline Station =  428.1
Downstream Elevation =  2366.5
           Centerline Station =  399.5

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@18cmp

  Q Culv Group (cfs)          2.17    Culv Full Len (ft)         46.70
  # Barrels                      1    Culv Vel US (ft/s)          0.11
  Q Barrel (cfs)              2.17    Culv Vel DS (ft/s)          0.11
  E.G. US. (ft)            2375.05    Culv Inv El Up (ft)      2366.70
  W.S. US. (ft)            2375.05    Culv Inv El Dn (ft)      2366.40
  E.G. DS (ft)             2375.05    Culv Frctn Ls (ft)          0.00
  W.S. DS (ft)             2375.05    Culv Exit Loss (ft)         0.00
  Delta EG (ft)               0.00    Culv Entr Loss (ft)         0.00
  Delta WS (ft)               0.00    Q Weir (cfs)               82.65
  E.G. IC (ft)             2367.22    Weir Sta Lft (ft)         215.00
  E.G. OC (ft)             2375.05    Weir Sta Rgt (ft)         875.00
  Culvert Control           Outlet    Weir Submerg                1.00
  Culv WS Inlet (ft)       2371.70    Weir Max Depth (ft)         2.94
  Culv WS Outlet (ft)      2371.40    Weir Avg Depth (ft)         2.22
  Culv Nml Depth (ft)                 Weir Flow Area (sq ft)   1376.44
  Culv Crt Depth (ft)         0.40    Min El Weir Flow (ft)    2372.12


Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not
         get a balance of energy within the specified tolerance and number of trials.  The program used
         the solution with the minimum error.
Warning: The weir over culvert is submerged.

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@18conc

  Q Culv Group (cfs)          1.43    Culv Full Len (ft)         46.70
```

| | | | |
|---|---|---|---|
| # Barrels | 1 | Culv Vel US (ft/s) | 0.11 |
| Q Barrel (cfs) | 1.43 | Culv Vel DS (ft/s) | 0.11 |
| E.G. US. (ft) | 2375.05 | Culv Inv El Up (ft) | 2366.90 |
| W.S. US. (ft) | 2375.05 | Culv Inv El Dn (ft) | 2366.60 |
| E.G. DS (ft) | 2375.05 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2375.05 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.00 | Culv Entr Loss (ft) | 0.00 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 82.65 |
| E.G. IC (ft) | 2367.35 | Weir Sta Lft (ft) | 215.00 |
| E.G. OC (ft) | 2375.05 | Weir Sta Rgt (ft) | 875.00 |
| Culvert Control | Outlet | Weir Submerg | 1.00 |
| Culv WS Inlet (ft) | 2370.90 | Weir Max Depth (ft) | 2.94 |
| Culv WS Outlet (ft) | 2370.60 | Weir Avg Depth (ft) | 2.22 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 1376.44 |
| Culv Crt Depth (ft) | 0.34 | Min El Weir Flow (ft) | 2372.12 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.

CULVERT OUTPUT Profile #Max WS Culv Group: culv@18conc2

| | | | |
|---|---|---|---|
| Q Culv Group (cfs) | 1.44 | Culv Full Len (ft) | 46.70 |
| # Barrels | 1 | Culv Vel US (ft/s) | 0.11 |
| Q Barrel (cfs) | 1.44 | Culv Vel DS (ft/s) | 0.11 |
| E.G. US. (ft) | 2375.05 | Culv Inv El Up (ft) | 2366.80 |
| W.S. US. (ft) | 2375.05 | Culv Inv El Dn (ft) | 2366.50 |
| E.G. DS (ft) | 2375.05 | Culv Frctn Ls (ft) | 0.00 |
| W.S. DS (ft) | 2375.05 | Culv Exit Loss (ft) | 0.00 |
| Delta EG (ft) | 0.00 | Culv Entr Loss (ft) | 0.00 |
| Delta WS (ft) | 0.00 | Q Weir (cfs) | 82.65 |
| E.G. IC (ft) | 2367.25 | Weir Sta Lft (ft) | 215.00 |
| E.G. OC (ft) | 2375.05 | Weir Sta Rgt (ft) | 875.00 |
| Culvert Control | Outlet | Weir Submerg | 1.00 |
| Culv WS Inlet (ft) | 2370.80 | Weir Max Depth (ft) | 2.94 |
| Culv WS Outlet (ft) | 2370.50 | Weir Avg Depth (ft) | 2.22 |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | 1376.44 |
| Culv Crt Depth (ft) | 0.35 | Min El Weir Flow (ft) | 2372.12 |

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning: The weir over culvert is submerged.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17.98

INPUT
Description: (skewed 20 degrees)
ADD 23.8 FEET TO EACH STATION
Copy of
18.2
This section a copy of 18.2. Adjusted -30' horiz. for
culvert
sta -60 = edge pavement copy of sta -30
sta -45 = cl
road +0.6' crown observed from 15
Station Elevation Data num= 71

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -32.58 | 2378.56 | -18.49 | 2379.16 | -4.39 | 2378.56 | 27.71 | 2377.26 | 72.57 | 2375.63 |
| 116.01 | 2375.45 | 121.49 | 2375.23 | 147.55 | 2372.6 | 164.61 | 2371.83 | 206.66 | 2370.66 |
| 250.17 | 2370.61 | 293.29 | 2370.82 | 337.43 | 2371.1 | 343.62 | 2370.7 | 382.8 | 2369.98 |
| 387.46 | 2368.11 | 388.33 | 2365.6 | 399.36 | 2365.6 | 401.65 | 2367.66 | 404.47 | 2367.66 |
| 411.65 | 2370.2 | 449.48 | 2370.63 | 469.4 | 2370.71 | 513.21 | 2370.61 | 557.44 | 2370.7 |
| 601.64 | 2370.76 | 645.9 | 2371.4 | 690.1 | 2371.54 | 734.28 | 2371.74 | 780.07 | 2372.1 |
| 826.17 | 2372.38 | 871.31 | 2372.56 | 915.97 | 2372.78 | 960.61 | 2373.46 | 1005.13 | 2373.7 |
| 1048.59 | 2373.85 | 1092.85 | 2374.03 | 1137.09 | 2374.22 | 1180.51 | 2373.94 | 1223.82 | 2374.2 |
| 1266.67 | 2374.57 | 1310.71 | 2374.79 | 1353.46 | 2375.08 | 1398.61 | 2375.46 | 1442.5 | 2375.82 |
| 1486.44 | 2376.18 | 1531.51 | 2376.45 | 1576.07 | 2376.71 | 1620.73 | 2376.88 | 1665.95 | 2377.21 |
| 1710.97 | 2377.65 | 1754.9 | 2378.11 | 1799.04 | 2378.08 | 1843.65 | 2378.59 | 1888.2 | 2379.1 |
| 1932.16 | 2379.58 | 1975.37 | 2379.98 | 2018.76 | 2380.45 | 2063.21 | 2381.04 | 2110.25 | 2382.8 |
| 2155.77 | 2383.81 | 2201.45 | 2384.6 | 2248.51 | 2385.61 | 2298.03 | 2387.17 | 2347.67 | 2389.8 |
| 2395.33 | 2393.62 | 2443.09 | 2398.4 | 2489.85 | 2403.66 | 2522.72 | 2406.83 | 2562 | 2409.6 |
| 2603.75 | 2411.14 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -32.58 | .03 | 382.8 | .035 | 411.65 | .03 |

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
382.8 411.65 88.4 116.9 116.8 .1 .3
Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -32.58 | 176.01 | 2385 | F |
| 875 | 2603.75 | 2385 | F |

Skew Angle = 20

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 88.40 | 116.90 | 116.80 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 819.45 | 223.47 | 1673.93 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 819.45 | 223.47 | 1673.93 |
| Q Total (cfs) | 72.60 | Flow (cfs) | 22.70 | 7.33 | 42.56 |
| Top Width (ft) | 660.00 | Top Width (ft) | 187.80 | 28.85 | 443.35 |
| Vel Total (ft/s) | 0.03 | Avg. Vel. (ft/s) | 0.03 | 0.03 | 0.03 |
| Max Chl Dpth (ft) | 9.45 | Hydr. Depth (ft) | 4.36 | 7.75 | 3.78 |
| Conv. Total (cfs) | 341595.9 | Conv. (cfs) | 106832.2 | 34500.9 | 200262.7 |
| Length Wtd. (ft) | 108.20 | Wetted Per. (ft) | 191.89 | 32.22 | 445.92 |
| Min Ch El (ft) | 2365.60 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 194.47 | 20.60 | 173.55 |
| C & E Loss (ft) | | Cum SA (acres) | 34.94 | 3.24 | 32.31 |

LATERAL STRUCTURE

RIVER: Minnie Cr
REACH: Upper RS: 17.97

```
INPUT
Description:
Lateral structure position      = Left overbank
Distance from Upstream XS =       .1
Deck/Roadway Width          =      30
Weir Coefficient            =     1.1
Weir Flow Reference         = Water Surface
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2379.2      90  2379.2  1088.5  2377.4  2132.1  2377.7  3393.2 2385.18

Weir crest shape                            = Broad Crested


LATERAL STRUCTURE OUTPUT  Profile #Max WS  Lat Struct

  E.G. US. (ft)             2375.05    Weir Sta US (ft)
  W.S. US. (ft)             2375.05    Weir Sta DS (ft)
  E.G. DS (ft)              2375.05    Weir Max Depth (ft)
  W.S. DS (ft)              2375.05    Weir Avg Depth (ft)
  Q US (cfs)                  72.60    Weir Submerg
  Q Leaving Total (cfs)        0.00    Min El Weir Flow (ft)    2377.40
  Q DS (cfs)                  72.46    Wr Top Wdth (ft)
  Perc Q Leaving               0.00    Q Gate Group (cfs)
  Q Weir (cfs)                         Gate Open Ht (ft)
  Q Gates (cfs)                        Gate #Open
  Q Culv (cfs)                         Gate Area (sq ft)
  Q Lat RC (cfs)                       Gate Submerg
  Weir Flow Area (sq ft)               Gate Invert (ft)


Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 17.9

INPUT
Description: Skew 20 degrees. add 12 feet to all stations
Survey 18.3
sta -15
             = 809 +0.6' vert rise as observed at 15.
sta 0 = copy of sec 18
             point 809 - slope.
sta 25.38 - 314.74 = copy of section 18 - 2'
             vertical.
sta 516.19 to right end copy of section 18 -2' vertical.
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      12  2378.4   35.85 2375.26   84.55 2373.63  130.87  2375.4  136.92 2375.23
  164.12  2372.1  181.46 2371.33  223.16 2371.16  265.72 2370.11  307.76 2370.32
  322.01  2370.3  365.24 2370.33  371.58 2369.22  379.53 2370.39     425  2370.4
   453.2 2370.71  497.06 2370.61  541.29  2370.7  585.48 2370.76  629.75  2370.9
  673.95 2371.04  718.13 2371.24  763.91  2371.6  810.02 2371.88  855.16 2372.06
  899.82 2372.28  944.46 2372.46  988.98  2372.7 1032.44 2372.85  1076.7 2373.03
 1120.85 2373.22 1164.36 2373.44 1207.67  2373.7 1250.52 2374.07 1294.56 2374.29
 1337.31 2374.58 1382.46 2374.96 1426.35  2375.3 1470.29 2375.68 1515.36 2375.95
 1559.92 2376.21 1604.58 2376.38  1649.8  2376.7 1694.82 2377.15 1738.75 2377.61
 1782.89 2378.08 1827.49 2378.59 1872.05  2379.1 1916.02 2379.58 1959.22 2379.98
 2002.61 2380.45 2047.06 2381.04  2094.1  2381.8 2139.61 2382.81  2185.3  2383.6
 2232.36 2384.61 2281.88 2386.17 2331.52  2388.8 2379.18 2392.62 2426.94  2397.4
  2473.7 2402.66 2506.56 2405.83 2545.85  2408.6  2587.6 2410.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      12     .03  365.24    .035  379.53     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        365.24  379.53           332.83  397.43  395.67              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     910  2587.6    2385        F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 1111.44 1205.41    2390    1243 1289.98    2390
Skew Angle = 20

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)            2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)                0.00    Wt. n-Val.                  0.030      0.035      0.030
  W.S. Elev (ft)            2375.05    Reach Len. (ft)            332.83     397.43     395.67
  Crit W.S. (ft)                       Flow Area (sq ft)          771.66      75.17    1914.48
  E.G. Slope (ft/ft)       0.000000    Area (sq ft)               771.66      75.17    1914.48
  Q Total (cfs)               72.60    Flow (cfs)                  21.29       1.98      49.33
  Top Width (ft)             660.00    Top Width (ft)             170.24      14.29     475.47
  Vel Total (ft/s)             0.03    Avg. Vel. (ft/s)             0.03       0.03       0.03
  Max Chl Dpth (ft)            5.83    Hydr. Depth (ft)             4.53       5.26       4.03
  Conv. Total (cfs)        351724.7    Conv. (cfs)             103158.1     9571.6   238995.0
  Length Wtd. (ft)           378.20    Wetted Per. (ft)           174.03      14.47     478.47
  Min Ch El (ft)            2369.22    Shear (lb/sq ft)             0.00       0.00       0.00
  Alpha                        1.00    Stream Power (lb/ft s)       0.00       0.00       0.00
  Frctn Loss (ft)              0.00    Cum Volume (acre-ft)       192.85      20.20     168.73
  C & E Loss (ft)                      Cum SA (acres)              34.58       3.19      31.08


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 17.6*

INPUT
Description: skew 13 degrees, add 13 ft fo all stations
Interpolated
Station Elevation Data    num=     117
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.94 2378.07   16.85 2377.38   25.03 2375.53   42.81  2374.4   57.97 2374.12
   65.33 2373.66   79.38 2373.75   83.27  2374.2   84.76 2374.39   87.85 2374.31
   88.87  2374.1   93.56 2373.39  111.96 2372.86  117.82 2372.89  134.93 2373.26
  158.34 2373.71  171.89 2373.81  177.72 2373.89  186.31 2373.75   194.7 2373.27
  224.93  2371.5  233.26 2371.29  249.54 2370.95  264.04 2370.92   295.1 2370.67
  308.75 2370.53  326.52 2370.17   357.9 2369.67  369.18 2369.54   389.2 2369.59
  420.21 2369.66  428.87 2369.69  449.11 2369.68  452.23 2369.68  485.19 2369.77
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 510.48 | 2369.96 | 516.9 | 2368.99 | 518.4 | 2368.79 | 521.93 | 2369.23 | 526.16 | 2369.9 |
| 566.76 | 2369.99 | 591.93 | 2370.25 | 599.75 | 2370.25 | 631.09 | 2370.16 | 670.57 | 2370.17 |
| 672.82 | 2370.17 | 710.03 | 2370.28 | 747.42 | 2370.43 | 749.55 | 2370.43 | 789 | 2370.4 |
| 816.7 | 2370.4 | 828.45 | 2370.43 | 869.32 | 2370.64 | 888.8 | 2370.71 | 910.47 | 2370.82 |
| 950.77 | 2370.94 | 960.93 | 2370.98 | 990.65 | 2371.12 | 1030.5 | 2371.27 | 1034.07 | 2371.29 |
| 1070.25 | 2371.43 | 1105.74 | 2371.51 | 1109.05 | 2371.52 | 1148.56 | 2371.68 | 1178.98 | 2371.8 |
| 1187.97 | 2371.83 | 1226.82 | 2372 | 1249.62 | 2372.12 | 1265.48 | 2372.21 | 1303.74 | 2372.5 |
| 1321.22 | 2372.59 | 1343.05 | 2372.67 | 1381.21 | 2372.88 | 1395.05 | 2372.97 | 1421.52 | 2373.15 |
| 1460.71 | 2373.38 | 1467.64 | 2373.43 | 1499.94 | 2373.67 | 1539.9 | 2373.88 | 1540.17 | 2373.88 |
| 1579.95 | 2374.07 | 1614.05 | 2374.17 | 1619.82 | 2374.19 | 1660.19 | 2374.42 | 1683.7 | 2374.6 |
| 1700.39 | 2374.75 | 1739.6 | 2375.12 | 1754.58 | 2375.26 | 1779.01 | 2375.54 | 1818.83 | 2376.01 |
| 1828.31 | 2376.12 | 1858.6 | 2376.51 | 1897.85 | 2377 | 1899.21 | 2377.01 | 1936.43 | 2377.43 |
| 1972.65 | 2377.87 | 1975.16 | 2377.9 | 2014.83 | 2378.52 | 2042.47 | 2379.01 | 2056.83 | 2379.27 |
| 2097.47 | 2380.18 | 2113.52 | 2380.48 | 2138.26 | 2380.95 | 2180.27 | 2381.88 | 2185.51 | 2382.04 |
| 2224.47 | 2383.39 | 2267.36 | 2385.56 | 2268.79 | 2385.62 | 2311.34 | 2388.5 | 2334.89 | 2390.44 |
| 2353.97 | 2391.99 | 2395.72 | 2395.77 | 2402.95 | 2396.33 | 2425.06 | 2397.82 | 2431.64 | 2398.13 |
| 2460.14 | 2400.02 | 2497.41 | 2401.55 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 8.94 | .03 | 510.48 | .035 | 526.16 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 510.48 | 526.16 | 332.83 | 397.43 | 395.67 | .1 | .3 |

Skew Angle = 13

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 332.83 | 397.43 | 395.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 886.40 | 89.59 | 2677.52 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 886.40 | 89.59 | 2677.52 |
| Q Total (cfs) | 72.58 | Flow (cfs) | 19.18 | 1.76 | 51.65 |
| Top Width (ft) | 790.00 | Top Width (ft) | 165.48 | 15.68 | 608.84 |
| Vel Total (ft/s) | 0.02 | Avg. Vel. (ft/s) | 0.02 | 0.02 | 0.02 |
| Max Chl Dpth (ft) | 6.26 | Hydr. Depth (ft) | 5.36 | 5.71 | 4.40 |
| Conv. Total (cfs) | 498394.6 | Conv. (cfs) | 131674.5 | 12070.1 | 354650.0 |
| Length Wtd. (ft) | 377.29 | Wetted Per. (ft) | 170.66 | 15.85 | 612.27 |
| Min Ch El (ft) | 2368.79 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 186.52 | 19.45 | 147.88 |
| C & E Loss (ft) | | Cum SA (acres) | 33.29 | 3.05 | 26.15 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17.3*

INPUT
Description: skew 6 degrees
Interpolated
Station Elevation Data num= 117

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -8.284 | 2377.73 | 1.969 | 2377.09 | 12.571 | 2374.16 | 35.594 | 2373.53 | 55.256 | 2373.35 |
| 64.803 | 2372.59 | 83.003 | 2373.09 | 88.045 | 2374.1 | 89.984 | 2374.52 | 93.982 | 2374.43 |
| 95.305 | 2374.02 | 101.372 | 2372.71 | 125.22 | 2372.09 | 132.828 | 2372 | 154.996 | 2372.26 |
| 185.319 | 2372.53 | 202.882 | 2372.37 | 210.441 | 2372.38 | 221.579 | 2372.27 | 232.45 | 2372 |
| 271.624 | 2370.91 | 282.424 | 2370.75 | 303.518 | 2370.57 | 322.315 | 2370.55 | 362.573 | 2370.15 |
| 380.265 | 2369.9 | 403.289 | 2369.48 | 443.945 | 2369.04 | 458.574 | 2368.97 | 484.531 | 2368.99 |
| 524.71 | 2369.04 | 535.928 | 2369.05 | 562.163 | 2369.06 | 566.191 | 2369.06 | 608.916 | 2369.22 |
| 641.705 | 2369.58 | 649.343 | 2368.54 | 651.143 | 2368.35 | 654.525 | 2368.72 | 658.582 | 2369.41 |
| 693.321 | 2369.58 | 714.862 | 2369.79 | 721.556 | 2369.82 | 748.378 | 2369.71 | 782.172 | 2369.64 |
| 784.101 | 2369.63 | 815.946 | 2369.79 | 847.939 | 2369.98 | 849.769 | 2369.97 | 883.533 | 2369.75 |
| 907.243 | 2369.61 | 917.297 | 2369.62 | 952.275 | 2369.68 | 968.943 | 2369.7 | 987.501 | 2369.75 |
| 1021.991 | 2369.82 | 1030.683 | 2369.85 | 1056.113 | 2369.95 | 1090.225 | 2370.08 | 1093.278 | 2370.09 |
| 1124.237 | 2370.15 | 1154.62 | 2370.19 | 1157.444 | 2370.21 | 1191.268 | 2370.32 | 1217.295 | 2370.43 |
| 1224.992 | 2370.45 | 1258.249 | 2370.57 | 1277.762 | 2370.64 | 1291.337 | 2370.72 | 1324.077 | 2370.93 |
| 1339.044 | 2371 | 1357.721 | 2371.06 | 1390.381 | 2371.18 | 1402.226 | 2371.24 | 1424.881 | 2371.33 |
| 1458.417 | 2371.47 | 1464.354 | 2371.5 | 1491.992 | 2371.66 | 1526.203 | 2371.82 | 1526.432 | 2371.82 |
| 1560.474 | 2371.93 | 1589.664 | 2371.99 | 1594.607 | 2372 | 1629.156 | 2372.14 | 1649.275 | 2372.24 |
| 1663.547 | 2372.35 | 1697.112 | 2372.62 | 1709.931 | 2372.73 | 1730.836 | 2372.99 | 1764.928 | 2373.43 |
| 1773.034 | 2373.54 | 1798.961 | 2373.92 | 1832.556 | 2374.42 | 1833.719 | 2374.43 | 1865.574 | 2374.87 |
| 1896.583 | 2375.32 | 1898.721 | 2375.36 | 1932.684 | 2376 | 1956.324 | 2376.48 | 1968.626 | 2376.74 |
| 2003.405 | 2377.55 | 2017.139 | 2377.84 | 2038.312 | 2378.3 | 2074.274 | 2379.16 | 2078.76 | 2379.29 |
| 2112.106 | 2380.6 | 2148.814 | 2382.4 | 2150.037 | 2382.45 | 2186.448 | 2384.37 | 2206.605 | 2385.61 |
| 2222.936 | 2386.58 | 2258.669 | 2388.87 | 2264.845 | 2389.23 | 2283.781 | 2389.81 | 2289.409 | 2389.92 |
| 2313.795 | 2391.44 | 2345.699 | 2392.96 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -8.284 | .03 | 641.705 | .035 | 658.582 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 641.705 | 658.582 | 332.83 | 397.43 | 395.67 | .1 | .3 |

