WITTMANN PHASE 2 ZONE AE FLOODPLAIN DELINEATION STUDY

CONTRACT FCD 2004C066

TECHNICAL DATA NOTEBOOK

Volume 2 of 2

(Appendix E.2 through Exhibit B)

July 2006

Revised October 2006

Prepared for:
Federal Emergency Management Agency
Risk Studies Division
Federal Insurance Administration
500 C Street, SW Room 422
Washington, DC 20472

Submitted by:

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In association with:

Primatech, LLC
1295 W. Washington Street, Suite 115
Tempe, Arizona 85281

on behalf of:

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009
(602) 506-1501

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CERTIFICATE NO.
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ADDENDUM TO WITTMANN PHASE 2 ZONE AE FLOODPLAIN DELINEATION STUDY CONTRACT FCD 2004C066 REVISED APRIL 2007

This addendum is prepared in April 2007. A field investigation during the FCDMC review process near River Mile 1.0 on Wash T4N-R3W-S09 determined that the bank stations should be revised to be closer to the main low flow channel. Refer to the below excerpt from the Technical Data Notebook (TDN). This bank station revision allowed the floodway to be narrowed slightly between River Mile 1.013 and 1.302. This revision affects workmap Sheets E14 and E15. The floodplains prepared by Hernan Aristizabal, P.E. appearing on Sheets E14 and E15 are not affected by this revision but are resealed with the new date. The revision affects data contained in the TDN. Floodplain delineations prepared by George Lopez-Cepero, P.E. are unaffected by this revision.

Excerpt from Page 5.7

5.7 Problems Encountered During the Study

5.7.1 Special Problems and Solutions

Bank Stations

The bank stations are initially set to define the channel, which is the width of the heavy vegetation as viewed from the aerial photography within reasonable geometric locations, since a low flow channel is not very well defined for each wash. The result of the initial bank station placement was very wide channels with very little flow in the overbanks. While this was not an issue for the natural floodplain mapping this presented a problem for the floodway modeling, the result was a very wide floodway with very little rise in the water surface elevations. The solution is to use a horizontal variation in 'n'-values and then move the bank stations inward to narrow the channel as much as possible without placing the bank stations in unreasonable geometric locations. The resulting channel defined by the new bank station locations is a very shallow channel in a majority of the cross-sections, in some cases as shallow as 0.2 feet deep.

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Appendix E.1 Roughness Coefficient Estimation

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Appendix E.2 Cross-Section Plots

Appendix E.3 Expansion and Contraction Coefficients

Appendix E.4 Analysis of Structures

Appendix E.5 Hydraulic Calculations

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Appendix E.5.2 Miscellaneous Hydraulic Calculations

Appendix E.5.3 HEC-RAS and CHECK-RAS Output

Appendix F Erosion and Sediment Transport Analysis

Exhibit A: Hydrology Watershed Maps

Exhibit B: Hydraulics Work Study Maps (reduced size 11 by 17 sheets, full size are bound separately)

Registered Professional Engineer (Civil)
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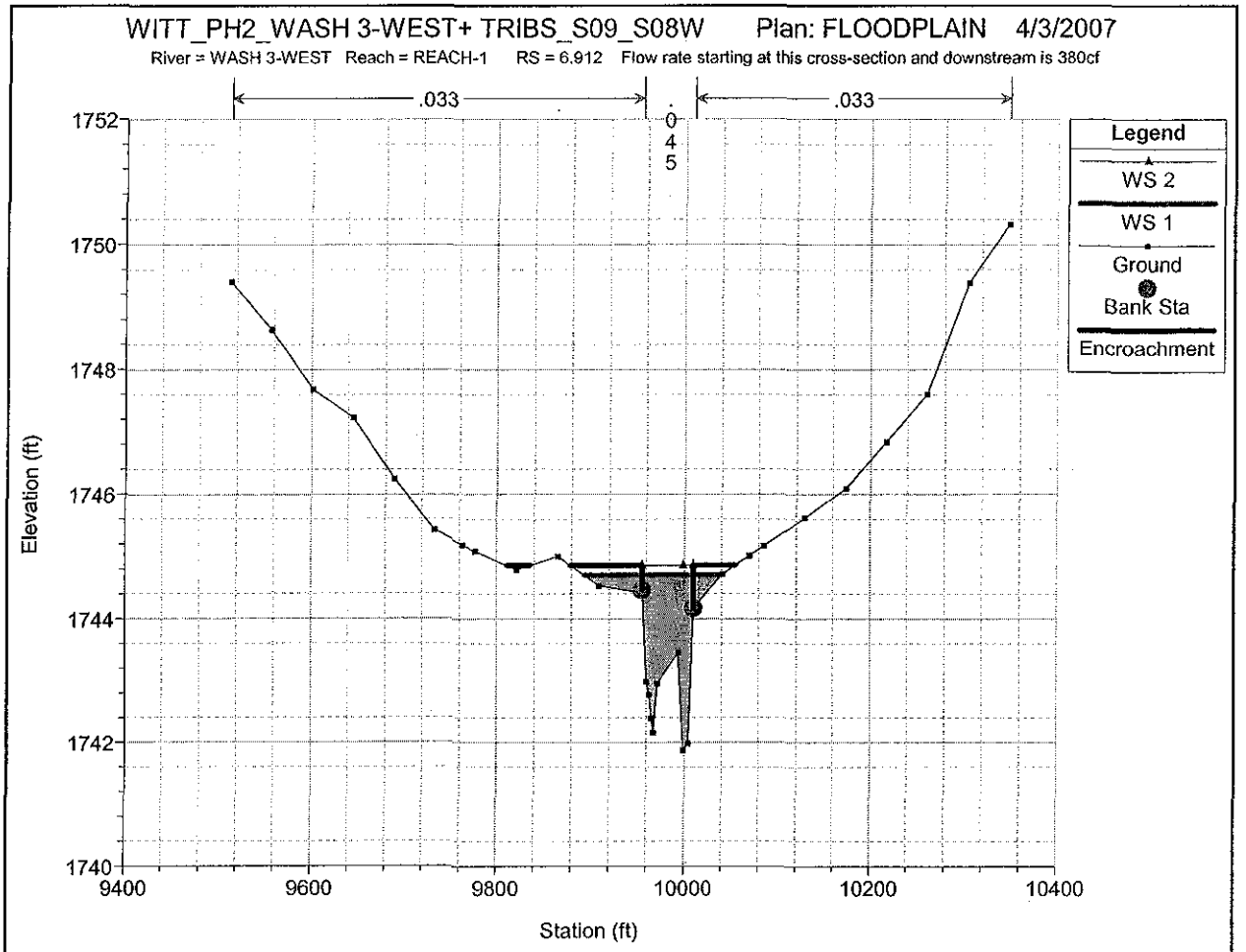
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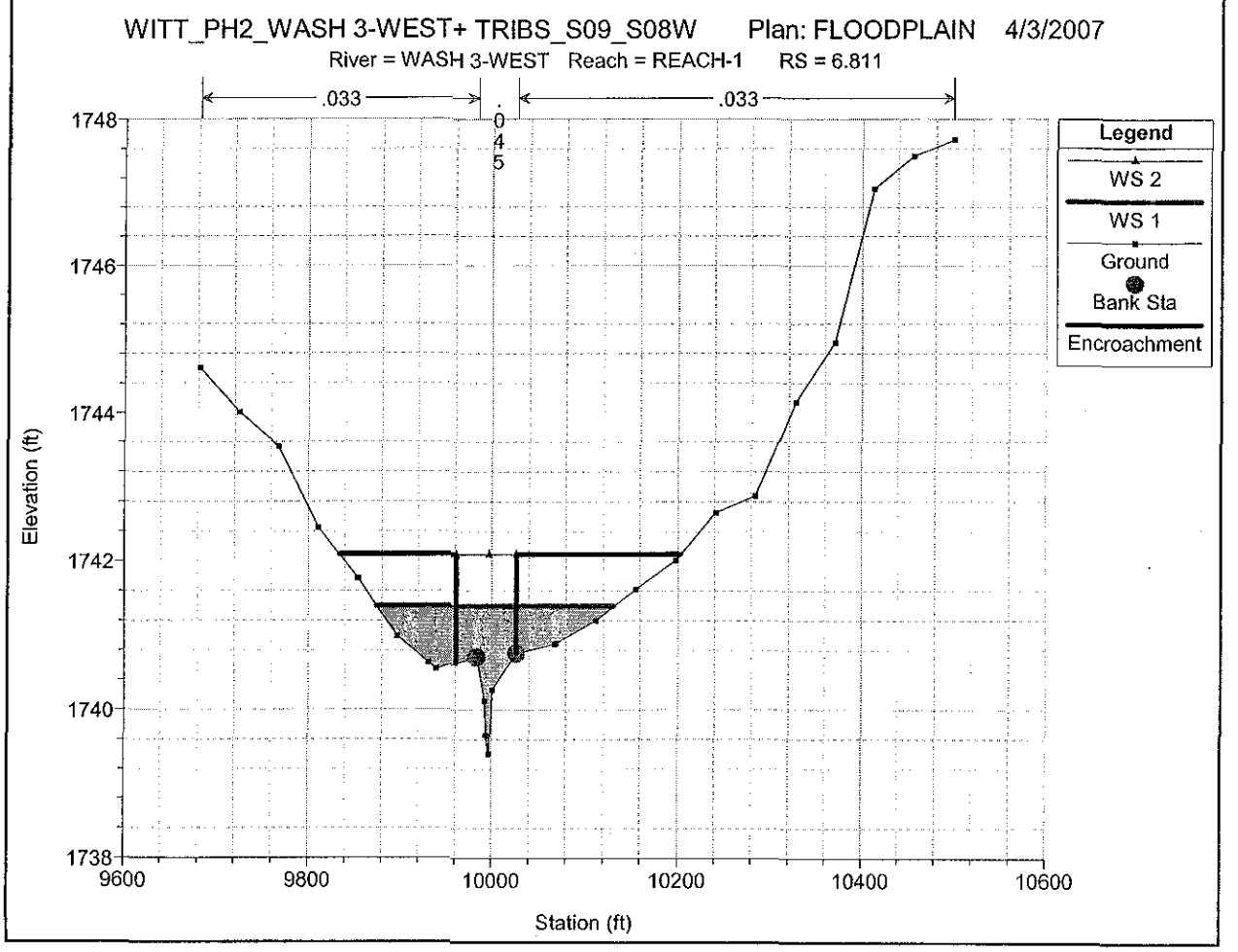
River = WASH 3-WEST Reach = REACH-1 RS = 6.912 Flow rate starting at this cross-section and downstream is 380cf
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1752
1750
1748
1746
1744
1742
1740
9400
9600
9800
10000
10200
10400
Station (ft)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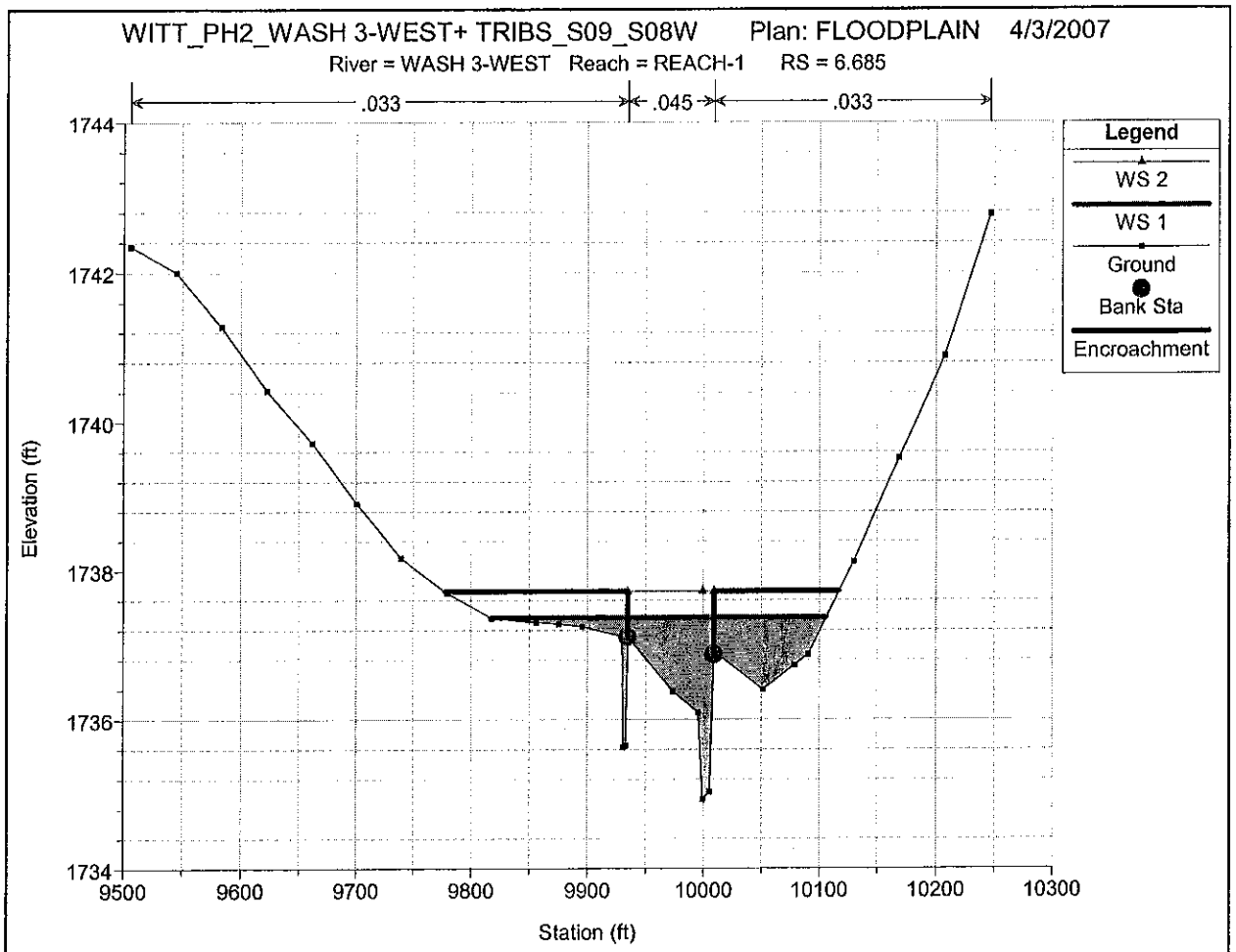
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1748
1746
1744
1742
1740
1738
9600
9800
10000
10200
10400
10600
Station (ft)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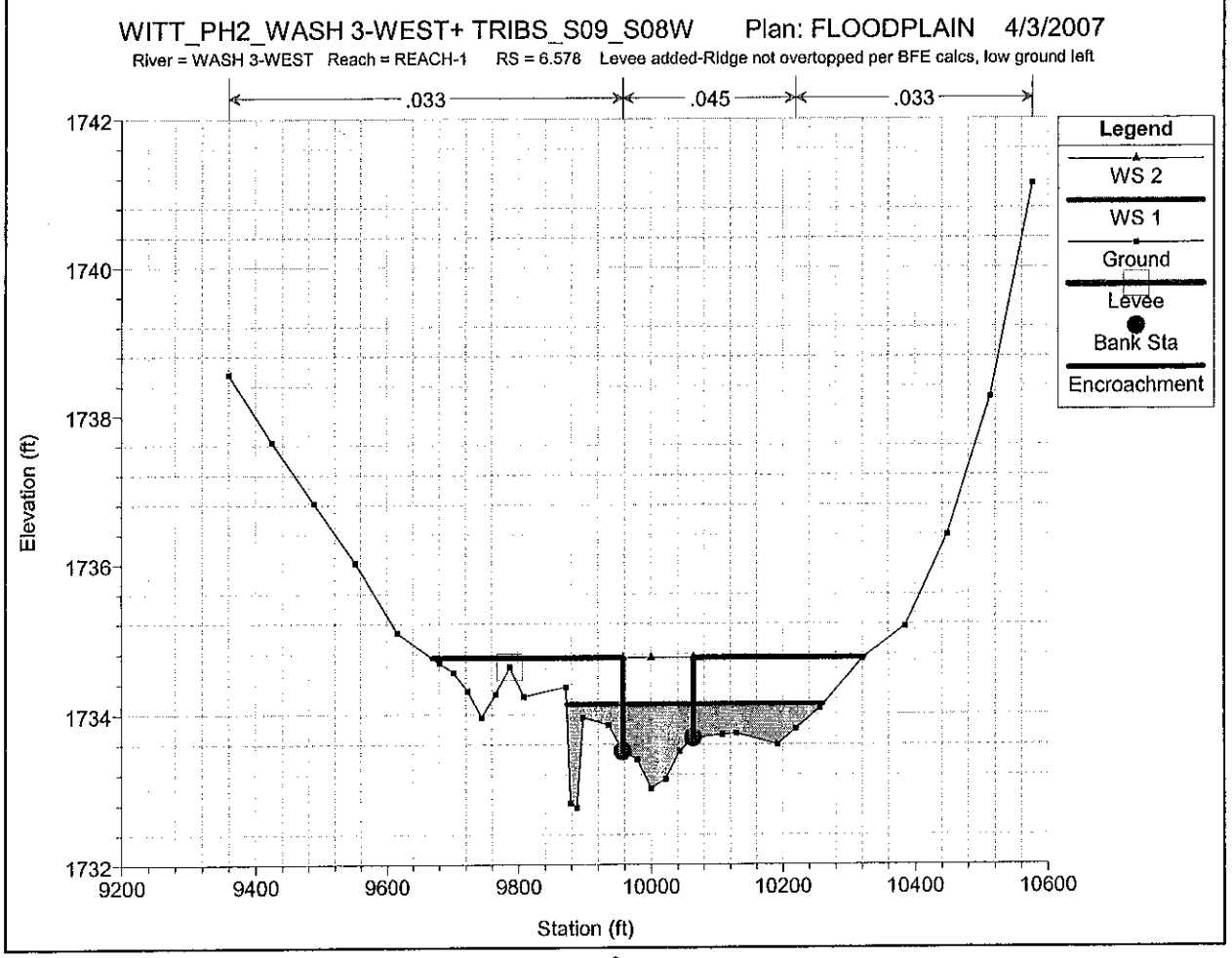
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1744
1742
1740
1738
1736
1734
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)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River = WASH 3-WEST Reach = REACH-1 RS = 6.578 Levee added-Ridge not overtopped per BFE calcs, low ground left
.033
.045
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1742
1740
1738
1736
1734
1732
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

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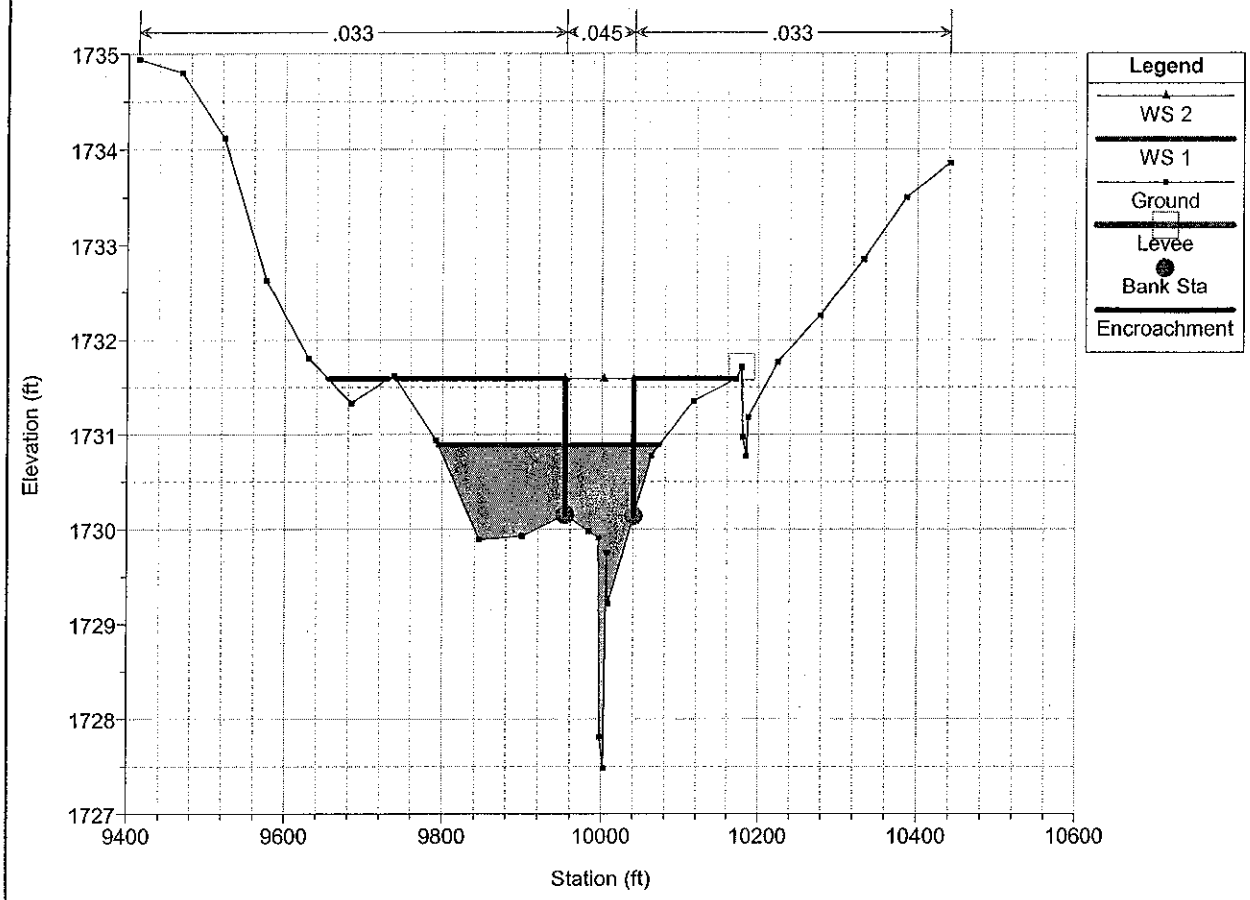

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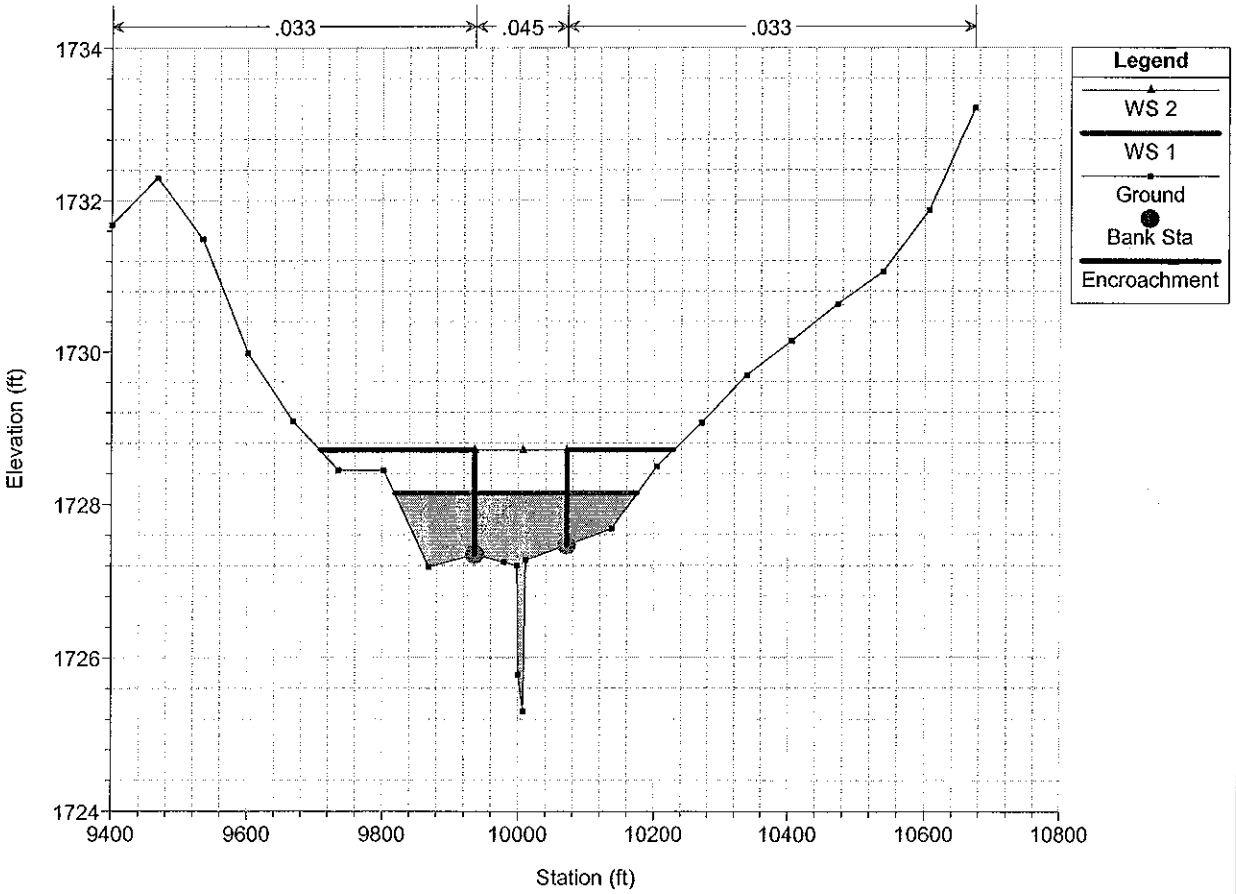

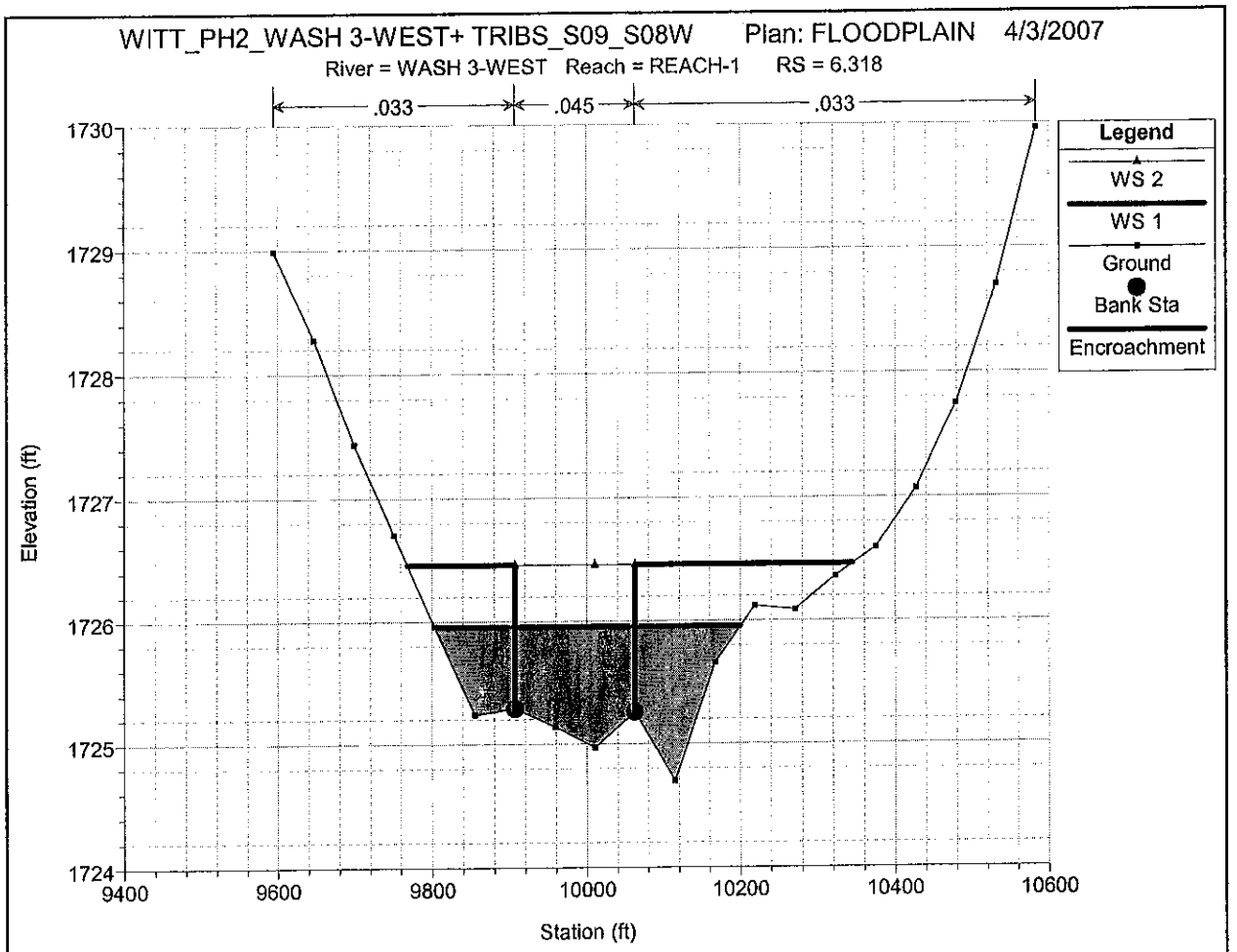
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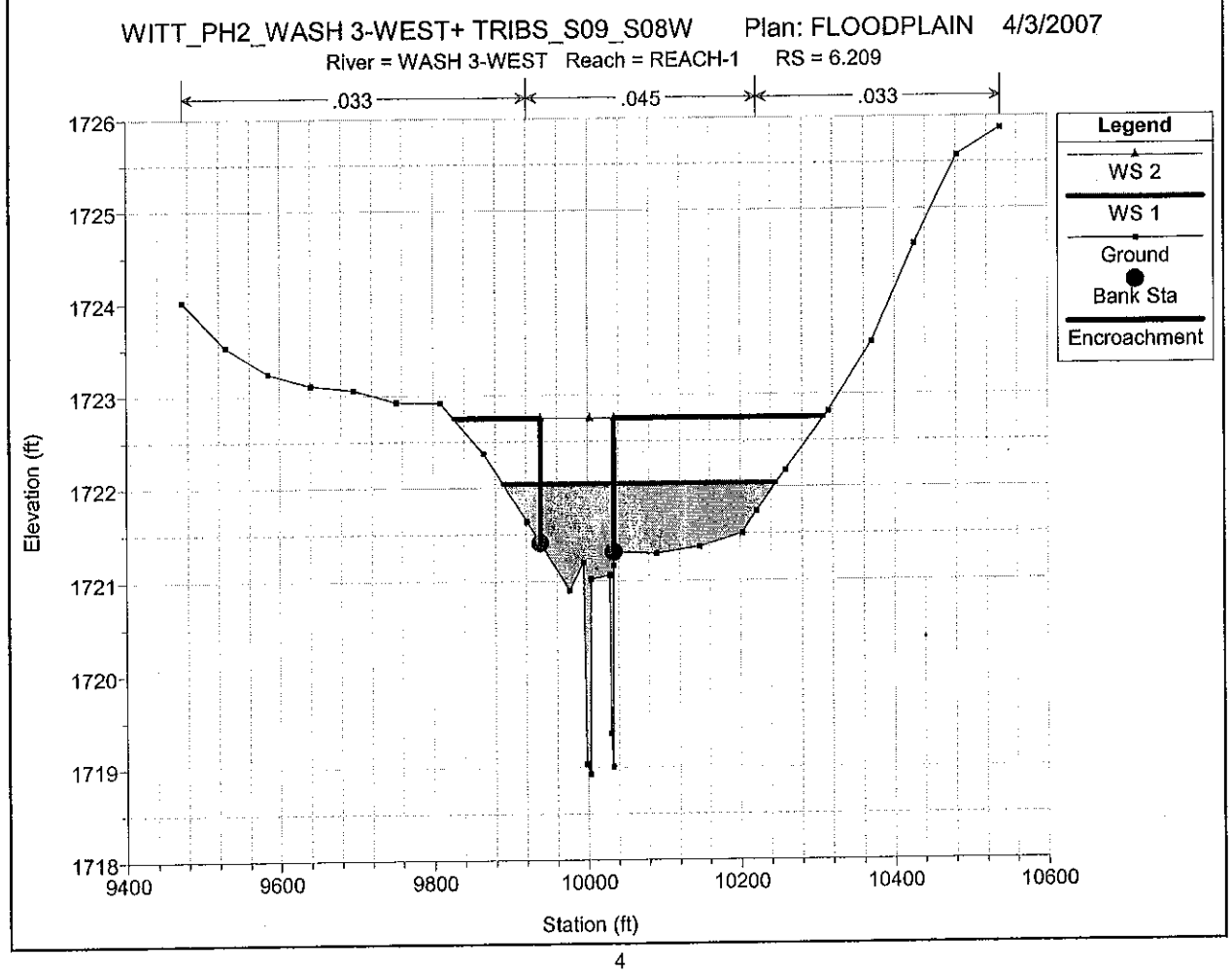
River = WASH 3-WEST Reach = REACH-1 RS = 6.318
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1730
1729
1728
1727
1726
1725
1724
9400
9600
9800
10000
10200
10400
10600
Station (ft)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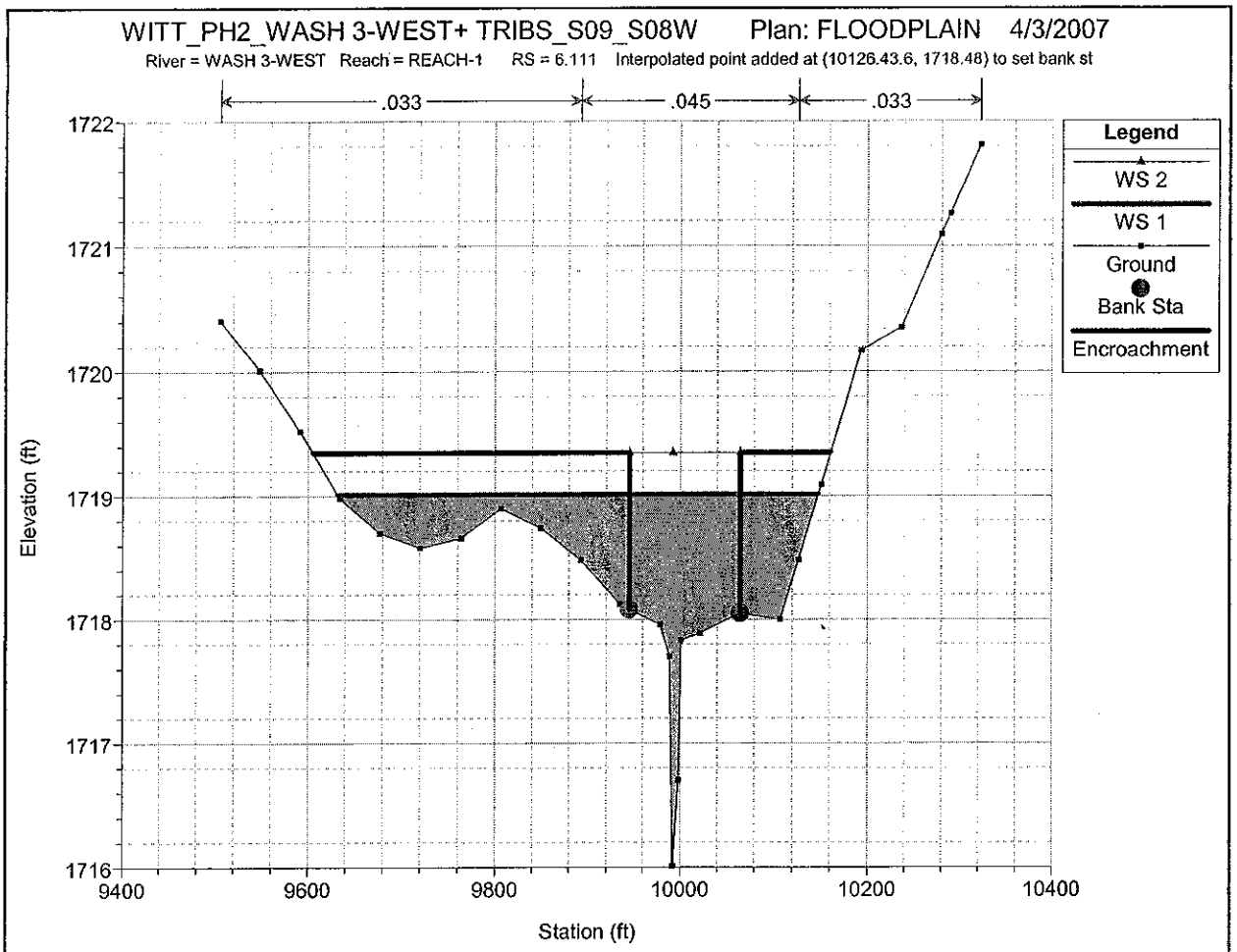
River = WASH 3-WEST Reach = REACH-1 RS = 6.209
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1726
1725
1724
1723
1722
1721
1720
1719
1718
9400
9600
9800
10000
10200
10400
10600
Station (ft)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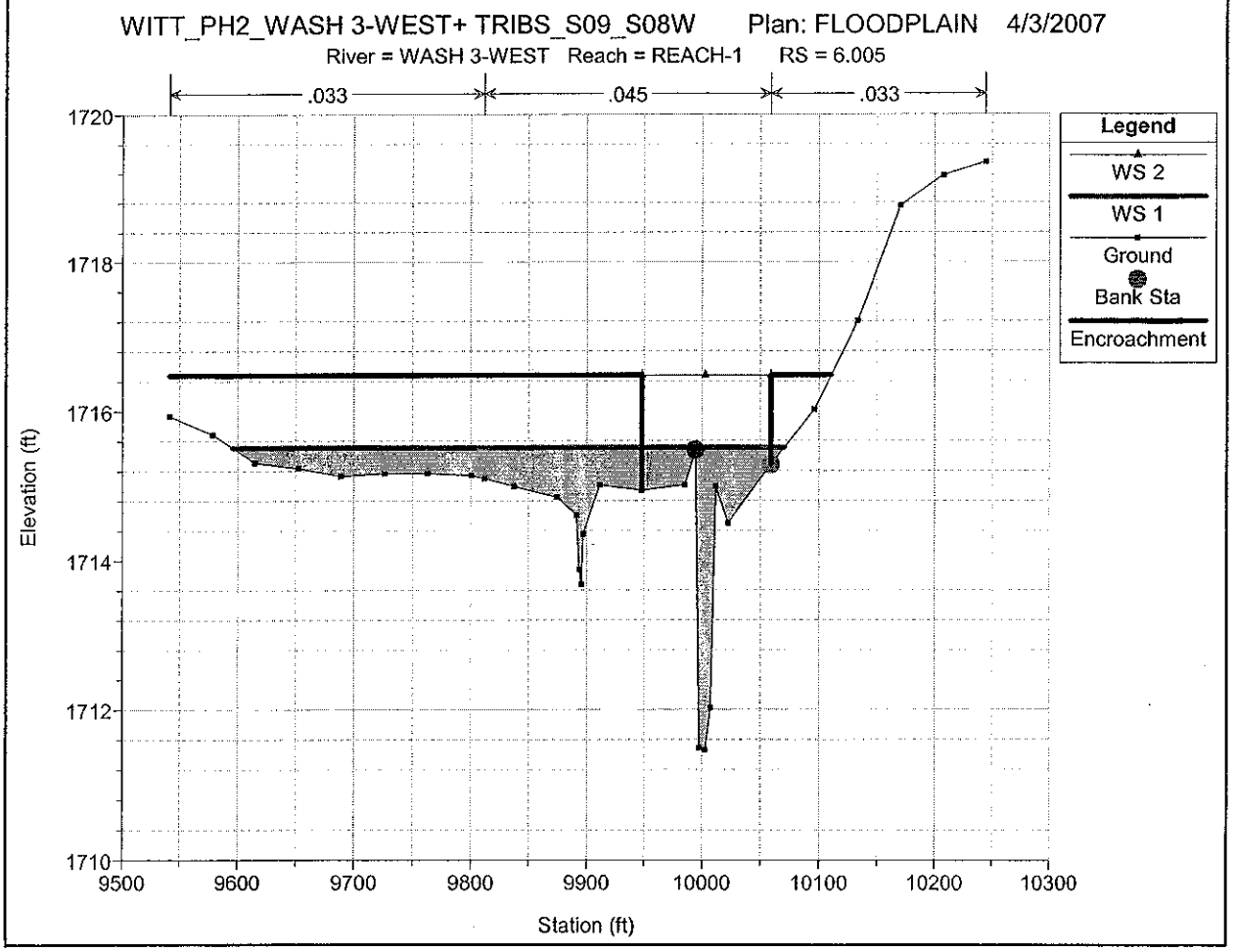
River = WASH 3-WEST Reach = REACH-1 RS = 6.111 Interpolated point added at (10126.43.6, 1718.48) to set bank st
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1722
1721
1720
1719
1718
1717
1716
9400
9600
9800
10000
10200
10400
Station (ft)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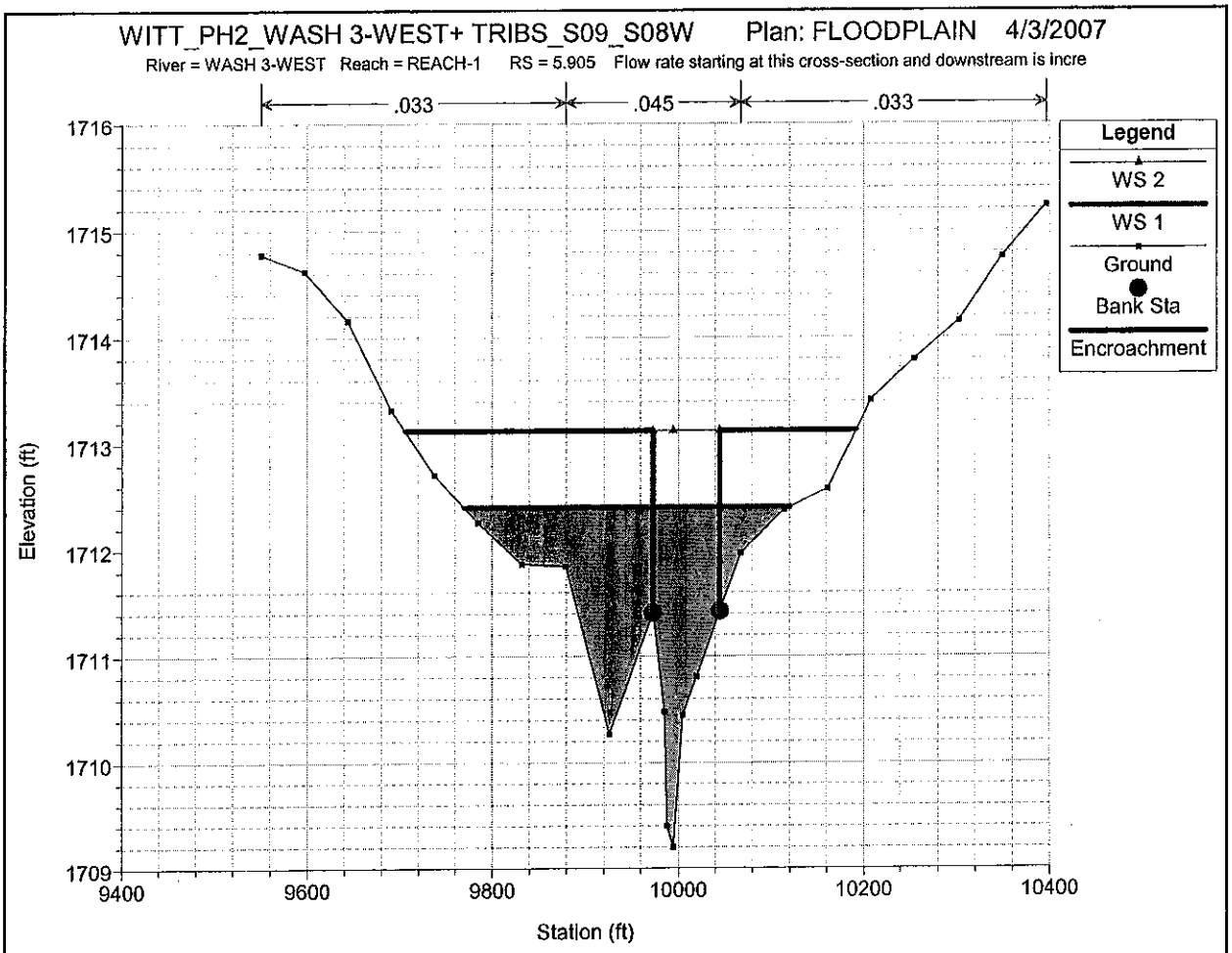
River = WASH 3-WEST Reach = REACH-1 RS = 6.005
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1720
1718
1716
1714
1712
1710
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)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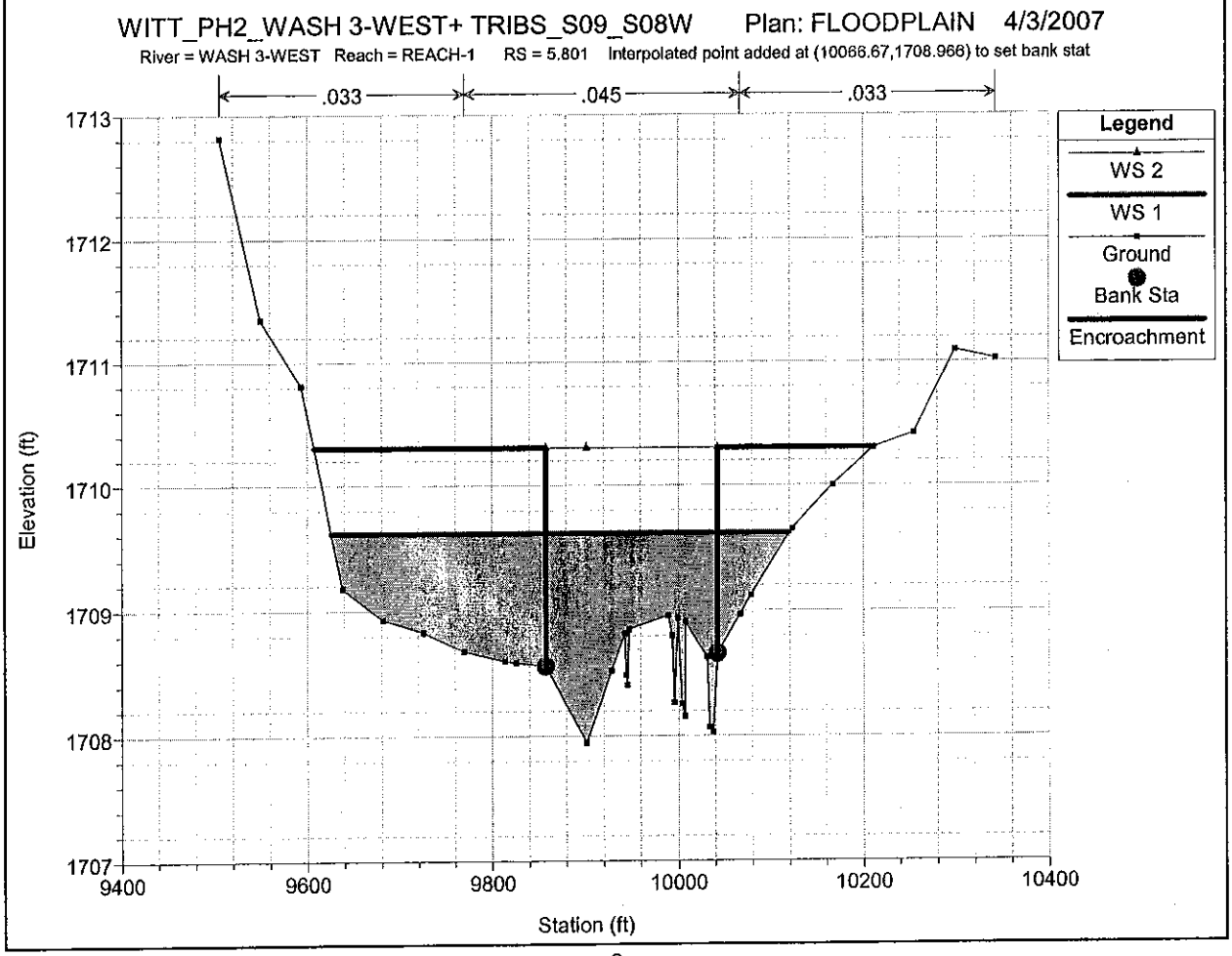
River = WASH 3-WEST Reach = REACH-1 RS = 5.905 Flow rate starting at this cross-section and downstream is incre
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1716
1715
1714
1713
1712
1711
1710
1709
9400
9600
9800
10000
10200
10400
Station (ft)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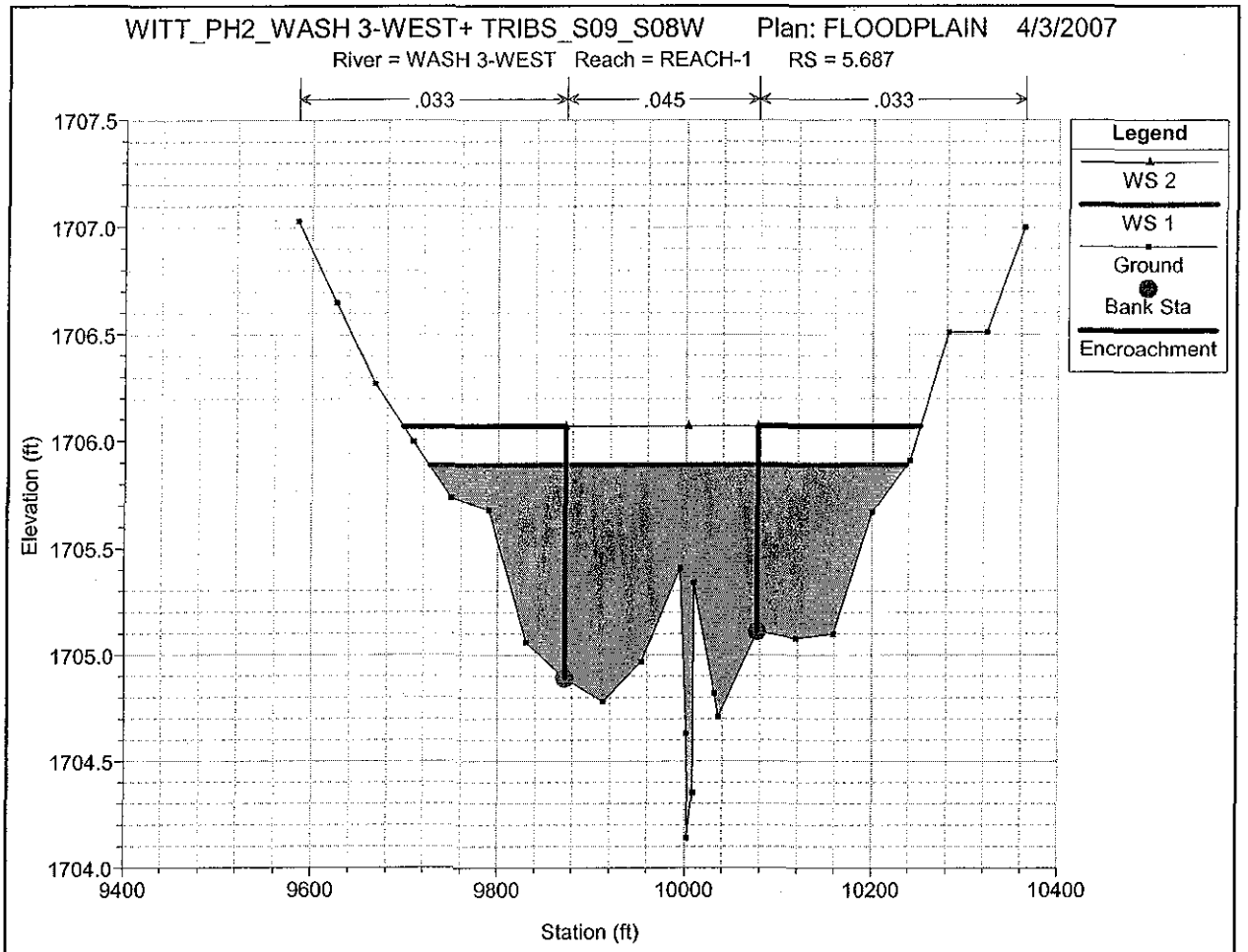
River = WASH 3-WEST Reach = REACH-1 RS = 5.801 Interpolated point added at (10066.67,1708.966) to set bank stat
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1713
1712
1711
1710
1709
1708
1707
9400
9600
9800
10000
10200
10400
Station (ft)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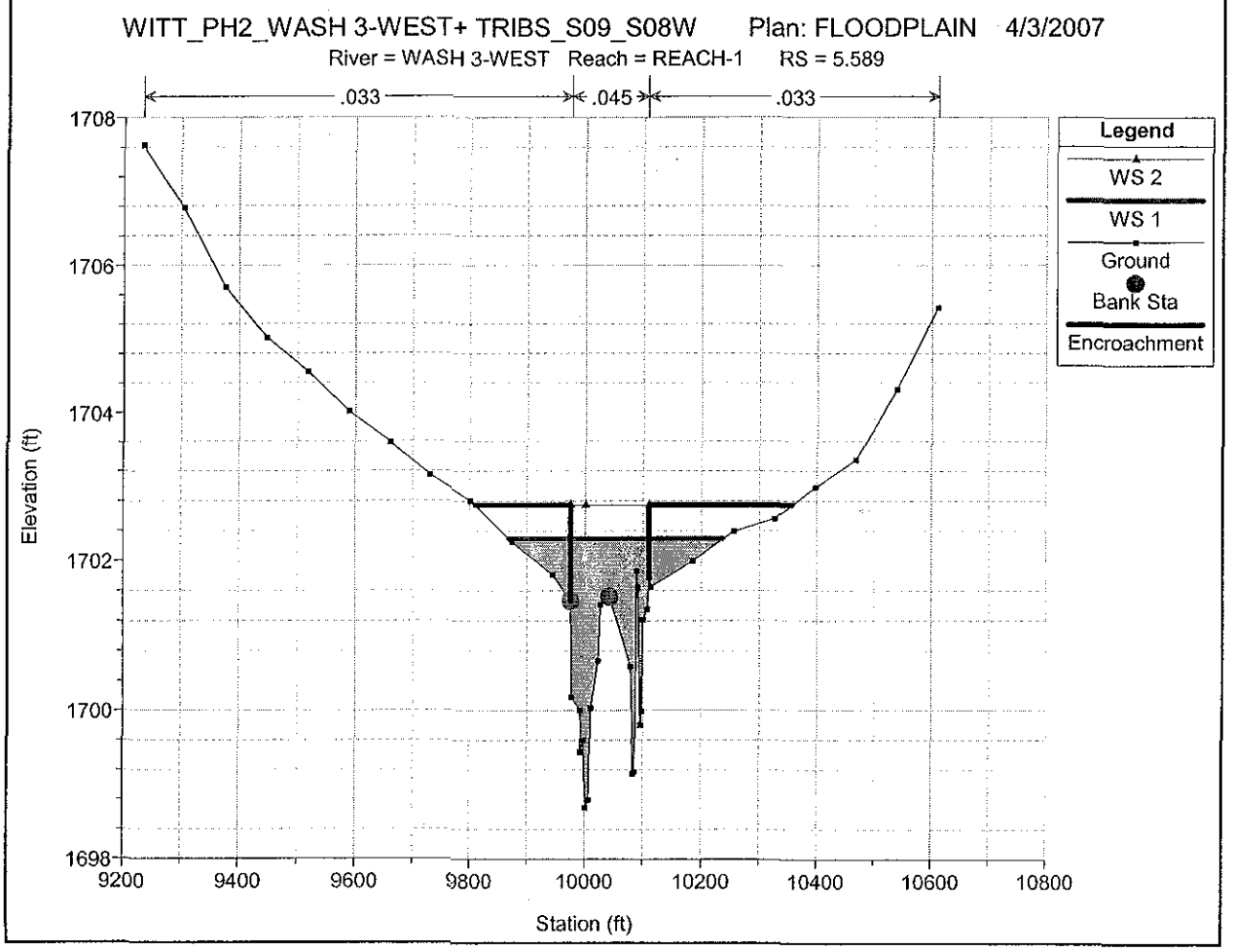
River = WASH 3-WEST Reach = REACH-1 RS = 5.687
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1707.5
1707.0
1706.5
1706.0
1705.5
1705.0
1704.5
1704.0
9400
9600
9800
10000
10200
10400
Station (ft)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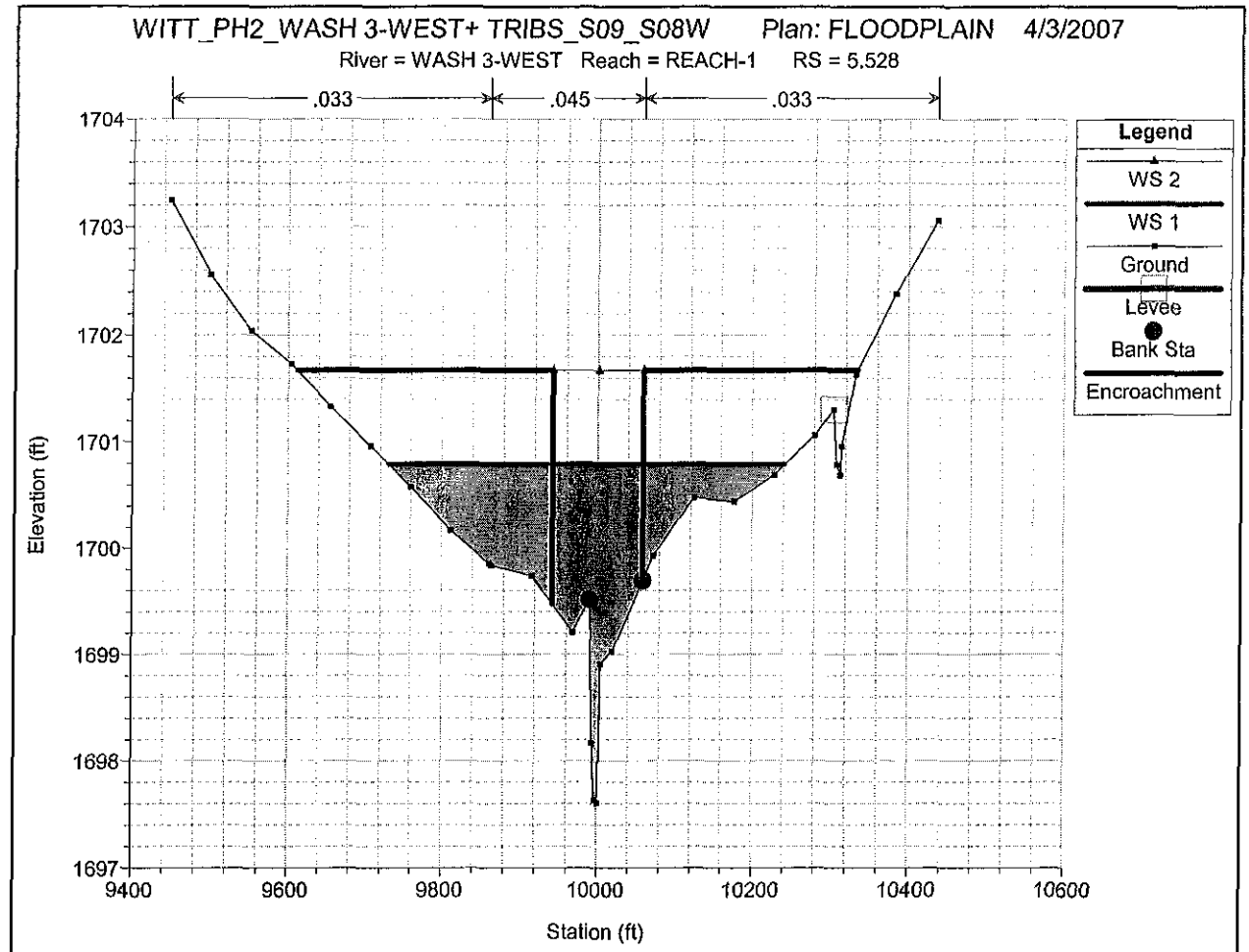
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1708
1706
1704
1702
1700
1698
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)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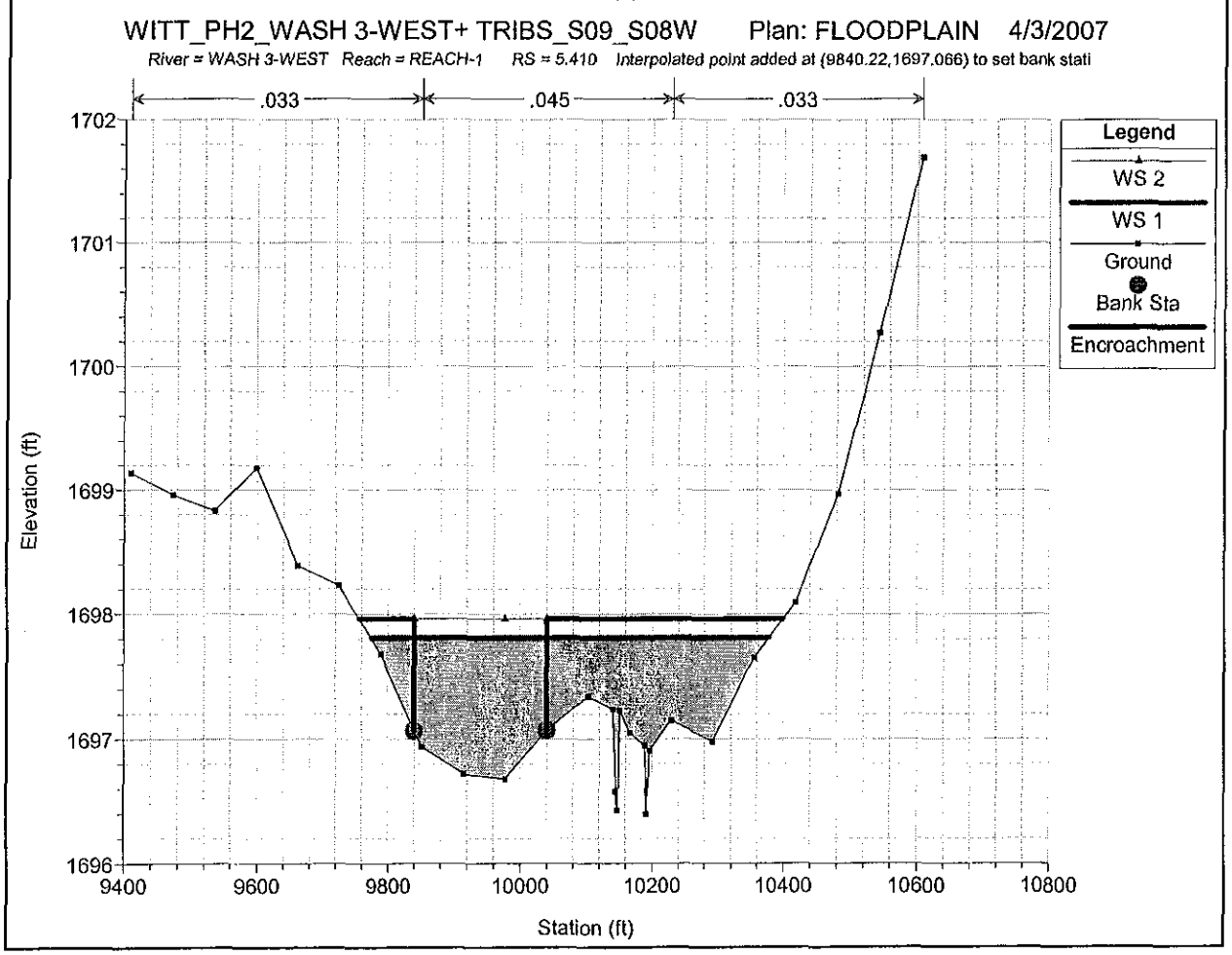
River = WASH 3-WEST Reach = REACH-1 RS = 5.528
.033
.045
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1704
1703
1702
1701
1700
1699
1698
1697
9400
9600
9800
10000
10200
10400
10600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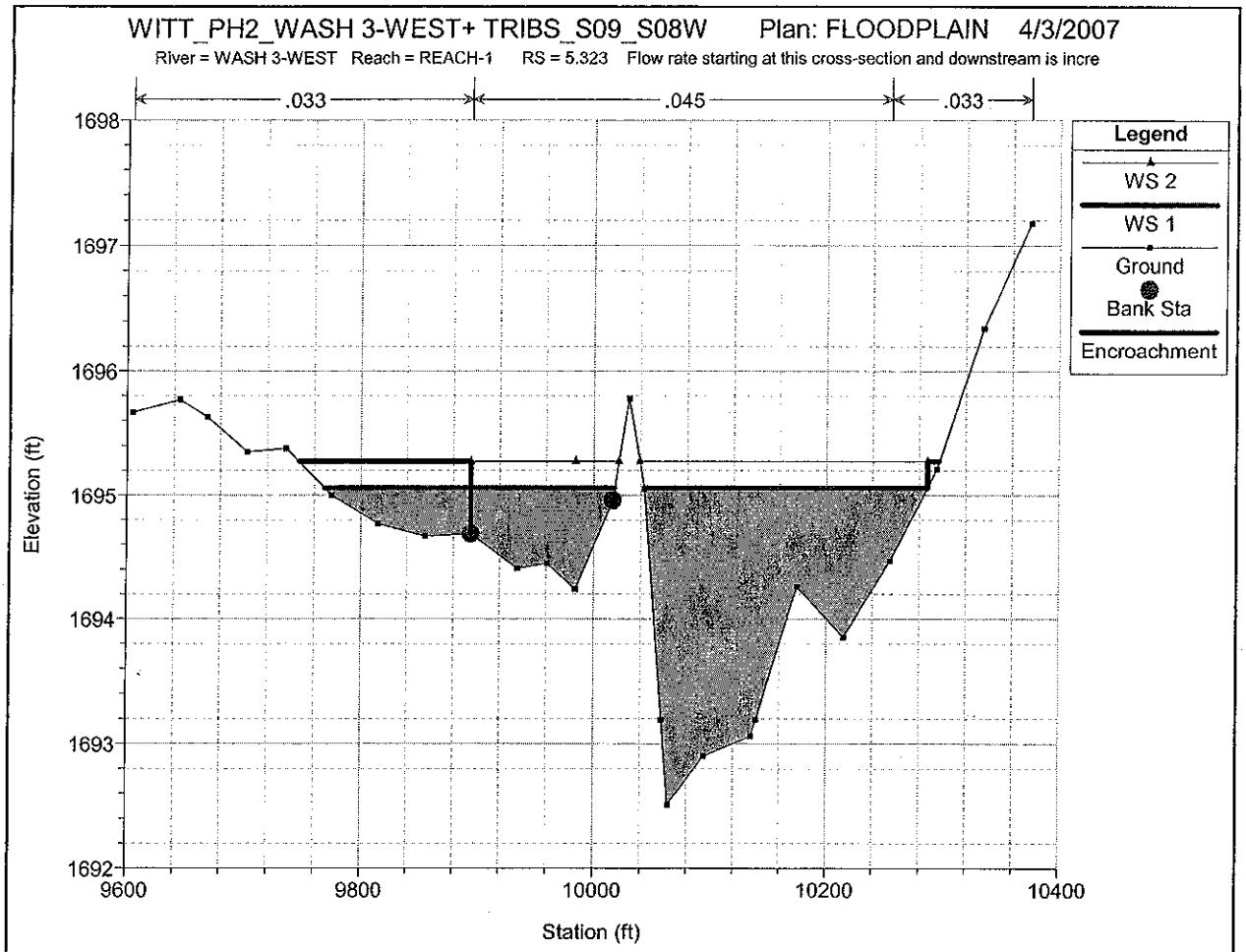
River = WASH 3-WEST Reach = REACH-1 RS = 5.410 Interpolated point added at (9840.22,1697.066) to set bank stati
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1702
1701
1700
1699
1698
1697
1696
9400
9600
9800
10000
10200
10400
10600
10800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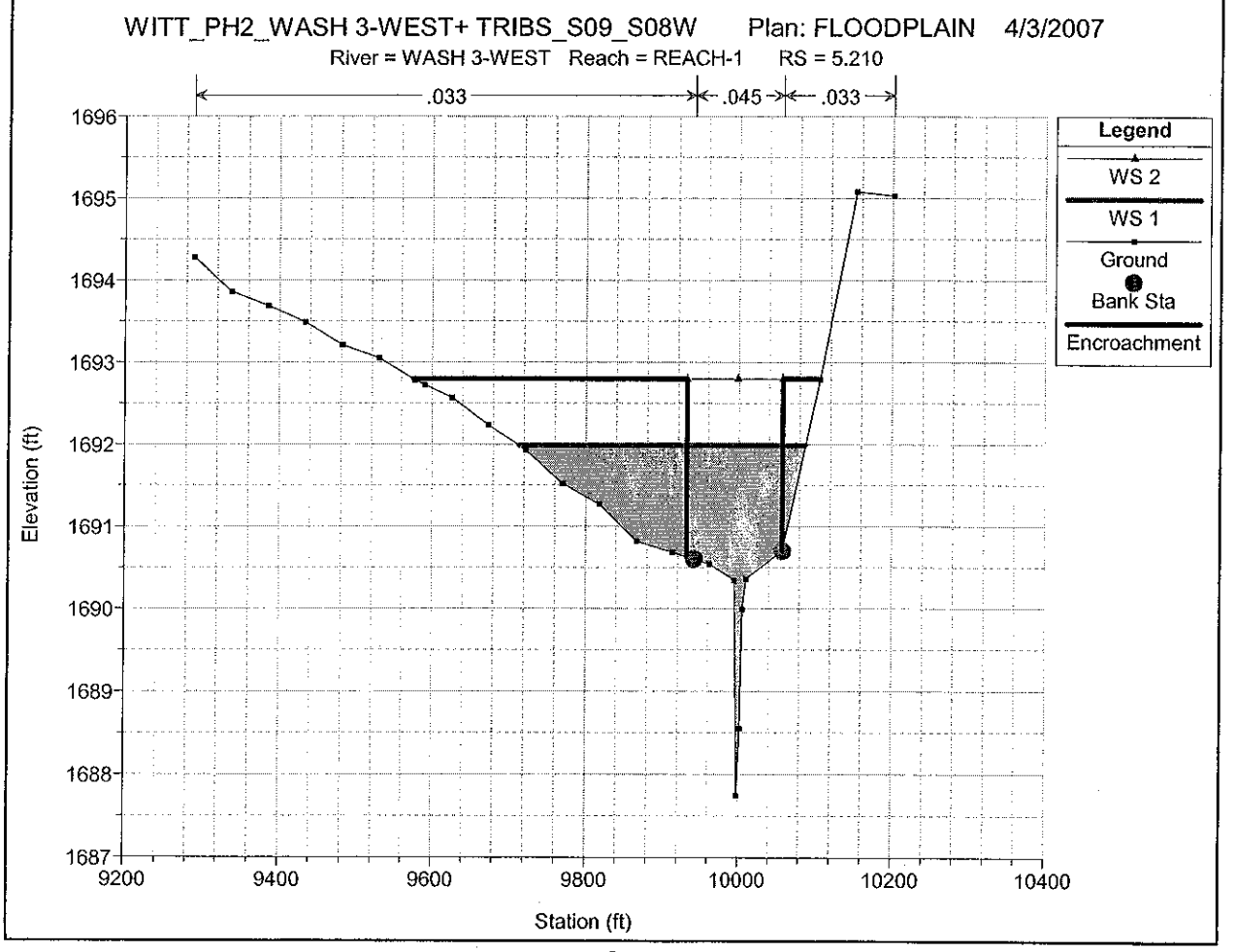
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1698
1697
1696
1695
1694
1693
1692
9600
9800
10000
10200
10400
Station (ft)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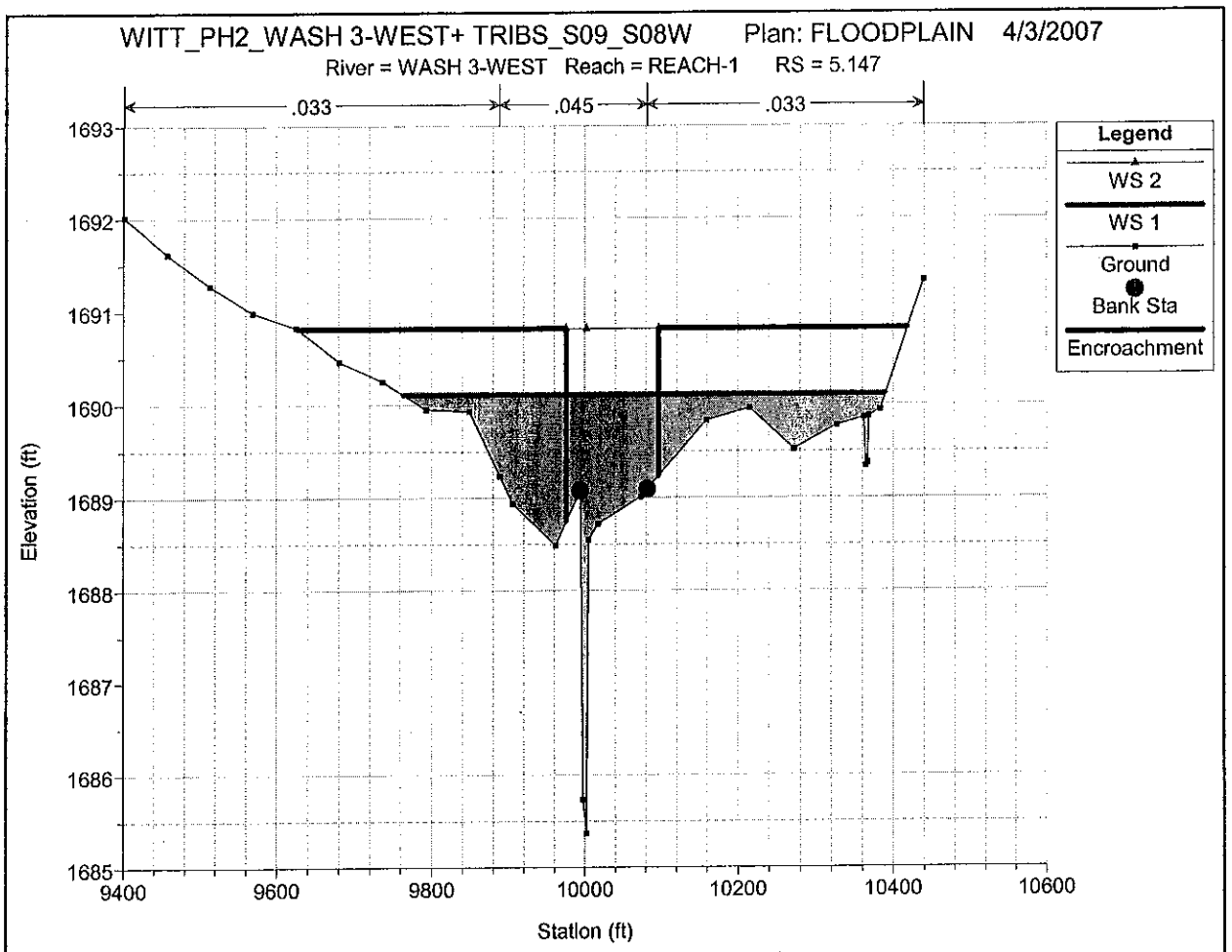
River = WASH 3-WEST Reach = REACH-1 RS = 5.210
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1696
1695
1694
1693
1692
1691
1690
1689
1688
1687
9200
9400
9600
9800
10000
10200
10400
Station (ft)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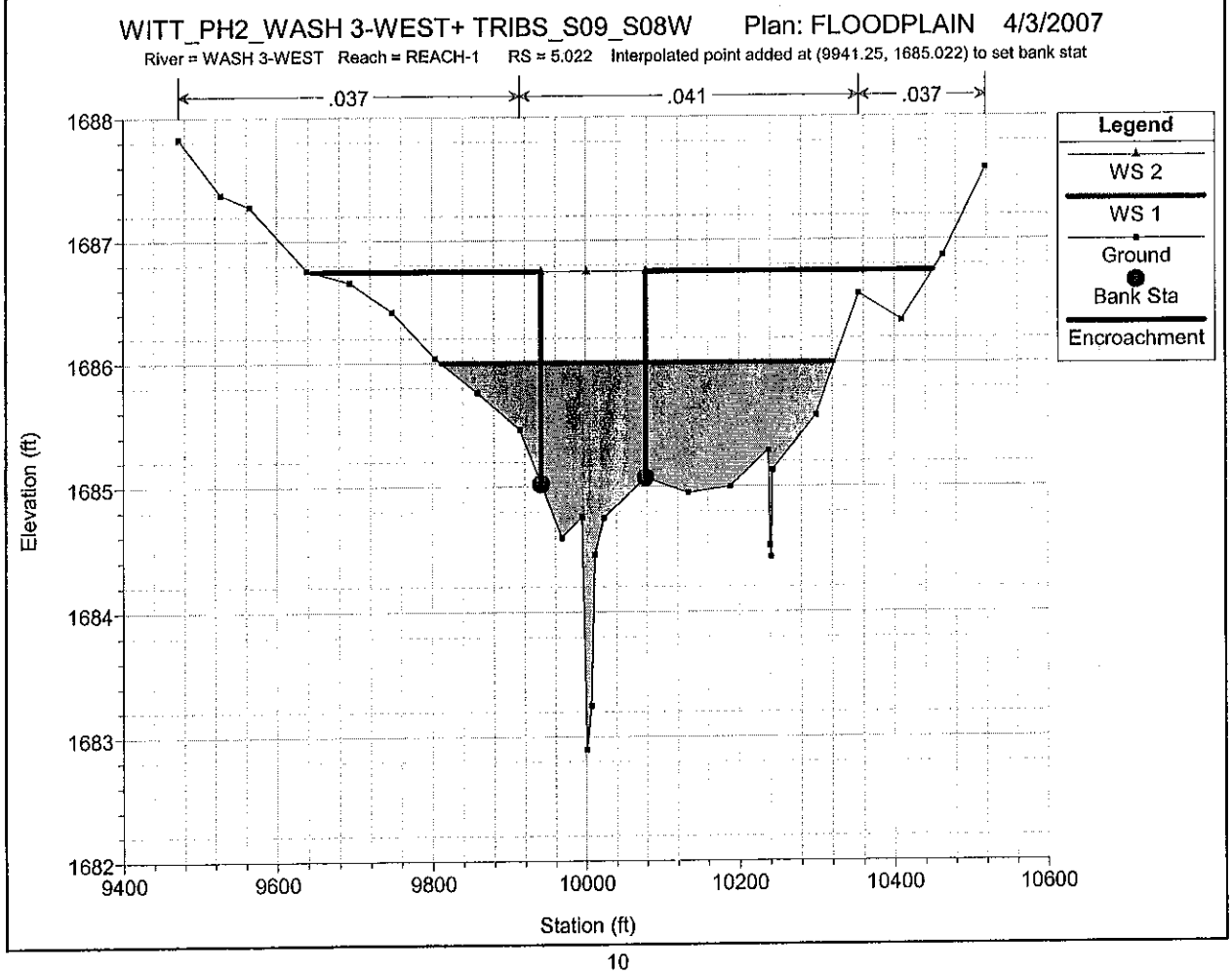
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1693
1692
1691
1690
1689
1688
1687
1686
1685
9400
9600
9800
10000
10200
10400
10600
Station (ft)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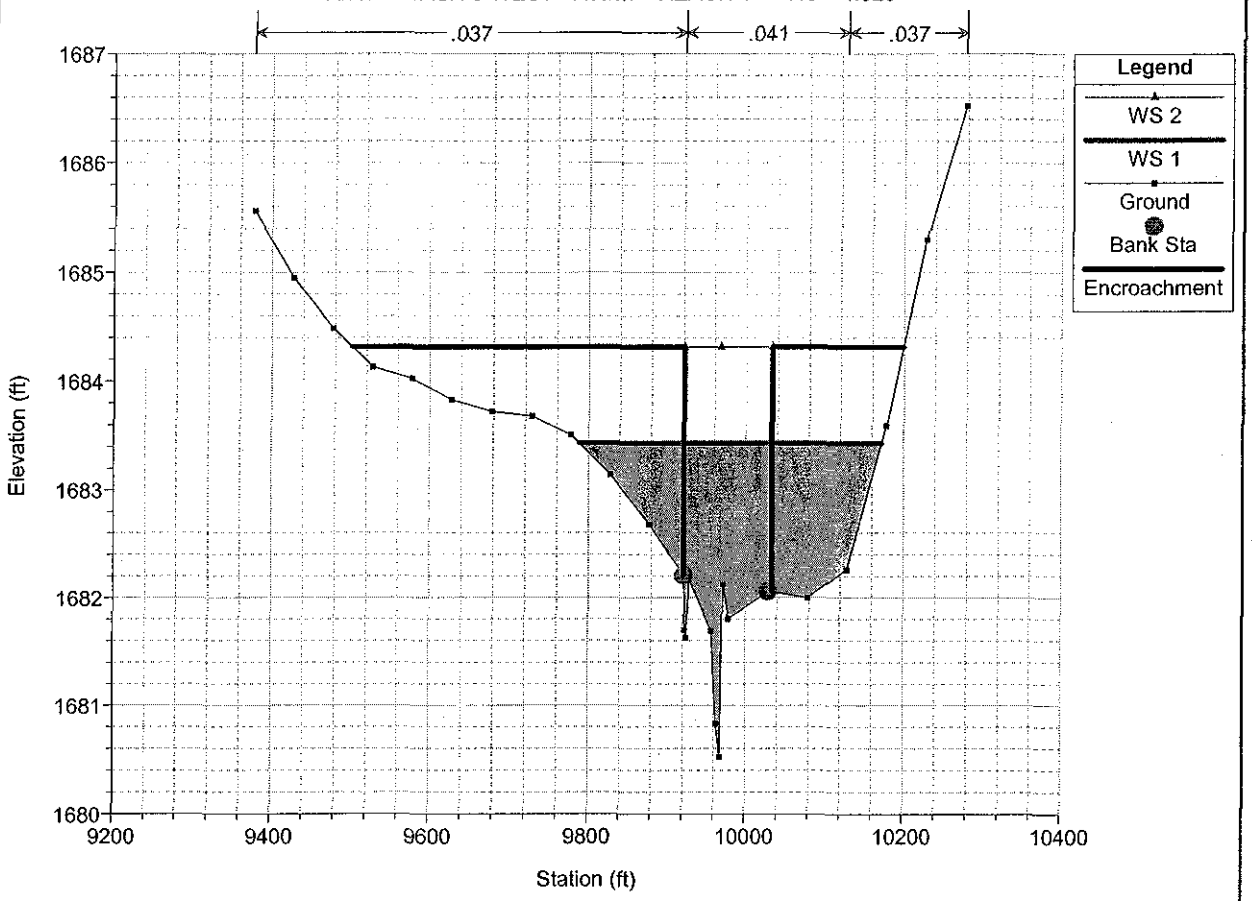
River = WASH 3-WEST Reach = REACH-1 RS = 5.022 Interpolated point added at (9941.25, 1685.022) to set bank stat
.037
.041
.037
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1688
1687
1686
1685
1684
1683
1682
9400
9600
9800
10000
10200
10400
10600
Station (ft)

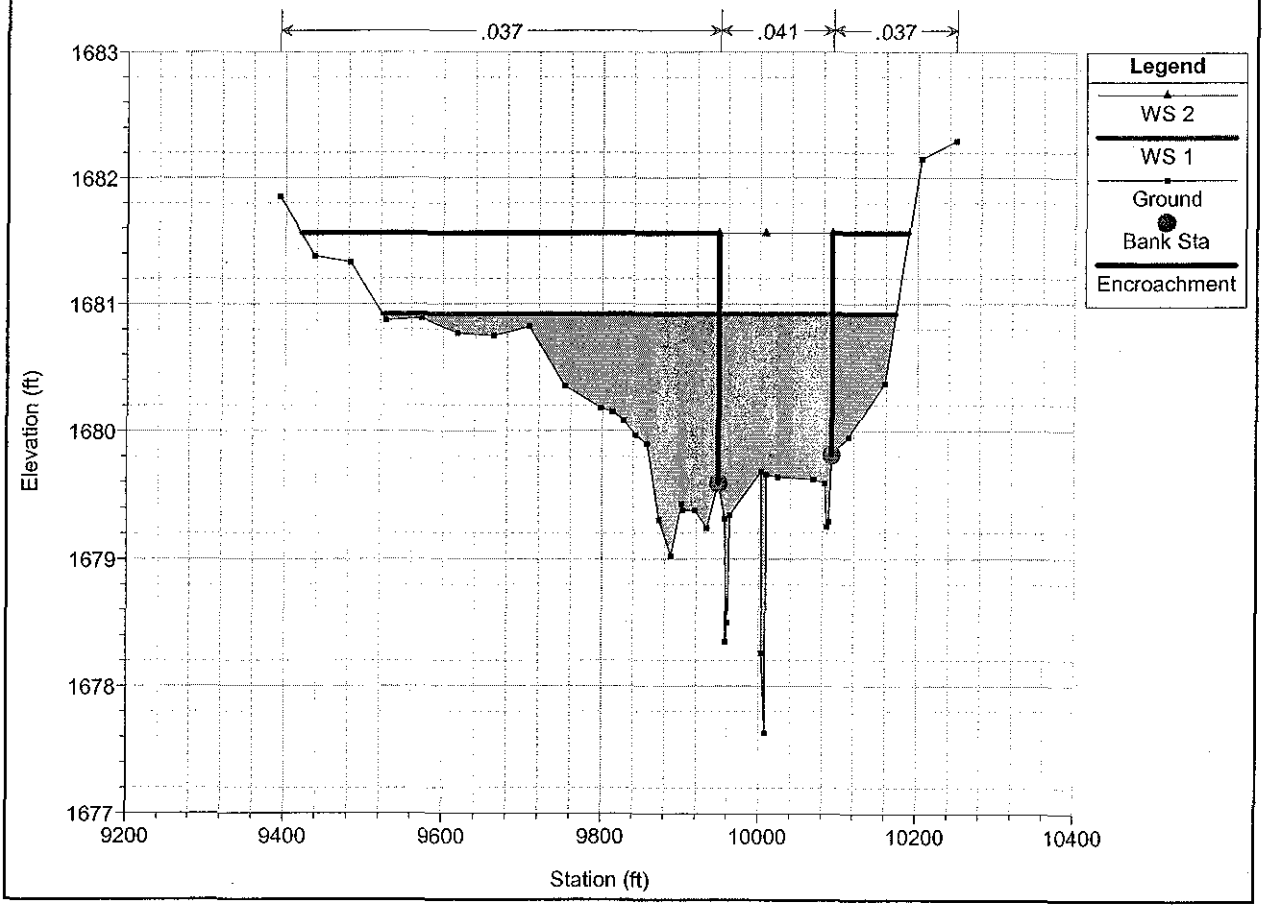
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

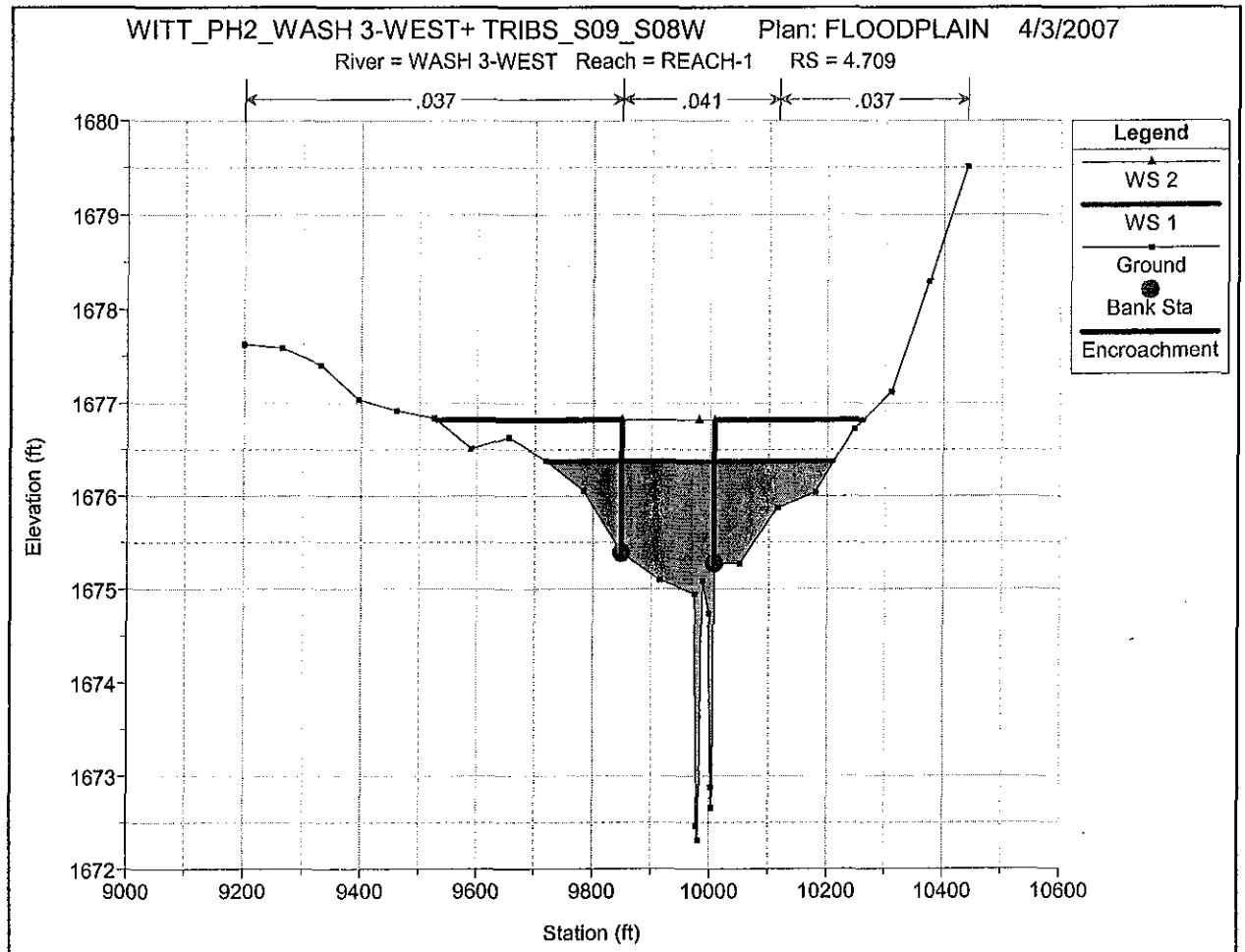
River = WASH 3-WEST Reach = REACH-1 RS = 4.928

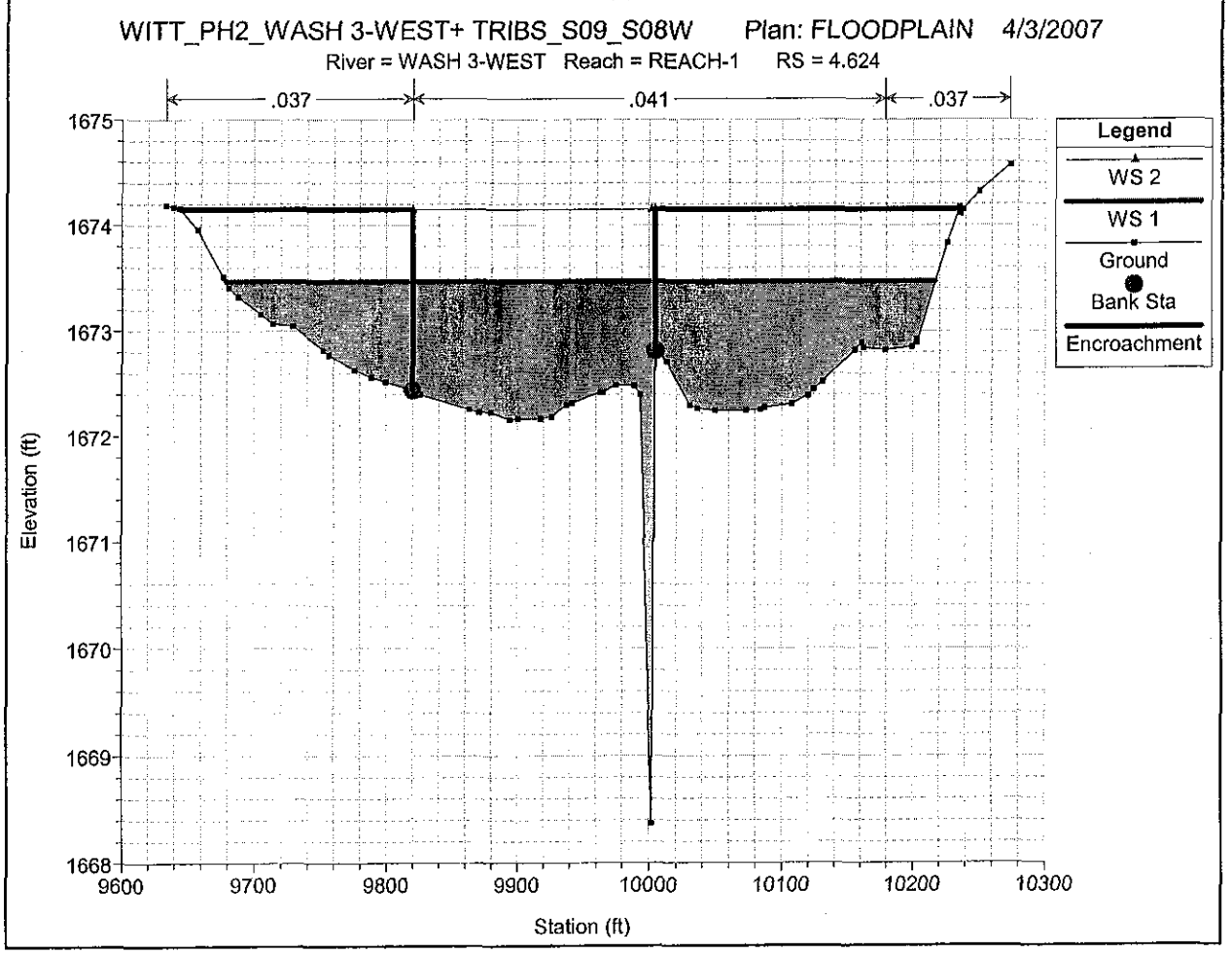


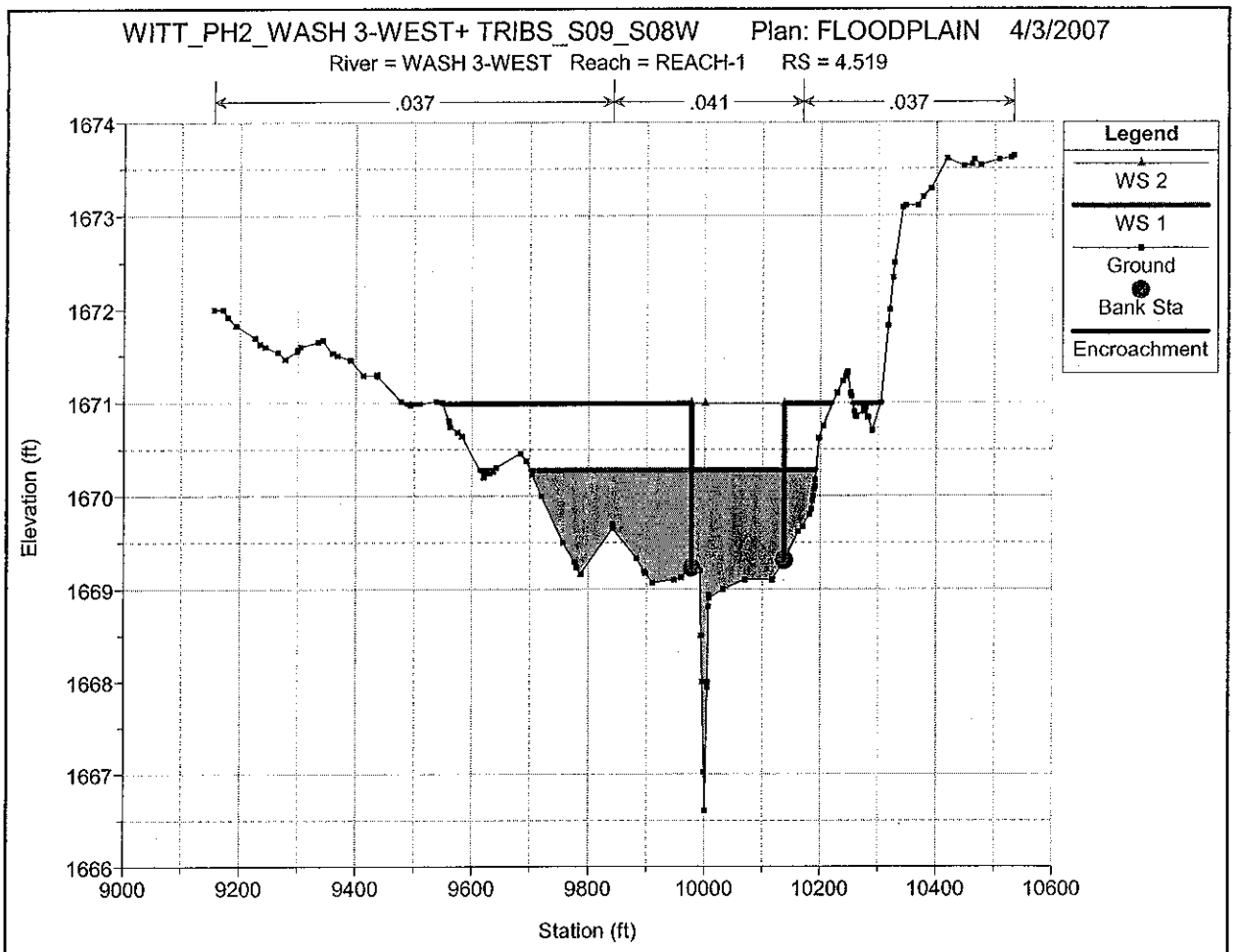
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

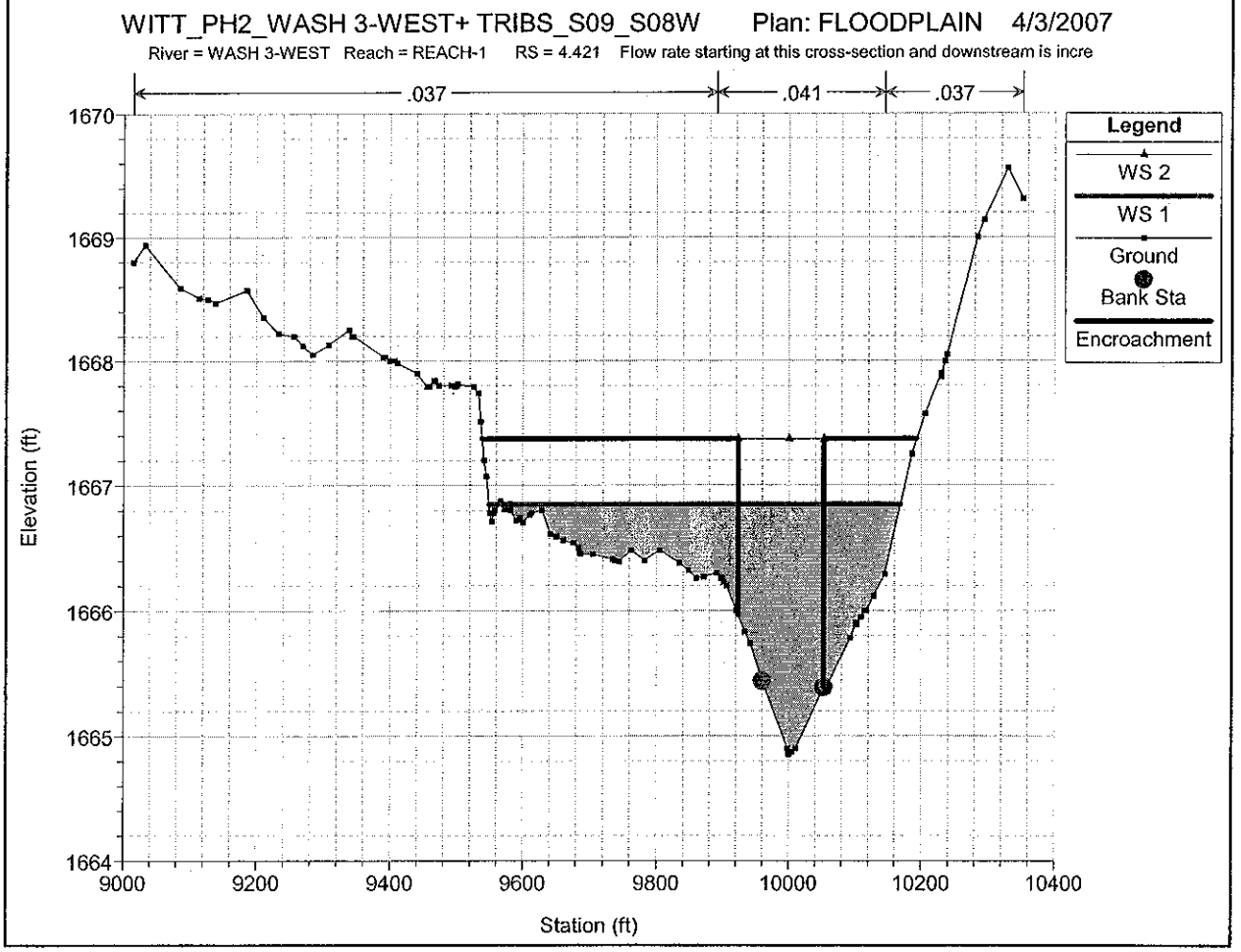
River = WASH 3-WEST Reach = REACH-1 RS = 4.837 Flow rate starting at this cross-section and downstream is incre

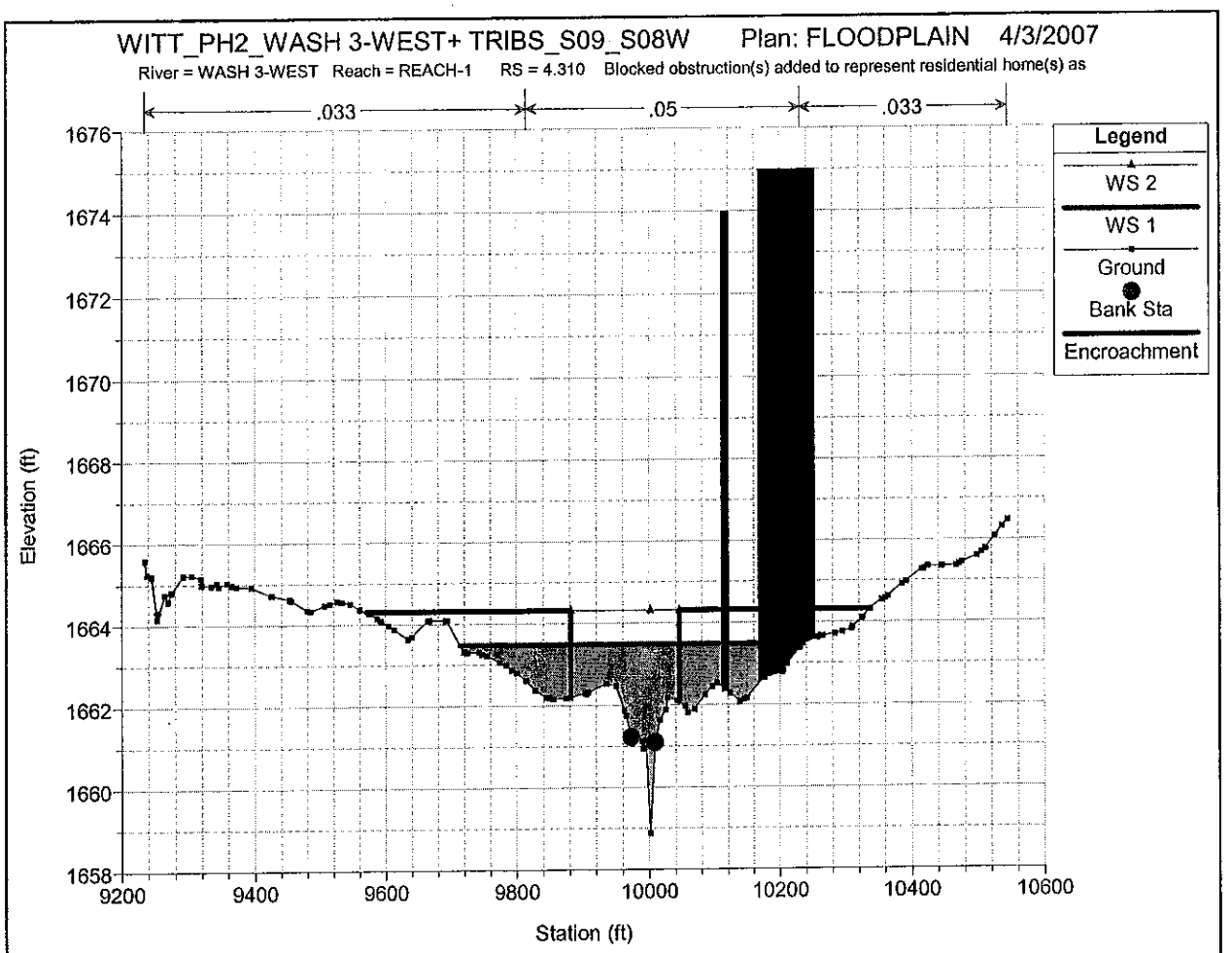


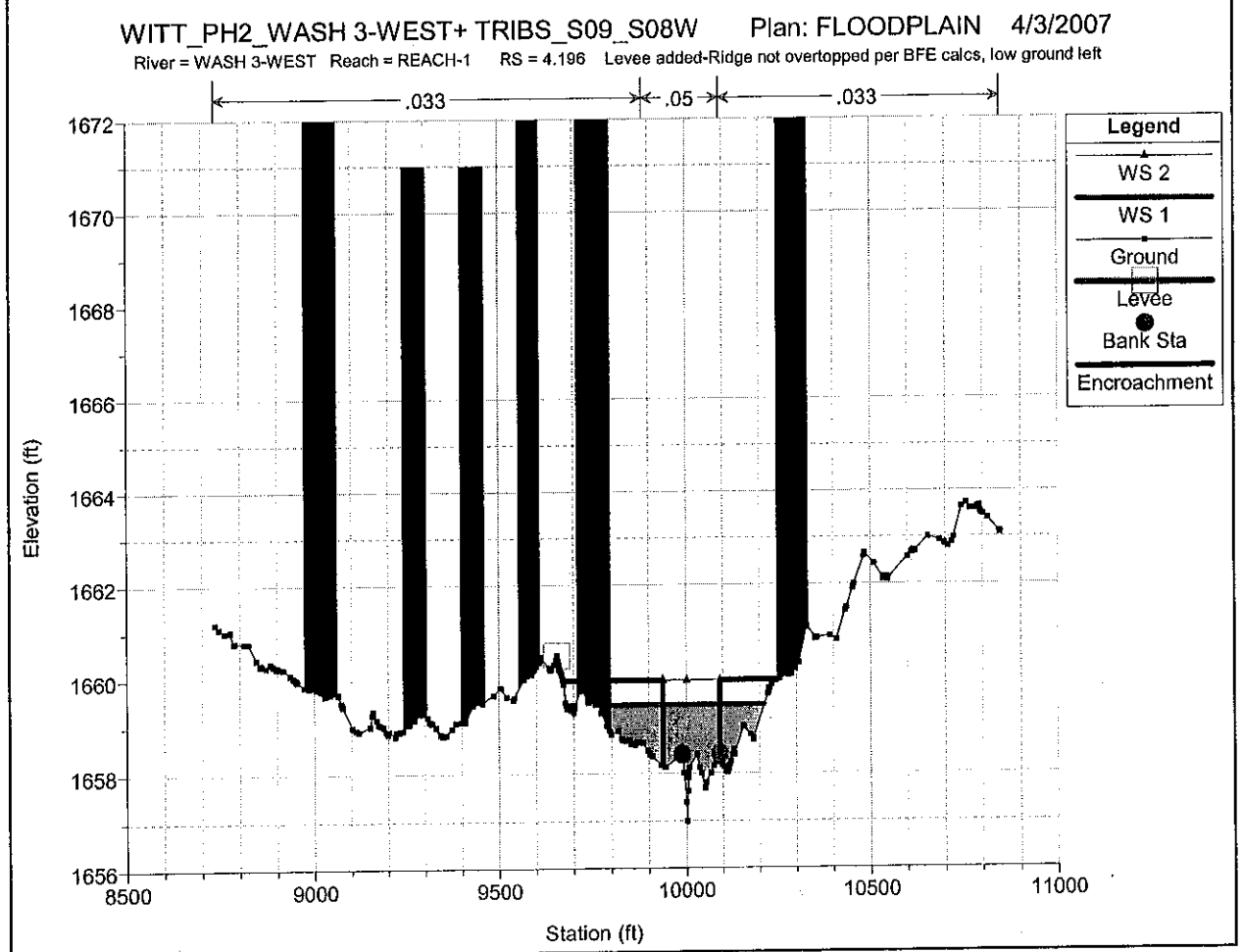

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.709
.037
.041
.037
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1680
1679
1678
1677
1676
1675
1674
1673
1672
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

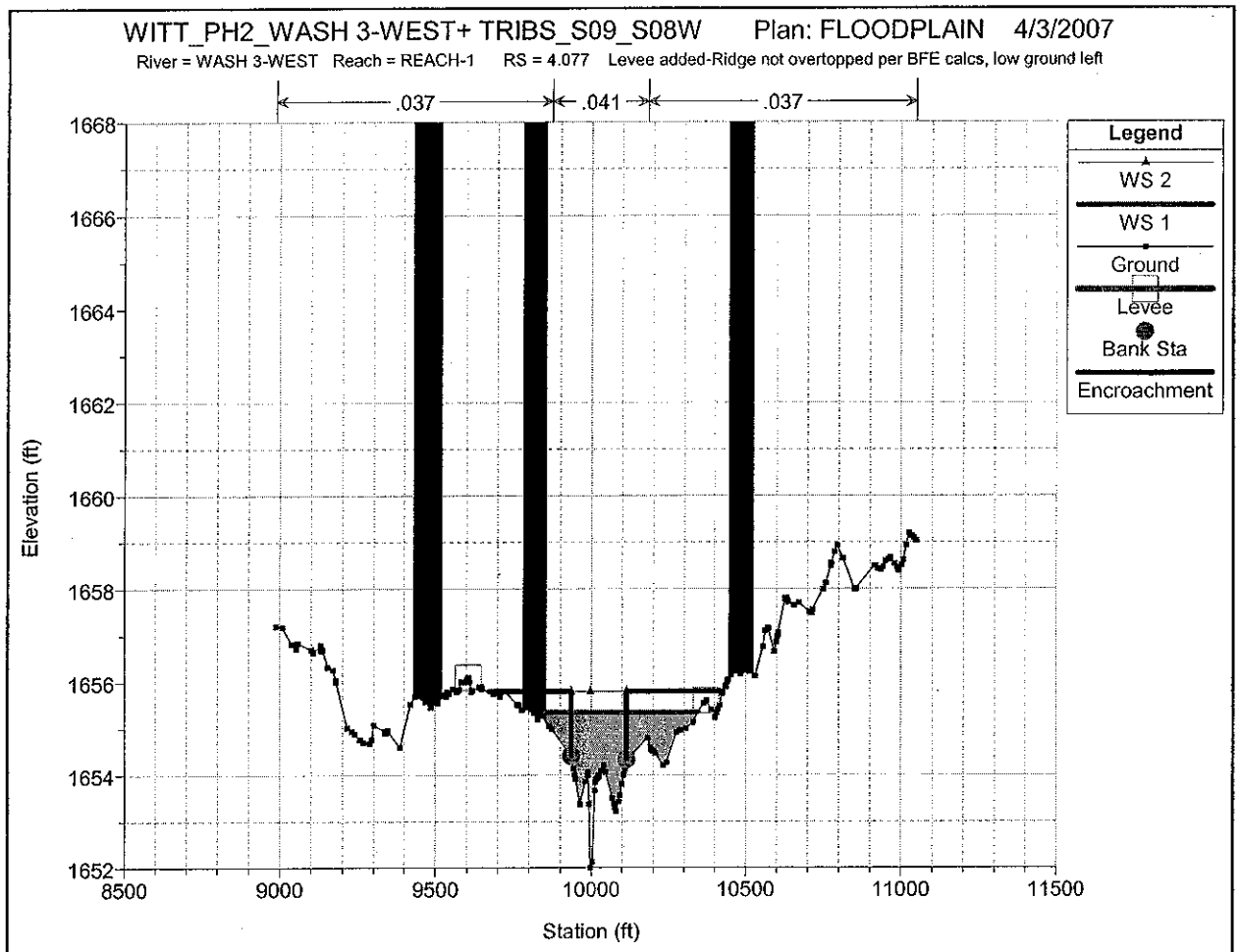

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.624
.037
.041
.037
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1675
1674
1673
1672
1671
1670
1669
1668
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

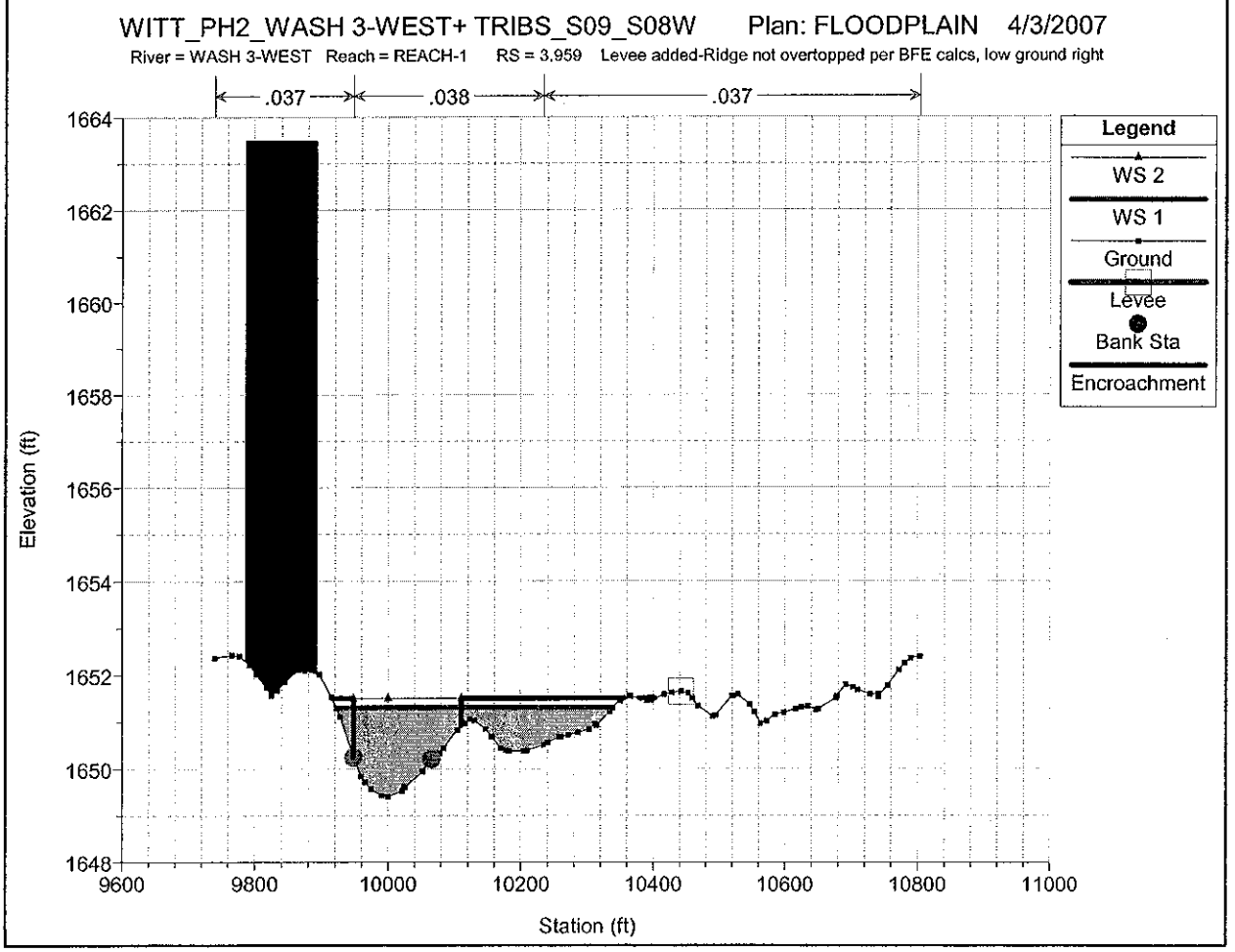

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.519
.037
.041
.037
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1674
1673
1672
1671
1670
1669
1668
1667
1666
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

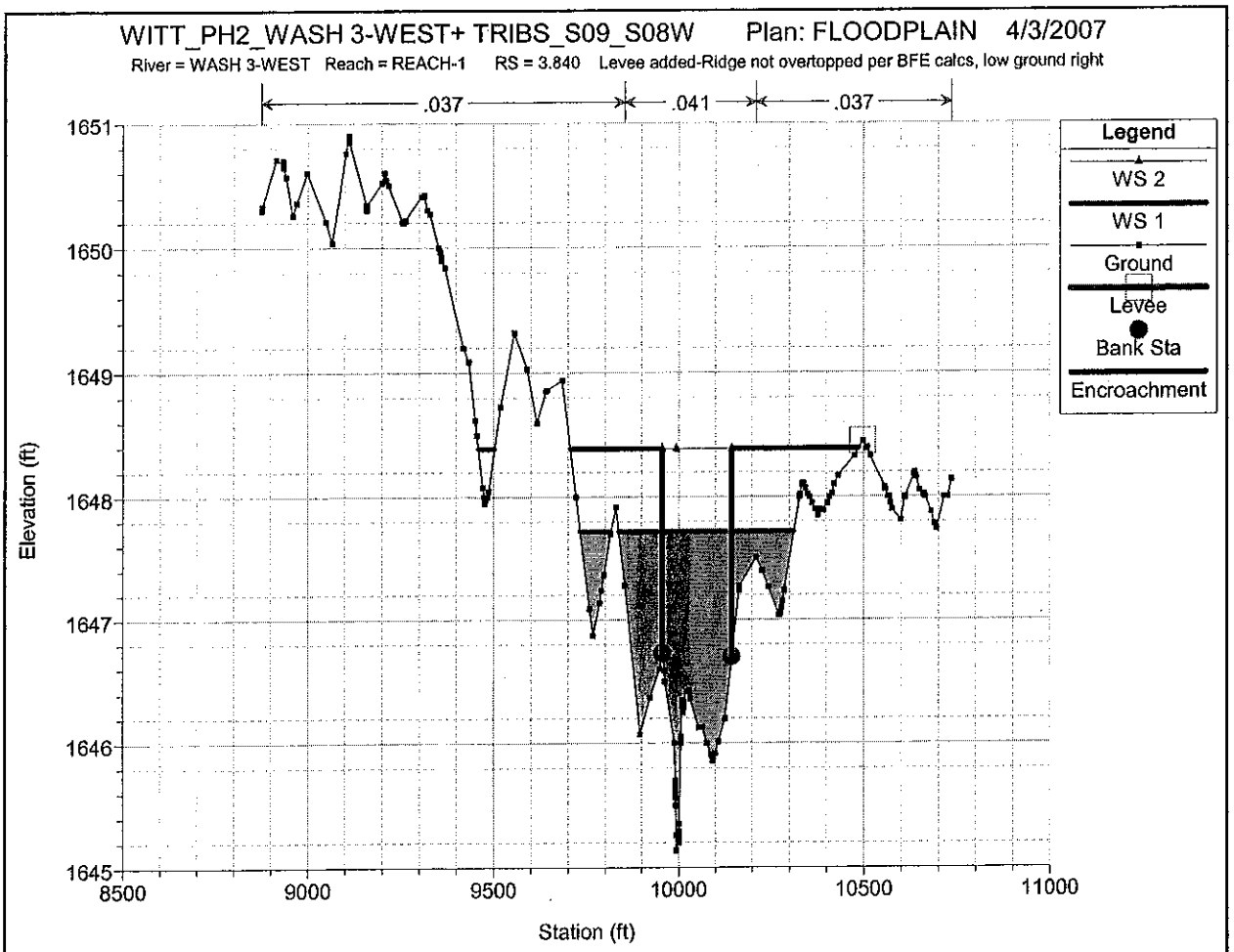

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.421 Flow rate starting at this cross-section and downstream is incre
.037
.041
.037
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1670
1669
1668
1667
1666
1665
1664
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

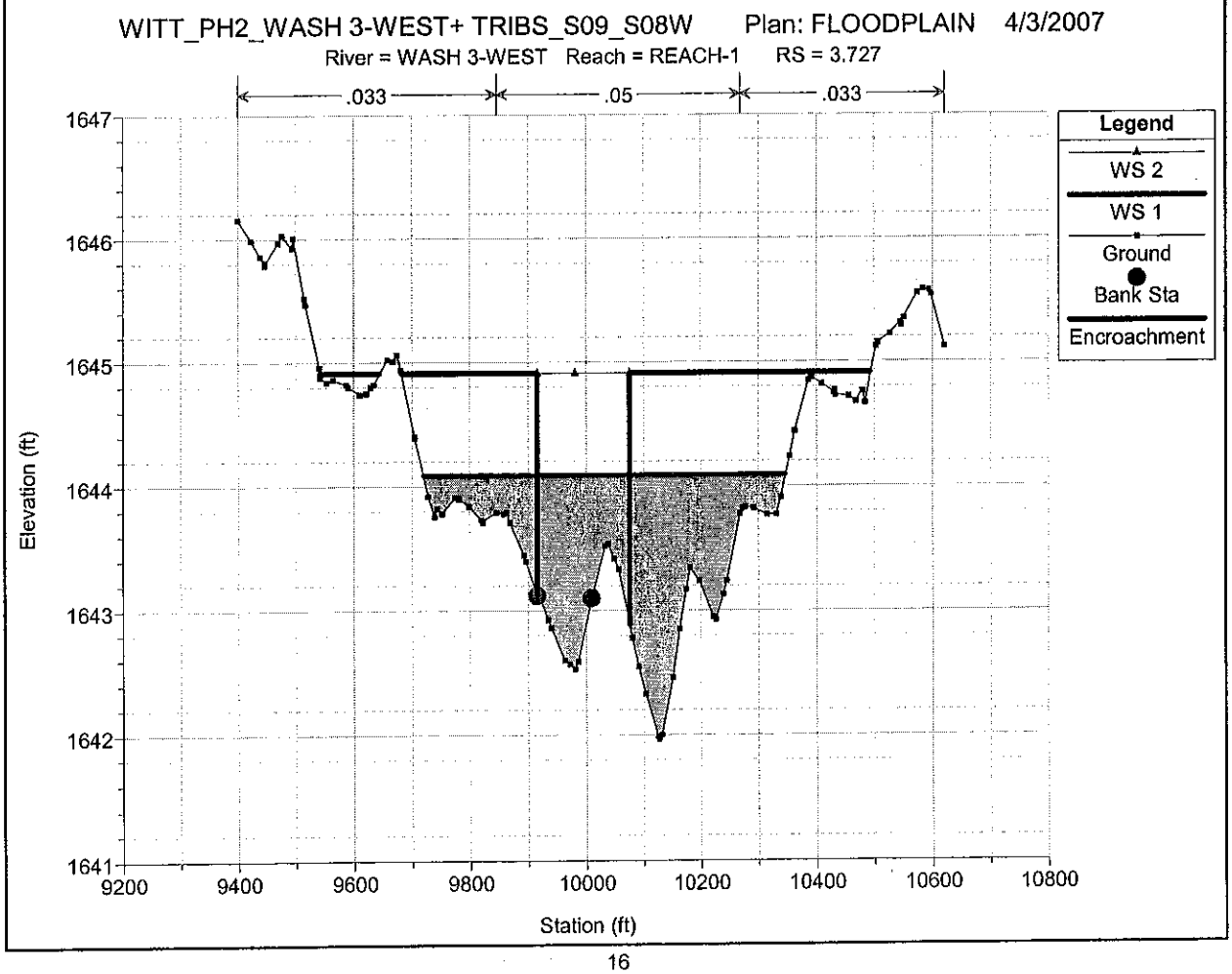

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.310 Blocked obstruction(s) added to represent residential home(s) as
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1676
1674
1672
1670
1668
1666
1664
1662
1660
1658
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

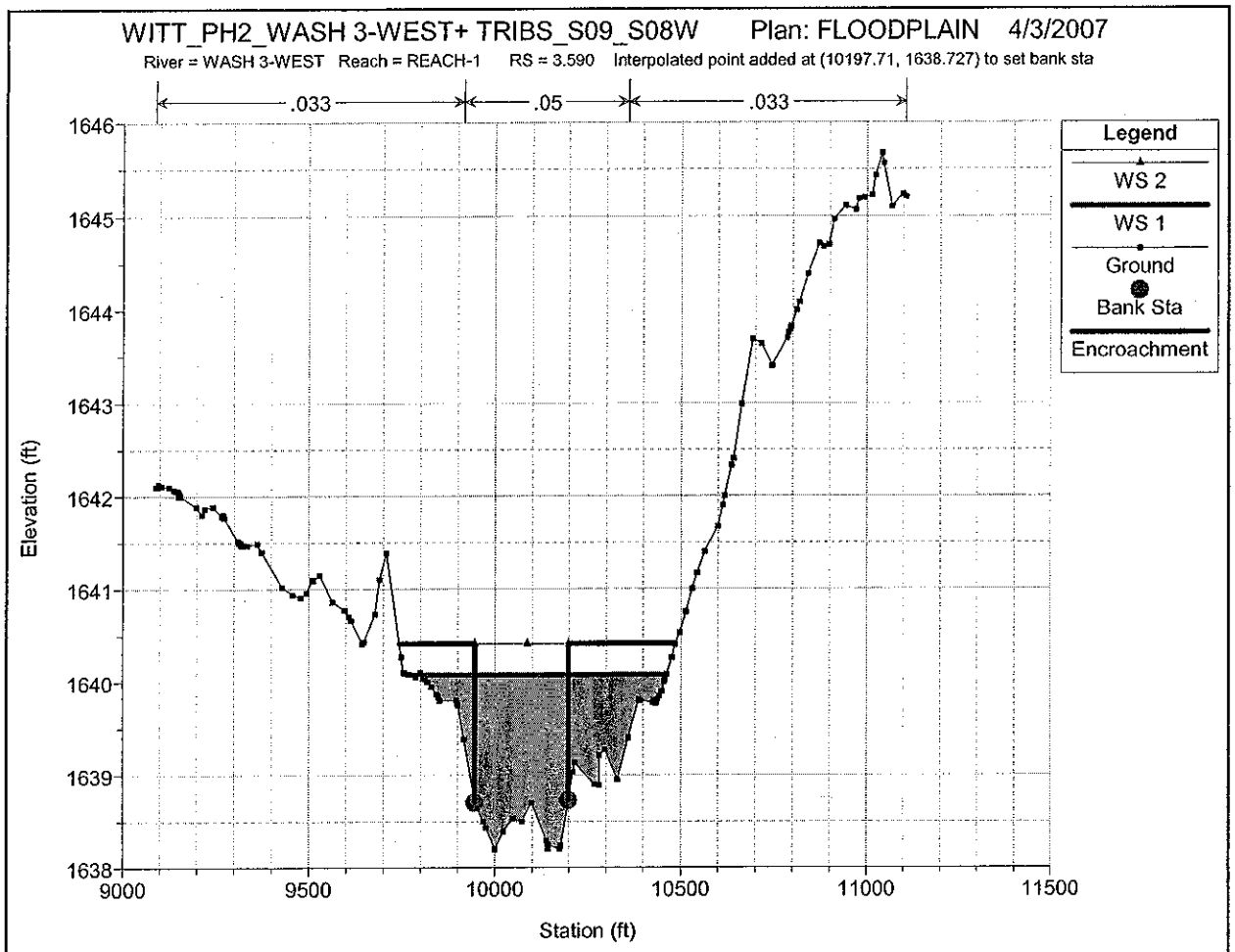

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.196 Levee added-Ridge not overtopped per BFE calcs, low ground left
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1672
1670
1668
1666
1664
1662
1660
1658
1656
8500
9000
9500
10000
10500
11000
Station (ft)

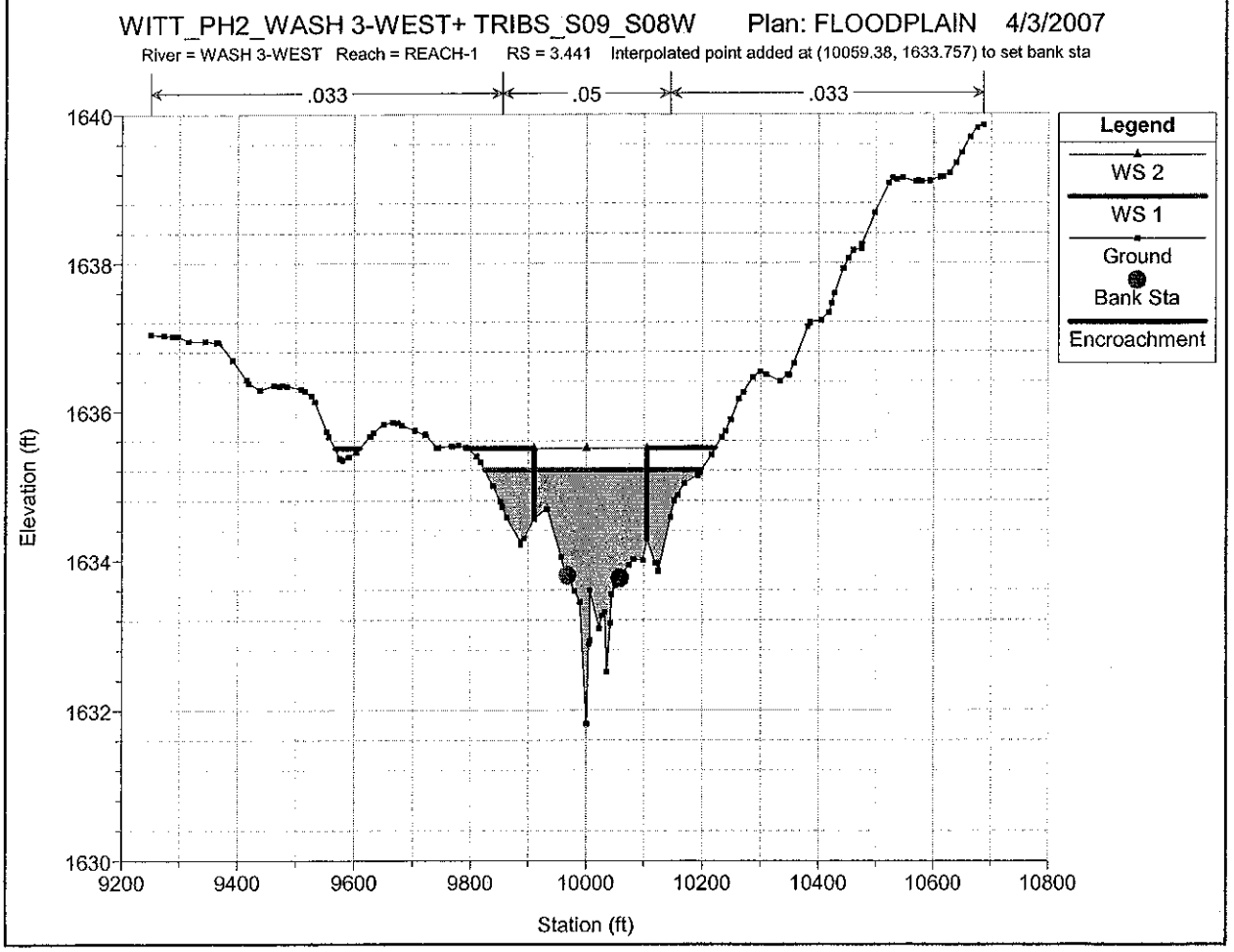

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 4.077 Levee added-Ridge not overtopped per BFE calcs, low ground left
.037
.041
.037
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1668
1666
1664
1662
1660
1658
1656
1654
1652
8500
9000
9500
10000
10500
11000
11500
Station (ft)

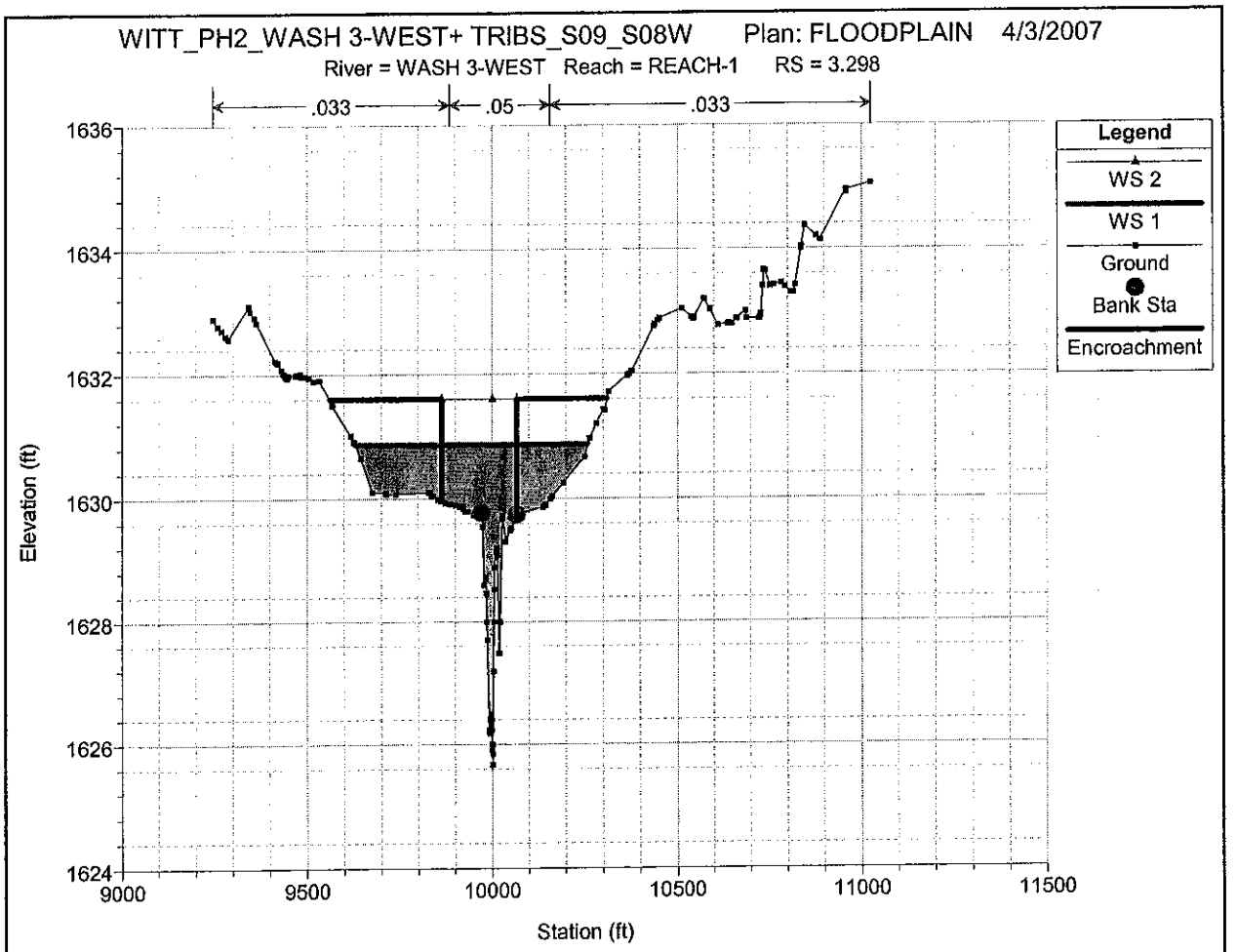

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.959 Levee added-Ridge not overtopped per BFE calcs, low ground right
.037
.038
.037
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1664
1662
1660
1658
1656
1654
1652
1650
1648
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

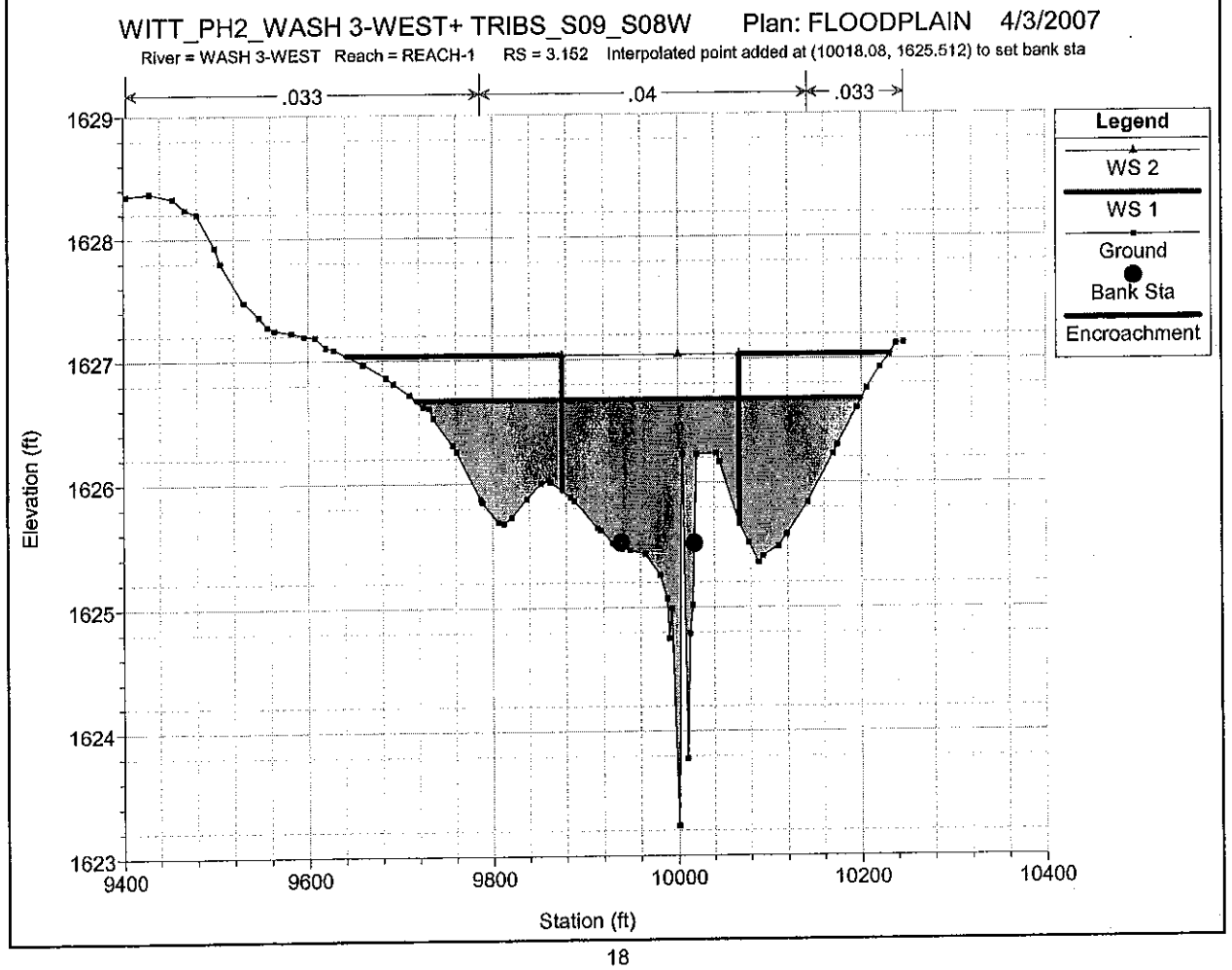

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.840 Levee added-Ridge not overtopped per BFE calcs, low ground right
.037
.041
.037
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1651
1650
1649
1648
1647
1646
1645
8500
9000
9500
10000
10500
11000

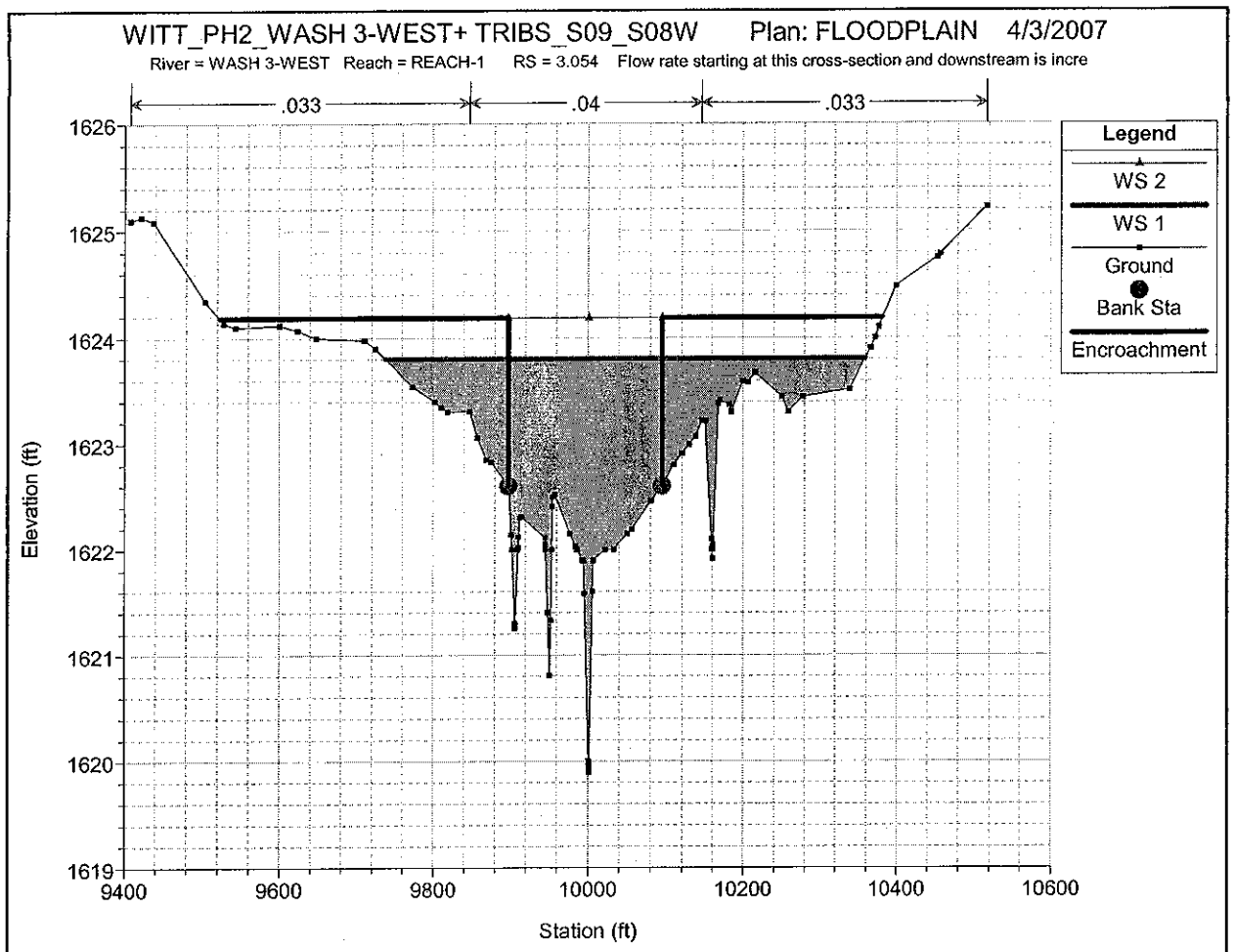

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.727
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1647
1646
1645
1644
1643
1642
1641
9200
9400
9600
9800
10000
10200
10400
10600
10800

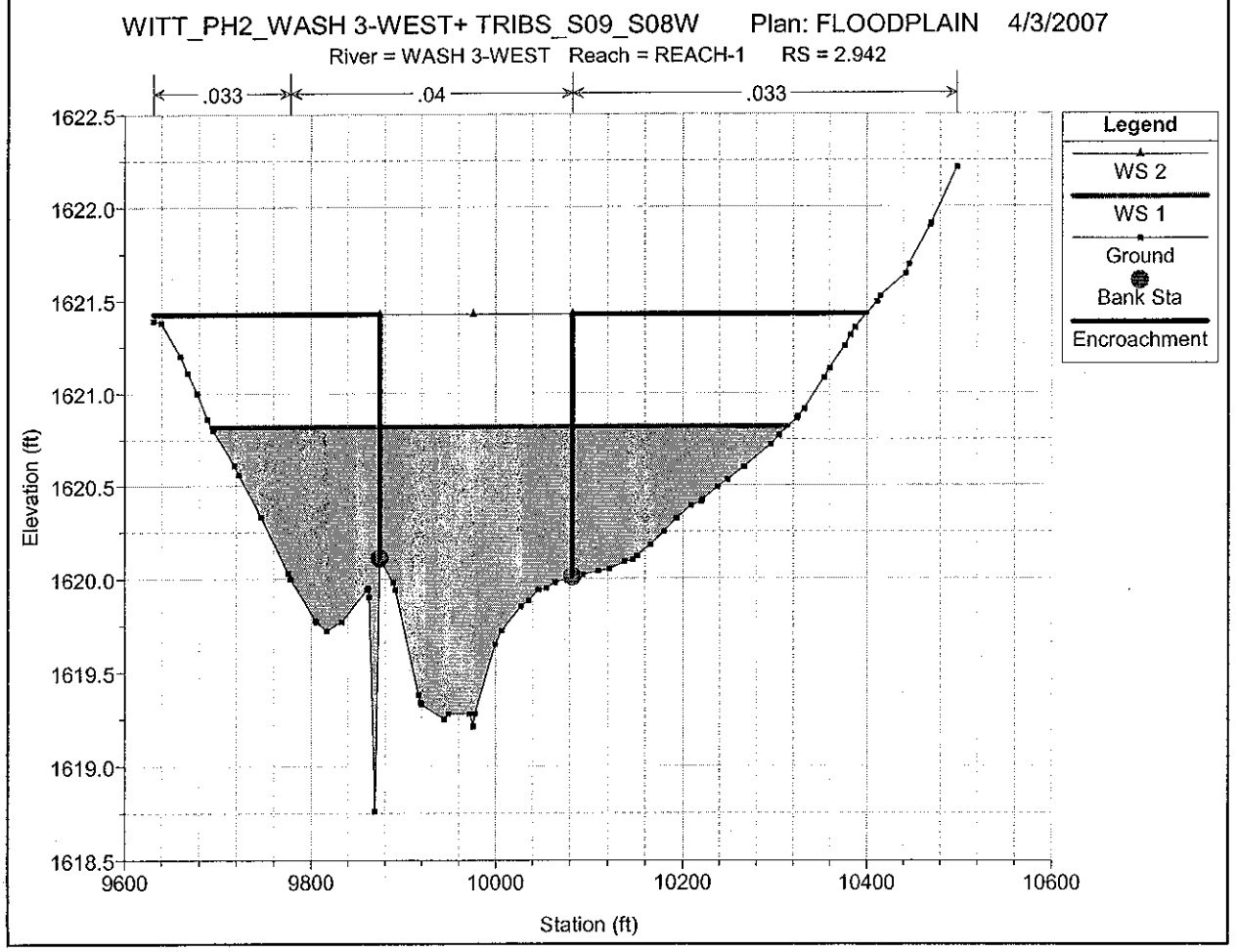

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.590 Interpolated point added at (10197.71, 1638.727) to set bank sta
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1646
1645
1644
1643
1642
1641
1640
1639
1638
9000
9500
10000
10500
11000
11500
Station (ft)

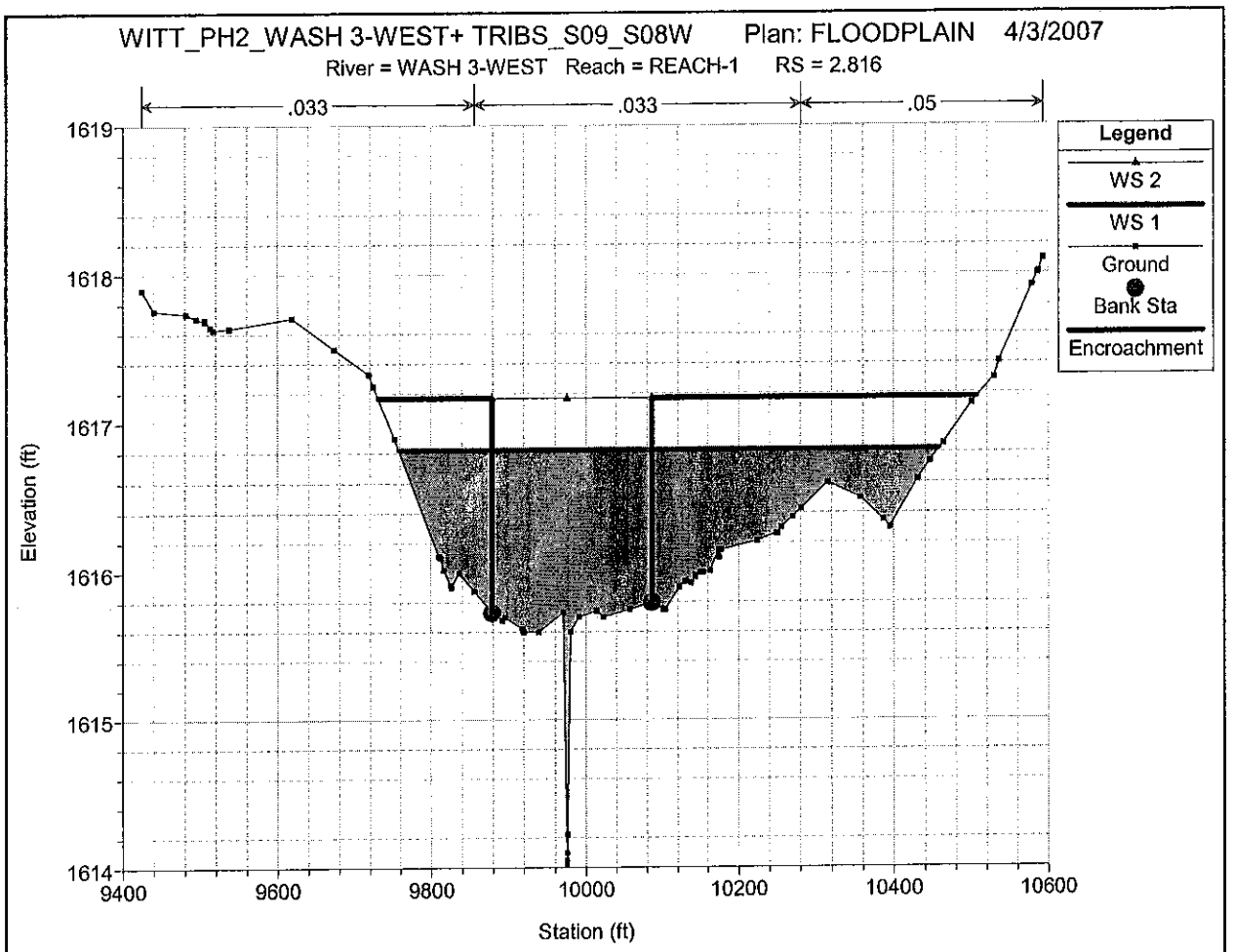

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.441 Interpolated point added at (10059.38, 1633.757) to set bank sta
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1640
1638
1636
1634
1632
1630
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

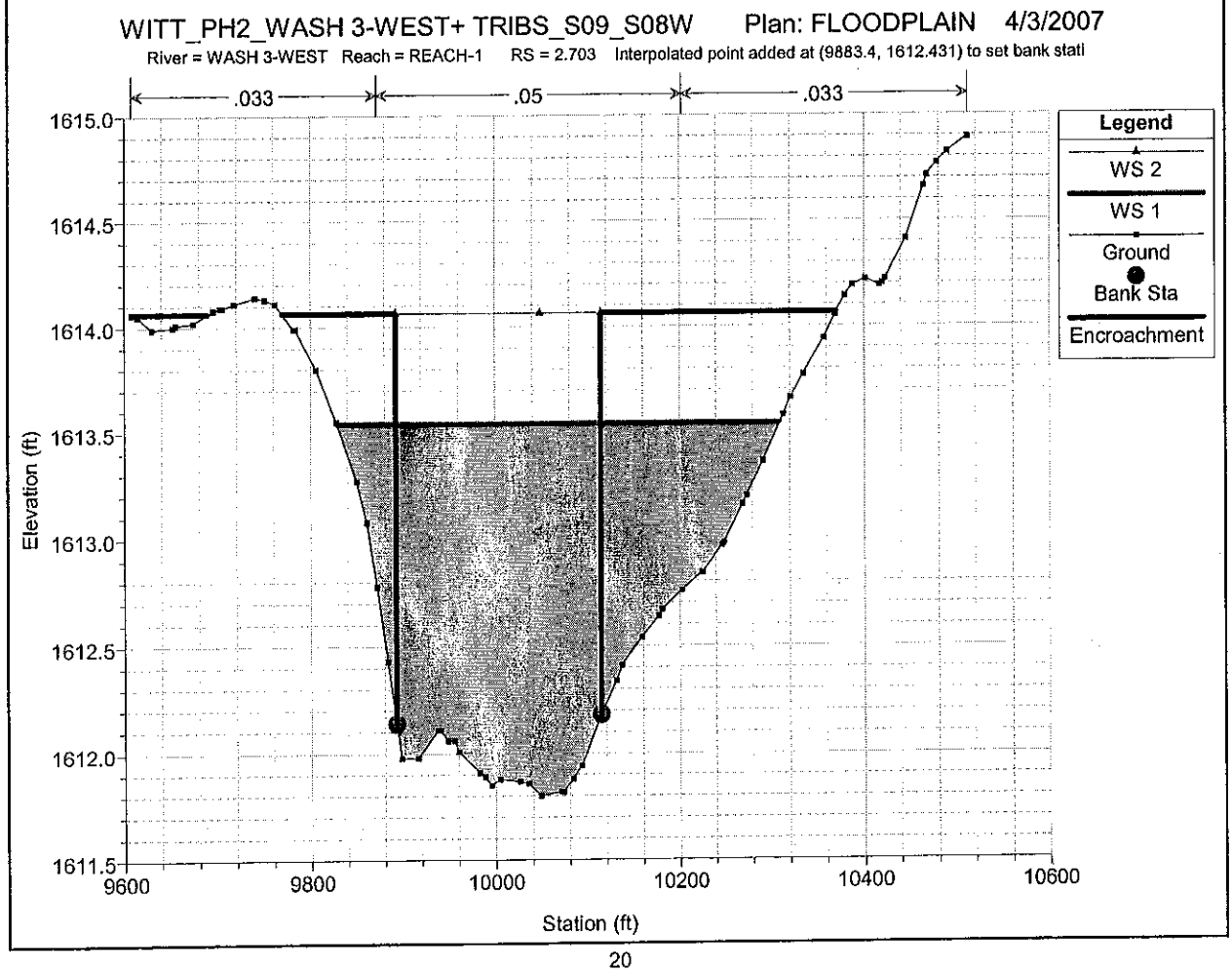

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.298
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1636
1634
1632
1630
1628
1626
1624
9000
9500
10000
10500
11000
11500
Station (ft)

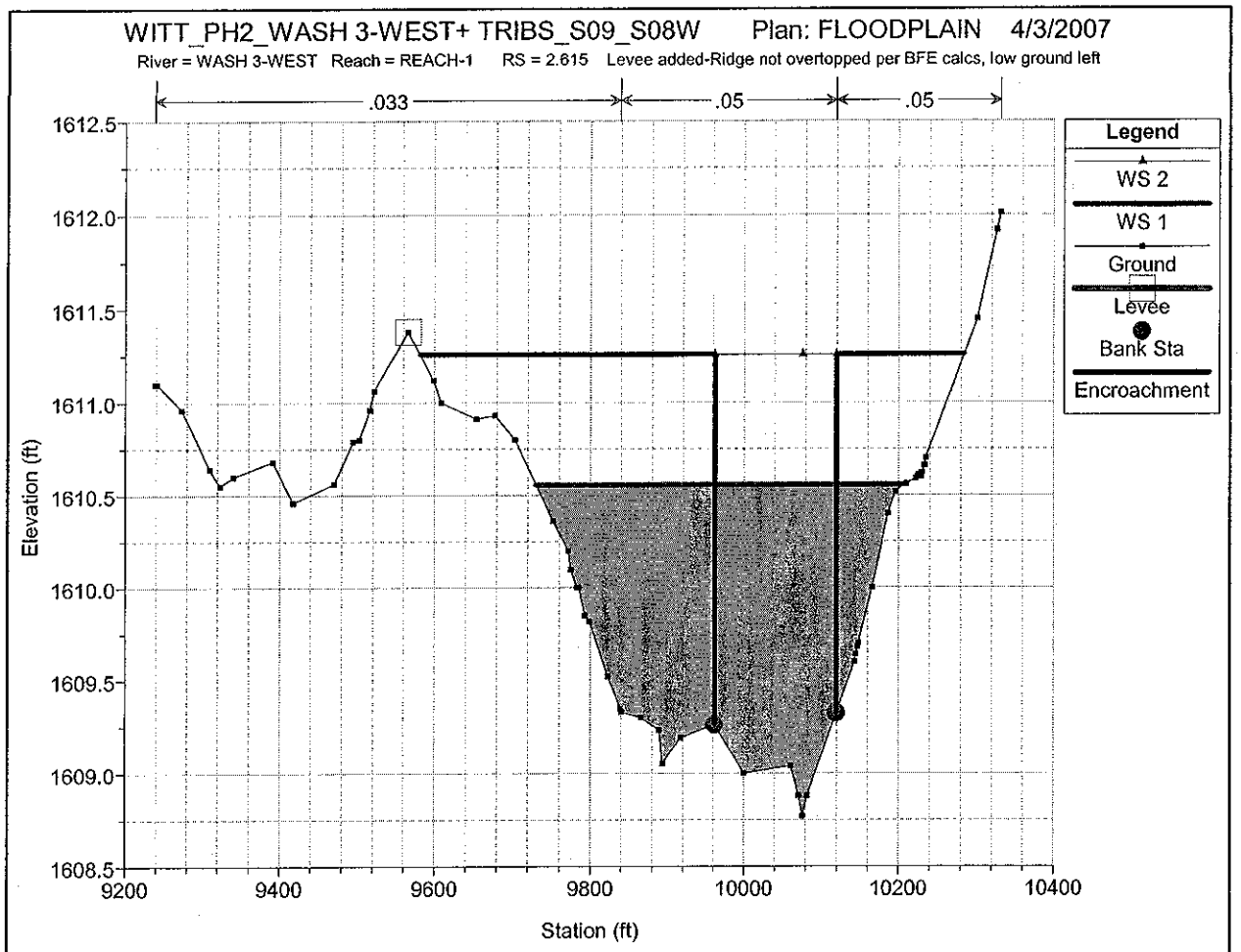

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.152 Interpolated point added at (10018.08, 1625.512) to set bank sta
.033
.04
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1629
1628
1627
1626
1625
1624
1623
9400
9600
9800
10000
10200
10400
Station (ft)

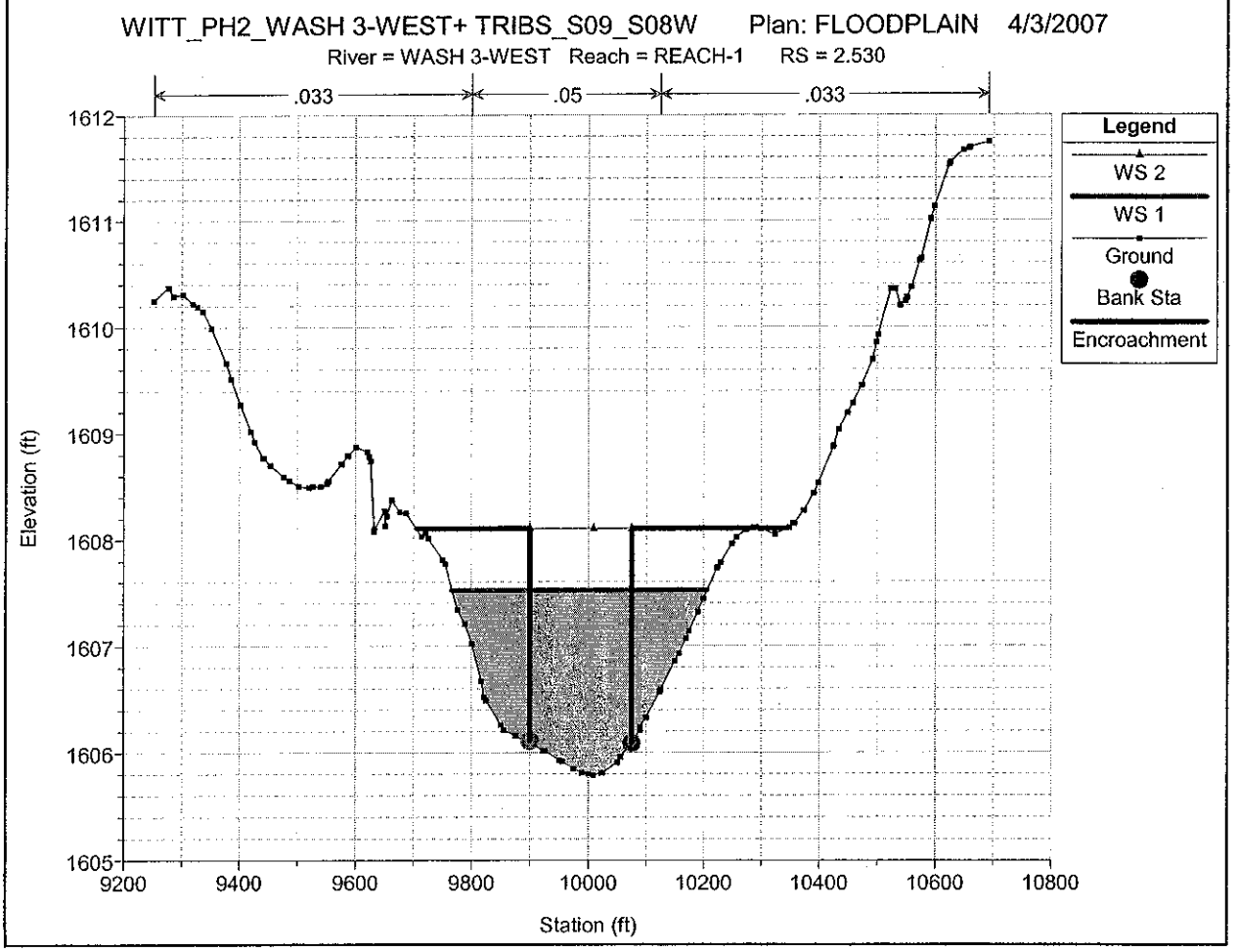

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 3.054 Flow rate starting at this cross-section and downstream is incre
.033
.04
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1626
1625
1624
1623
1622
1621
1620
1619
9400
9600
9800
10000
10200
10400
10600
Station (ft)

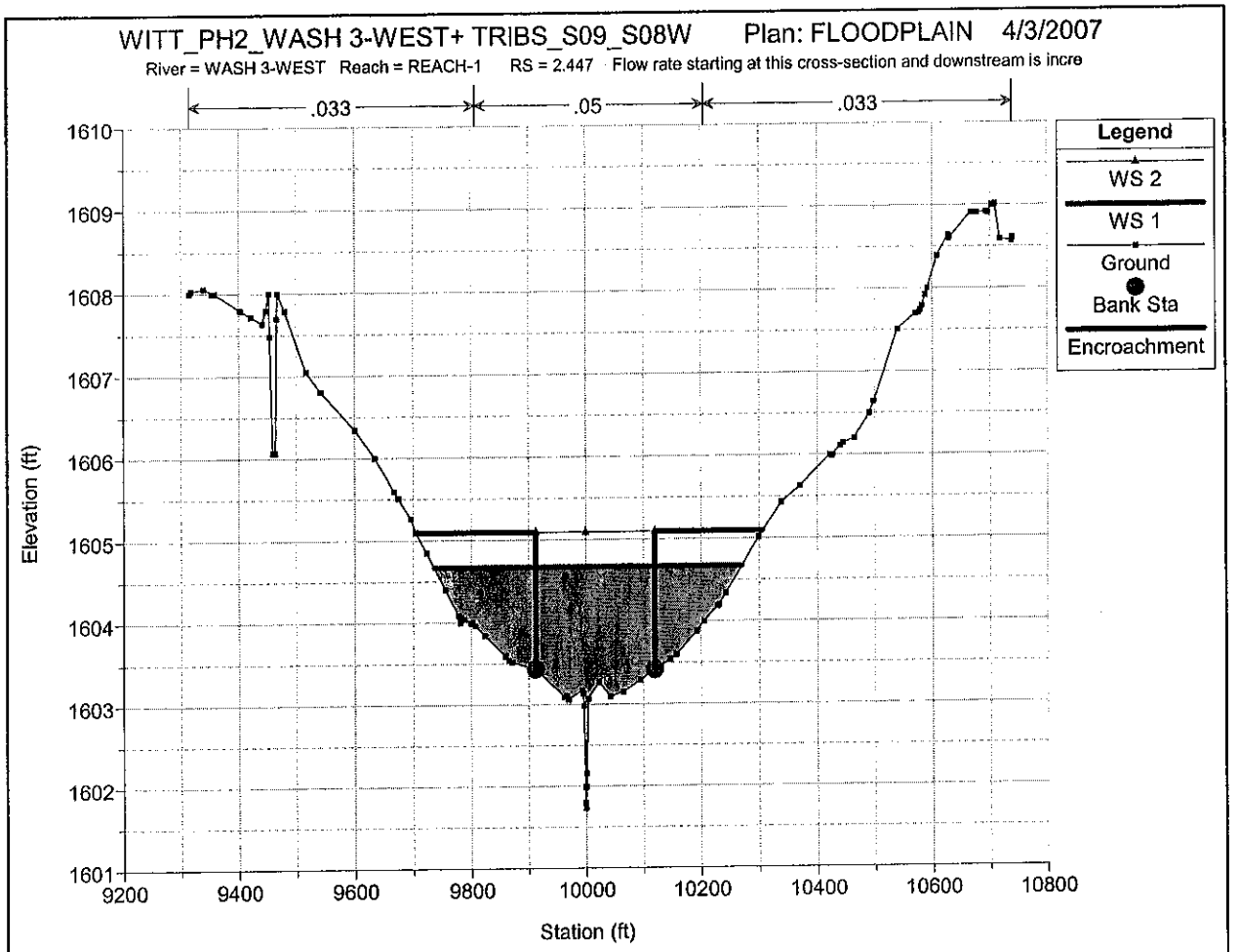

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.942
.033
.04
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1622.5
1622.0
1621.5
1621.0
1620.5
1620.0
1619.5
1619.0
1618.5
9600
9800
10000
10200
10400
10600
Station (ft)

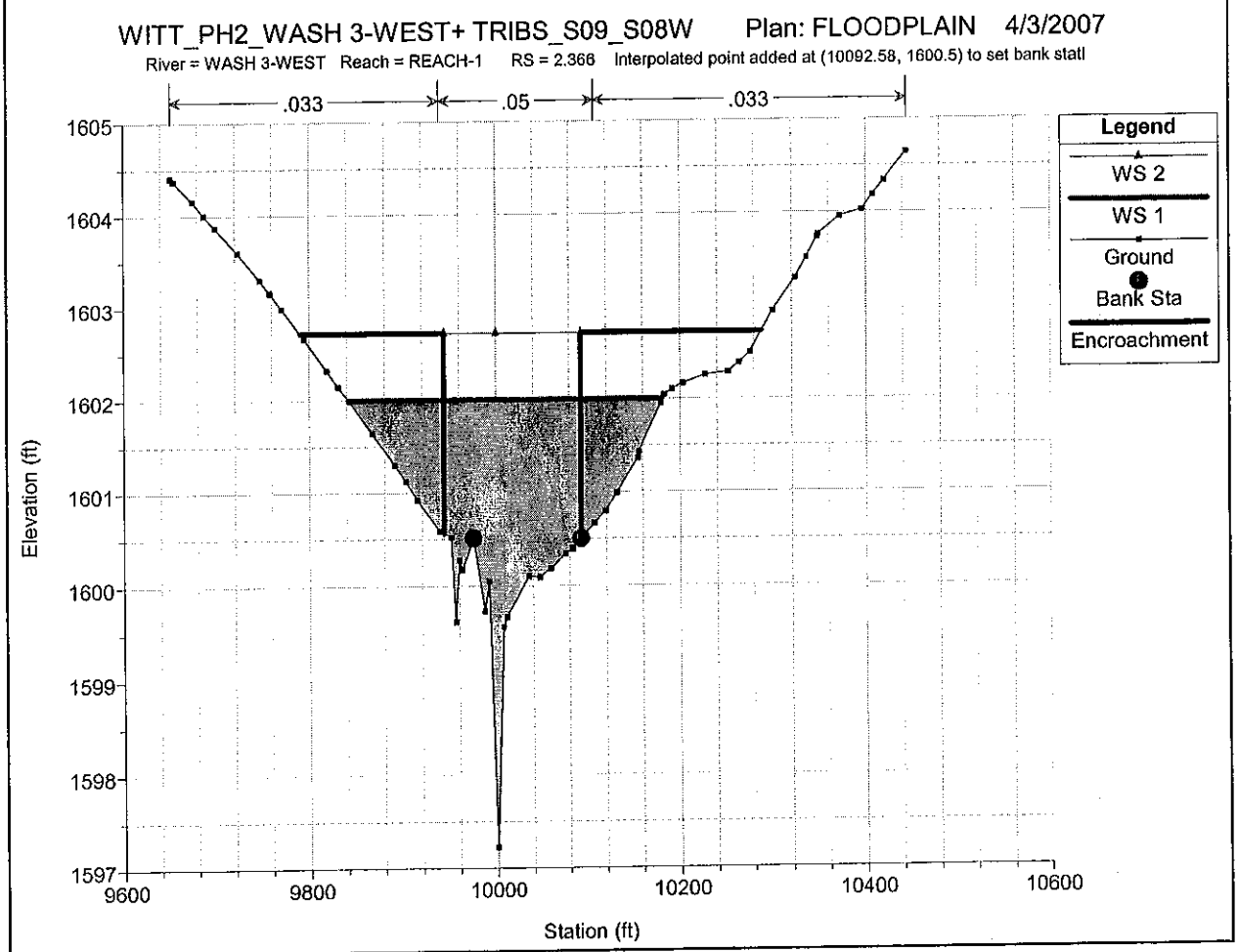

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.816
.033
.033
.05
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1619
1618
1617
1616
1615
1614
9400
9600
9800
10000
10200
10400
10600
Station (ft)

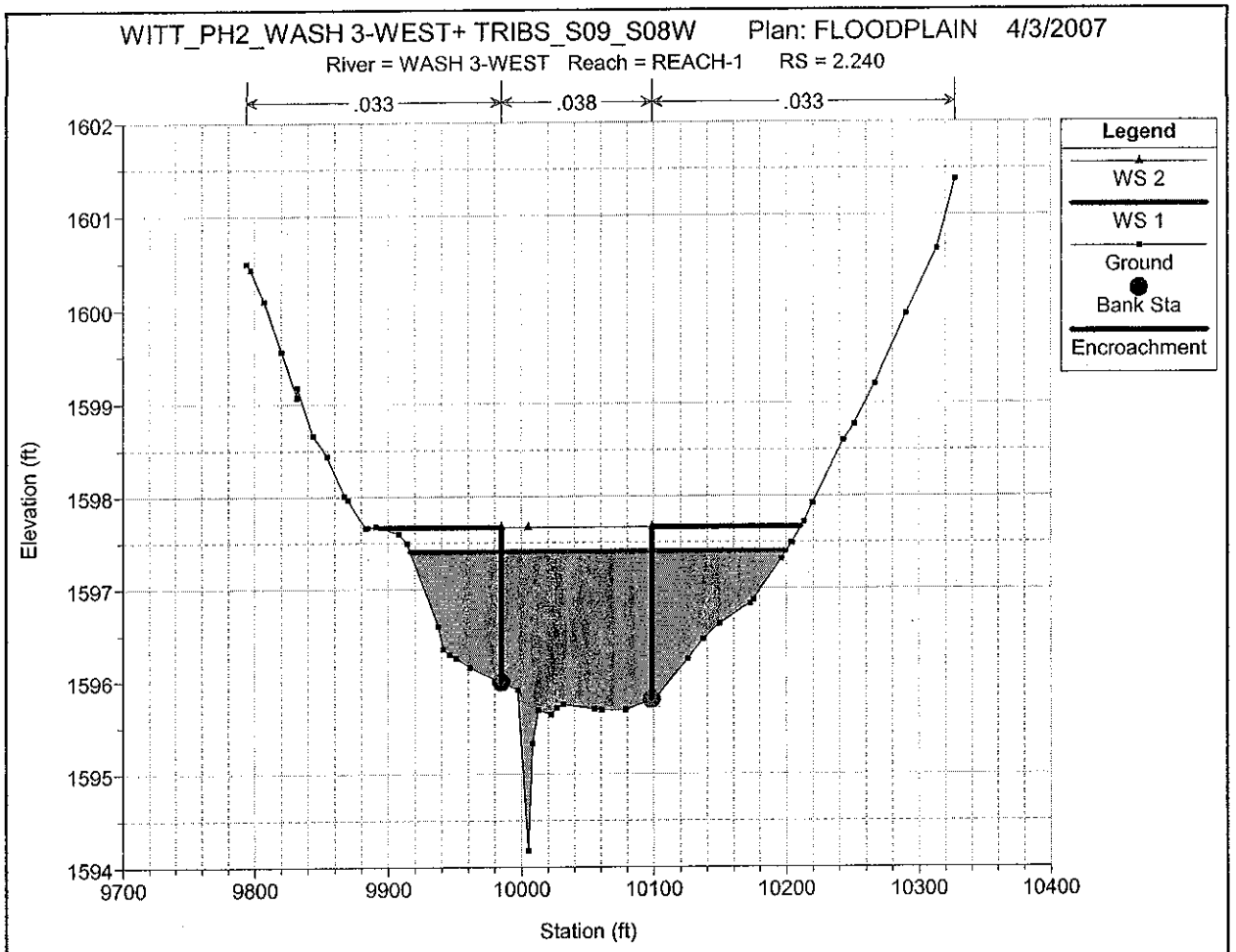

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.703 Interpolated point added at (9883.4, 1612.431) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1615.0
1614.5
1614.0
1613.5
1613.0
1612.5
1612.0
1611.5
9600
9800
10000
10200
10400
10600
Station (ft)

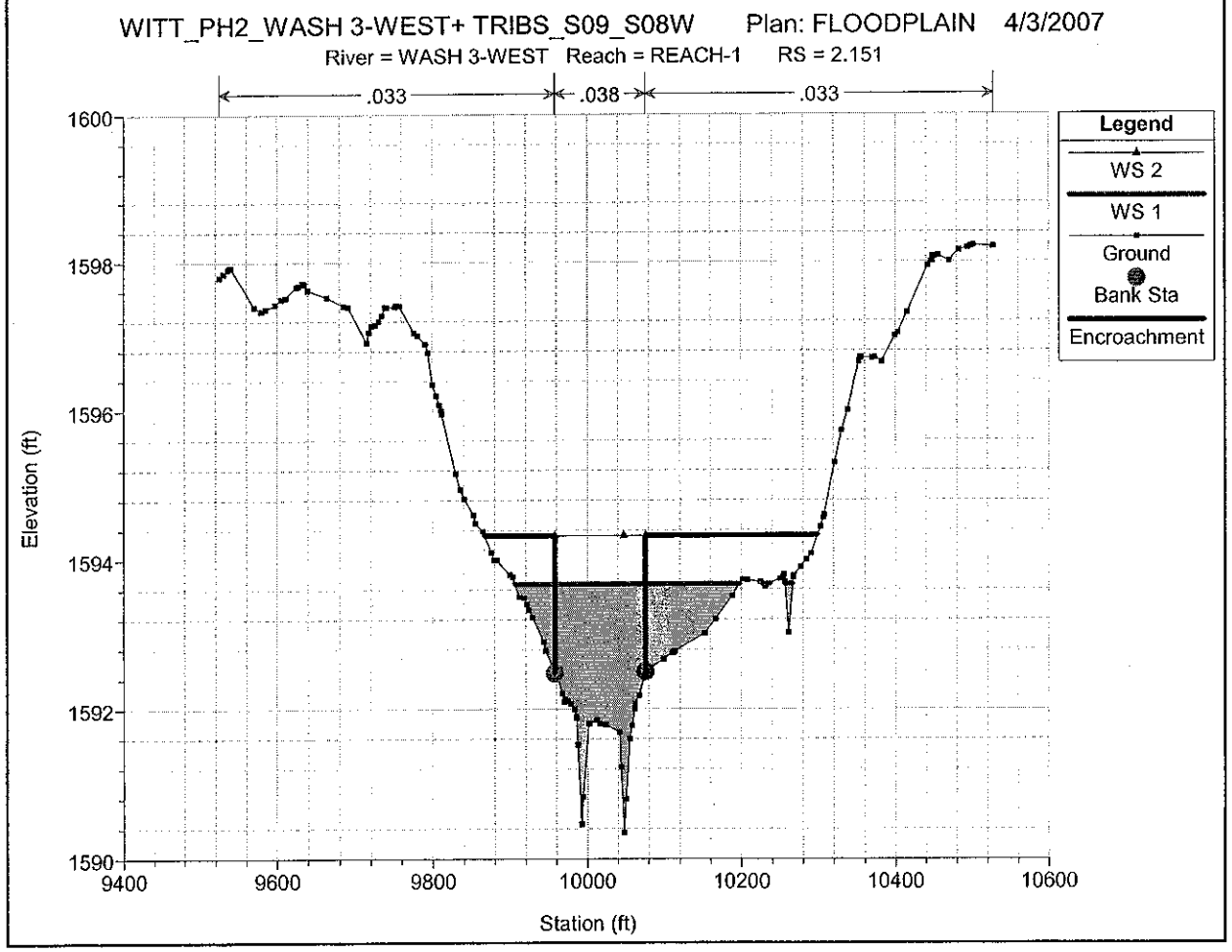

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.615 Levee added-Ridge not overtopped per BFE calcs, low ground left
.033
.05
.05
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1612.5
1612.0
1611.5
1611.0
1610.5
1610.0
1609.5
1609.0
1608.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.530
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1612
1611
1610
1609
1608
1607
1606
1605
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.447 Flow rate starting at this cross-section and downstream is incre
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1610
1609
1608
1607
1606
1605
1604
1603
1602
1601
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

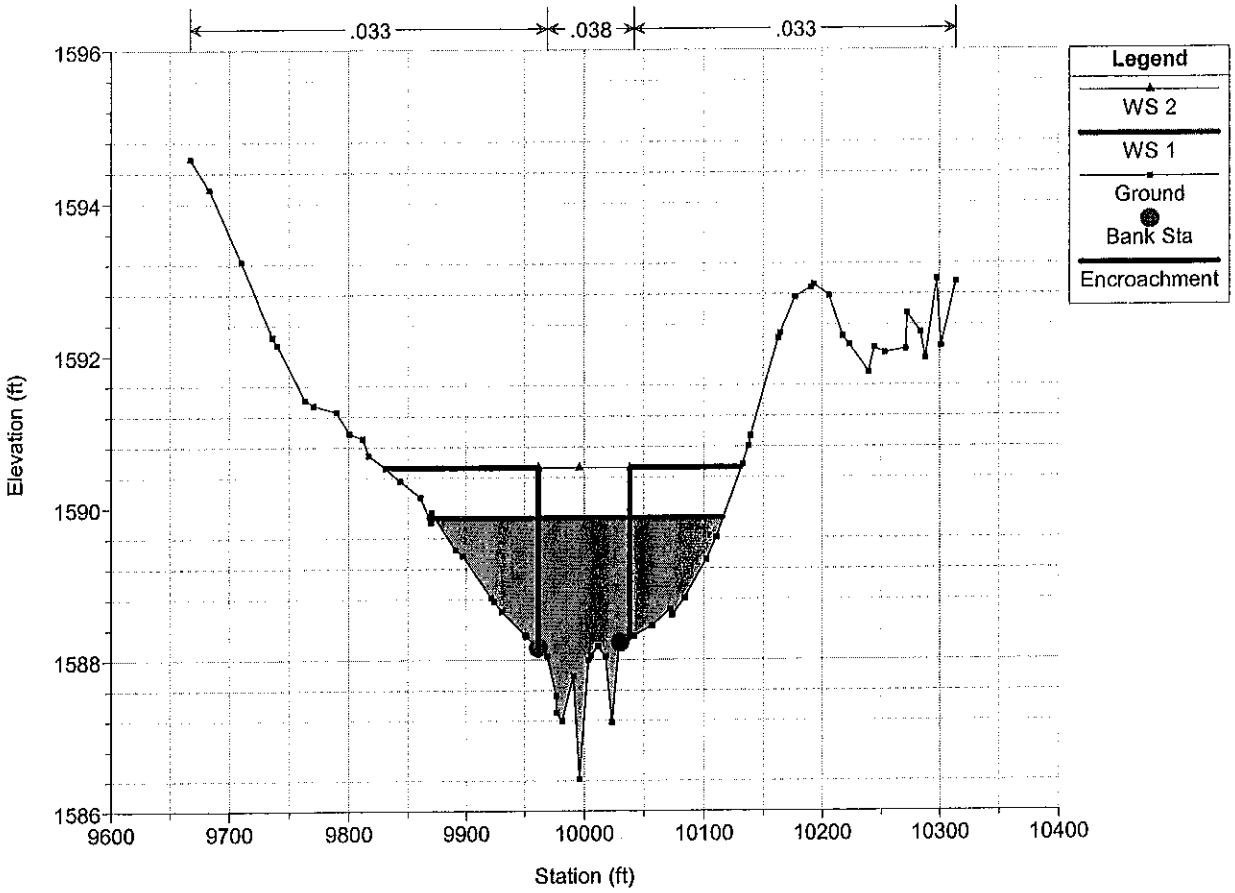

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.366 Interpolated point added at (10092.58, 1600.5) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1605
1604
1603
1602
1601
1600
1599
1598
1597
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.240
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1602
1601
1600
1599
1598
1597
1596
1595
1594
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 2.151
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1600
1598
1596
1594
1592
1590
9400
9600
9800
10000
10200
10400
10600
Station (ft)

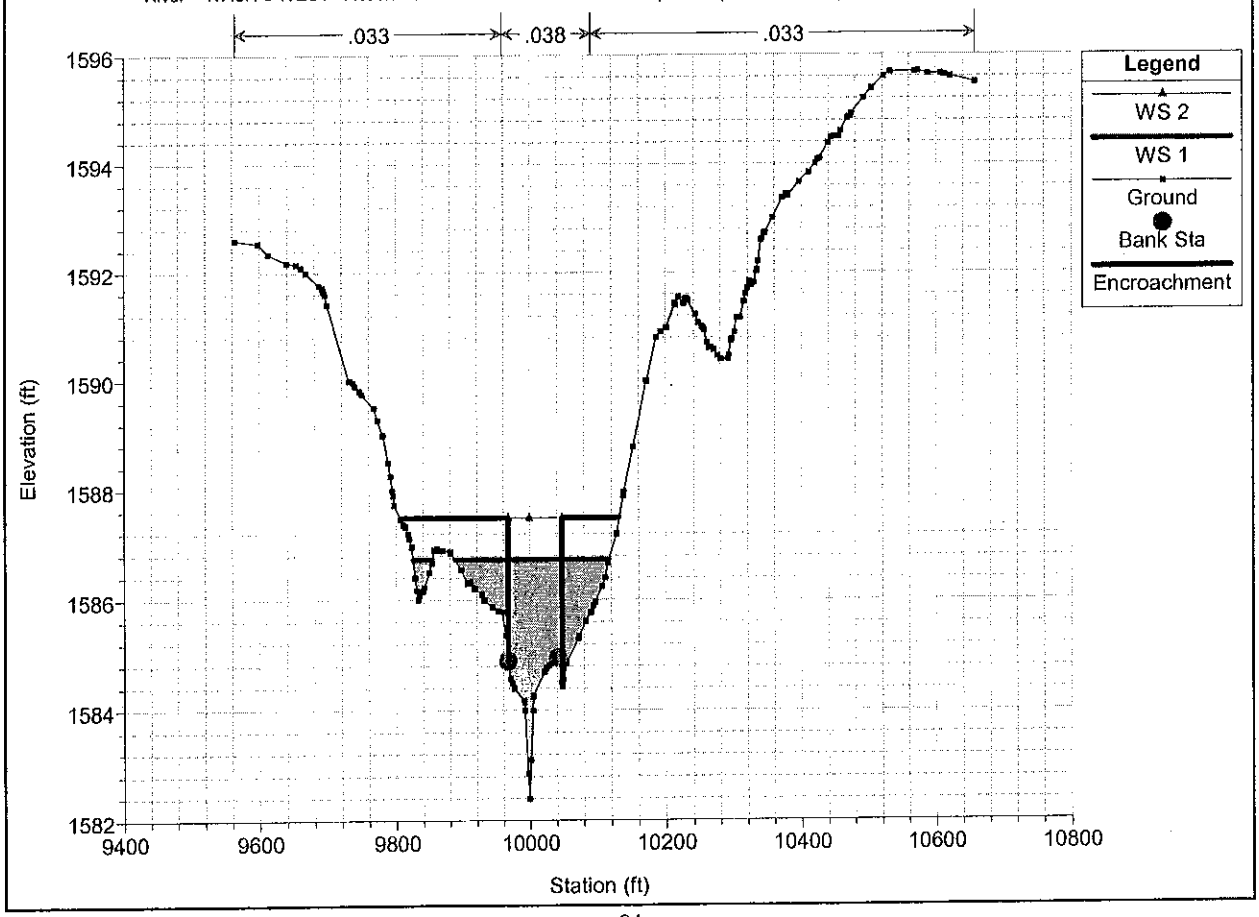
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

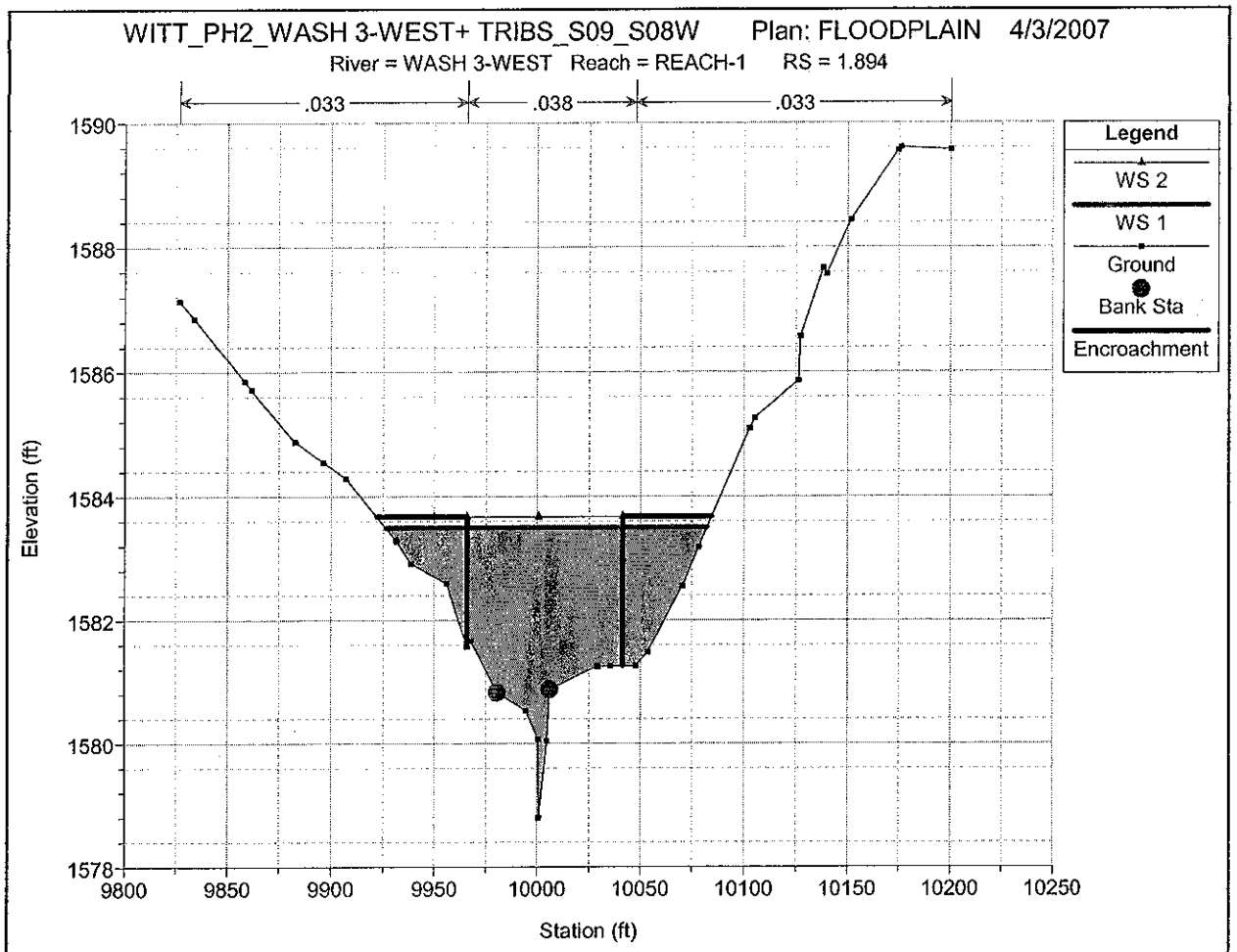
River = WASH 3-WEST Reach = REACH-1 RS = 2.061 Flow rate starting at this cross-section and downstream is incre