Skew Angle = 6

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 332.83 | 397.43 | 395.67 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 1483.31 | 103.99 | 3312.95 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 1483.31 | 103.99 | 3312.95 |
| Q Total (cfs) | 72.57 | Flow (cfs) | 23.36 | 1.46 | 47.75 |
| Top Width (ft) | 920.00 | Top Width (ft) | 251.71 | 16.88 | 651.42 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.02 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 6.70 | Hydr. Depth (ft) | 5.89 | 6.16 | 5.09 |
| Conv. Total (cfs) | 734310.7 | Conv. (cfs) | 236370.0 | 14745.5 | 483195.1 |
| Length Wtd. (ft) | 374.29 | Wetted Per. (ft) | 257.04 | 17.04 | 655.64 |
| Min Ch El (ft) | 2368.35 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.01 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 177.47 | 18.57 | 120.67 |
| C & E Loss (ft) | | Cum SA (acres) | 31.70 | 2.90 | 20.43 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 17

INPUT

Description: -12,5 = center road + 0.6' vertical observed from 15
Station Elevation Data num= 58

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.4 | 0 | 2376.8 | 12.93 | 2372.79 | 64.96 | 2372.57 | 76.6 | 2371.52 |
| 98.79 | 2372.44 | 104.94 | 2374 | 107.3 | 2374.64 | 112.18 | 2374.54 | 113.79 | 2373.95 |
| 121.19 | 2372.04 | 159.53 | 2371.1 | 186.56 | 2371.27 | 223.53 | 2371.36 | 244.94 | 2370.93 |
| 280.98 | 2370.72 | 341.9 | 2370.2 | 390.53 | 2370.18 | 439.61 | 2369.62 | 489.25 | 2368.8 |
| 538.82 | 2368.4 | 588.29 | 2368.4 | 637.27 | 2368.41 | 687.85 | 2368.44 | 739.93 | 2368.67 |
| 779.9 | 2369.21 | 788.69 | 2368.1 | 790.76 | 2367.92 | 793.94 | 2368.2 | 797.75 | 2368.92 |
| 848.88 | 2369.38 | 899.66 | 2369.1 | 951.49 | 2369.52 | 999.63 | 2368.83 | 1049.73 | 2368.68 |
| 1099.85 | 2368.71 | 1150.67 | 2368.9 | 1200.47 | 2368.86 | 1251.36 | 2369.05 | 1300.45 | 2369.17 |
| 1350.2 | 2369.42 | 1401.5 | 2369.5 | 1451.94 | 2369.56 | 1502.15 | 2369.75 | 1553.67 | 2369.81 |
| 1602.07 | 2369.88 | 1651.32 | 2370.2 | 1702.55 | 2370.95 | 1751.82 | 2371.85 | 1802.85 | 2372.77 |
| 1851.36 | 2373.95 | 1900.73 | 2375.2 | 1950.76 | 2376.53 | 2007.63 | 2379.24 | 2054.55 | 2380.79 |
| 2101.84 | 2382.12 | 2121.78 | 2381.7 | 2167.48 | 2384.37 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -12.5 | .03 | 779.9 | .035 | 797.75 | .03 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 779.9 | 797.75 | 521.8 | 598.55 | 598 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.030 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 521.80 | 598.55 | 598.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2152.82 | 117.78 | 3906.94 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2152.82 | 117.78 | 3906.94 |
| Q Total (cfs) | 72.55 | Flow (cfs) | 26.10 | 1.25 | 45.20 |
| Top Width (ft) | 1010.00 | Top Width (ft) | 334.90 | 17.85 | 657.25 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.01 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 7.13 | Hydr. Depth (ft) | 6.43 | 6.60 | 5.94 |
| Conv. Total (cfs) | 1013626.0 | Conv. (cfs) | 364641.7 | 17487.2 | 631497.0 |
| Length Wtd. (ft) | 564.38 | Wetted Per. (ft) | 340.43 | 18.01 | 662.74 |
| Min Ch El (ft) | 2367.92 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 163.57 | 17.56 | 87.88 |
| C & E Loss (ft) | | Cum SA (acres) | 29.46 | 2.74 | 14.49 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 16.5*

INPUT
Description: Interpolated
Station Elevation Data num= 104

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.55 | -1.74 | 2377.03 | 2.4 | 2376.28 | 11.71 | 2373.57 | 17.82 | 2372.83 |
| 48.05 | 2373.07 | 59.21 | 2372.73 | 64.07 | 2373.39 | 65.9 | 2373.71 | 70.44 | 2373.64 |
| 71.96 | 2373.29 | 78.81 | 2372.25 | 79.85 | 2372.25 | 91.7 | 2371.78 | 93.73 | 2371.46 |
| 96.36 | 2371.21 | 114.25 | 2373.03 | 120.19 | 2373.06 | 127.52 | 2373.74 | 130.33 | 2374.03 |
| 136.15 | 2373.9 | 138.07 | 2373.58 | 146.74 | 2372.53 | 146.89 | 2372.51 | 188.99 | 2371.99 |
| 192.61 | 2371.95 | 224.83 | 2371.99 | 232.16 | 2371.98 | 268.91 | 2371.94 | 275.23 | 2371.88 |
| 294.44 | 2371.61 | 317.47 | 2371.43 | 337.41 | 2371.29 | 360.15 | 2371.1 | 402.79 | 2370.92 |
| 410.04 | 2370.84 | 445.23 | 2370.61 | 468.02 | 2370.65 | 486.97 | 2370.6 | 526.54 | 2370.29 |
| 528.38 | 2370.27 | 570.76 | 2370.17 | 585.72 | 2370.09 | 612.62 | 2370.04 | 644.82 | 2369.89 |
| 654.09 | 2369.88 | 696.39 | 2369.85 | 703.8 | 2369.71 | 738.86 | 2369.03 | 762.15 | 2369.08 |
| 762.2 | 2369.08 | 778.69 | 2368.81 | 820.5 | 2368.51 | 822.51 | 2368.52 | 862.11 | 2368.69 |
| 884.6 | 2368.71 | 905.28 | 2368.8 | 932.26 | 2369.21 | 941.15 | 2367.94 | 943.25 | 2367.67 |
| 946.34 | 2367.94 | 949.68 | 2368.42 | 951.55 | 2368.47 | 961.51 | 2368.94 | 999.7 | 2369.06 |
| 1037.63 | 2368.8 | 1040.28 | 2368.81 | 1076.35 | 2368.95 | 1112.31 | 2368.54 | 1113.98 | 2368.54 |
| 1149.74 | 2368.53 | 1187.18 | 2368.62 | 1188.31 | 2368.62 | 1225.14 | 2368.87 | 1262.35 | 2369.01 |
| 1266.79 | 2369.04 | 1300.36 | 2369.38 | 1337.03 | 2369.71 | 1341.39 | 2369.76 | 1374.2 | 2370.58 |
| 1412.52 | 2371.44 | 1417.49 | 2371.55 | 1450.2 | 2371.92 | 1481.36 | 2372.31 | 1487.71 | 2372.4 |
| 1526.19 | 2372.85 | 1550.63 | 2373.14 | 1562.35 | 2373.21 | 1599.14 | 2373.54 | 1613.46 | 2373.74 |
| 1637.41 | 2374.37 | 1674.22 | 2375.43 | 1685.38 | 2375.75 | 1712.34 | 2376.47 | 1748.57 | 2377.59 |
| 1785.46 | 2378.34 | 1822.83 | 2379.12 | 1826.78 | 2379.26 | 1865.31 | 2380.49 | 1900.36 | 2381.26 |
| 1904.96 | 2381.34 | 1935.69 | 2381.95 | 1950.59 | 2381.76 | 1984.72 | 2383.14 | | |

Manning's n Values num= 5

| Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | .03 | 932.26 | .035 | 961.51 | .03 | 1266.79 | .04 | 1984.72 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 932.26 | 961.51 | 521.8 | 598.55 | 598 | .1 | .3 |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.031 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 521.80 | 598.55 | 598.00 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2822.72 | 193.72 | 2269.75 |
| E.G. Slope (ft/ft) | 0.000000 | Area (sq ft) | 2822.72 | 193.72 | 2269.75 |
| Q Total (cfs) | 72.52 | Flow (cfs) | 37.94 | 2.56 | 32.02 |
| Top Width (ft) | 920.00 | Top Width (ft) | 522.26 | 29.25 | 368.49 |
| Vel Total (ft/s) | 0.01 | Avg. Vel. (ft/s) | 0.01 | 0.01 | 0.01 |
| Max Chl Dpth (ft) | 7.38 | Hydr. Depth (ft) | 5.40 | 6.62 | 6.16 |
| Conv. Total (cfs) | 818667.7 | Conv. (cfs) | 428279.0 | 28895.3 | 361493.4 |
| Length Wtd. (ft) | 553.93 | Wetted Per. (ft) | 526.49 | 29.42 | 373.90 |
| Min Ch El (ft) | 2367.67 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.00 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 133.77 | 15.42 | 45.48 |
| C & E Loss (ft) | | Cum SA (acres) | 24.33 | 2.42 | 7.44 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 16