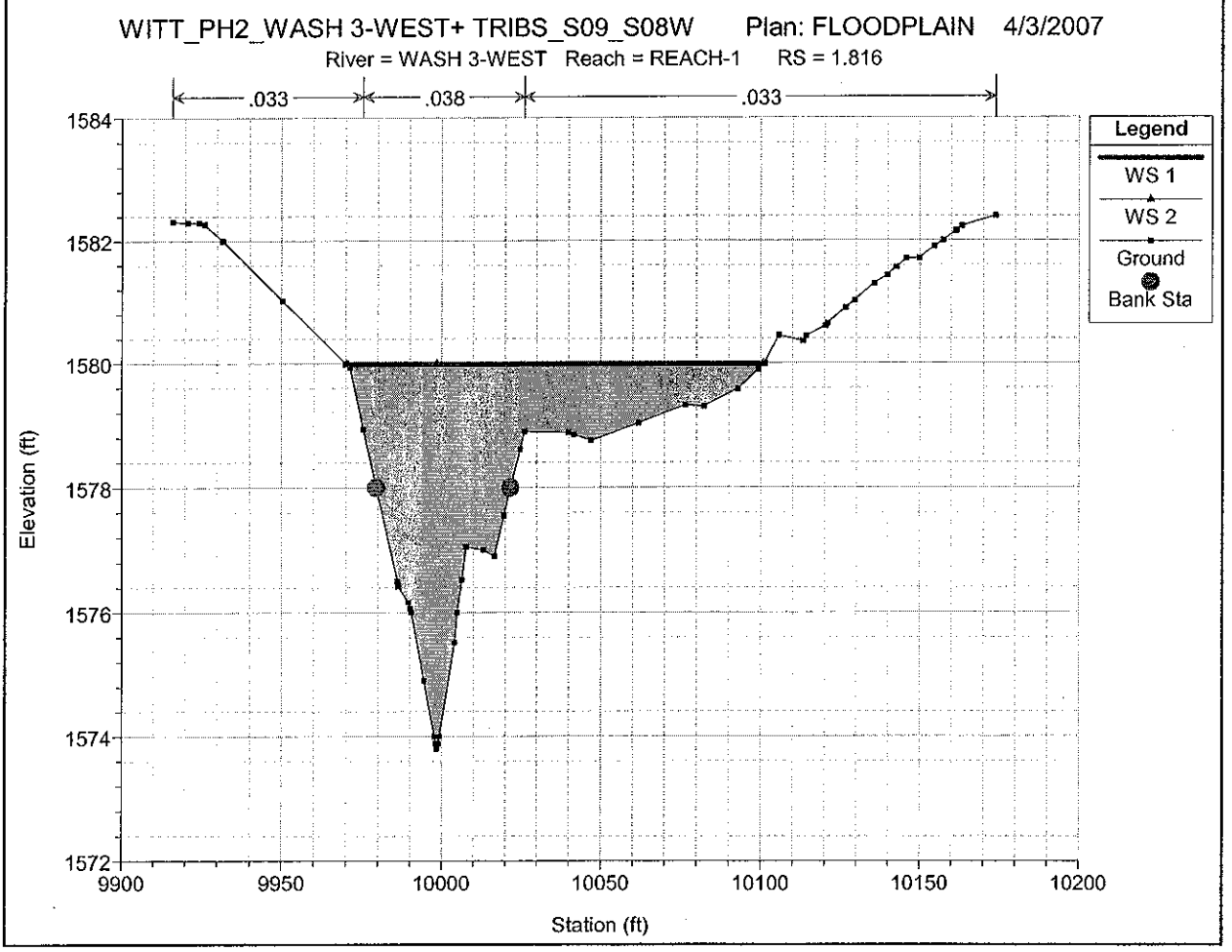


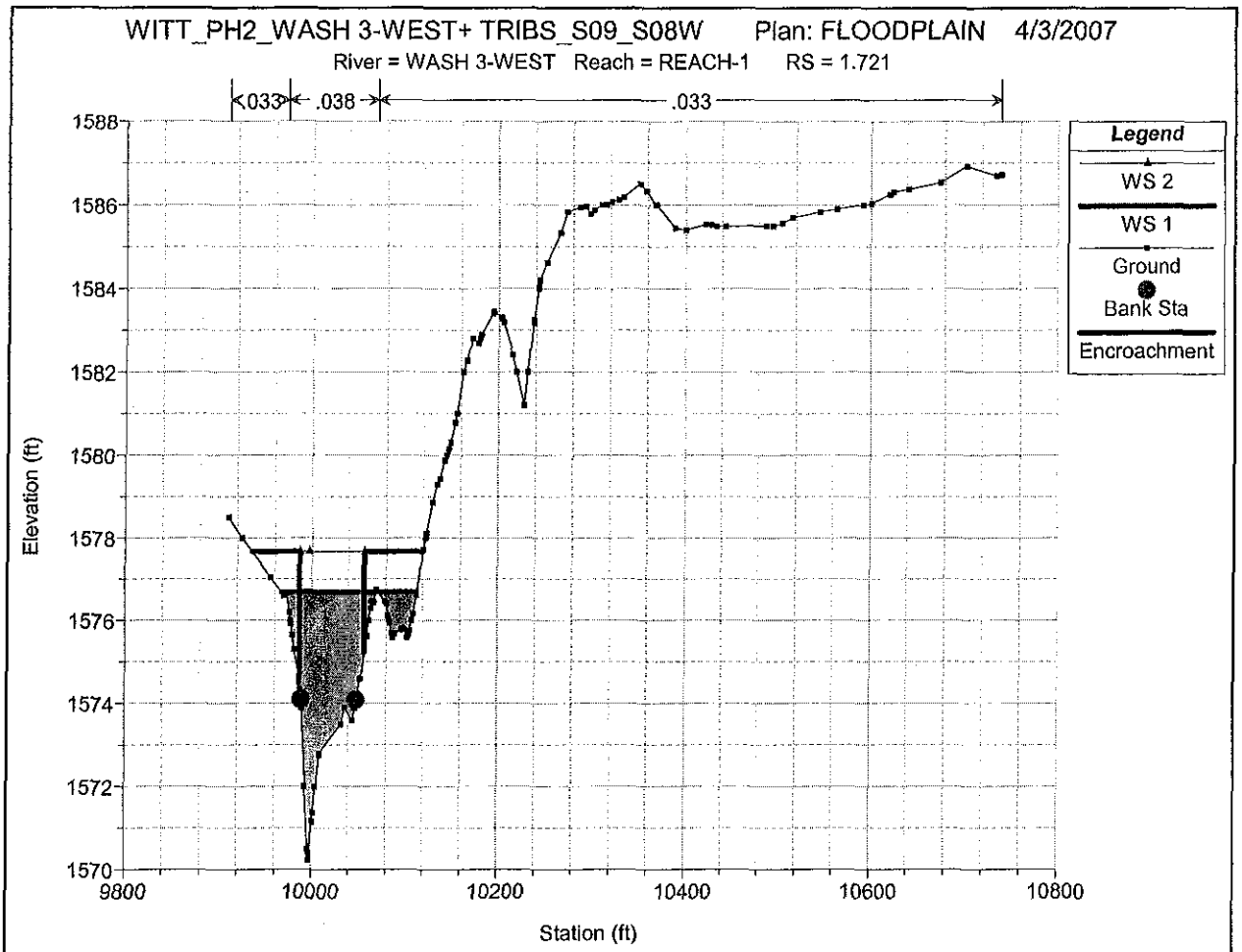
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

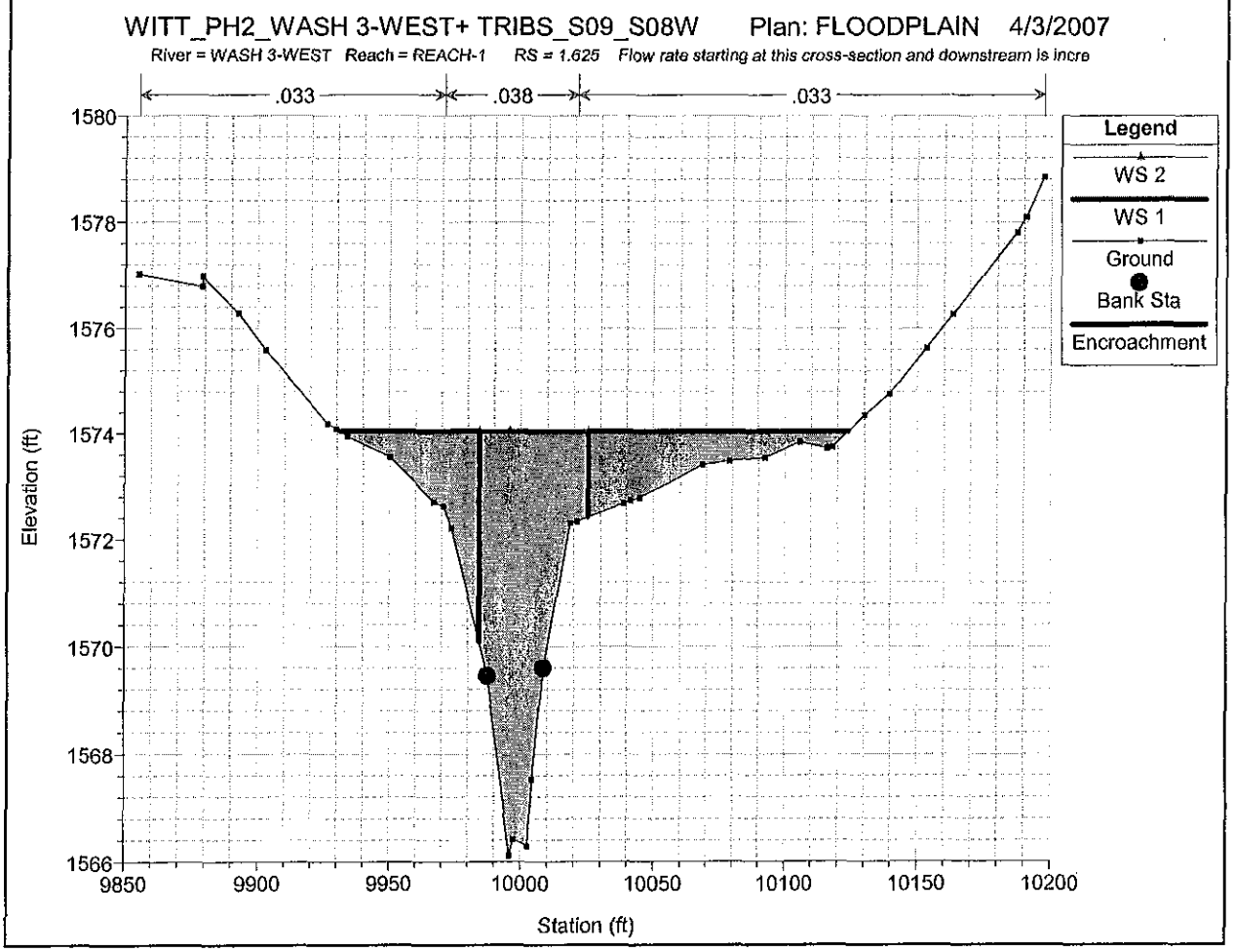
River = WASH 3-WEST Reach = REACH-1 RS = 1.979 Interpolated point added at (9966.79, 1584.893) to set bank stat

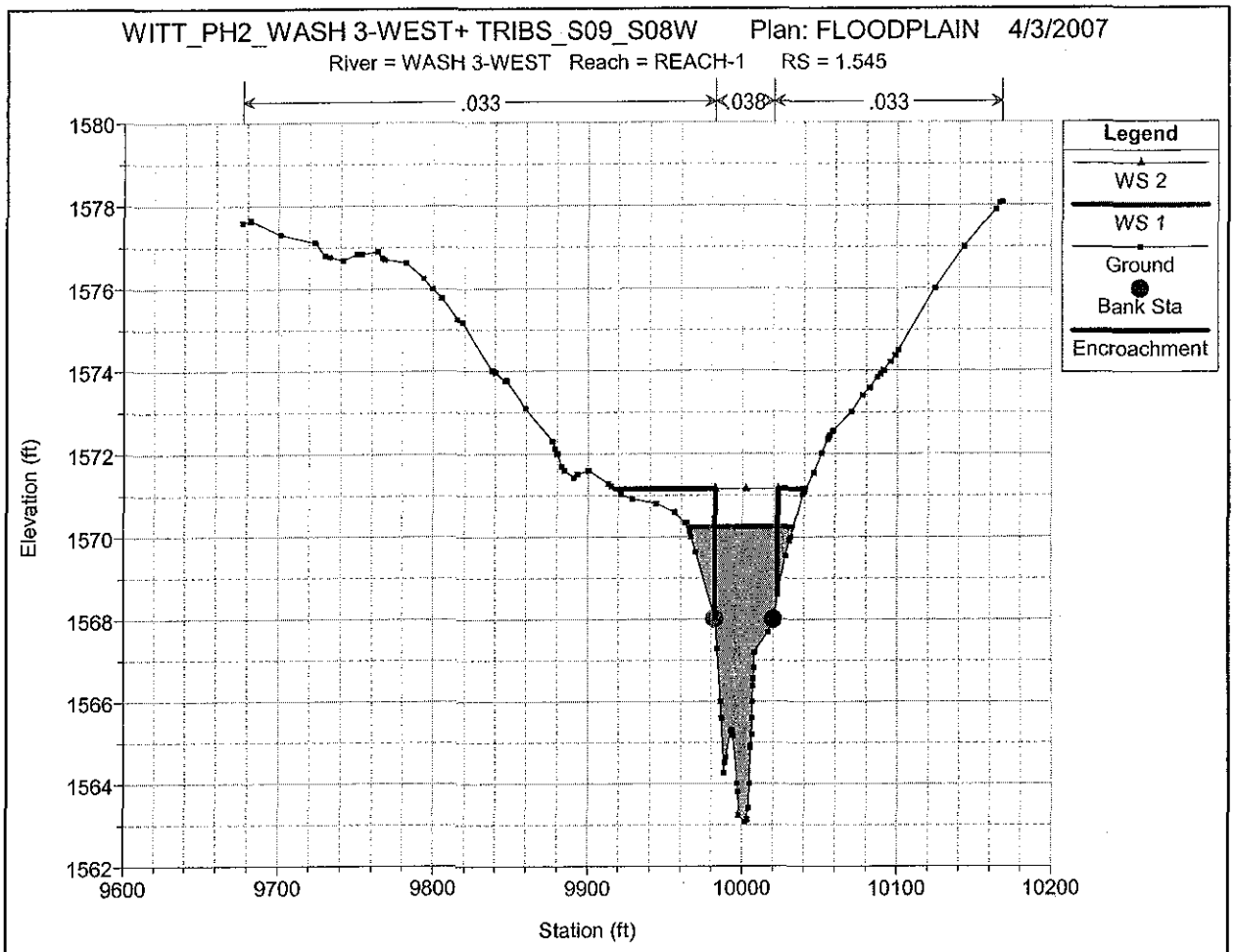


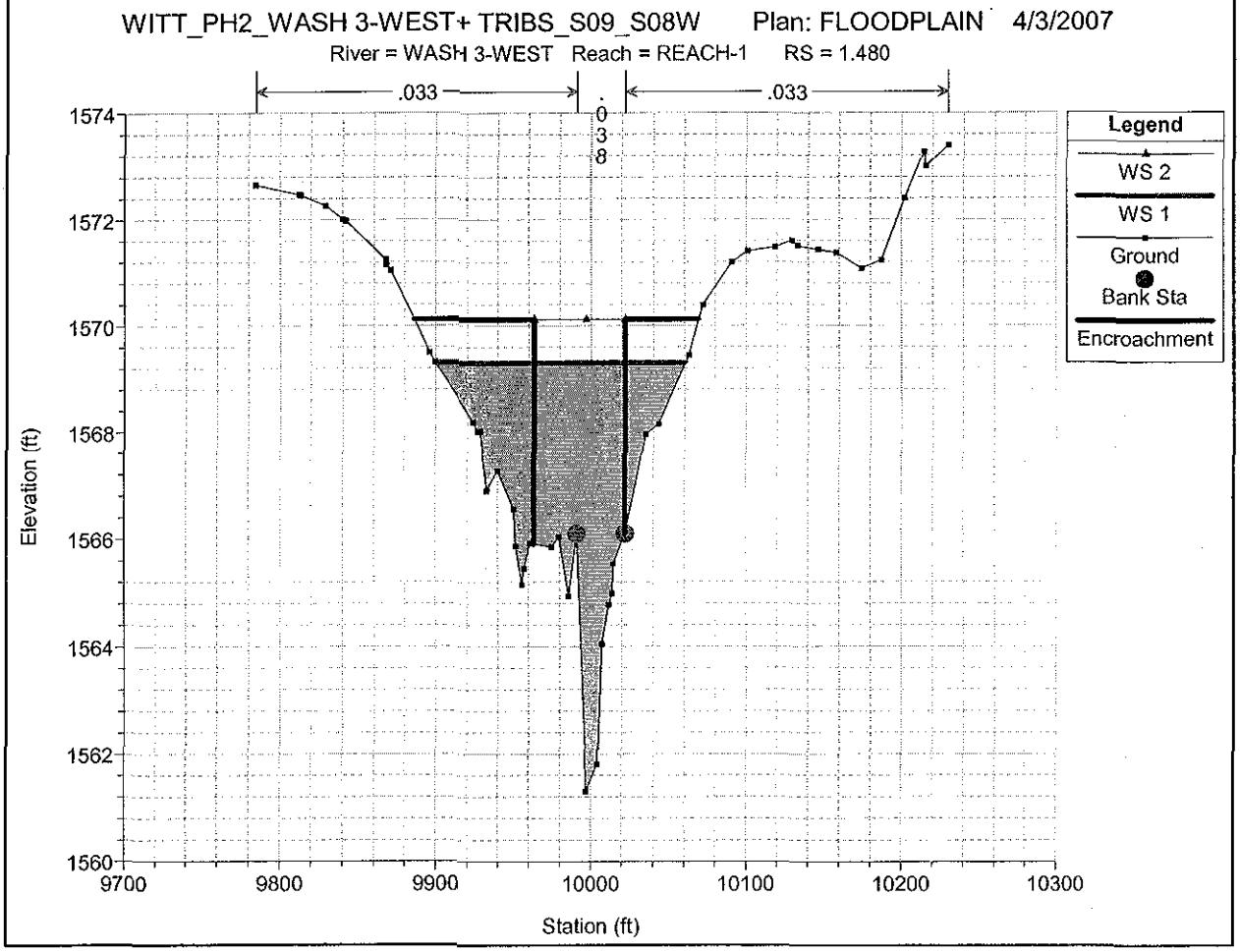

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.894
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1590
1588
1586
1584
1582
1580
1578
9800
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

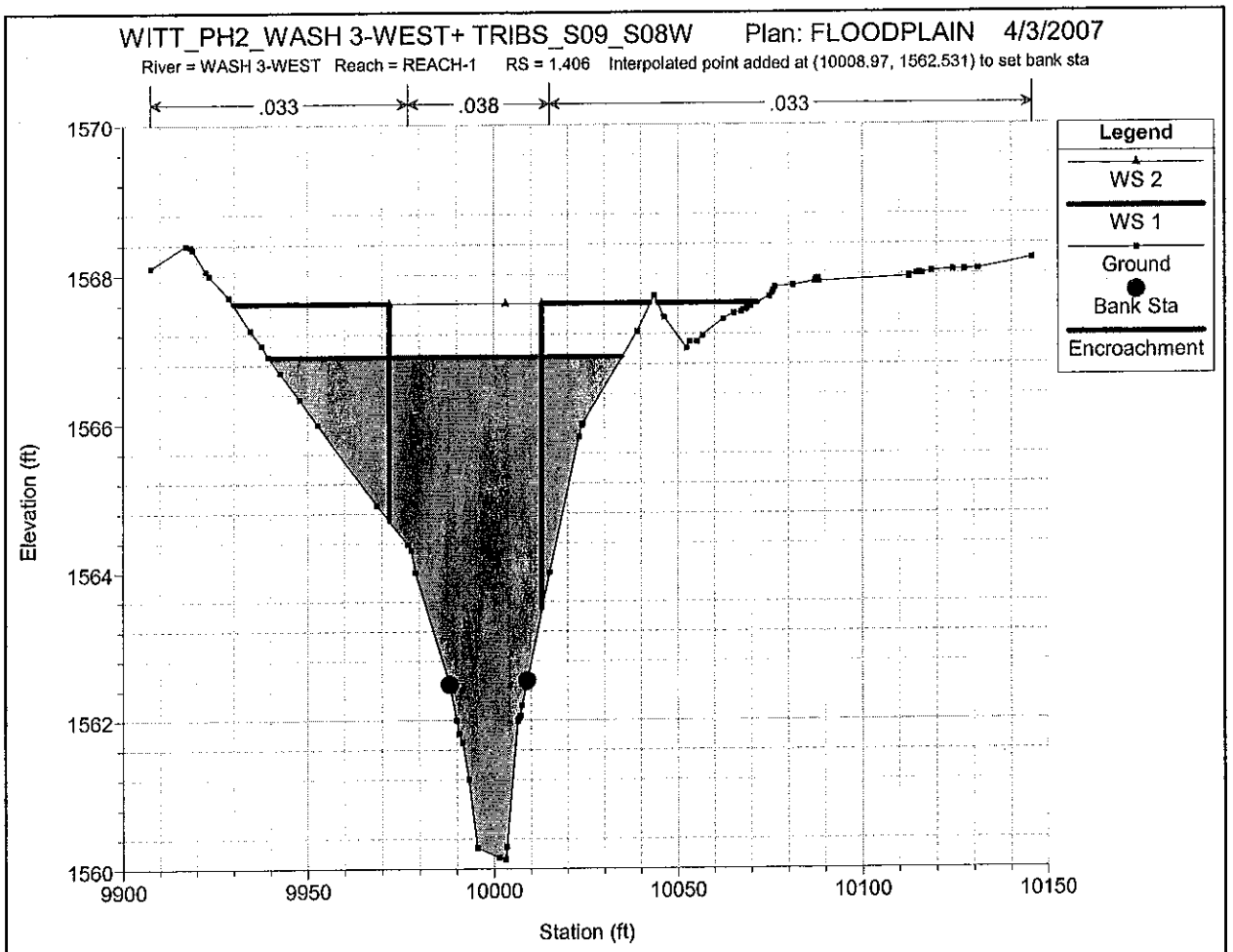

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.816
.033
.038
.033
Legend
WS 1
WS 2
Ground
Bank Sta
Elevation (ft)
1584
1582
1580
1578
1576
1574
1572
9900
9950
10000
10050
10100
10150
10200
Station (ft)

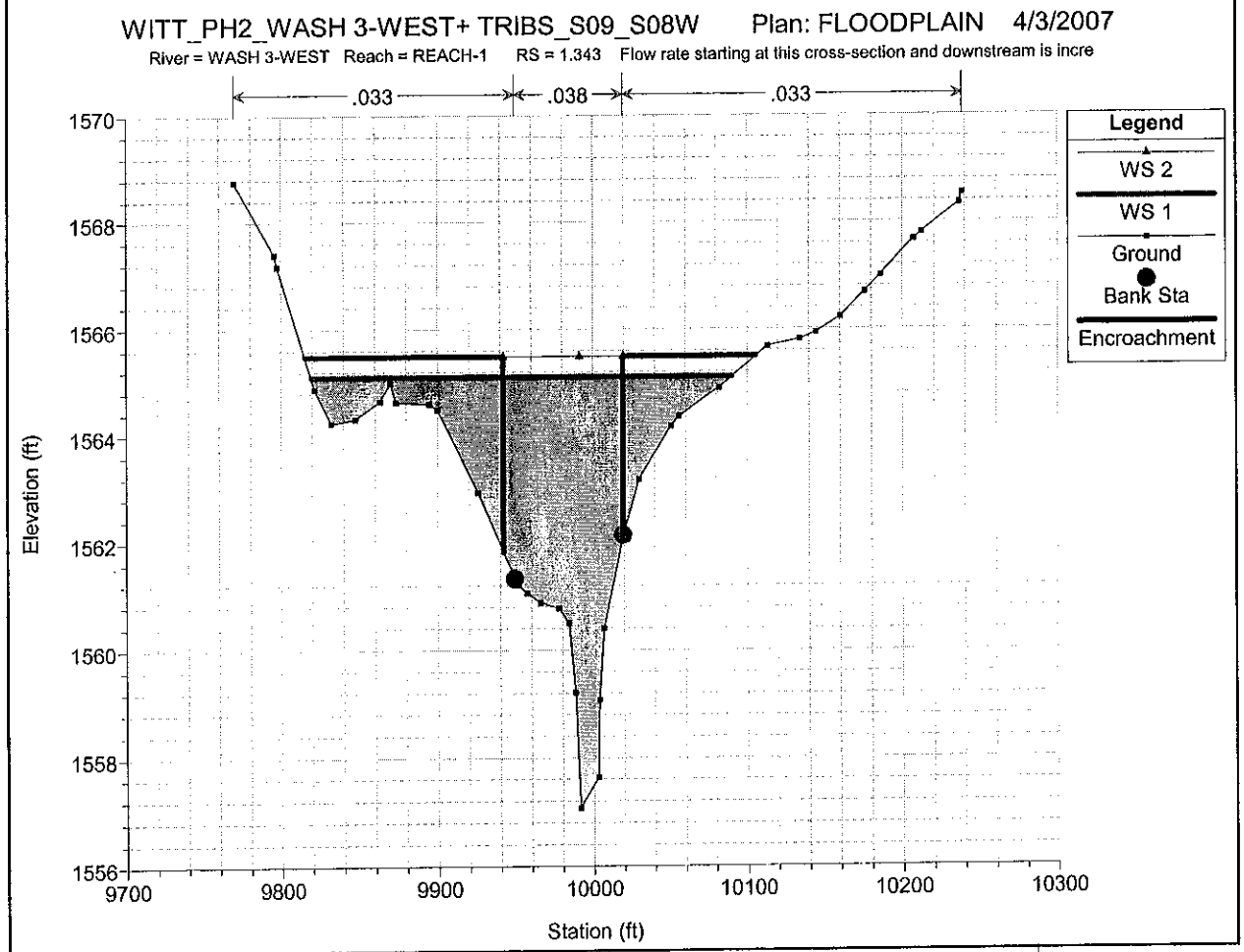

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.721
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1588
1586
1584
1582
1580
1578
1576
1574
1572
1570
9800
10000
10200
10400
10600
10800
Station (ft)

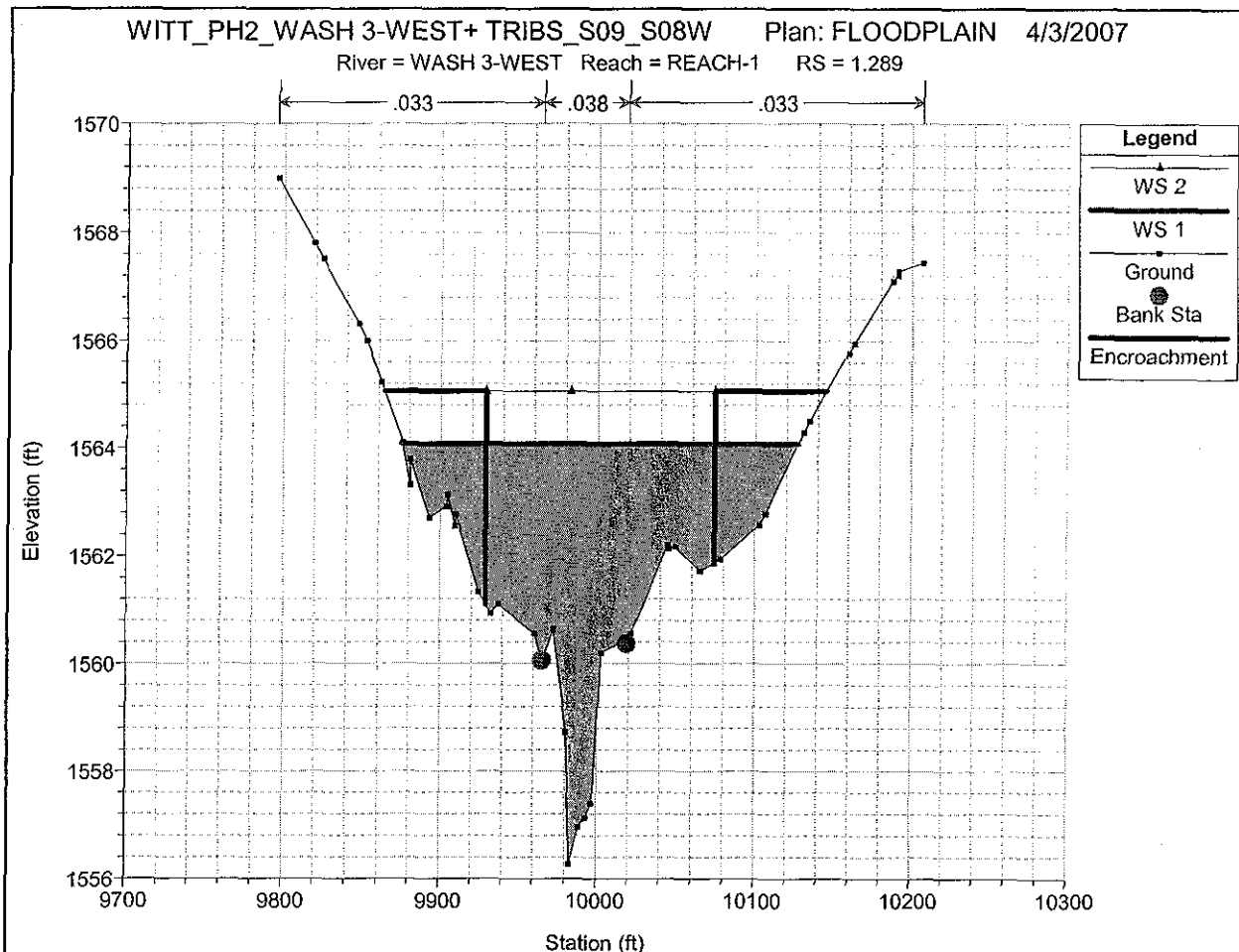

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.625 Flow rate starting at this cross-section and downstream is incre
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1580
1578
1576
1574
1572
1570
1568
1566
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

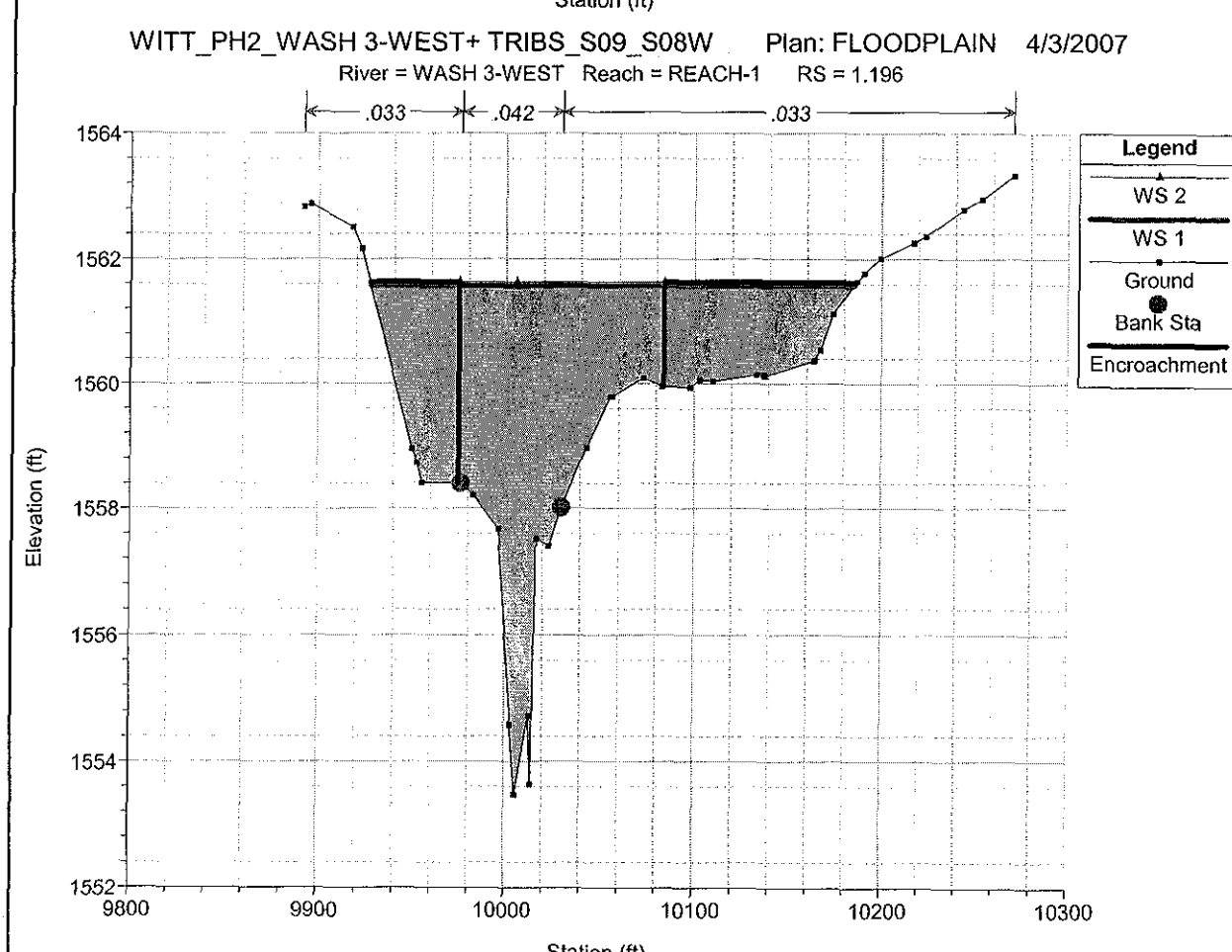

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.545
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1580
1578
1576
1574
1572
1570
1568
1566
1564
1562
9600
9700
9800
9900
10000
10100
10200
Station (ft)

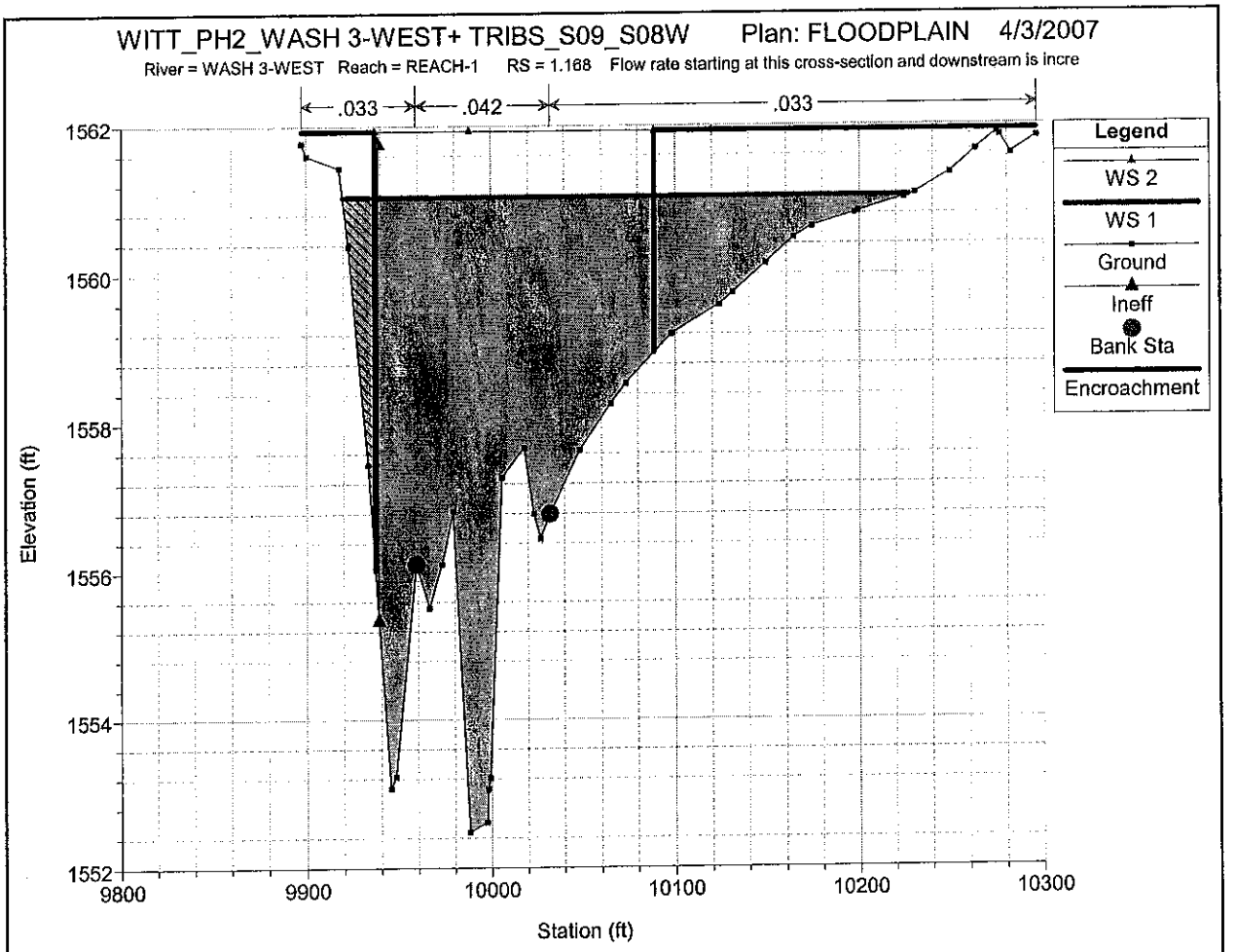

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.480
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1574
1572
1570
1568
1566
1564
1562
1560
9700
9800
9900
10000
10100
10200
10300
Station (ft)

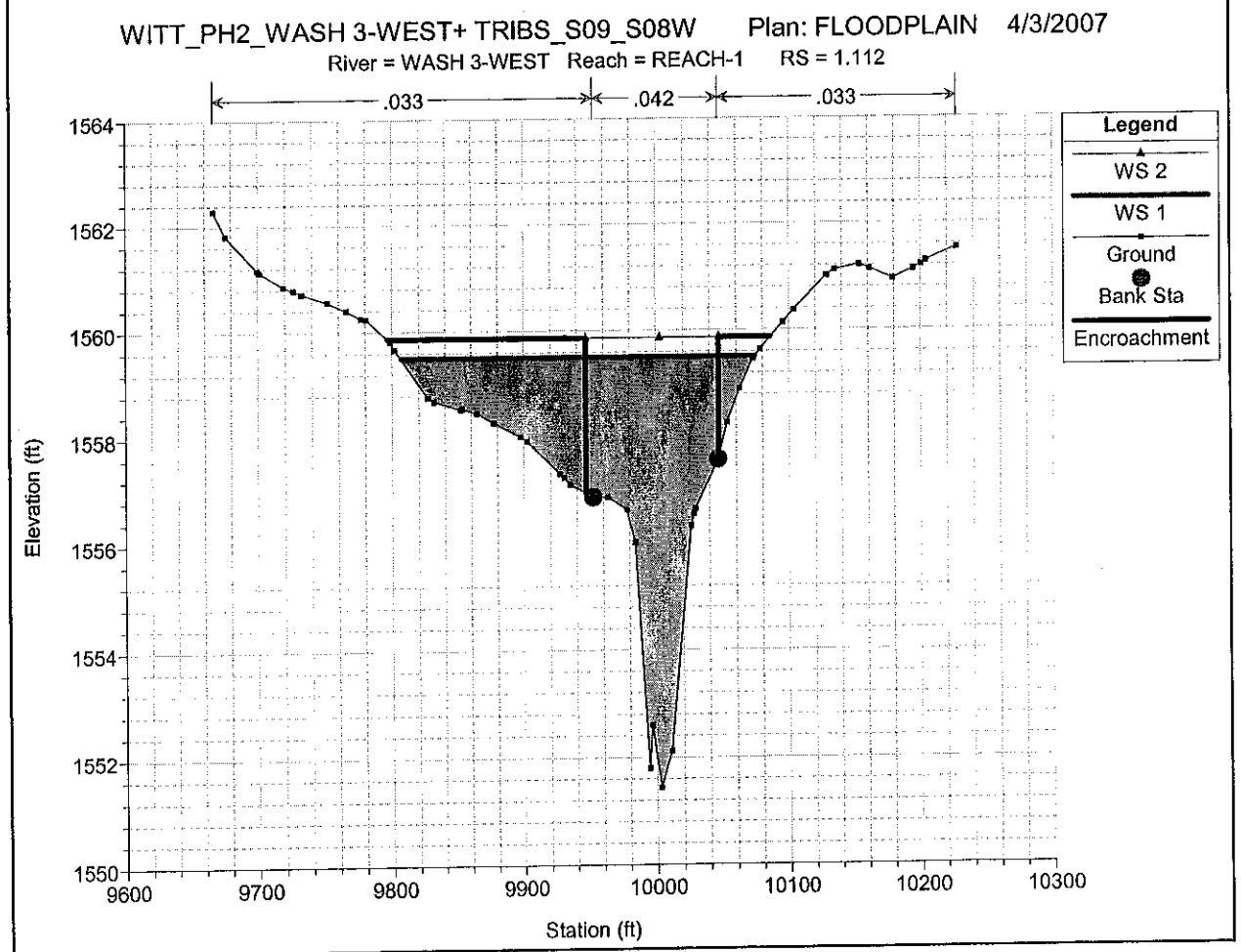

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.406 Interpolated point added at (10008.97, 1562.531) to set bank sta
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1570
1568
1566
1564
1562
1560
9900
9950
10000
10050
10100
10150
Station (ft)

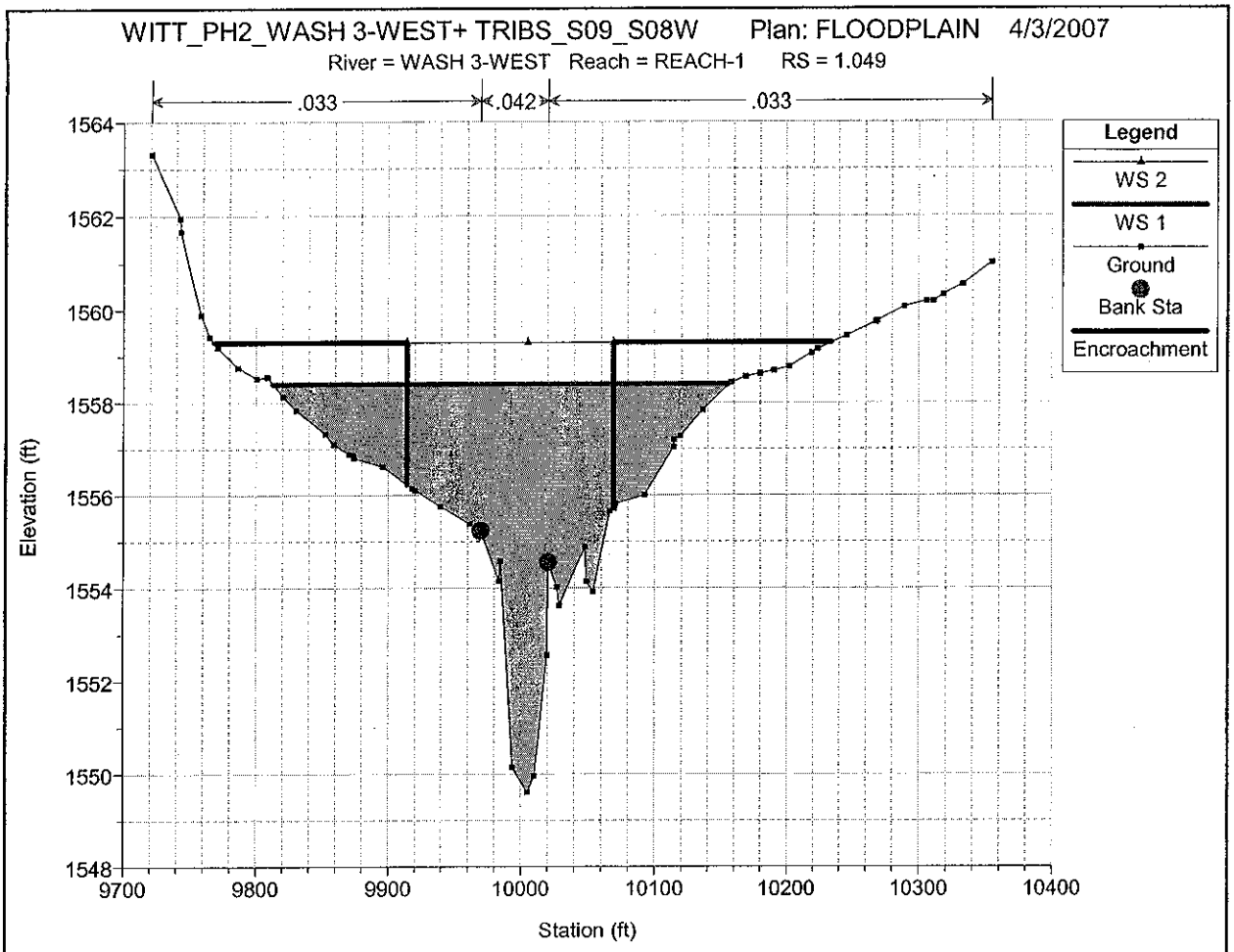

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.343 Flow rate starting at this cross-section and downstream is incre
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1570
1568
1566
1564
1562
1560
1558
1556
9700
9800
9900
10000
10100
10200
10300
Station (ft)

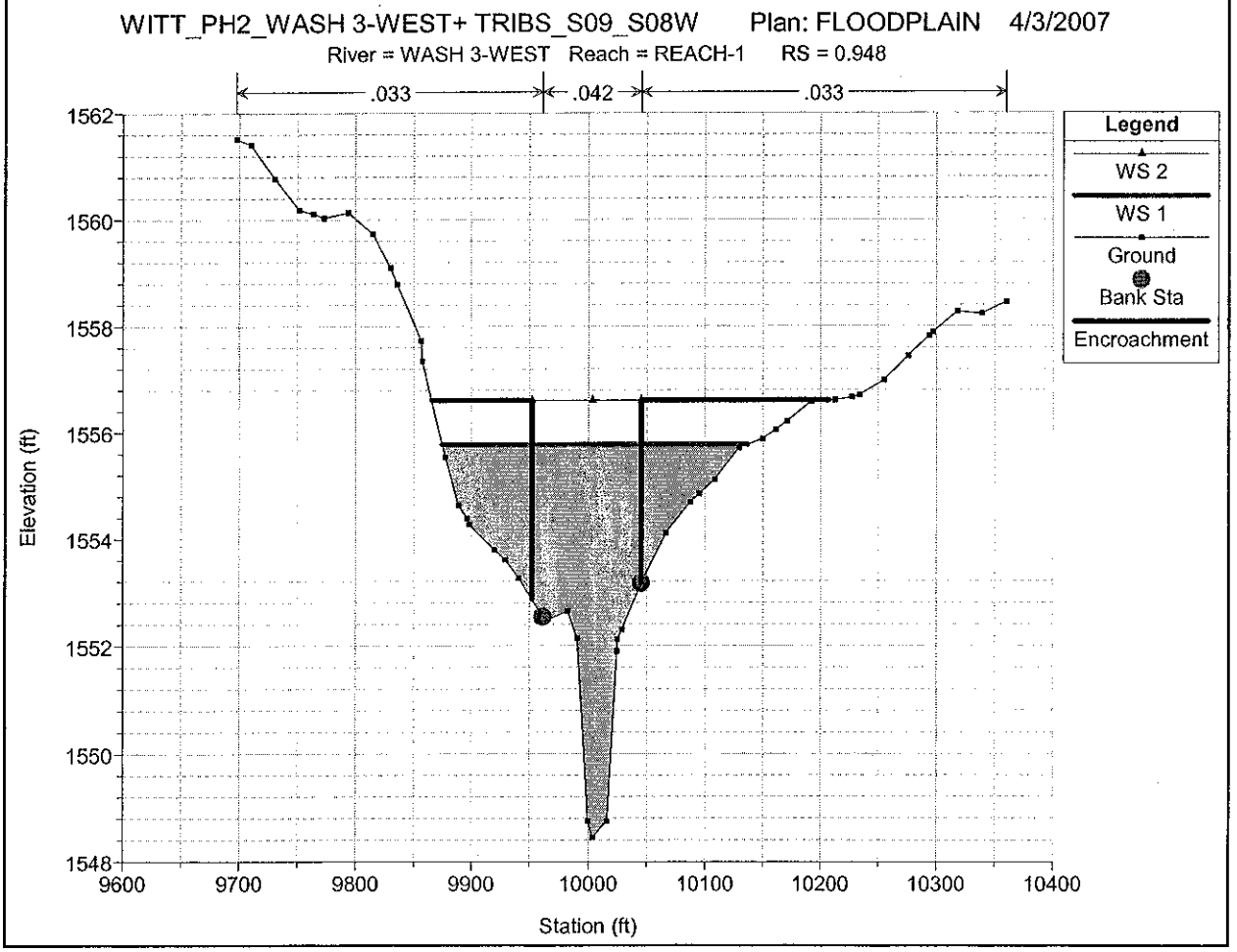

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.289
.033
.038
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1570
1568
1566
1564
1562
1560
1558
1556
9700
9800
9900
10000
10100
10200
10300
Station (ft)

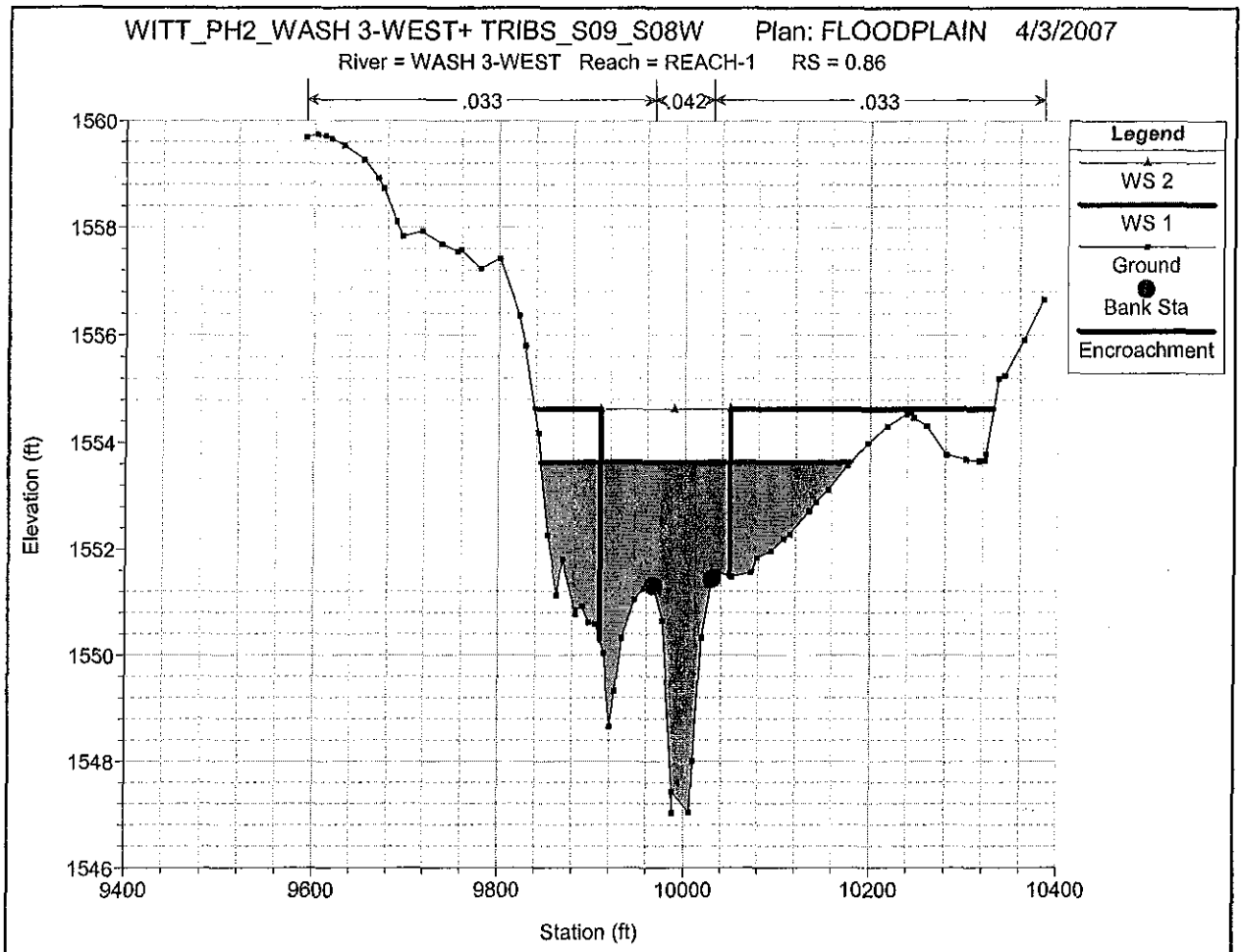

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.196
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1564
1562
1560
1558
1556
1554
1552
9800
9900
10000
10100
10200
10300
Station (ft)

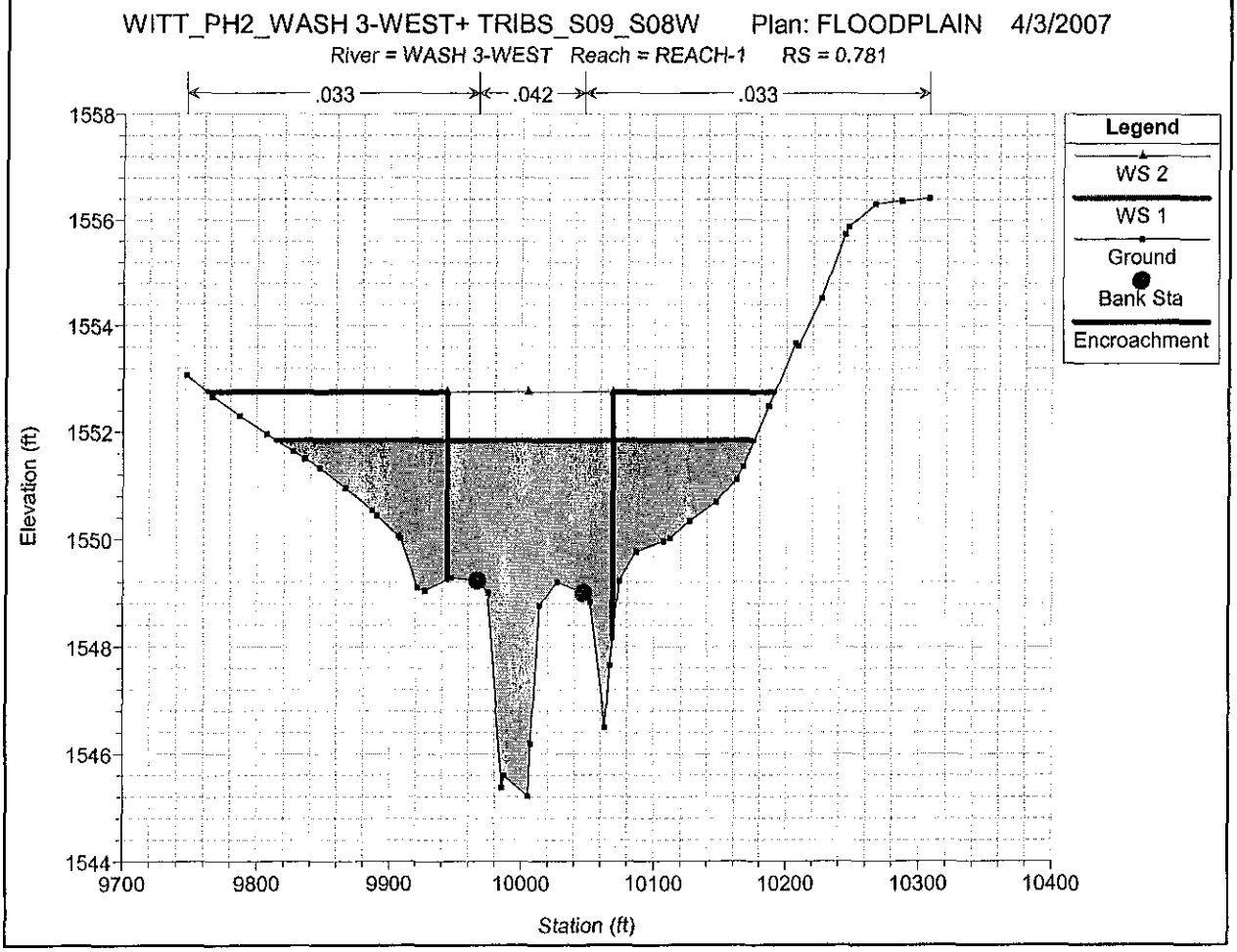

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.168 Flow rate starting at this cross-section and downstream is incre
.033
.042
.033
Legend
WS 2
WS 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
1562
1560
1558
1556
1554
1552
9800
9900
10000
10100
10200
10300
Station (ft)

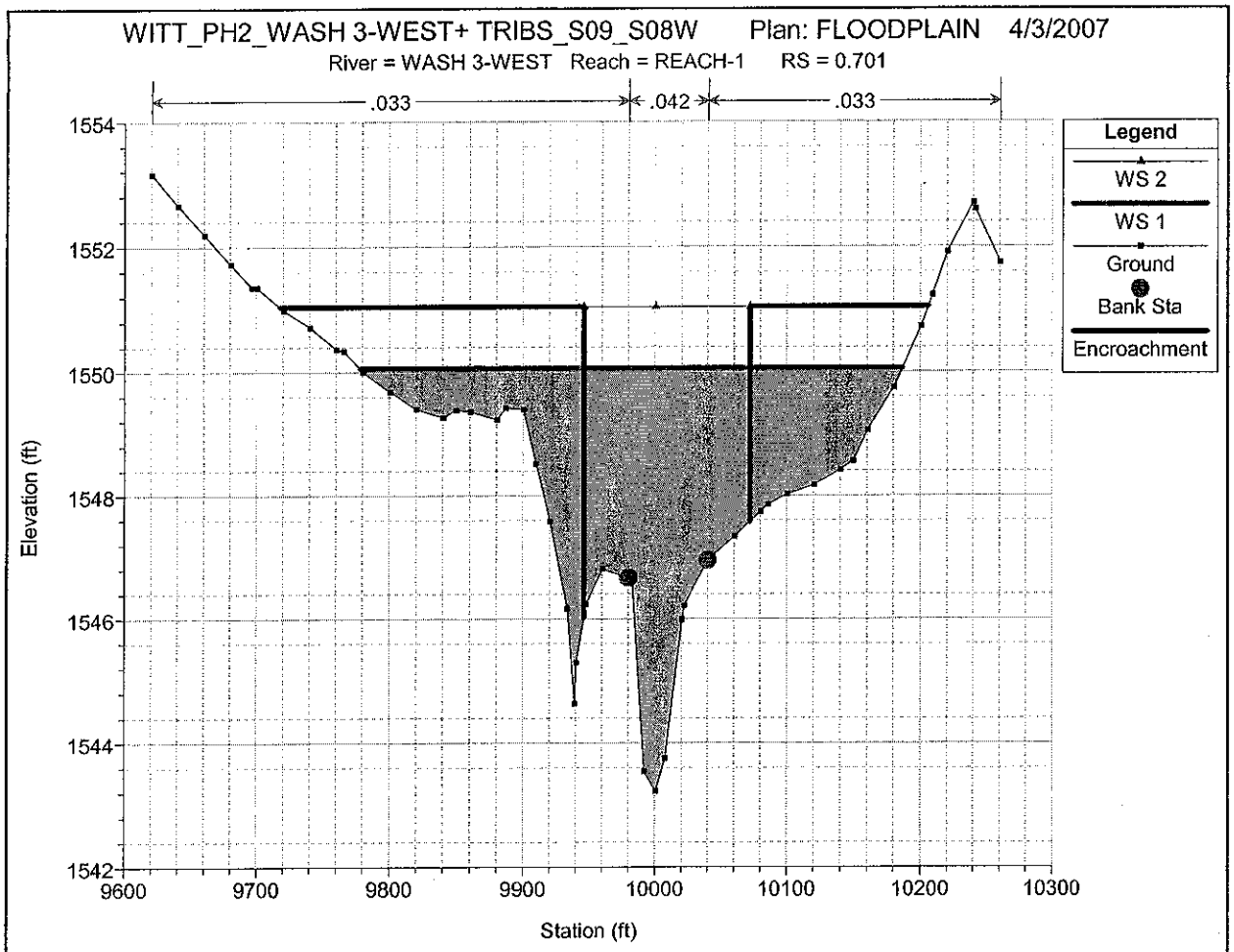

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.112
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1564
1562
1560
1558
1556
1554
1552
1550
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

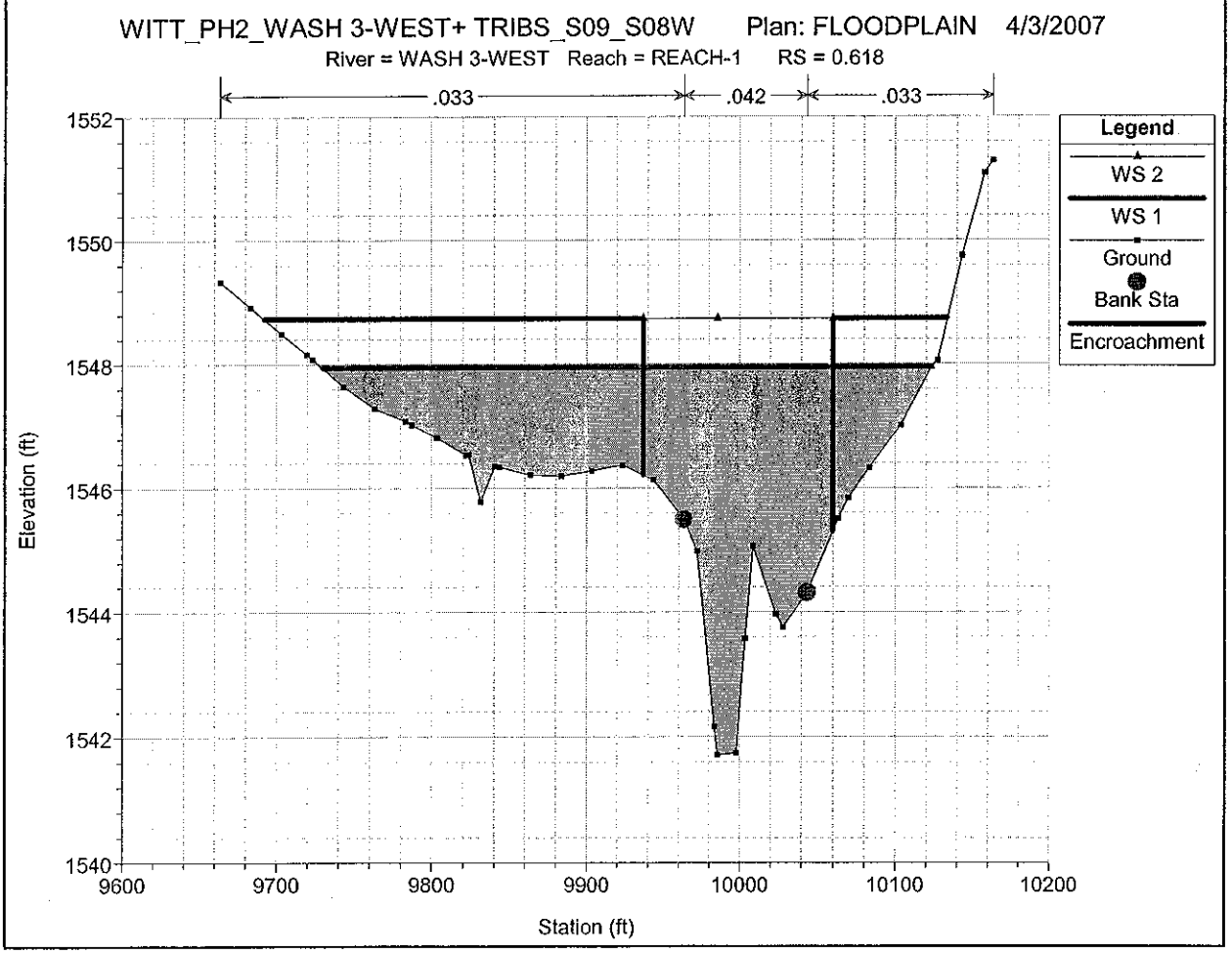

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 1.049
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1564
1562
1560
1558
1556
1554
1552
1550
1548
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

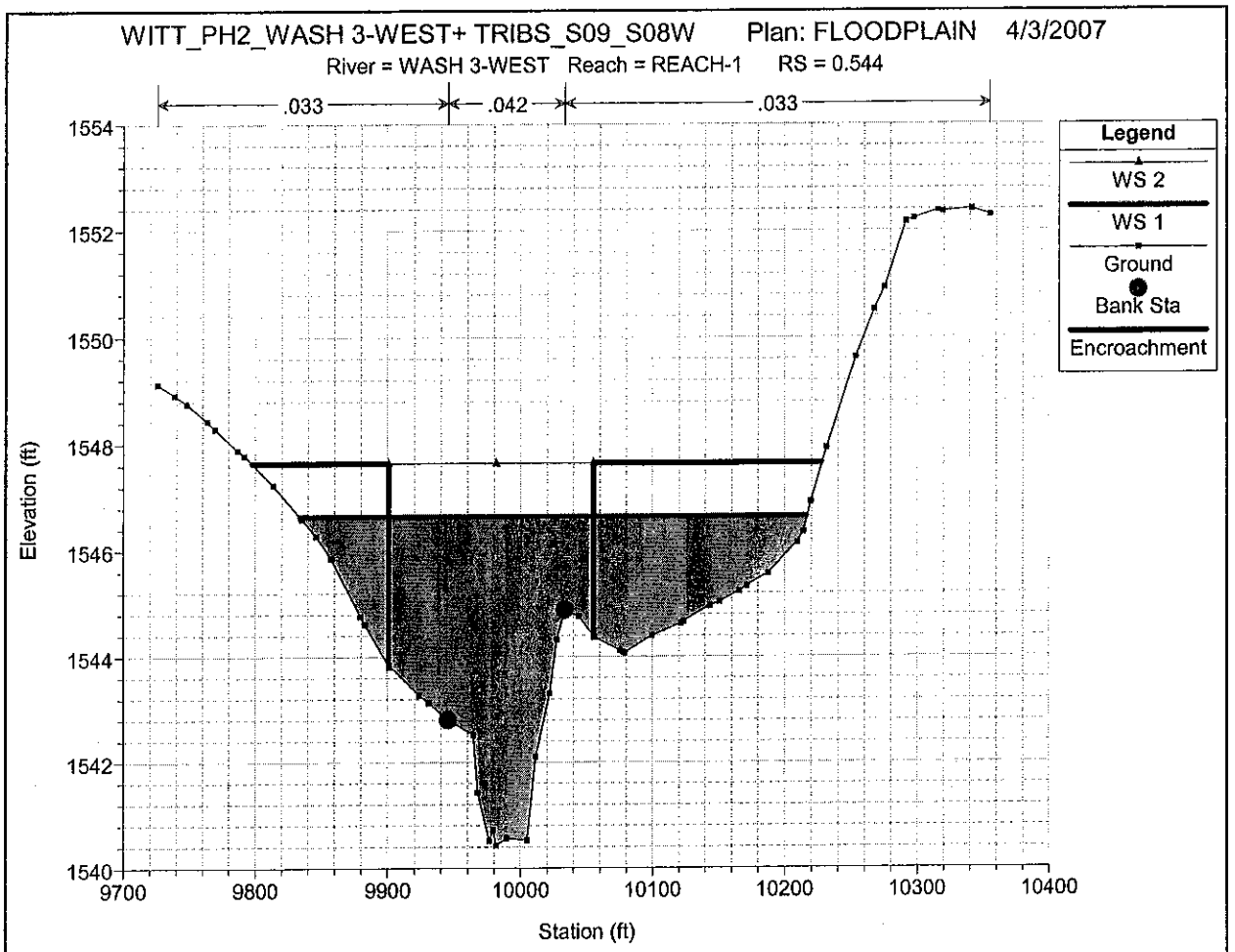

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.948
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1562
1560
1558
1556
1554
1552
1550
1548
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

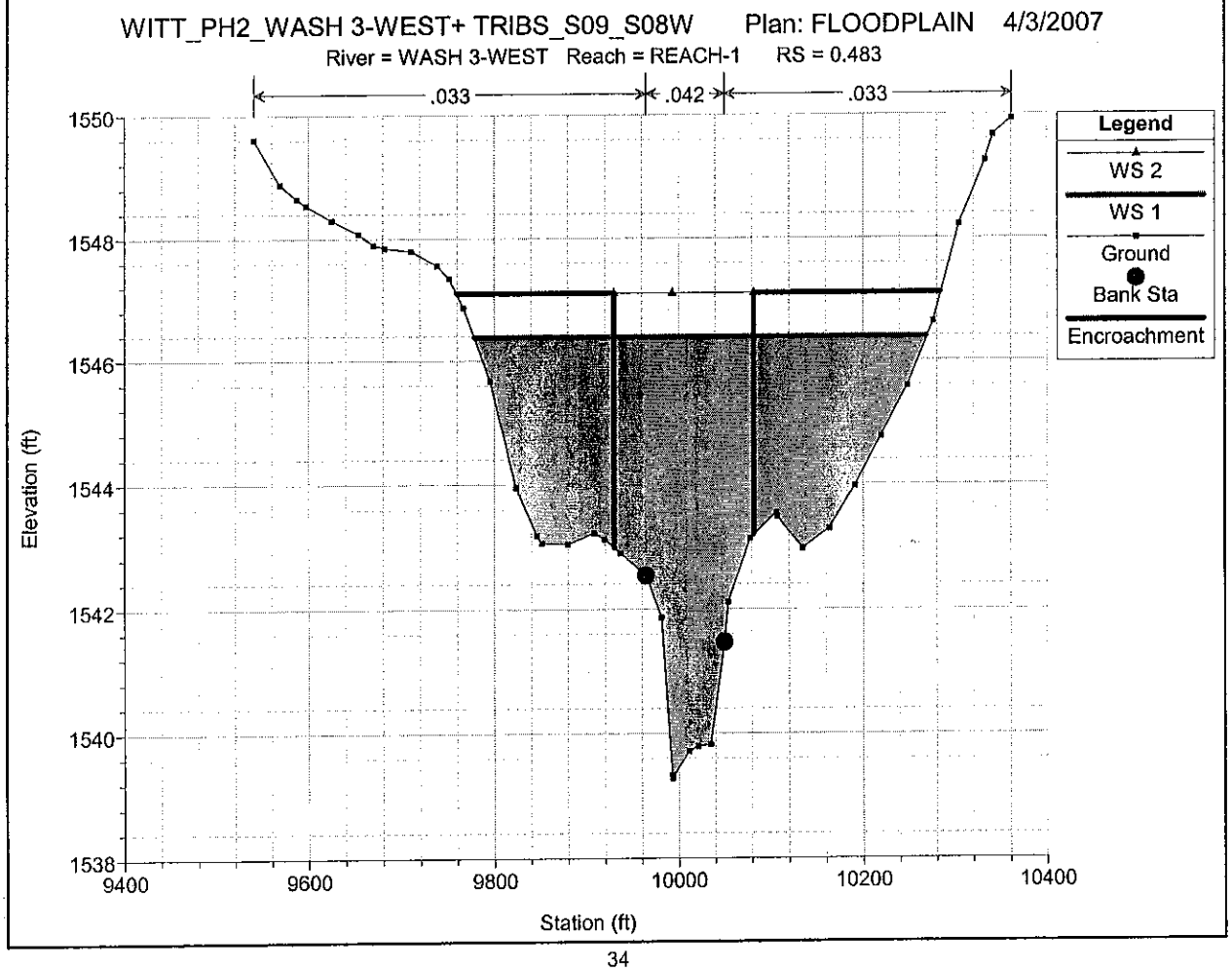

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.86
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1560
1558
1556
1554
1552
1550
1548
1546
9400
9600
9800
10000
10200
10400
Station (ft)

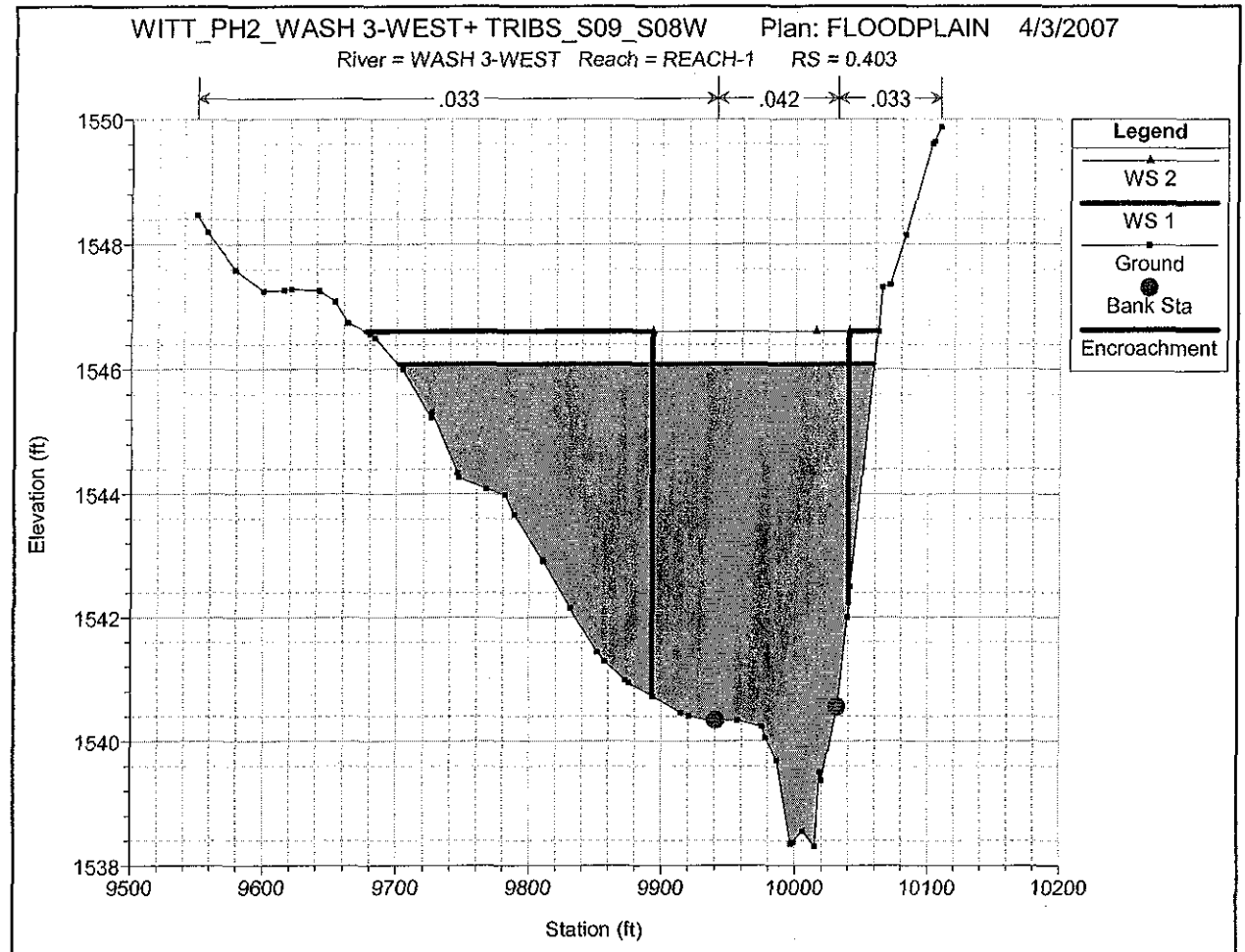

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.781
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1558
1556
1554
1552
1550
1548
1546
1544
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

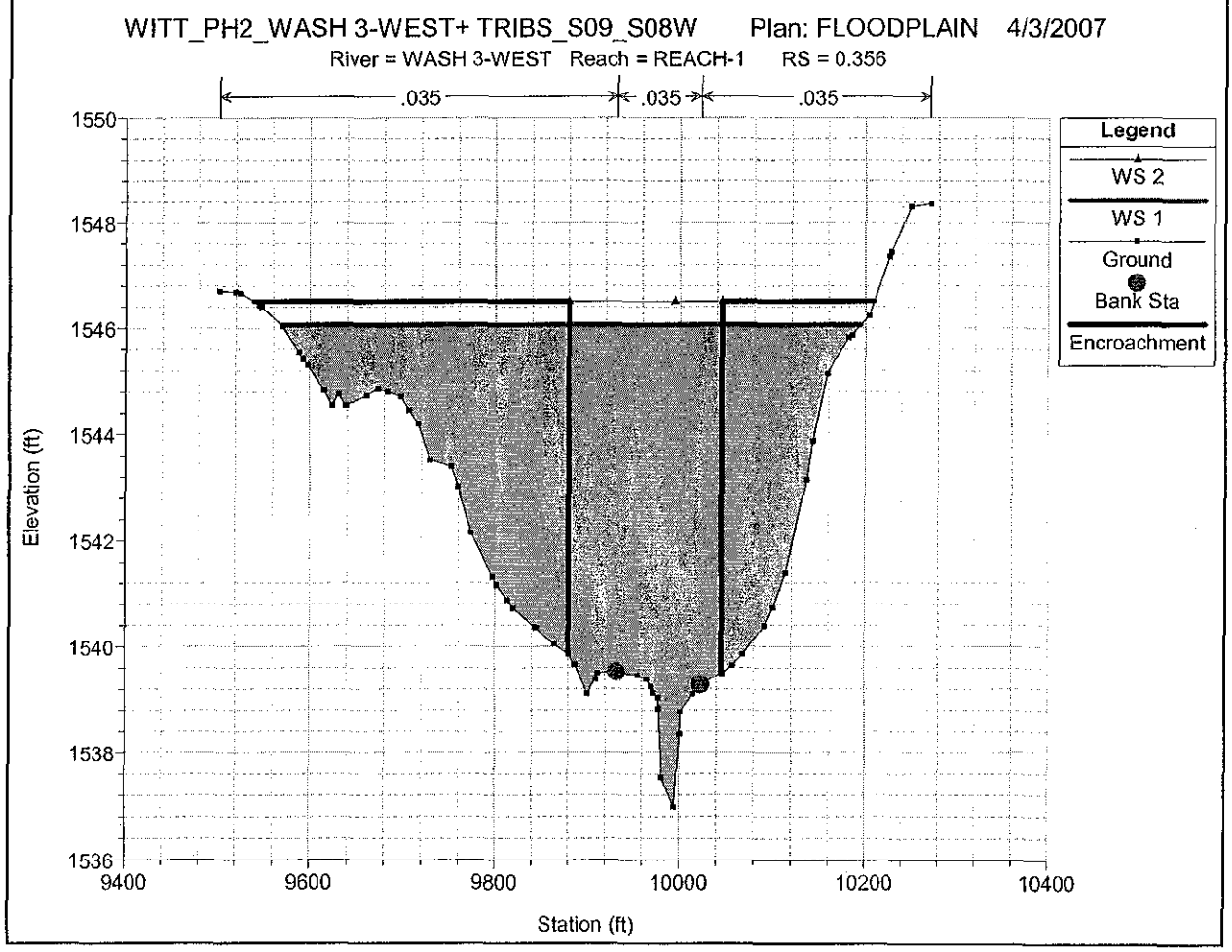

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.701
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1554
1552
1550
1548
1546
1544
1542
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

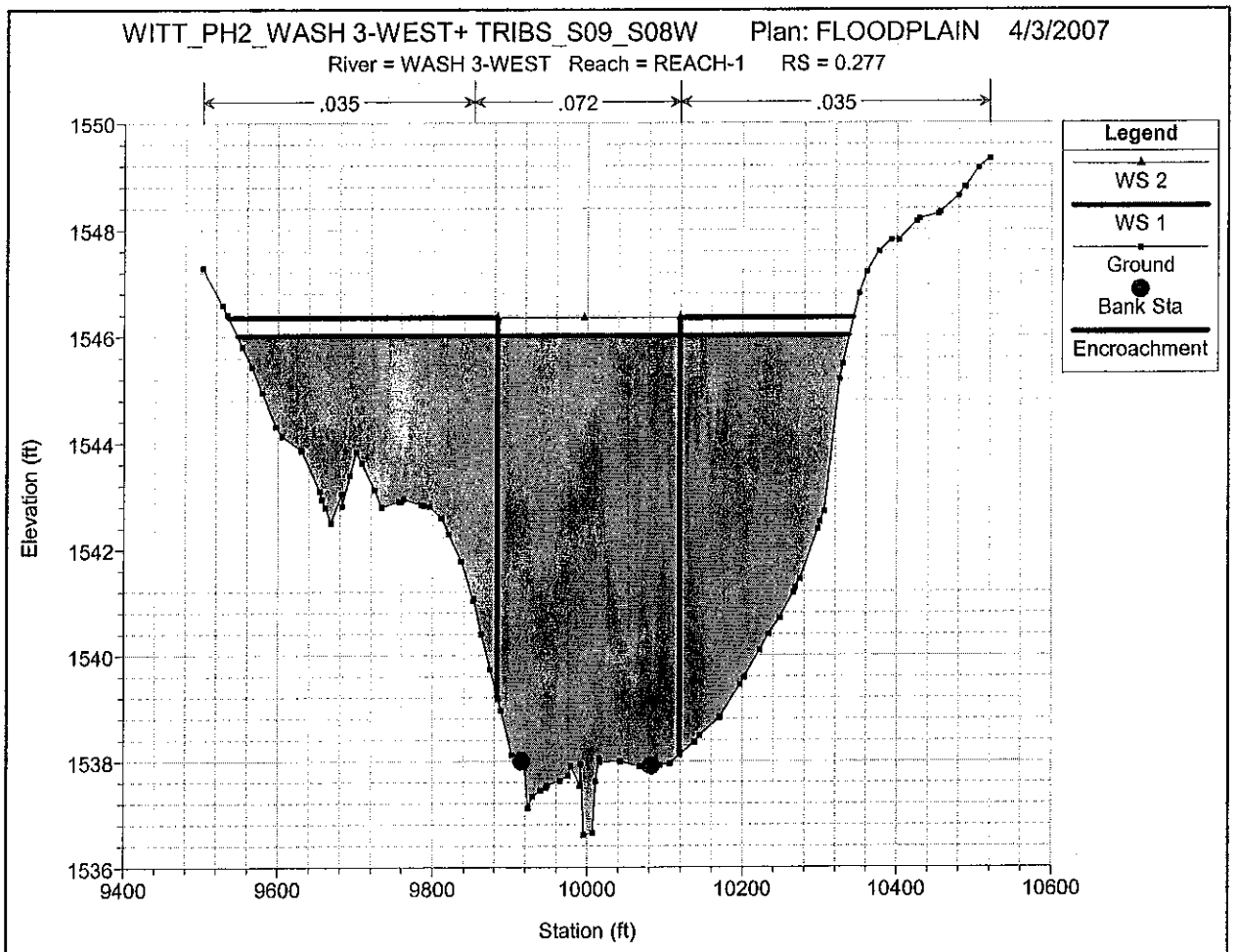

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.618
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1552
1550
1548
1546
1544
1542
1540
9600
9700
9800
9900
10000
10100
10200
Station (ft)

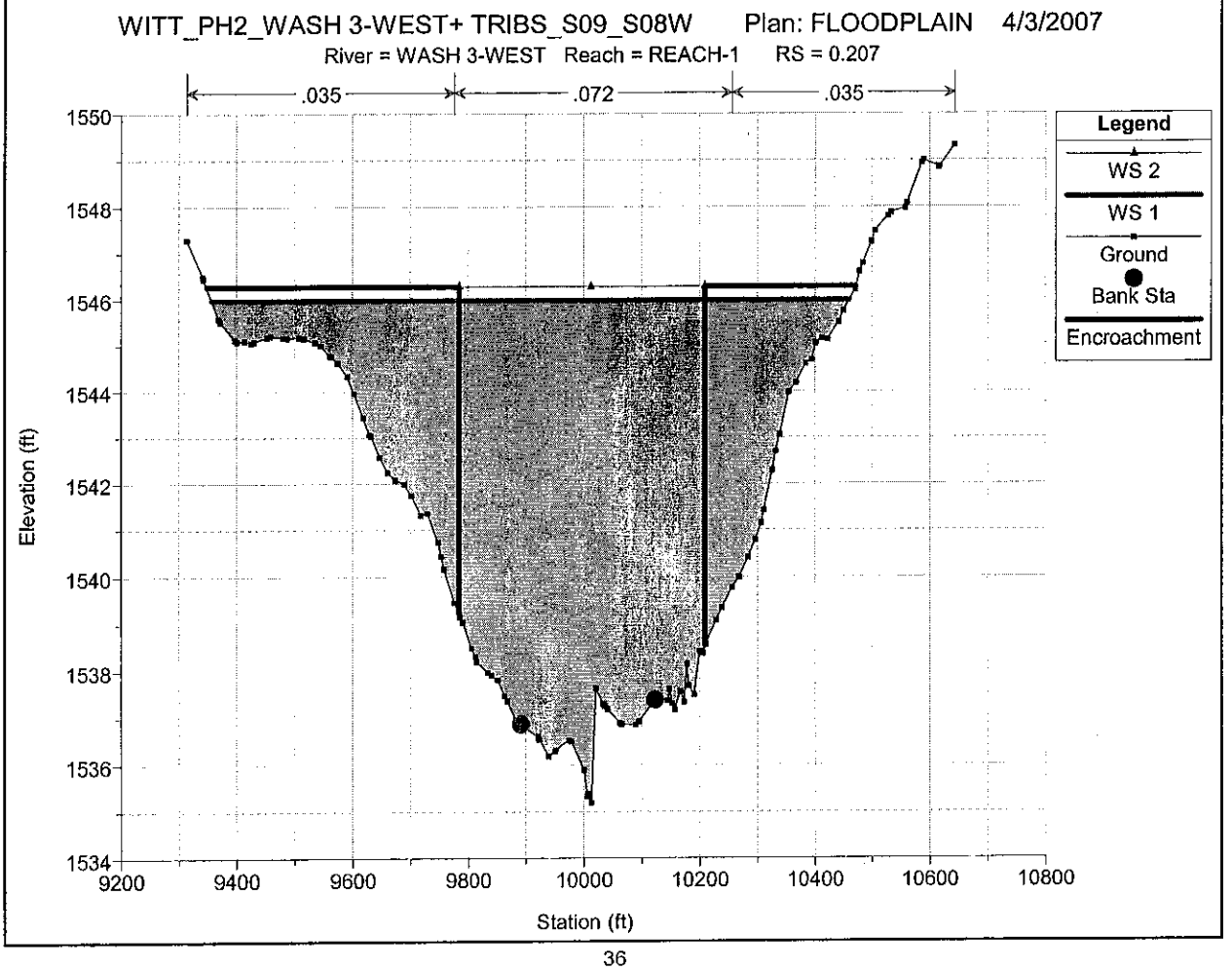

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.544
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1554
1552
1550
1548
1546
1544
1542
1540
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

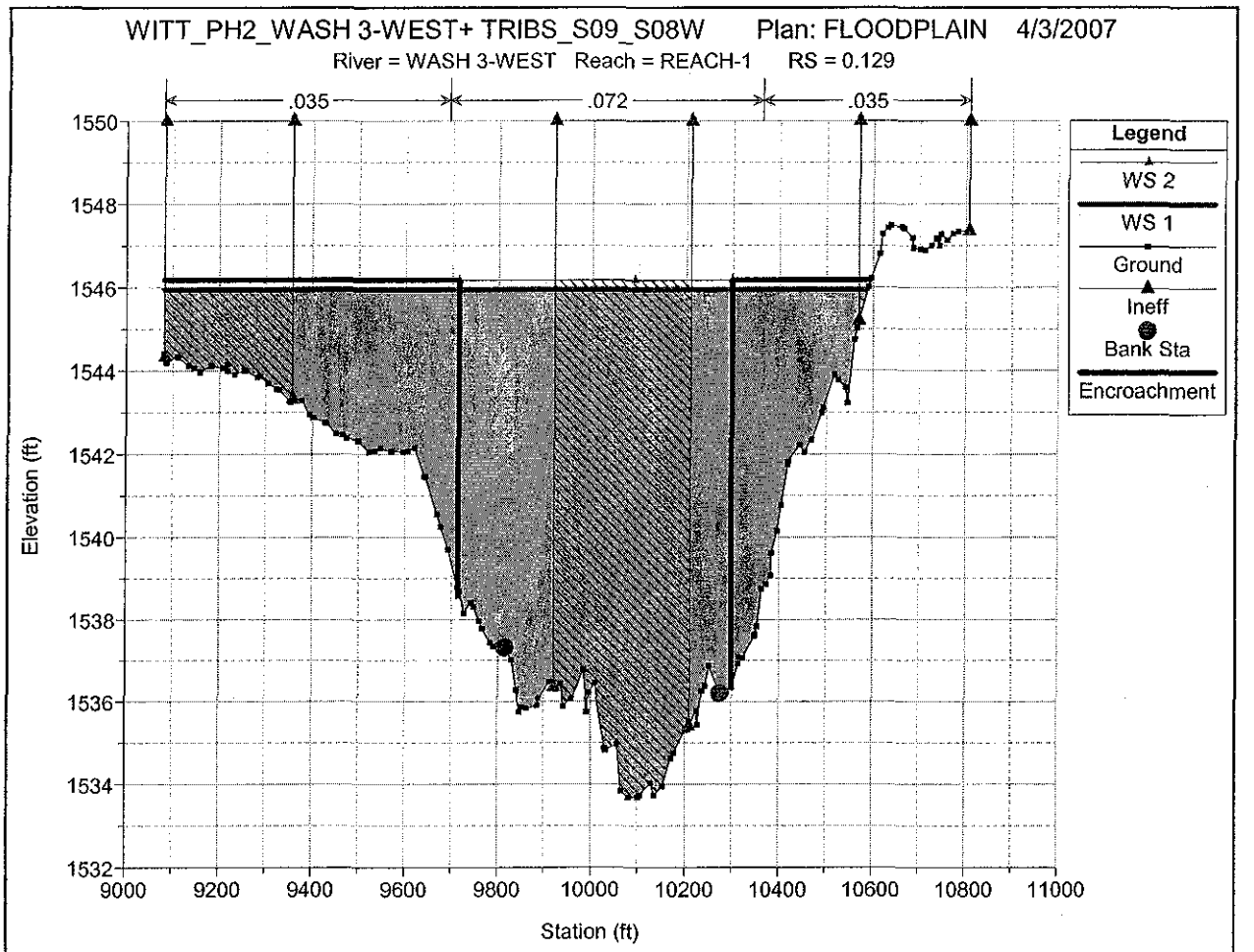

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.483
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1550
1548
1546
1544
1542
1540
1538
9400
9600
9800
10000
10200
10400
Station (ft)

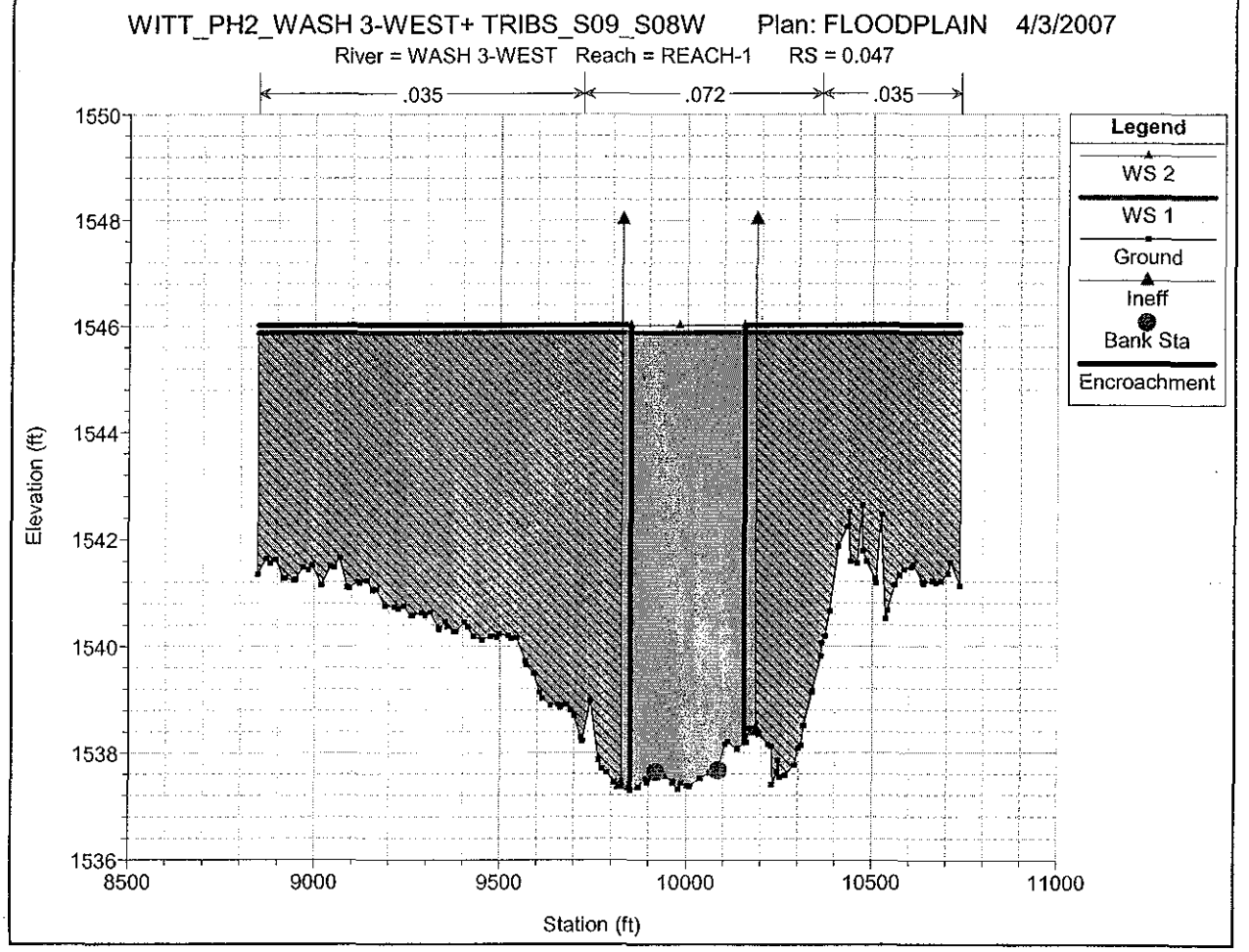

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.403
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1550
1548
1546
1544
1542
1540
1538
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

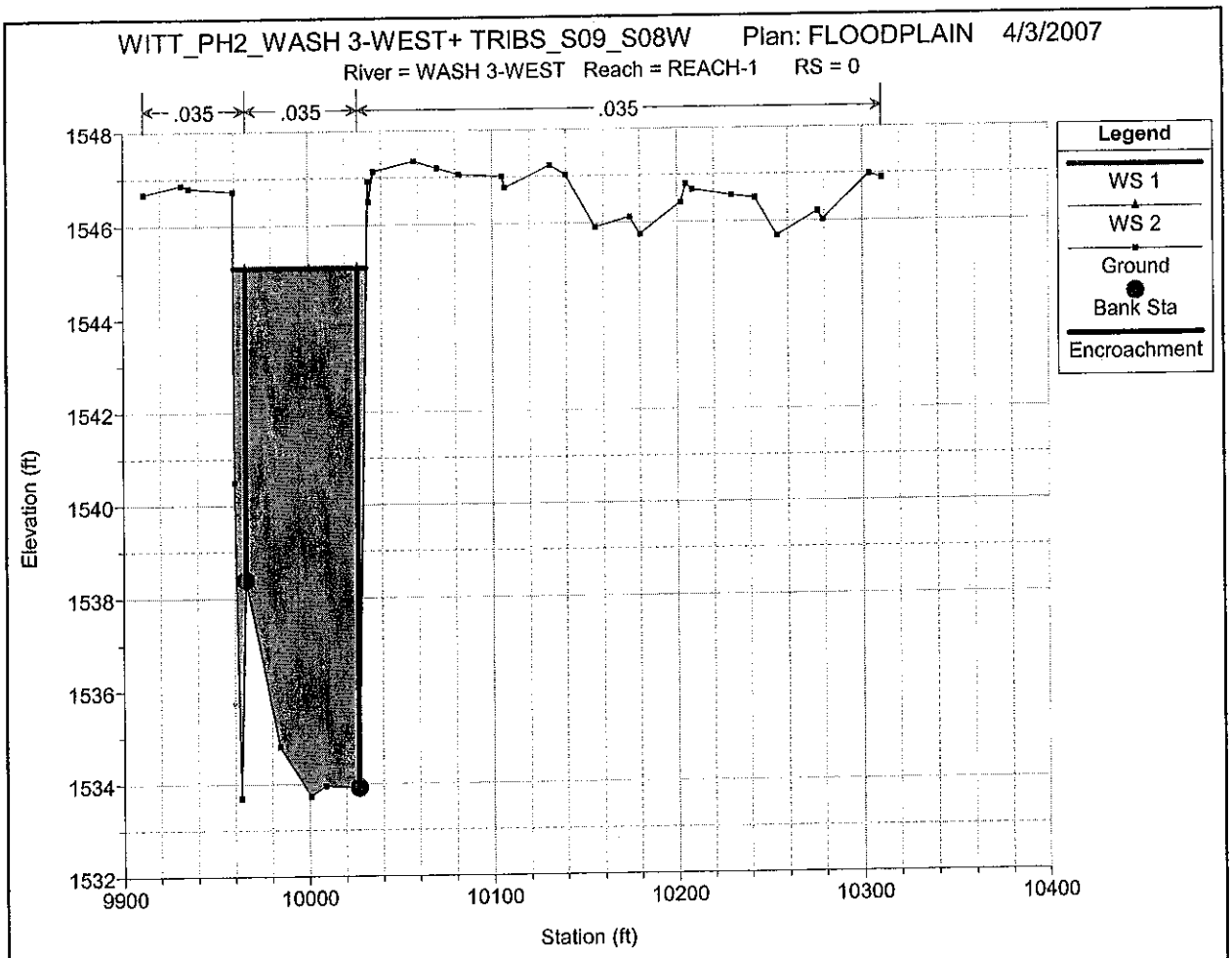

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.356
.035
.035
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1550
1548
1546
1544
1542
1540
1538
1536
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.277
.035
.072
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1550
1548
1546
1544
1542
1540
1538
1536
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.207
.035
.072
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1550
1548
1546
1544
1542
1540
1538
1536
1534
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

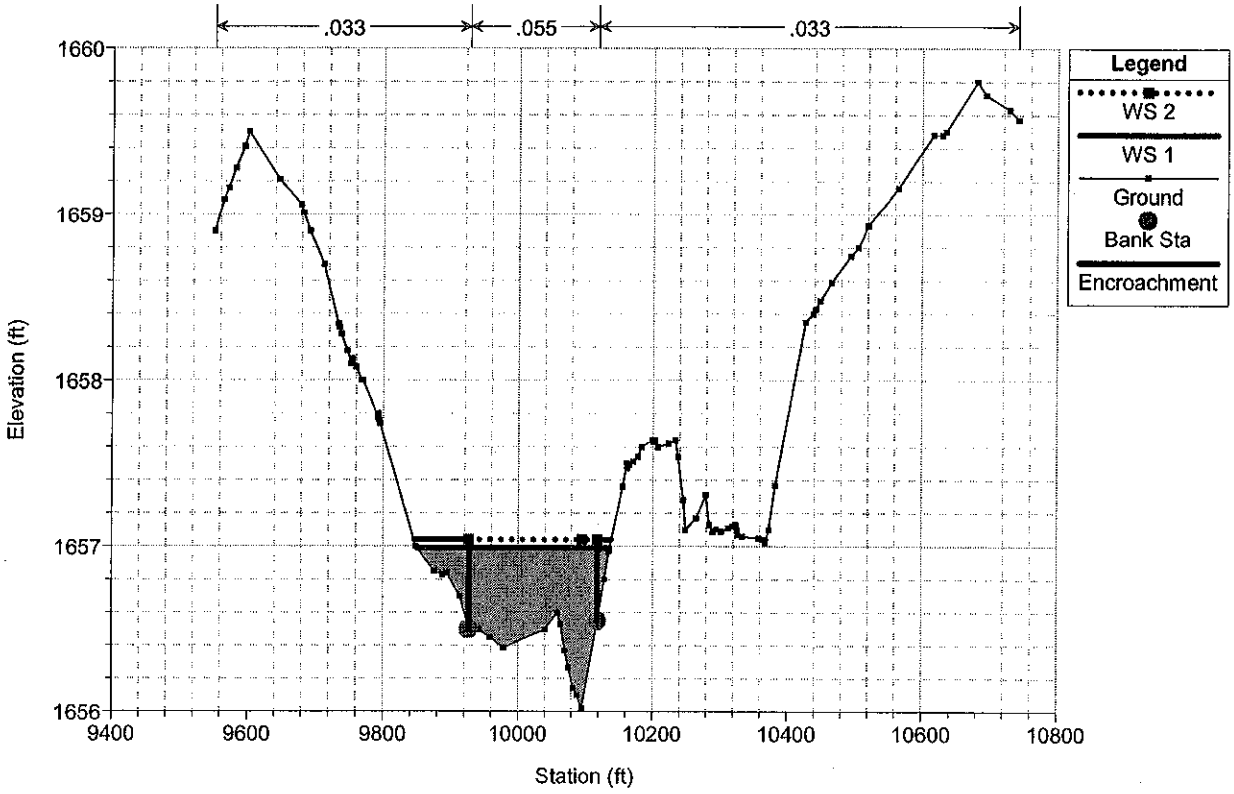

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.129
.035
.072
.035
Legend
WS 2
WS 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0.047
.035
.072
.035
Legend
WS 2
WS 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = WASH 3-WEST Reach = REACH-1 RS = 0
.035
.035
.035
Legend
WS 1
WS 2
Ground
Bank Sta
Encroachment
Elevation (ft)
1548
1546
1544
1542
1540
1538
1536
1534
1532
9900
10000
10100
10200
10300
10400
Station (ft)

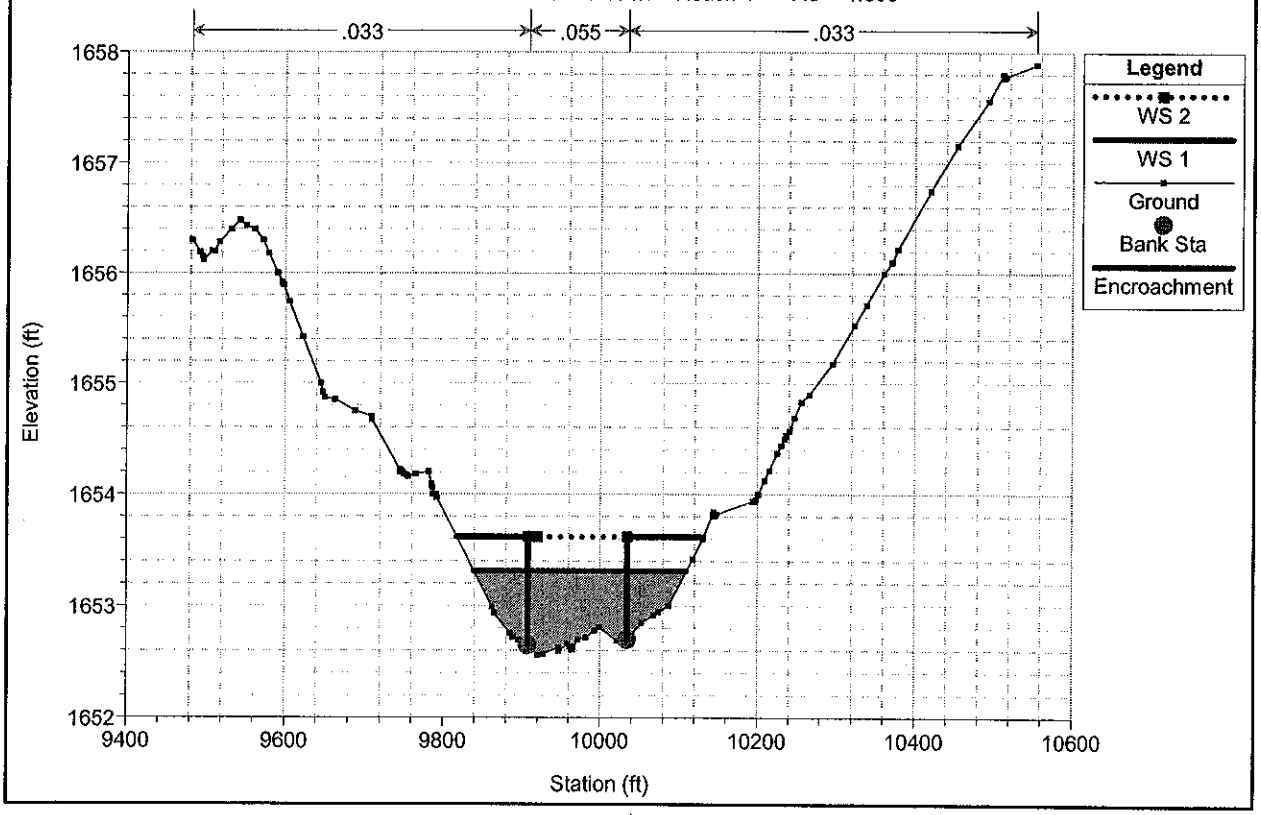
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S07 Reach = Reach-1 RS = 1.993 Flow rate at this cross-section and downstream is 220cfs.