INPUT
Description: sta -12.5 = center road +0.6' verical observed from 15
Station Elevation Data num= 52

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -12.5 | 2377.7 | 0 | 2377.1 | 15.62 | 2372.76 | 57.82 | 2373.46 | 70.77 | 2372.82 |
| 76.42 | 2374.16 | 78.54 | 2374.8 | 83.81 | 2374.67 | 85.58 | 2373.98 | 93.53 | 2371.93 |
| 108.5 | 2371.88 | 113.92 | 2370.8 | 134.69 | 2373.83 | 172.42 | 2372.99 | 221.48 | 2372.8 |
| 271.62 | 2372.68 | 321.63 | 2372.5 | 370.68 | 2372.04 | 420.24 | 2371.65 | 469.76 | 2371.58 |
| 519.05 | 2371.03 | 567.52 | 2371.2 | 615.6 | 2370.95 | 664.82 | 2371.33 | 713.43 | 2371.46 |
| 761.59 | 2371.36 | 810.71 | 2371.3 | 860.03 | 2369.66 | 887.07 | 2369.76 | 906.28 | 2369.2 |
| 954.83 | 2368.59 | 1003.15 | 2368.8 | 1053.29 | 2368.69 | 1084.61 | 2369.22 | 1095.74 | 2367.43 |
| 1100.74 | 2367.86 | 1106.13 | 2368.7 | 1125.26 | 2368.97 | 1177.36 | 2368.49 | 1226.1 | 2368.25 |

```
 1275.26 2368.53 1327.16  2369.2  1376.5 2370.32 1426.83  2373.6 1469.07 2374.91
 1514.88 2376.43 1556.43    2377    1604 2379.39 1645.79 2381.24 1697.51 2381.74
 1749.22 2381.72 1801.97  2381.9

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   -12.5     .03 1084.61    .035 1125.26     .03 1327.16     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1084.61 1125.26            681.4   708.3   710.5              .1       .3

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035      0.030
  W.S. Elev (ft)           2375.05    Reach Len. (ft)            681.40     708.30     710.50
  Crit W.S. (ft)                      Flow Area (sq ft)         2919.34     267.34    1139.97
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)              2919.34     267.34    1139.97
  Q Total (cfs)              72.50    Flow (cfs)                  45.98       4.53      21.99
  Top Width (ft)            840.00    Top Width (ft)             624.61      40.65     174.74
  Vel Total (ft/s)            0.02    Avg. Vel. (ft/s)            0.02       0.02       0.02
  Max Chl Dpth (ft)           7.62    Hydr. Depth (ft)            4.67       6.58       6.52
  Conv. Total (cfs)       634998.3    Conv. (cfs)             402705.9    39692.1   192600.2
  Length Wtd. (ft)          687.43    Wetted Per. (ft)           628.12      40.88     180.95
  Min Ch El (ft)           2367.43    Shear (lb/sq ft)            0.00       0.00       0.00
  Alpha                       1.03    Stream Power (lb/ft s)      0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       99.38      12.25      22.08
  C & E Loss (ft)                     Cum SA (acres)             17.46       1.94       3.72


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 15.5*

INPUT
Description:
Station Elevation Data     num=      89
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  446.69 2380.01  451.86 2379.78   452.5 2379.68  463.44 2378.21  468.24 2377.41
  475.43 2376.02  479.69 2374.26   483.9  2374.2  485.97 2374.65  487.56 2375.14
  490.62 2375.14  491.83 2374.63  493.27 2374.16  497.22 2373.11  506.43 2372.38
  507.37 2372.38  511.05 2371.86  525.14 2373.42  531.81 2373.34  550.73 2372.09
  567.66 2371.21  582.35 2371.55  584.01  2371.5  593.84  2371.2  618.02  2370.9
  632.91  2370.7  651.94 2370.57  685.21 2370.22   713.5 2369.95  718.82 2369.76
  730.89  2369.4  752.41 2369.43   756.3 2369.41  785.84 2369.27  818.72 2369.47
  840.95 2369.46  851.33 2369.45  884.72 2369.72  917.69 2369.87  935.21 2369.88
  950.36 2369.83  983.68 2369.74 1013.94 2368.94 1017.13 2368.86 1035.47 2368.91
  1048.5 2368.63 1081.43 2368.32 1095.54 2368.36 1114.21 2368.47 1148.22 2368.49
 1169.46 2368.81 1205.69 2368.48 1231.89 2368.41 1263.32 2368.23 1271.02 2368.21
 1310.19 2368.64 1317.23 2368.85  1371.6 2368.81 1385.78  2367.2 1389.51  2367.5
 1393.54 2368.01 1407.83 2368.48 1417.54 2371.97    1429 2372.38 1459.69 2373.61
 1483.58 2374.66 1499.95 2375.69 1518.74 2379.31 1532.94 2380.35 1537.46 2380.06
 1539.25 2380.15  1572.6 2381.27 1585.97 2381.52 1614.97 2382.09 1636.63 2382.49
 1676.16 2382.87 1682.59 2382.84 1701.01 2383.05 1710.17 2383.17 1735.21 2384.38
 1743.79 2384.77 1781.43 2385.61 1786.89 2385.64 1826.33 2385.58 1838.64 2385.82
 1868.82 2386.26 1895.83 2385.82 1909.22 2385.62 1954.17  2385.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  446.69     .03  1371.6    .035 1407.83    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1371.6 1407.83            681.4   708.3   710.5              .1       .3

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                  0.030      0.035
  W.S. Elev (ft)           2375.05    Reach Len. (ft)            681.40     708.30     710.50
  Crit W.S. (ft)                      Flow Area (sq ft)         3568.59     255.33
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)              3568.59     255.33
  Q Total (cfs)              72.48    Flow (cfs)                  68.32       4.15
  Top Width (ft)            622.83    Top Width (ft)             586.60      36.23
  Vel Total (ft/s)            0.02    Avg. Vel. (ft/s)            0.02       0.02
  Max Chl Dpth (ft)           7.85    Hydr. Depth (ft)            6.08       7.05
  Conv. Total (cfs)       620754.9    Conv. (cfs)             585178.3    35576.7
  Length Wtd. (ft)          687.64    Wetted Per. (ft)           592.41      42.95
  Min Ch El (ft)           2367.20    Shear (lb/sq ft)            0.00       0.00
  Alpha                       1.00    Stream Power (lb/ft s)      0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       48.64       8.00      12.78
  C & E Loss (ft)                     Cum SA (acres)              7.98       1.31       2.29


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 15

INPUT
Description:
Station Elevation Data     num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2382.4   45.85  2379.2   86.98 2375.87  109.34 2374.35  141.96 2372.69
  209.68  2366.7  246.52    2366  284.87 2365.44  313.99 2364.54  355.62 2364.39
  390.07  2364.3   407.7 2363.95  442.83 2363.73  479.54 2364.98   509.4 2366.23
  535.33  2368.1  547.07 2370.76  555.77 2371.74  567.17 2373.69   578.9 2377.77
  580.14  2380.9  586.46 2383.37  600.47 2384.69  606.79 2384.06  616.18 2385.33
  639.64  2385.8  665.27 2385.02  675.52 2383.39  684.67 2385.46  717.31 2384.95
  725.19  2388.3  740.12 2386.04  756.24 2385.74  757.89  2382.4  774.13  2382.2
  784.13  2389.3  805.49 2389.04  818.09 2386.13  827.42 2385.42  857.01 2380.04
     870  2377.3  877.69  2373.8  885.29 2373.69  889.03 2374.61   891.9  2375.6
  897.44  2375.6  898.83 2374.89  905.75 2372.88  919.09 2373.06  937.94 2369.52
  945.66  2370.3   951.7 2369.63  972.24 2368.79 1014.61 2368.18 1023.75 2367.17
 1037.11  2367.3 1081.61 2367.89 1131.16 2368.36 1172.55 2368.06 1215.45 2368.04
 1254.31  2368.4 1271.54 2366.97 1286.12 2367.99 1314.83 2368.06 1357.71 2367.96
 1400.64     2369 1434.98 2371.03 1472.14 2373.31 1518.28 2374.88 1564.48  2377.4
  1608.6  2380.1 1629.19 2386.22 1644.75 2387.47  1649.7 2386.63 1688.21    2388
 1734.65  2388.4  1801.7 2388.82 1828.94 2388.26 1838.98 2388.08 1875.82  2389.8
 1923.05     2390 1966.28 2389.53 2012.84  2390.8 2057.11 2389.48 2106.38 2388.91

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  284.87    .035   509.4     .03 1254.31    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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```
      1254.31 1286.12              100   144.9  150.67              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
      0    1004    2385       F
   1550 2106.38    2385       F
Left Levee      Station=  784.13      Elevation=  2389.3

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.035
  W.S. Elev (ft)           2375.05    Reach Len. (ft)          100.00     144.90     150.67
  Crit W.S. (ft)                      Flow Area (sq ft)       1618.73     237.33     978.23
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)            1618.73     237.33     978.23
  Q Total (cfs)              72.46    Flow (cfs)                44.75       5.96      21.75
  Top Width (ft)            415.00    Top Width (ft)           229.31      31.81     153.88
  Vel Total (ft/s)            0.03    Avg. Vel. (ft/s)           0.03       0.03       0.02
  Max Chl Dpth (ft)           8.08    Hydr. Depth (ft)           7.06       7.46       6.36
  Conv. Total (cfs)       467087.5    Conv. (cfs)           288468.7    38396.4   140222.5
  Length Wtd. (ft)          120.00    Wetted Per. (ft)         237.19      31.90     157.68
  Min Ch El (ft)           2366.97    Shear (lb/sq ft)           0.00       0.00       0.00
  Alpha                       1.03    Stream Power (lb/ft s)     0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       8.07       3.99       4.81
  C & E Loss (ft)                     Cum SA (acres)             1.60       0.76       1.04

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 14.75*

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  811.62  2368.5  862.43 2369.01  919.01 2369.44  966.27 2369.35 1015.25 2369.44
 1023.62 2369.51 1059.63 2369.46 1074.23 2367.18 1077.69 2366.97 1078.57 2367.01
 1098.33 2370.09 1120.22 2369.95 1152.91  2369.6 1175.32 2369.88 1185.63 2370.15
 1211.81 2371.62 1240.14 2373.26 1275.32 2374.47 1310.54  2376.3 1344.17 2378.25
 1359.87  2382.4 1371.73 2383.29 1375.51 2382.75 1404.86 2383.79 1440.27 2384.21
  1440.9 2384.22 1491.38 2384.74 1512.15 2384.47  1519.8 2384.39 1547.89 2385.67
 1583.89 2385.98 1616.85 2385.83 1652.35 2386.85  1686.1 2386.14 1723.66 2385.94

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  811.62     .03 1059.63    .035 1098.33    .037 1723.66    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      1059.63 1098.33              120   144.9  150.67              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  811.62     887    2385       F
    1270 1723.66    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.037
  W.S. Elev (ft)           2375.05    Reach Len. (ft)          120.00     144.90     150.67
  Crit W.S. (ft)                      Flow Area (sq ft)        899.64     261.46     588.89
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)             899.64     261.46     588.89
  Q Total (cfs)              72.47    Flow (cfs)                40.97      11.71      19.79
  Top Width (ft)            320.00    Top Width (ft)           159.63      38.70     121.67
  Vel Total (ft/s)            0.04    Avg. Vel. (ft/s)           0.05       0.04       0.03
  Max Chl Dpth (ft)           8.08    Hydr. Depth (ft)           5.64       6.76       4.84
  Conv. Total (cfs)       243777.1    Conv. (cfs)           137821.1    39384.0    66572.0
  Length Wtd. (ft)          133.56    Wetted Per. (ft)         165.39      39.12     124.69
  Min Ch El (ft)           2366.97    Shear (lb/sq ft)           0.00       0.00       0.00
  Alpha                       1.05    Stream Power (lb/ft s)     0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)       5.17       3.16       2.10
  C & E Loss (ft)                     Cum SA (acres)             1.16       0.64       0.56

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 14.5*

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  643.25 2370.12  706.86 2370.53  759.99 2370.64  815.06 2370.84  824.47  2370.9
  864.94 2370.51  880.22 2367.12  883.83 2366.97  884.97 2367.01  910.54  2372.2
   925.6 2371.84   948.1 2371.25  963.53  2371.1  970.63  2371.3  988.65 2372.21
 1008.15 2373.22 1032.36 2374.06  1056.6 2375.21 1079.75 2376.41 1090.55 2378.59
 1098.71 2379.11 1101.31 2378.86 1121.52 2379.58 1145.89 2380.03 1146.32 2380.04
 1181.07 2380.67 1195.36 2380.68 1200.63  2380.7 1219.96 2381.55 1244.74 2381.97
 1267.42 2382.13 1291.85  2382.9 1315.08 2382.79 1340.93 2382.97

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  643.25     .03  864.94    .035  910.54    .038 1340.93    .038

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       864.94  910.54               70   144.9  150.67              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  643.25     762    2385       F
     995 1340.93    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2375.05    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.00    Wt. n-Val.                0.030      0.035      0.038
  W.S. Elev (ft)           2375.05    Reach Len. (ft)           70.00     144.90     150.67
  Crit W.S. (ft)                      Flow Area (sq ft)        408.76     272.68     274.94
  E.G. Slope (ft/ft)      0.000000    Area (sq ft)             408.76     272.68     274.94
  Q Total (cfs)              72.47    Flow (cfs)                33.15      24.00      15.32
  Top Width (ft)            220.00    Top Width (ft)            94.94      45.60      79.46
```

| | | | | | |
|---|---|---|---|---|---|
| Vel Total (ft/s) | 0.08 | Avg. Vel. (ft/s) | 0.08 | 0.09 | 0.06 |
| Max Chl Dpth (ft) | 8.08 | Hydr. Depth (ft) | 4.31 | 5.98 | 3.46 |
| Conv. Total (cfs) | 113672.8 | Conv. (cfs) | 51995.3 | 37646.5 | 24031.0 |
| Length Wtd. (ft) | 121.66 | Wetted Per. (ft) | 99.32 | 46.50 | 82.27 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.09 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 3.37 | 2.27 | 0.60 |
| C & E Loss (ft) | | Cum SA (acres) | 0.80 | 0.50 | 0.21 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 14.25

INPUT
Description: Survey 14.1
end point of survey deleted and point 470 created by linear interpolation.

Station Elevation Data num= 10

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 470 | 2371.48 | 625.31 | 2372.3 | 670.26 | 2371.57 | 686.21 | 2367.06 | 689.98 | 2366.97 |
| 691.38 | 2367.01 | 722.75 | 2374.3 | 751.74 | 2372.31 | 851.74 | 2375.85 | 958.21 | 2380 |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 470 | .03 | 670.26 | .035 | 722.75 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 670.26 | 722.75 | 49.82 | 50.9 | 50.52 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 470 | 650 | 2385 | F |
| 727 | 958.21 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 49.82 | 50.90 | 50.52 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 67.21 | 271.02 | 2.81 |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 197.09 | 271.02 | 2.81 |
| Q Total (cfs) | 72.46 | Flow (cfs) | 13.01 | 59.31 | 0.14 |
| Top Width (ft) | 121.00 | Top Width (ft) | 65.26 | 52.49 | 3.25 |
| Vel Total (ft/s) | 0.21 | Avg. Vel. (ft/s) | 0.19 | 0.22 | 0.05 |
| Max Chl Dpth (ft) | 8.08 | Hydr. Depth (ft) | 3.32 | 5.16 | 0.86 |
| Conv. Total (cfs) | 41232.4 | Conv. (cfs) | 7404.0 | 33749.1 | 79.3 |
| Length Wtd. (ft) | 50.80 | Wetted Per. (ft) | 20.26 | 53.95 | 4.23 |
| Min Ch El (ft) | 2366.97 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.02 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.89 | 1.37 | 0.12 |
| C & E Loss (ft) | | Cum SA (acres) | 0.68 | 0.34 | 0.07 |

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 14.2

INPUT
Description: Survey 14.2
Reduced data to width of max water surface without floodway encroachments. This was so that the floodway width could be obtained. Encroachments made on the privious wider cross section created erroneous results.
-200 = RR x-sec extended 200' on grade

Station Elevation Data num= 7

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 653.41 | 2373.97 | 689.47 | 2373.25 | 704.82 | 2366.74 | 706.07 | 2366.51 | 707.43 | 2366.36 |
| 719.64 | 2372.9 | 744.6 | 2374.02 | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| 653.41 | .03 | 689.47 | .035 | 719.64 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 689.47 | 719.64 | 43 | 44 | 43.28 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| 653.41 | 688 | 2385 | F |
| 722 | 744.6 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2375.05 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | 0.030 | 0.035 | 0.040 |
| W.S. Elev (ft) | 2375.05 | Reach Len. (ft) | 43.00 | 44.00 | 43.28 |
| Crit W.S. (ft) | | Flow Area (sq ft) | 2.62 | 165.99 | 4.95 |
| E.G. Slope (ft/ft) | 0.000012 | Area (sq ft) | 51.89 | 165.99 | 39.66 |
| Q Total (cfs) | 72.46 | Flow (cfs) | 0.66 | 70.77 | 1.03 |
| Top Width (ft) | 91.19 | Top Width (ft) | 36.06 | 30.17 | 24.96 |
| Vel Total (ft/s) | 0.42 | Avg. Vel. (ft/s) | 0.25 | 0.43 | 0.21 |
| Max Chl Dpth (ft) | 8.69 | Hydr. Depth (ft) | 1.78 | 5.50 | 2.10 |
| Conv. Total (cfs) | 21112.3 | Conv. (cfs) | 191.1 | 20620.4 | 300.8 |
| Length Wtd. (ft) | 44.00 | Wetted Per. (ft) | 1.47 | 33.16 | 2.36 |
| Min Ch El (ft) | 2366.36 | Shear (lb/sq ft) | 0.00 | 0.00 | 0.00 |
| Alpha | 1.03 | Stream Power (lb/ft s) | 0.00 | 0.00 | 0.00 |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | 2.74 | 1.11 | 0.10 |
| C & E Loss (ft) | | Cum SA (acres) | 0.62 | 0.29 | 0.05 |

CULVERT

RIVER: Minnie Cr
REACH: Upper RS: 14.01

INPUT
Description:

```
Distance from Upstream XS =       2
Deck/Roadway Width        =    40.5
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -200 2375.28                0 2375.32           44.99 2375.33
   92.51 2375.38           139.18 2375.48          188.77 2375.55
  234.46  2375.6           283.59  2375.7          330.27 2375.77
  378.75 2375.83           425.79 2375.94          473.19     2376
  520.84  2376.2           568.13 2376.27          615.45  2376.3
  662.56 2376.34           709.56  2376.4          754.64 2376.41
  782.31 2376.78           799.87 2376.67          808.75 2376.77
  826.65  2376.7           847.68 2376.71          856.34 2376.87
  871.28 2377.07           894.13 2377.01          903.97     2377
  951.07 2377.14           987.52 2377.25         1029.32 2377.37
 1034.24 2377.38          1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97          1226.53  2378.2         1276.96 2378.67
    1324    2379          1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87          1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5          1726.47  2380.5

Upstream Bridge Cross Section Data
Station Elevation Data     num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  653.41 2373.97  689.47 2373.25  704.82 2366.74  706.07 2366.51  707.43 2366.36
  719.64  2372.9   744.6 2374.02

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  653.41     .03  689.47    .035  719.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        689.47  719.64            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  653.41     688    2385       F
     722   744.6    2385       F

Downstream  Deck/Roadway Coordinates
    num=      44
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -200 2375.28                0 2375.32           44.99 2375.33
   92.51 2375.38           139.18 2375.48          188.77 2375.55
  234.46  2375.6           283.59  2375.7          330.27 2375.77
  378.75 2375.83           425.79 2375.94          473.19     2376
  520.84  2376.2           568.13 2376.27          615.45  2376.3
  662.56 2376.34           709.56  2376.4          754.64 2376.41
  782.31 2376.78           799.87 2376.67          808.75 2376.77
  826.65  2376.7           847.68 2376.71          856.34 2376.87
  871.28 2377.07           894.13 2377.01          903.97     2377
  951.07 2377.14           987.52 2377.25         1029.32 2377.37
 1034.24 2377.38          1081.42  2377.4         1129.26 2377.78
 1176.62 2377.97          1226.53  2378.2         1276.96 2378.67
    1324    2379          1370.05 2379.34         1416.97 2379.59
 1465.43 2379.87          1511.88 2380.11         1558.69  2380.3
 1605.16  2380.5          1726.47  2380.5

Downstream Bridge Cross Section Data
Station Elevation Data     num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -435.46 2380.04       7  2373.3   51.99 2373.33   99.51 2373.38  146.18 2373.48
  195.77 2373.55  241.46  2373.6  290.59  2373.7  337.27 2373.77  385.75 2373.83
  432.79 2373.94  480.19    2374  527.84  2374.2  575.13 2374.27  622.45  2374.3
  648.61  2374.2  696.47 2373.25  711.82 2366.74  713.07 2366.51  714.43 2366.36
  726.64  2372.9  756.85 2374.25  761.64 2374.41  789.31 2374.78  806.87 2374.67
  815.75 2374.77  833.65  2374.7  854.68 2374.71  863.34 2374.87  878.28 2375.07
  901.13 2375.01  910.97    2375  958.07 2375.14  994.52 2375.25 1036.32 2375.37
 1041.24 2375.38 1088.42  2375.4 1136.26 2375.78 1183.62 2375.97 1233.53  2376.2
 1283.96 2376.67    1331    2377 1377.05 2377.34 1423.97 2377.59 1472.43 2377.87
 1518.88 2378.11 1565.69  2378.3 1612.16  2378.5 1726.47    2380

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -435.46     .03  696.47    .035  726.64     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        696.47  726.64            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -435.46     607    2385       F
     816 1726.47    2385       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@14         Circular     3.2
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  2    40.5     .011     .011        0                  .5                  1
Upstream   Elevation =  2367.4
           Centerline Station =  705.8
Downstream Elevation =  2366.8
           Centerline Station =  713.7

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@14

  Q Culv Group (cfs)         72.46    Culv Full Len (ft)         40.50
  # Barrels                      1    Culv Vel US (ft/s)          9.01
  Q Barrel (cfs)             72.46    Culv Vel DS (ft/s)          9.01
  E.G. US. (ft)            2374.97    Culv Inv El Up (ft)      2367.40
  W.S. US. (ft)            2375.05    Culv Inv El Dn (ft)      2366.80
  E.G. DS (ft)             2372.84    Culv Frctn Ls (ft)          0.24
  W.S. DS (ft)             2372.83    Culv Exit Loss (ft)         1.25
  Delta EG (ft)               2.13    Culv Entr Loss (ft)         0.63
  Delta WS (ft)               2.22    Q Weir (cfs)
  E.G. IC (ft)             2372.16    Weir Sta Lft (ft)
  E.G. OC (ft)             2374.97    Weir Sta Rgt (ft)
```