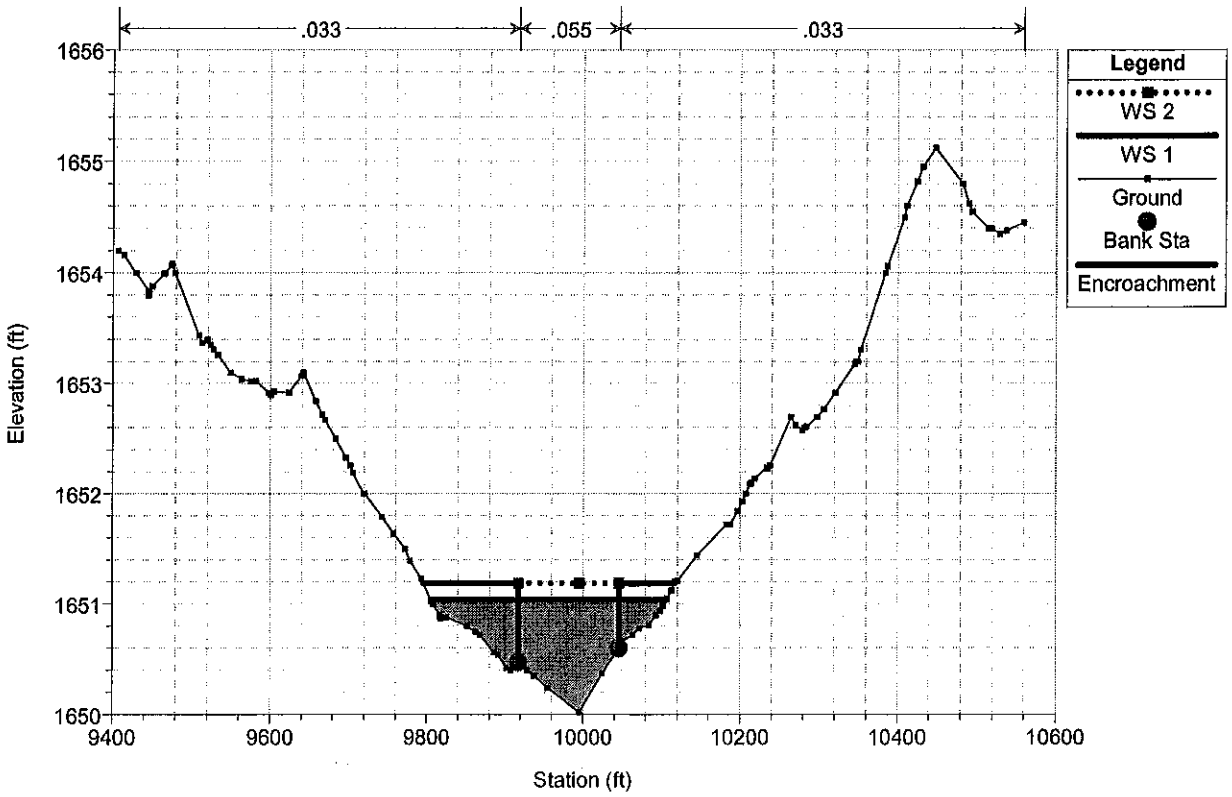
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S07 Reach = Reach-1 RS = 1.893



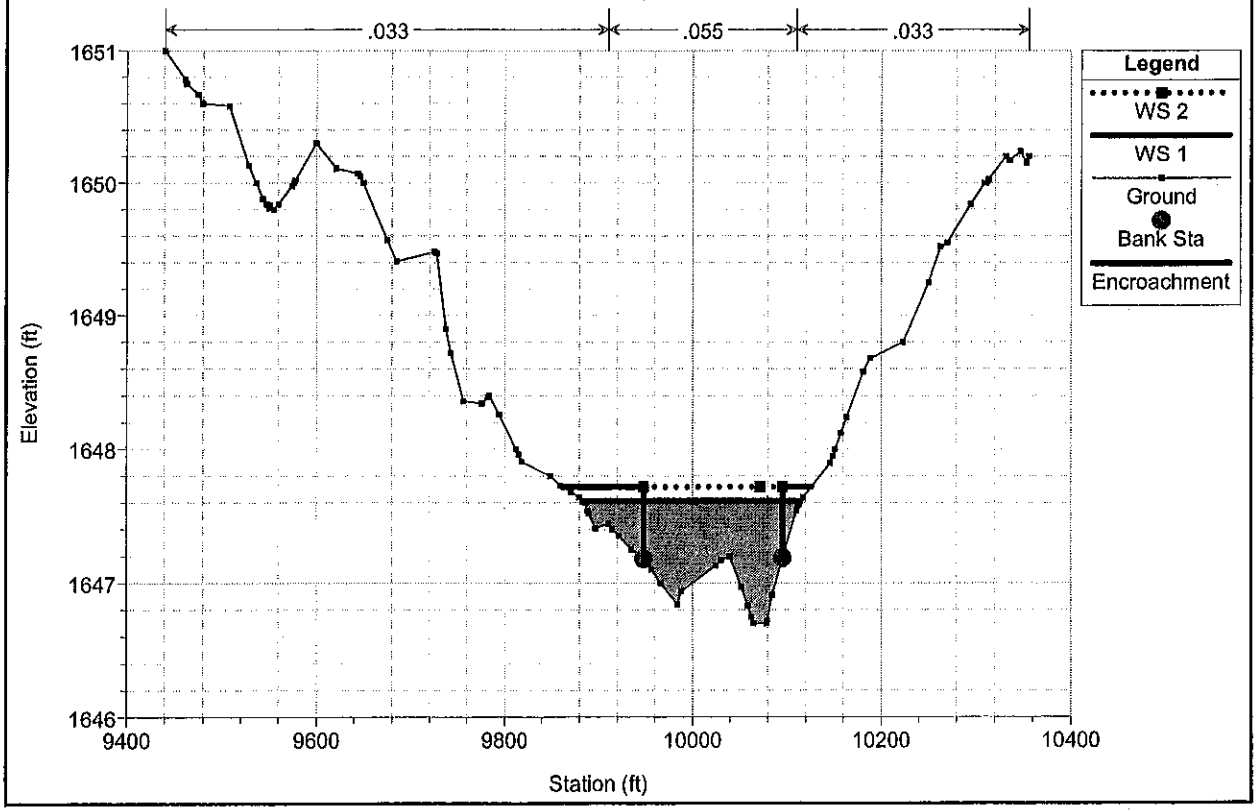
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

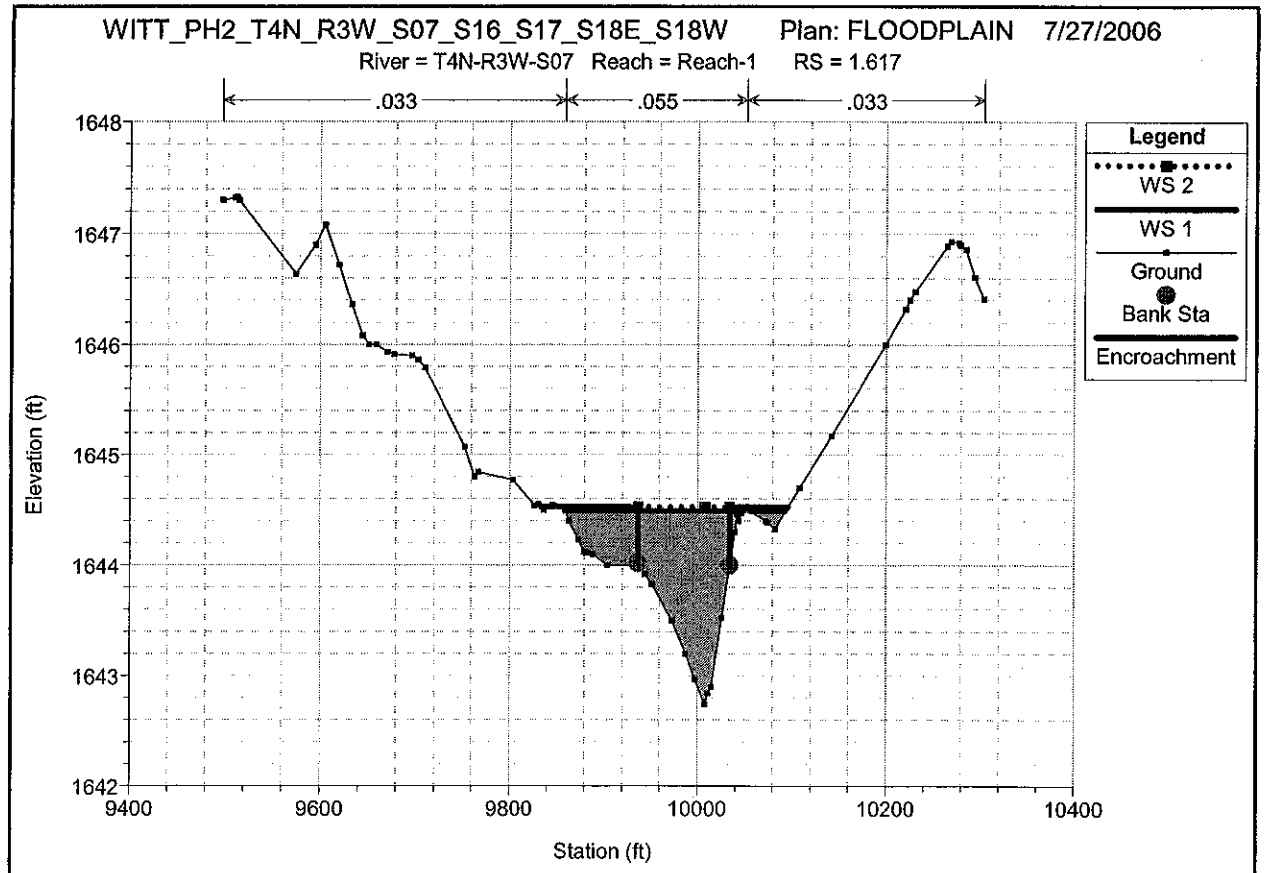
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.807

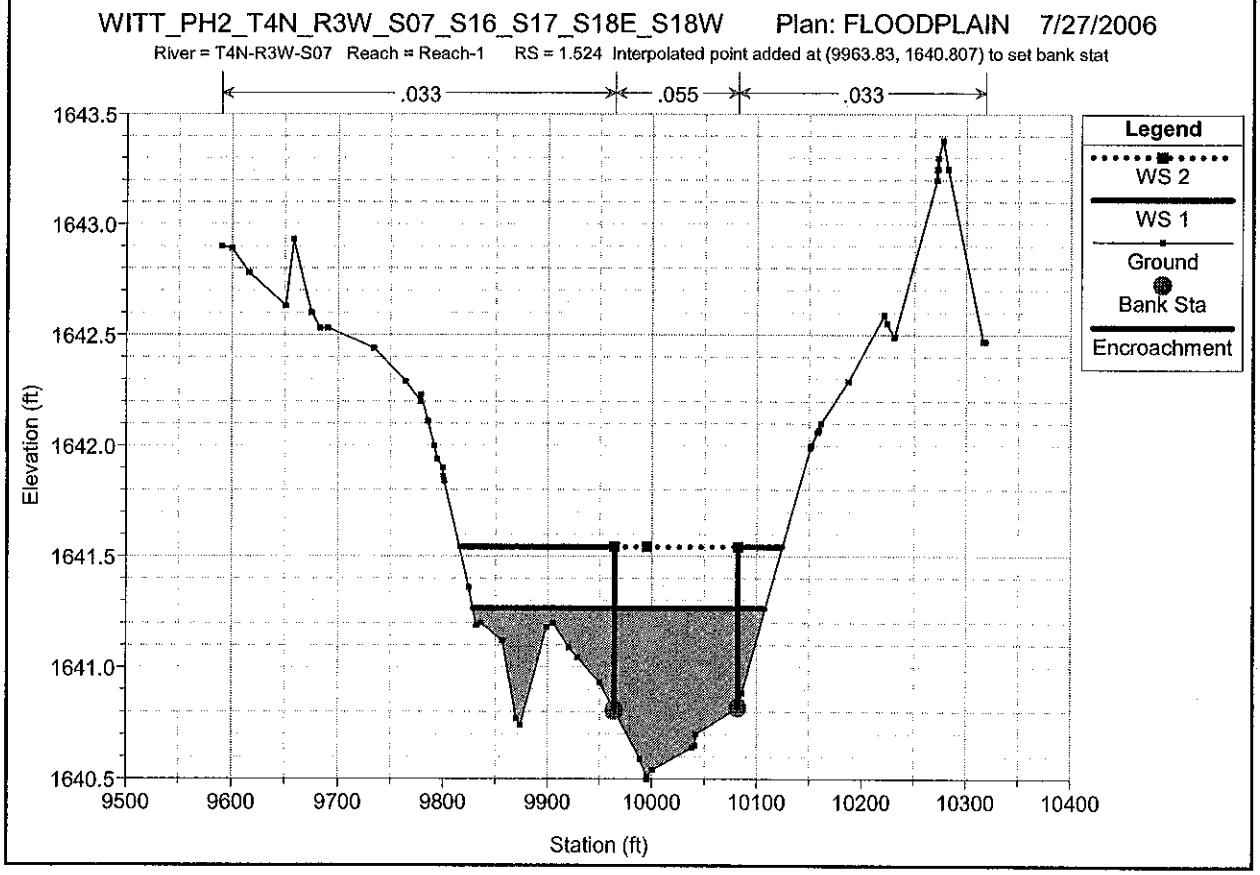


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S07 Reach = Reach-1 RS = 1.710 Interpolated point added at (10095.83,1647.187) to set bank stat

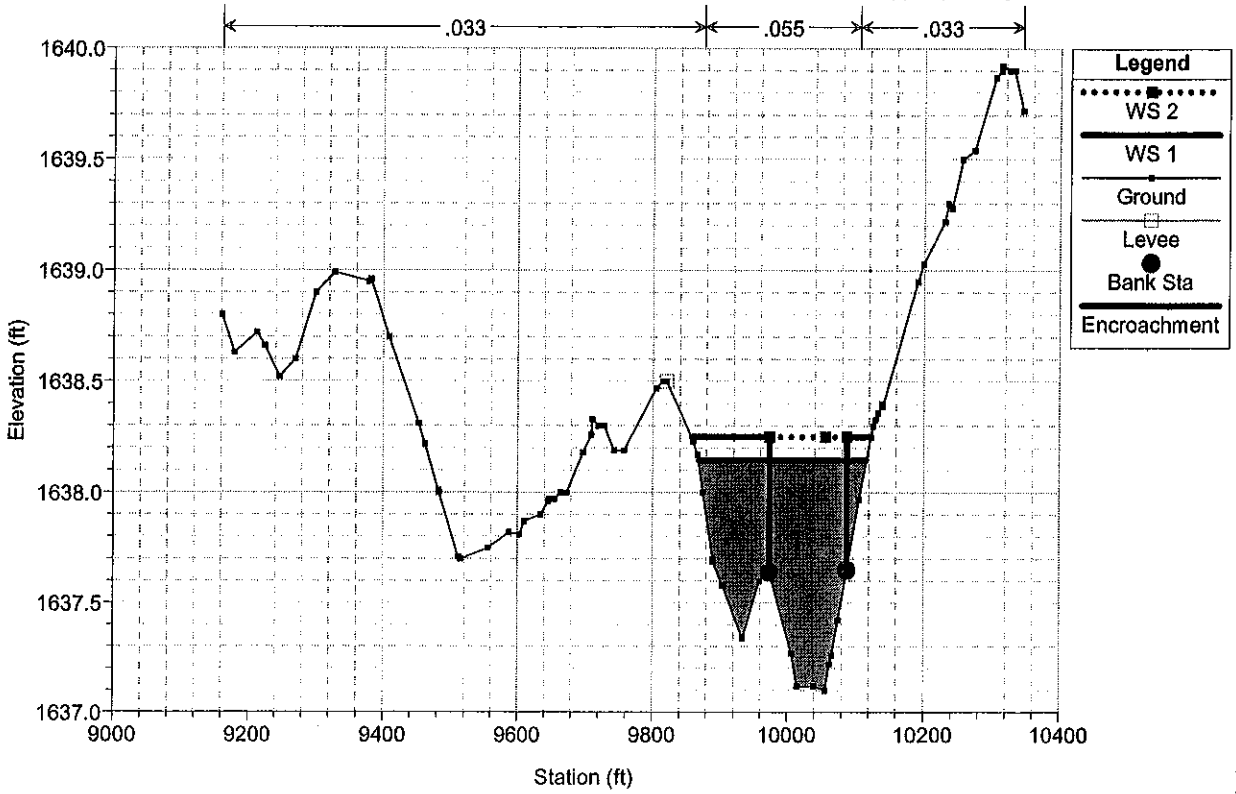



WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.617
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1648
1647
1646
1645
1644
1643
1642
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.524 Interpolated point added at (9963.83, 1640.807) to set bank stat
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1643.5
1643.0
1642.5
1642.0
1641.5
1641.0
1640.5
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

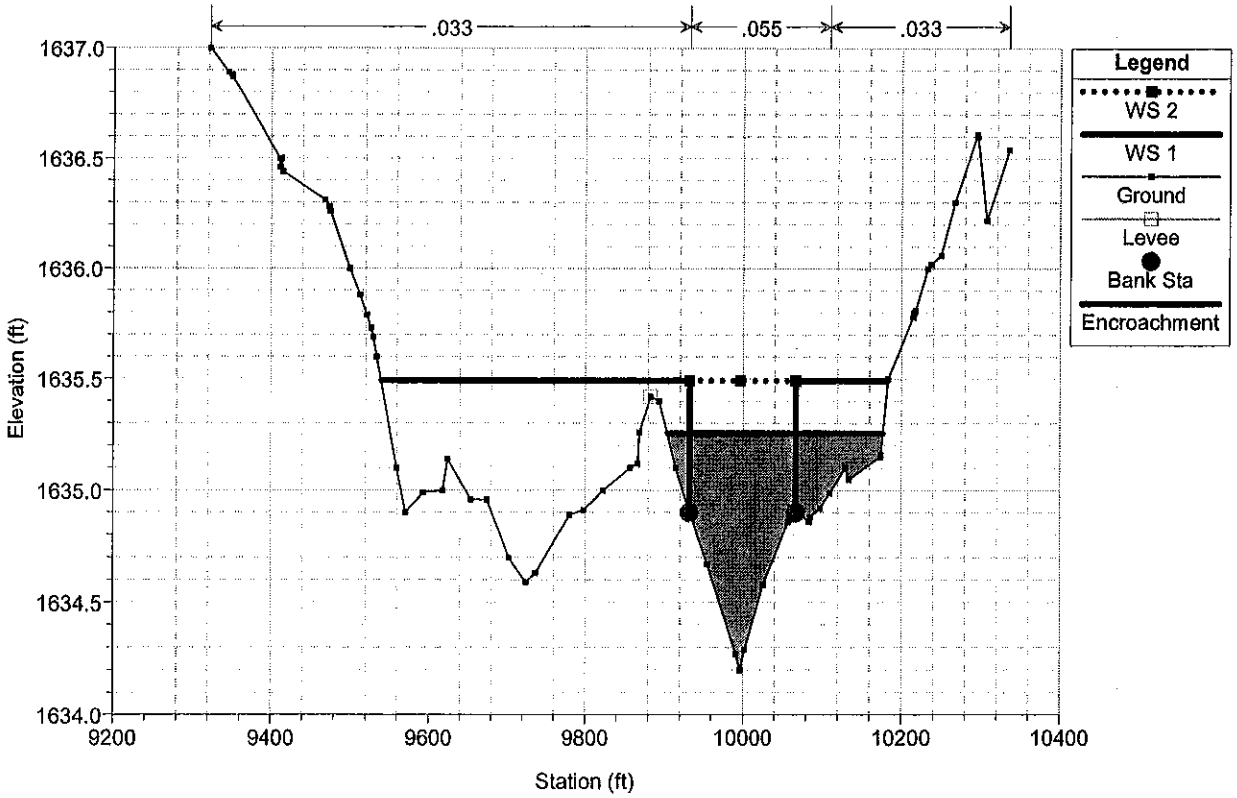
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

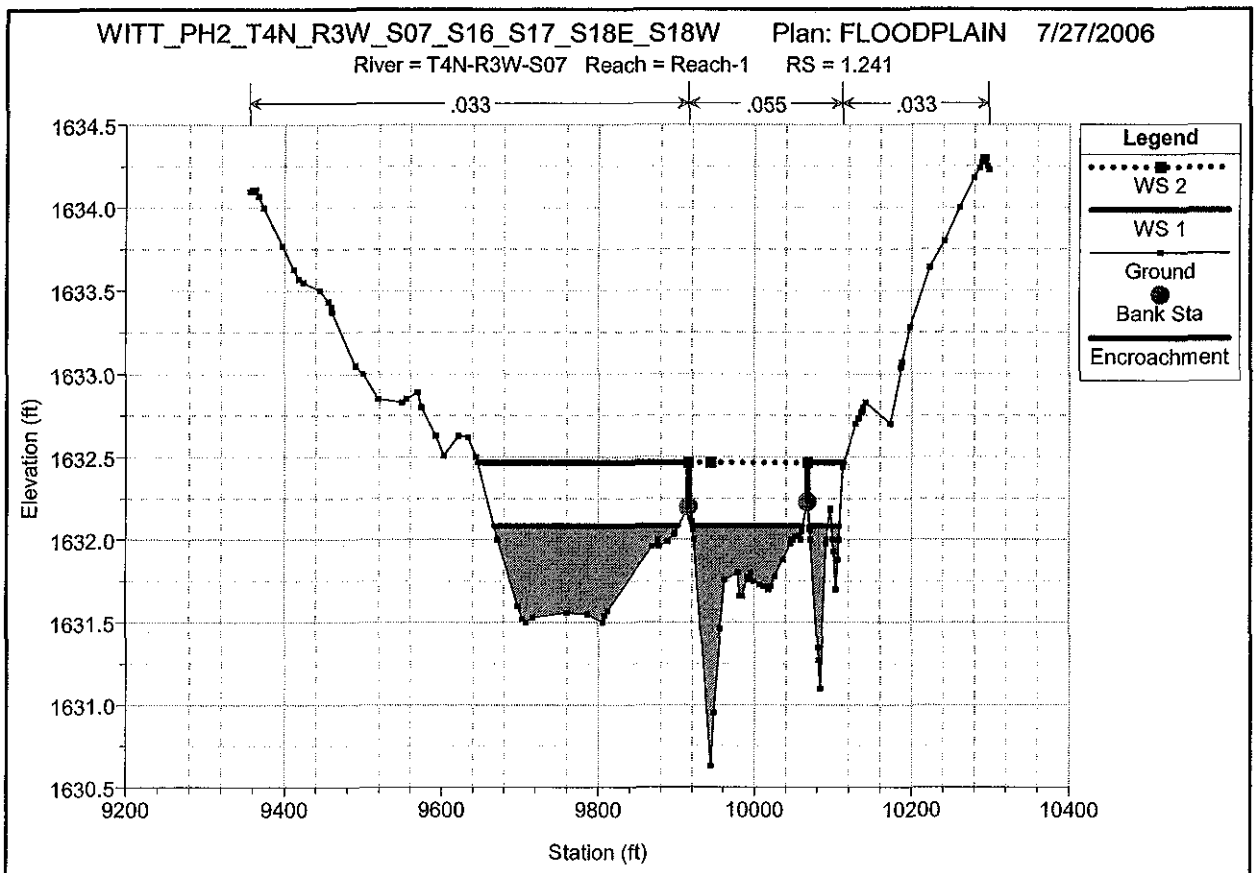
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.431 Levee added-Ridge not overtopped per rough BFE calcs

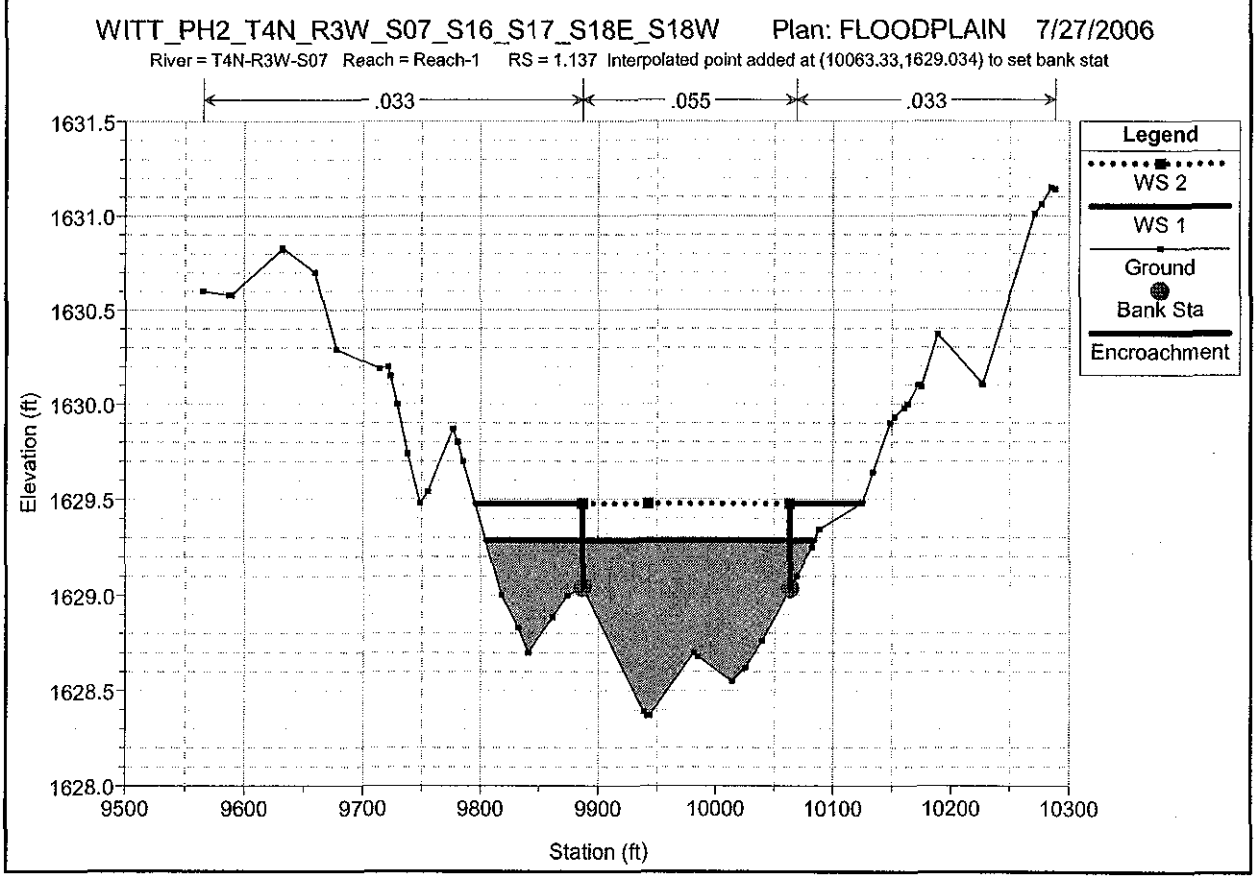


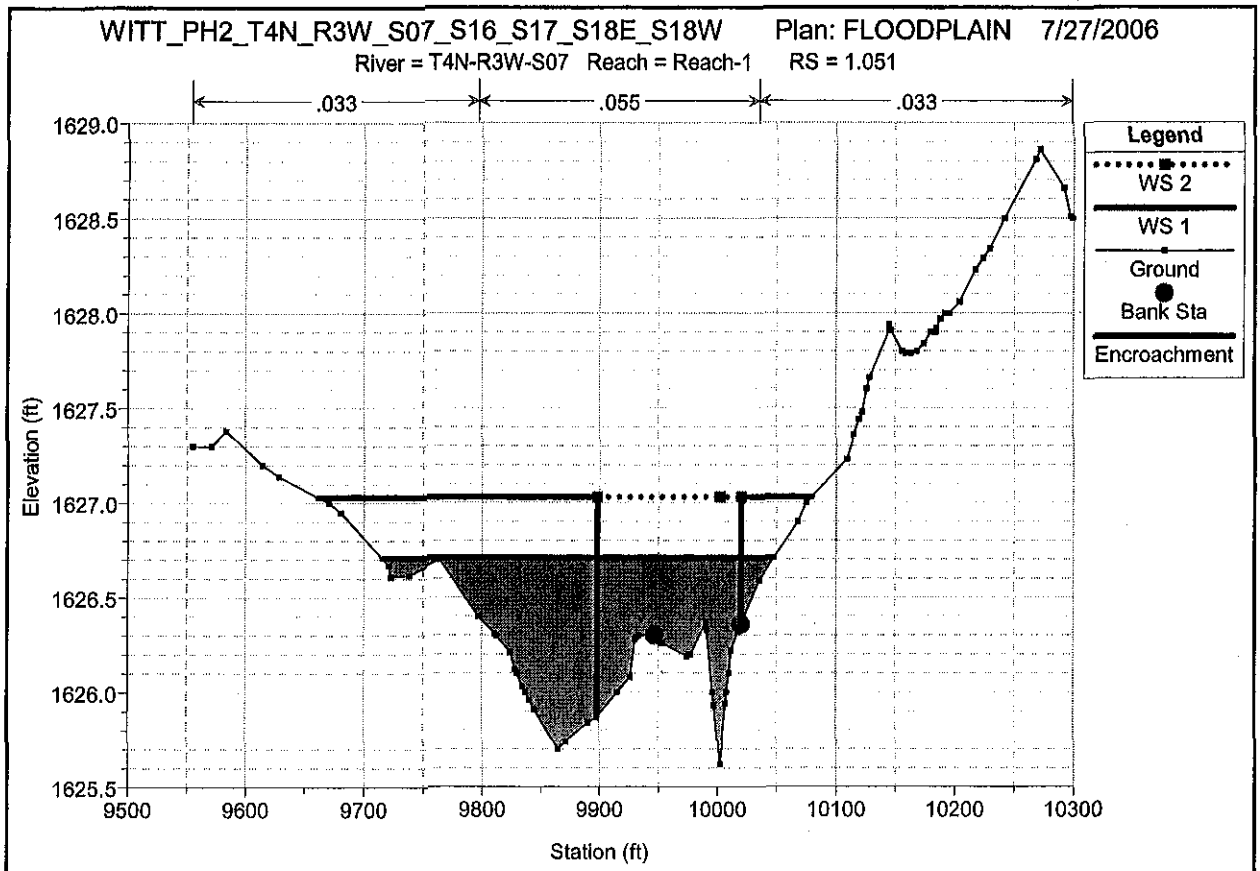
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

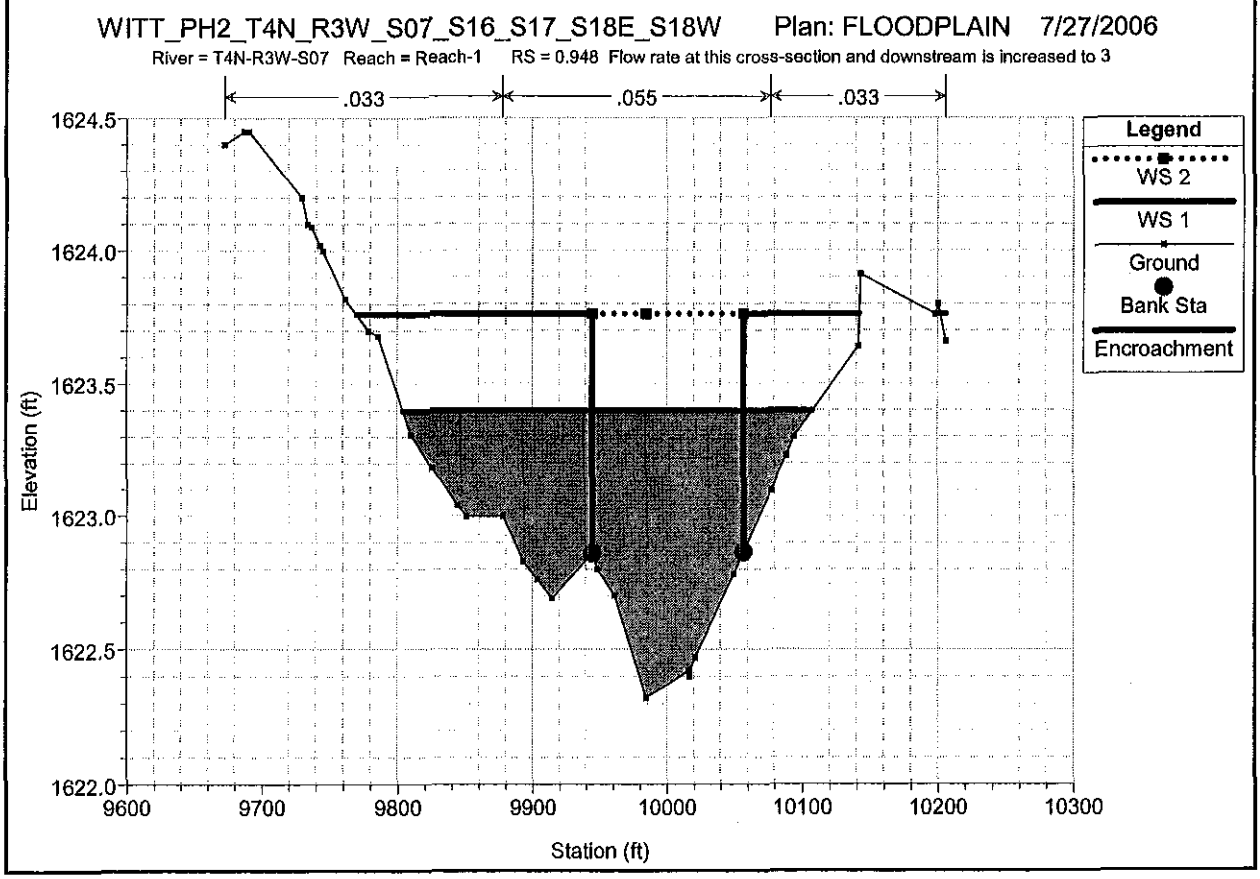
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.336 Levee added-Ridge not overtopped per rough BFE calcs

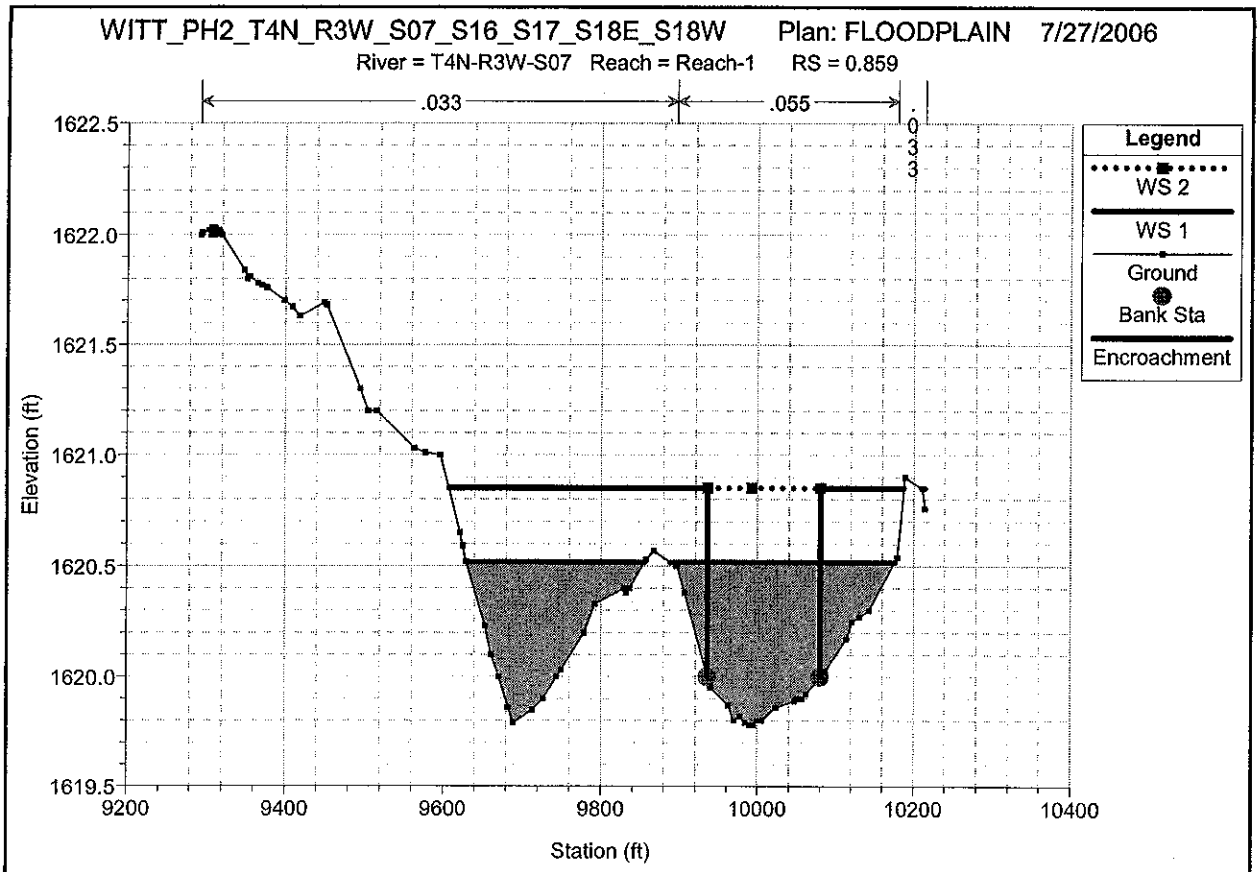


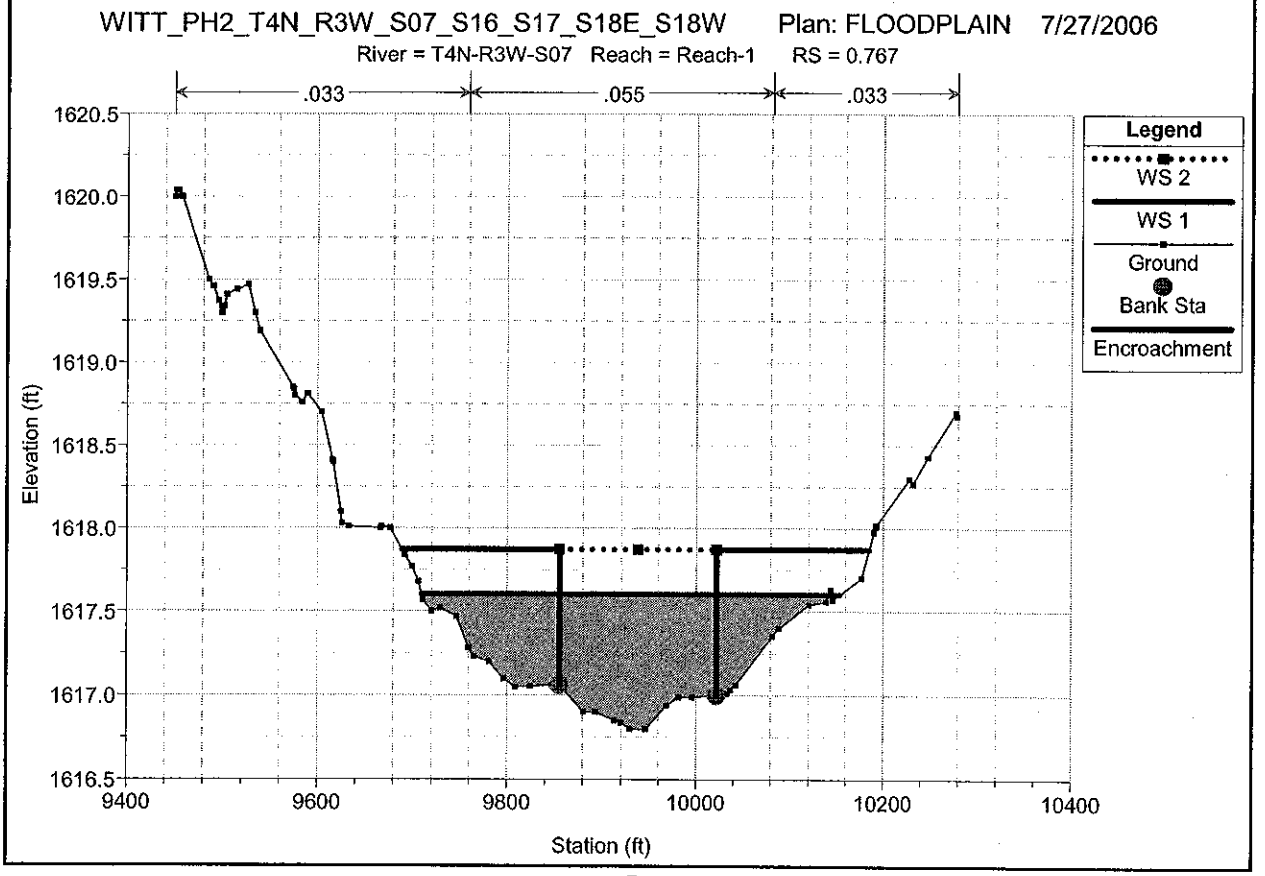

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.241
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

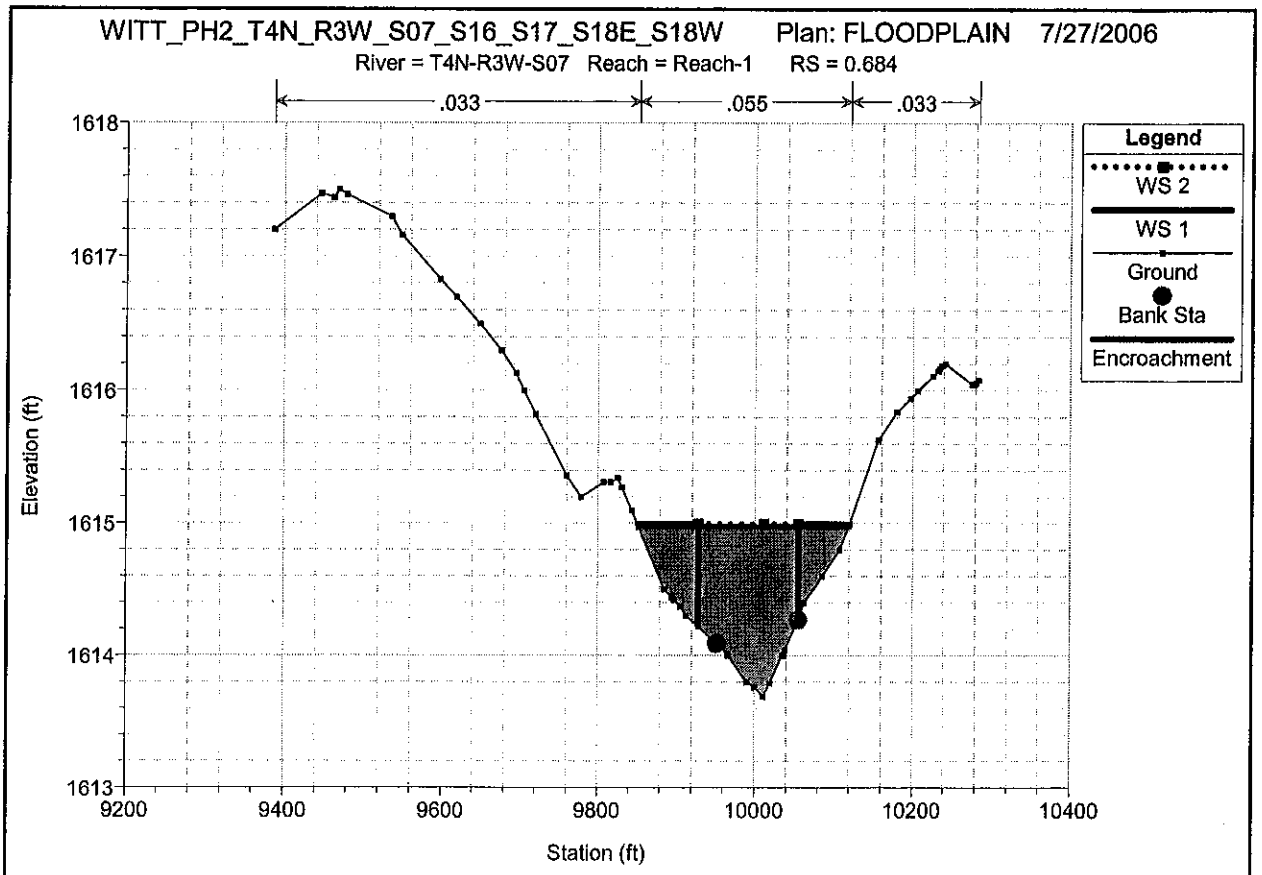

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.137 Interpolated point added at (10063.33,1629.034) to set bank stat
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

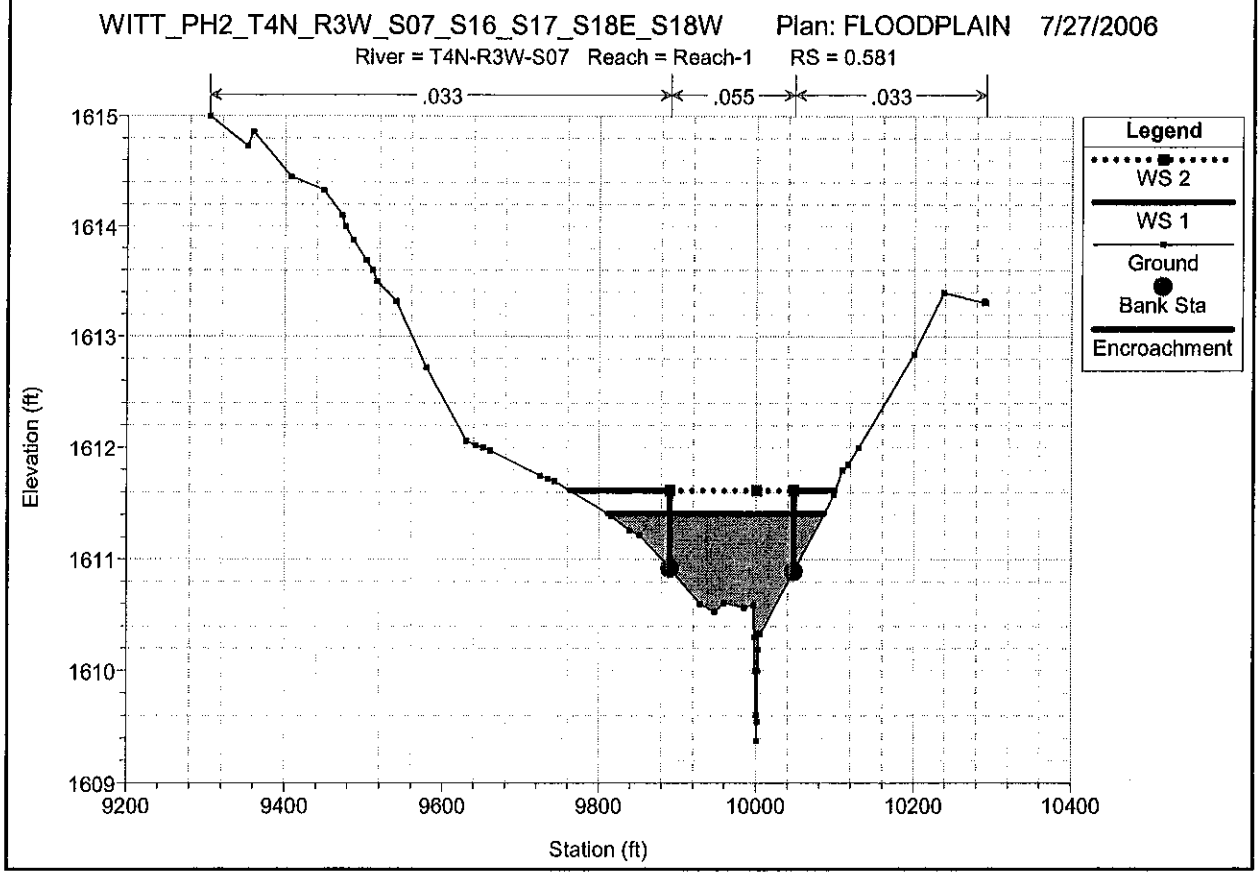

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 1.051
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

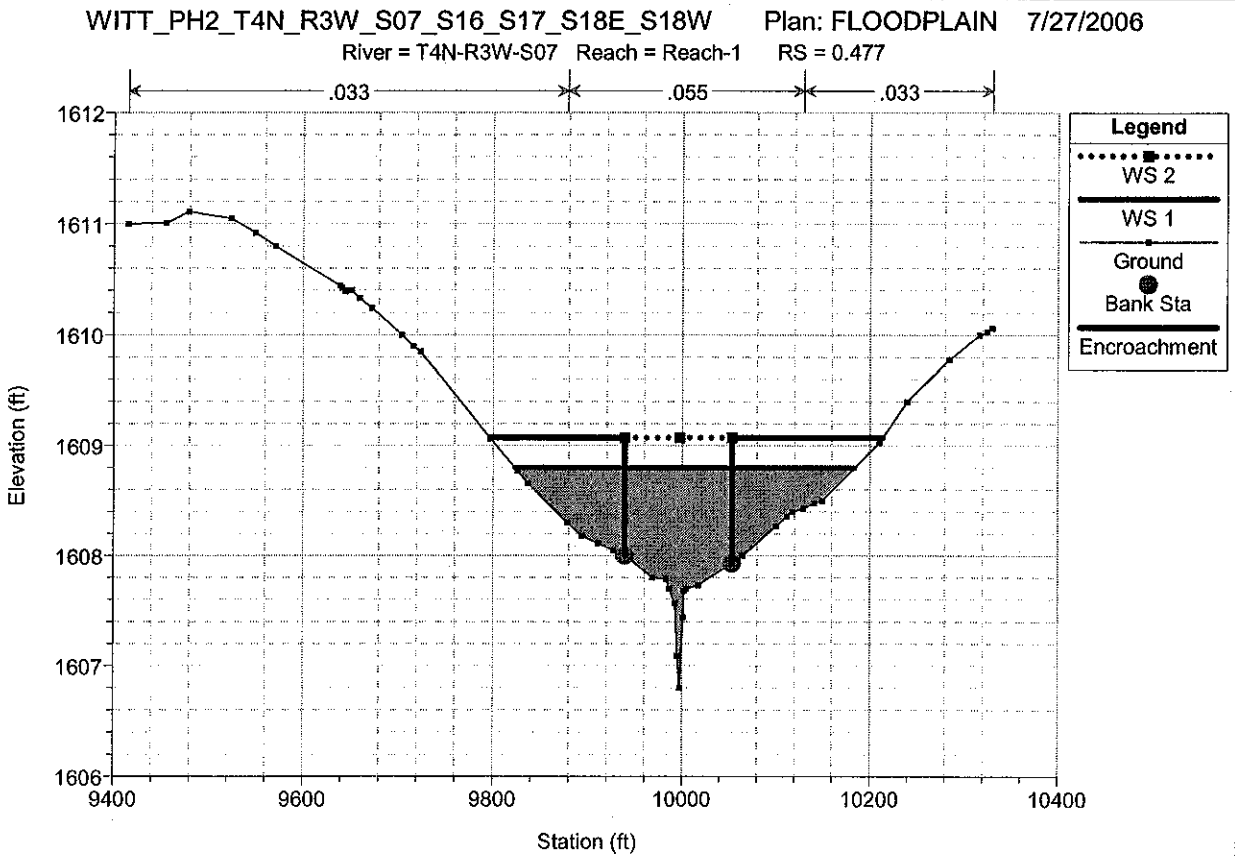

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.948 Flow rate at this cross-section and downstream is increased to 3
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

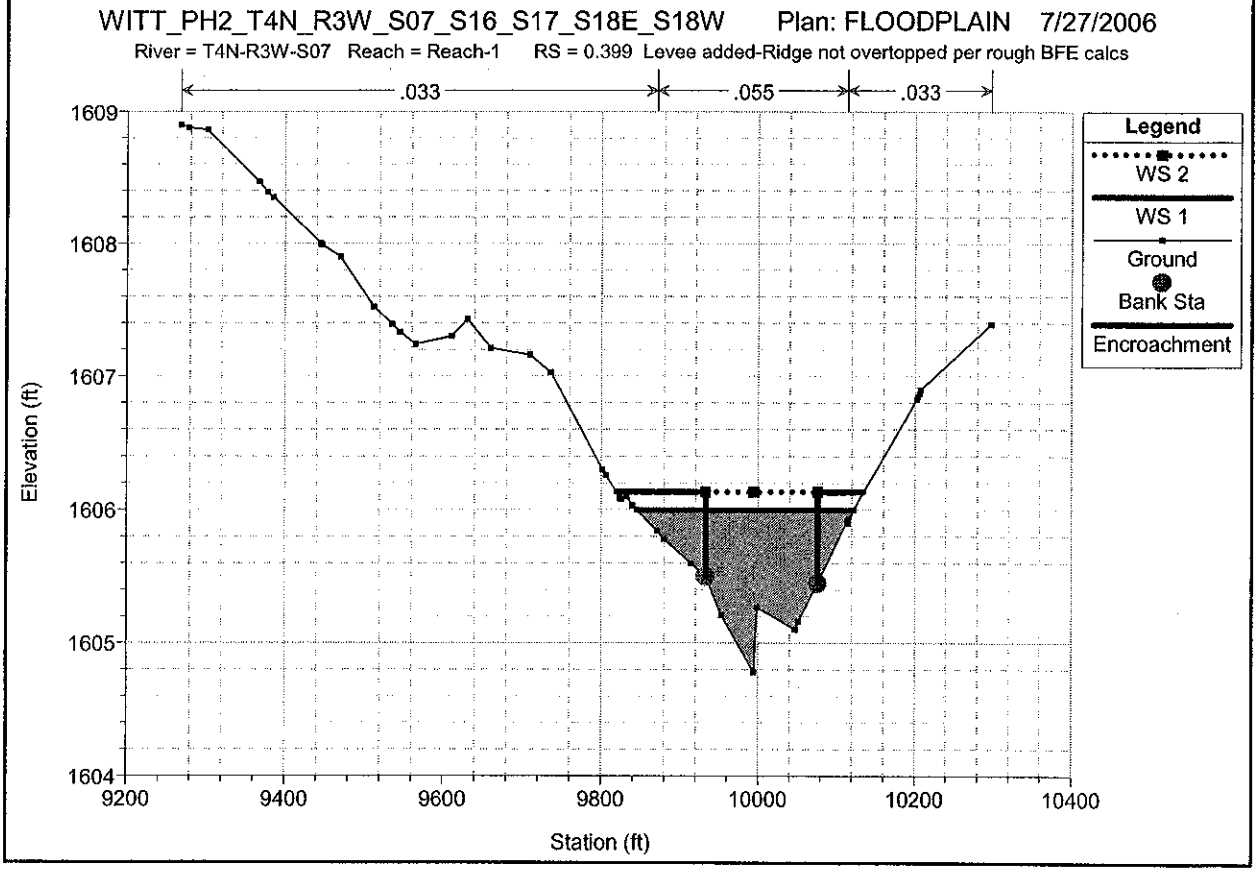

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.859
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1622.5
1622.0
1621.5
1621.0
1620.5
1620.0
1619.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)

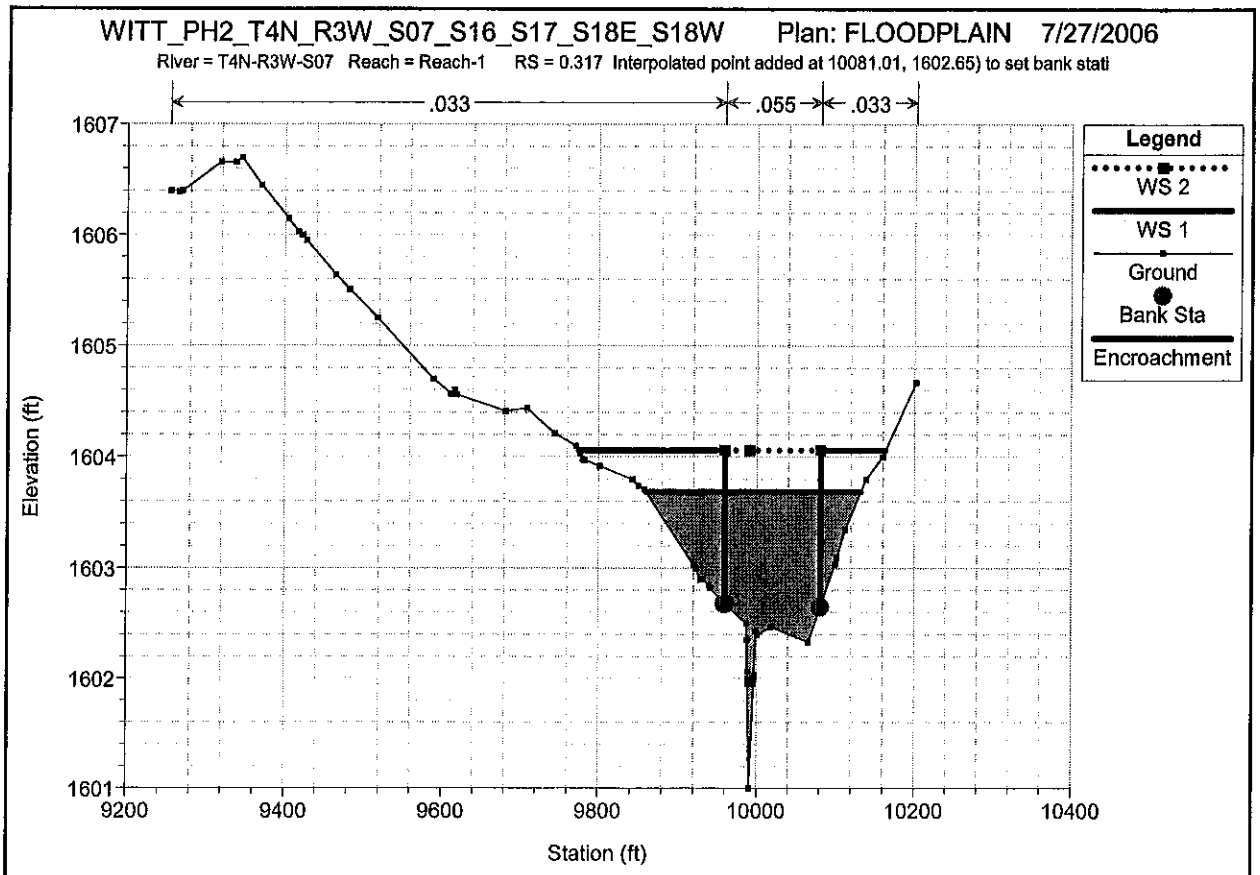

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.767
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1620.5
1620.0
1619.5
1619.0
1618.5
1618.0
1617.5
1617.0
1616.5
9400
9600
9800
10000
10200
10400
Station (ft)

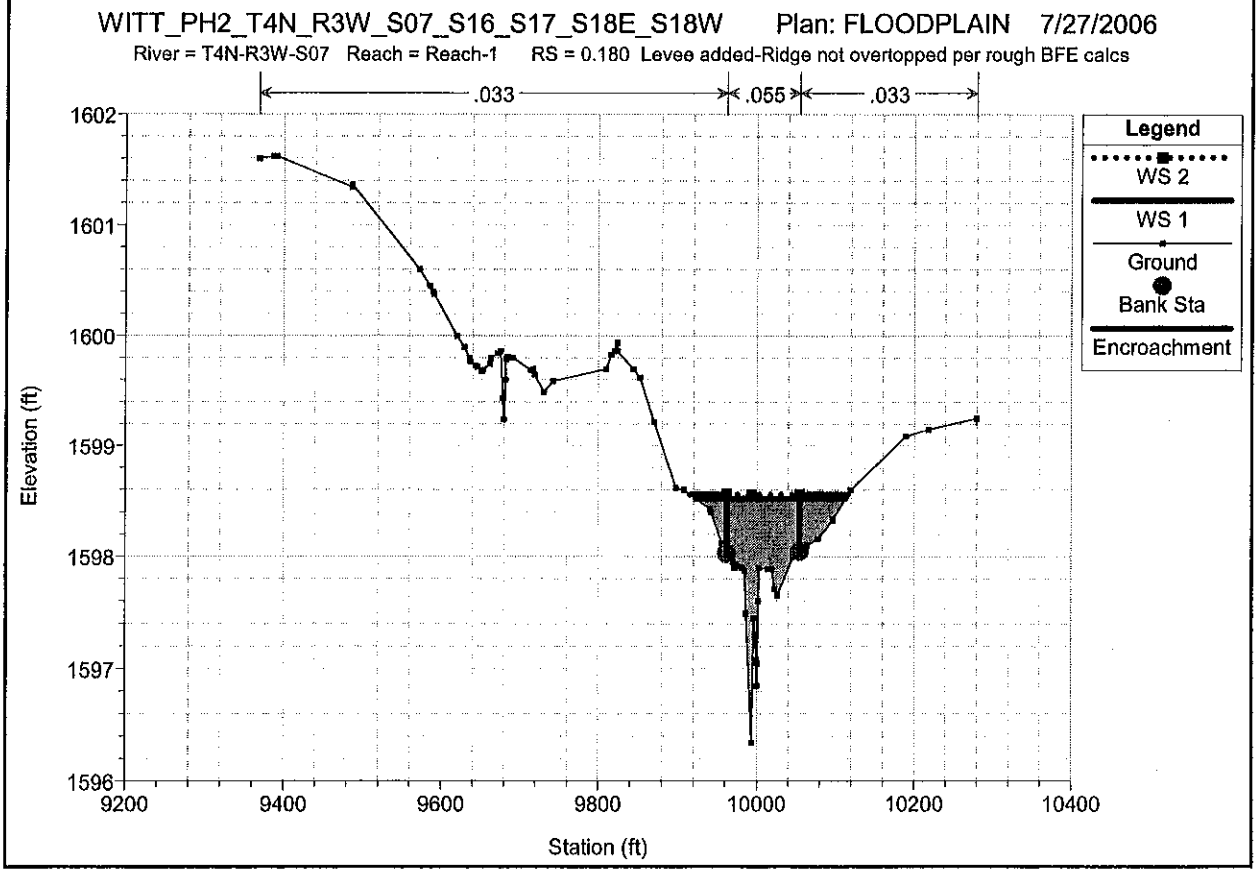

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.684
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1618
1617
1616
1615
1614
1613
9200
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.581
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1615
1614
1613
1612
1611
1610
1609
9200
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.477
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1612
1611
1610
1609
1608
1607
1606
9400
9600
9800
10000
10200
10400
Station (ft)

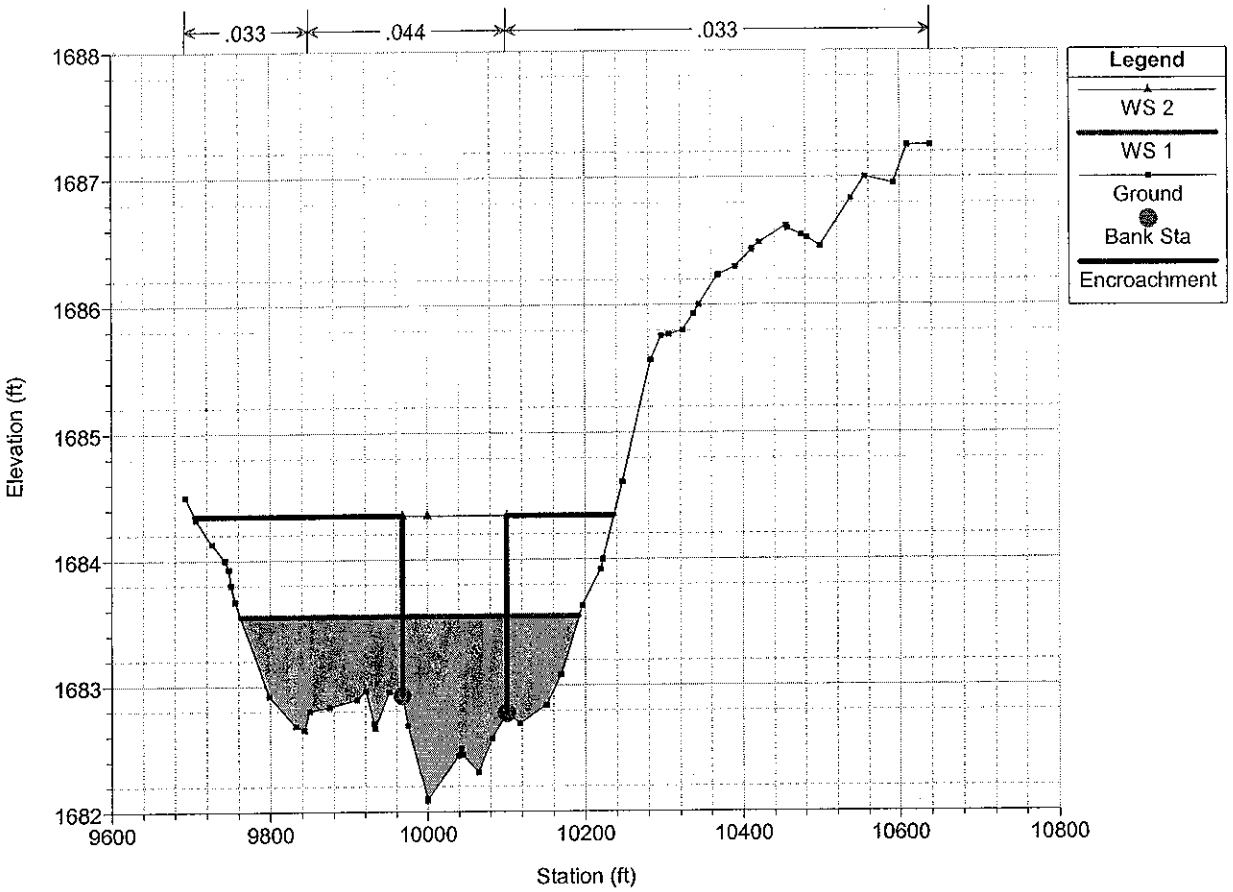

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.399 Levee added-Ridge not overtopped per rough BFE calcs
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1609
1608
1607
1606
1605
1604
9200
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.317 Interpolated point added at 10081.01, 1602.65) to set bank stati
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1607
1606
1605
1604
1603
1602
1601
9200
9400
9600
9800
10000
10200
10400


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S07 Reach = Reach-1 RS = 0.180 Levee added-Ridge not overtopped per rough BFE calcs
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1602
1601
1600
1599
1598
1597
1596
9200
9400
9600
9800
10000
10200
10400

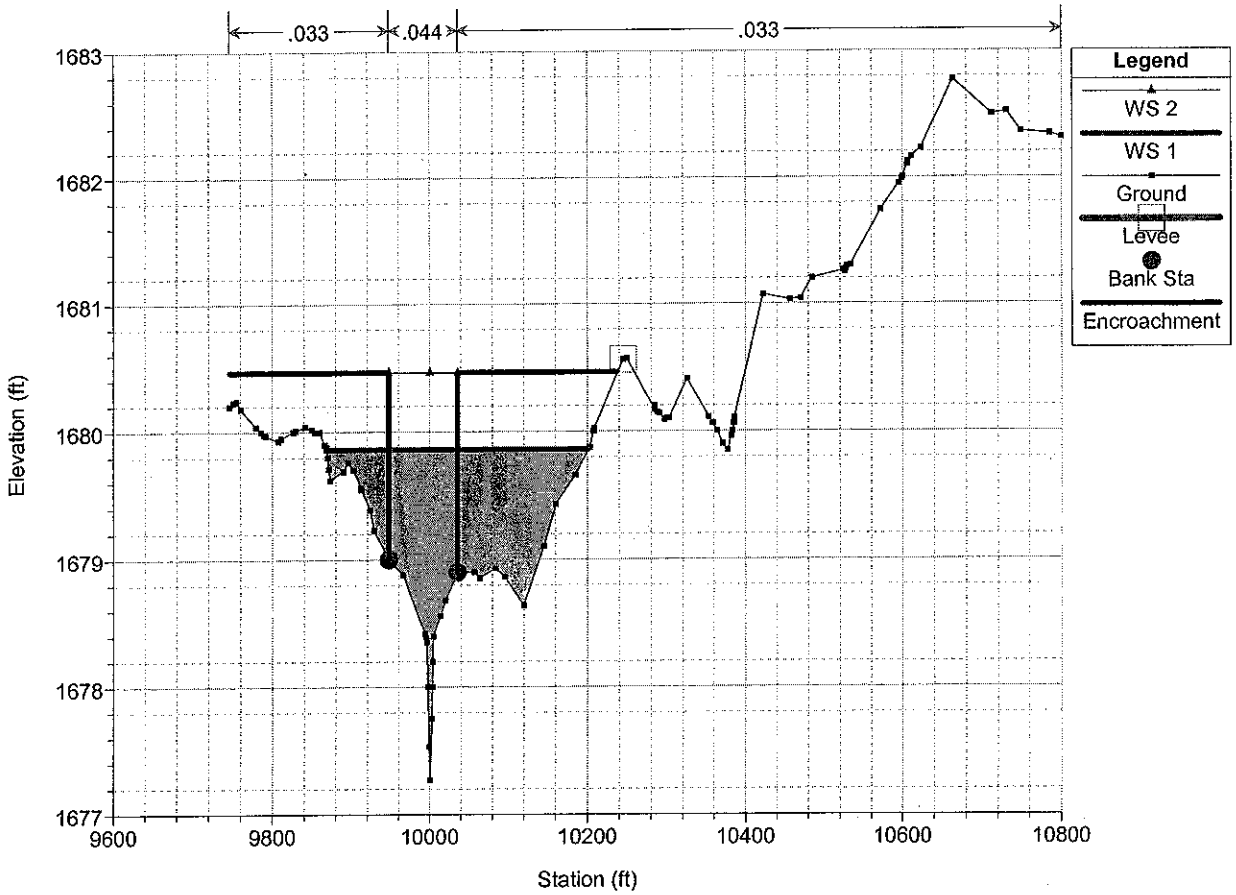
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

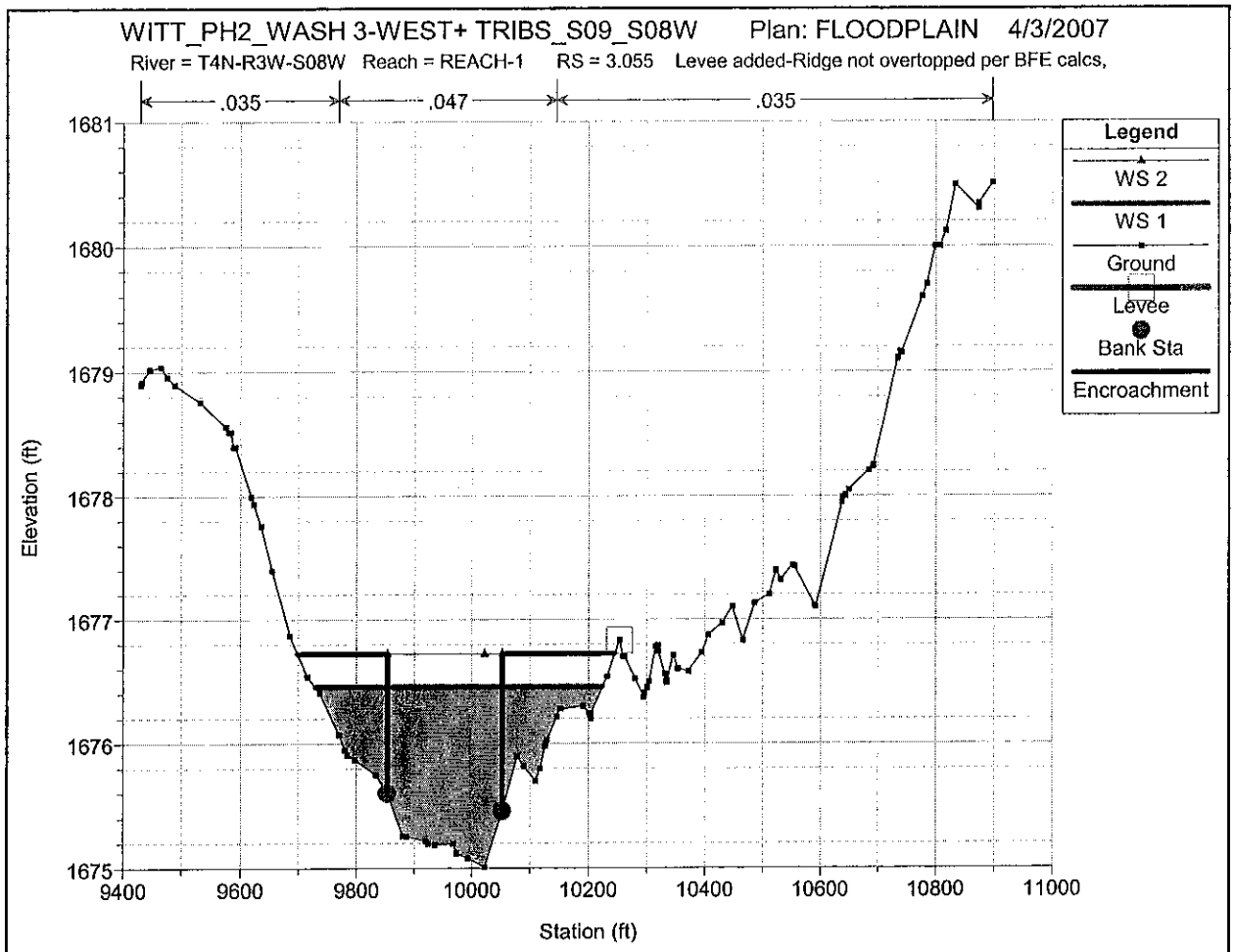
River = T4N-R3W-S08W Reach = REACH-1 RS = 3.254 Flow rate starting at this cross-section and downstream is 880cf

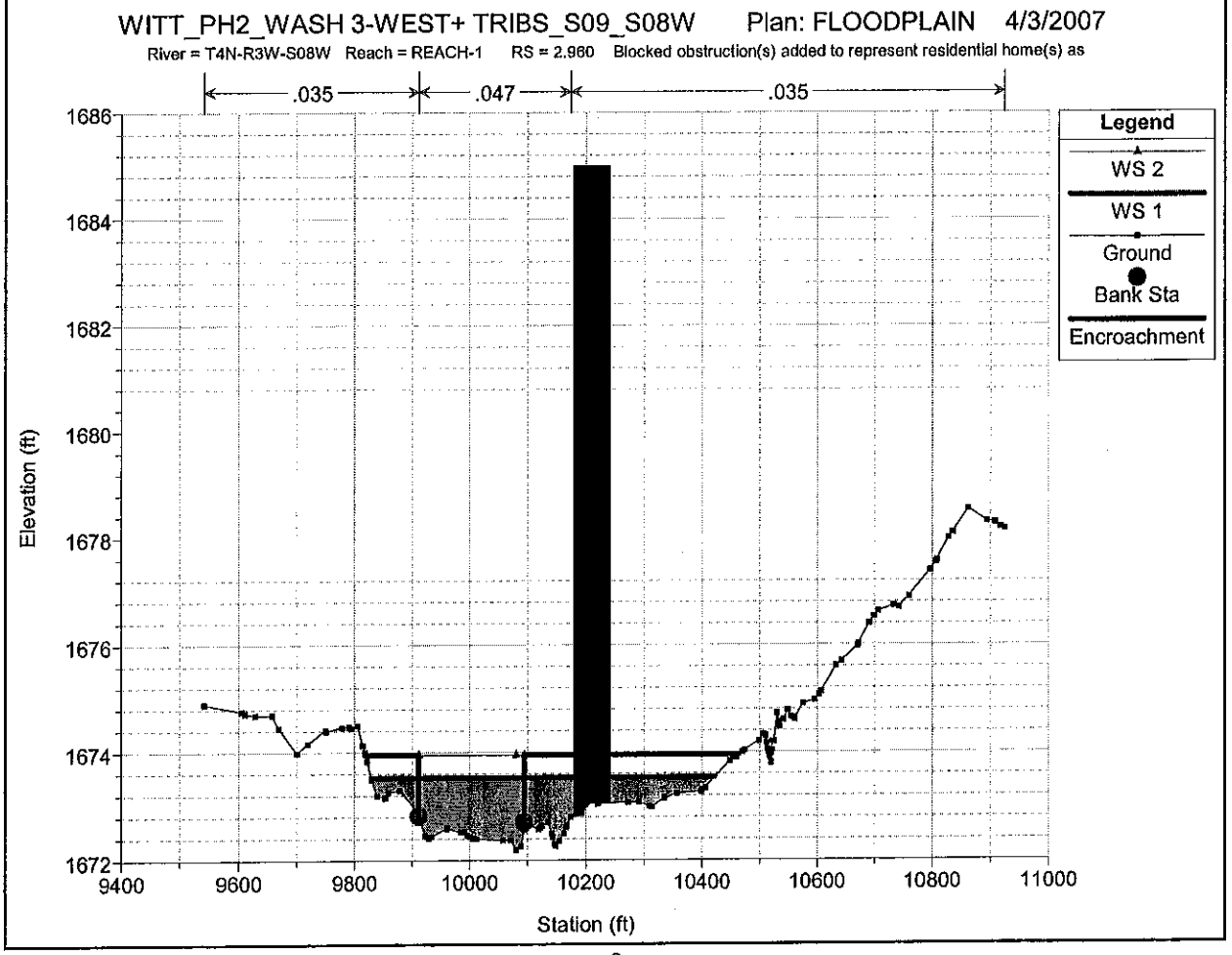


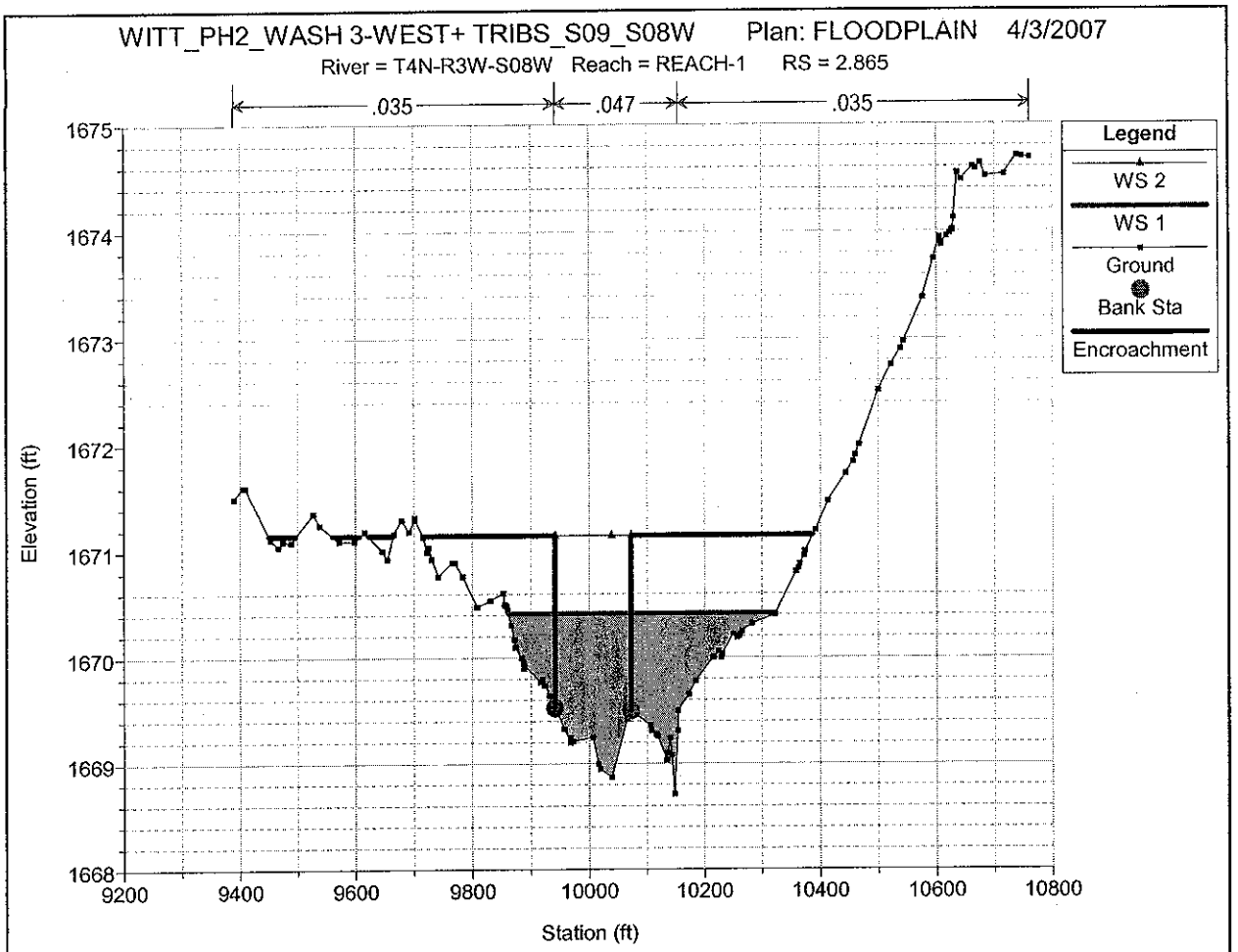
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

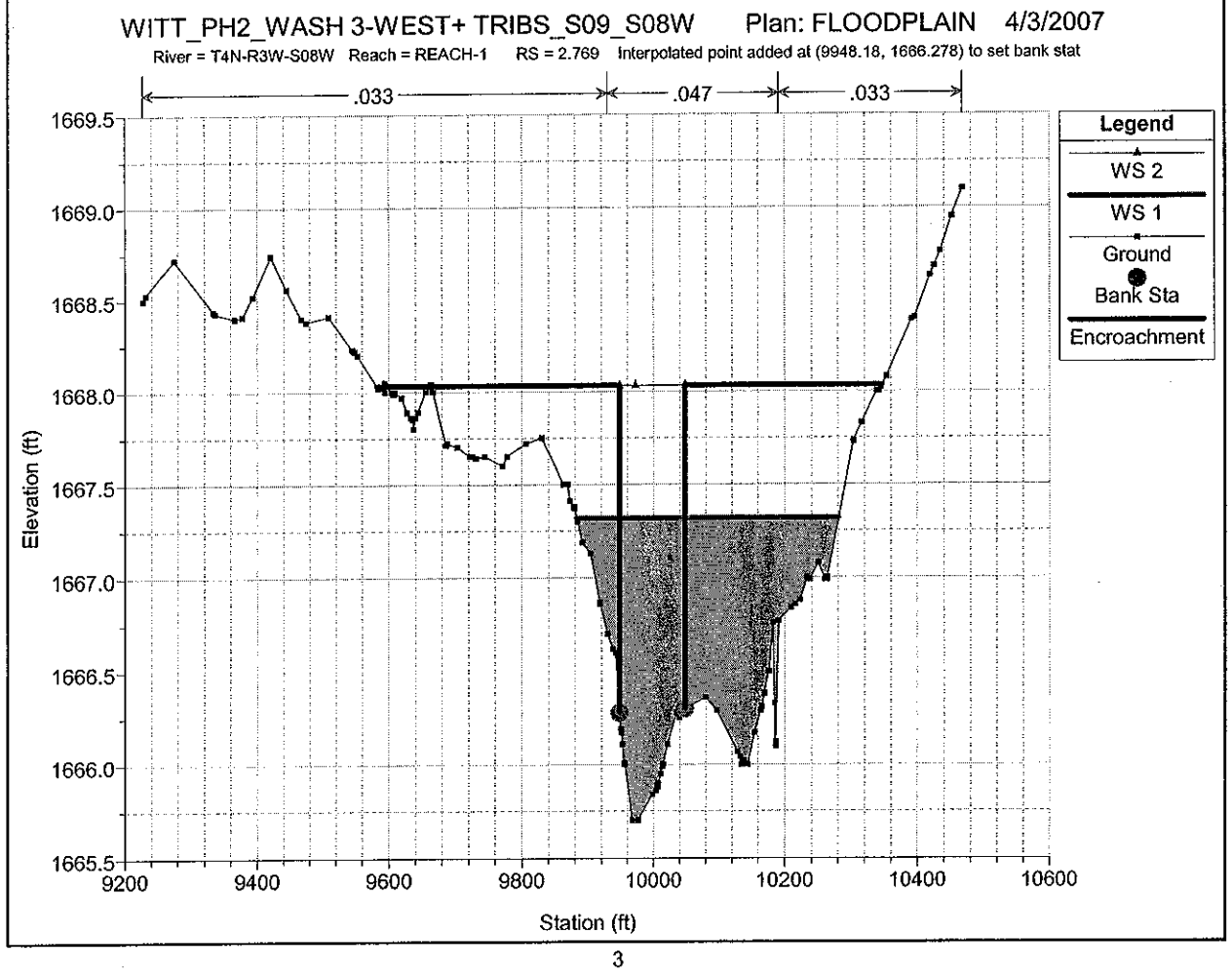
River = T4N-R3W-S08W Reach = REACH-1 RS = 3.156 Levee added-Ridge not overtopped per BFE calcs, low ground right