| | | | |
|---|---|---|---|
| Culvert Control | Outlet | Weir Submerg | |
| Culv WS Inlet (ft) | 2370.60 | Weir Max Depth (ft) | |
| Culv WS Outlet (ft) | 2370.00 | Weir Avg Depth (ft) | |
| Culv Nml Depth (ft) | | Weir Flow Area (sq ft) | |
| Culv Crt Depth (ft) | 2.70 | Min El Weir Flow (ft) | 2376.38 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 13.98

INPUT
Description: -435.46 = point # 892 on section 15
Station Elevation Data num= 49

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -435.46 | 2380.04 | 7 | 2373.3 | 51.99 | 2373.33 | 99.51 | 2373.38 | 146.18 | 2373.48 |
| 195.77 | 2373.55 | 241.46 | 2373.6 | 290.59 | 2373.7 | 337.27 | 2373.77 | 385.75 | 2373.83 |
| 432.79 | 2373.94 | 480.19 | 2374 | 527.84 | 2374.2 | 575.13 | 2374.27 | 622.45 | 2374.3 |
| 648.61 | 2374.2 | 696.47 | 2373.25 | 711.82 | 2366.74 | 713.07 | 2366.51 | 714.43 | 2366.36 |
| 726.64 | 2372.9 | 756.85 | 2374.25 | 761.64 | 2374.41 | 789.31 | 2374.78 | 806.87 | 2374.67 |
| 815.75 | 2374.77 | 833.65 | 2374.7 | 854.68 | 2374.71 | 863.34 | 2374.87 | 878.28 | 2375.07 |
| 901.13 | 2375.01 | 910.97 | 2375 | 958.07 | 2375.14 | 994.52 | 2375.25 | 1036.32 | 2375.37 |
| 1041.24 | 2375.38 | 1088.42 | 2375.4 | 1136.26 | 2375.78 | 1183.62 | 2375.97 | 1233.53 | 2376.2 |
| 1283.96 | 2376.67 | 1331 | 2377 | 1377.05 | 2377.34 | 1423.97 | 2377.59 | 1472.43 | 2377.87 |
| 1518.88 | 2378.11 | 1565.69 | 2378.3 | 1612.16 | 2378.5 | 1726.47 | 2380 | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -435.46 | .03 | 696.47 | .035 | 726.64 | .04 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 696.47 | 726.64 | 91.58 | 80 | 73.15 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -435.46 | 607 | 2385 | F |
| 816 | 1726.47 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.01 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2372.83 | Reach Len. (ft) | 91.58 | 80.00 | 73.15 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 99.31 | |
| E.G. Slope (ft/ft) | 0.000065 | Area (sq ft) | | 99.31 | |
| Q Total (cfs) | 72.45 | Flow (cfs) | | 72.45 | |
| Top Width (ft) | 29.06 | Top Width (ft) | | 29.06 | |
| Vel Total (ft/s) | 0.73 | Avg. Vel. (ft/s) | | 0.73 | |
| Max Chl Dpth (ft) | 6.47 | Hydr. Depth (ft) | | 3.42 | |
| Conv. Total (cfs) | 8980.6 | Conv. (cfs) | | 8980.6 | |
| Length Wtd. (ft) | 80.00 | Wetted Per. (ft) | | 31.95 | |
| Min Ch El (ft) | 2366.36 | Shear (lb/sq ft) | | 0.01 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.01 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.72 | 0.98 | 0.08 |
| C & E Loss (ft) | | Cum SA (acres) | 0.60 | 0.26 | 0.04 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 13.9

INPUT
Description: Survey 14.3
Station Elevation Data num= 13

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| -489.62 | 2386.13 | -175.09 | 2380 | 0 | 2374.5 | 27.65 | 2375.82 | 39.43 | 2374.49 |
| 59.56 | 2367.32 | 63.82 | 2366.93 | 66.64 | 2367 | 74.66 | 2370.43 | 78.26 | 2370.63 |
| 92.6 | 2373.98 | 131.29 | 2375.49 | 155.75 | 2380 | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|
| -489.62 | .04 | 39.43 | .035 | 92.6 | .045 |

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 39.43 | 92.6 | 35.2 | 45.1 | 51.9 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -489.62 | 2 | 2385 | F |
| 130 | 155.75 | 2385 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | | | |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.84 | Element | Left OB | Channel | Right OB |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.035 | |
| W.S. Elev (ft) | 2372.83 | Reach Len. (ft) | 35.20 | 45.10 | 51.90 |
| Crit W.S. (ft) | | Flow Area (sq ft) | | 135.15 | |
| E.G. Slope (ft/ft) | 0.000037 | Area (sq ft) | | 135.15 | |
| Q Total (cfs) | 72.46 | Flow (cfs) | | 72.46 | |
| Top Width (ft) | 43.59 | Top Width (ft) | | 43.59 | |
| Vel Total (ft/s) | 0.54 | Avg. Vel. (ft/s) | | 0.54 | |
| Max Chl Dpth (ft) | 5.90 | Hydr. Depth (ft) | | 3.10 | |
| Conv. Total (cfs) | 11851.4 | Conv. (cfs) | | 11851.4 | |
| Length Wtd. (ft) | 44.88 | Wetted Per. (ft) | | 45.53 | |
| Min Ch El (ft) | 2366.93 | Shear (lb/sq ft) | | 0.01 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.00 | |
| Frctn Loss (ft) | 0.00 | Cum Volume (acre-ft) | 2.72 | 0.77 | 0.08 |
| C & E Loss (ft) | | Cum SA (acres) | 0.60 | 0.19 | 0.04 |

CROSS SECTION

RIVER: Minnie Cr
REACH: Upper RS: 13.25

INPUT
Description: Survey 13.1
Station Elevation Data num= 11

| Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev | Sta | Elev |
|---|---|---|---|---|---|---|---|---|---|
| 32.92 | 2389.25 | 324.35 | 2380 | 541.99 | 2373.5 | 569.03 | 2374.12 | 589.95 | 2370.64 |
| 602.58 | 2367.39 | 606.53 | 2366.71 | 608.7 | 2367 | 617.89 | 2372.08 | 669.28 | 2375.78 |
| 722.24 | 2380 | | | | | | | | |

Manning's n Values num= 3

| Sta | n Val | Sta | n Val | Sta | n Val |
|---|---|---|---|---|---|

```
   32.92     .04  589.95    .035  617.89     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        589.95  617.89            45.81    48.1   46.76             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   32.92     562    2385       F
     644  722.24    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2372.84    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                  0.040      0.035      0.040
  W.S. Elev (ft)           2372.83    Reach Len. (ft)             45.81      48.10      46.76
  Crit W.S. (ft)                      Flow Area (sq ft)           12.15     114.19       0.08
  E.G. Slope (ft/ft)      0.000034    Area (sq ft)                12.15     114.19       0.08
  Q Total (cfs)              72.46    Flow (cfs)                   3.23      69.23       0.00
  Top Width (ft)             36.00    Top Width (ft)               7.95      27.94       0.11
  Vel Total (ft/s)            0.57    Avg. Vel. (ft/s)             0.27       0.61       0.05
  Max Chl Dpth (ft)           6.12    Hydr. Depth (ft)             1.53       4.09       0.75
  Conv. Total (cfs)        12442.4    Conv. (cfs)                 554.2    11887.6        0.6
  Length Wtd. (ft)           48.05    Wetted Per. (ft)             8.93      29.74       0.85
  Min Ch El (ft)           2366.71    Shear (lb/sq ft)             0.00       0.01       0.00
  Alpha                       1.08    Stream Power (lb/ft s)       0.00       0.00       0.00
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)         2.71       0.64       0.08
  C & E Loss (ft)                     Cum SA (acres)               0.60       0.16       0.04


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 13.2

INPUT
Description: Survey 13.2
Station Elevation Data    num=      10
     Sta     Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.55 2386.04  283.21    2380  526.11  2373.7  586.88 2373.56  603.27    2366
   605.2  2365.6  607.08    2366  620.73    2375   658.9 2376.32  702.61    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8.55    .035  586.88    .035  620.73     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        586.88  620.73           136.18     136  136.18             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.55  586.88    2385       F
  620.73  702.61    2385       F

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)           2372.83    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.01    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2372.83    Reach Len. (ft)            136.18     136.00     136.18
  Crit W.S. (ft)                      Flow Area (sq ft)                     112.61
  E.G. Slope (ft/ft)      0.000044    Area (sq ft)                          112.61
  Q Total (cfs)              72.46    Flow (cfs)                             72.46
  Top Width (ft)             28.96    Top Width (ft)                         28.96
  Vel Total (ft/s)            0.64    Avg. Vel. (ft/s)                        0.64
  Max Chl Dpth (ft)           7.23    Hydr. Depth (ft)                        3.89
  Conv. Total (cfs)        10926.6    Conv. (cfs)                          10926.6
  Length Wtd. (ft)          136.00    Wetted Per. (ft)                       32.59
  Min Ch El (ft)           2365.60    Shear (lb/sq ft)                        0.01
  Alpha                       1.00    Stream Power (lb/ft s)                  0.01
  Frctn Loss (ft)                     Cum Volume (acre-ft)         2.71       0.51       0.08
  C & E Loss (ft)                     Cum SA (acres)               0.59       0.13       0.04


CULVERT


RIVER: Minnie Cr
REACH: Upper              RS: 13.01

INPUT
Description:
Distance from Upstream XS =       .2
Deck/Roadway Width        =    134.2
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=      25
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8.12 2384.66           48.84 2384.46           98.68    2384
  146.46 2383.67          196.58  2383.2          244.93 2382.78
  293.89 2382.31          344.44  2381.7          393.51 2381.16
  444.16  2380.8          493.71 2380.57          543.54 2380.38
   591.6 2380.19           624.5 2380.24           668.9  2380.5
  717.31 2380.75           746.6 2380.94           795.8 2381.05
  845.73  2381.1           894.9 2381.08          939.79 2380.87
  988.28  2380.7         1037.77  2380.7         1087.36 2380.53
  1136.9 2380.13

Upstream Bridge Cross Section Data
Station Elevation Data    num=      10
     Sta     Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8.55 2386.04  283.21    2380  526.11  2373.7  586.88 2373.56  603.27    2366
   605.2  2365.6  607.08    2366  620.73    2375   658.9 2376.32  702.61    2380

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8.55    .035  586.88    .035  620.73     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        586.88  620.73            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.55  586.88    2385       F
  620.73  702.61    2385       F

Downstream  Deck/Roadway Coordinates
    num=      25
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    8.12 2384.66           48.84 2384.46           98.68    2384
  146.46 2383.67          196.58  2383.2          244.93 2382.78
  293.89 2382.31          344.44  2381.7          393.51 2381.16
```

```
  444.16  2380.8          493.71 2380.57          543.54 2380.38
   591.6 2380.19           624.5 2380.24           668.9  2380.5
  717.31 2380.75           746.6 2380.94           795.8 2381.05
  845.73  2381.1           894.9 2381.08          939.79 2380.87
  988.28  2380.7          1037.77  2380.7         1087.36 2380.53
  1136.9 2380.13

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        568.48  602.33            .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
culv@13        Circular     4.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              .2   134.2     .011     .011        0                  .5                  1
Upstream   Elevation =  2365.7
           Centerline Station =  605.2
Downstream Elevation =  2364.9
           Centerline Station =  586.8

CULVERT OUTPUT  Profile #Max WS  Culv Group:  culv@13

  Q Culv Group (cfs)         72.46    Culv Full Len (ft)        134.20
  # Barrels                      1    Culv Vel US (ft/s)          4.56
  Q Barrel (cfs)             72.46    Culv Vel DS (ft/s)          4.56
  E.G. US. (ft)           2372.82    Culv Inv El Up (ft)      2365.70
  W.S. US. (ft)           2372.83    Culv Inv El Dn (ft)      2364.90
  E.G. DS (ft)            2372.21    Culv Frctn Ls (ft)          0.13
  W.S. DS (ft)            2372.20    Culv Exit Loss (ft)         0.32
  Delta EG (ft)              0.61    Culv Entr Loss (ft)         0.16
  Delta WS (ft)              0.62    Q Weir (cfs)
  E.G. IC (ft)            2369.27    Weir Sta Lft (ft)
  E.G. OC (ft)            2372.82    Weir Sta Rgt (ft)
  Culvert Control          Outlet    Weir Submerg
  Culv WS Inlet (ft)      2370.20    Weir Max Depth (ft)
  Culv WS Outlet (ft)     2369.40    Weir Avg Depth (ft)
  Culv Nml Depth (ft)                Weir Flow Area (sq ft)
  Culv Crt Depth (ft)         2.48   Min El Weir Flow (ft)    2380.20


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 12.98

INPUT
Description: Copy of Section 13.2
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  507.71  2373.7  568.48 2373.56  584.02 2365.56   586.8  2364.8  589.68 2365.56
  602.33    2375  640.82 2376.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  507.71     .04  568.48    .035  602.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        568.48  602.33            62.62    61.2   58.67             .1       .3

CROSS SECTION OUTPUT  Profile #Max WS

  E.G. Elev (ft)          2372.21    Element                    Left OB    Channel   Right OB
  Vel Head (ft)              0.01    Wt. n-Val.                            0.035
  W.S. Elev (ft)          2372.20    Reach Len. (ft)             62.62     61.20      58.67
  Crit W.S. (ft)                     Flow Area (sq ft)                    112.15
  E.G. Slope (ft/ft)      0.000040   Area (sq ft)                         112.15
  Q Total (cfs)             70.31    Flow (cfs)                            70.31
  Top Width (ft)            27.46    Top Width (ft)                        27.46
  Vel Total (ft/s)           0.63    Avg. Vel. (ft/s)                       0.63
  Max Chl Dpth (ft)          7.40    Hydr. Depth (ft)                       4.08
  Conv. Total (cfs)        11106.5   Conv. (cfs)                         11106.5
  Length Wtd. (ft)           61.20   Wetted Per. (ft)                      31.48
  Min Ch El (ft)          2364.80    Shear (lb/sq ft)                       0.01
  Alpha                      1.00    Stream Power (lb/ft s)                 0.01
  Frctn Loss (ft)            0.00    Cum Volume (acre-ft)         2.71      0.16       0.08
  C & E Loss (ft)                    Cum SA (acres)               0.59      0.04       0.04


CROSS SECTION


RIVER: Minnie Cr
REACH: Upper              RS: 12.9

INPUT
Description: Survey 13.3
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -468.15     2380  -80.78 2366.23   532.9    2368  552.85 2368.71  576.34 2370.05
  587.39 2366.87  592.08 2366.51  596.24    2367   603.6 2370.22  617.72 2372.01
  630.09 2368.24  635.91 2369.38  646.49  2369.3  665.33 2372.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -468.15     .04  576.34     .04   603.6    .045
```

| Bank Sta: Left | Right | Lengths: Left | Channel | Right | Coeff Contr. | Expan. |
|---|---|---|---|---|---|---|
| 576.34 | 603.6 | 0 | 0 | 0 | .1 | .3 |

Ineffective Flow num= 2

| Sta L | Sta R | Elev | Permanent |
|---|---|---|---|
| -468.15 | 576.34 | 2378 | F |
| 603.6 | 665.33 | 2378 | F |

CROSS SECTION OUTPUT Profile #Max WS

| | | | Left OB | Channel | Right OB |
|---|---|---|---|---|---|
| E.G. Elev (ft) | 2372.20 | Element | | | |
| Vel Head (ft) | 0.00 | Wt. n-Val. | | 0.040 | |
| W.S. Elev (ft) | 2372.20 | Reach Len. (ft) | | | |
| Crit W.S. (ft) | 2367.26 | Flow Area (sq ft) | | 116.24 | |
| E.G. Slope (ft/ft) | 0.000003 | Area (sq ft) | 3764.80 | 116.24 | 113.67 |
| Q Total (cfs) | 19.83 | Flow (cfs) | | 19.83 | |
| Top Width (ft) | 910.87 | Top Width (ft) | 825.06 | 27.26 | 58.54 |
| Vel Total (ft/s) | 0.17 | Avg. Vel. (ft/s) | | 0.17 | |
| Max Chl Dpth (ft) | 5.97 | Hydr. Depth (ft) | | 4.26 | |
| Conv. Total (cfs) | 11042.4 | Conv. (cfs) | | 11042.4 | |
| Length Wtd. (ft) | | Wetted Per. (ft) | | 28.42 | |
| Min Ch El (ft) | 2366.51 | Shear (lb/sq ft) | | 0.00 | |
| Alpha | 1.00 | Stream Power (lb/ft s) | | 0.00 | |
| Frctn Loss (ft) | | Cum Volume (acre-ft) | | | |
| C & E Loss (ft) | | Cum SA (acres) | | | |

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Minnie Cr

| Reach | River Sta. | n1 | n2 | n3 | n4 | n5 | n6 | n7 | n8 |
|---|---|---|---|---|---|---|---|---|---|
| Upper | 23 | .03 | .035 | .03 | | | | | |
| Upper | 22.75* | .03 | .038 | .03 | | | | | |
| Upper | 22.5* | .03 | .04 | .03 | | | | | |
| Upper | 22.25* | .03 | .043 | .03 | | | | | |
| Upper | 22 | .03 | .045 | .03 | | | | | |
| Upper | 21 | .035 | .045 | .05 | | | | | |
| Upper | 20.75* | .034 | .031 | .034 | .045 | .032 | .05 | .05 | .05 |
| Upper | 20.5* | .032 | .032 | .032 | .045 | .035 | .05 | .05 | .05 |
| Upper | 20.25* | .031 | .045 | .03 | .037 | .05 | .05 | .05 | |
| Upper | 20 | .03 | .045 | .035 | .03 | .04 | .05 | | |
| Upper | 19 | .03 | .035 | .03 | | | | | |
| Upper | 18.25 | .03 | .035 | .03 | | | | | |
| Upper | 18.2 | .03 | .035 | .03 | | | | | |
| Upper | 18.01 | Culvert | | | | | | | |
| Upper | 17.98 | .03 | .035 | .03 | | | | | |
| Upper | 17.97 | Lat Struct | | | | | | | |
| Upper | 17.9 | .03 | .035 | .03 | | | | | |
| Upper | 17.6* | .03 | .035 | .03 | | | | | |
| Upper | 17.3* | .03 | .035 | .03 | | | | | |
| Upper | 17 | .03 | .035 | .03 | | | | | |
| Upper | 16.5* | .03 | .035 | .03 | .04 | .04 | | | |
| Upper | 16 | .03 | .035 | .03 | .05 | | | | |
| Upper | 15.5* | .03 | .035 | .035 | | | | | |
| Upper | 15 | .04 | .035 | .03 | .035 | | | | |
| Upper | 14.75* | .03 | .035 | .037 | .037 | | | | |
| Upper | 14.5* | .03 | .035 | .038 | .038 | | | | |
| Upper | 14.25 | .03 | .035 | .04 | | | | | |
| Upper | 14.2 | .03 | .035 | .04 | | | | | |
| Upper | 14.01 | Culvert | | | | | | | |
| Upper | 13.98 | .03 | .035 | .04 | | | | | |
| Upper | 13.9 | .04 | .035 | .045 | | | | | |
| Upper | 13.25 | .04 | .035 | .04 | | | | | |
| Upper | 13.2 | .035 | .035 | .04 | | | | | |
| Upper | 13.01 | Culvert | | | | | | | |
| Upper | 12.98 | .04 | .035 | .04 | | | | | |
| Upper | 12.9 | .04 | .04 | .045 | | | | | |