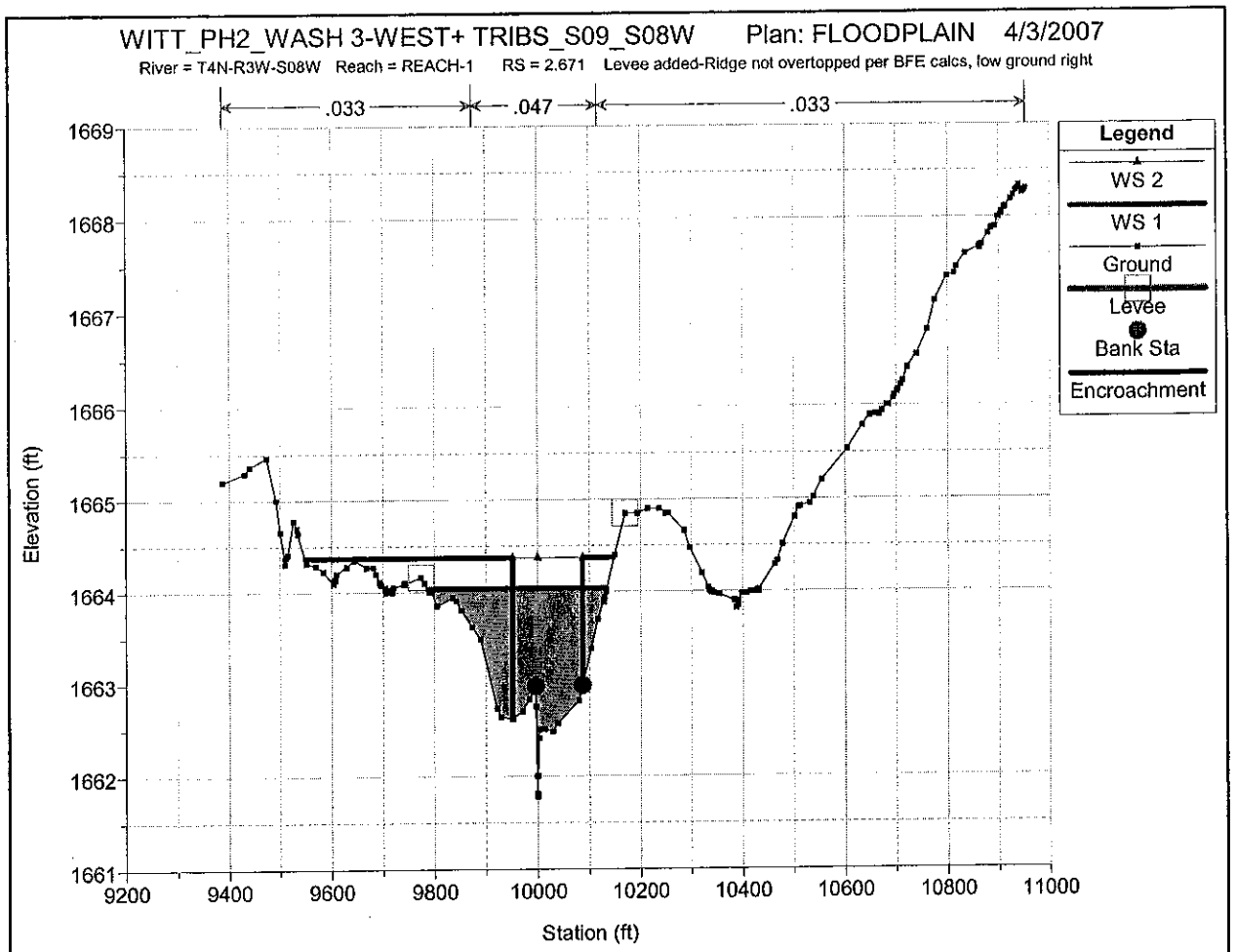


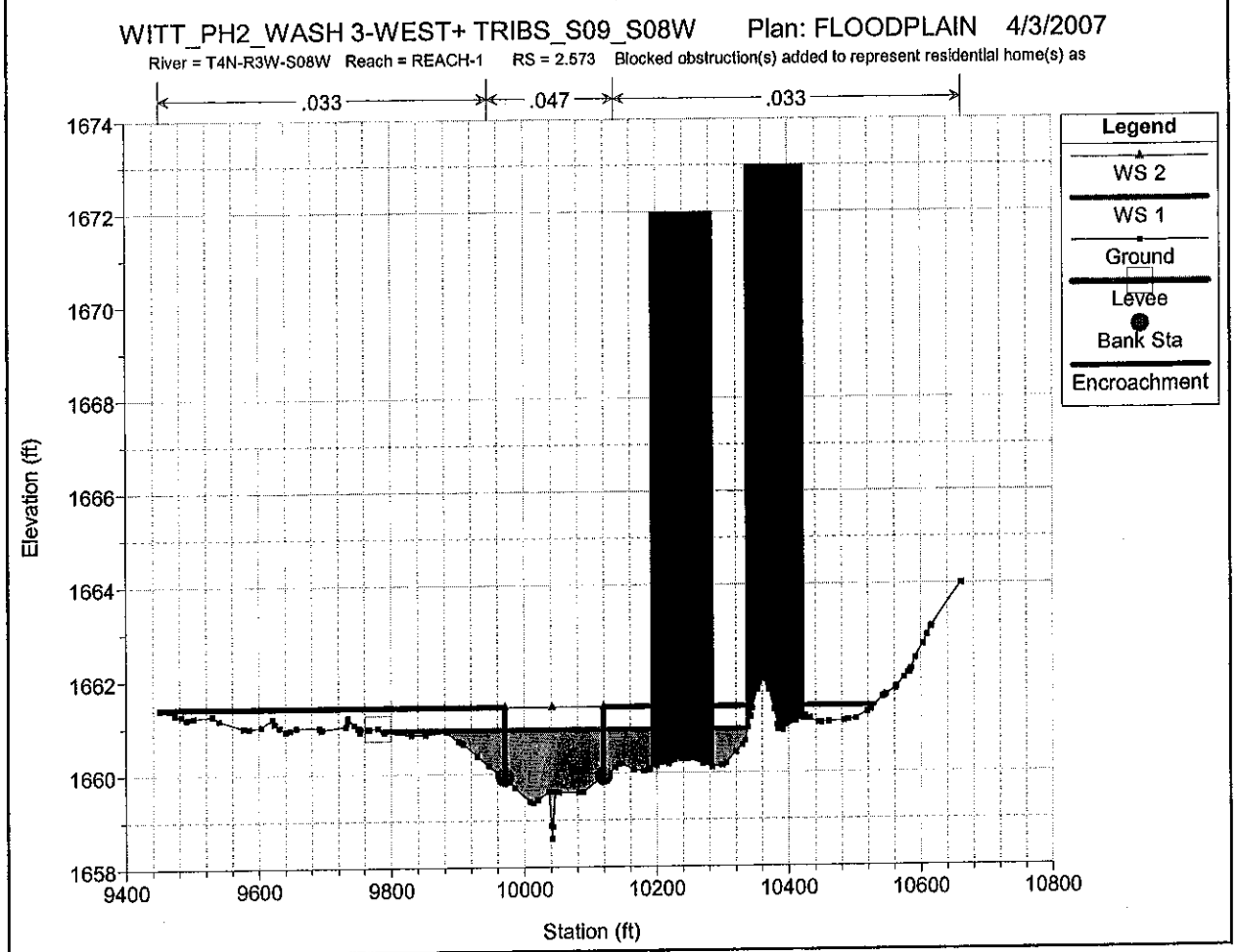

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 3.055 Levee added-Ridge not overtopped per BFE calcs,
.035
.047
.035
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1681
1680
1679
1678
1677
1676
1675
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.960 Blocked obstruction(s) added to represent residential home(s) as
.035
.047
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1686
1684
1682
1680
1678
1676
1674
1672
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.865
.035
.047
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1675
1674
1673
1672
1671
1670
1669
1668
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

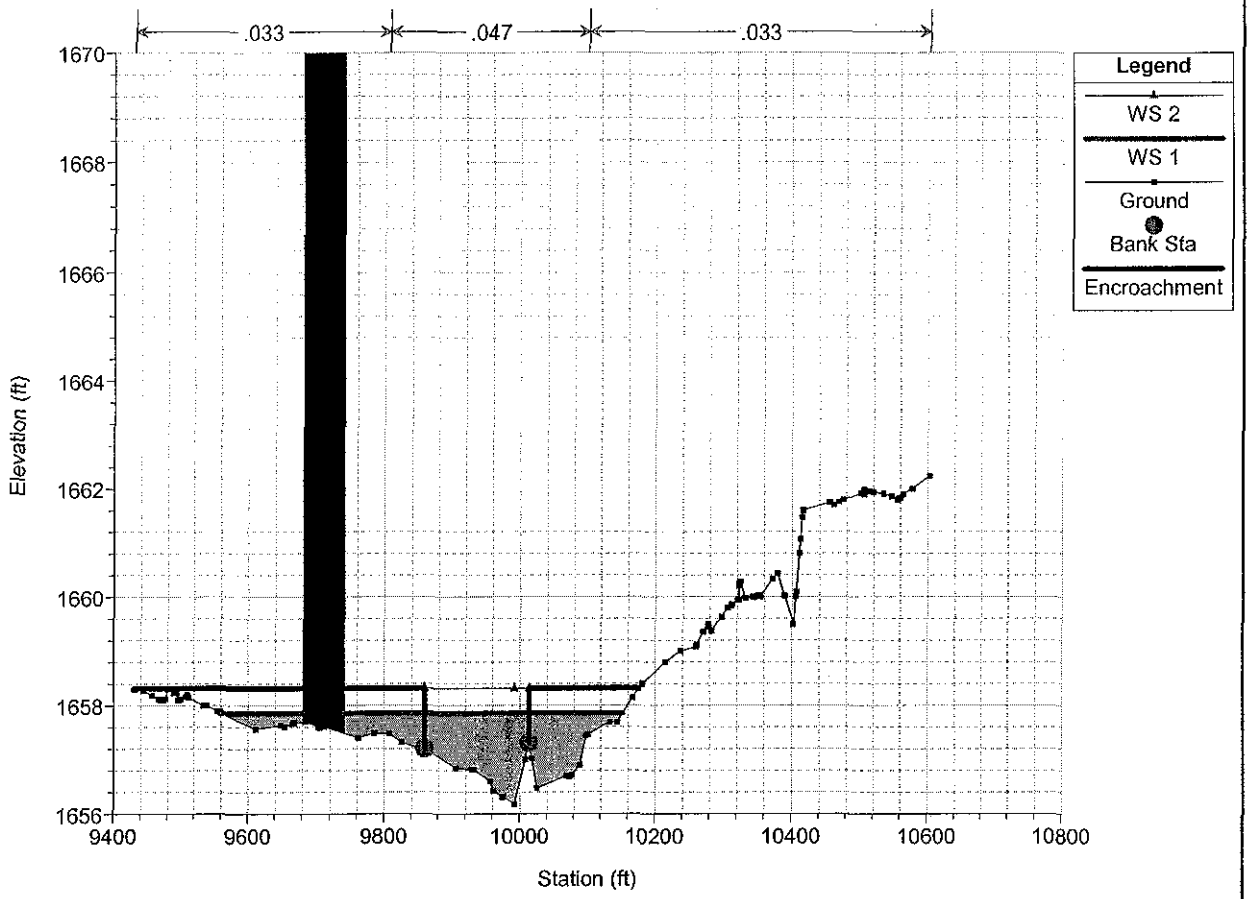

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.769 Interpolated point added at (9948.18, 1666.278) to set bank stat
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1669.5
1669.0
1668.5
1668.0
1667.5
1667.0
1666.5
1666.0
1665.5
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.671 Levee added-Ridge not overtopped per BFE calcs, low ground right
.033
.047
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1669
1668
1667
1666
1665
1664
1663
1662
1661
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.573 Blocked obstruction(s) added to represent residential home(s) as
.033
.047
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1674
1672
1670
1668
1666
1664
1662
1660
1658
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

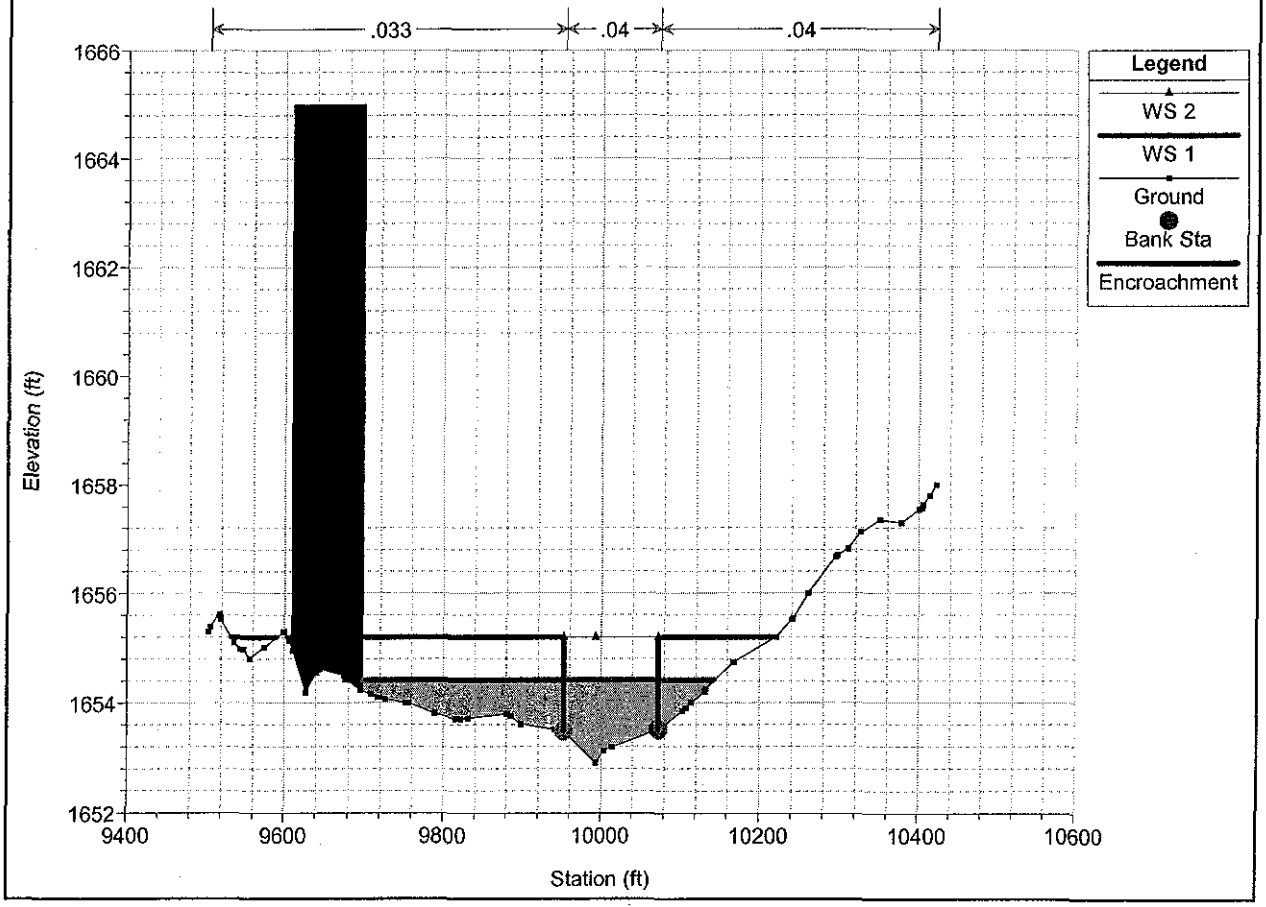
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S08W Reach = REACH-1 RS = 2.476 Blocked obstruction(s) added to represent residential home(s) as



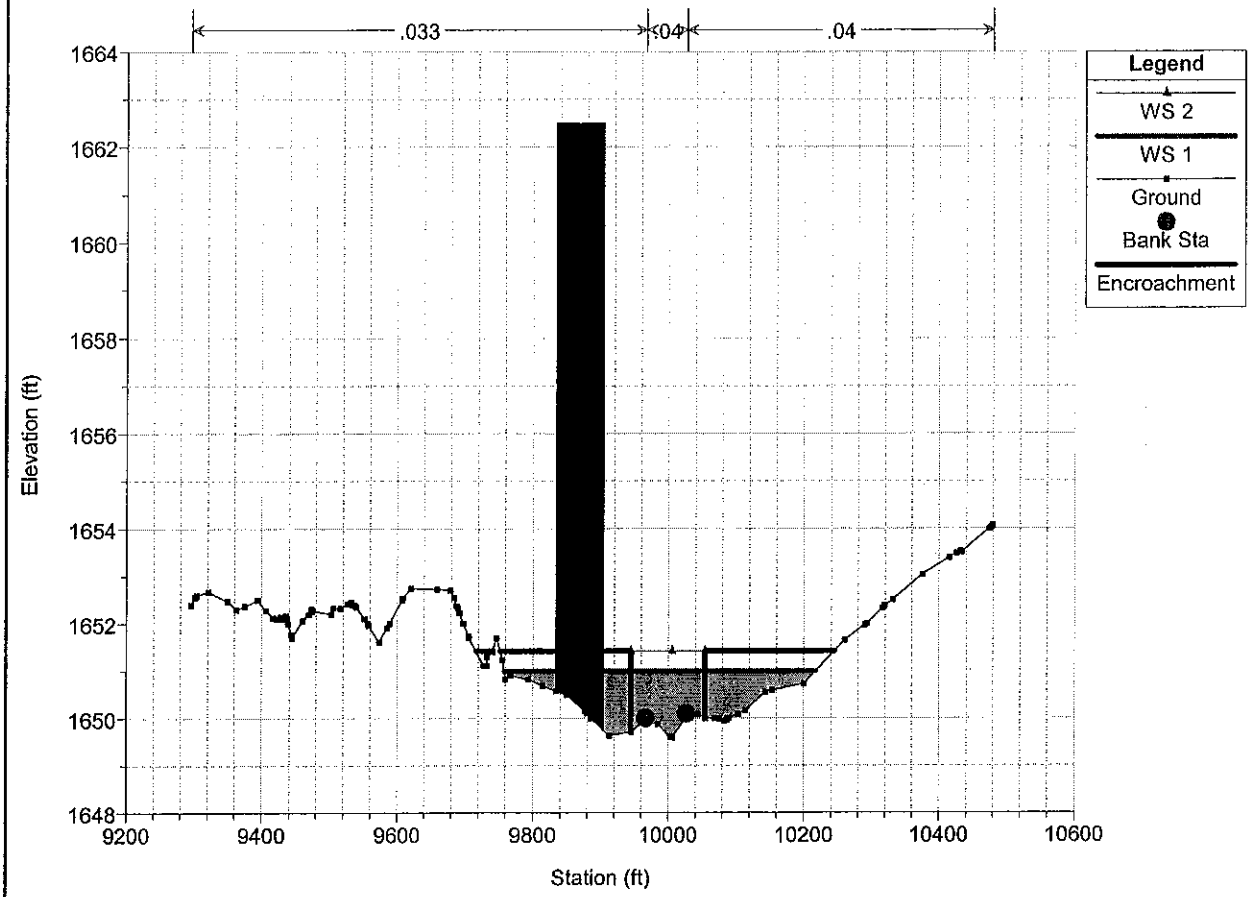
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S08W Reach = REACH-1 RS = 2.375 Flow rate starting at this cross-section and downstream is incre



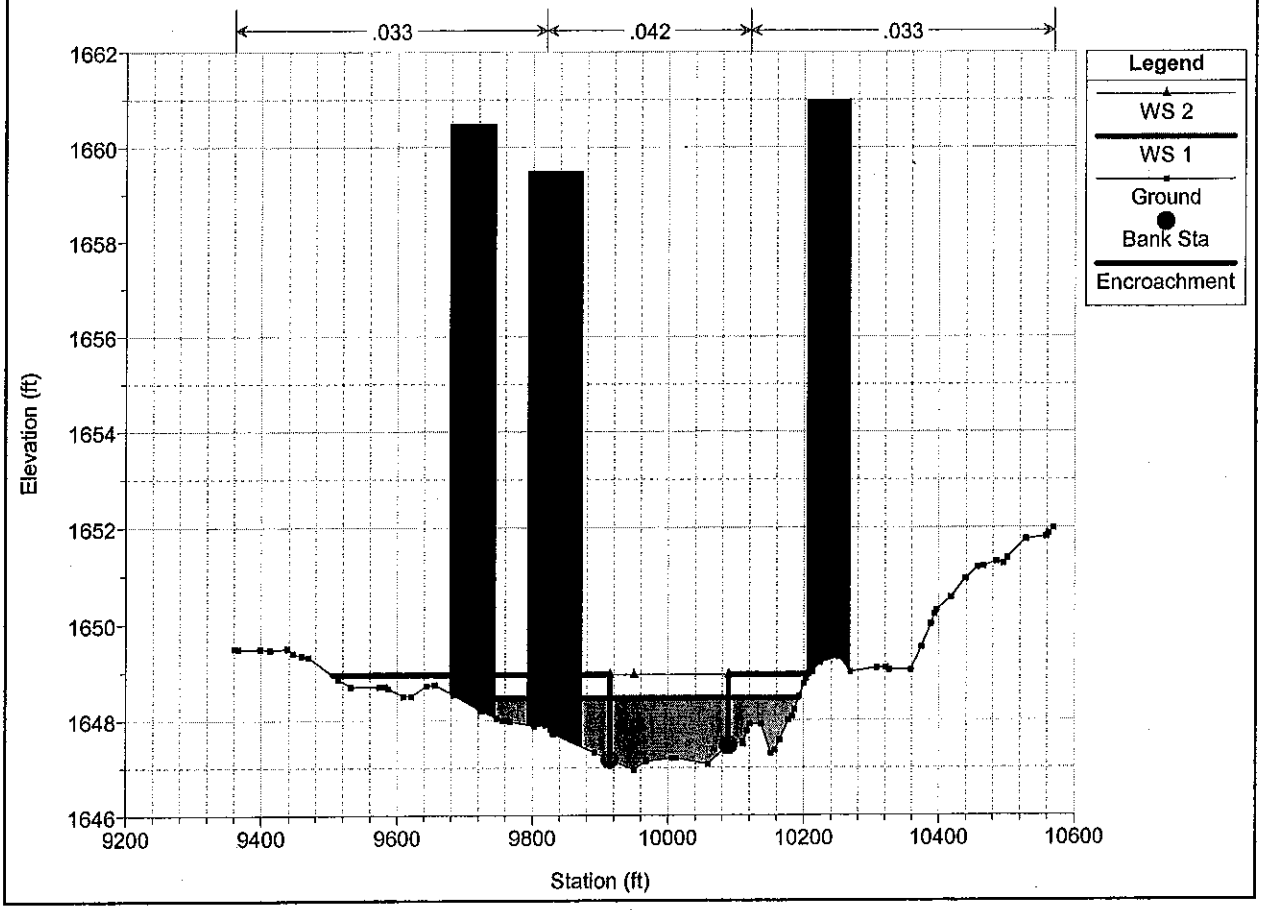
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

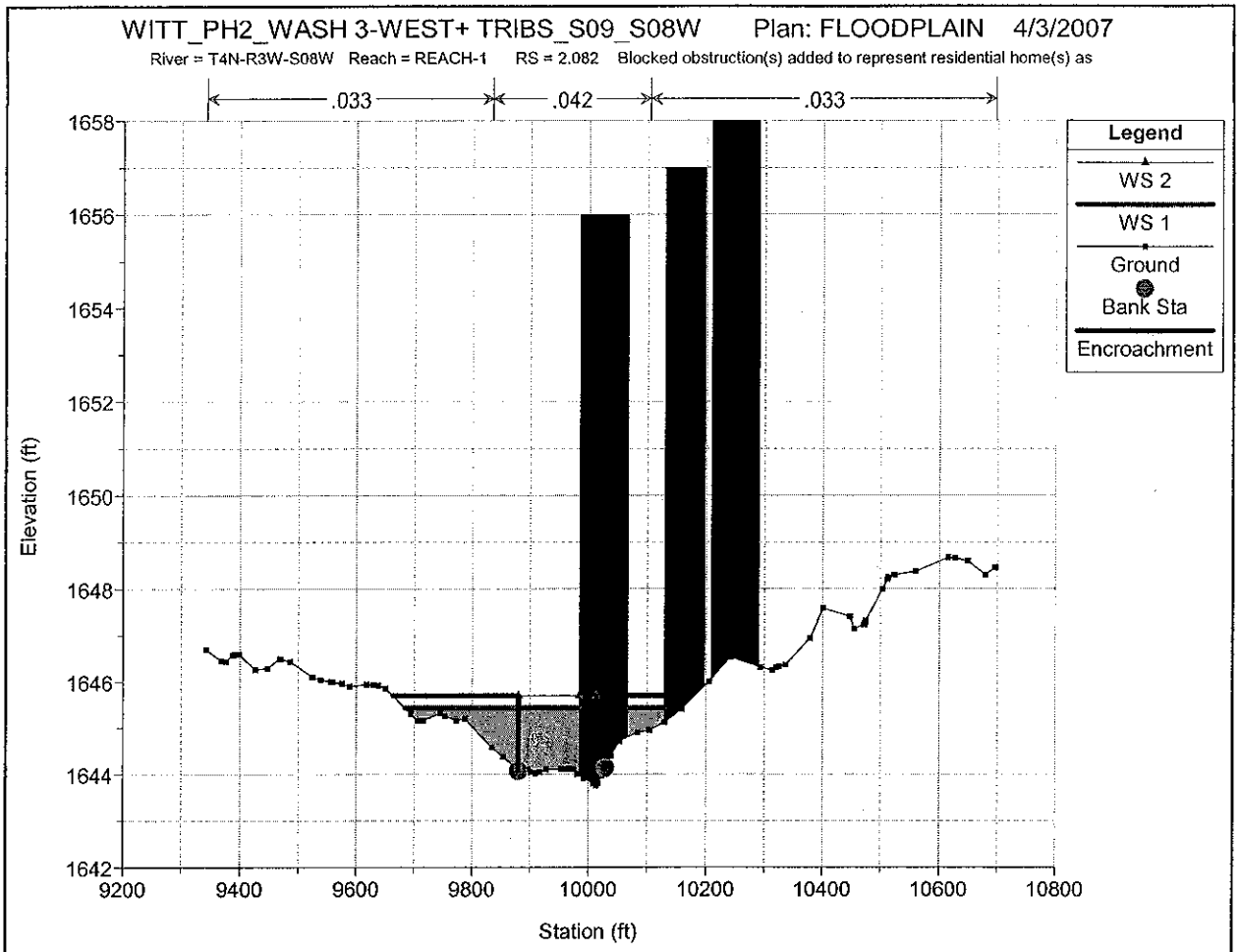
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.277 Blocked obstruction(s) added to represent residential home(s) as

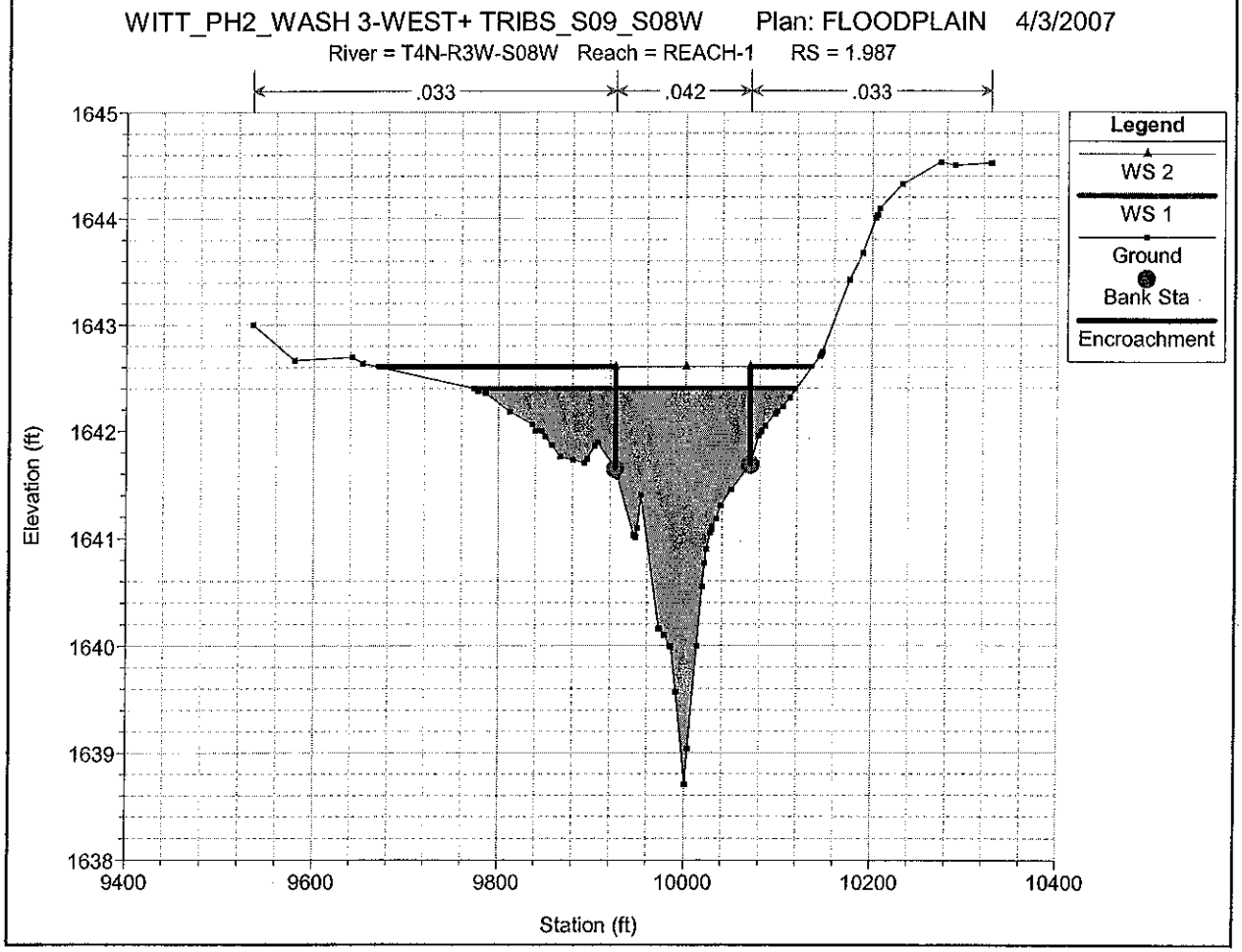


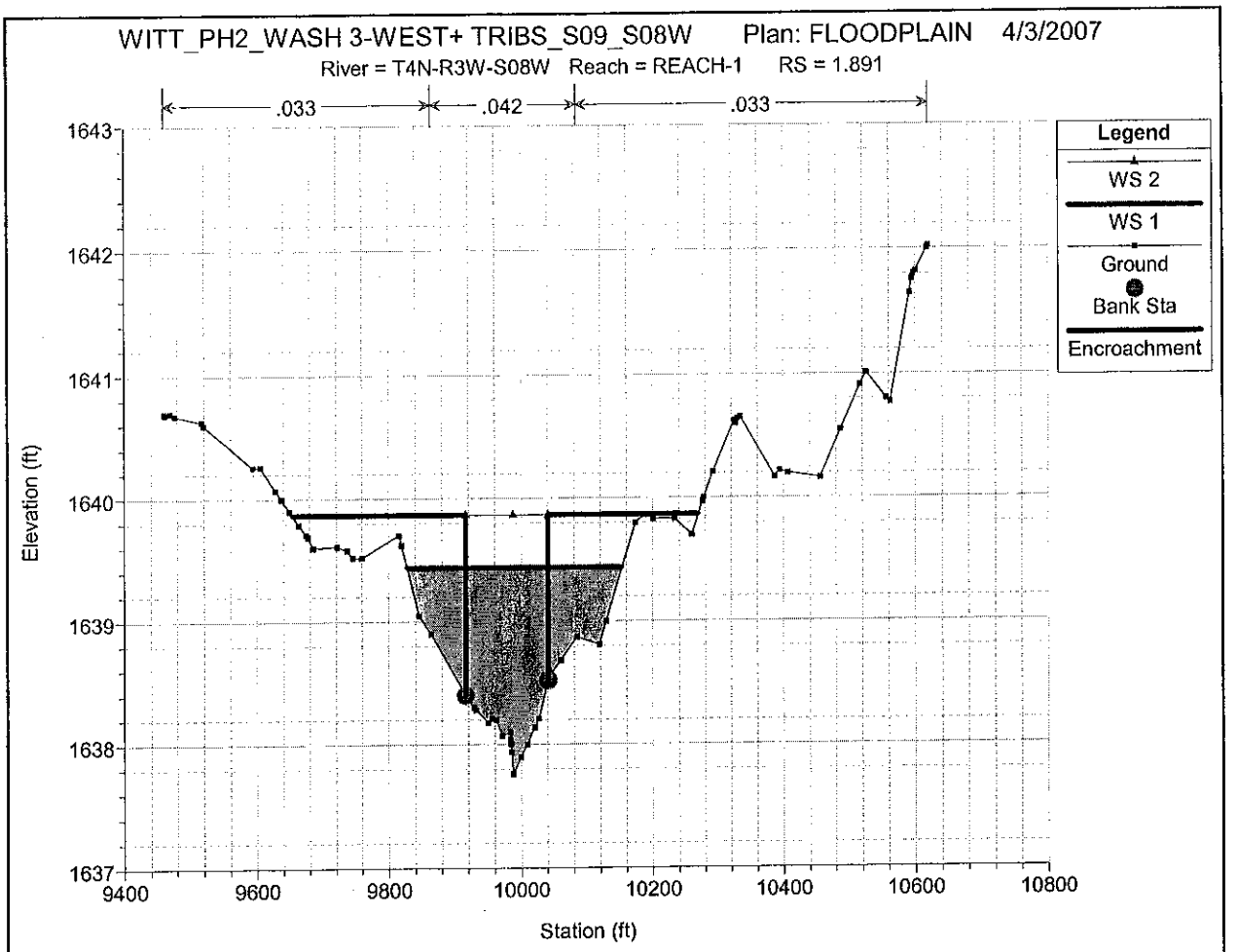
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

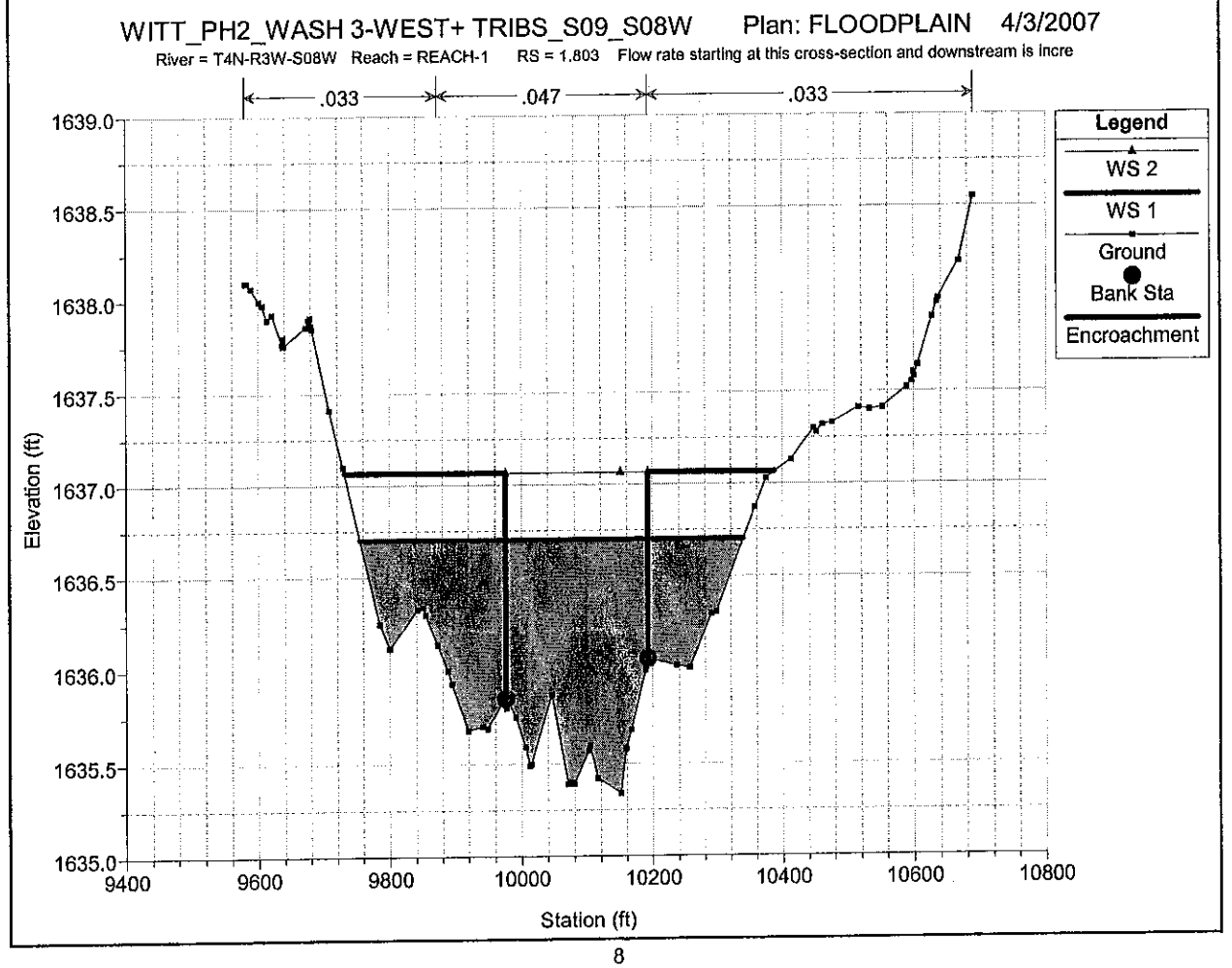
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.181 Blocked obstruction(s) added to represent residential home(s) as

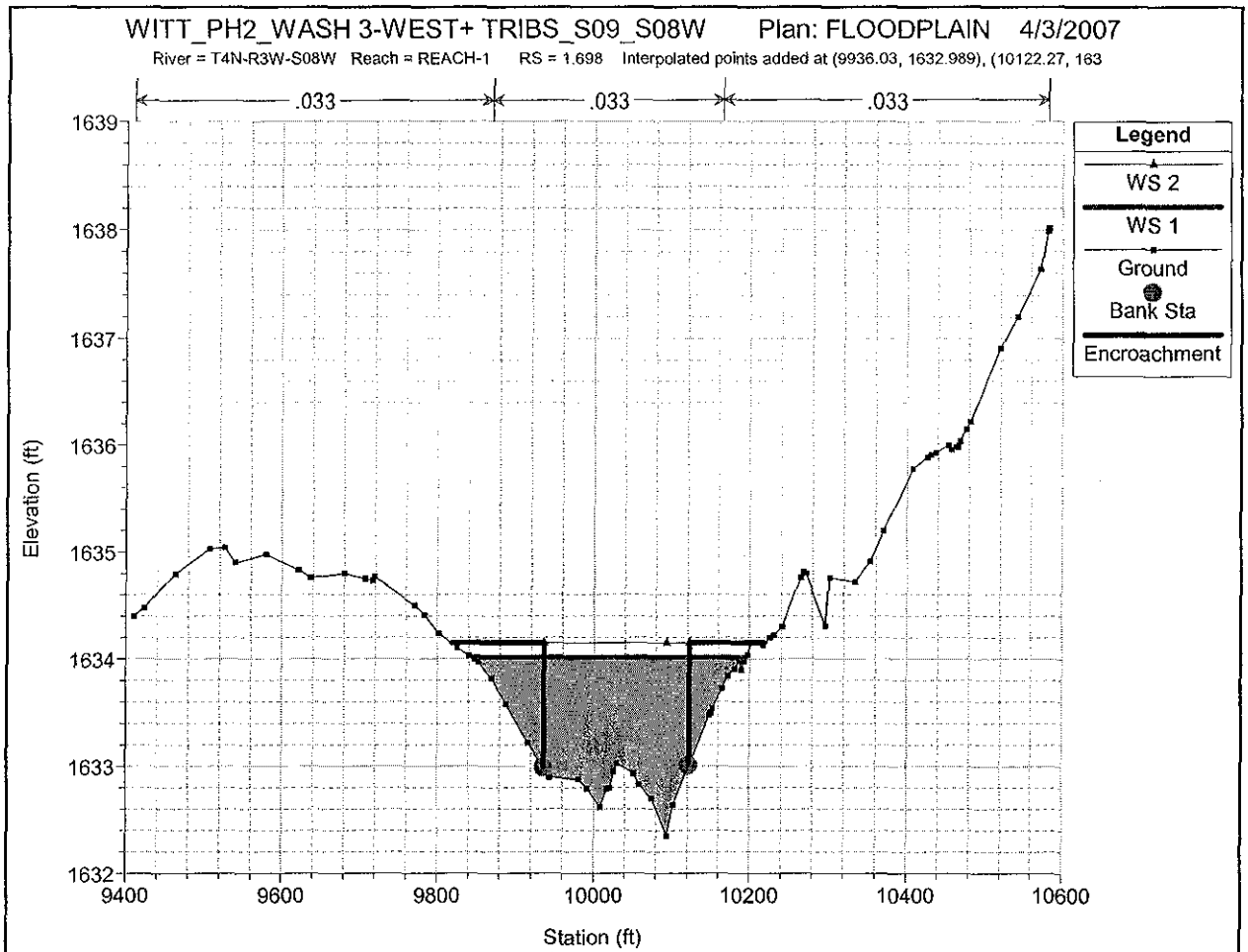


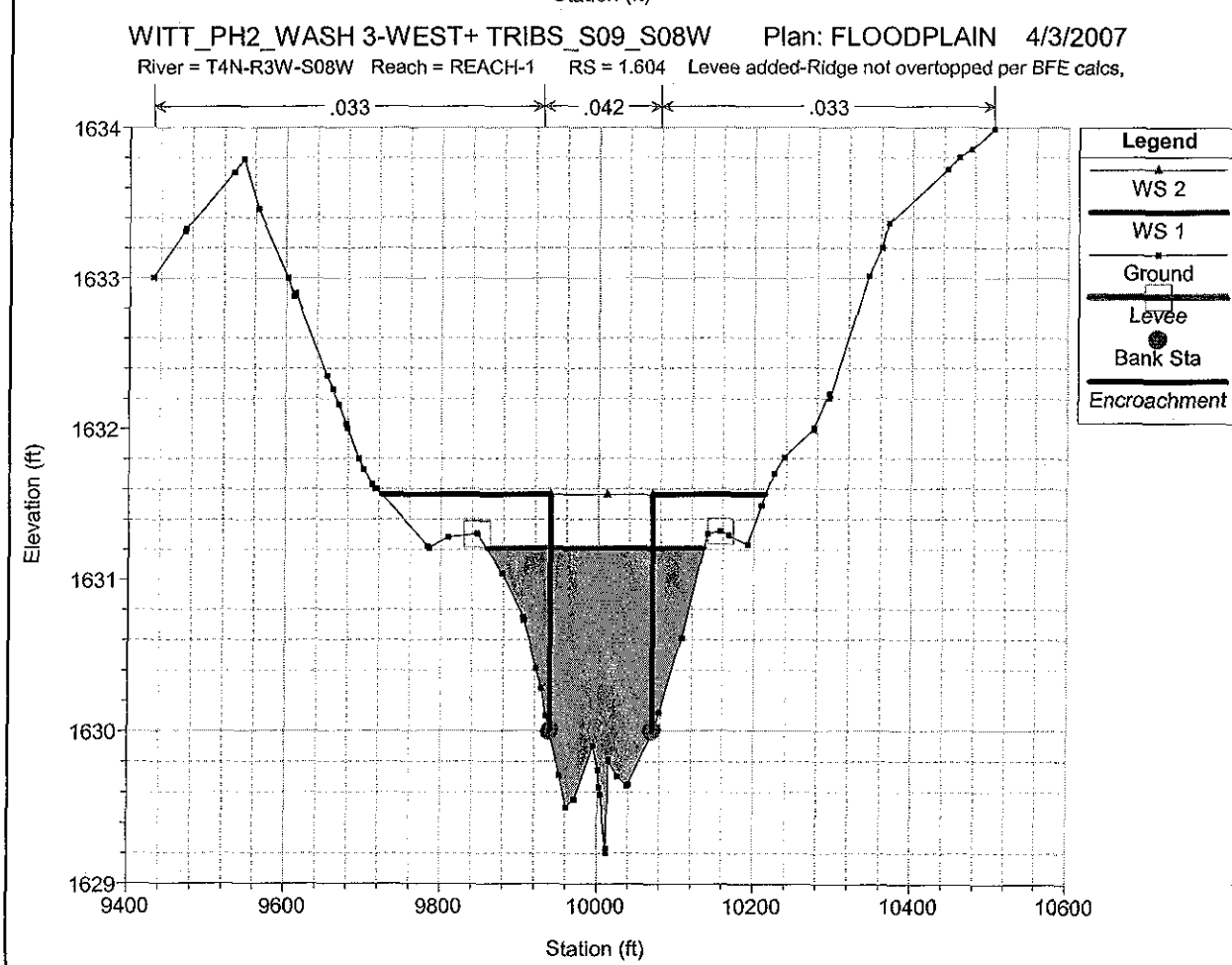

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 2.082 Blocked obstruction(s) added to represent residential home(s) as
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1658
1656
1654
1652
1650
1648
1646
1644
1642
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.987
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1645
1644
1643
1642
1641
1640
1639
1638
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.891
.033
.042
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1643
1642
1641
1640
1639
1638
1637
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

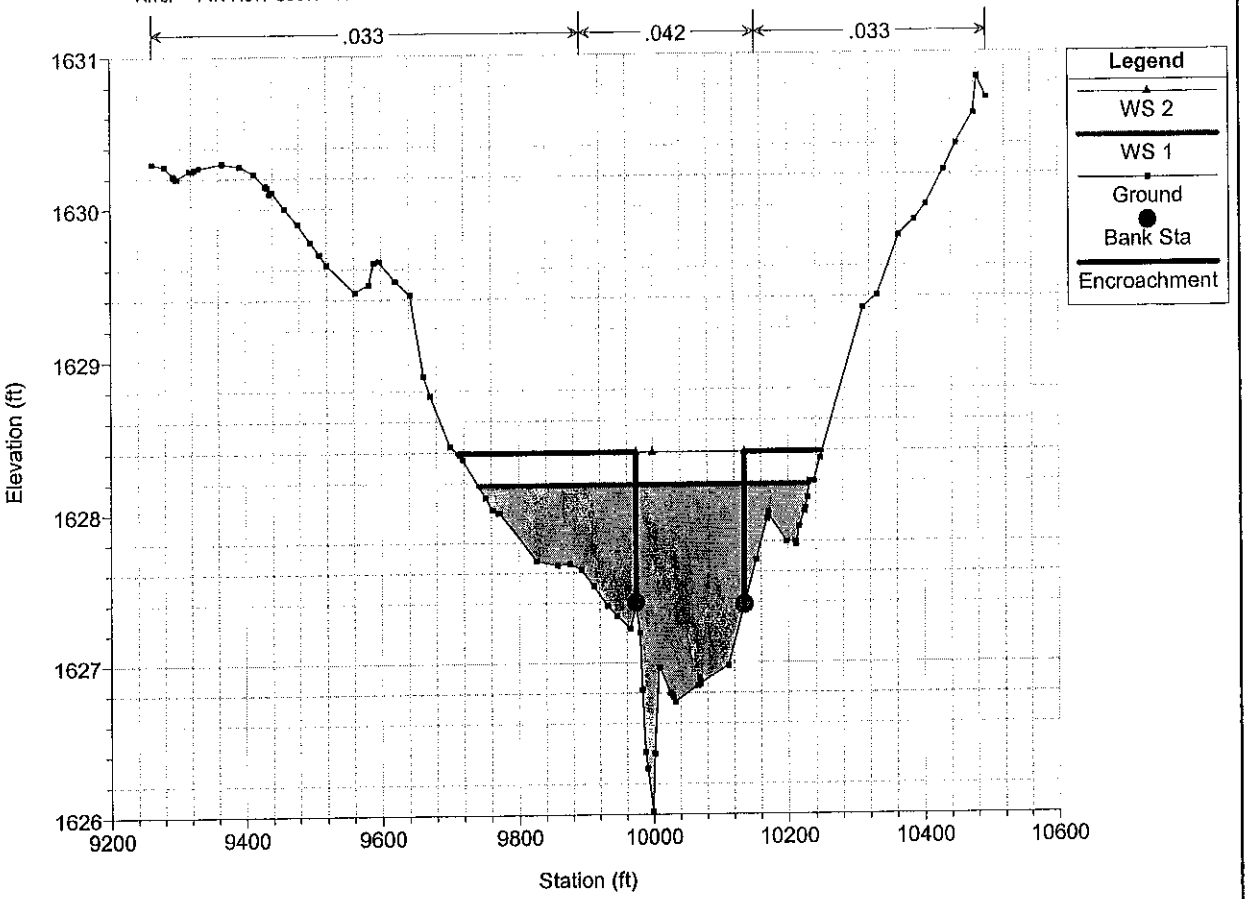

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.803 Flow rate starting at this cross-section and downstream is incre
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1639.0
1638.5
1638.0
1637.5
1637.0
1636.5
1636.0
1635.5
1635.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.698 Interpolated points added at (9936.03, 1632.989), (10122.27, 163
.033
.033
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1639
1638
1637
1636
1635
1634
1633
1632
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.604 Levee added-Ridge not overtopped per BFE calcs,
.033
.042
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1634
1633
1632
1631
1630
1629
9400
9600
9800
10000
10200
10400
10600
Station (ft)

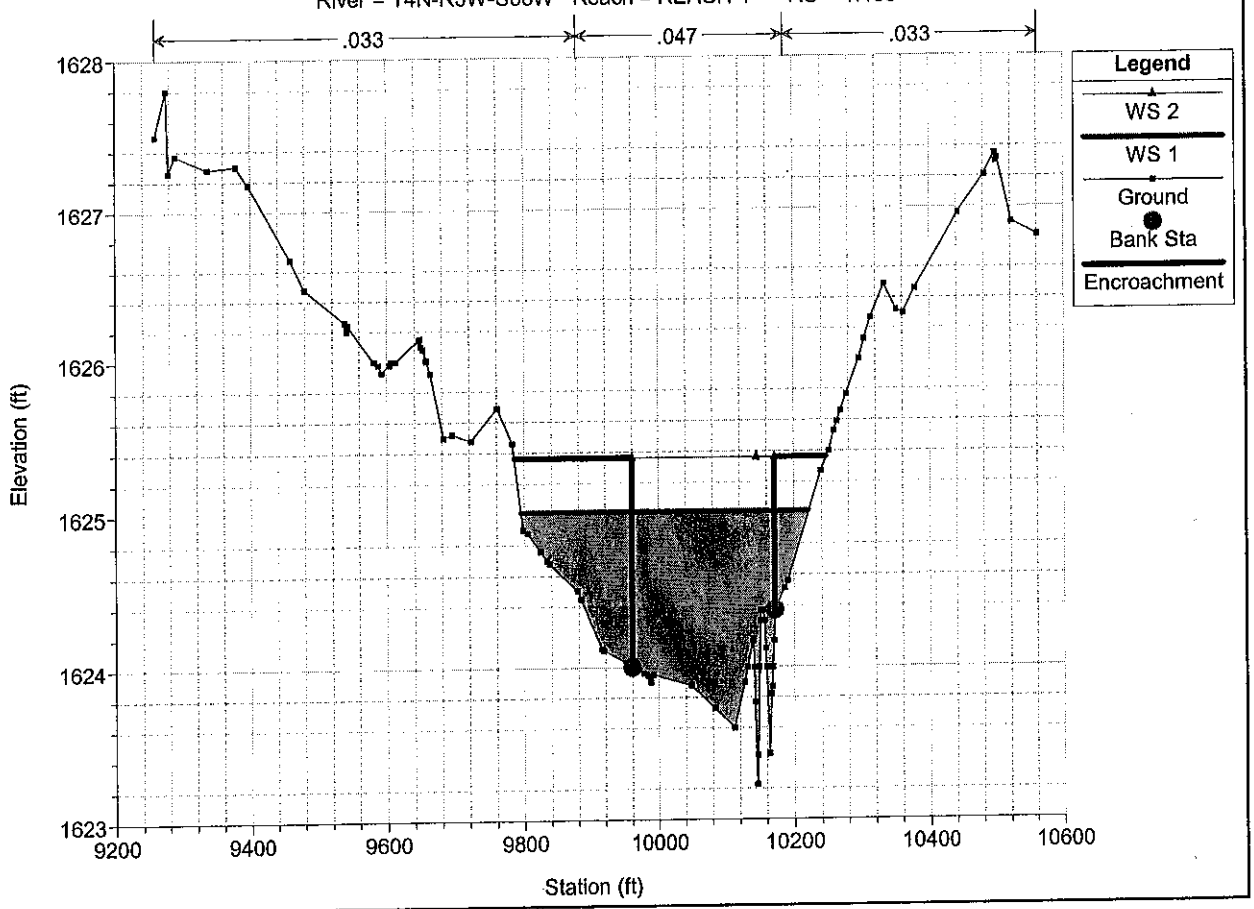
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

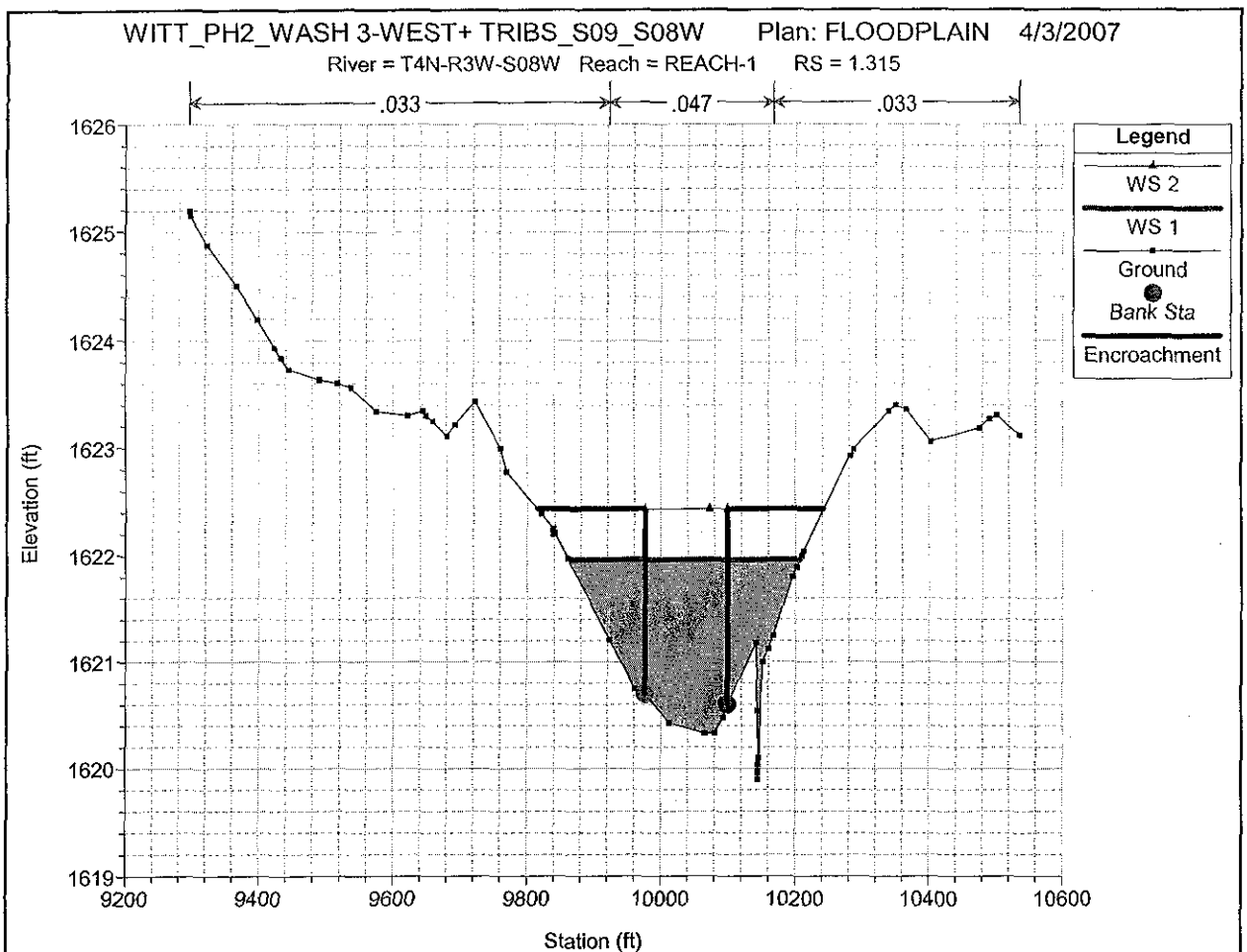
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.506 Interpolated point added at (10135.22, 1627.384) to set bank sta

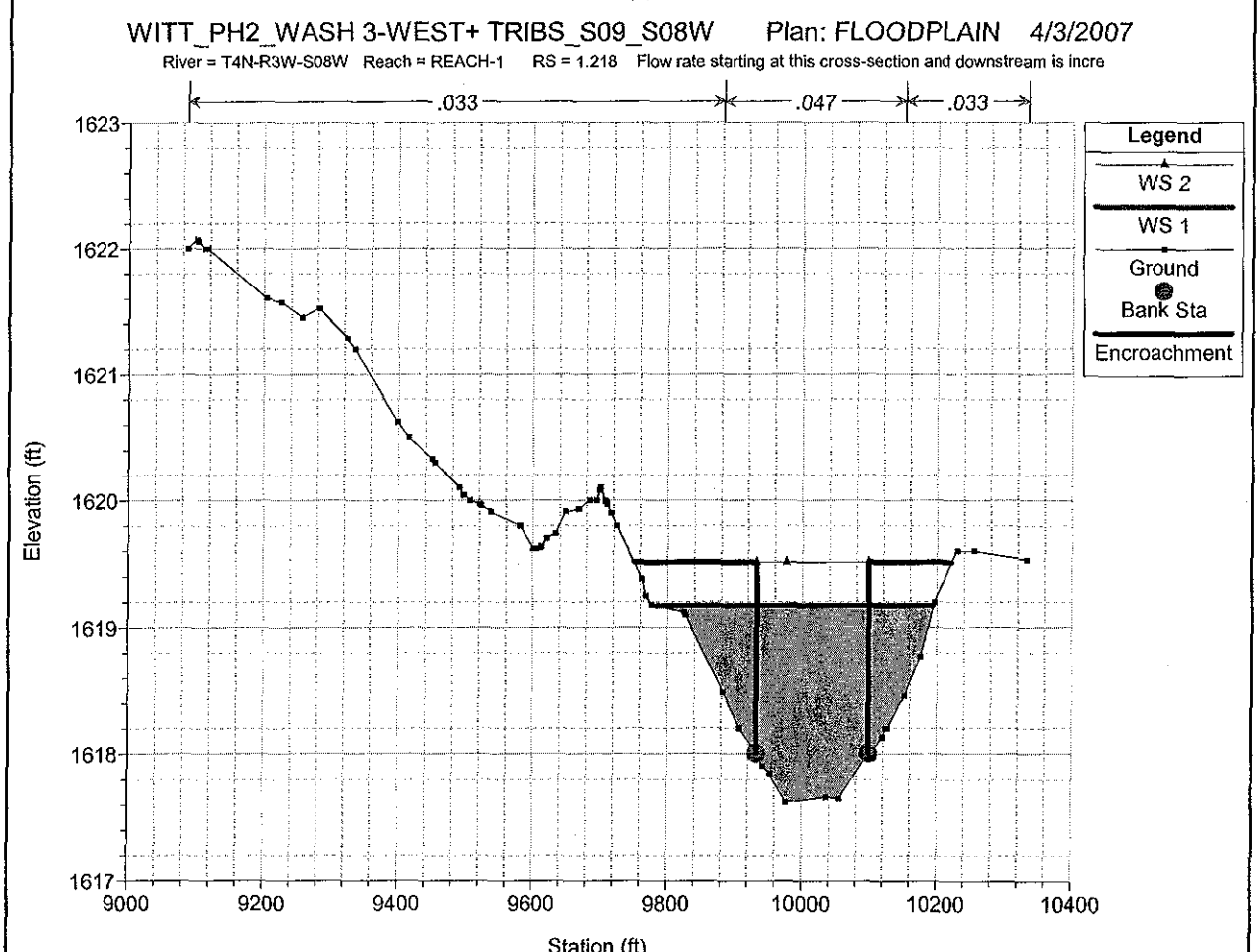


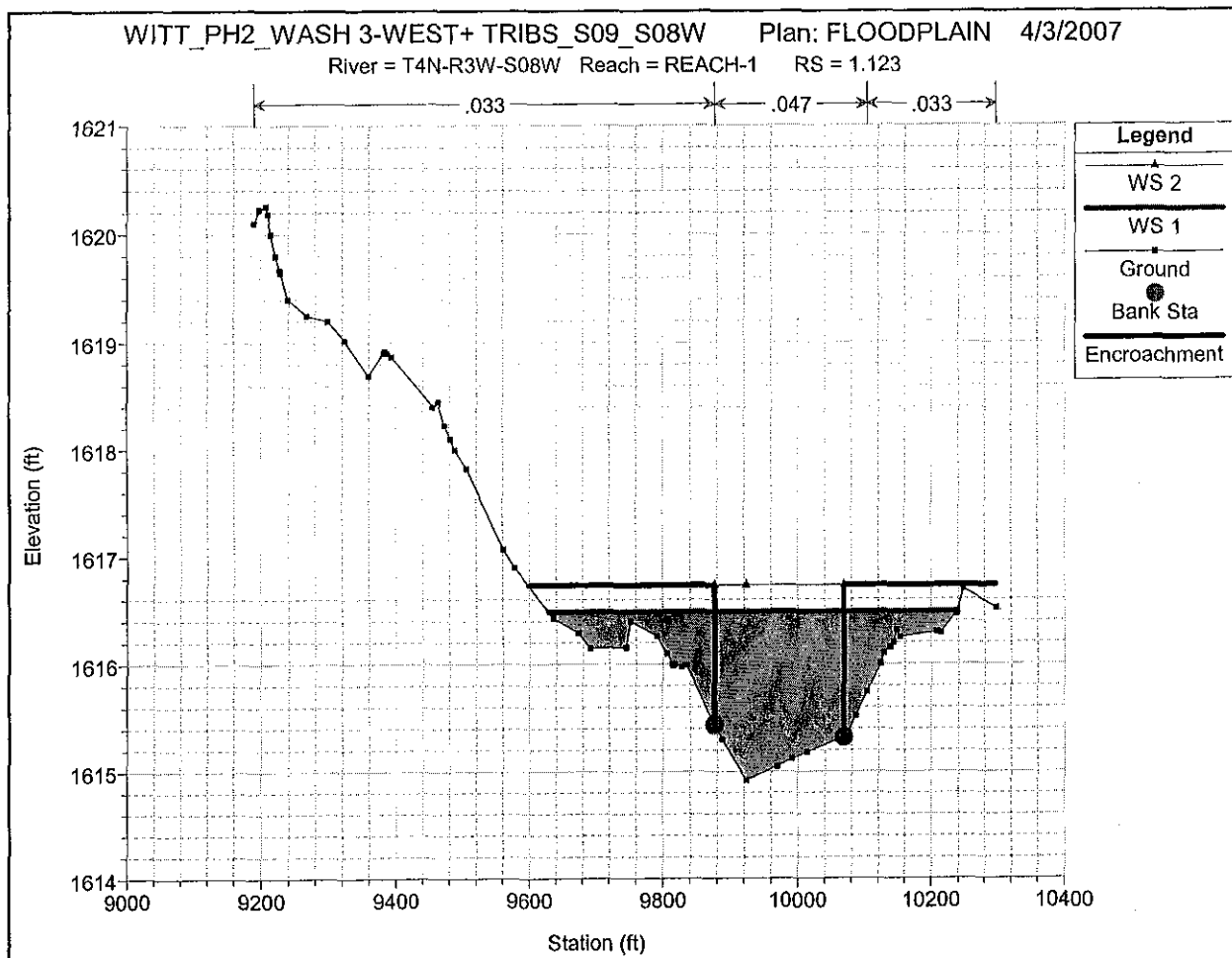
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

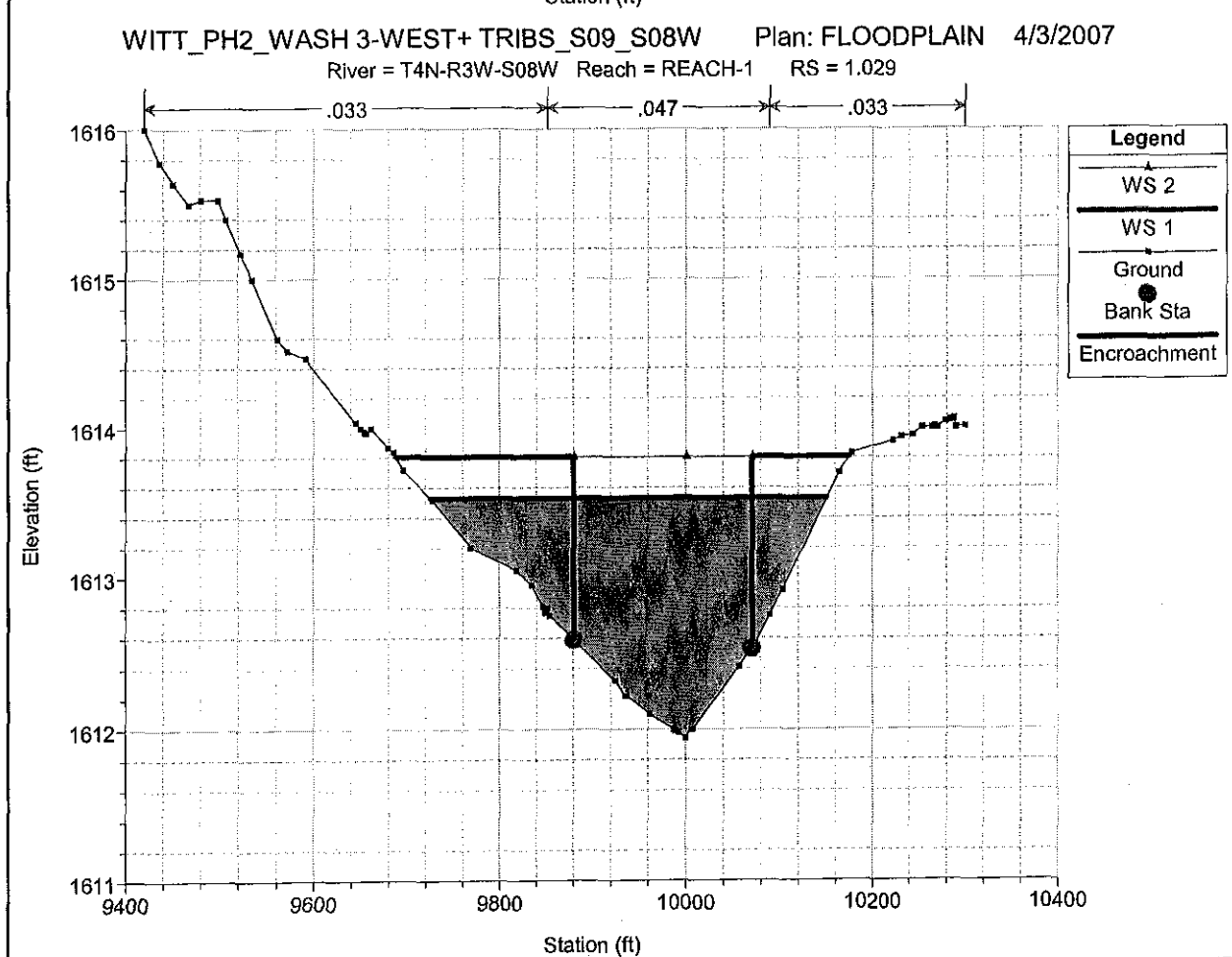
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.408

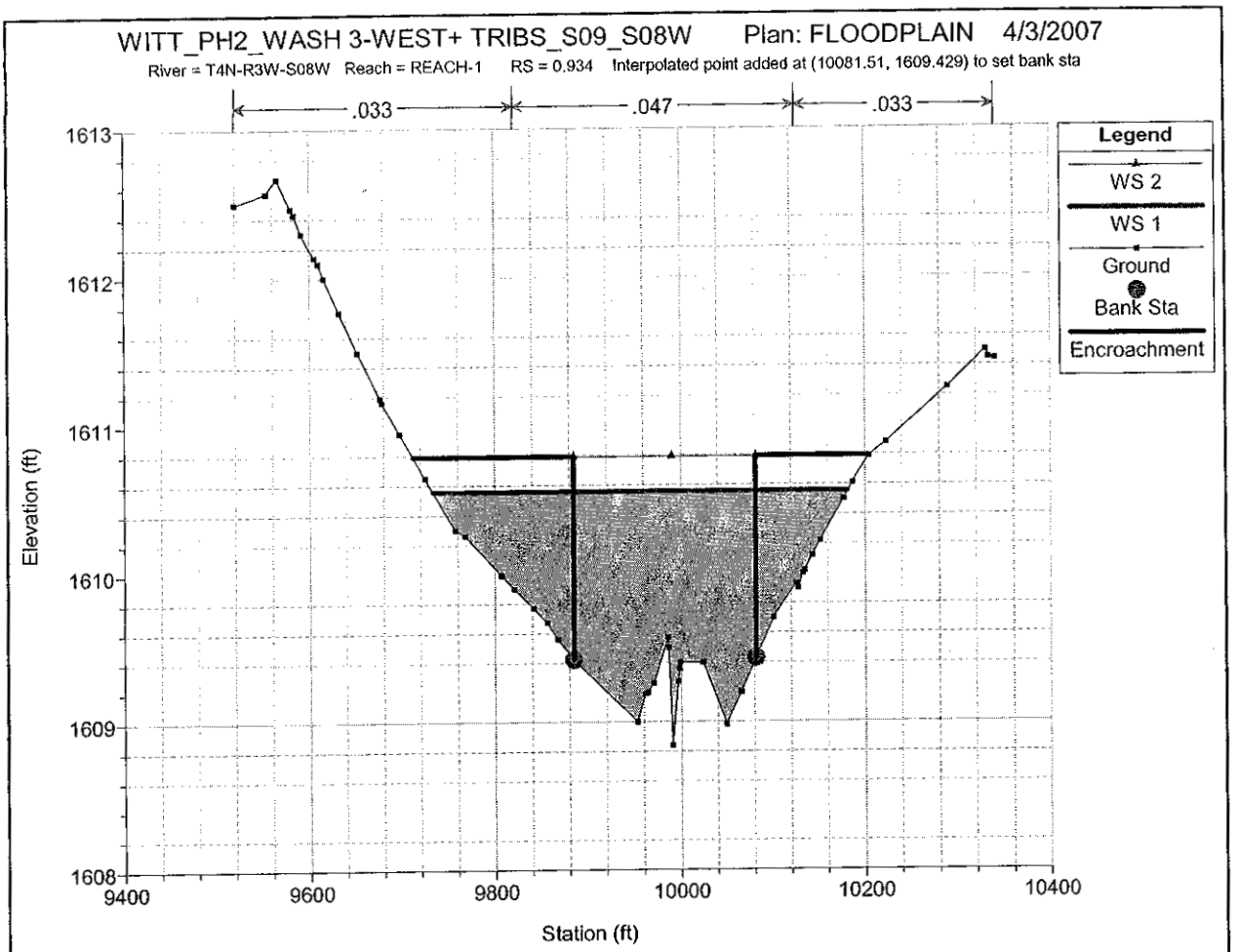


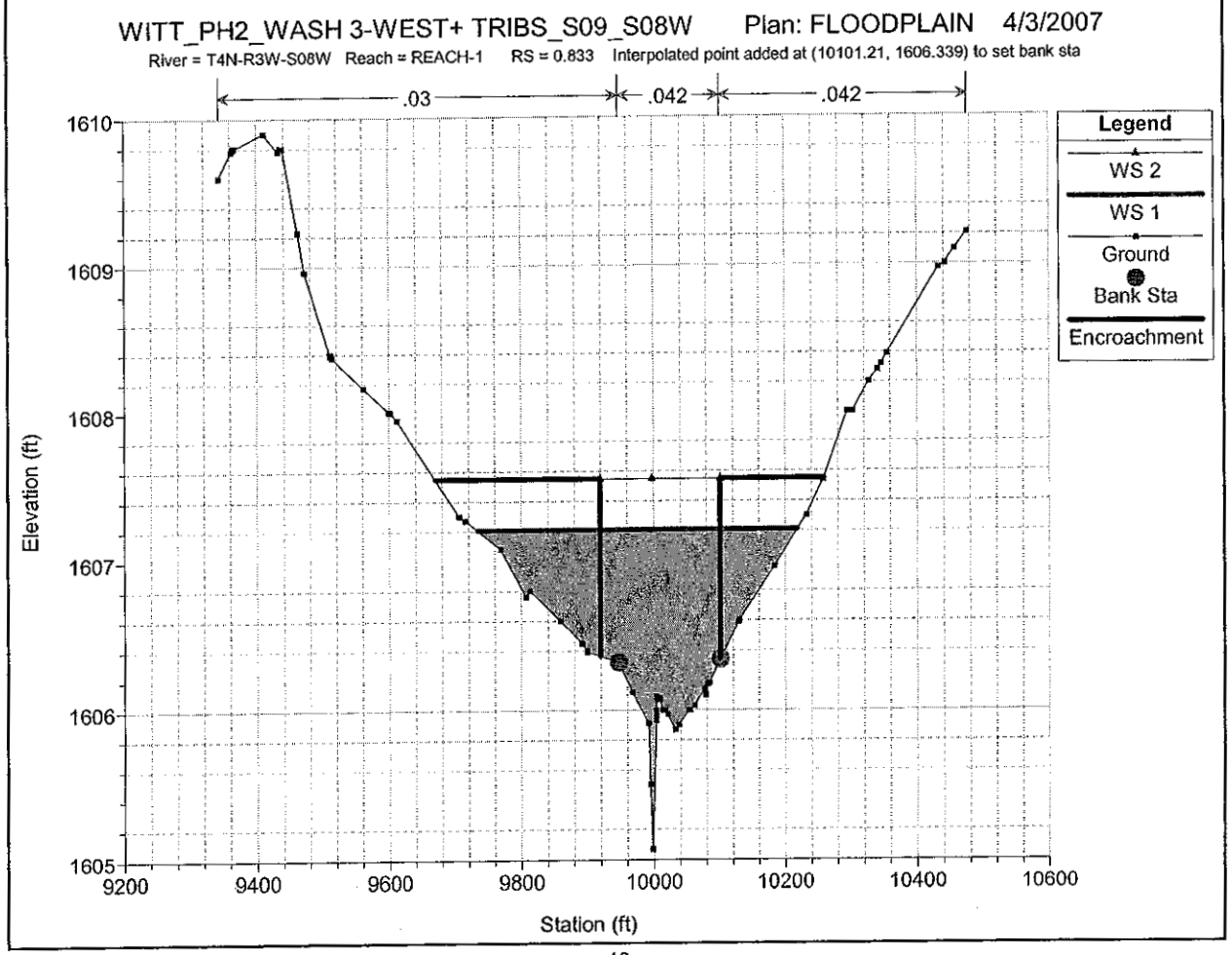

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.315
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1626
1625
1624
1623
1622
1621
1620
1619
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

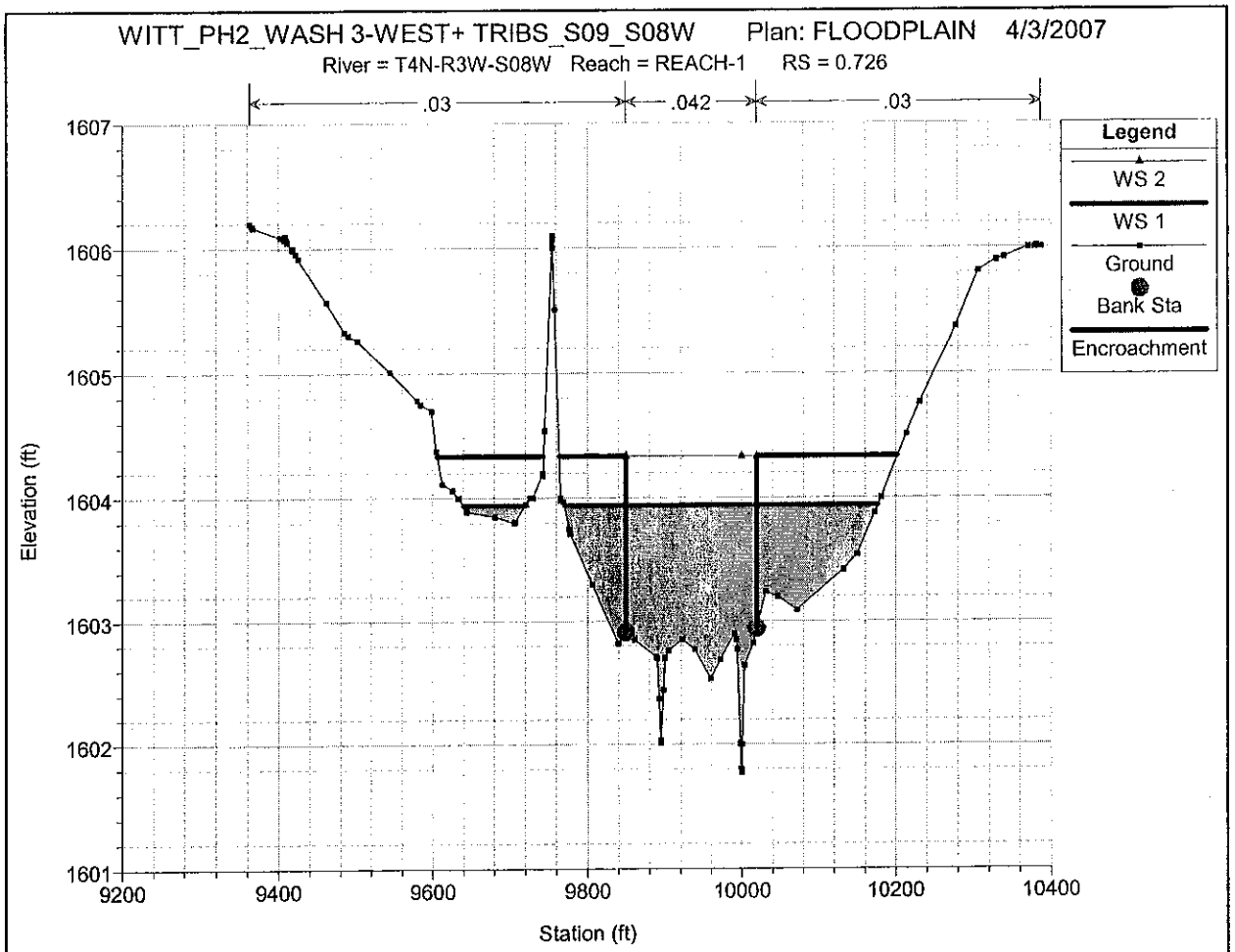

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.218 Flow rate starting at this cross-section and downstream is incre
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1623
1622
1621
1620
1619
1618
1617
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

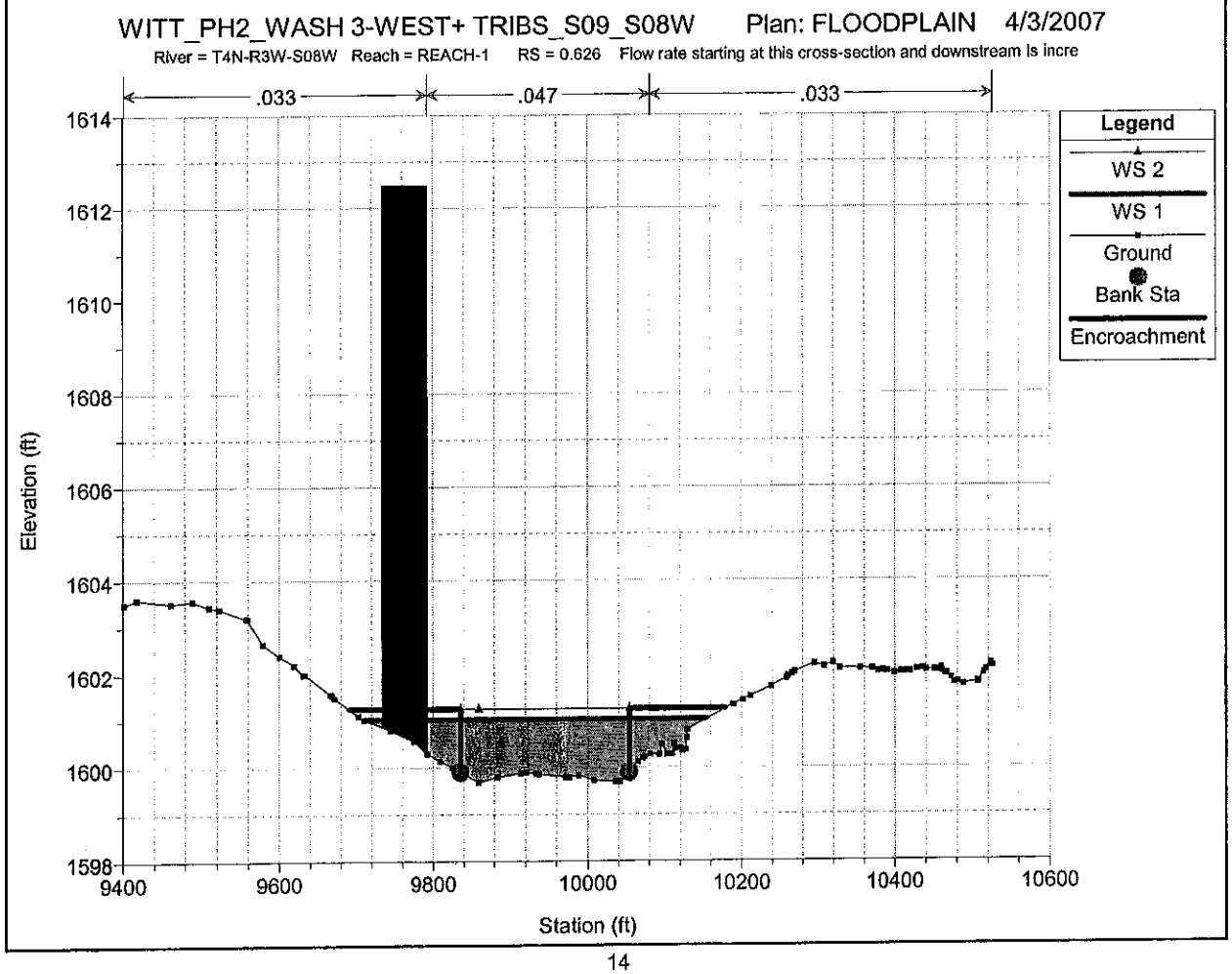

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.123
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1621
1620
1619
1618
1617
1616
1615
1614
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

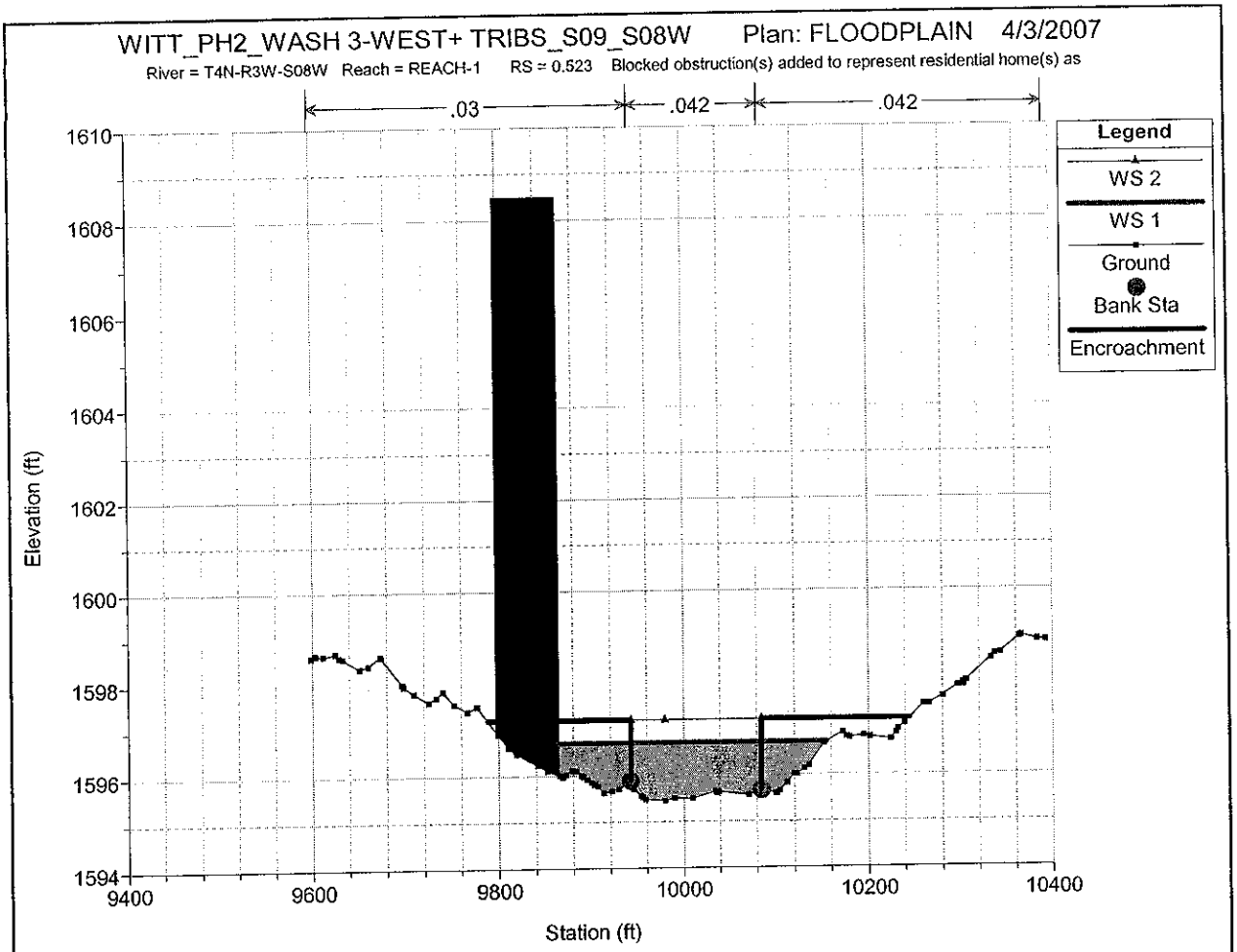

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 1.029
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1616
1615
1614
1613
1612
1611
9400
9600
9800
10000
10200
10400
Station (ft)

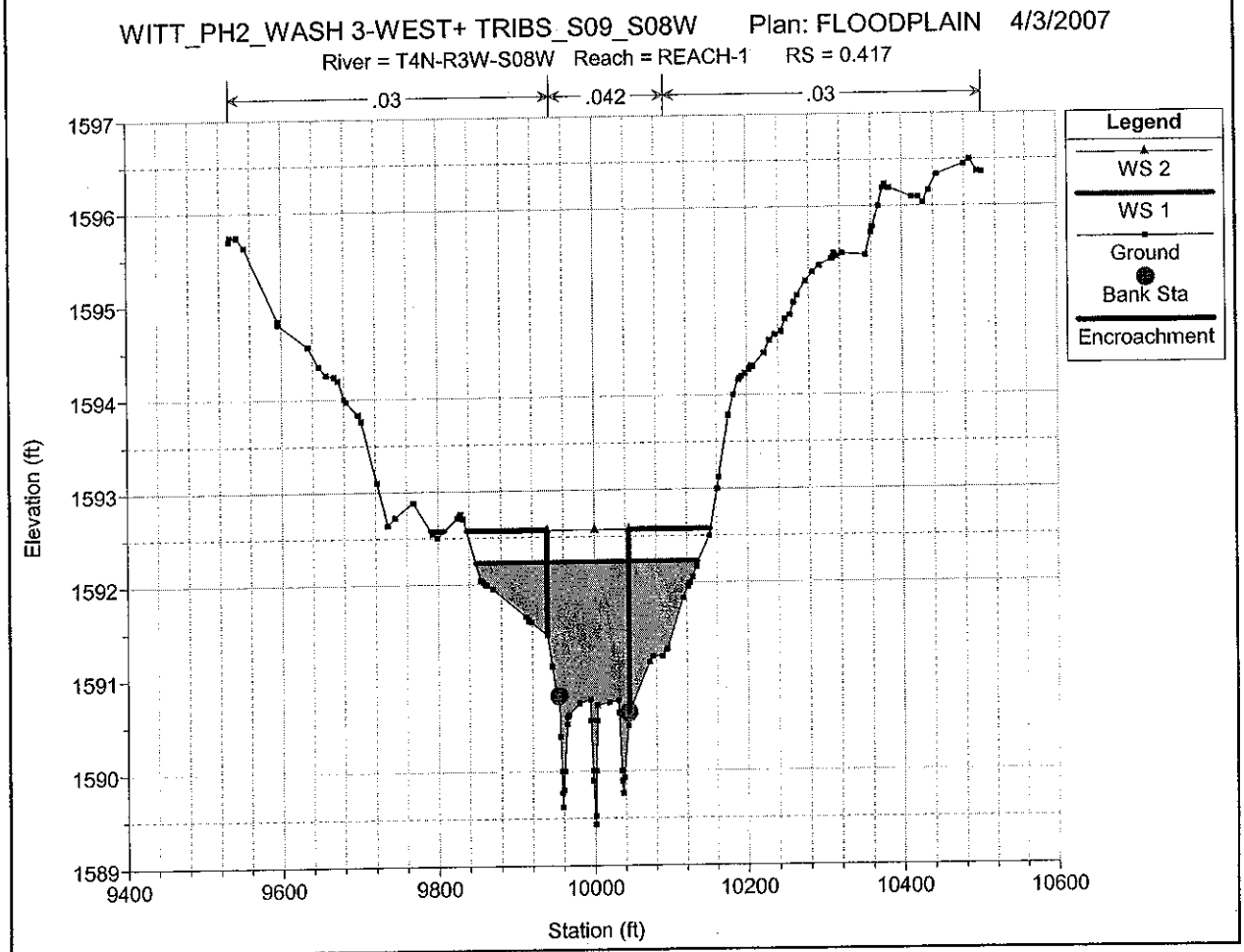

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.934 Interpolated point added at (10081.51, 1609.429) to set bank sta
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1613
1612
1611
1610
1609
1608
9400
9600
9800
10000
10200
10400
Station (ft)

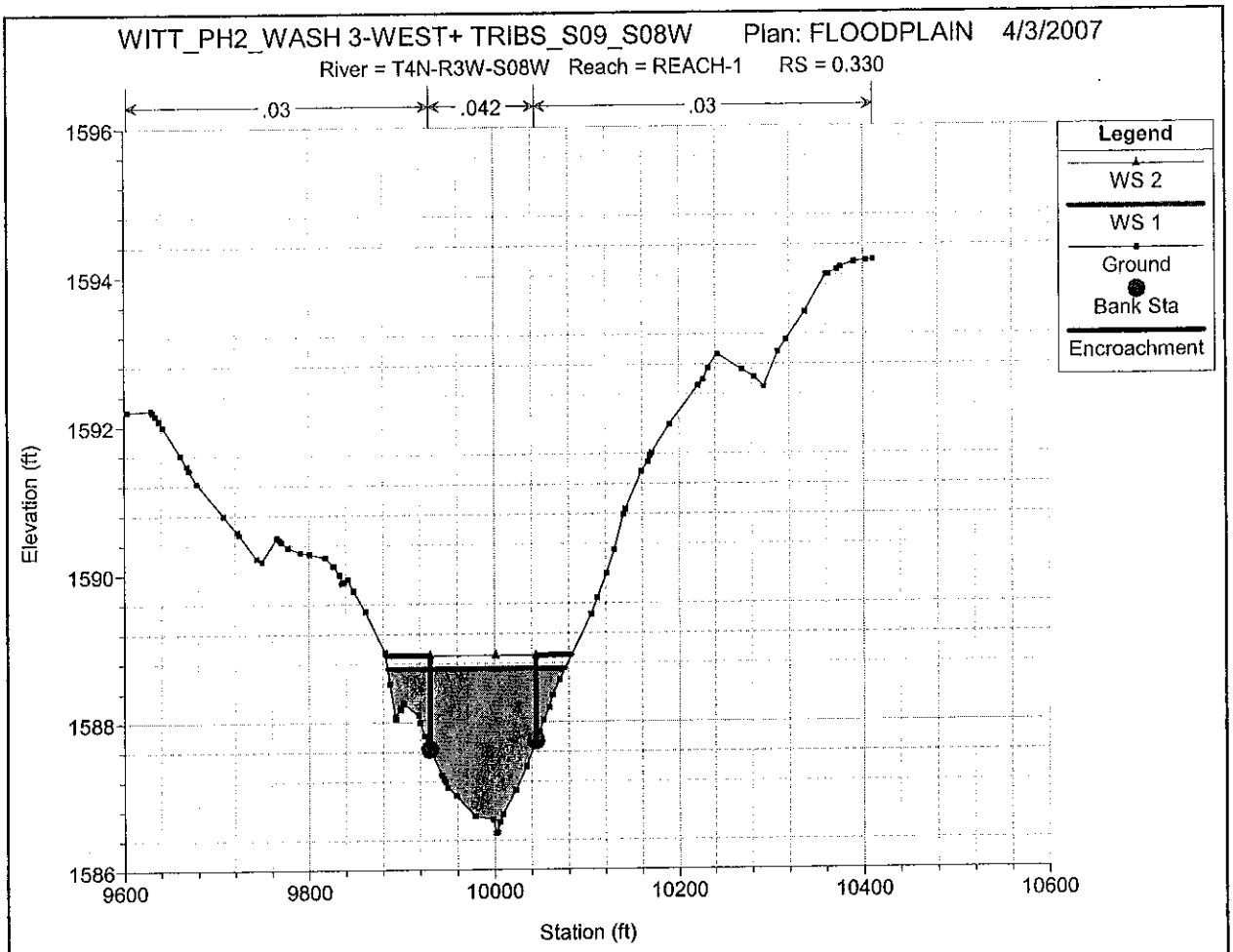

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.833 Interpolated point added at (10101.21, 1606.339) to set bank sta
.03
.042
.042
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1610
1609
1608
1607
1606
1605
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