SUMMARY OF REACH LENGTHS

River: Minnie Cr

| Reach | River Sta. | Left | Channel | Right |
|---|---|---|---|---|
| Upper | 23 | 333.75 | 243.9 | 279.24 |
| Upper | 22.75* | 333.75 | 243.9 | 279.24 |
| Upper | 22.5* | 333.75 | 243.9 | 279.24 |
| Upper | 22.25* | 333.75 | 243.9 | 279.24 |
| Upper | 22 | 2241 | 2146.6 | 2331 |
| Upper | 21 | 473 | 459.55 | 487.5 |
| Upper | 20.75* | 473 | 459.55 | 487.5 |
| Upper | 20.5* | 473 | 459.55 | 487.5 |
| Upper | 20.25* | 473 | 459.55 | 487.5 |
| Upper | 20 | 891 | 901.5 | 1024 |
| Upper | 19 | 828.4 | 847.3 | 759 |
| Upper | 18.25 | 330 | 85.7 | 76.3 |
| Upper | 18.2 | 44.3 | 52.9 | 53 |
| Upper | 18.01 | Culvert | | |
| Upper | 17.98 | 88.4 | 116.9 | 116.8 |
| Upper | 17.97 | Lat Struct | | |
| Upper | 17.9 | 332.83 | 397.43 | 395.67 |
| Upper | 17.6* | 332.83 | 397.43 | 395.67 |
| Upper | 17.3* | 332.83 | 397.43 | 395.67 |
| Upper | 17 | 521.8 | 598.55 | 598 |
| Upper | 16.5* | 521.8 | 598.55 | 598 |
| Upper | 16 | 681.4 | 708.3 | 710.5 |
| Upper | 15.5* | 681.4 | 708.3 | 710.5 |
| Upper | 15 | 100 | 144.9 | 150.67 |
| Upper | 14.75* | 120 | 144.9 | 150.67 |
| Upper | 14.5* | 70 | 144.9 | 150.67 |
| Upper | 14.25 | 49.82 | 50.9 | 50.52 |
| Upper | 14.2 | 43 | 44 | 43.28 |
| Upper | 14.01 | Culvert | | |
| Upper | 13.98 | 91.58 | 80 | 73.15 |
| Upper | 13.9 | 35.2 | 45.1 | 51.9 |
| Upper | 13.25 | 45.81 | 48.1 | 46.76 |
| Upper | 13.2 | 136.18 | 136 | 136.18 |
| Upper | 13.01 | Culvert | | |

| | | | | |
|---|---|---|---|---|
| Upper | 12.98 | 62.62 | 61.2 | 58.67 |
| Upper | 12.9 | 0 | 0 | 0 |

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Minnie Cr

| Reach | River Sta. | Contr. | Expan. |
|---|---|---|---|
| Upper | 23 | .1 | .3 |
| Upper | 22.75* | .1 | .3 |
| Upper | 22.5* | .1 | .3 |
| Upper | 22.25* | .1 | .3 |
| Upper | 22 | .1 | .3 |
| Upper | 21 | .1 | .3 |
| Upper | 20.75* | .1 | .3 |
| Upper | 20.5* | .1 | .3 |
| Upper | 20.25* | .1 | .3 |
| Upper | 20 | .1 | .3 |
| Upper | 19 | .1 | .3 |
| Upper | 18.25 | .1 | .3 |
| Upper | 18.2 | .1 | .3 |
| Upper | 18.01 | Culvert | |
| Upper | 17.98 | .1 | .3 |
| Upper | 17.97 | Lat Struct | |
| Upper | 17.9 | .1 | .3 |
| Upper | 17.6* | .1 | .3 |
| Upper | 17.3* | .1 | .3 |
| Upper | 17 | .1 | .3 |
| Upper | 16.5* | .1 | .3 |
| Upper | 16 | .1 | .3 |
| Upper | 15.5* | .1 | .3 |
| Upper | 15 | .1 | .3 |
| Upper | 14.75* | .1 | .3 |
| Upper | 14.5* | .1 | .3 |
| Upper | 14.25 | .1 | .3 |
| Upper | 14.2 | .1 | .3 |
| Upper | 14.01 | Culvert | |
| Upper | 13.98 | .1 | .3 |
| Upper | 13.9 | .1 | .3 |
| Upper | 13.25 | .1 | .3 |
| Upper | 13.2 | .1 | .3 |
| Upper | 13.01 | Culvert | |
| Upper | 12.98 | .1 | .3 |
| Upper | 12.9 | .1 | .3 |

Profile Output Table - Floodway Data

| Reach | River Sta | Profile | Cum Ch Len (ft) | Top Wdth Act (ft) | Area (sq ft) | Vel Chnl (ft/s) | W.S. Elev (ft) | W.S. Elev (ft) | W.S. Elev (ft) | Length Chnl (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Upper | 12.9 | Max WS | | 27.26 | 3994.71 | 0.17 | 2372.20 | 2372.20 | 2372.20 | |
| Upper | 12.98 | Max WS | 61.20 | 27.46 | 112.15 | 0.63 | 2372.20 | 2372.20 | 2372.20 | 61.20 |
| Upper | 13.01 | | Culvert | | | | | | | |
| Upper | 13.2 | Max WS | 197.20 | 28.96 | 112.61 | 0.64 | 2372.83 | 2372.83 | 2372.83 | 136.00 |
| Upper | 13.25 | Max WS | 245.30 | 36.00 | 126.42 | 0.61 | 2372.83 | 2372.83 | 2372.83 | 48.10 |
| Upper | 13.9 | Max WS | 290.40 | 43.59 | 135.15 | 0.54 | 2372.83 | 2372.83 | 2372.83 | 45.10 |
| Upper | 13.98 | Max WS | 370.40 | 29.06 | 99.31 | 0.73 | 2372.83 | 2372.83 | 2372.83 | 80.00 |
| Upper | 14.01 | | Culvert | | | | | | | |
| Upper | 14.2 | Max WS | 414.40 | 34.00 | 257.55 | 0.43 | 2375.05 | 2375.05 | 2375.05 | 44.00 |
| Upper | 14.25 | Max WS | 465.30 | 76.00 | 470.92 | 0.22 | 2375.05 | 2375.05 | 2375.05 | 50.90 |
| Upper | 14.5* | Max WS | 610.20 | 220.00 | 956.37 | 0.09 | 2375.05 | 2375.05 | 2375.05 | 144.90 |
| Upper | 14.75* | Max WS | 755.10 | 320.00 | 1749.98 | 0.04 | 2375.05 | 2375.05 | 2375.05 | 144.90 |
| Upper | 15 | Max WS | 900.00 | 415.00 | 2834.29 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 144.90 |
| Upper | 15.5* | Max WS | 1608.30 | 622.83 | 3823.92 | 0.02 | 2375.05 | 2375.05 | 2375.05 | 708.30 |
| Upper | 16 | Max WS | 2316.60 | 840.00 | 4326.65 | 0.02 | 2375.05 | 2375.05 | 2375.05 | 708.30 |
| Upper | 16.5* | Max WS | 2915.15 | 920.00 | 5286.18 | 0.01 | 2375.05 | 2375.05 | 2375.05 | 598.55 |
| Upper | 17 | Max WS | 3513.70 | 1010.00 | 6177.53 | 0.01 | 2375.05 | 2375.05 | 2375.05 | 598.55 |
| Upper | 17.3* | Max WS | 3911.13 | 920.00 | 4900.25 | 0.01 | 2375.05 | 2375.05 | 2375.05 | 397.43 |
| Upper | 17.6* | Max WS | 4308.56 | 790.00 | 3653.51 | 0.02 | 2375.05 | 2375.05 | 2375.05 | 397.43 |
| Upper | 17.9 | Max WS | 4705.99 | 660.00 | 2761.31 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 397.43 |
| Upper | 17.97 | | Lat Struct | | | | | | | |
| Upper | 17.98 | Max WS | 4822.89 | 660.00 | 2716.85 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 116.90 |
| Upper | 18.01 | | Culvert | | | | | | | |
| Upper | 18.2 | Max WS | 4875.79 | 660.00 | 2835.56 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 52.90 |
| Upper | 18.25 | Max WS | 4961.49 | 670.00 | 2229.19 | 0.04 | 2375.05 | 2375.05 | 2375.05 | 85.70 |
| Upper | 19 | Max WS | 5808.79 | 680.00 | 1930.60 | 0.04 | 2375.05 | 2375.05 | 2375.05 | 847.30 |
| Upper | 20 | Max WS | 6710.29 | 635.52 | 2098.50 | 0.05 | 2375.05 | 2375.05 | 2375.05 | 901.50 |
| Upper | 20.25* | Max WS | 7169.84 | 729.40 | 2548.43 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 459.55 |
| Upper | 20.5* | Max WS | 7629.39 | 637.62 | 2413.79 | 0.04 | 2375.05 | 2375.05 | 2375.05 | 459.55 |
| Upper | 20.75* | Max WS | 8088.94 | 786.40 | 3494.61 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 459.55 |
| Upper | 21 | Max WS | 8548.49 | 967.82 | 4888.30 | 0.02 | 2375.05 | 2375.05 | 2375.05 | 459.55 |
| Upper | 22 | Max WS | 10695.09 | 837.05 | 4470.45 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 2146.60 |
| Upper | 22.25* | Max WS | 10938.99 | 900.05 | 3612.37 | 0.03 | 2375.05 | 2375.05 | 2375.05 | 243.90 |
| Upper | 22.5* | Max WS | 11182.89 | 490.23 | 2326.30 | 0.05 | 2375.05 | 2375.05 | 2375.05 | 243.90 |
| Upper | 22.75* | Max WS | 11426.79 | 454.30 | 1227.13 | 0.06 | 2375.05 | 2375.05 | 2375.05 | 243.90 |
| Upper | 23 | Max WS | 11670.69 | 416.42 | 879.54 | 0.07 | 2375.05 | 2375.05 | 2375.05 | 243.90 |