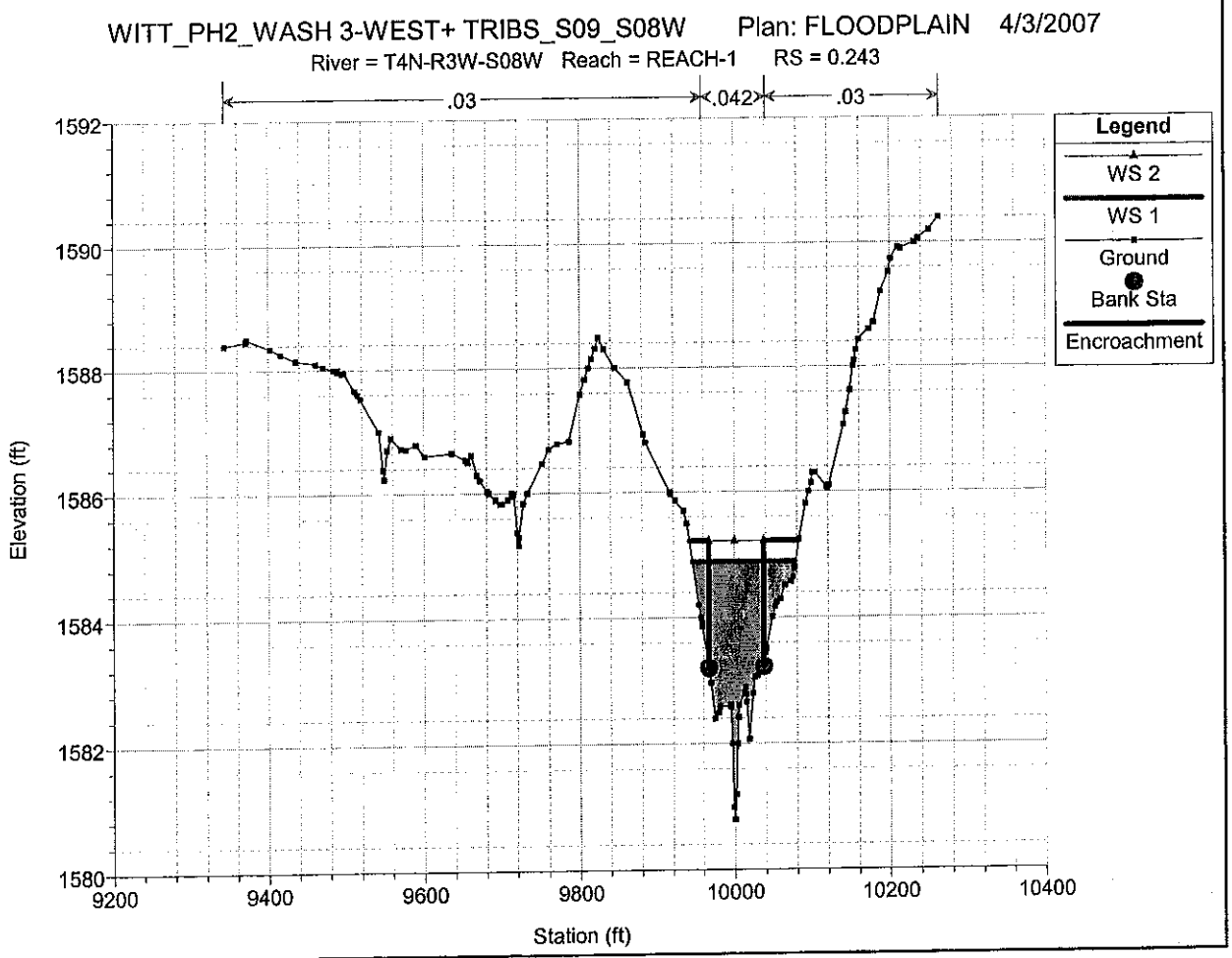

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.726
.03
.042
.03
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1607
1606
1605
1604
1603
1602
1601
9200
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.626 Flow rate starting at this cross-section and downstream is incre
.033
.047
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1614
1612
1610
1608
1606
1604
1602
1600
1598
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.523 Blocked obstruction(s) added to represent residential home(s) as
.03
.042
.042
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1610
1608
1606
1604
1602
1600
1598
1596
1594
9400
9600
9800
10000
10200
10400
Station (ft)

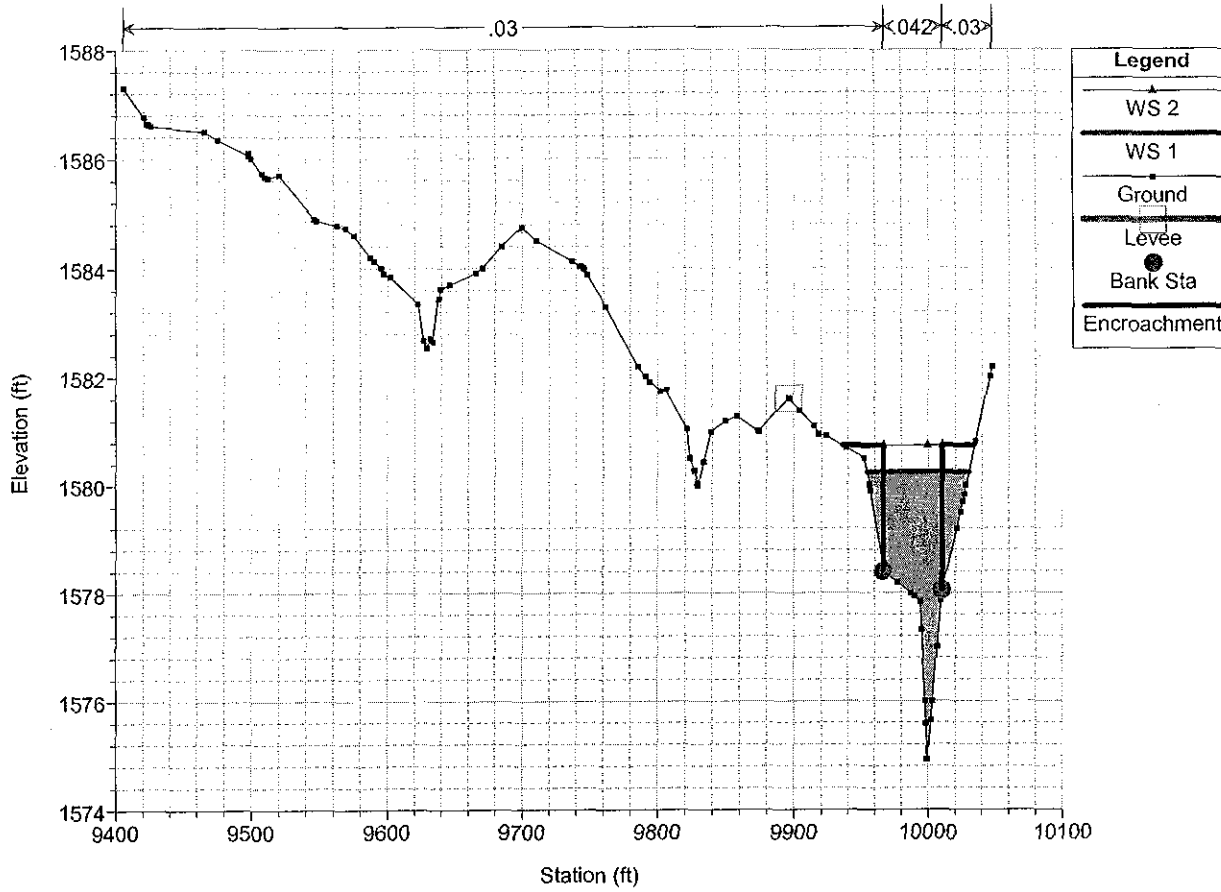

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.417
.03
.042
.03
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1597
1596
1595
1594
1593
1592
1591
1590
1589
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.330
.03
.042
.03
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1596
1594
1592
1590
1588
1586
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S08W Reach = REACH-1 RS = 0.243
.03
.042
.03
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1592
1590
1588
1586
1584
1582
1580
9200
9400
9600
9800
10000
10200
10400
Station (ft)

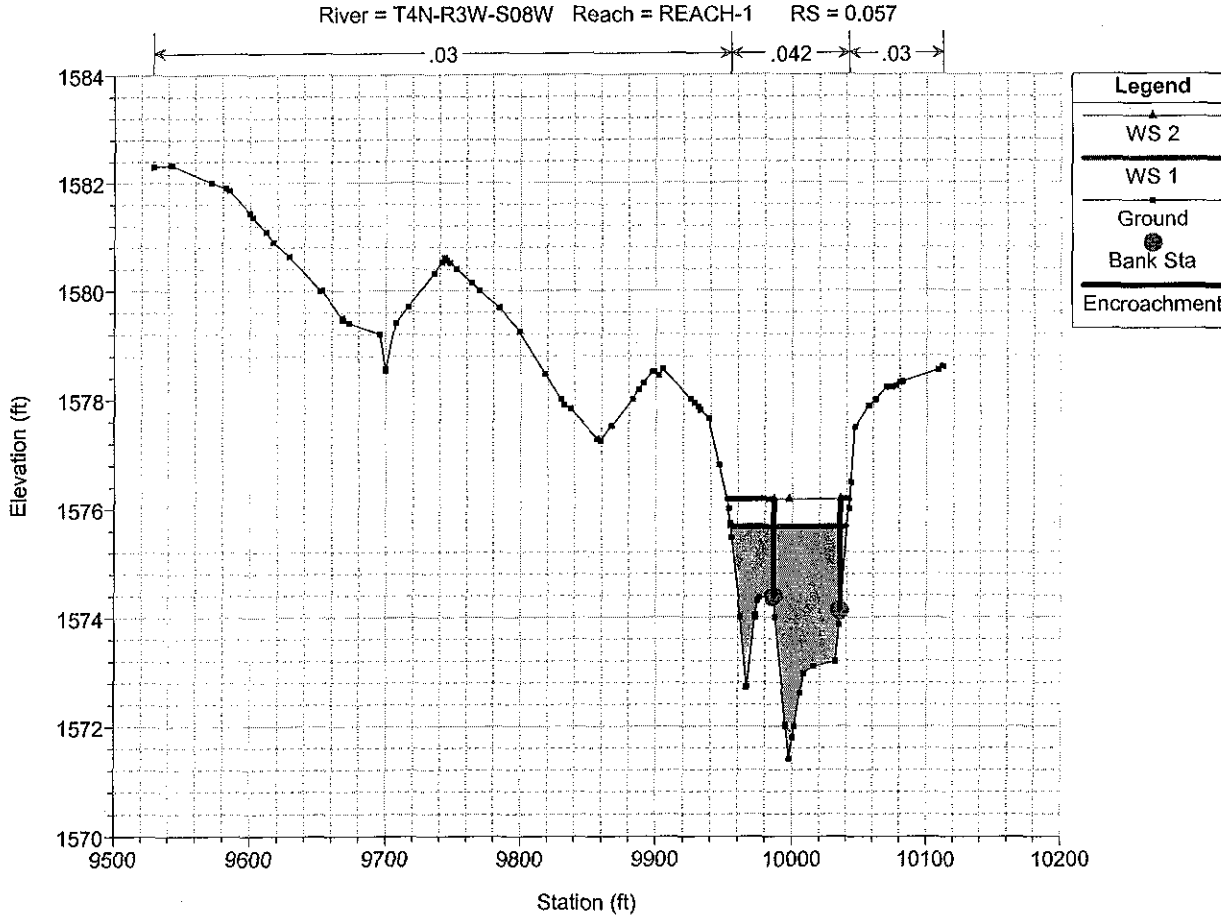
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S08W Reach = REACH-1 RS = 0.156 Levee added-Ridge not overtopped per BFE calcs, low ground left



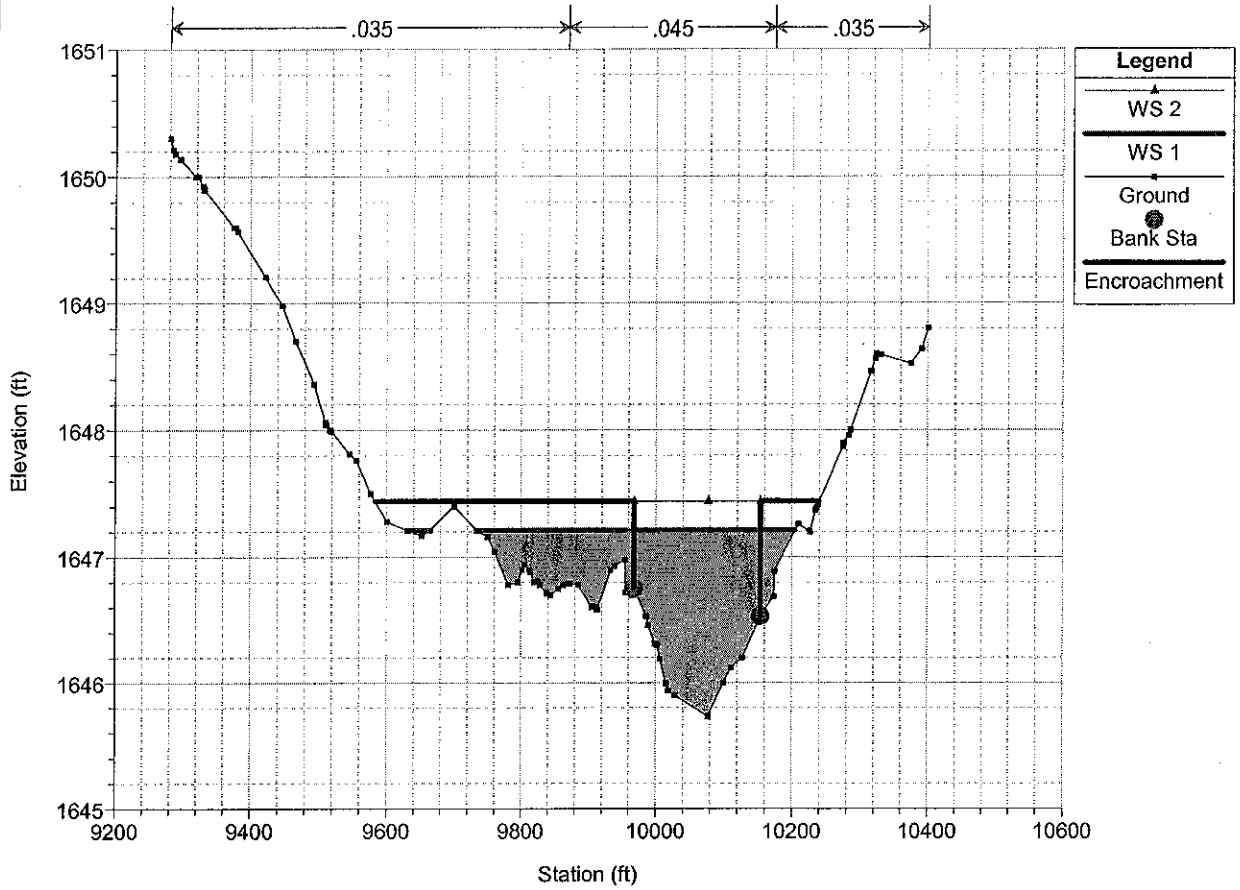
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S08W Reach = REACH-1 RS = 0.057



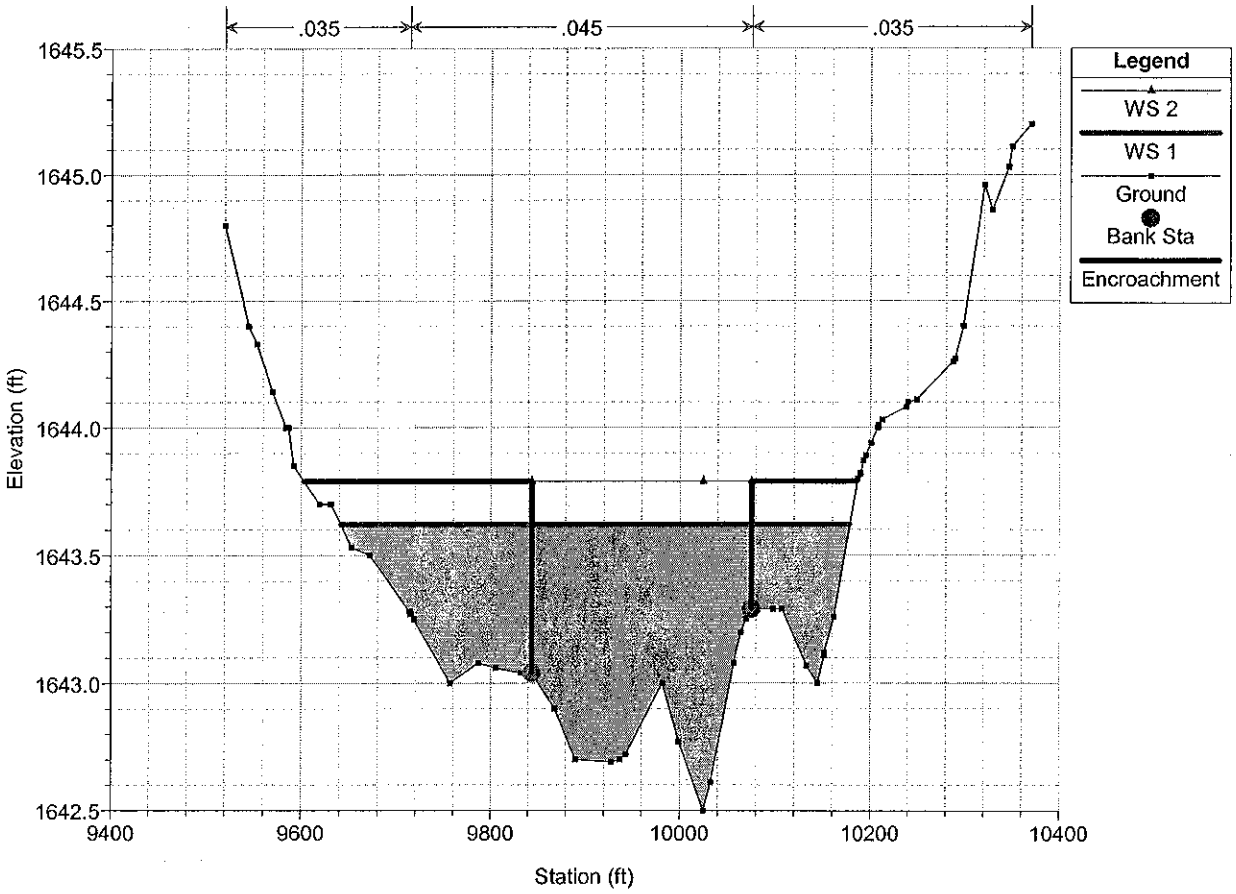
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 2.651 Flow rate starting at this cross-section and downstream is 710cf



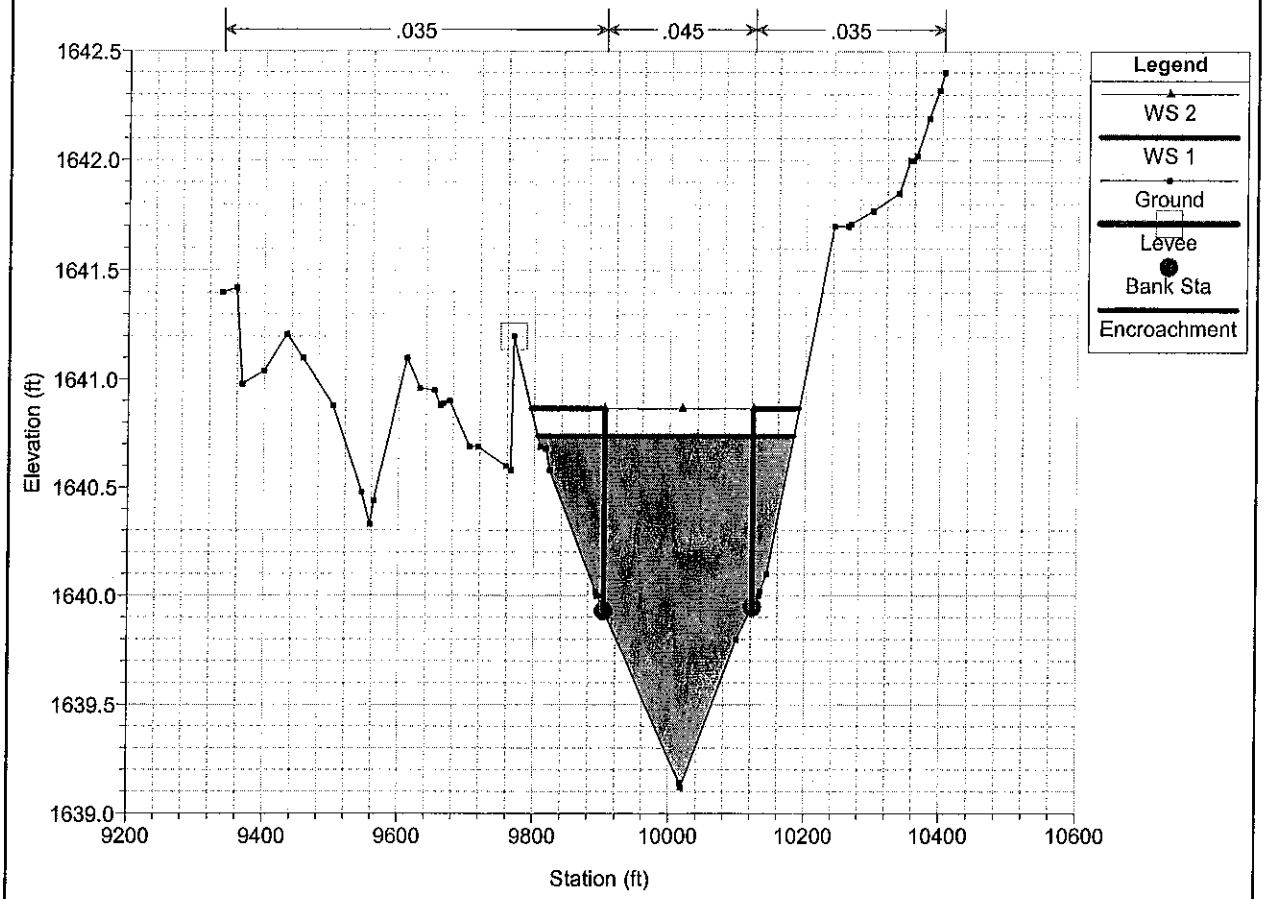
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 2.552



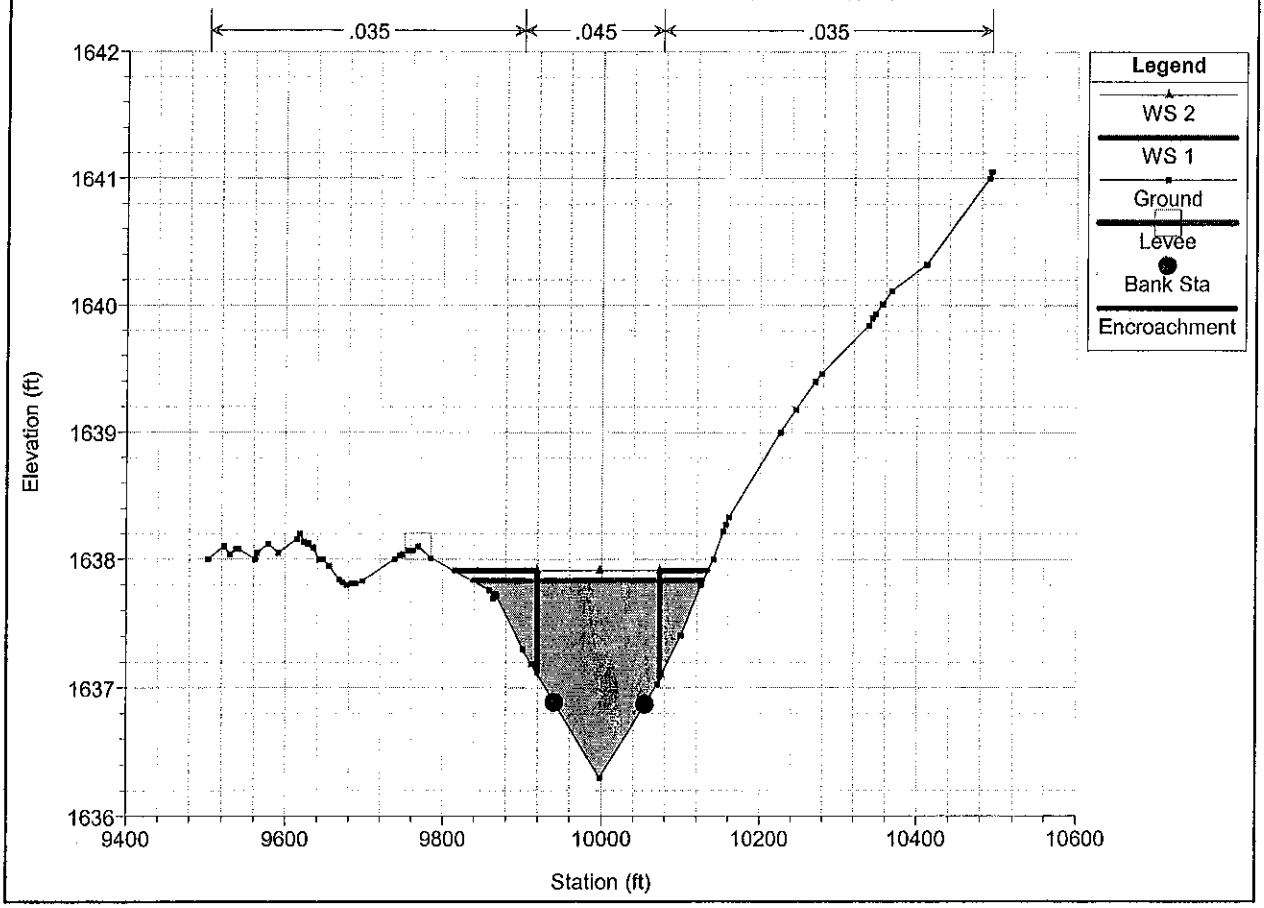
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

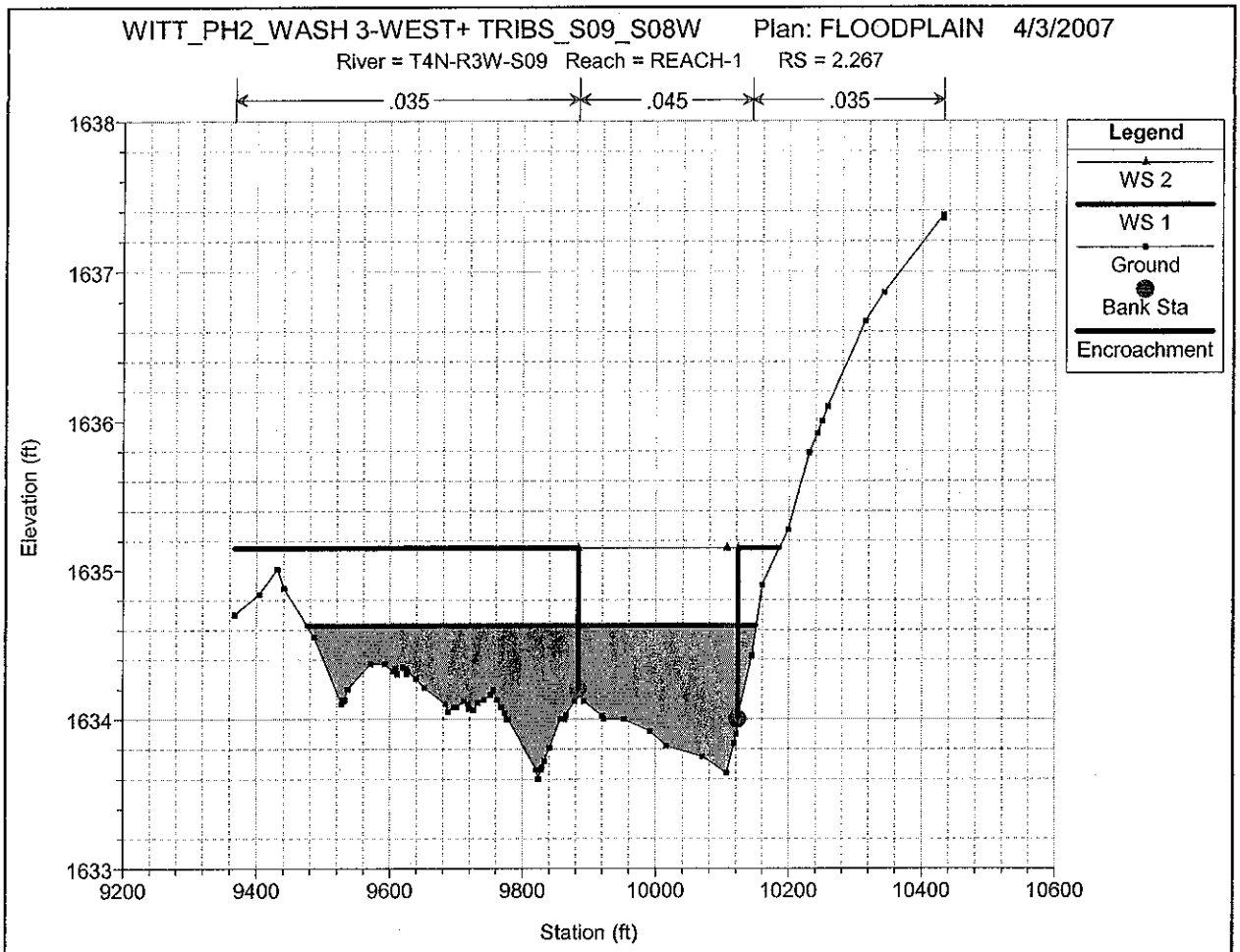
River = T4N-R3W-S09 Reach = REACH-1 RS = 2.454 Levee added-Ridge not overtopped per BFE calcs, low ground left

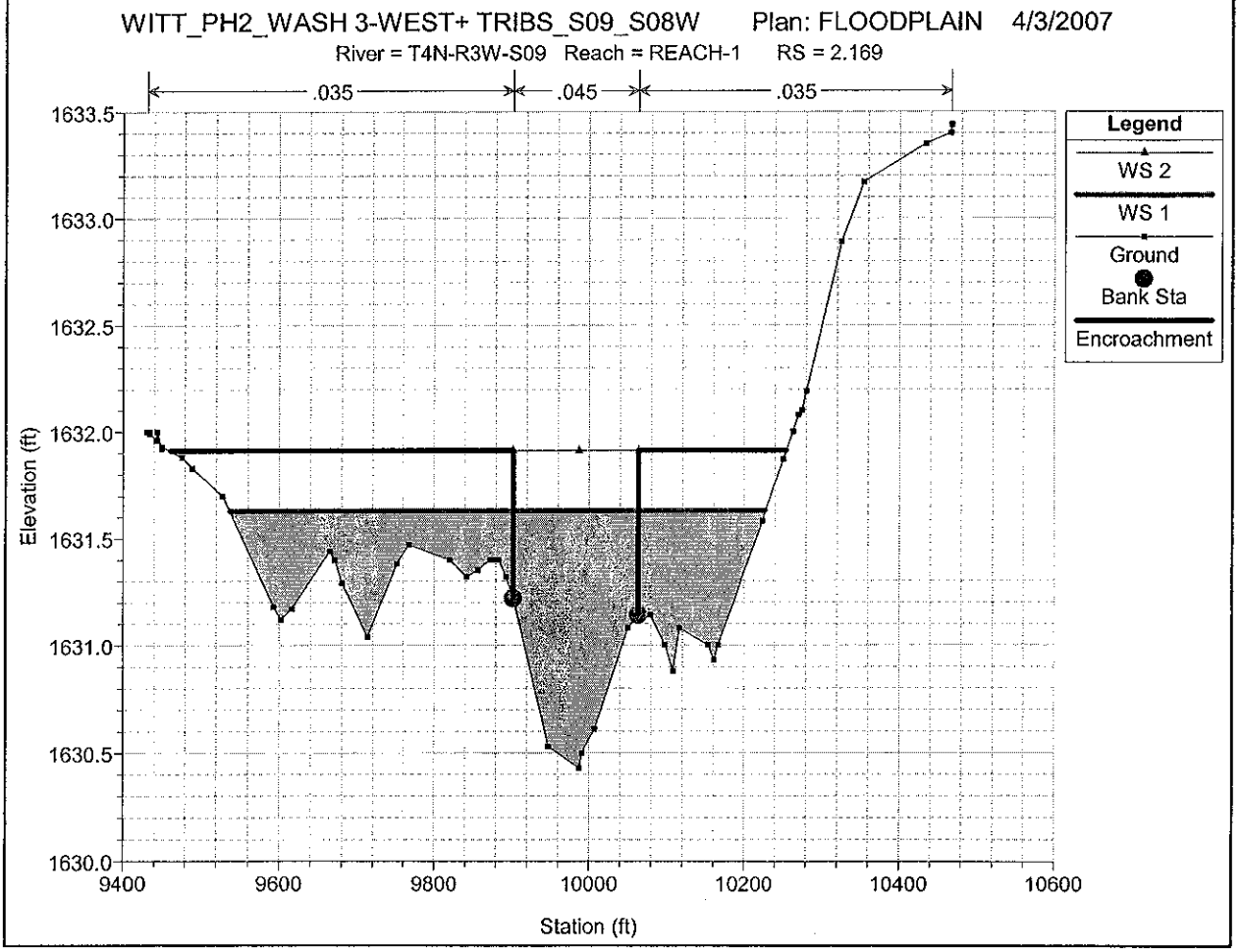


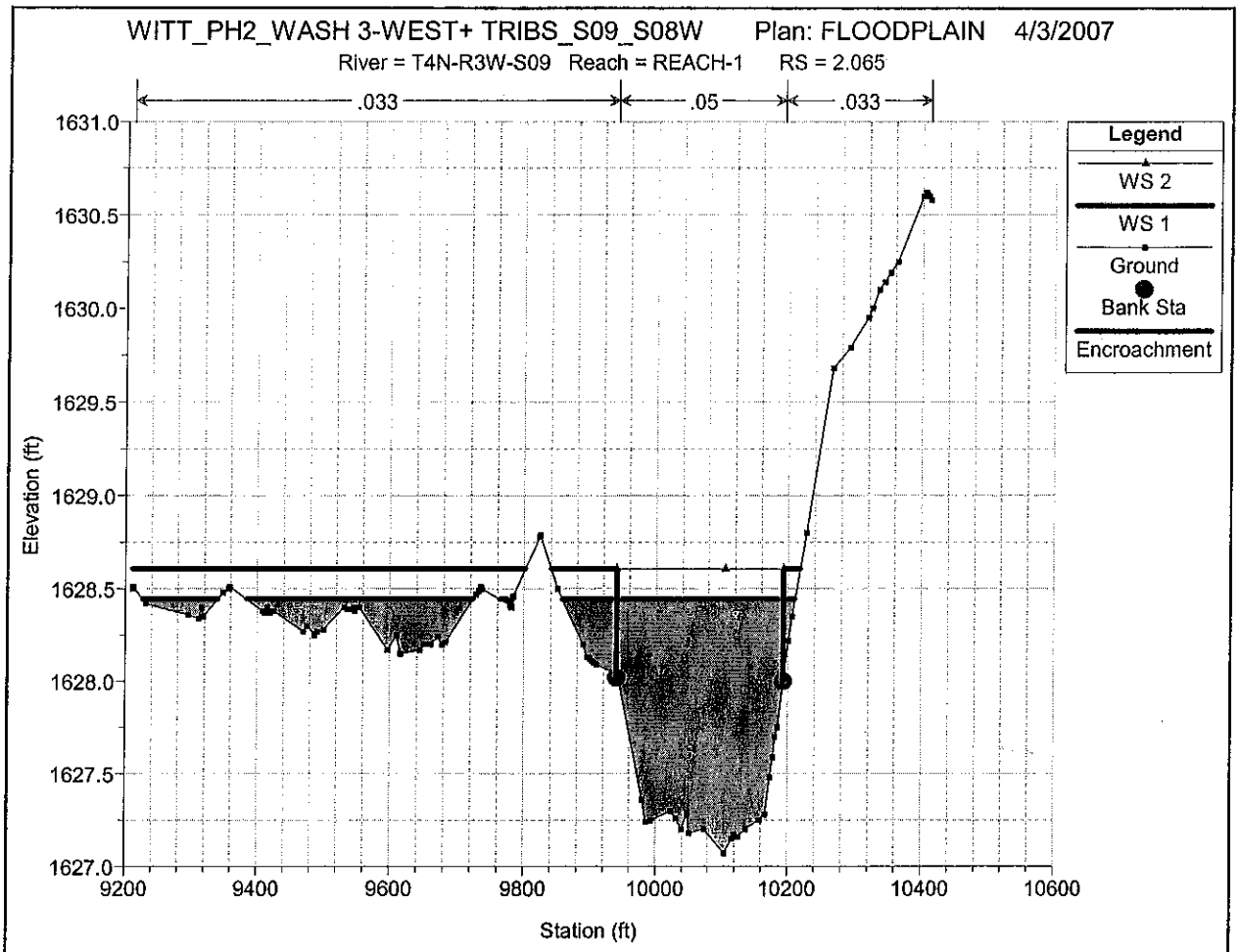
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

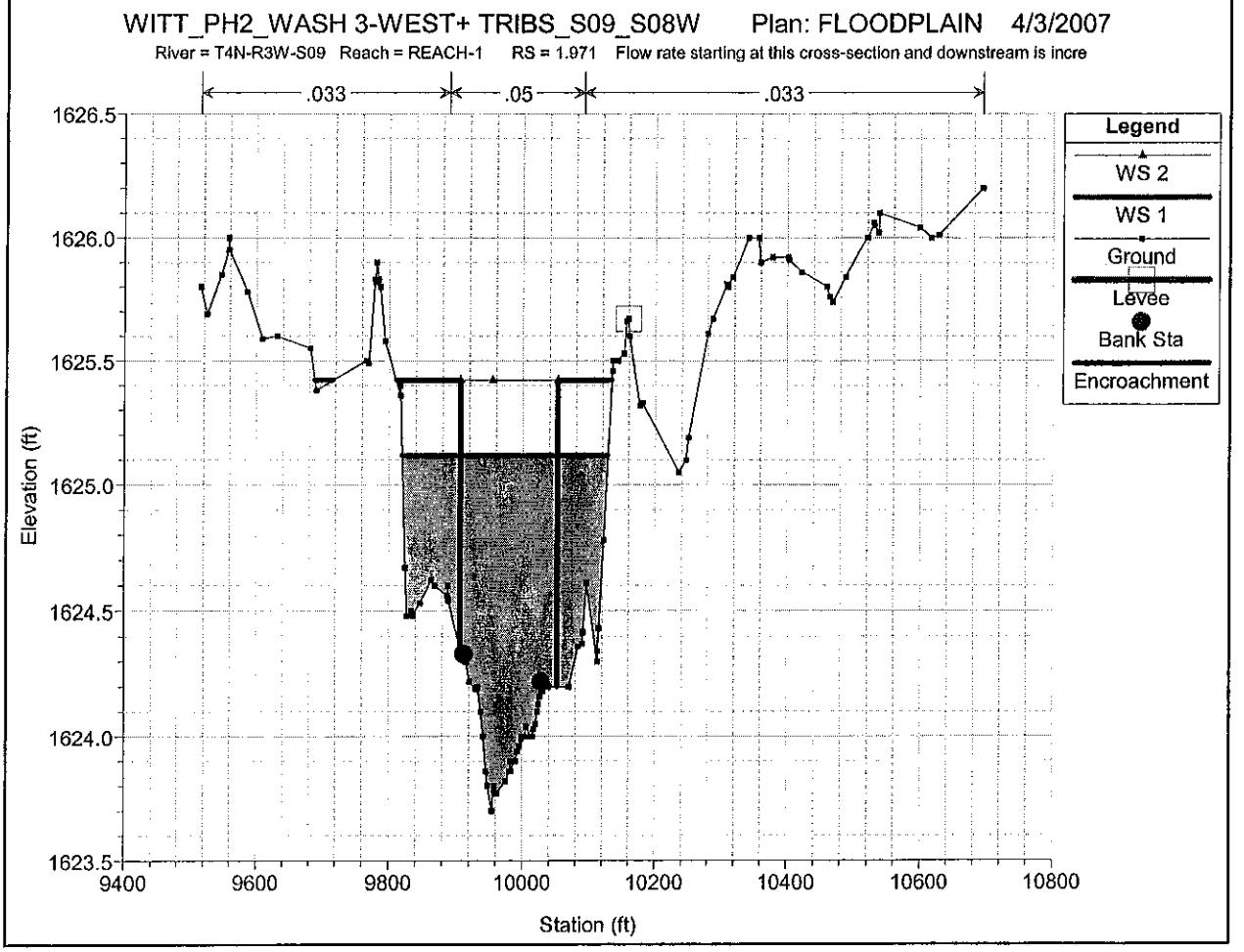
River = T4N-R3W-S09 Reach = REACH-1 RS = 2.362 Levee added-Ridge not overtopped per BFE calcs, low ground left

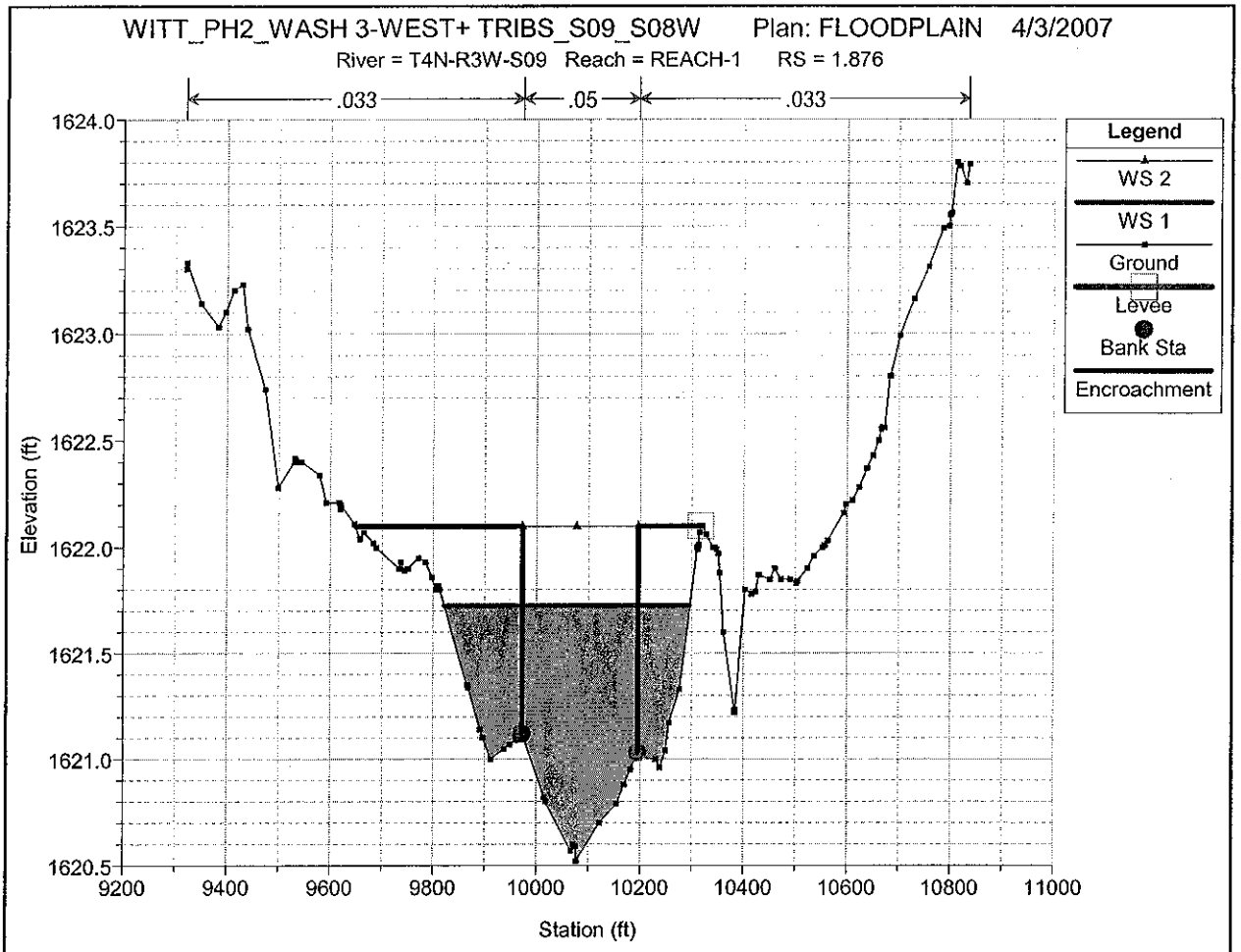


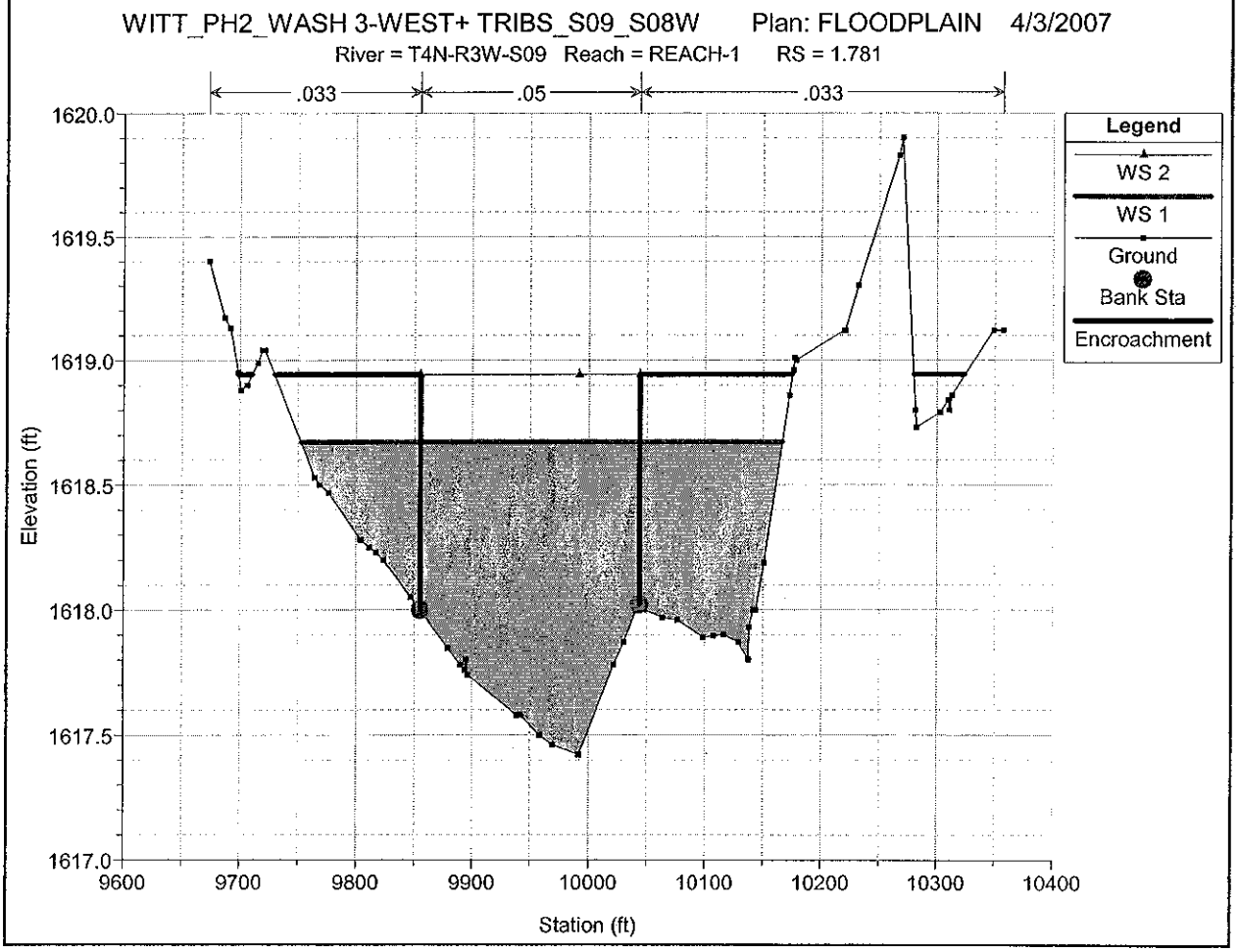

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 2.267
.035
.045
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1638
1637
1636
1635
1634
1633
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

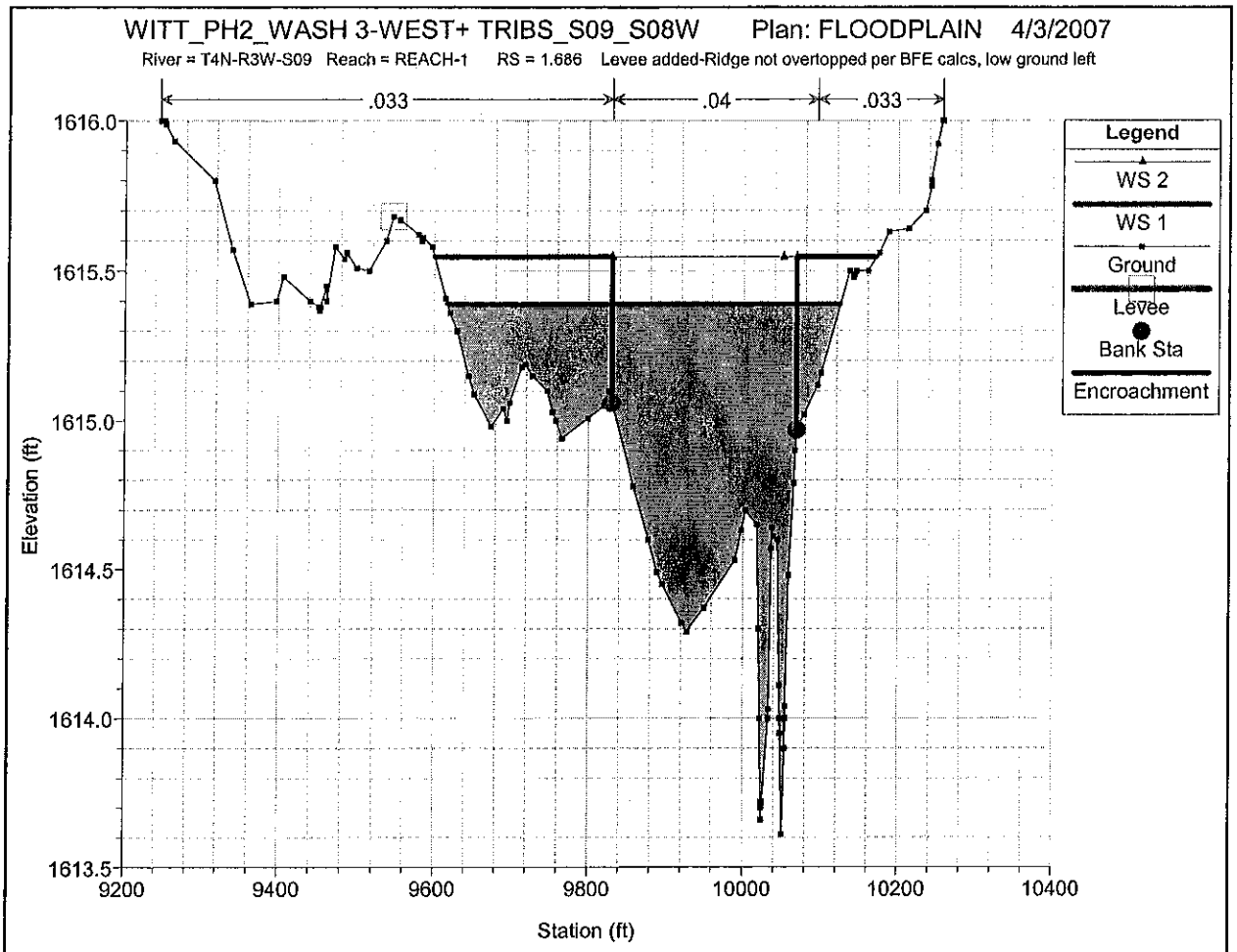

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 2.169
.035
.045
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1633.5
1633.0
1632.5
1632.0
1631.5
1631.0
1630.5
1630.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

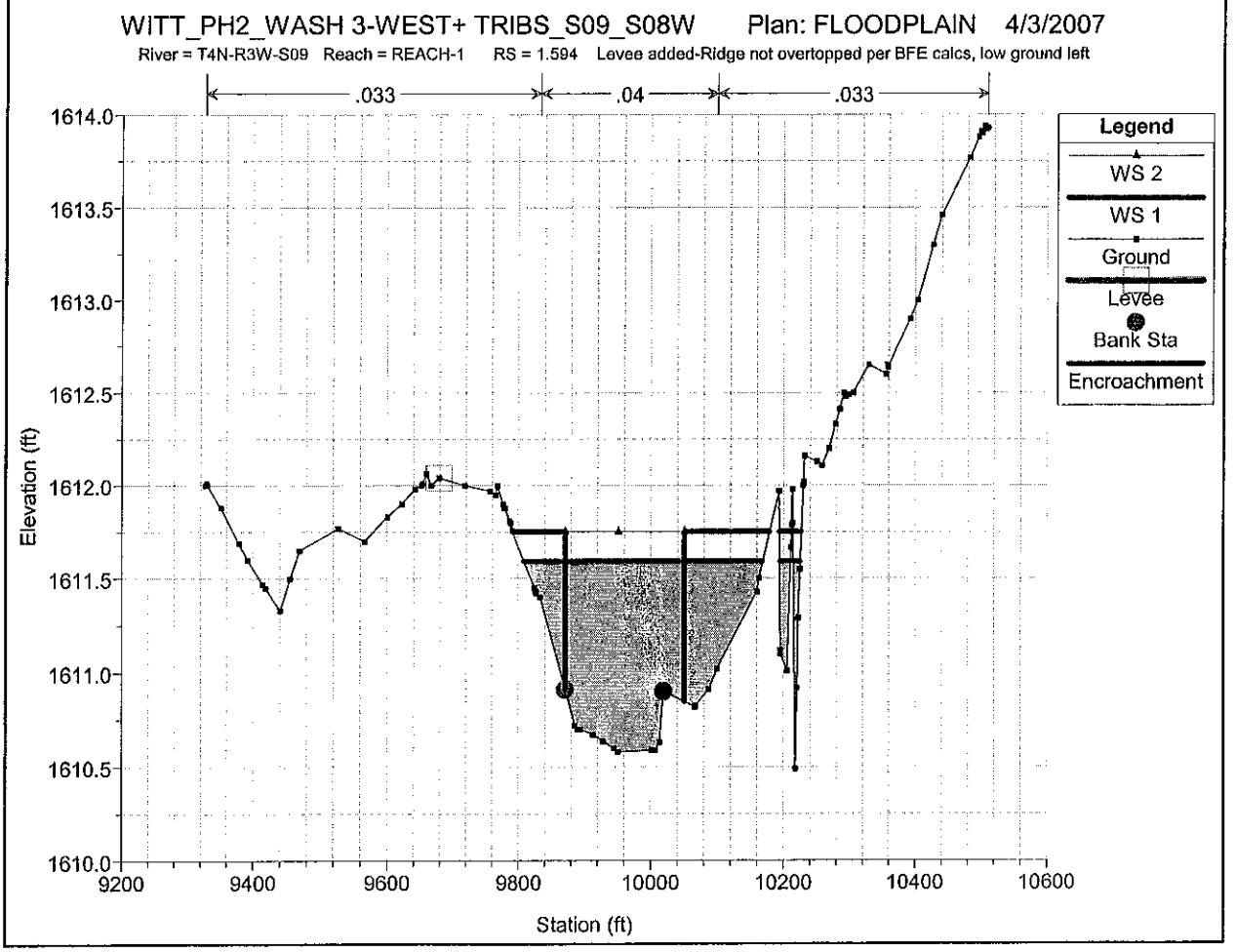

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 2.065
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1631.0
1630.5
1630.0
1629.5
1629.0
1628.5
1628.0
1627.5
1627.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

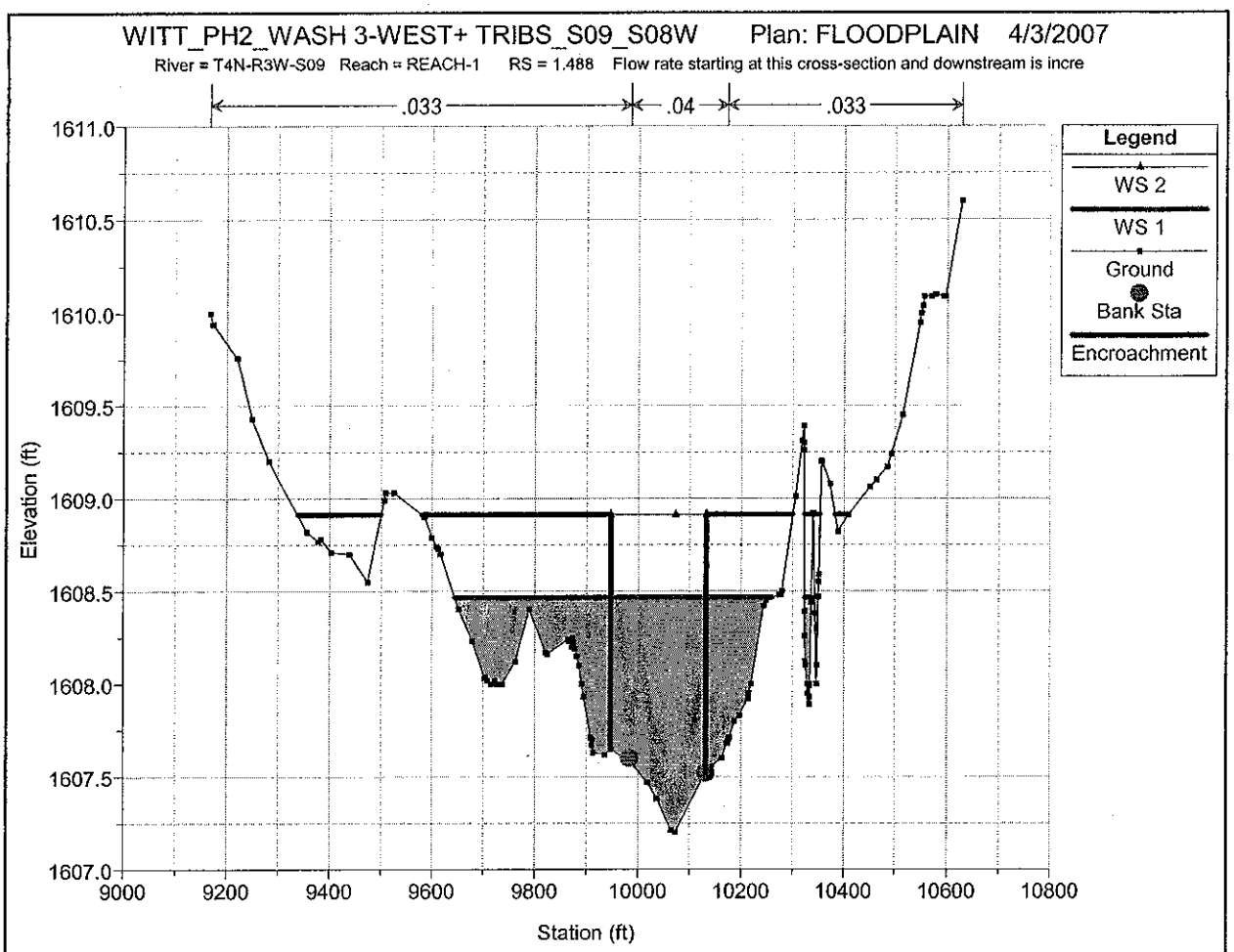

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.971 Flow rate starting at this cross-section and downstream is incre
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1626.5
1626.0
1625.5
1625.0
1624.5
1624.0
1623.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

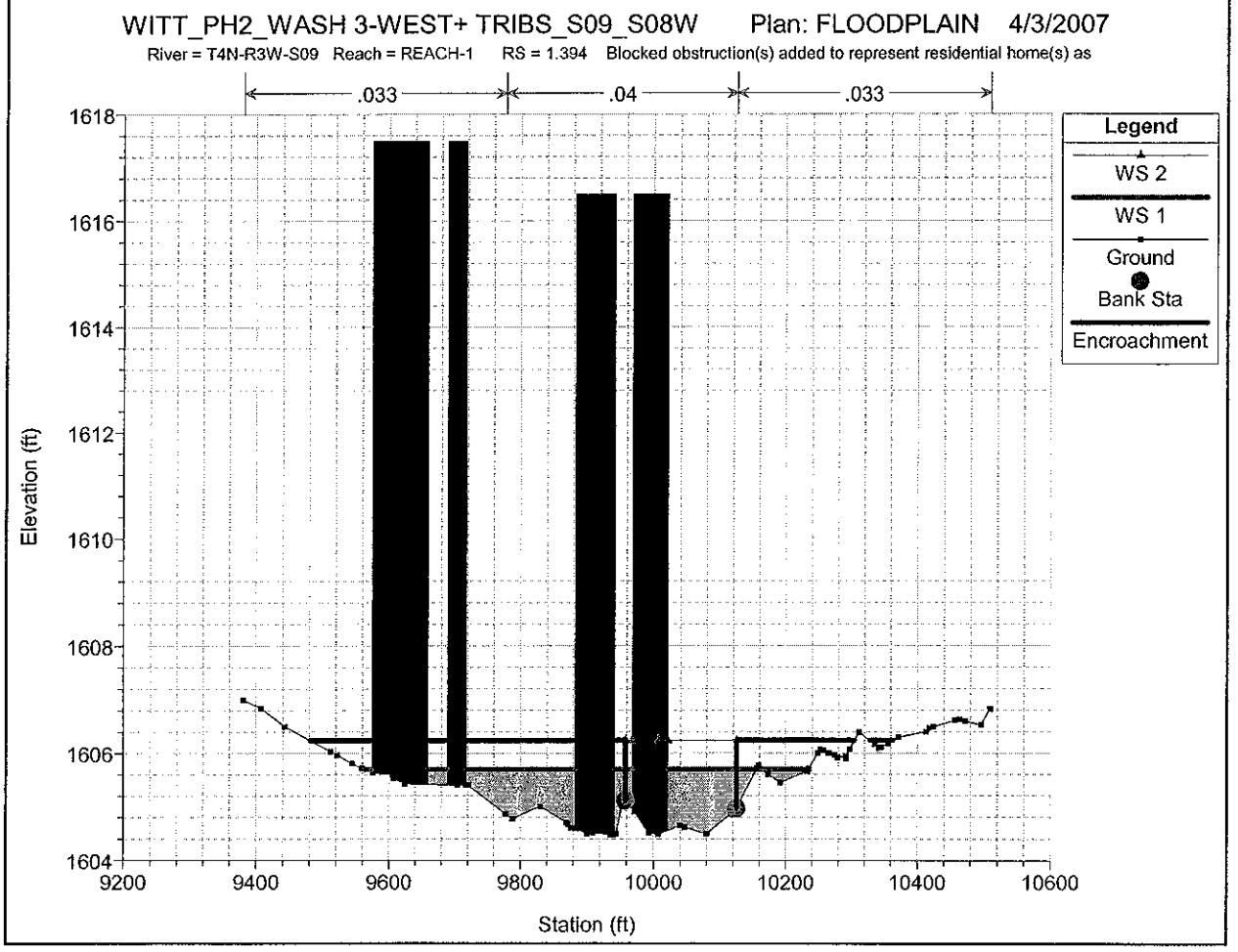

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.876
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1624.0
1623.5
1623.0
1622.5
1622.0
1621.5
1621.0
1620.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.781
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1620.0
1619.5
1619.0
1618.5
1618.0
1617.5
1617.0
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.686 Levee added-Ridge not overtopped per BFE calcs, low ground left
.033
.04
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1616.0
1615.5
1615.0
1614.5
1614.0
1613.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)

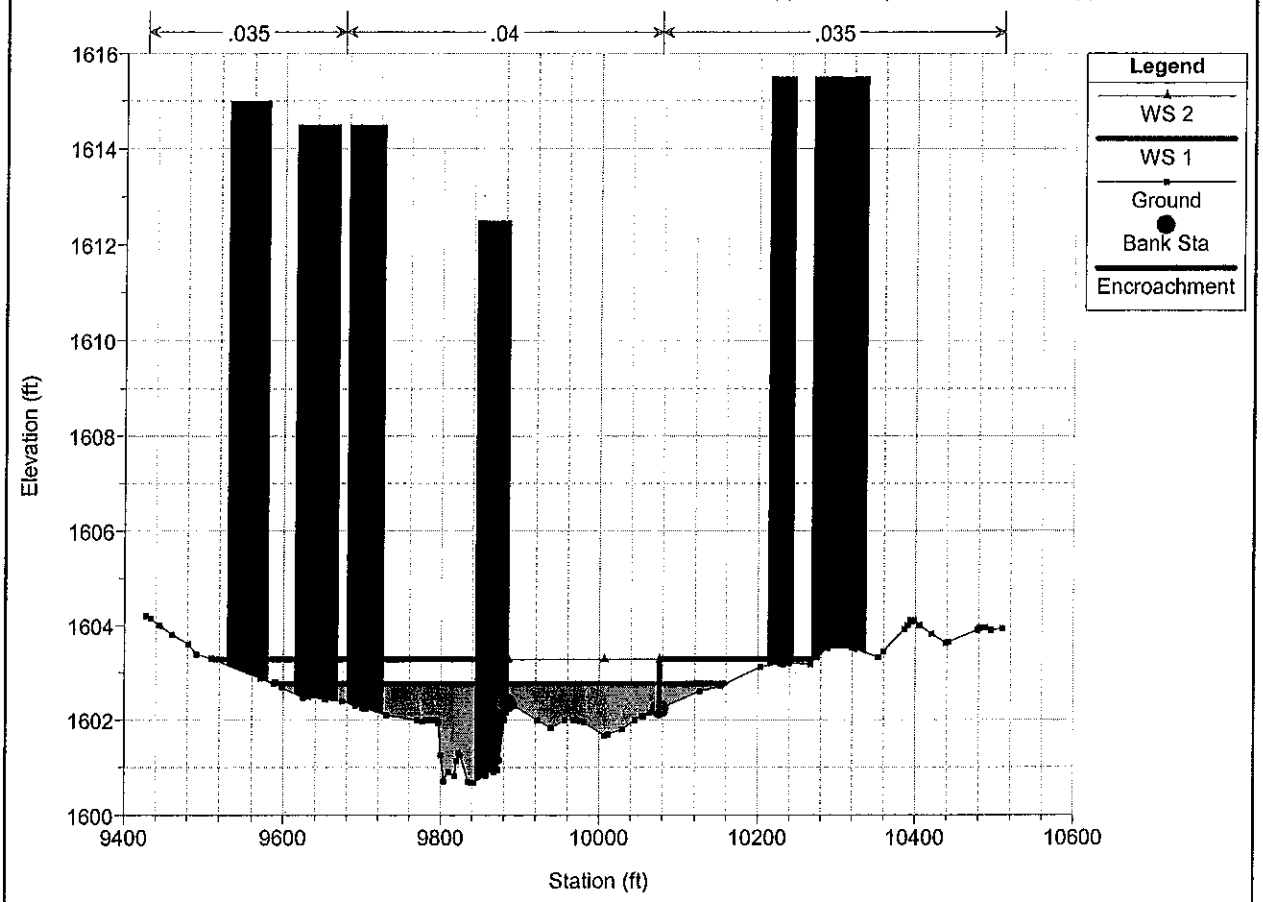

WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.594 Levee added-Ridge not overtopped per BFE calcs, low ground left
.033
.04
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1614.0
1613.5
1613.0
1612.5
1612.0
1611.5
1611.0
1610.5
1610.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.488 Flow rate starting at this cross-section and downstream is incre
.033
.04
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1611.0
1610.5
1610.0
1609.5
1609.0
1608.5
1608.0
1607.5
1607.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.394 Blocked obstruction(s) added to represent residential home(s) as
.033
.04
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1618
1616
1614
1612
1610
1608
1606
1604
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

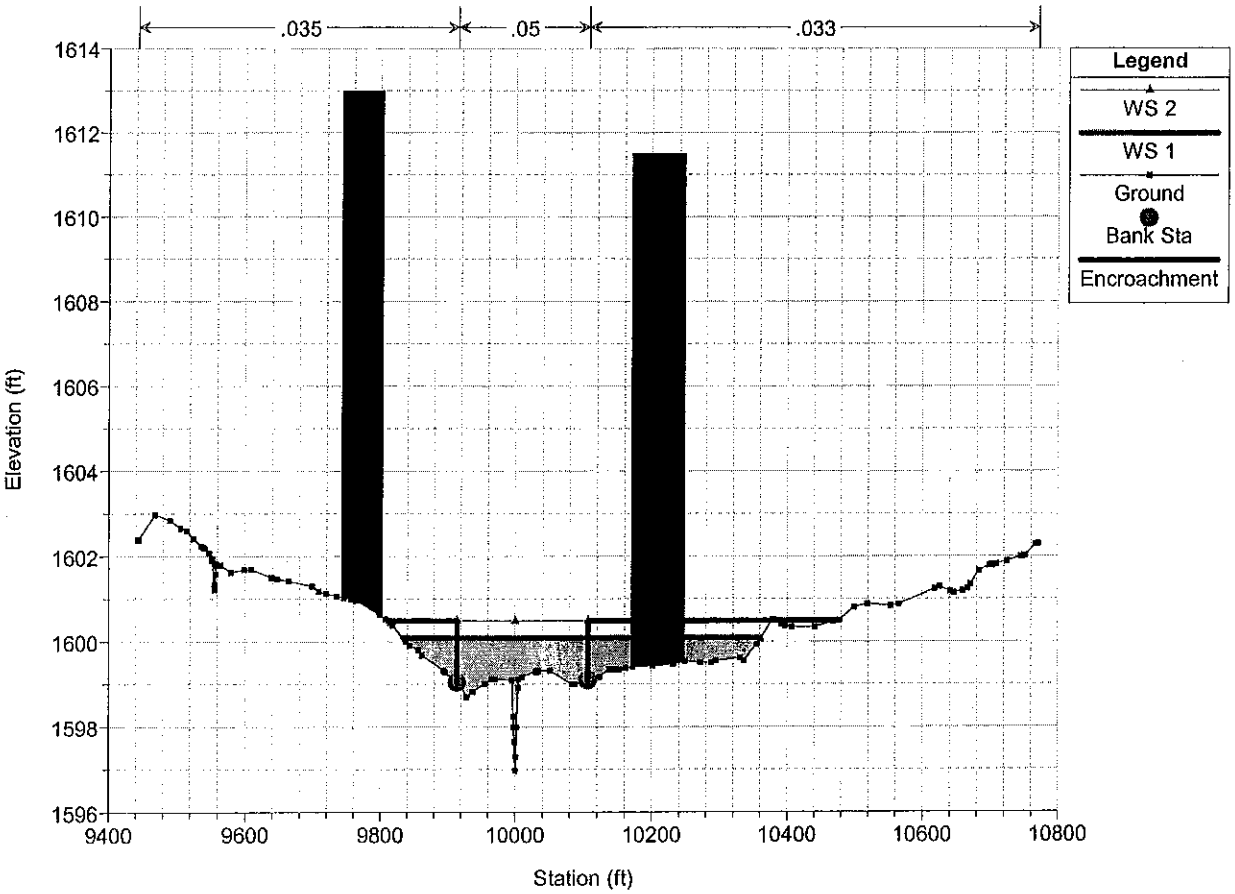
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

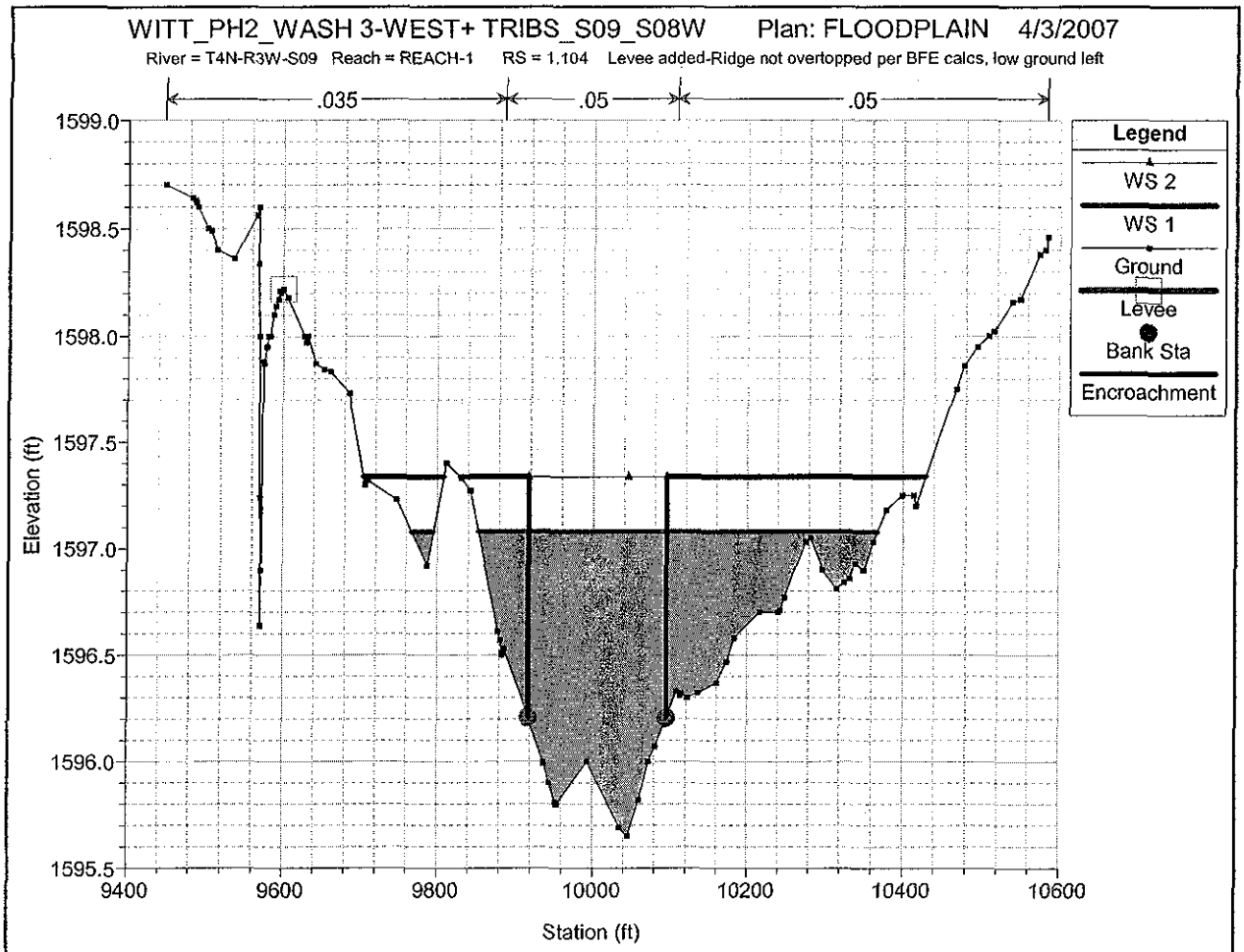
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.302 Blocked obstruction(s) added to represent residential home(s) as

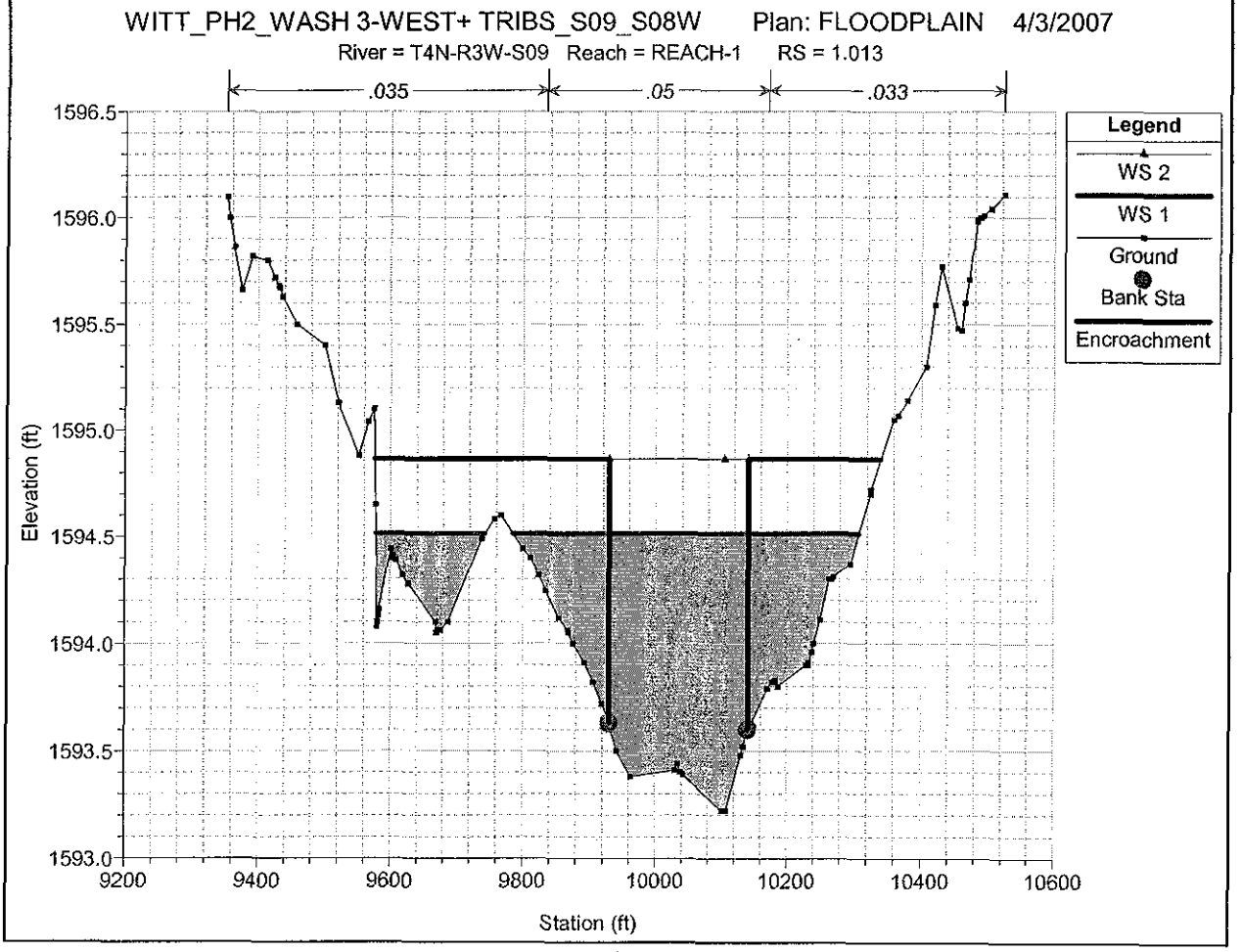


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 1.201 Blocked obstruction(s) added to represent residential home(s) as

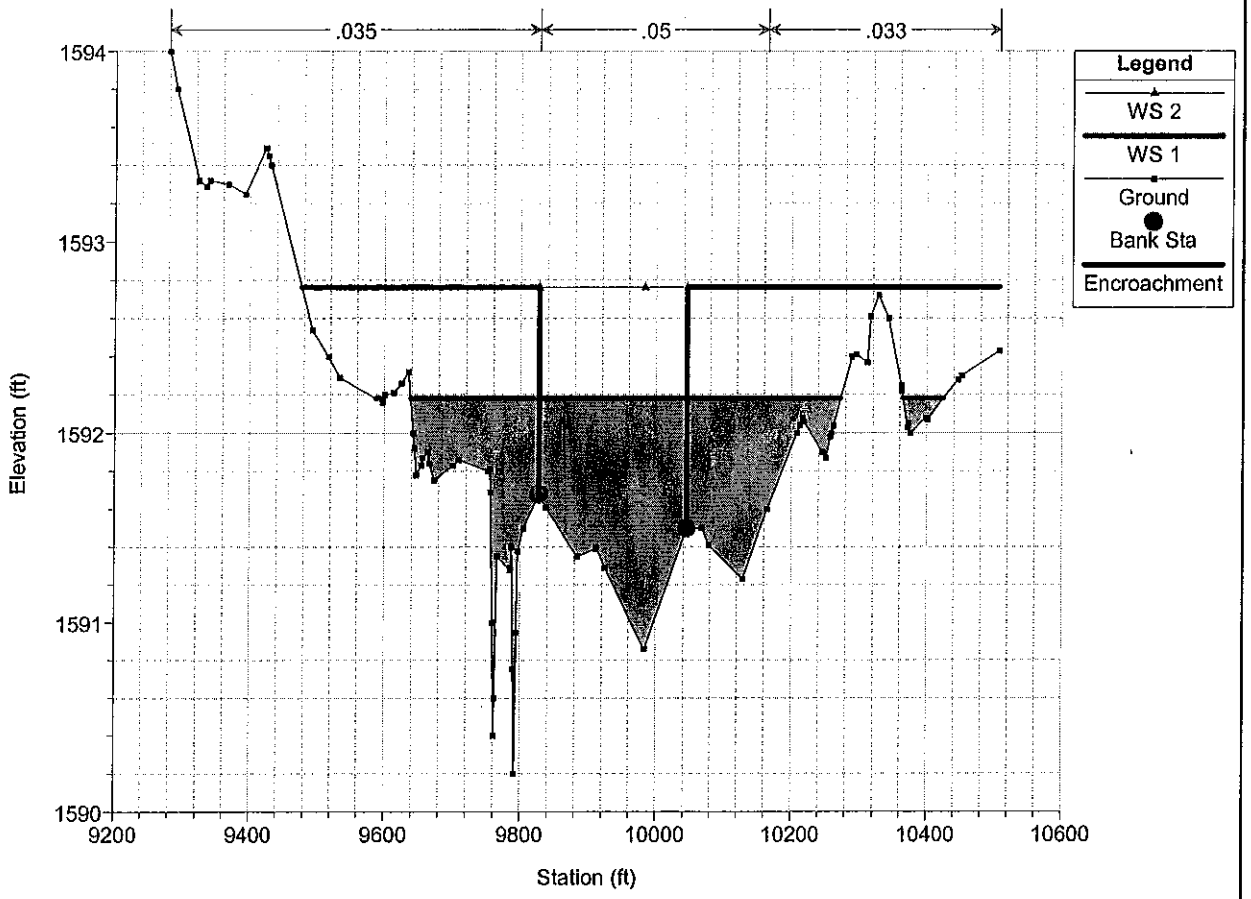



WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.104 Levee added-Ridge not overtopped per BFE calcs, low ground left
.035
.05
.05
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1599.0
1598.5
1598.0
1597.5
1597.0
1596.5
1596.0
1595.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 1.013
.035
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1596.5
1596.0
1595.5
1595.0
1594.5
1594.0
1593.5
1593.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

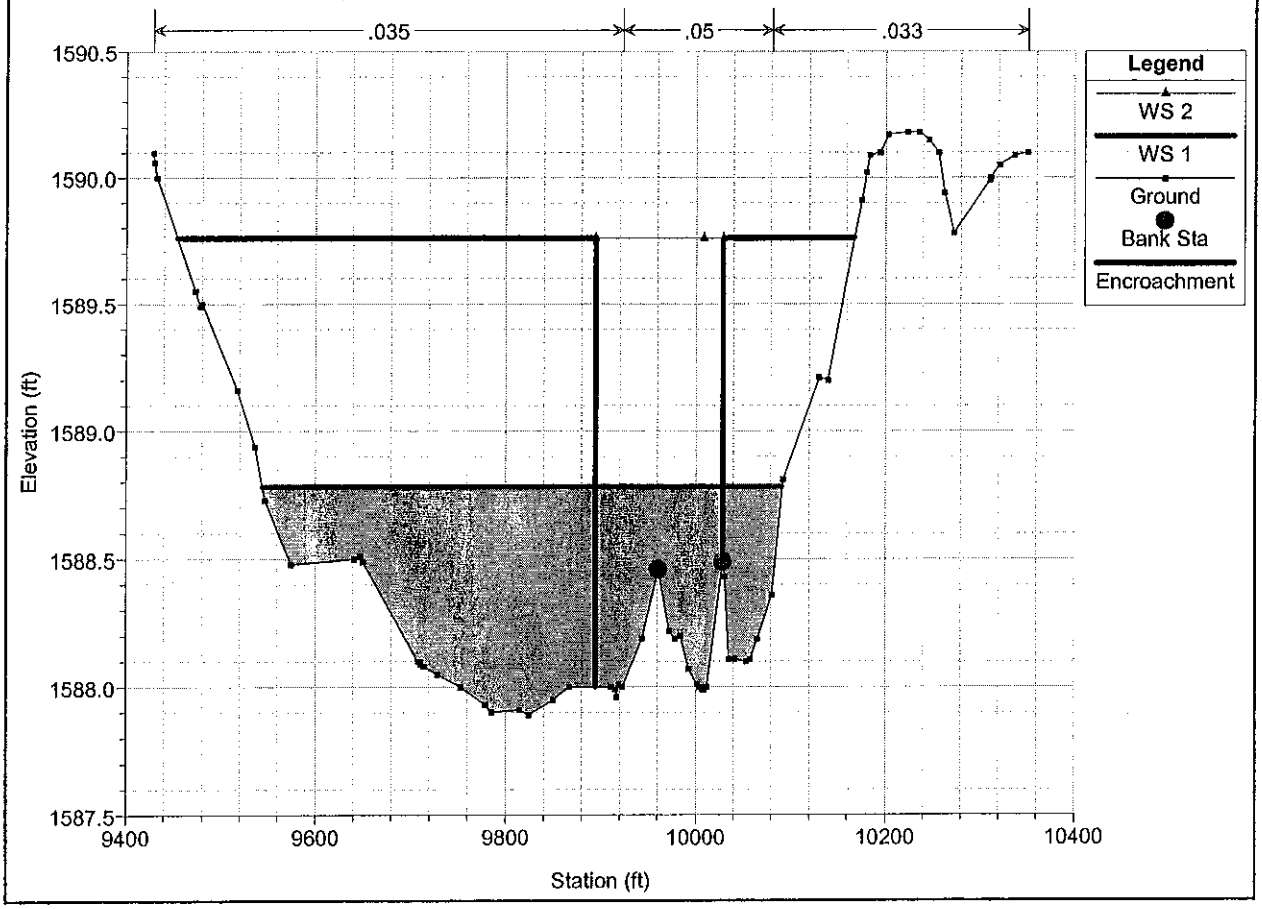
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

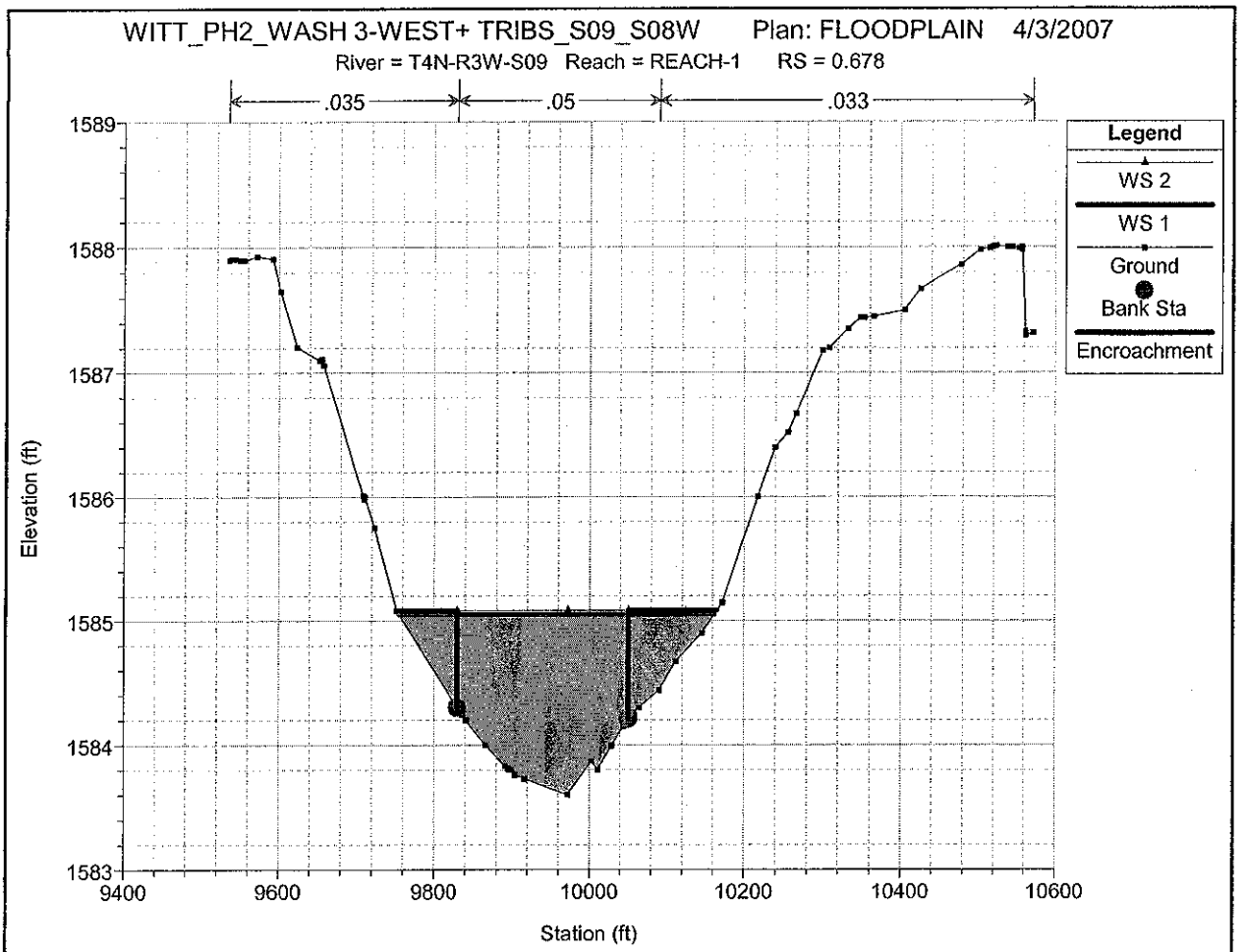
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.920 Flow rate starting at this cross-section and downstream is incre

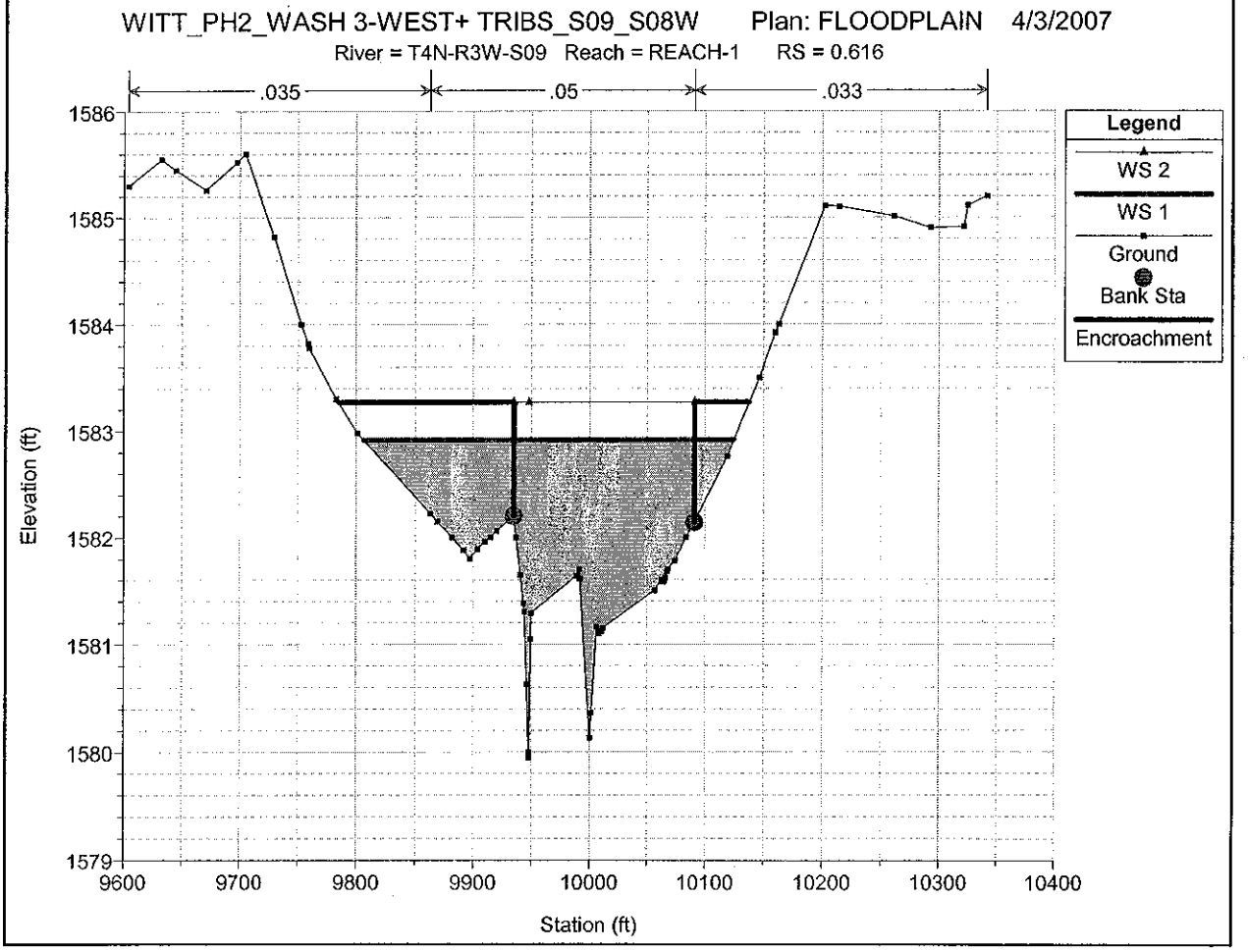


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 0.819

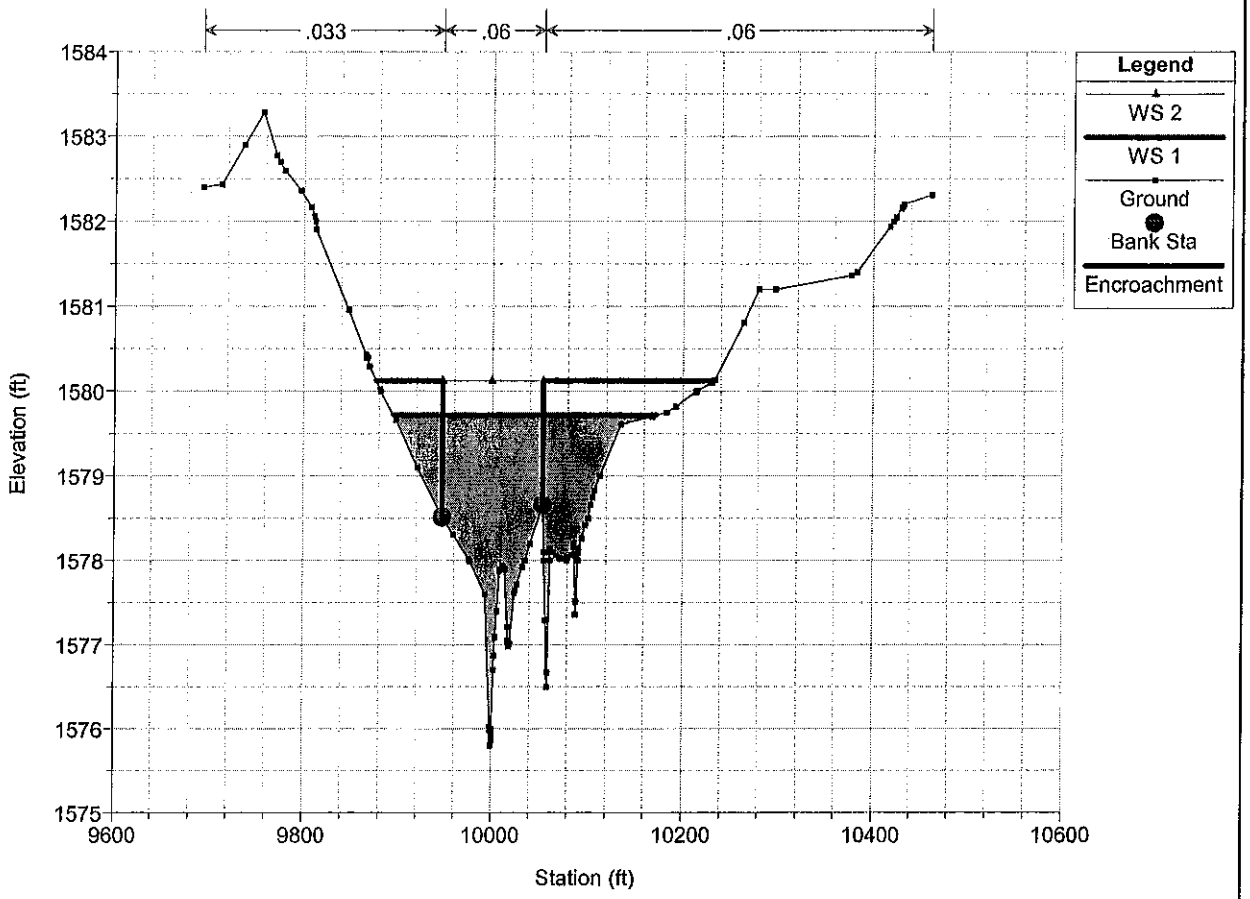



WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.678
.035
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1589
1588
1587
1586
1585
1584
1583
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.616
.035
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1586
1585
1584
1583
1582
1581
1580
1579
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

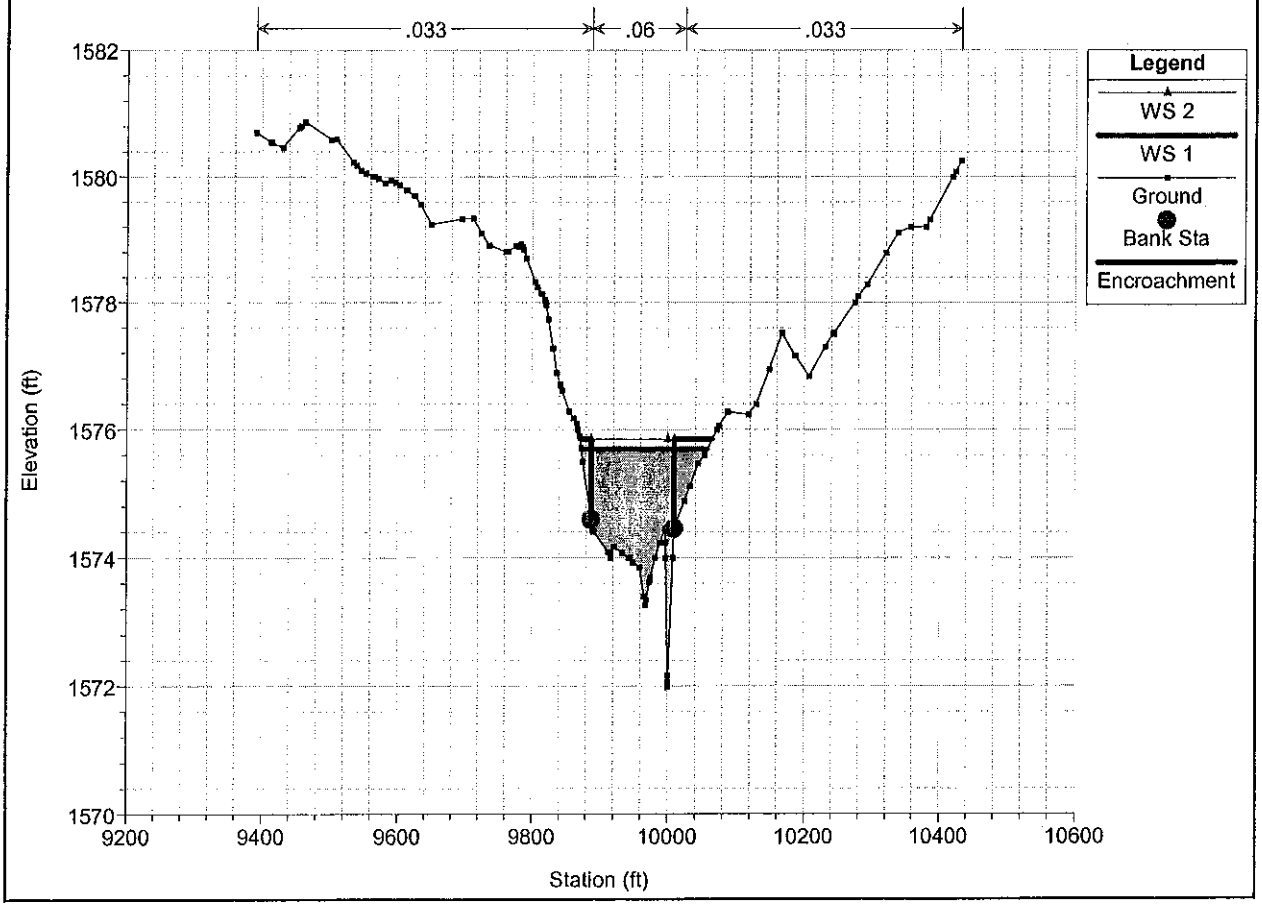
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

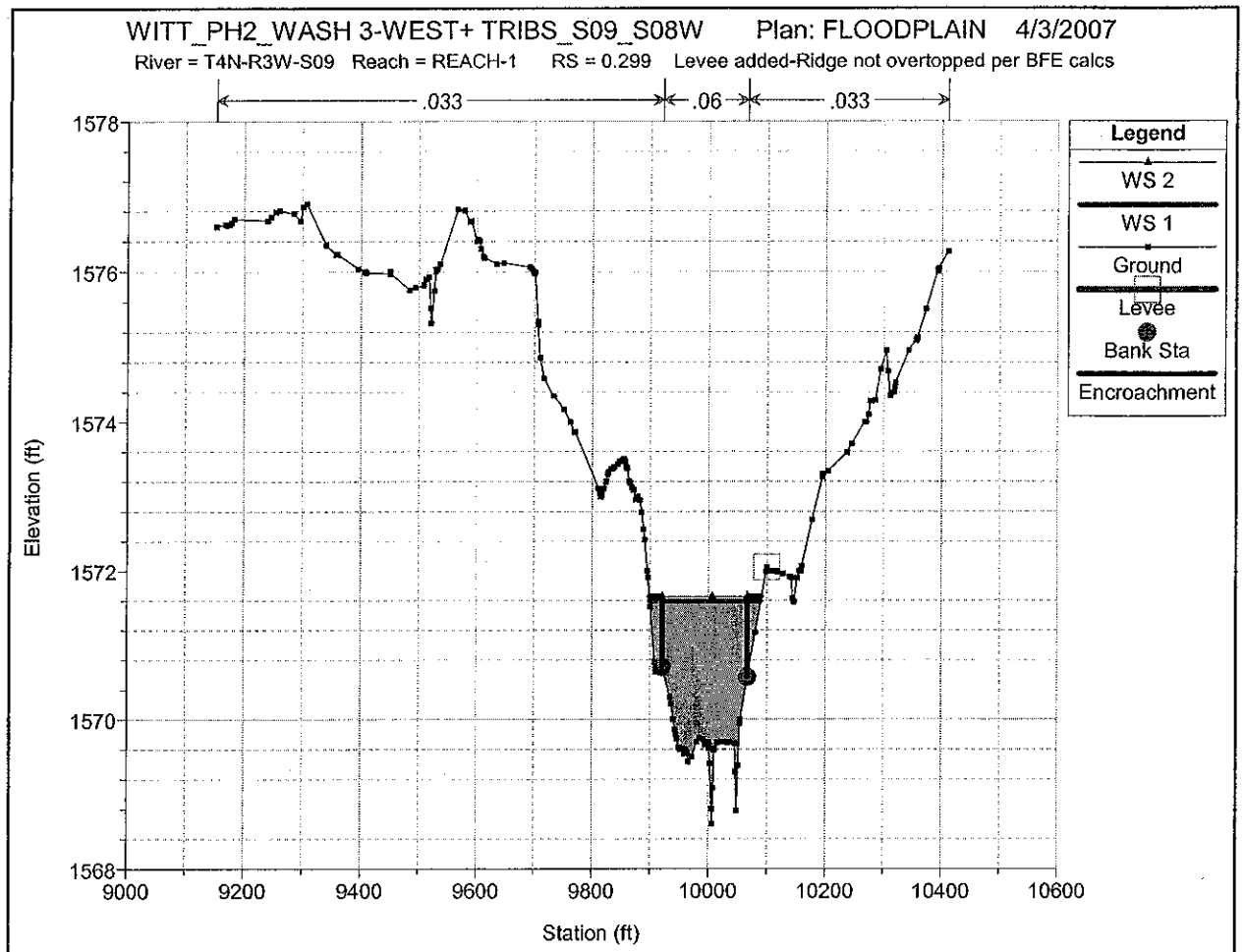
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.501

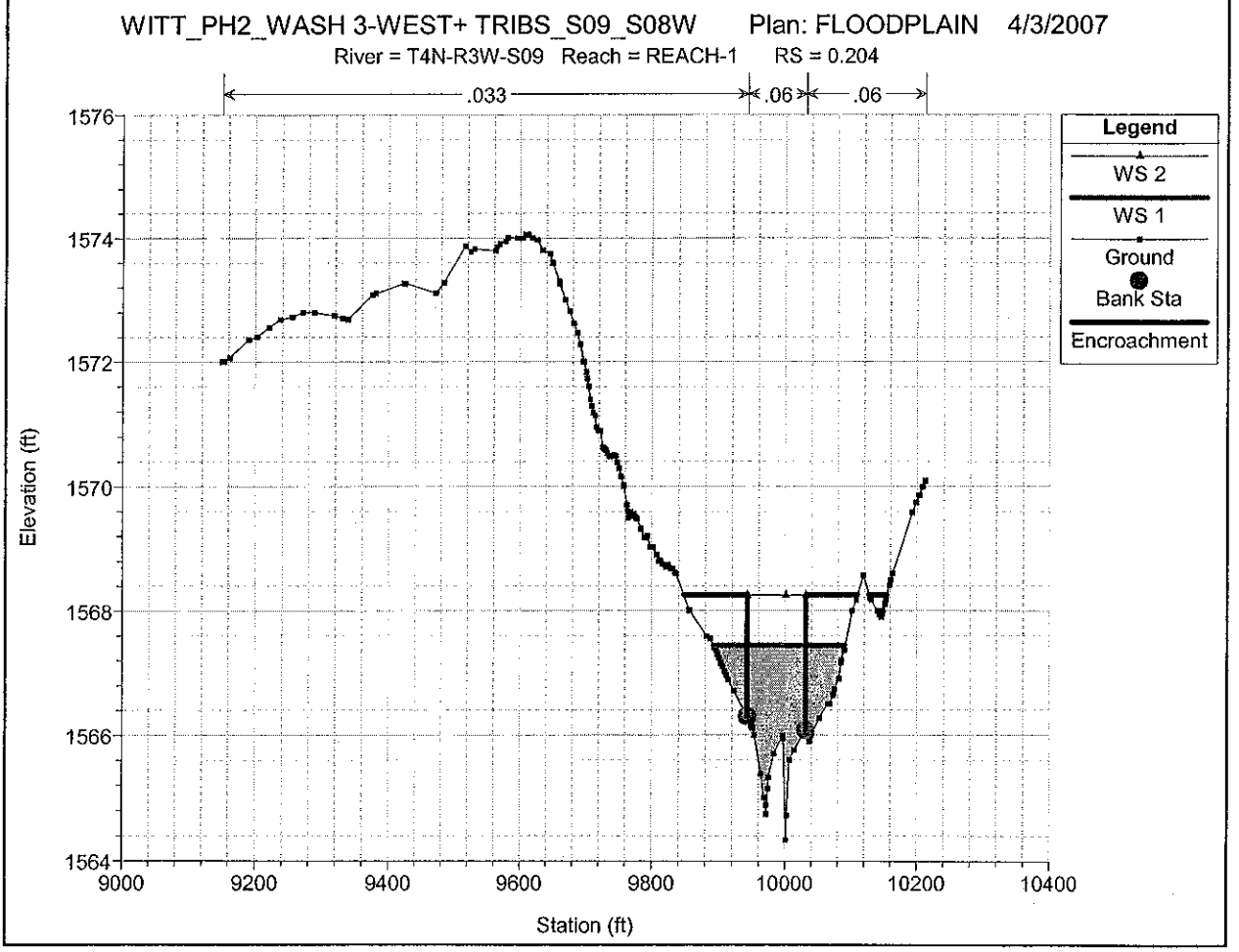


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 0.398 Flow rate starting at this cross-section and downstream is incre

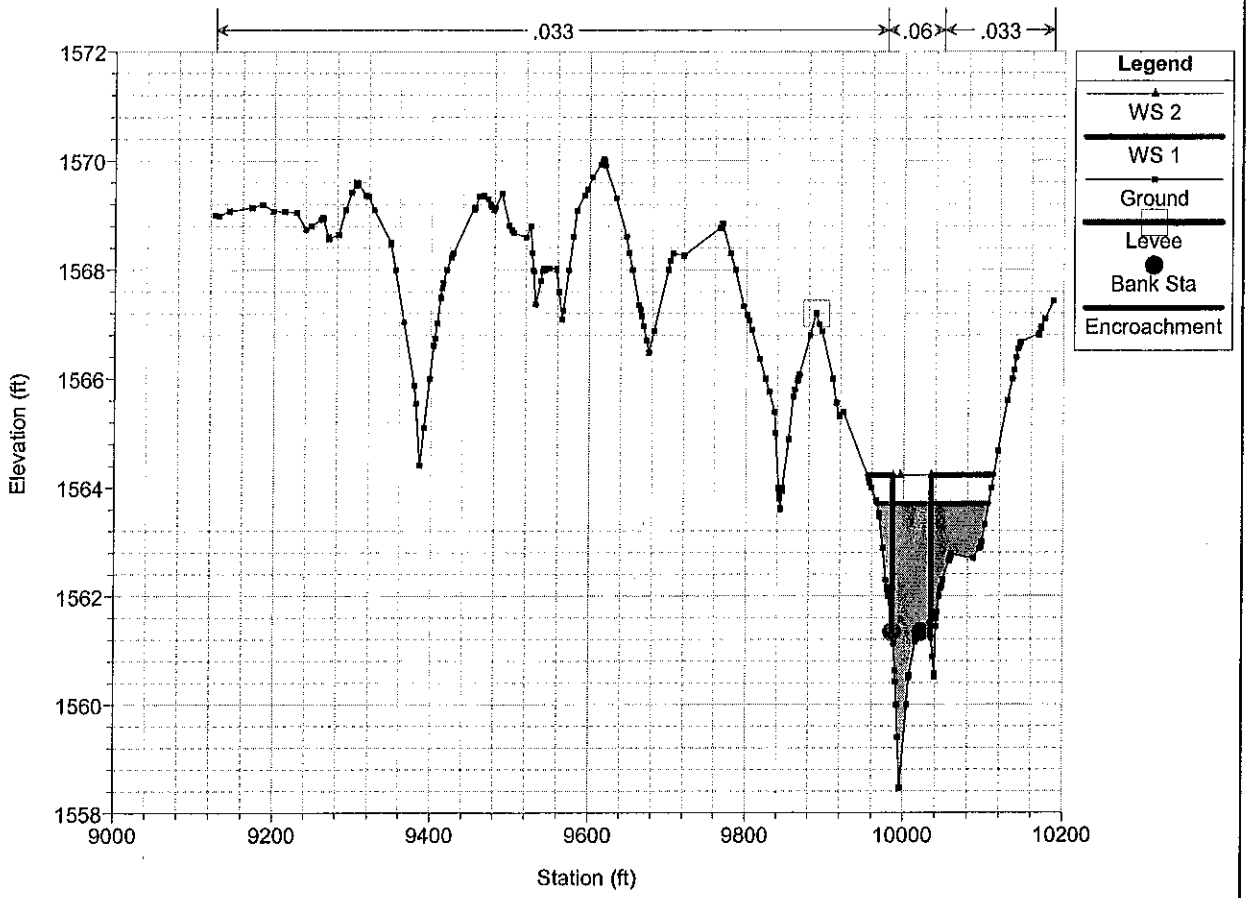



WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.299 Levee added-Ridge not overtopped per BFE calcs
.033
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1578
1576
1574
1572
1570
1568
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007
River = T4N-R3W-S09 Reach = REACH-1 RS = 0.204
.033
.06
.06
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1576
1574
1572
1570
1568
1566
1564
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

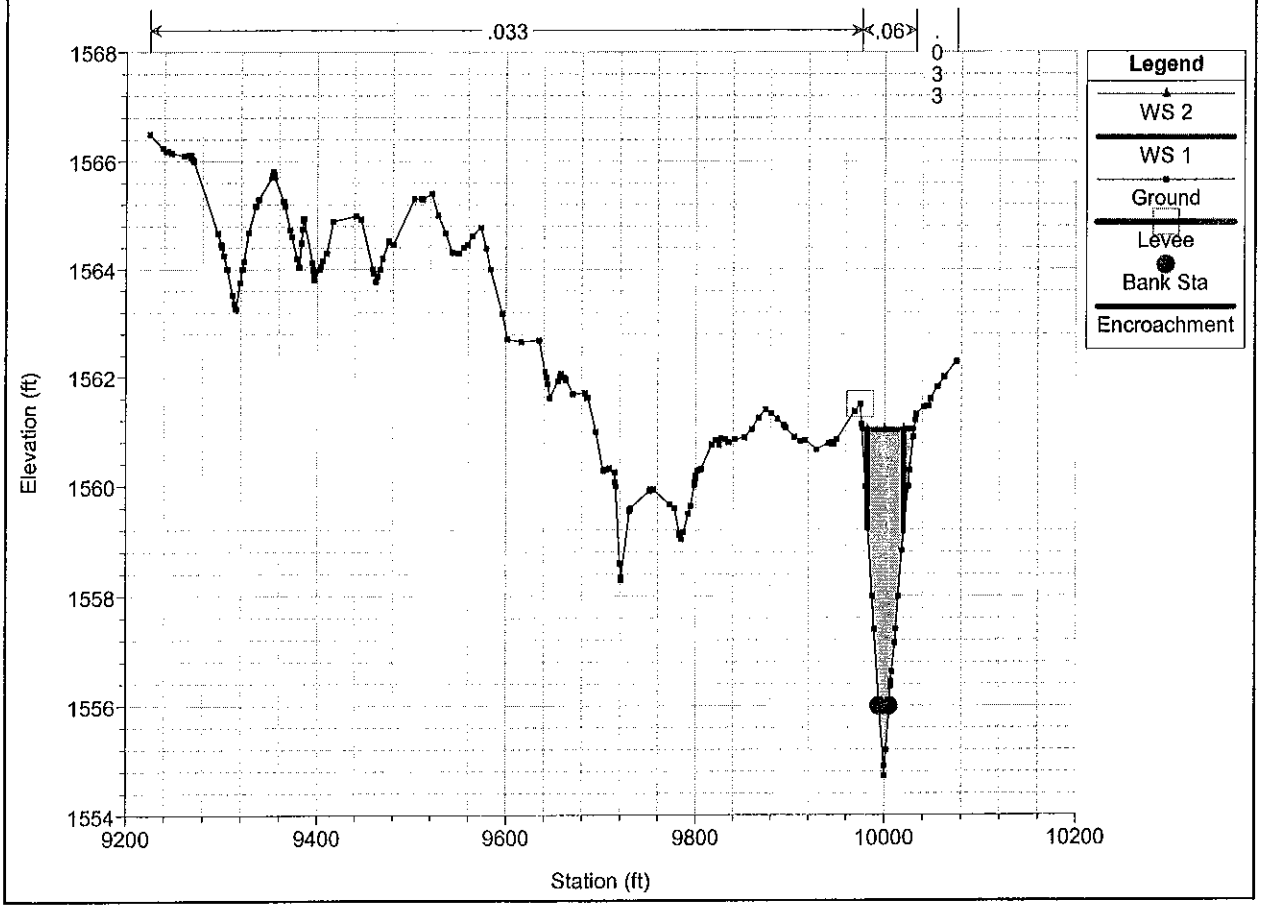
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 0.104 Levee added-Ridge not overtopped per BFE calcs, low ground left



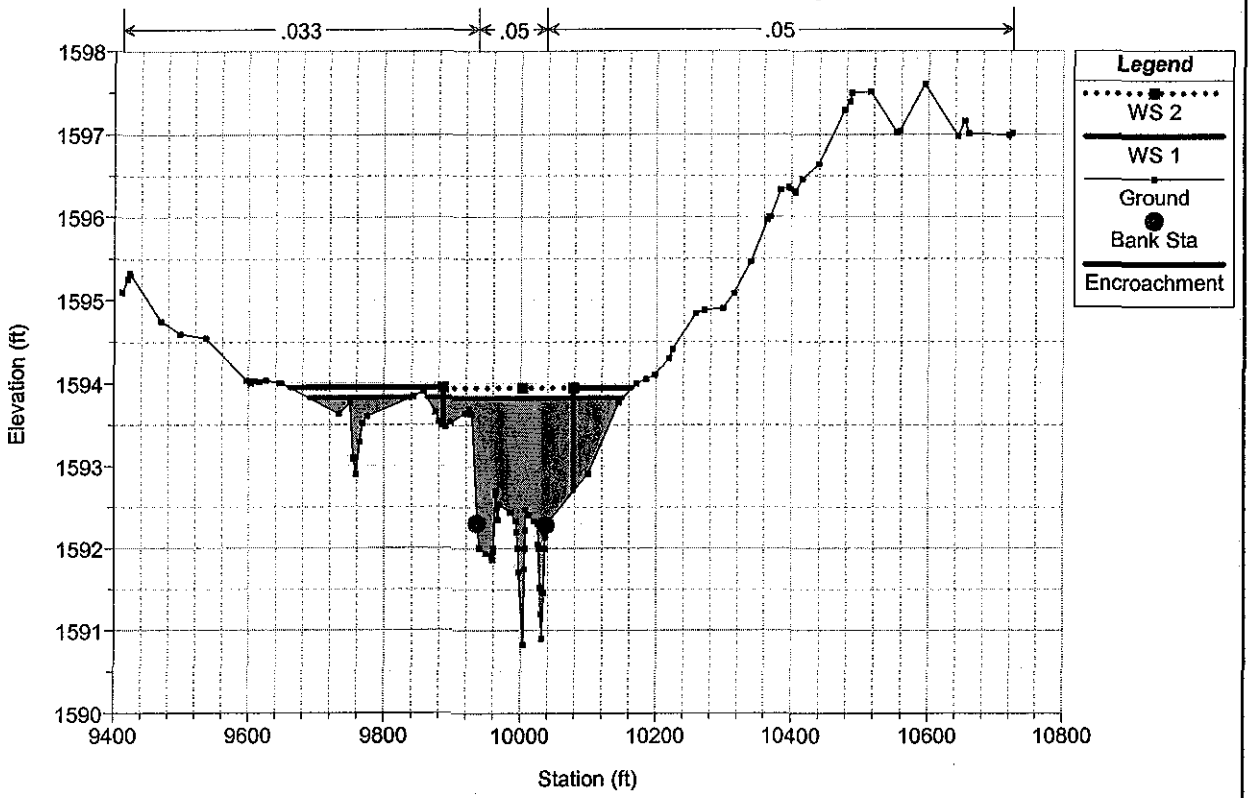
WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W Plan: FLOODPLAIN 4/3/2007

River = T4N-R3W-S09 Reach = REACH-1 RS = 0.032 Levee added-Ridge not overtopped per BFE calcs, low ground left



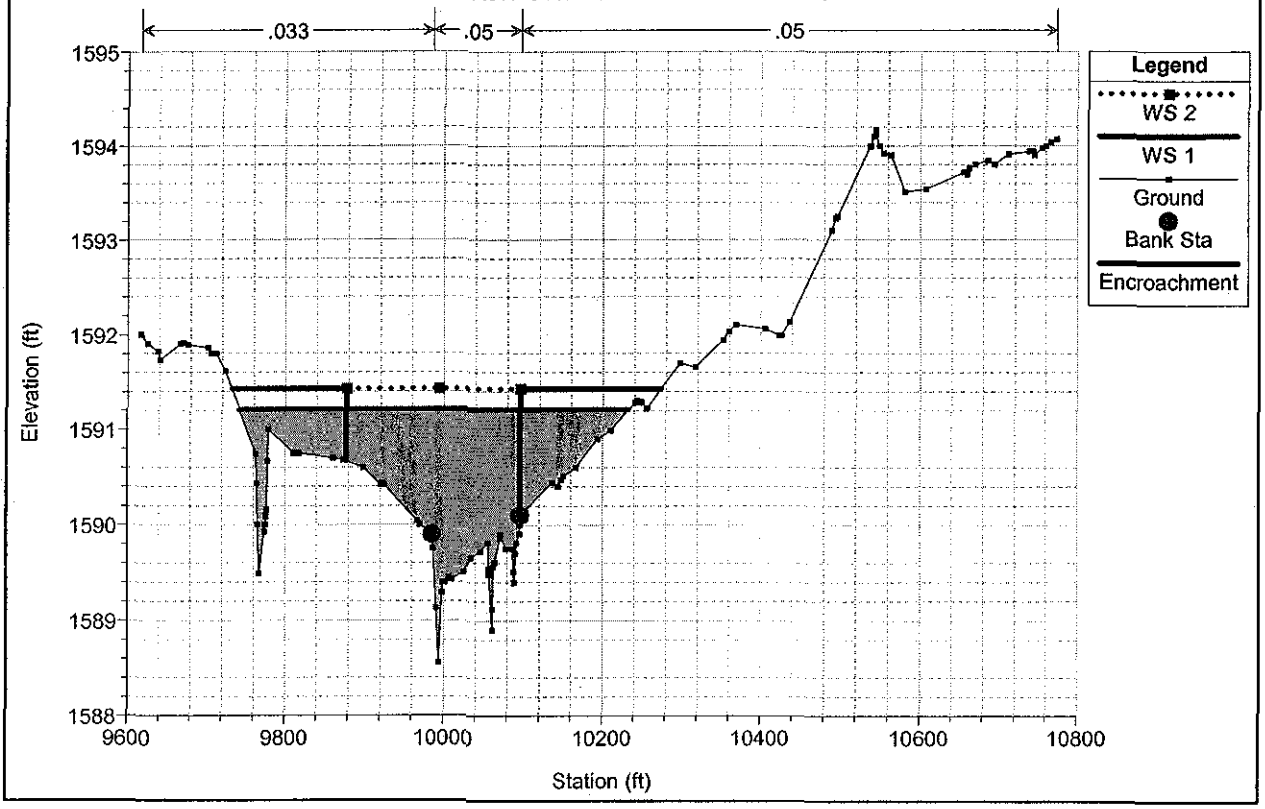
WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006

River = T4N-R3W-S10N Reach = Reach-1 RS = 1.492 Flow rate starting at this cross-section is 930cfs.



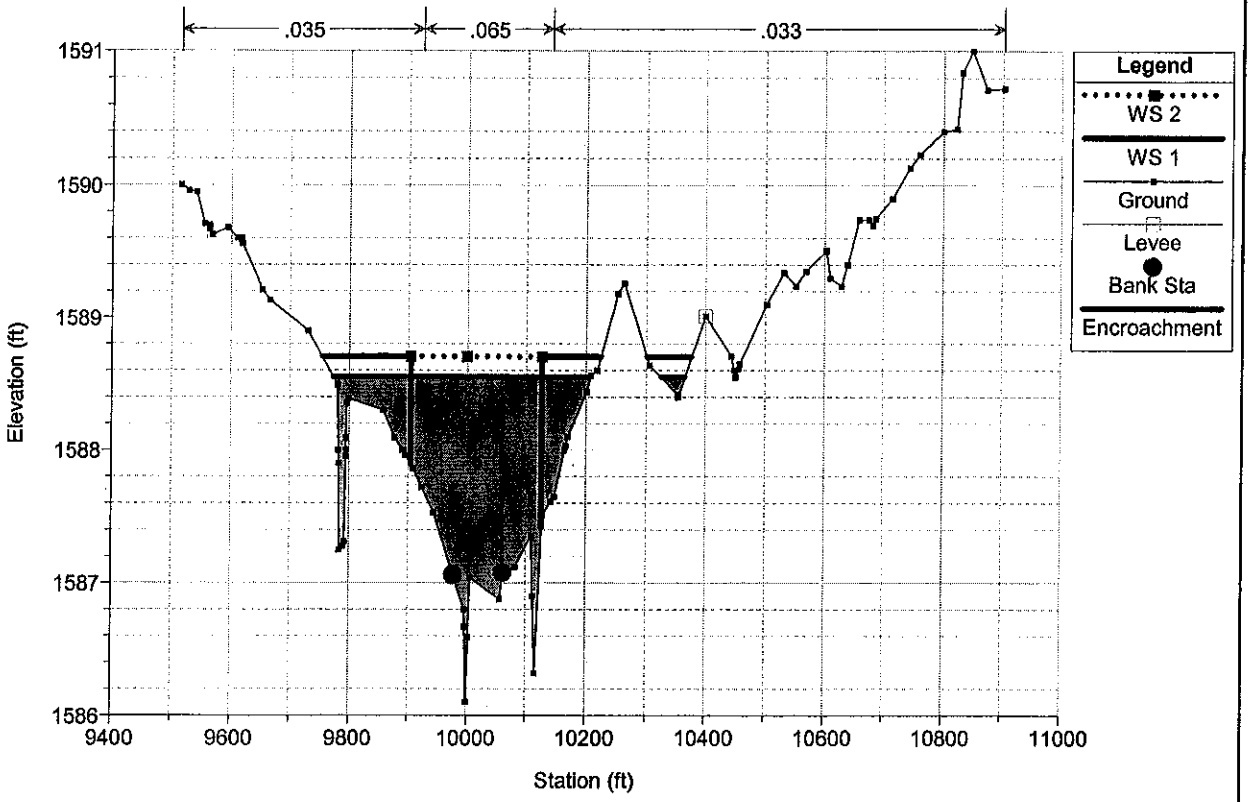
WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006

River = T4N-R3W-S10N Reach = Reach-1 RS = 1.395



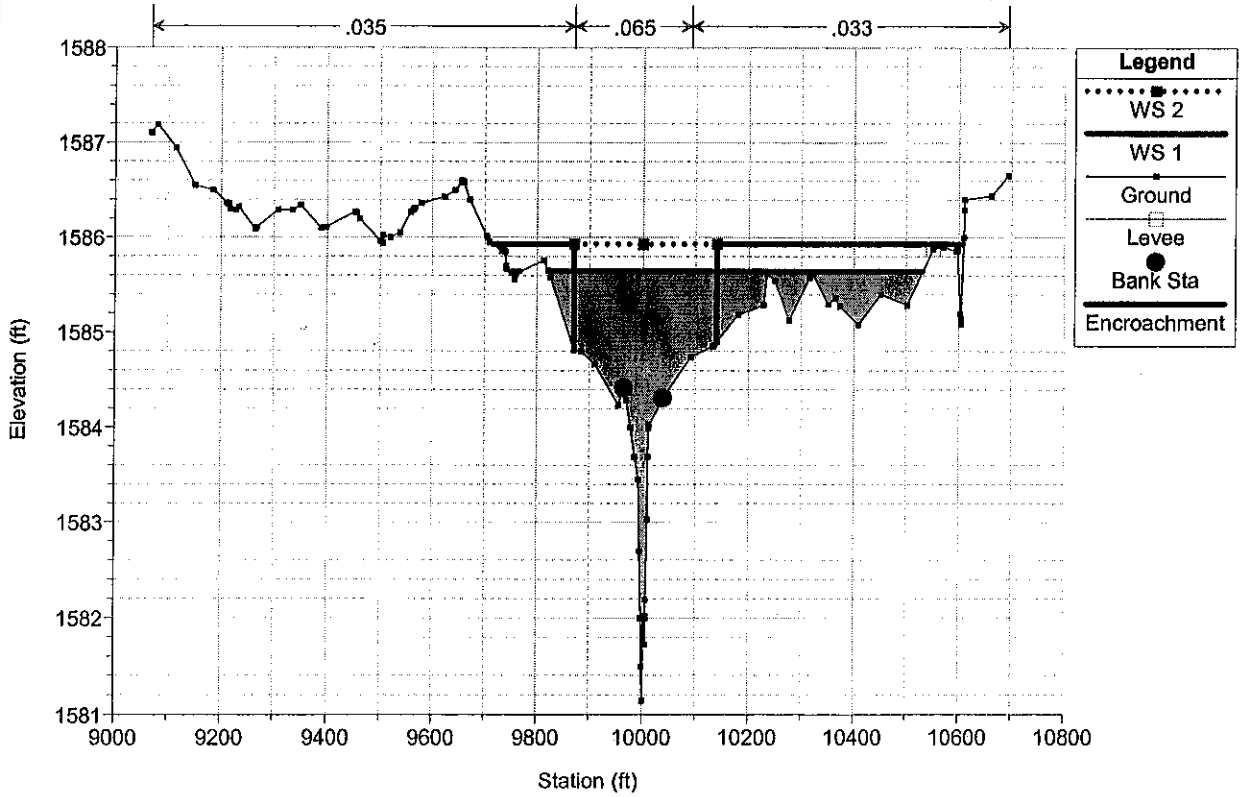
WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006

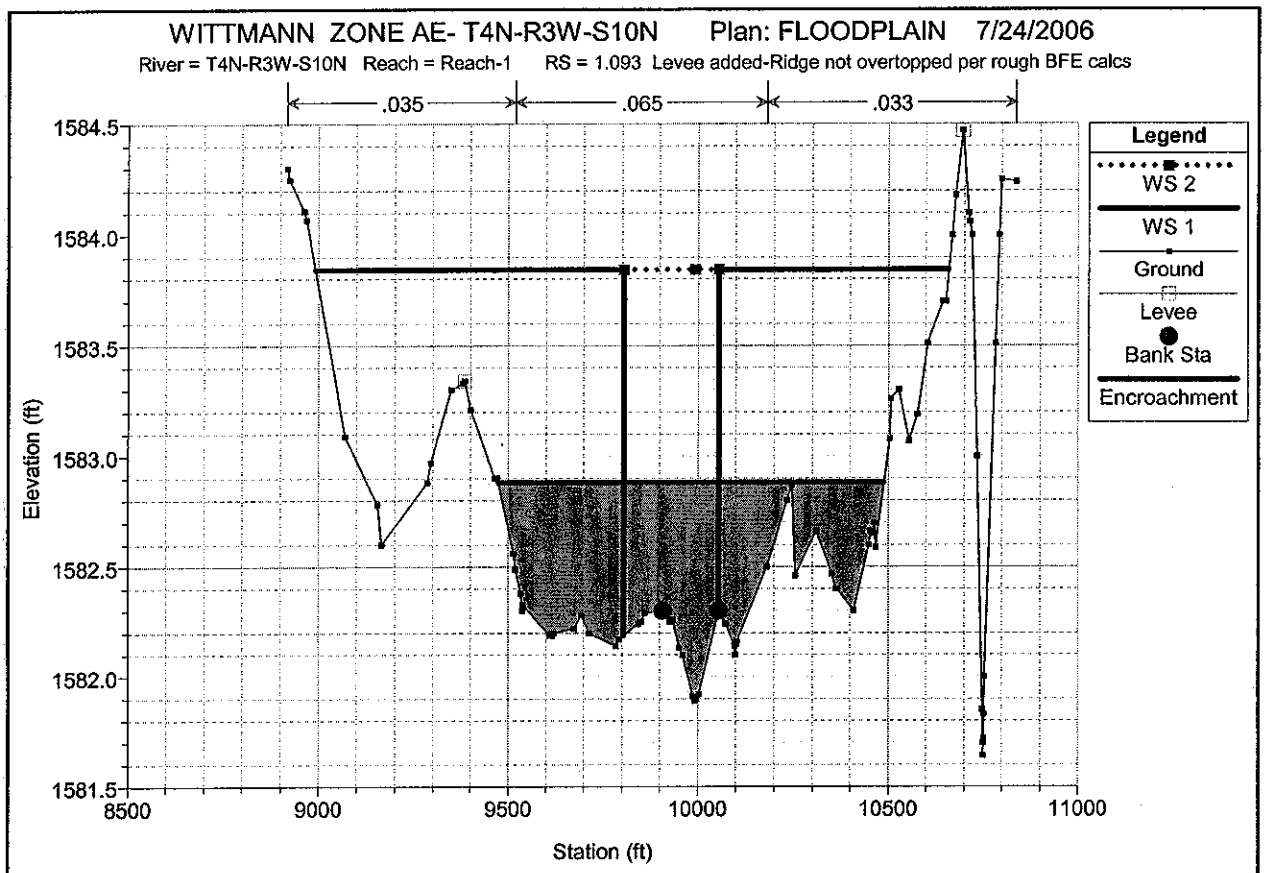
River = T4N-R3W-S10N Reach = Reach-1 RS = 1.292 Interpolated point added at (9976.52, 1587.082) to set bank stat

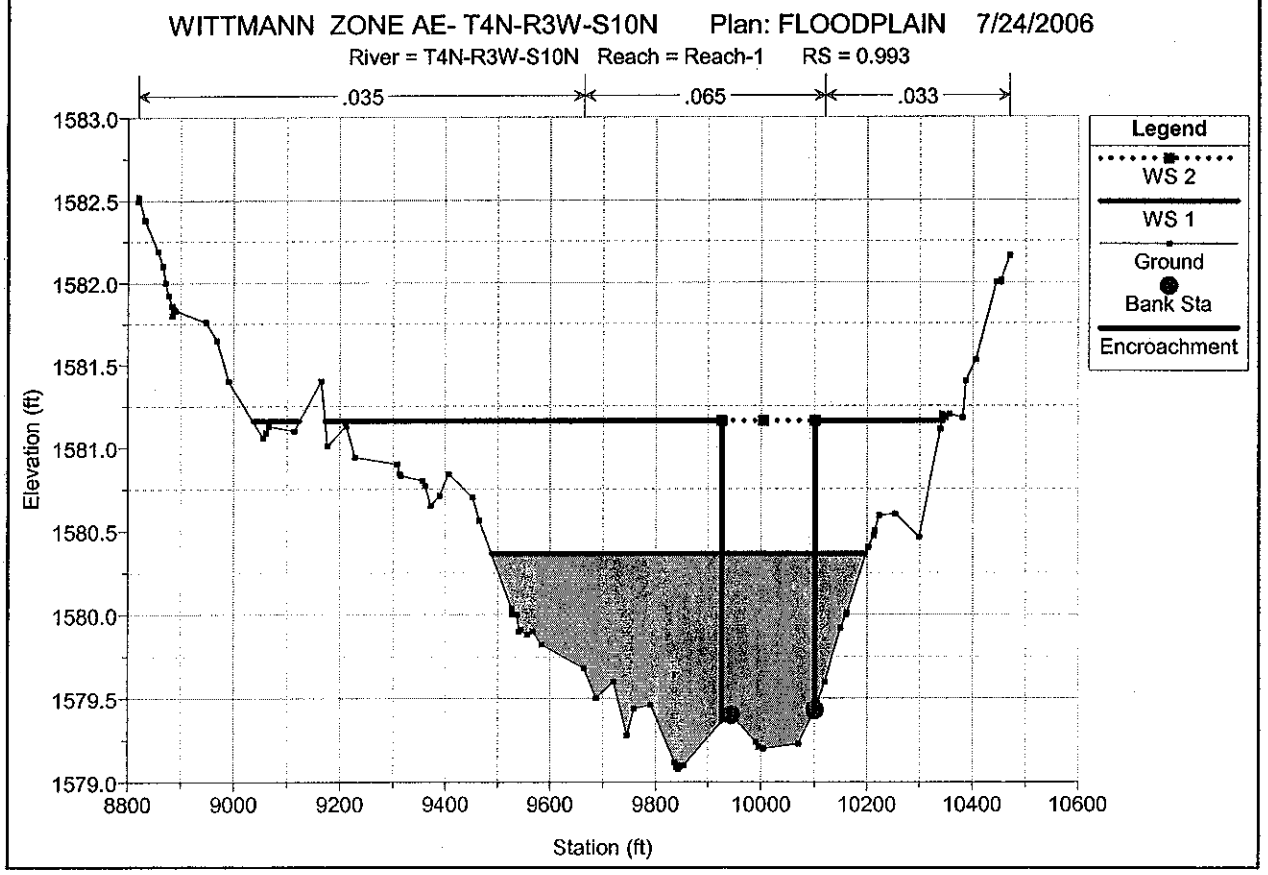


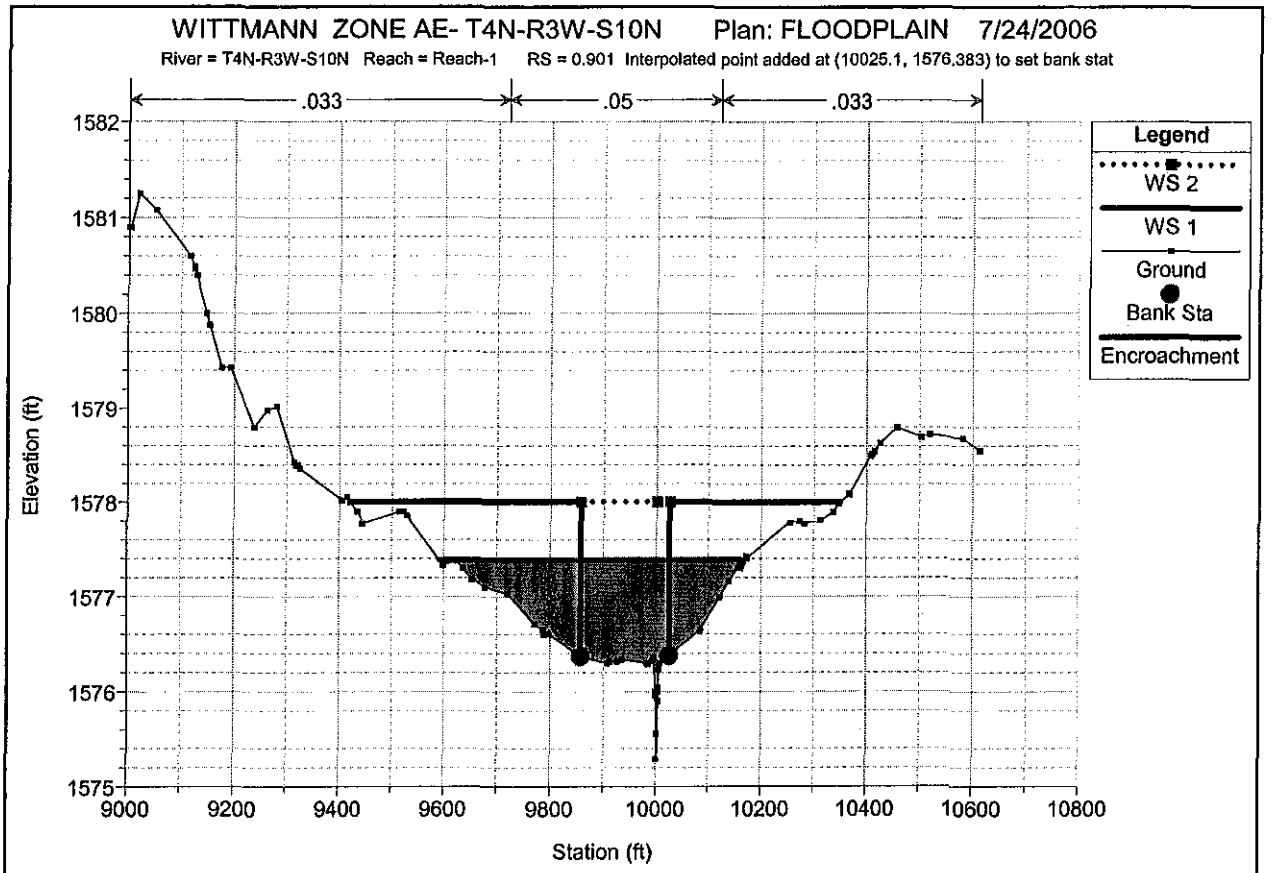
WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006

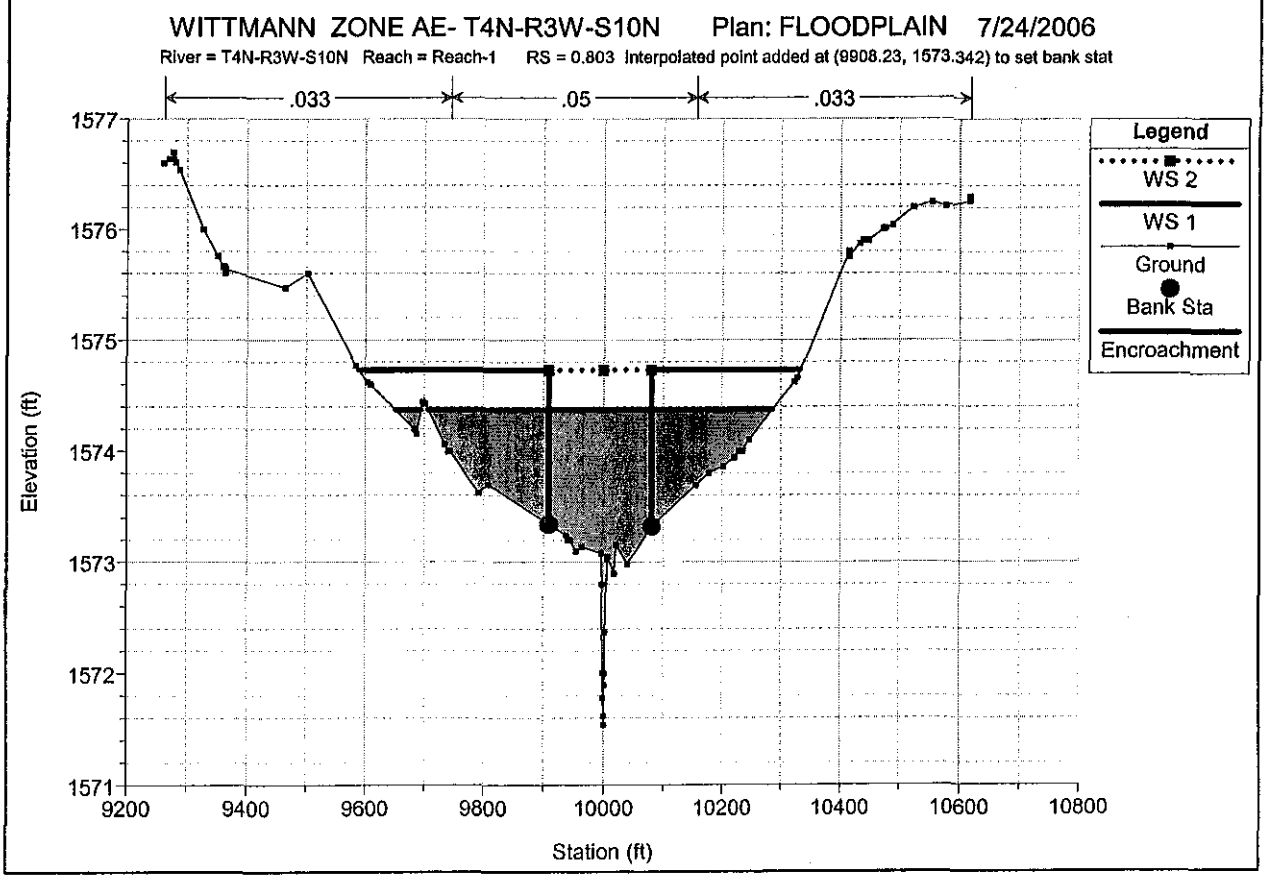
River = T4N-R3W-S10N Reach = Reach-1 RS = 1.184 Levee added-Ridge not overtopped per BFE calcs;

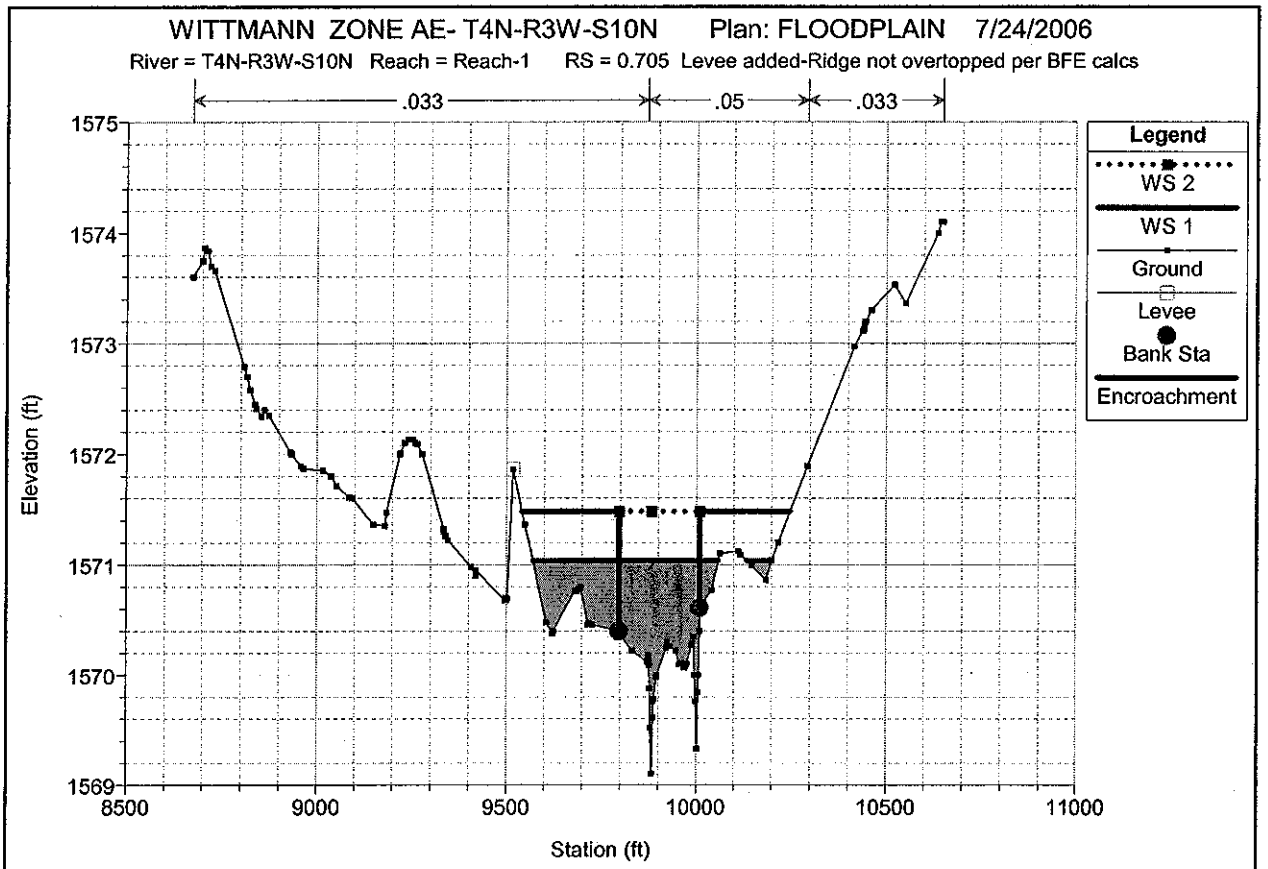


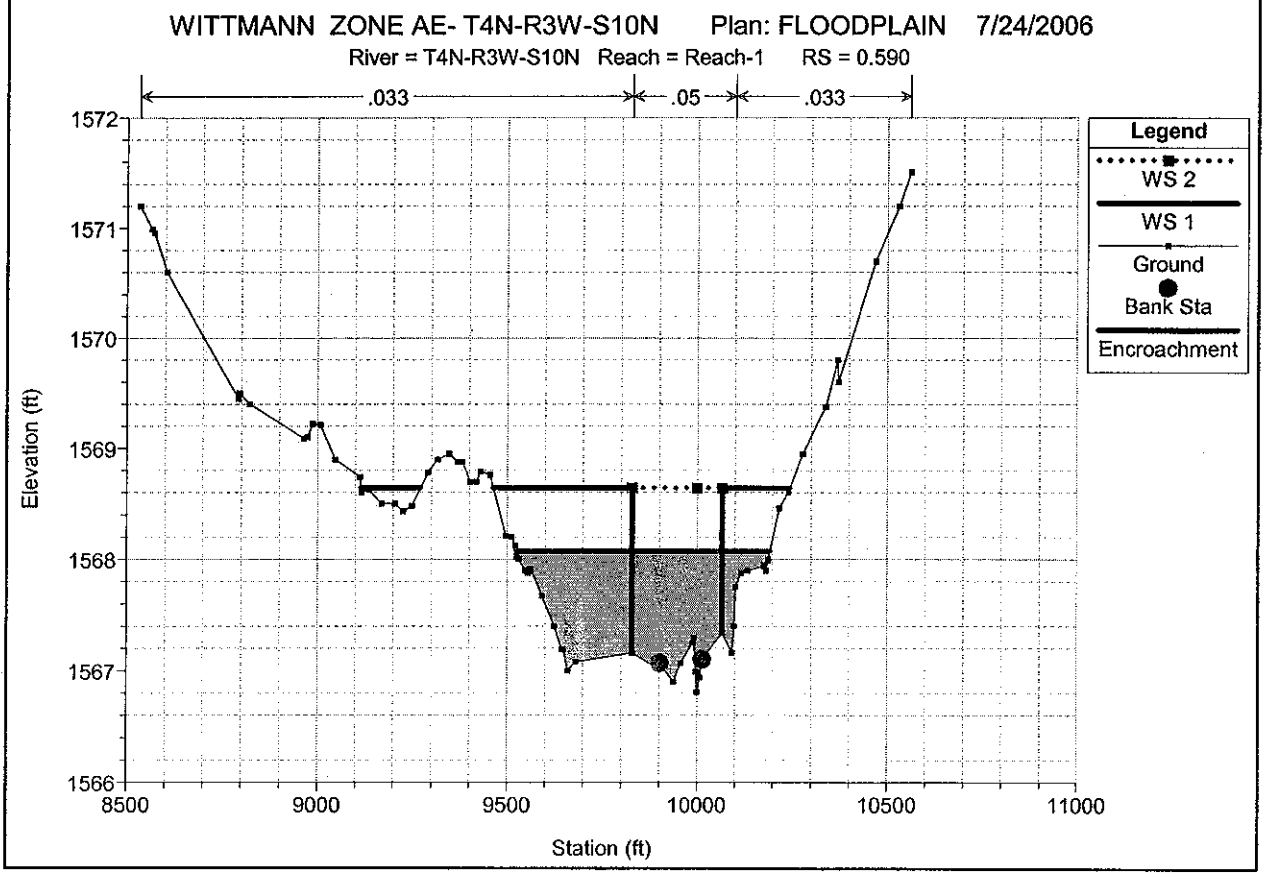

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 1.093 Levee added-Ridge not overtopped per rough BFE calcs
.035
.065
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1584.5
1584.0
1583.5
1583.0
1582.5
1582.0
1581.5
8500
9000
9500
10000
10500
11000
Station (ft)

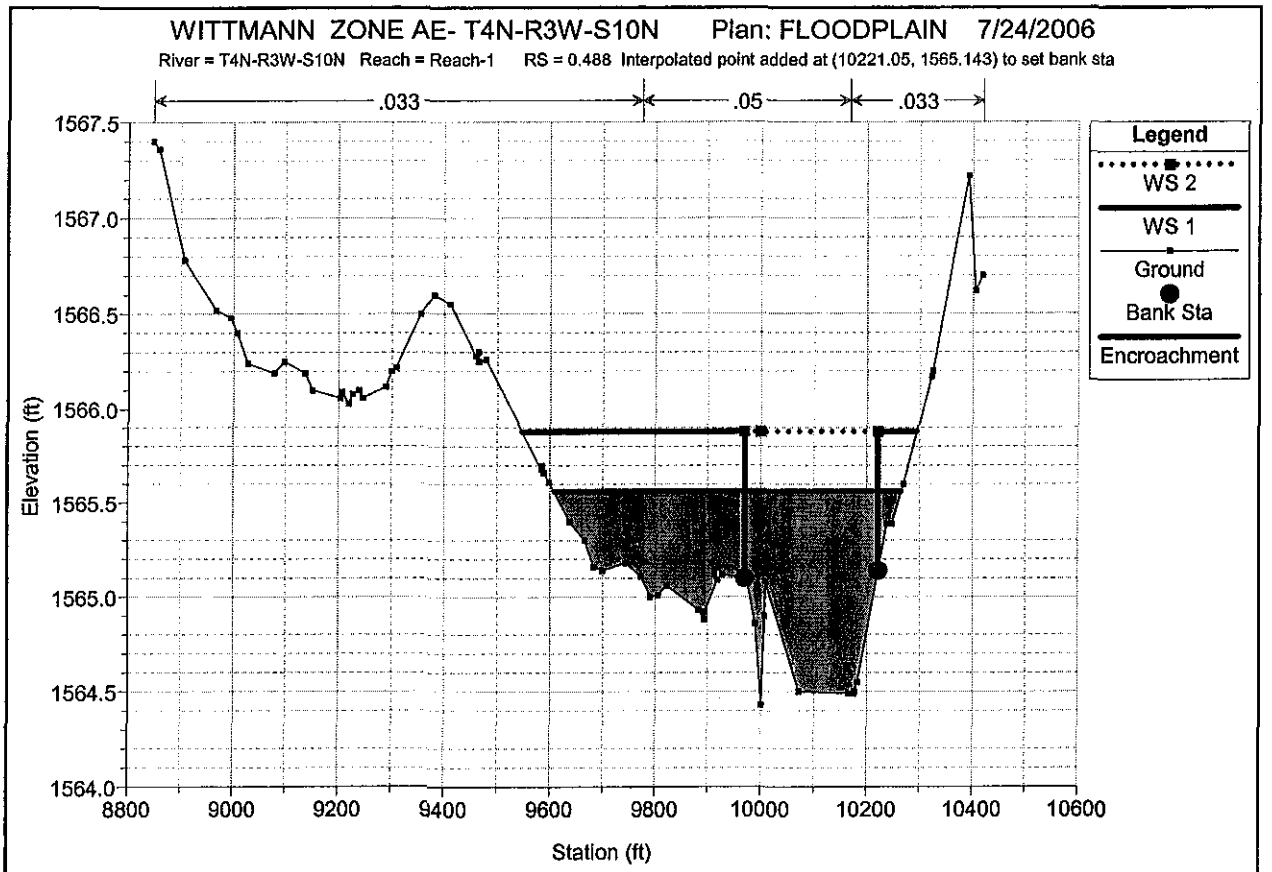

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.993
.035
.065
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1583.0
1582.5
1582.0
1581.5
1581.0
1580.5
1580.0
1579.5
1579.0
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

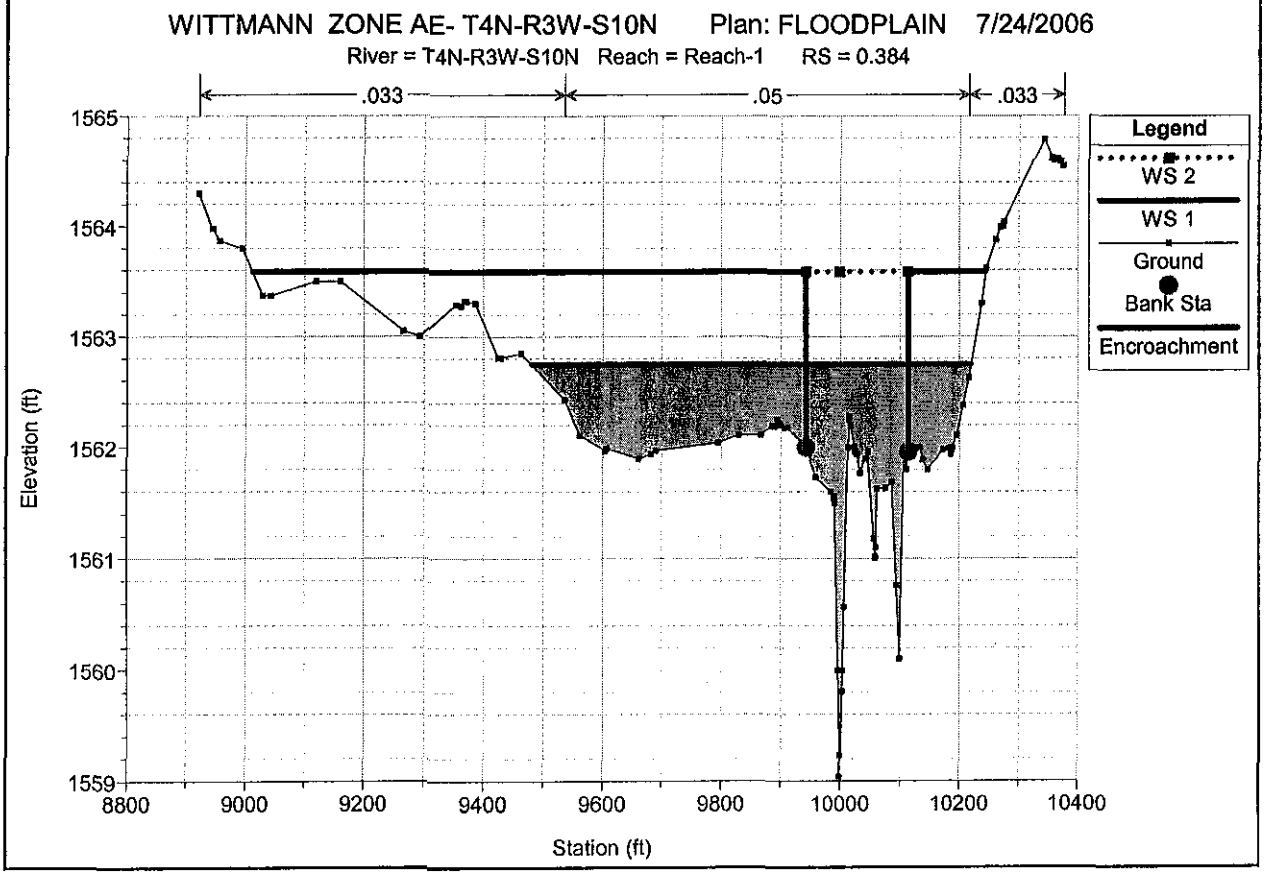

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.901 Interpolated point added at (10025.1, 1576.383) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1582
1581
1580
1579
1578
1577
1576
1575
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

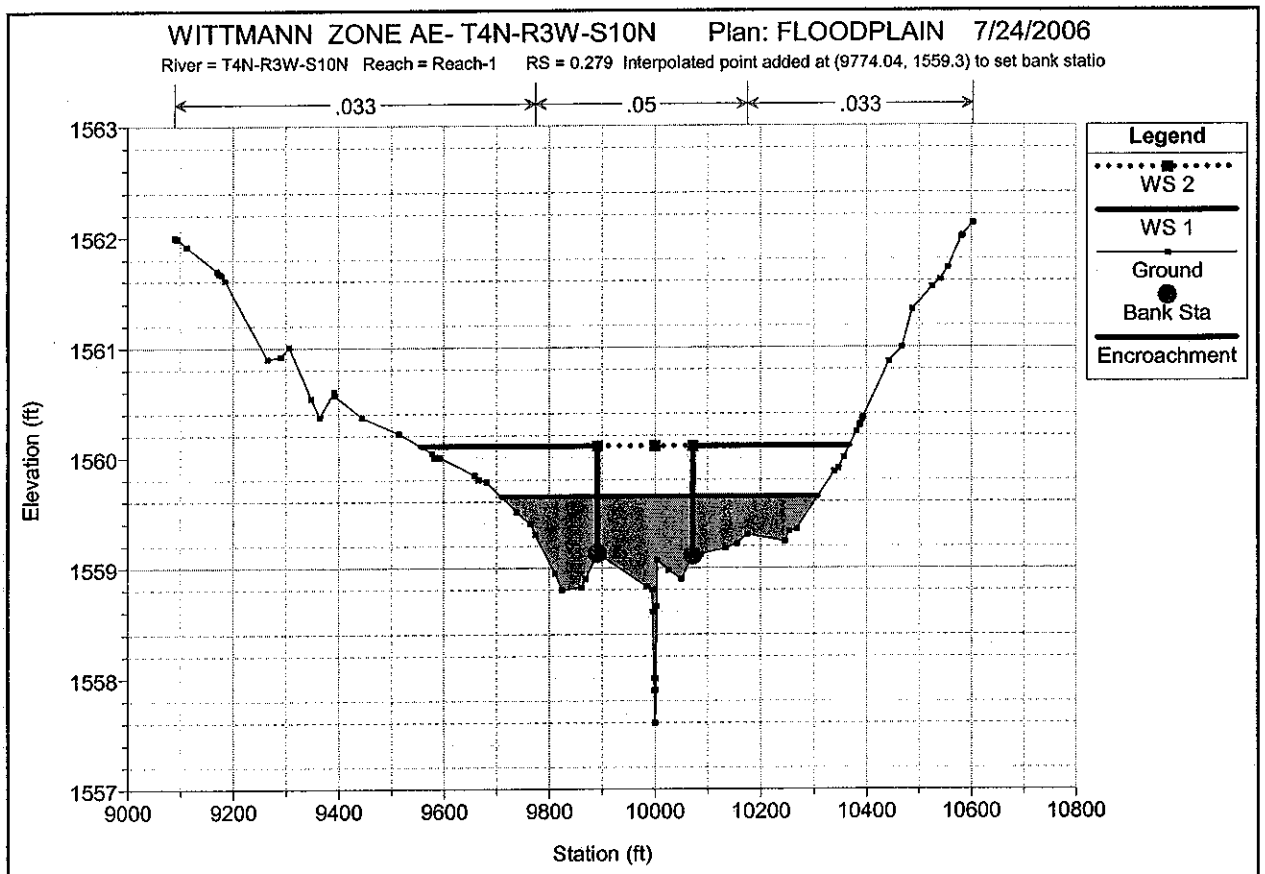

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.803 Interpolated point added at (9908.23, 1573.342) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1577
1576
1575
1574
1573
1572
1571
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

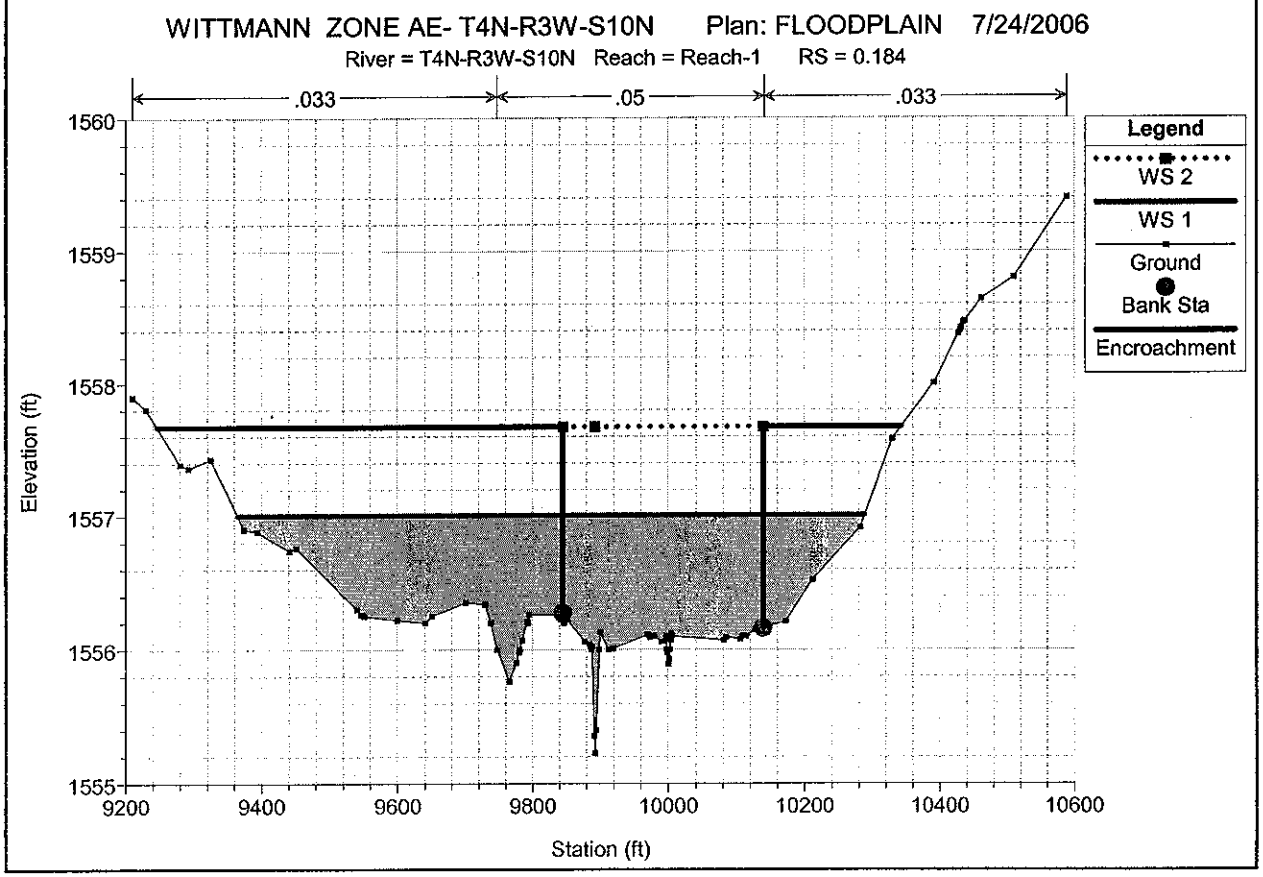

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.705 Levee added-Ridge not overtopped per BFE calcs
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1575
1574
1573
1572
1571
1570
1569
8500
9000
9500
10000
10500
11000
Station (ft)

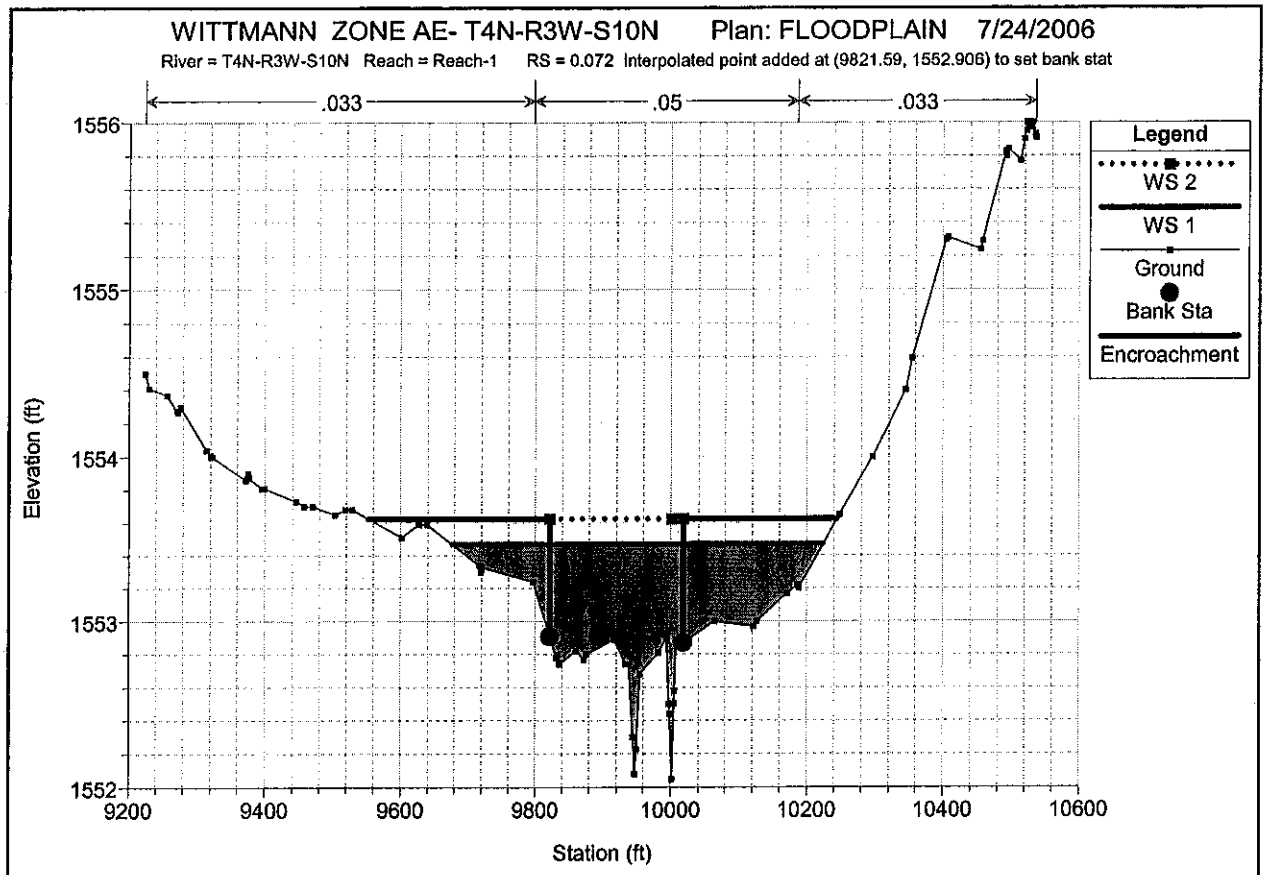

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.590
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1572
1571
1570
1569
1568
1567
1566
8500
9000
9500
10000
10500
11000
Station (ft)

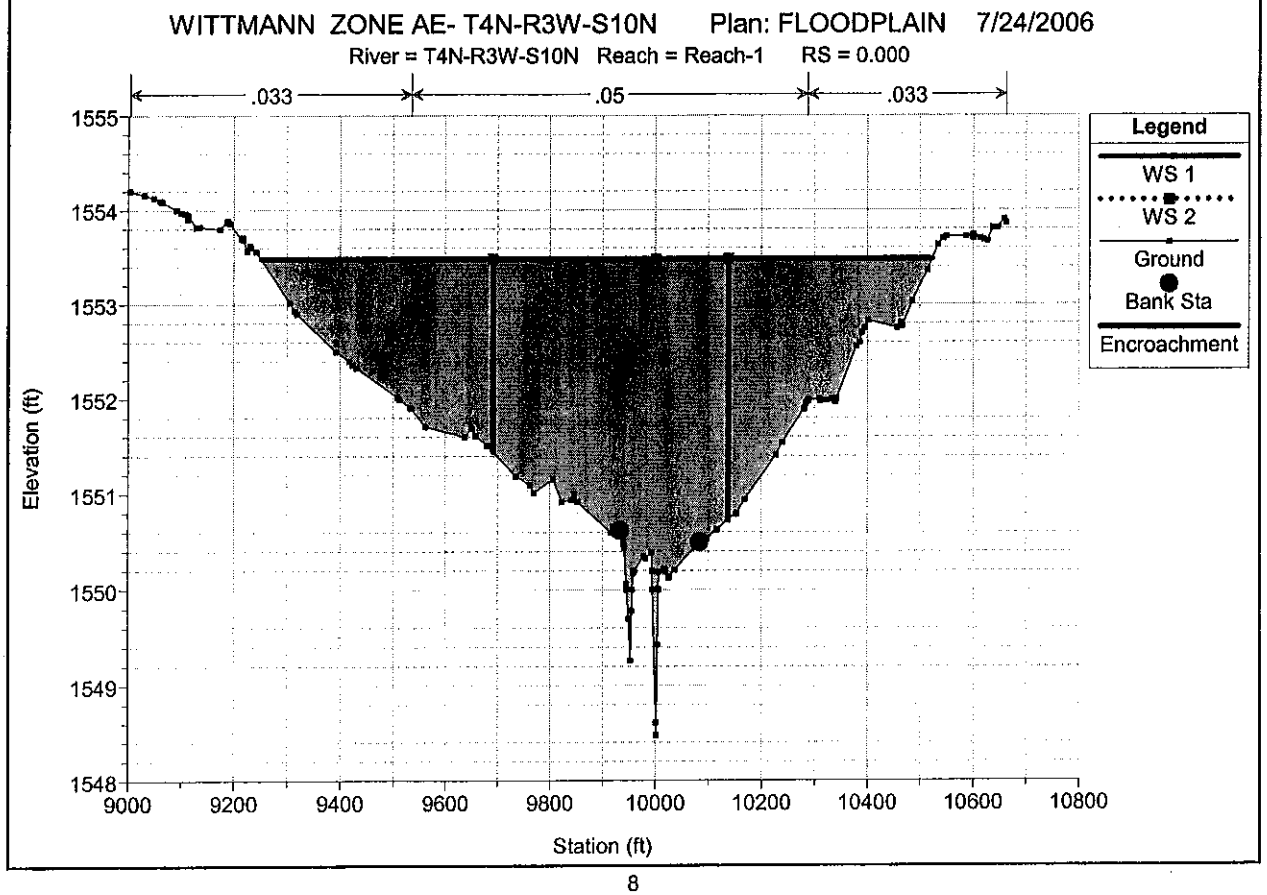

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.488 Interpolated point added at (10221.05, 1565.143) to set bank sta
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1567.5
1567.0
1566.5
1566.0
1565.5
1565.0
1564.5
1564.0
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

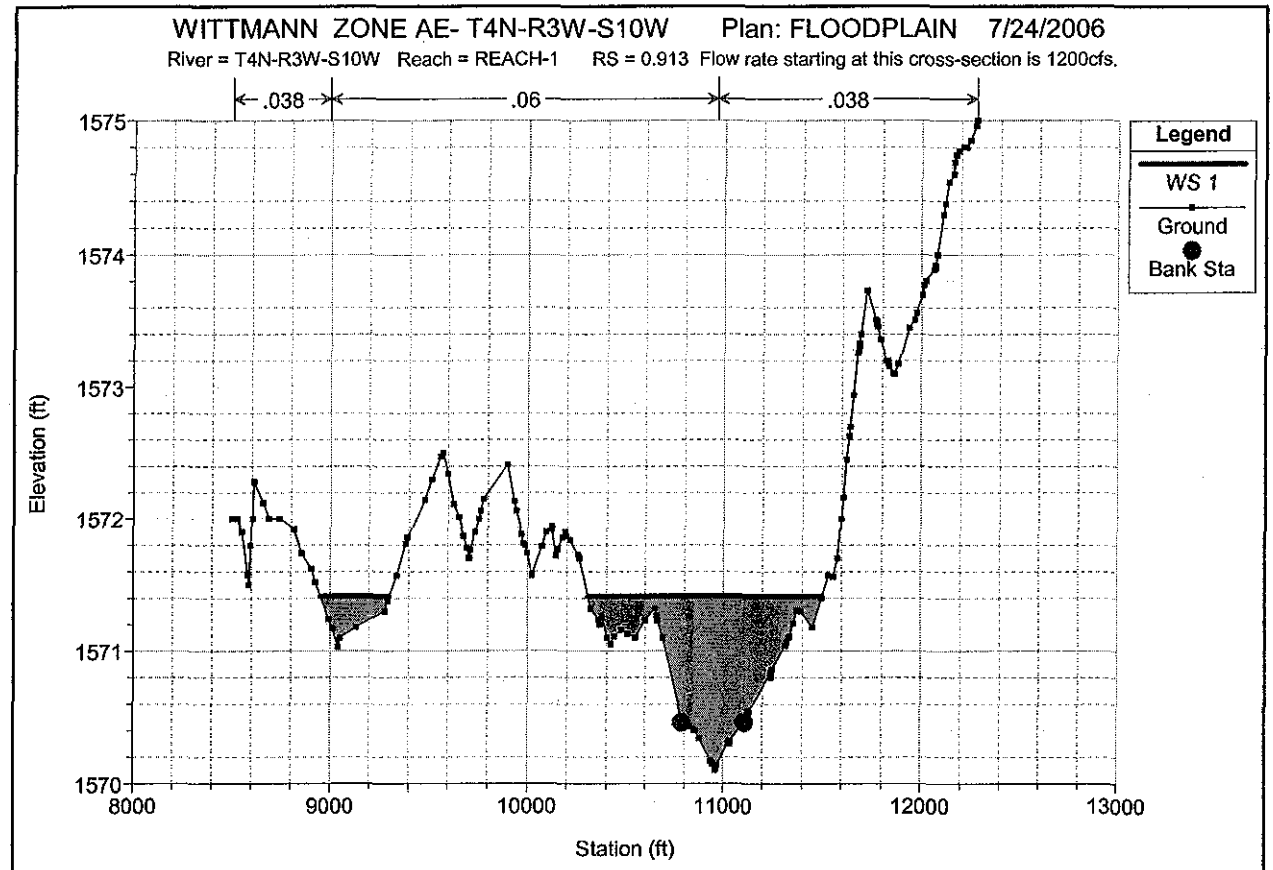

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.384
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1565
1564
1563
1562
1561
1560
1559
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

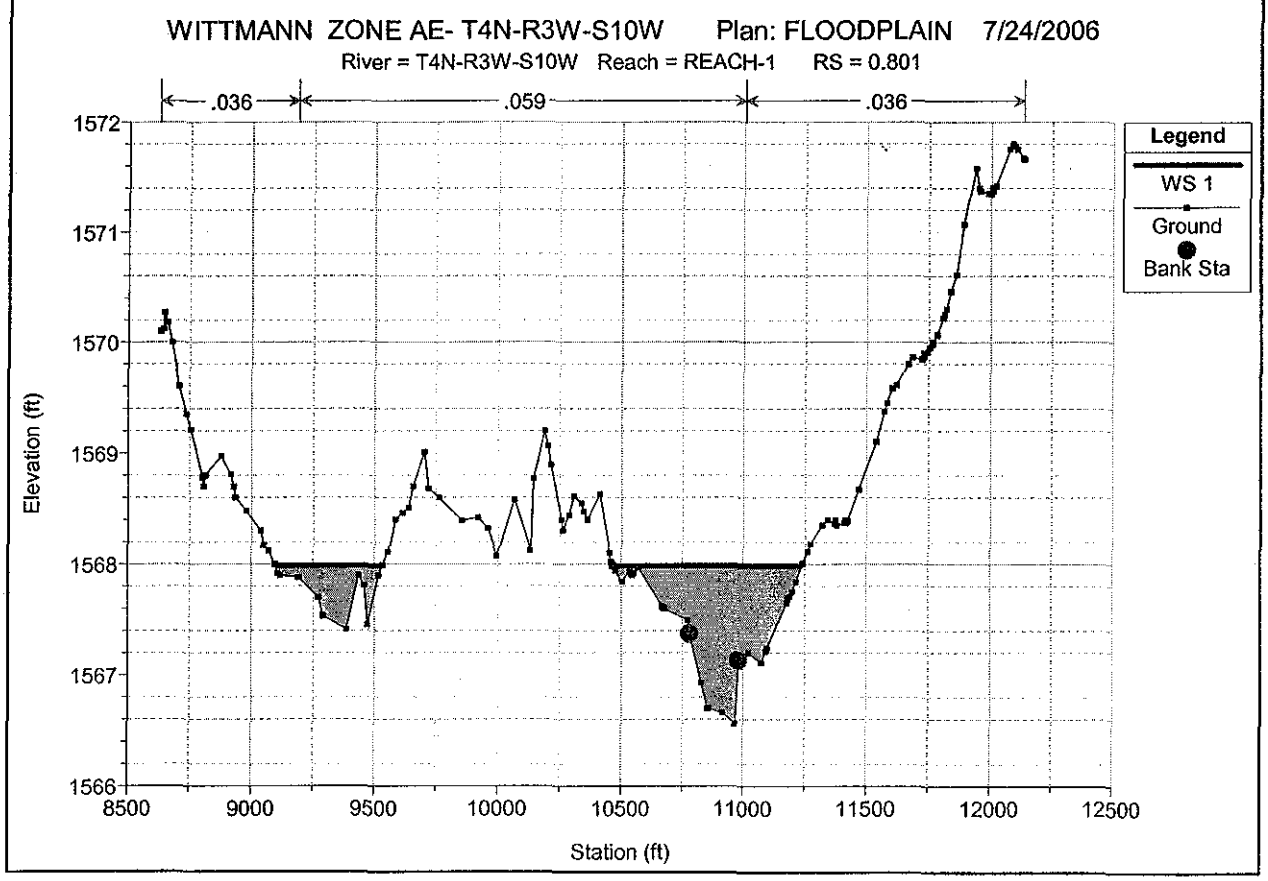

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.279 Interpolated point added at (9774.04, 1559.3) to set bank statio
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1563
1562
1561
1560
1559
1558
1557
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

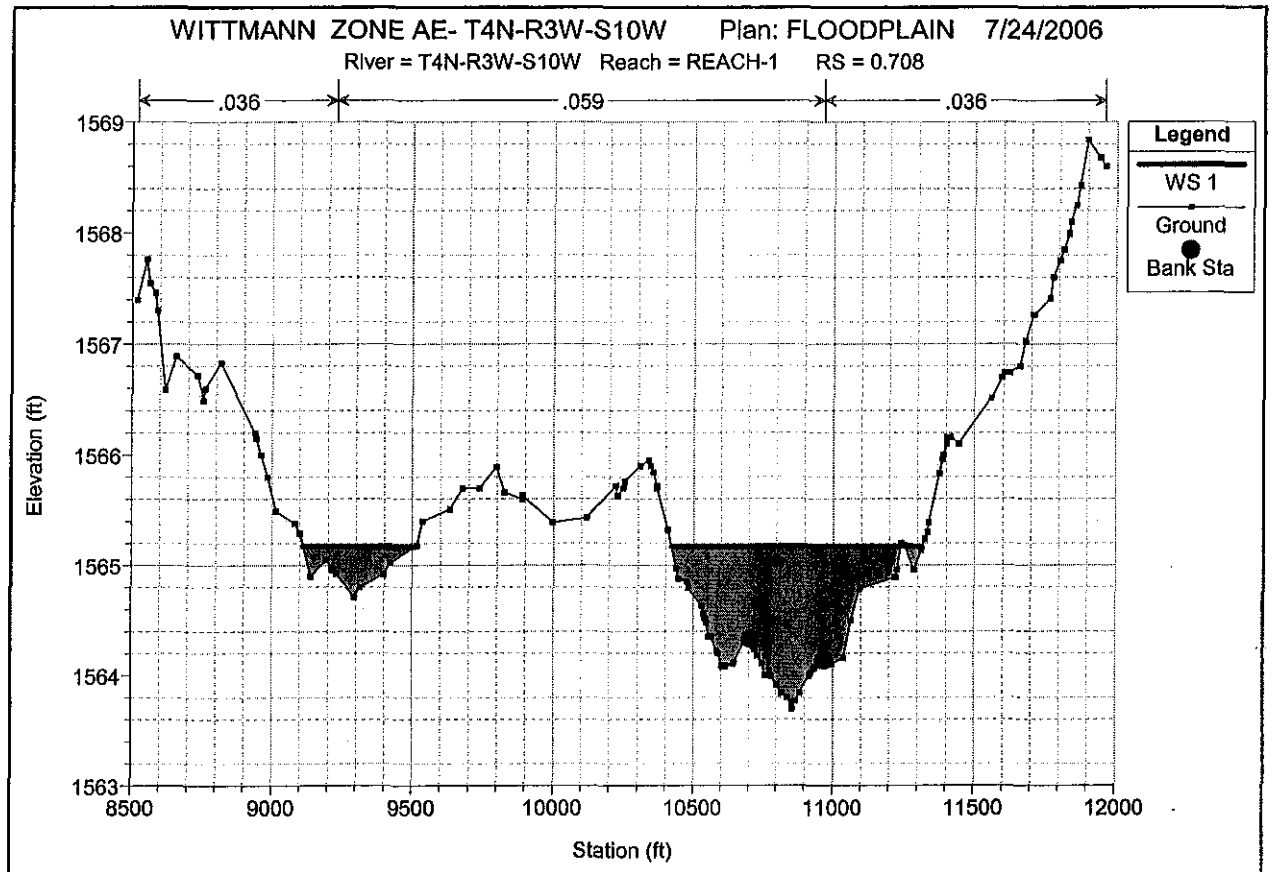

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.184
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1560
1559
1558
1557
1556
1555
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

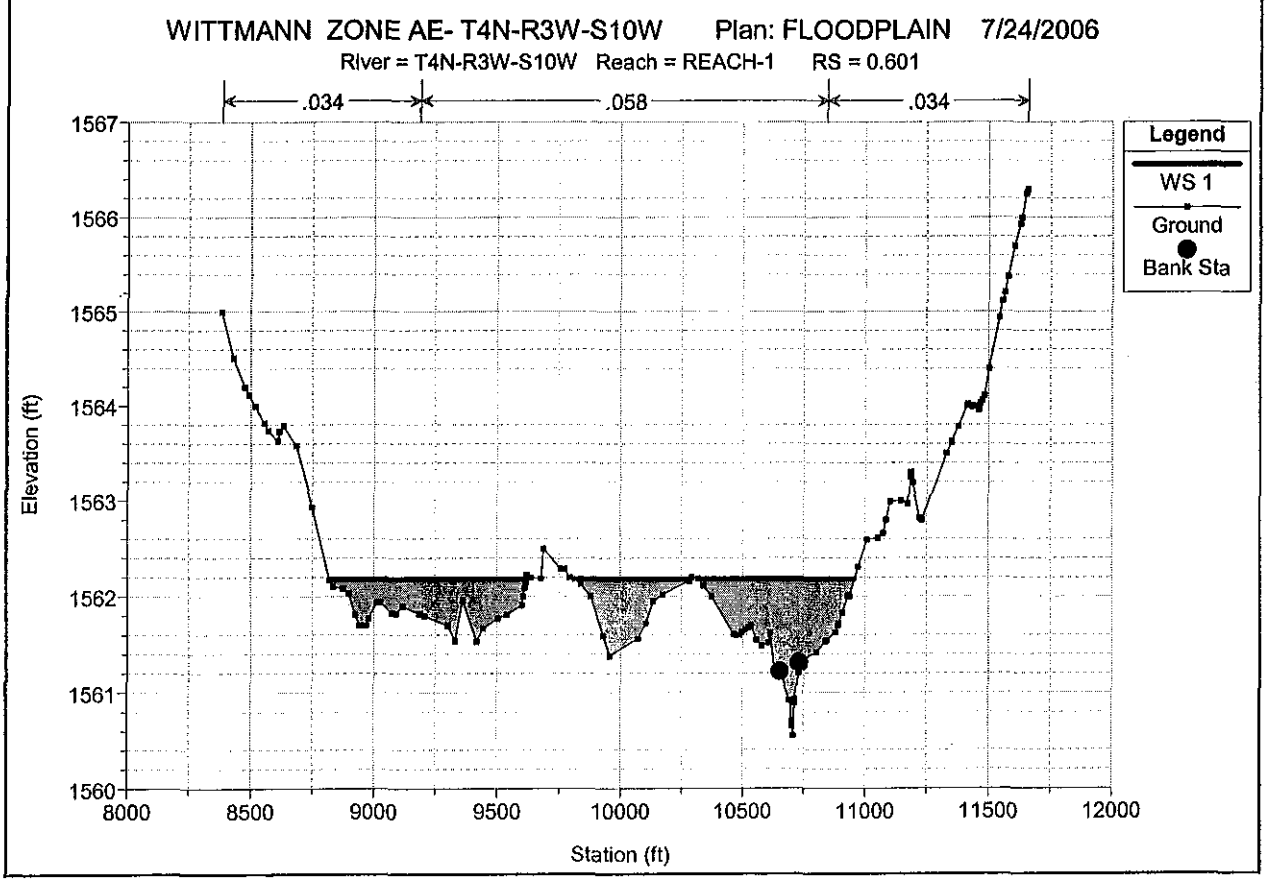

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.072 Interpolated point added at (9821.59, 1552.906) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1556
1555
1554
1553
1552
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

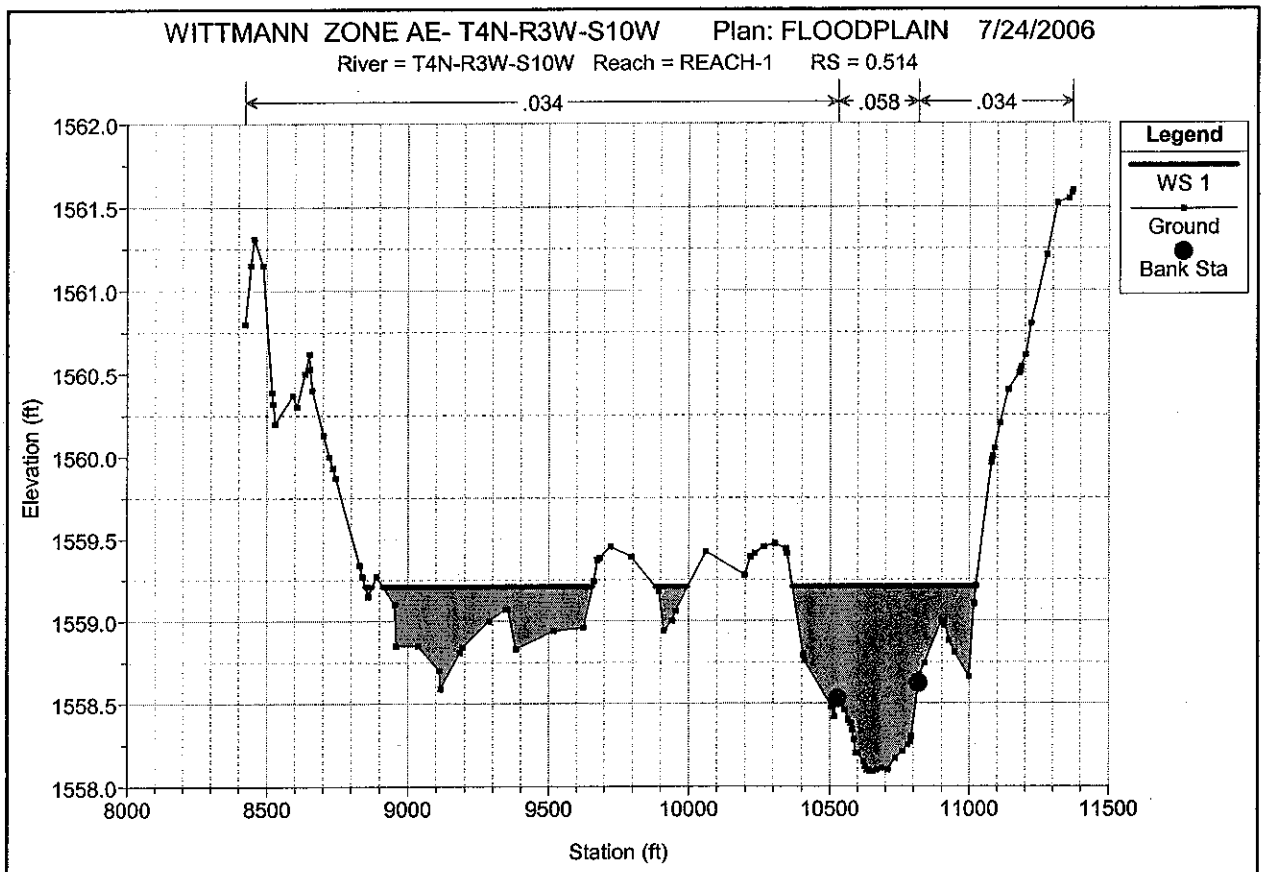

WITTMANN ZONE AE- T4N-R3W-S10N Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10N Reach = Reach-1 RS = 0.000
.033
.05
.033
Legend
WS 1
WS 2
Ground
Bank Sta
Encroachment
Elevation (ft)
1555
1554
1553
1552
1551
1550
1549
1548
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

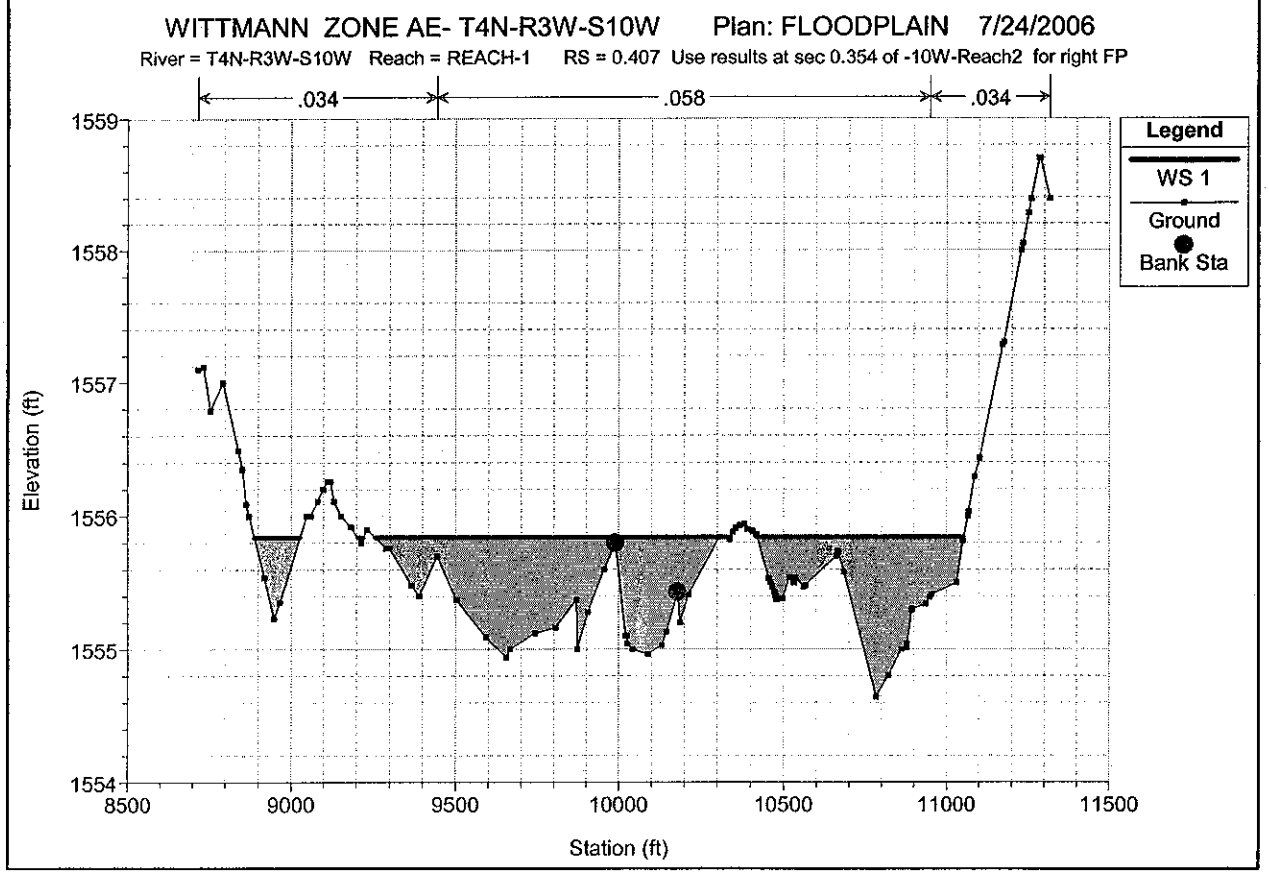

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.913 Flow rate starting at this cross-section is 1200cfs.
.038
.06
.038
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1575
1574
1573
1572
1571
1570
8000
9000
10000
11000
12000
13000
Station (ft)

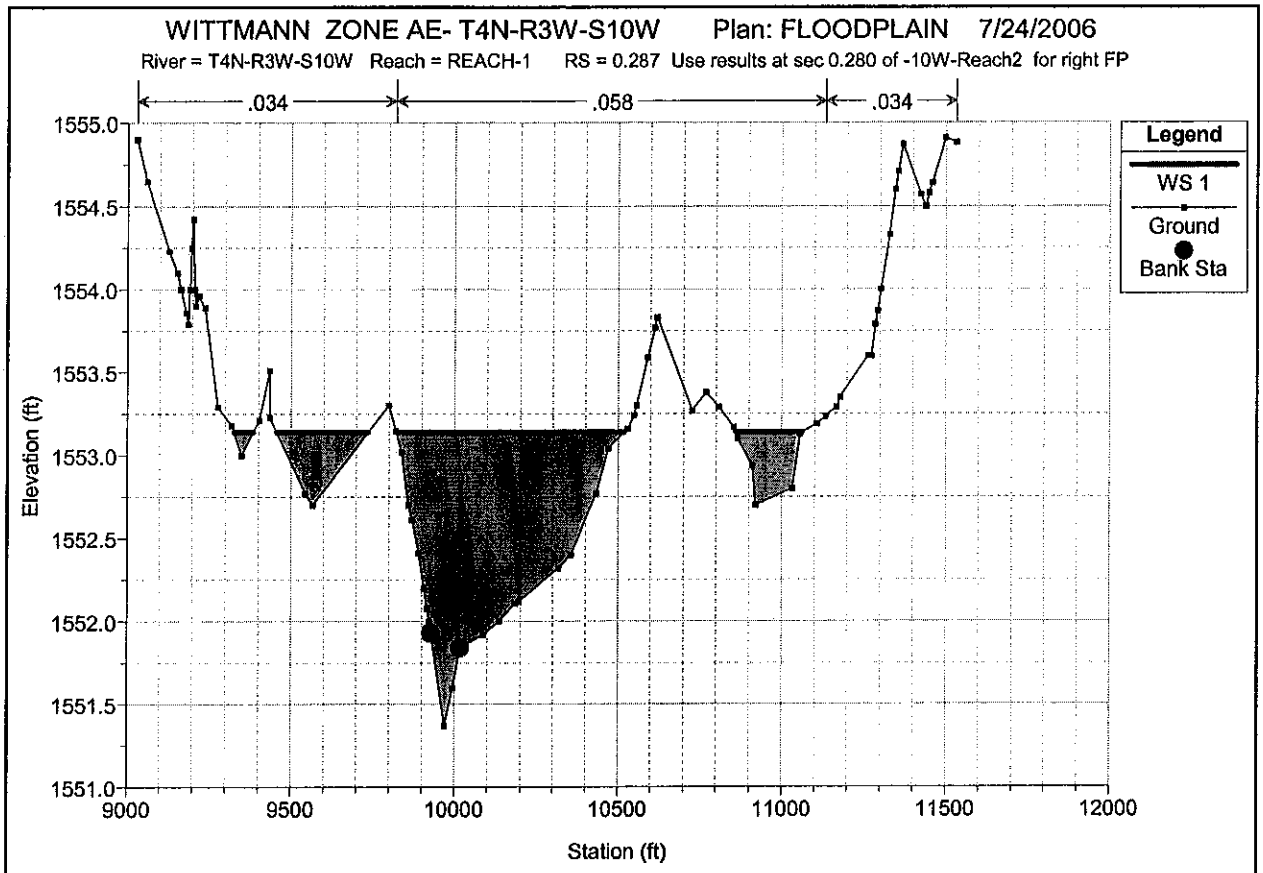

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.801
.036
.059
.036
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1572
1571
1570
1569
1568
1567
1566
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

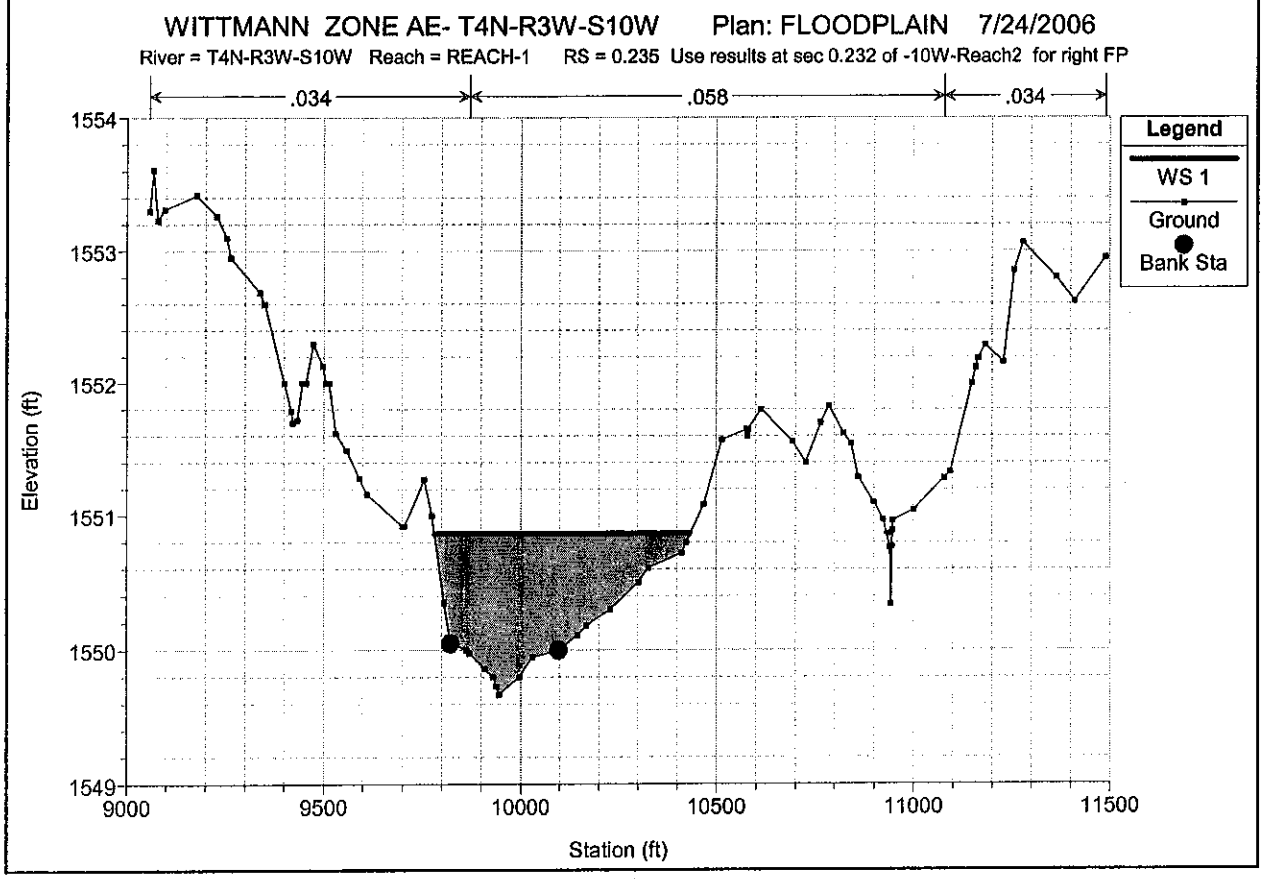

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.708
.036
.059
.036
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1569
1568
1567
1566
1565
1564
1563
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

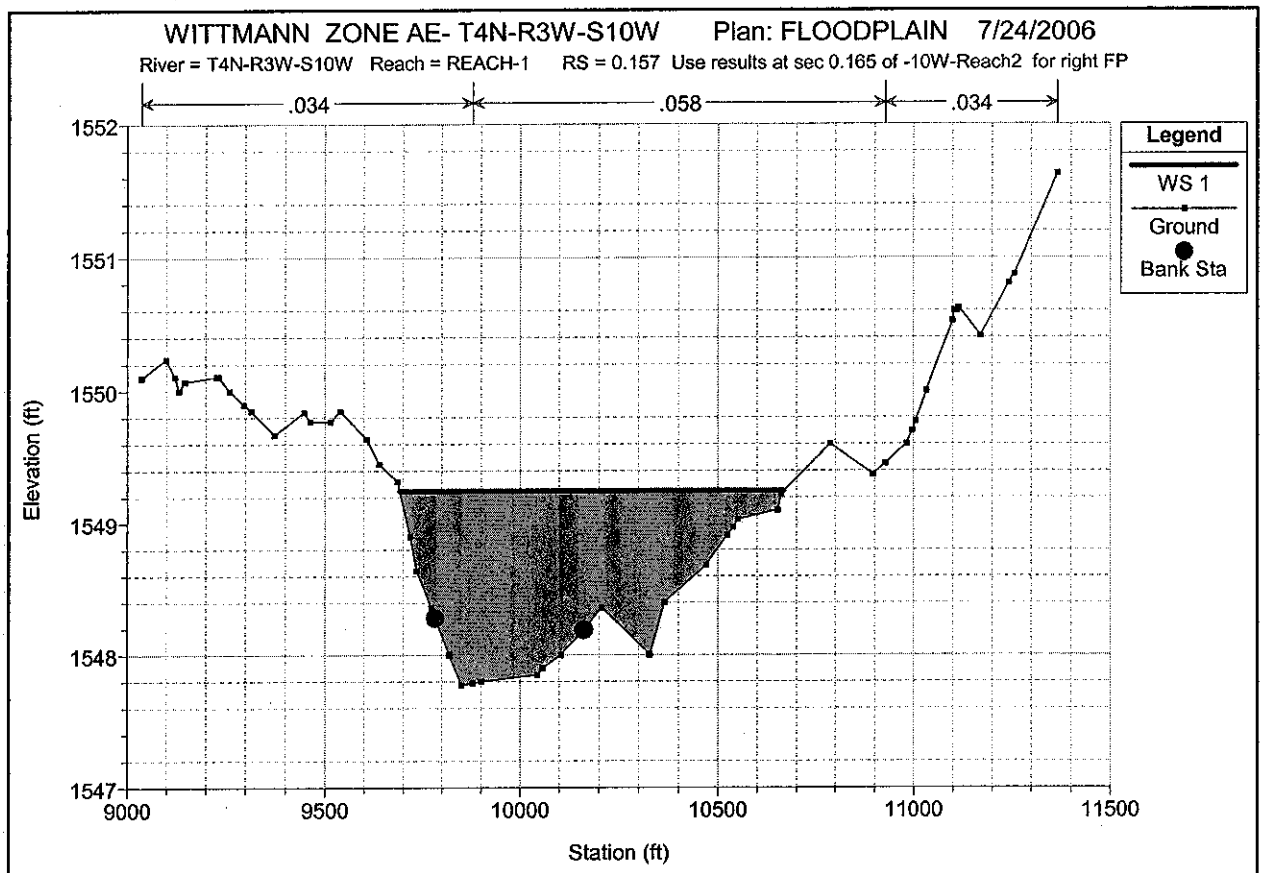

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.601
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1567
1566
1565
1564
1563
1562
1561
1560
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

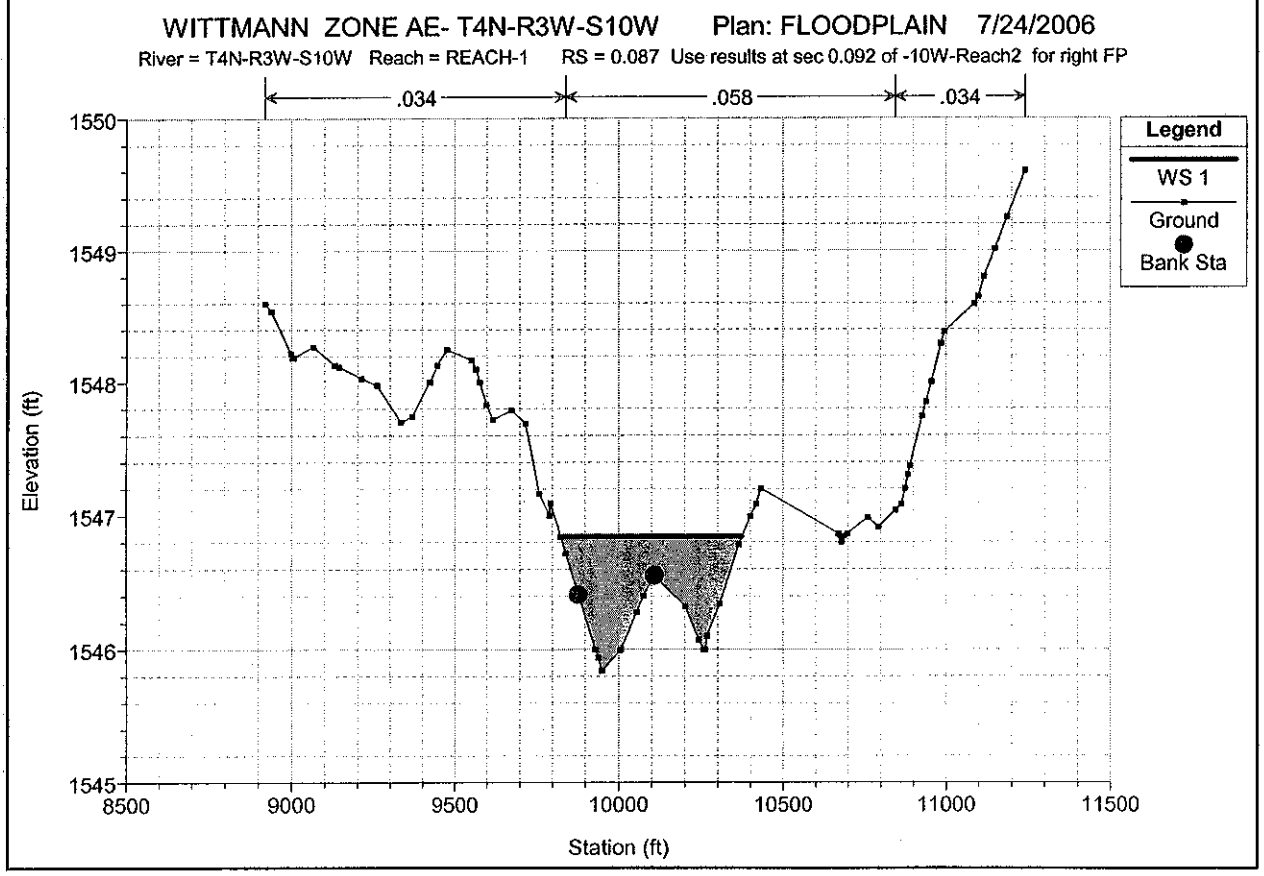

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.514
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1562.0
1561.5
1561.0
1560.5
1560.0
1559.5
1559.0
1558.5
1558.0
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

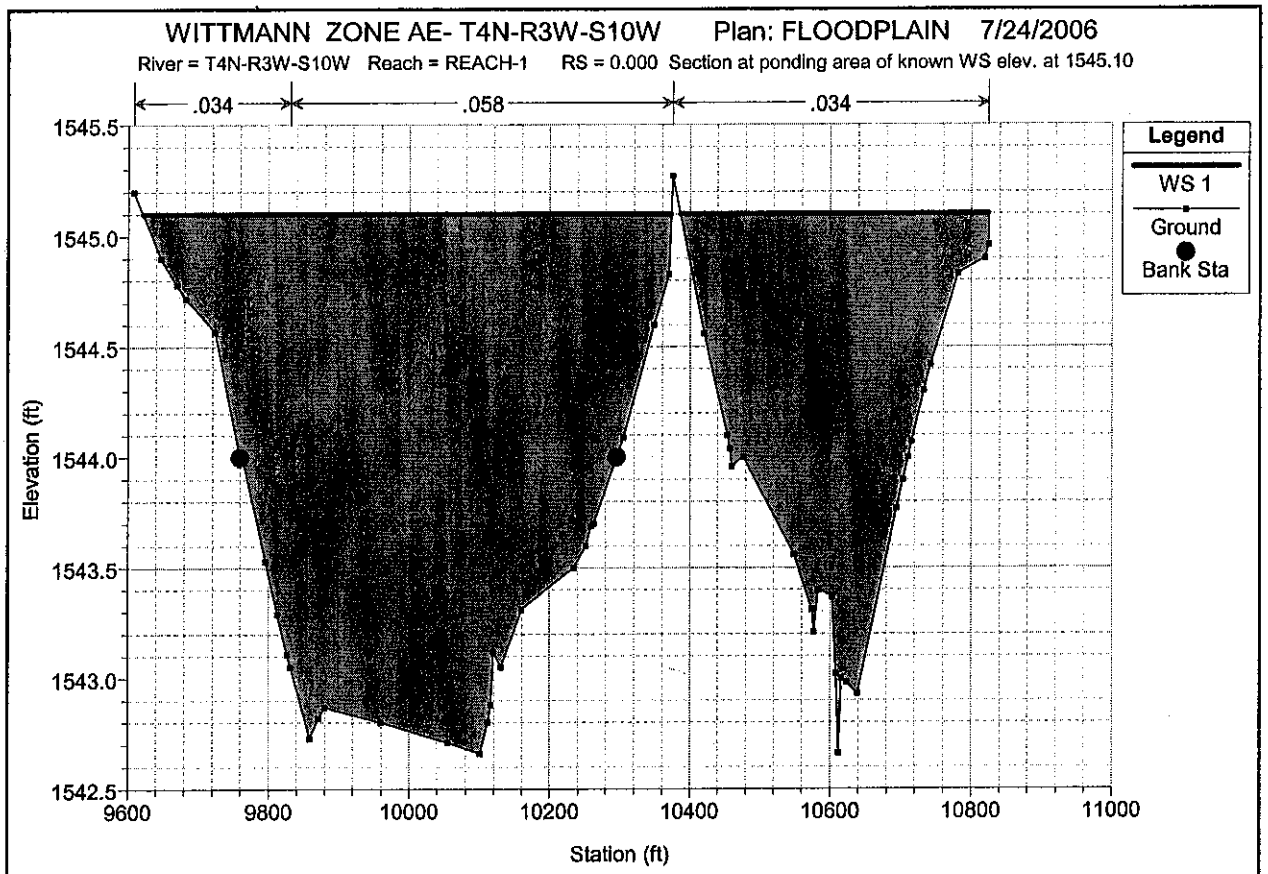

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.407 Use results at sec 0.354 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1559
1558
1557
1556
1555
1554
8500
9000
9500
10000
10500
11000
11500
Station (ft)

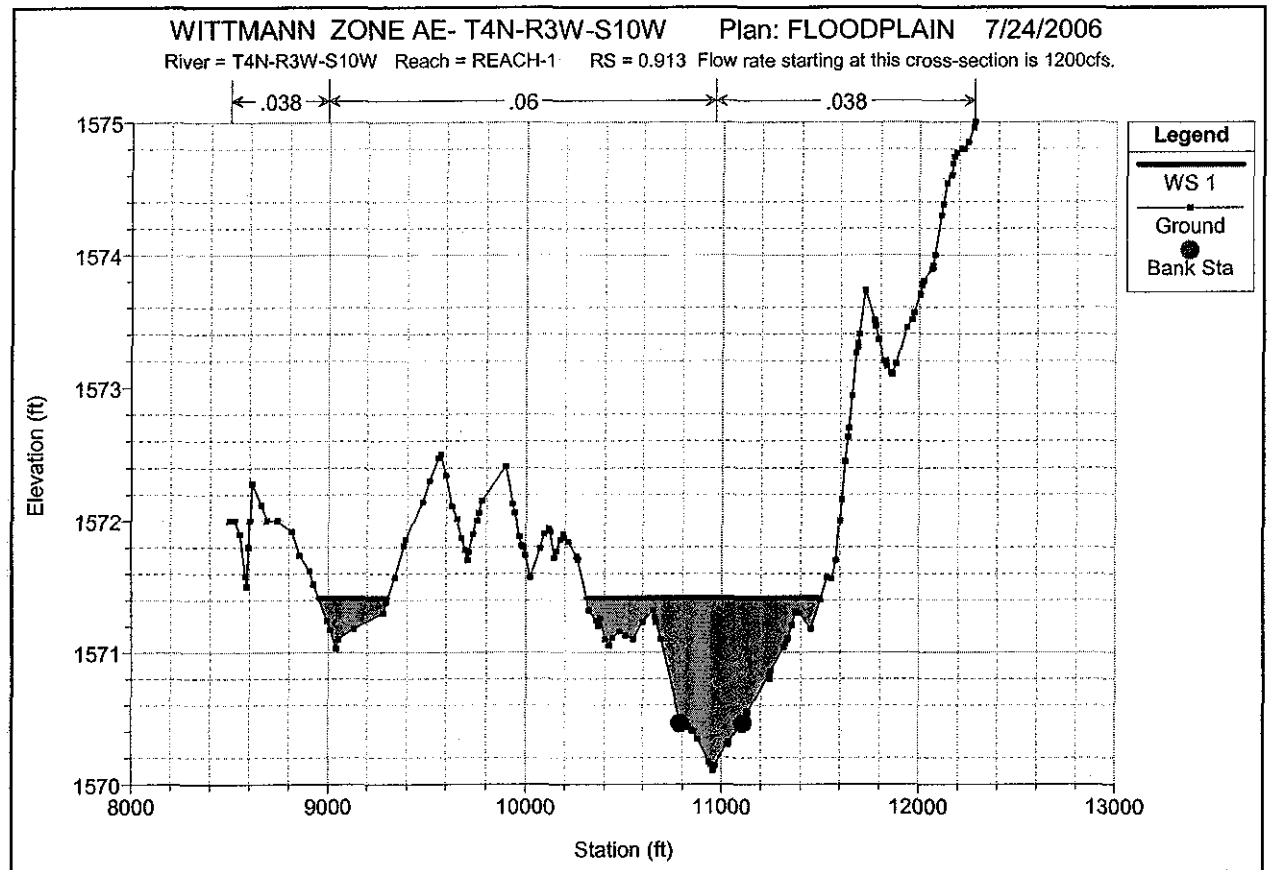

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.287 Use results at sec 0.280 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1555.0
1554.5
1554.0
1553.5
1553.0
1552.5
1552.0
1551.5
1551.0
9000
9500
10000
10500
11000
11500
12000
Station (ft)

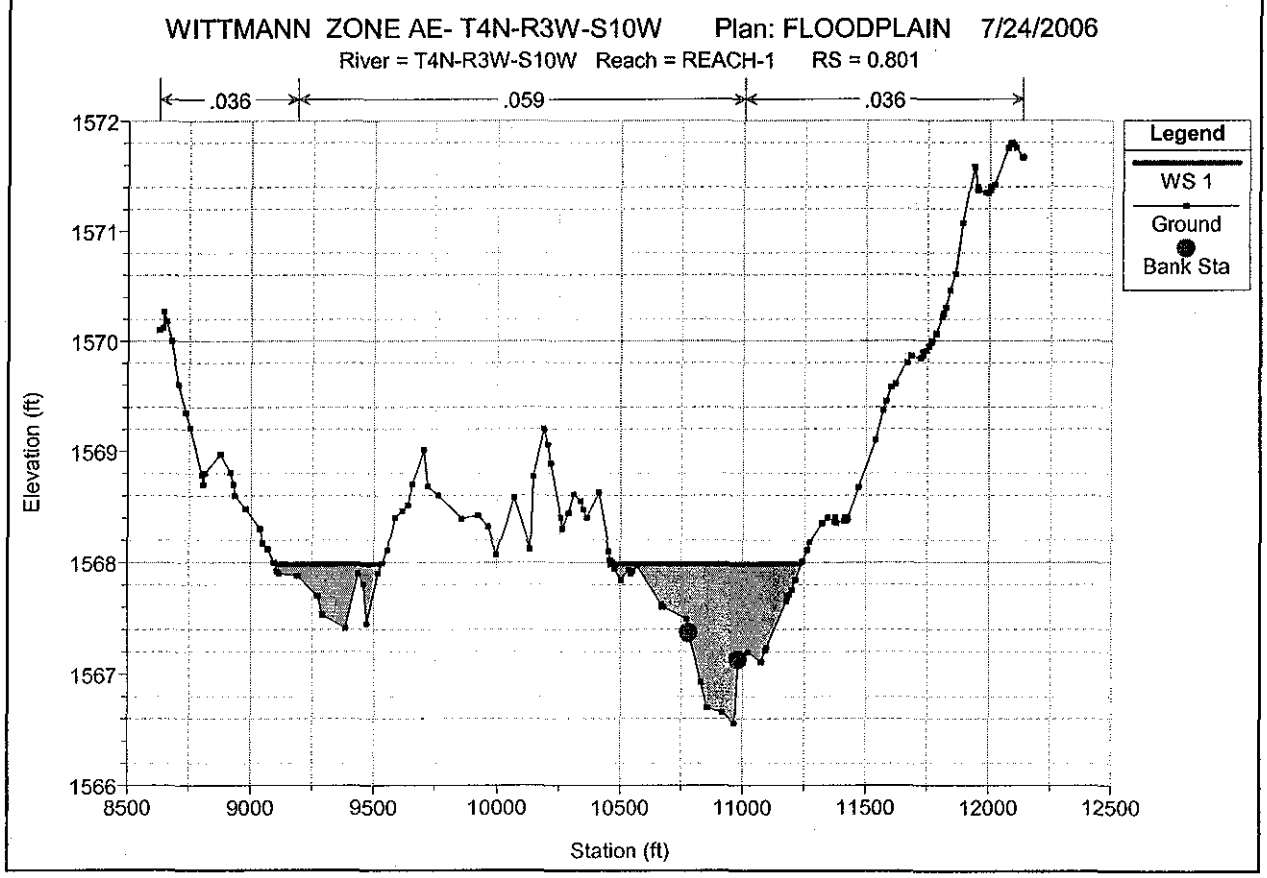

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.235 Use results at sec 0.232 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1554
1553
1552
1551
1550
1549
9000
9500
10000
10500
11000
11500
Station (ft)

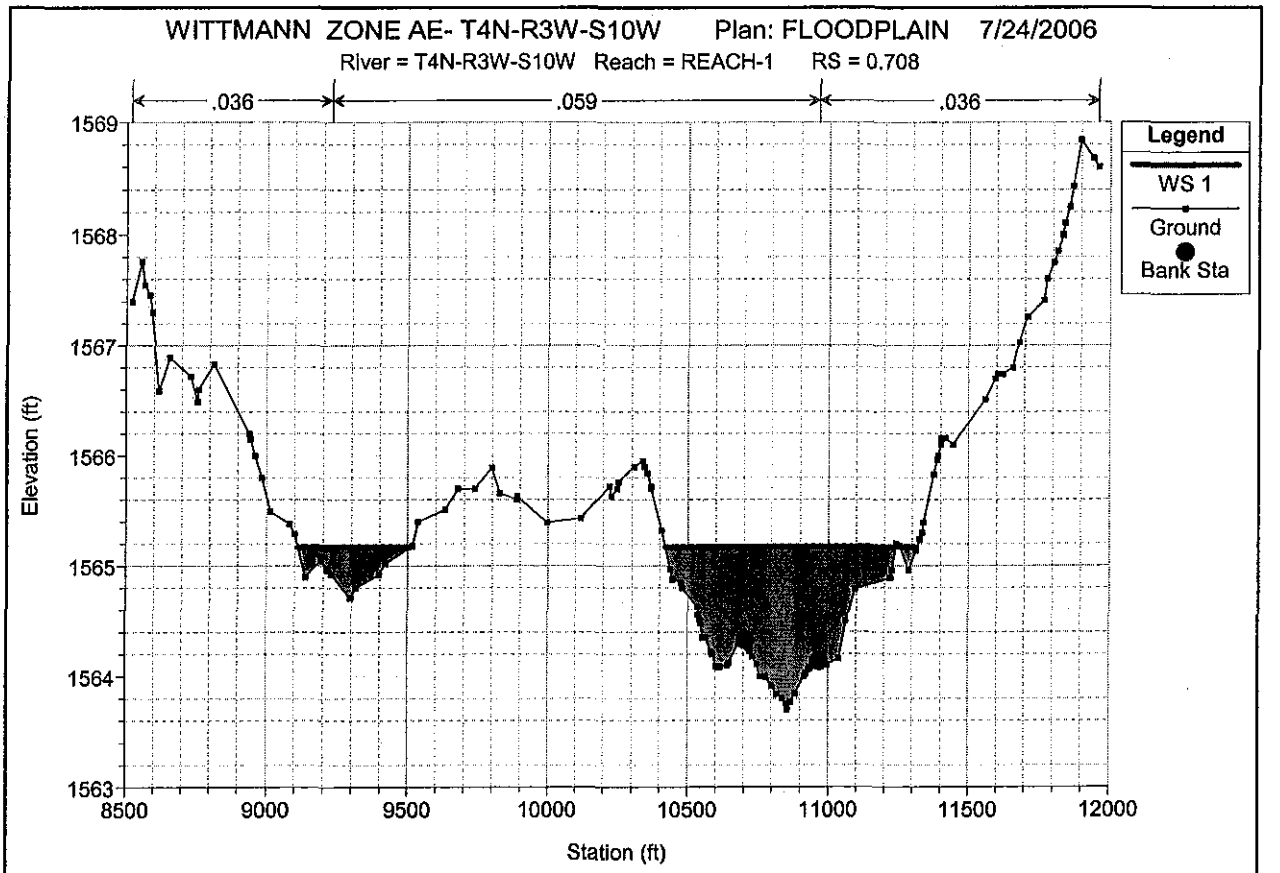

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.157 Use results at sec 0.165 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1552
1551
1550
1549
1548
1547
9000
9500
10000
10500
11000
11500
Station (ft)

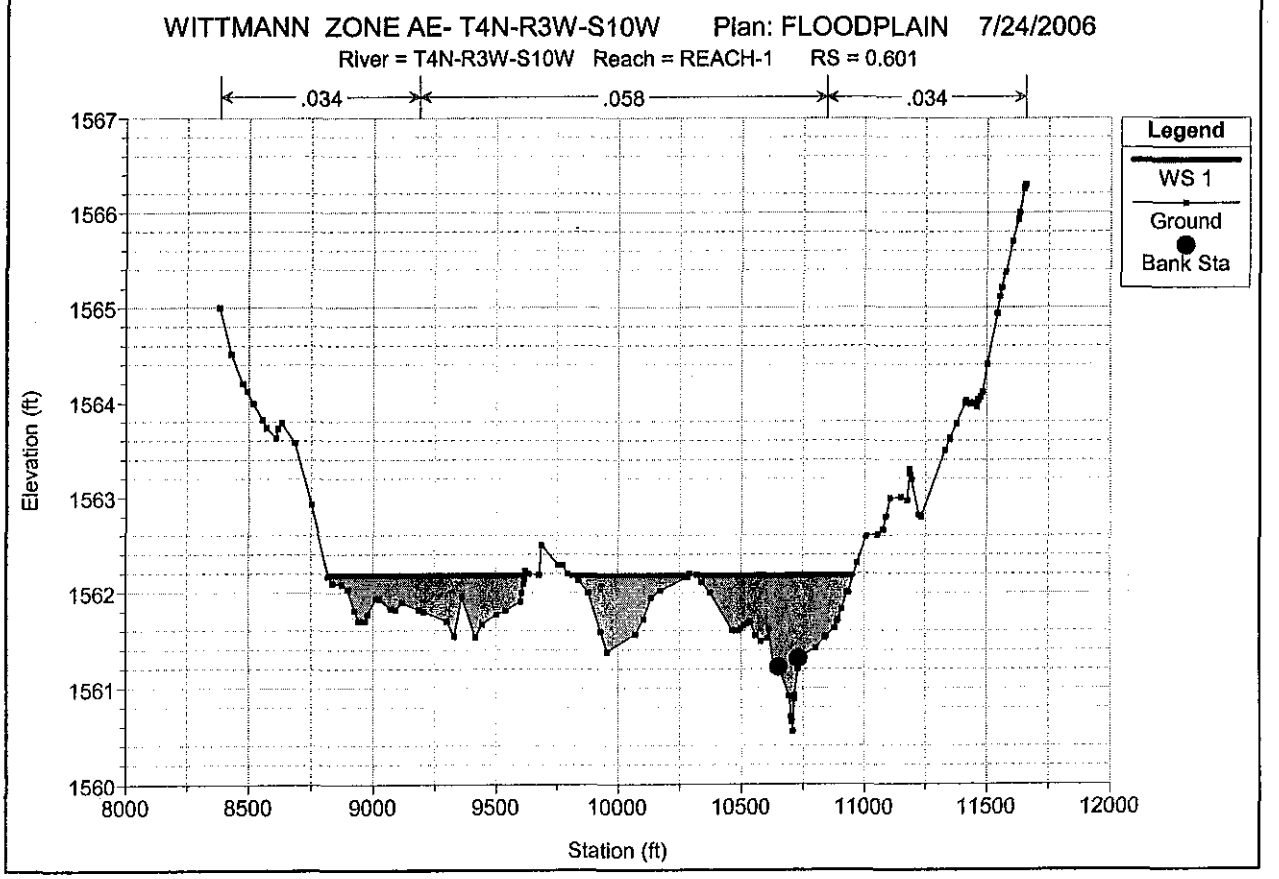

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.087 Use results at sec 0.092 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1550
1549
1548
1547
1546
1545
8500
9000
9500
10000
10500
11000
11500
Station (ft)

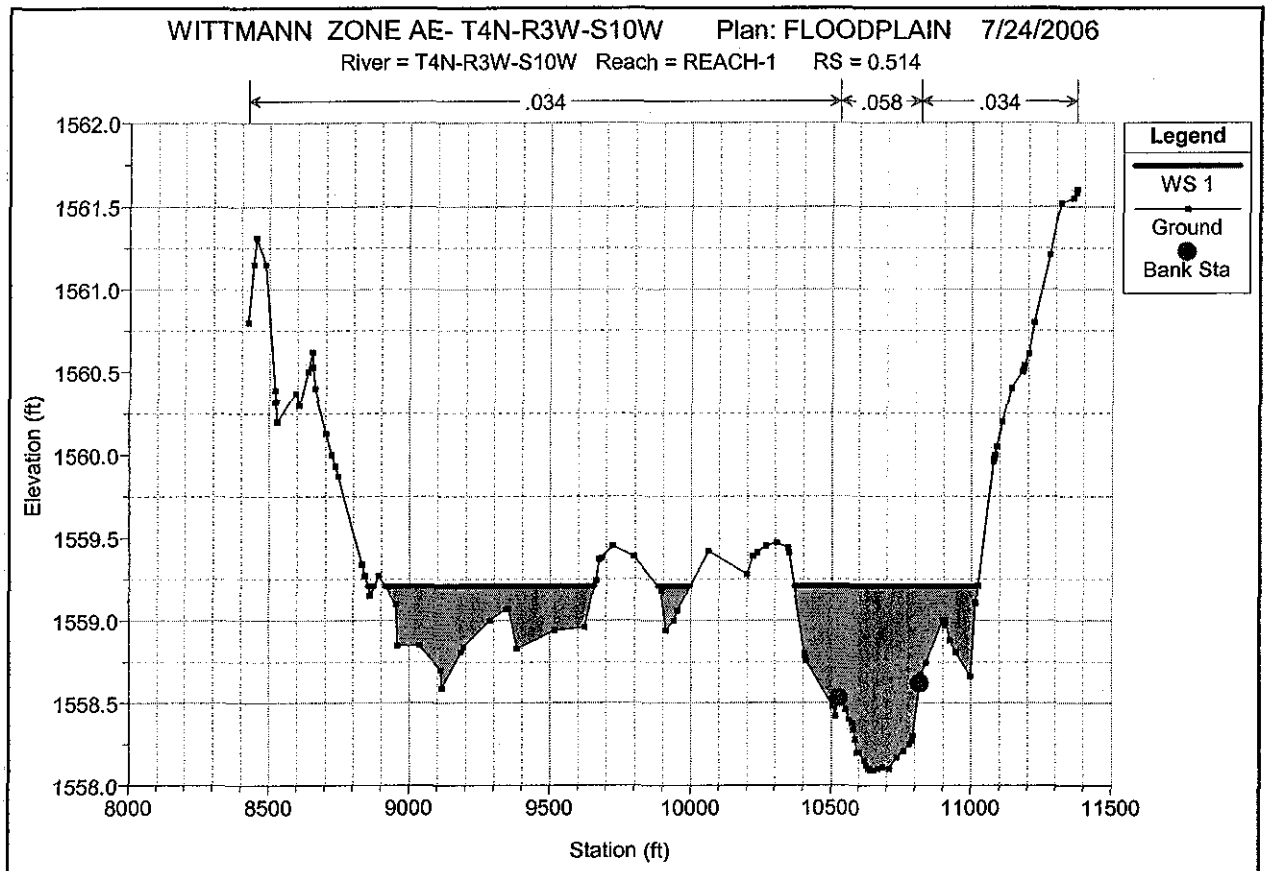

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.000 Section at ponding area of known WS elev. at 1545.10
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1545.5
1545.0
1544.5
1544.0
1543.5
1543.0
1542.5
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

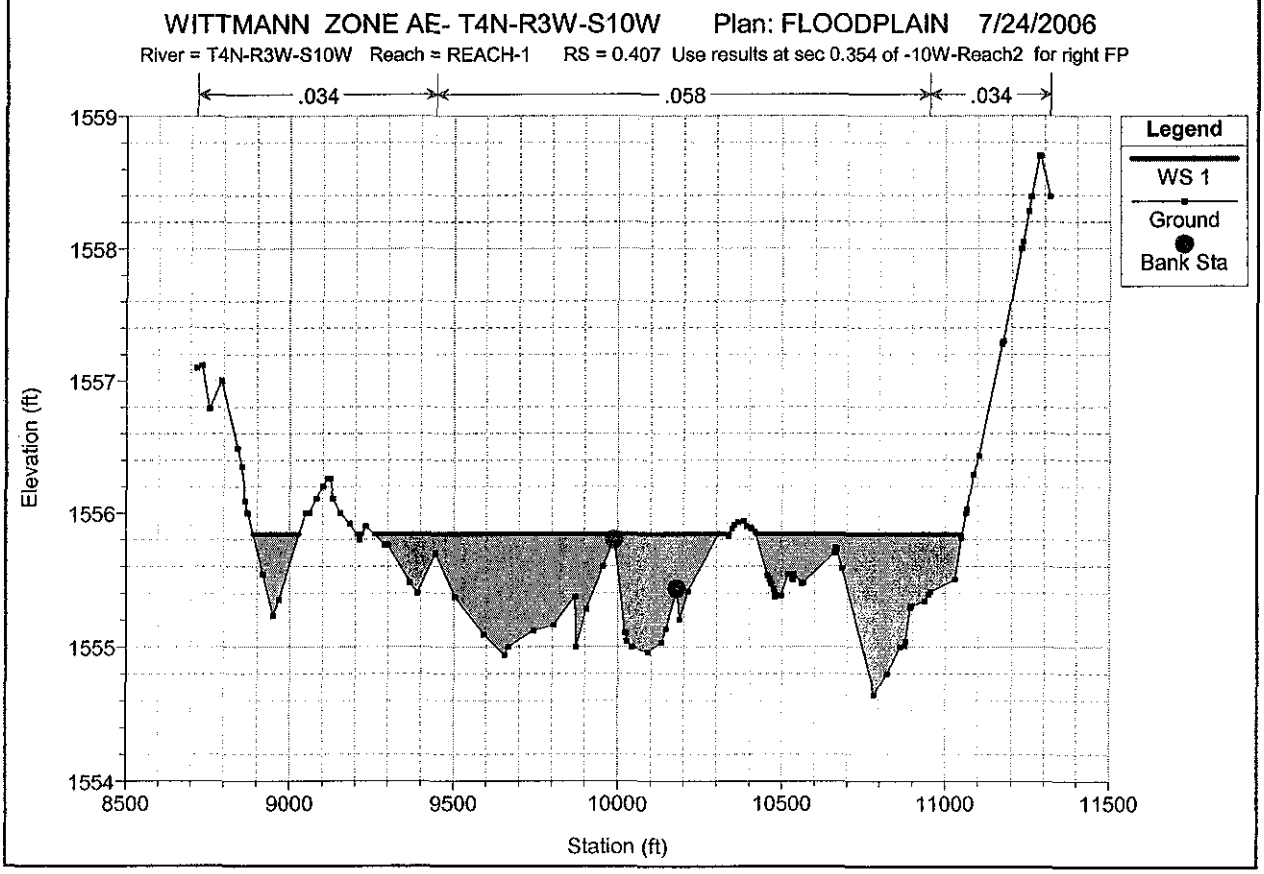

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.913 Flow rate starting at this cross-section is 1200cfs.
.038
.06
.038
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1575
1574
1573
1572
1571
1570
8000
9000
10000
11000
12000
13000
Station (ft)

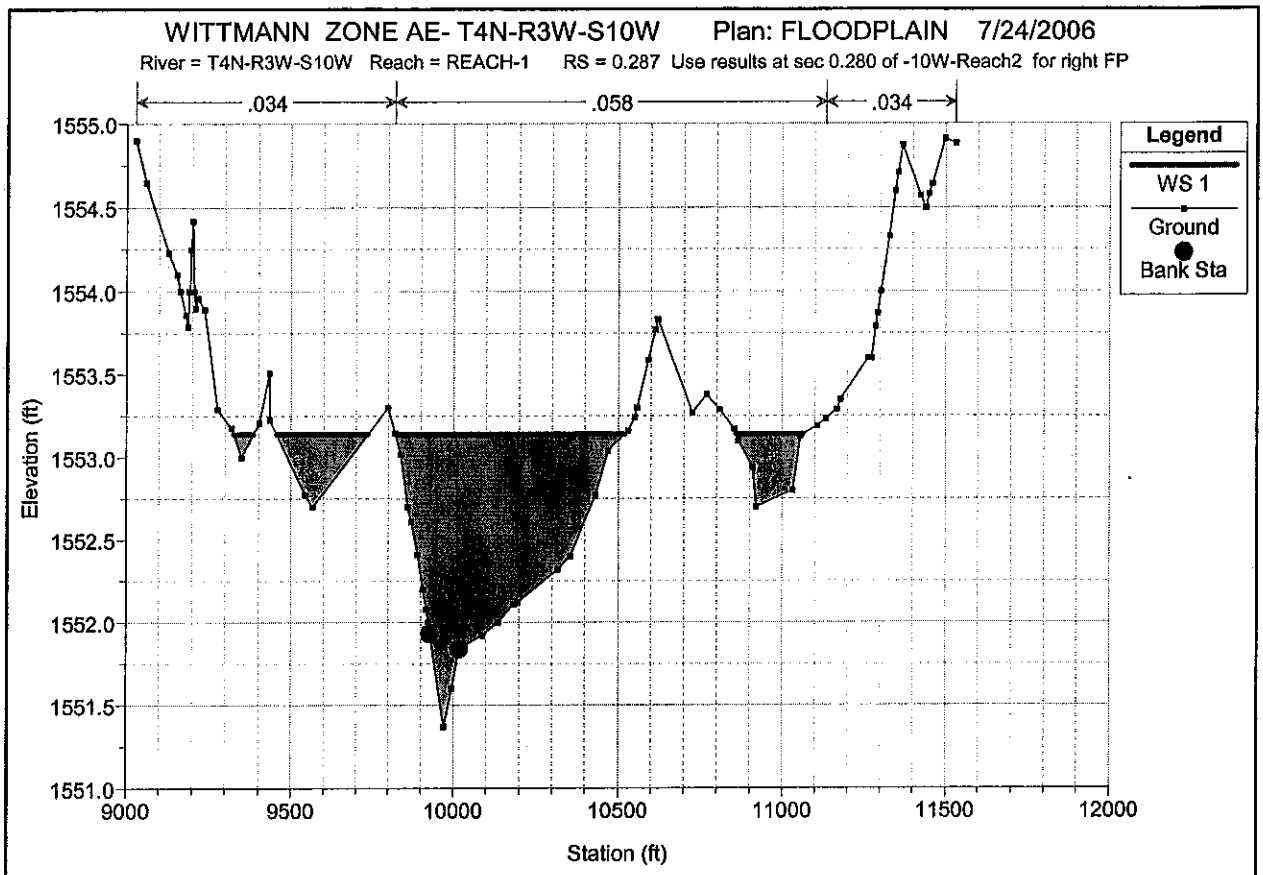

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.801
.036
.059
.036
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1572
1571
1570
1569
1568
1567
1566
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

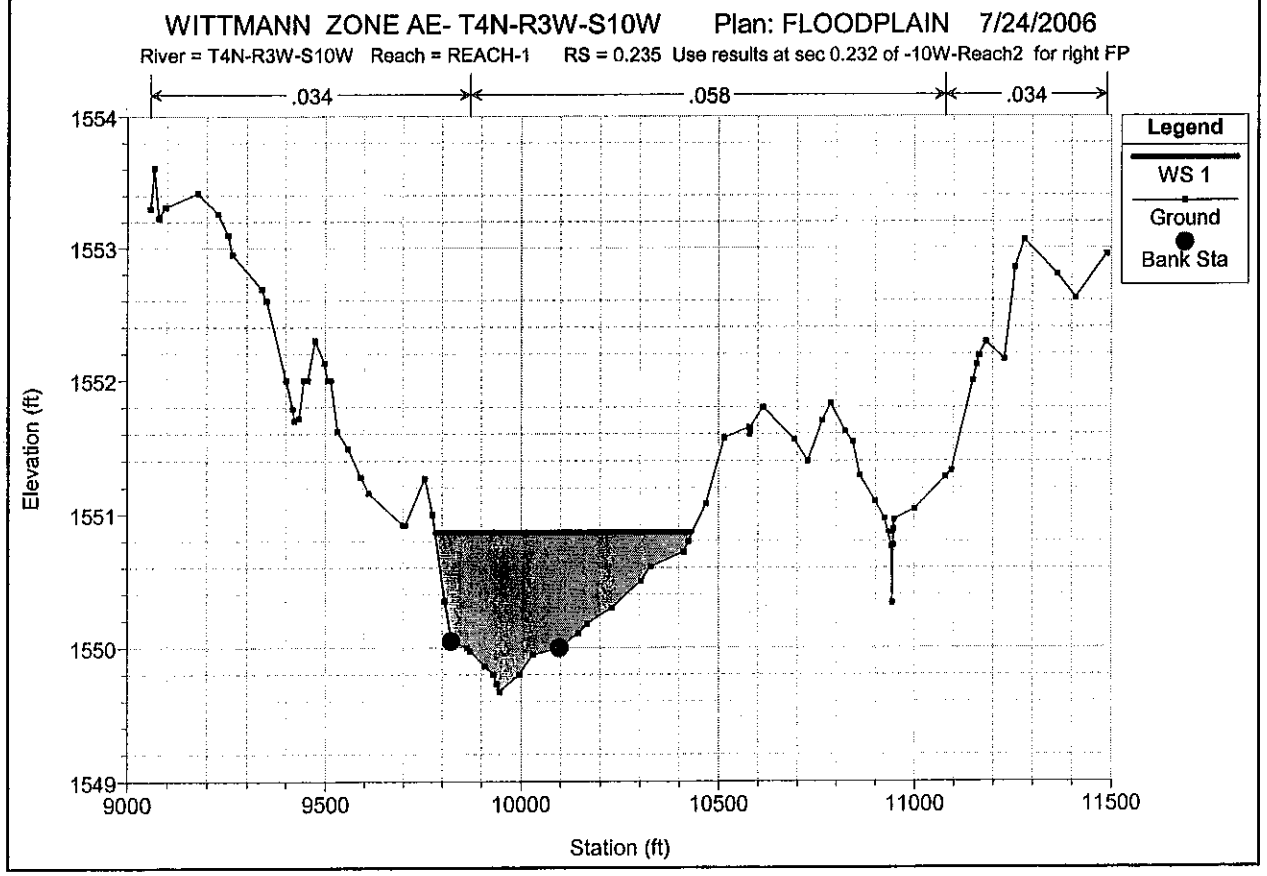

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.708
.036
.059
.036
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1569
1568
1567
1566
1565
1564
1563
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

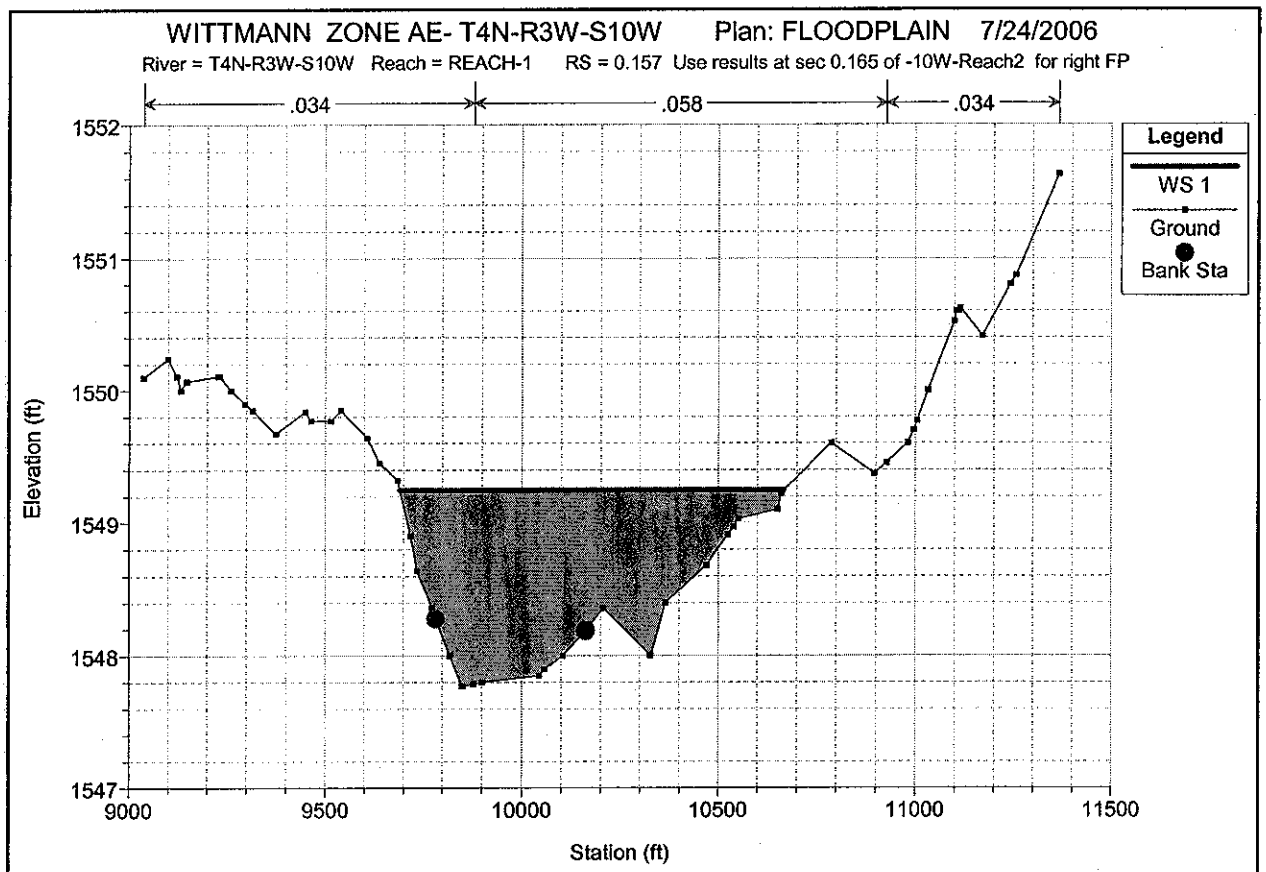

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.601
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1567
1566
1565
1564
1563
1562
1561
1560
8000
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

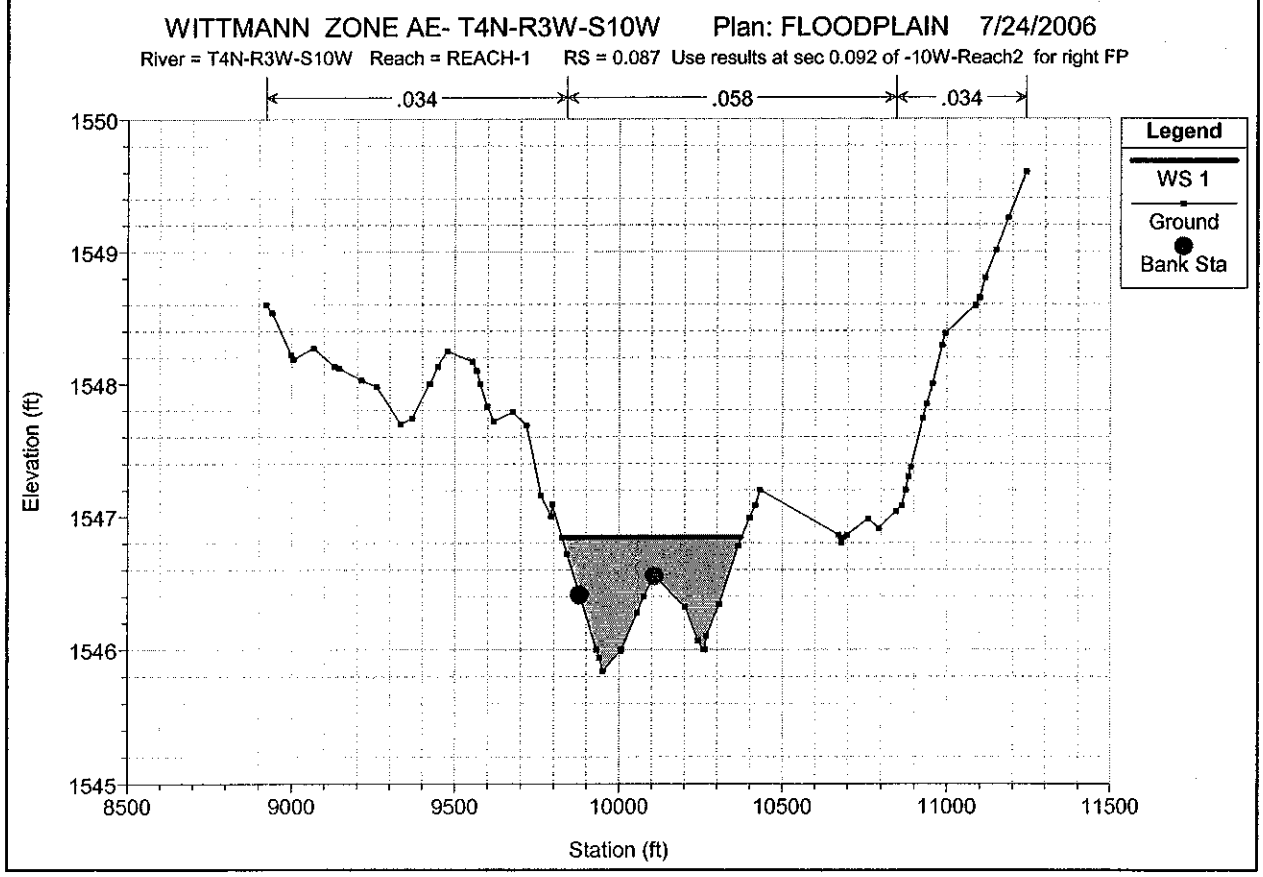

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.514
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1562.0
1561.5
1561.0
1560.5
1560.0
1559.5
1559.0
1558.5
1558.0
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

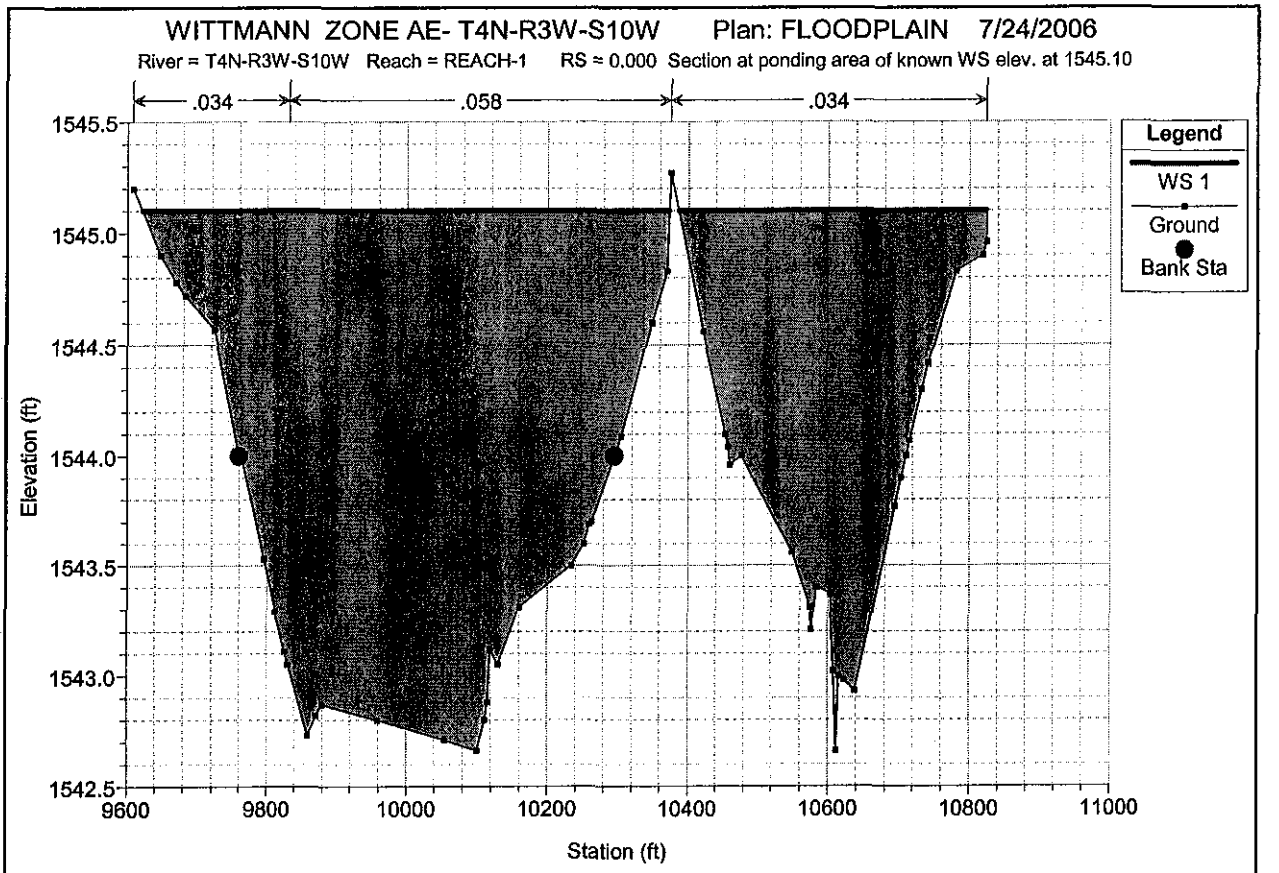

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.407 Use results at sec 0.354 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1559
1558
1557
1556
1555
1554
8500
9000
9500
10000
10500
11000
11500
Station (ft)

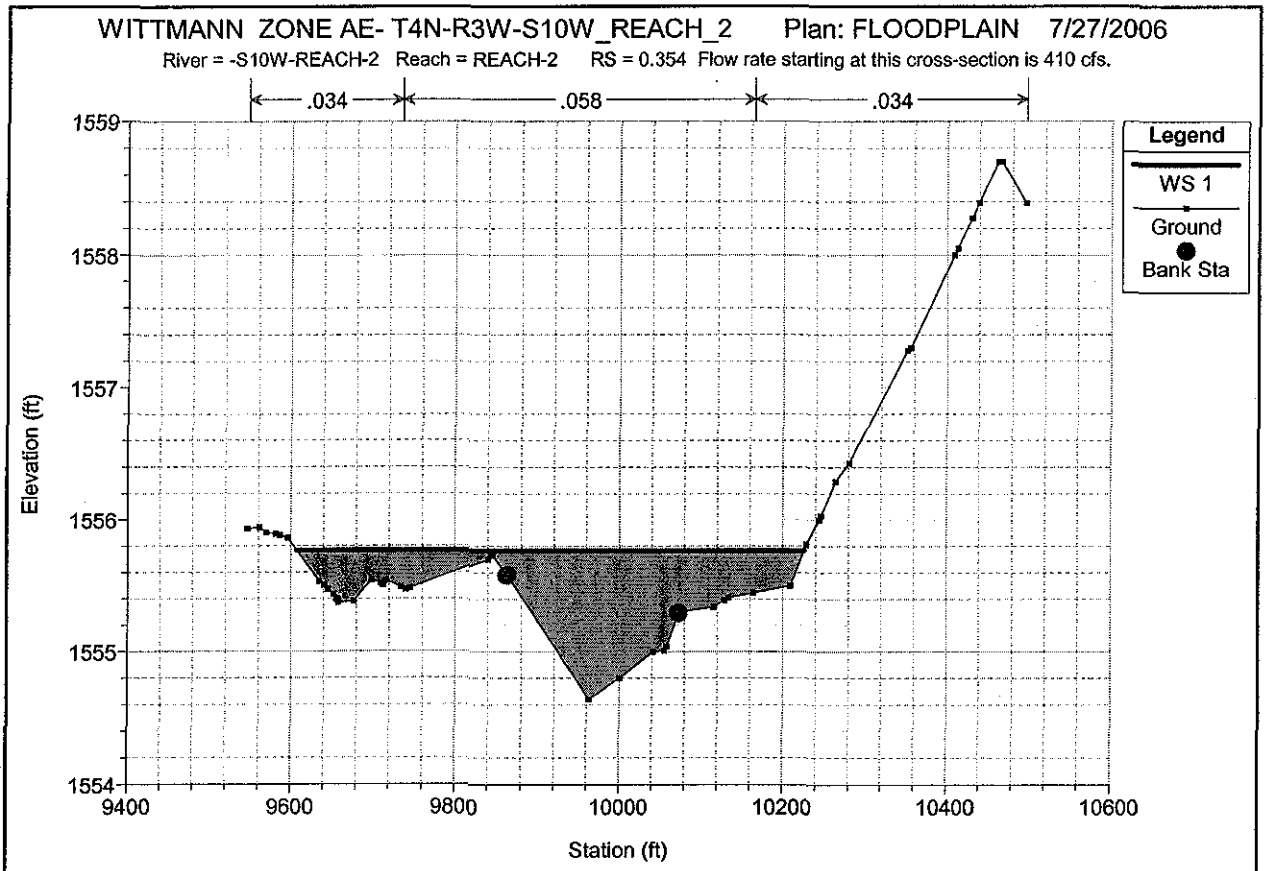

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.287 Use results at sec 0.280 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1555.0
1554.5
1554.0
1553.5
1553.0
1552.5
1552.0
1551.5
1551.0
9000
9500
10000
10500
11000
11500
12000
Station (ft)

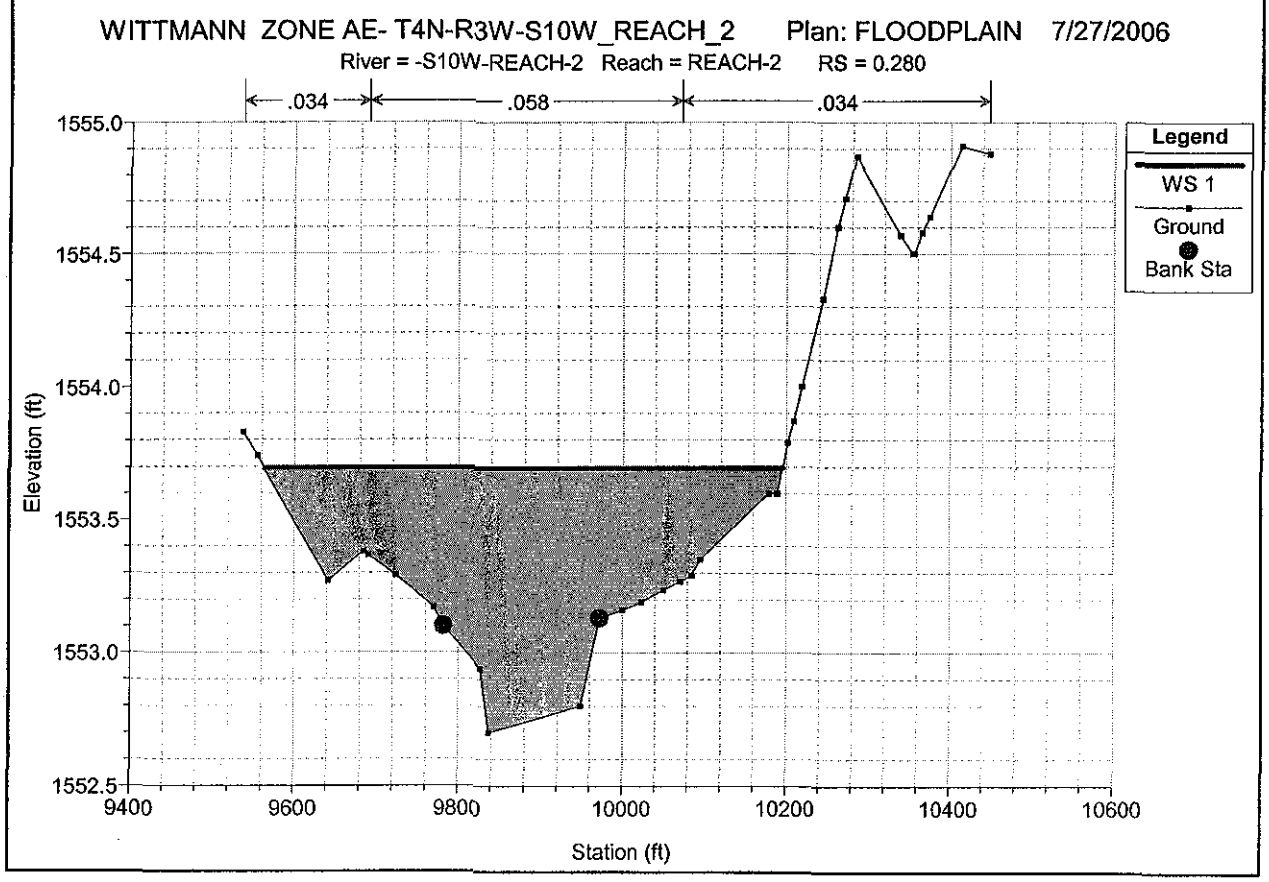

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.235 Use results at sec 0.232 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1554
1553
1552
1551
1550
1549
9000
9500
10000
10500
11000
11500
Station (ft)

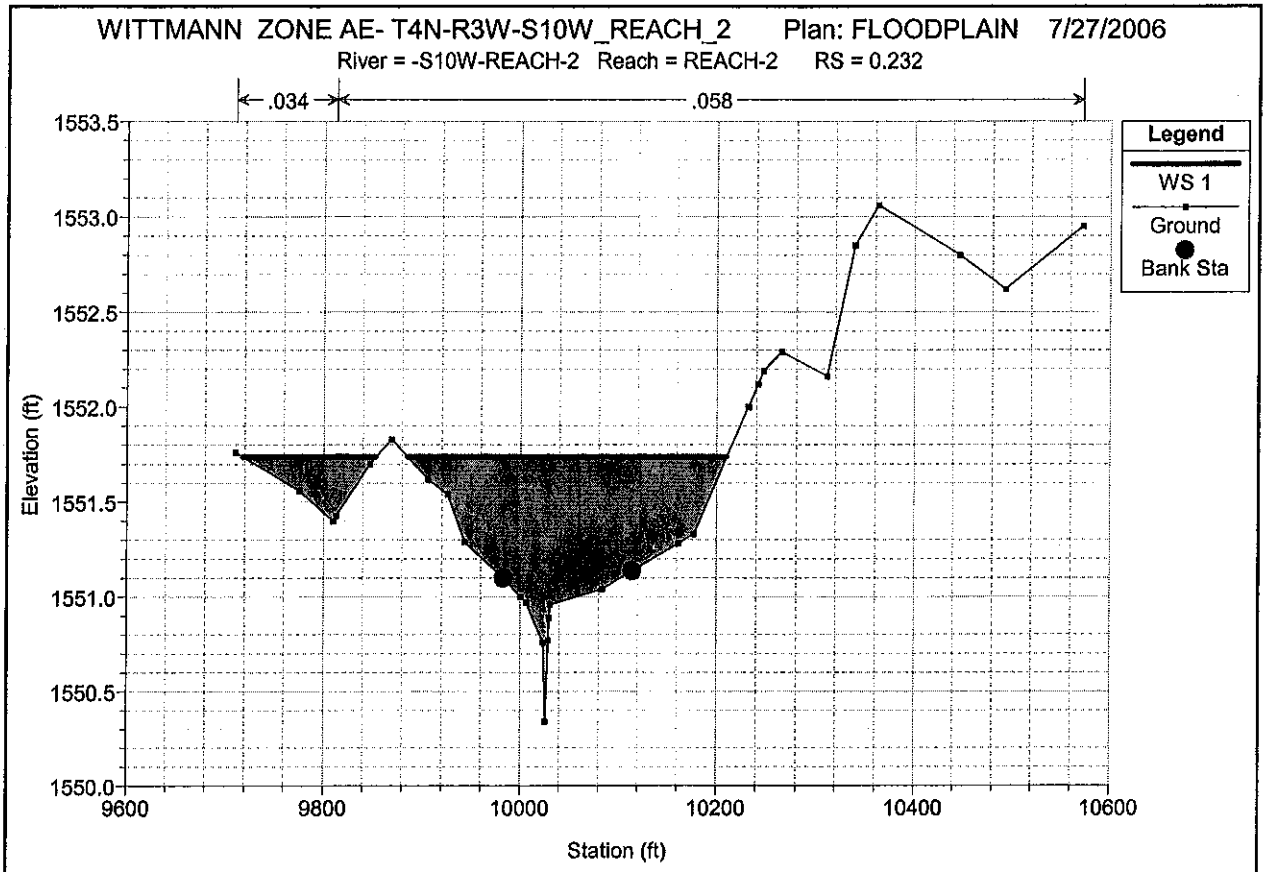

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.157 Use results at sec 0.165 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1552
1551
1550
1549
1548
1547
9000
9500
10000
10500
11000
11500
Station (ft)

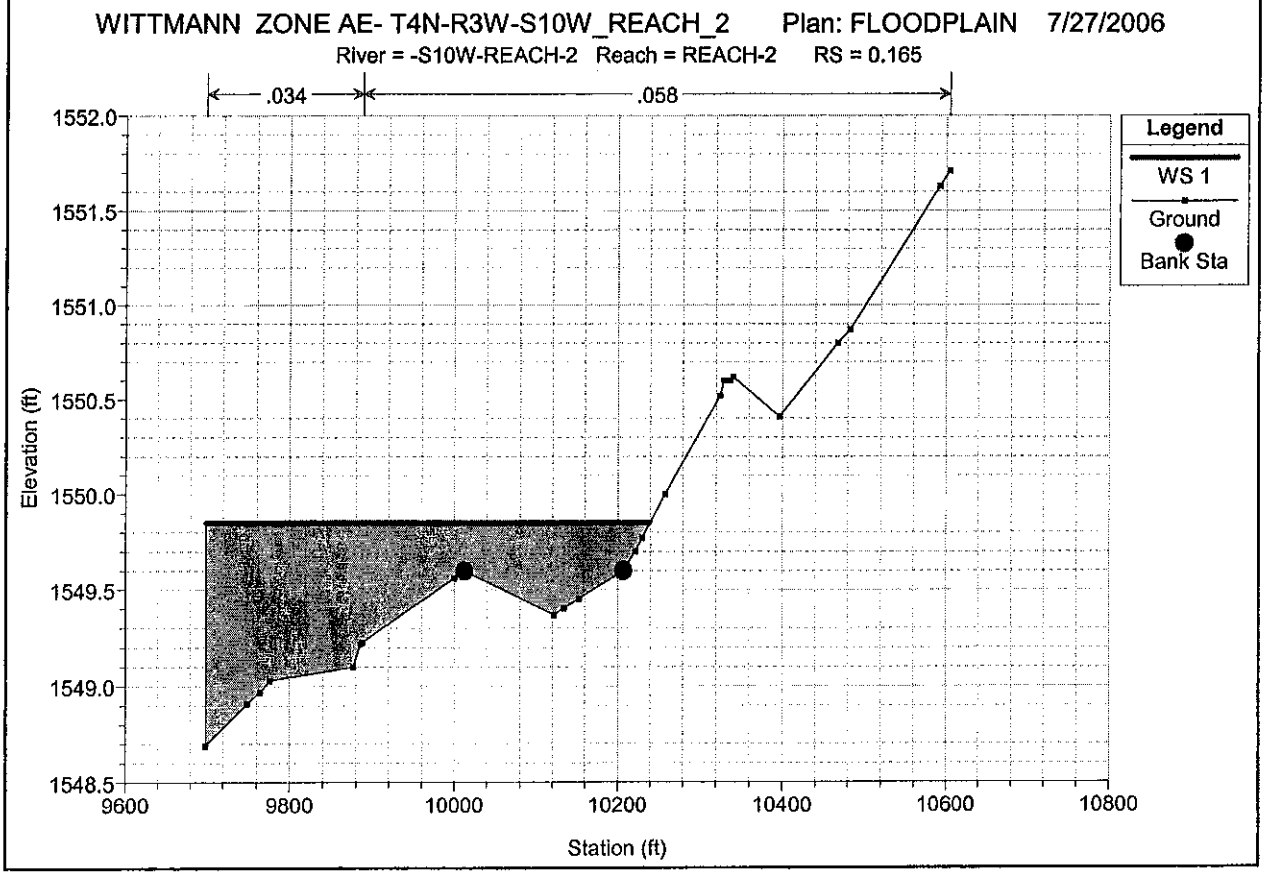

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.087 Use results at sec 0.092 of -10W-Reach2 for right FP
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1550
1549
1548
1547
1546
1545
8500
9000
9500
10000
10500
11000
11500
Station (ft)

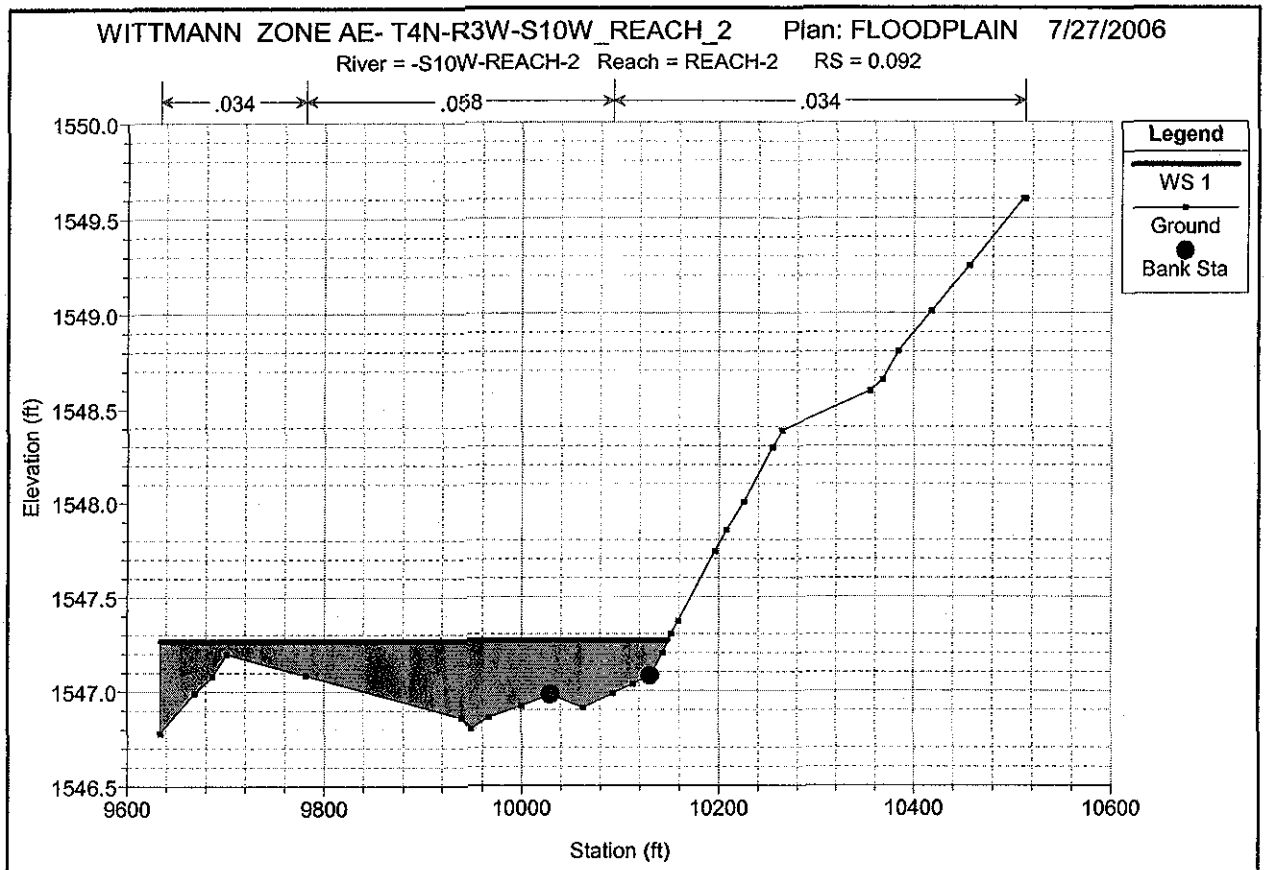

WITTMANN ZONE AE- T4N-R3W-S10W Plan: FLOODPLAIN 7/24/2006
River = T4N-R3W-S10W Reach = REACH-1 RS = 0.000 Section at ponding area of known WS elev. at 1545.10
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1545.5
1545.0
1544.5
1544.0
1543.5
1543.0
1542.5
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

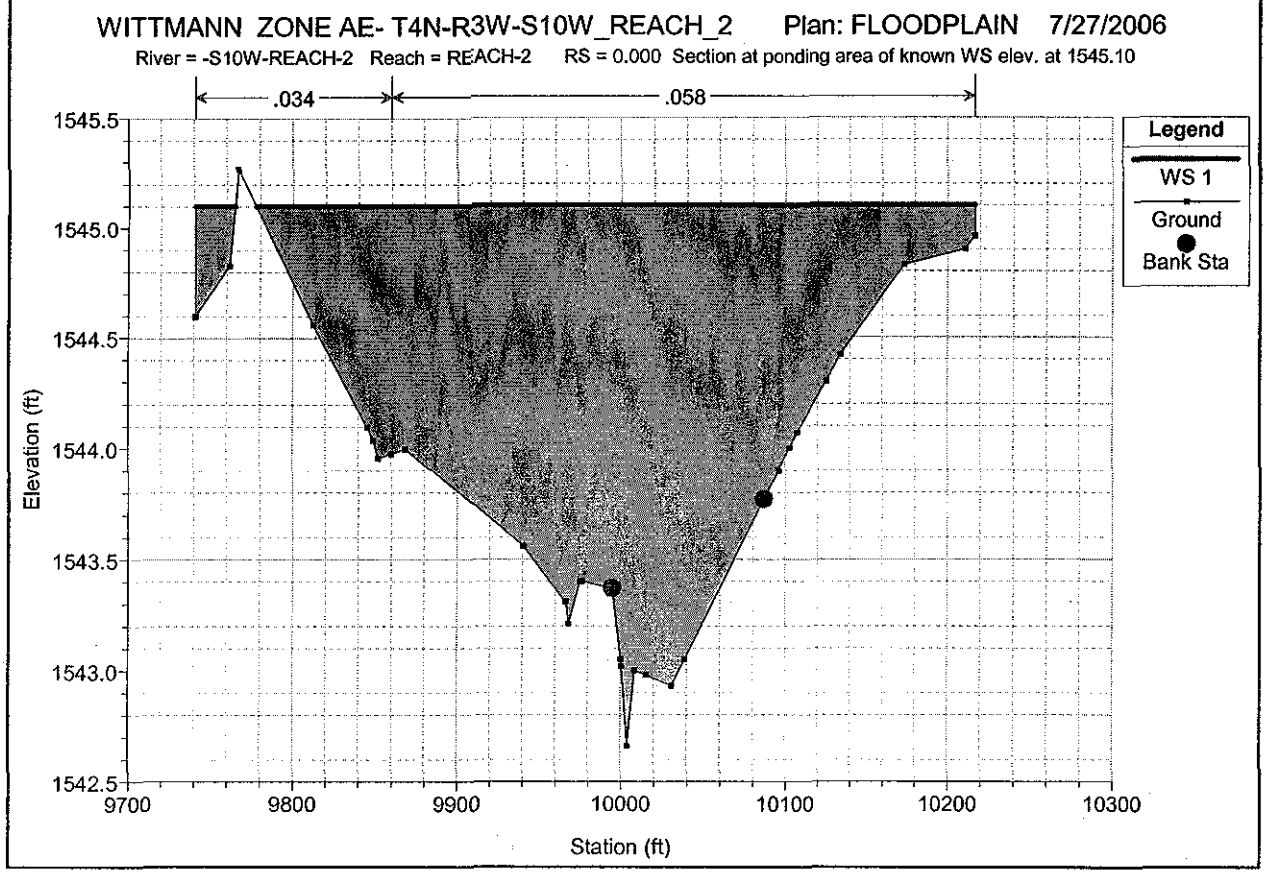

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.354 Flow rate starting at this cross-section is 410 cfs.
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1559
1558
1557
1556
1555
1554
9400
9600
9800
10000
10200
10400
10600
Station (ft)

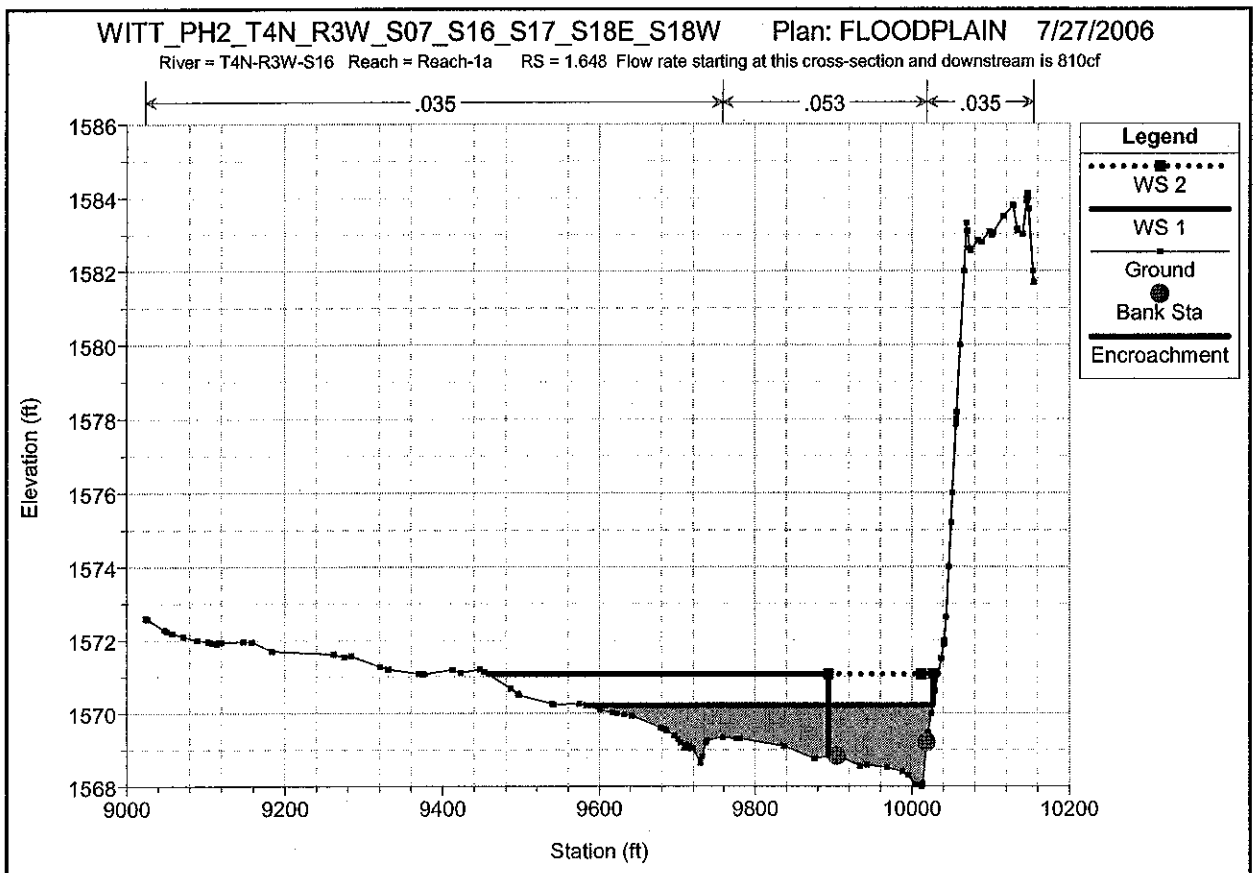

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.280
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1555.0
1554.5
1554.0
1553.5
1553.0
1552.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

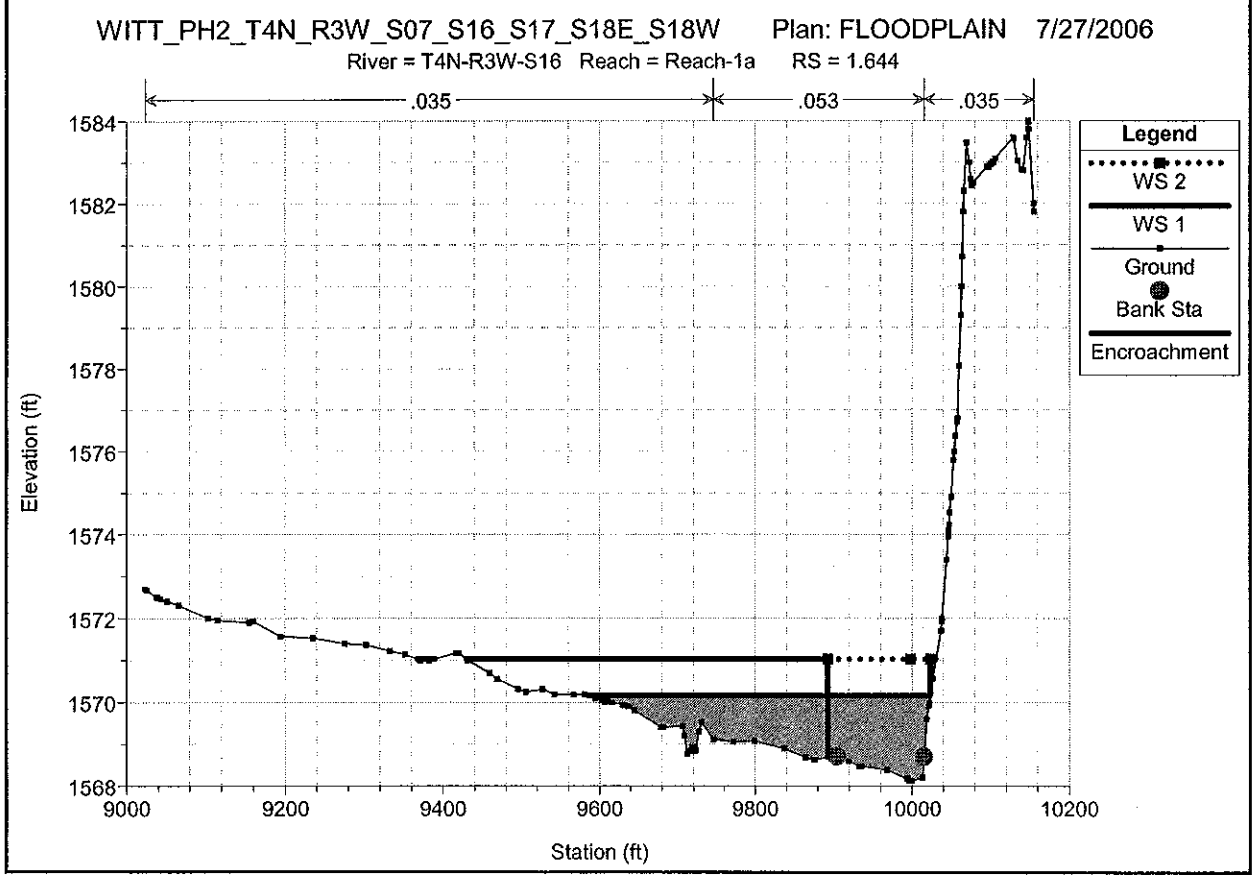

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.232
.034
.058
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1553.5
1553.0
1552.5
1552.0
1551.5
1551.0
1550.5
1550.0
9600
9800
10000
10200
10400
10600
Station (ft)

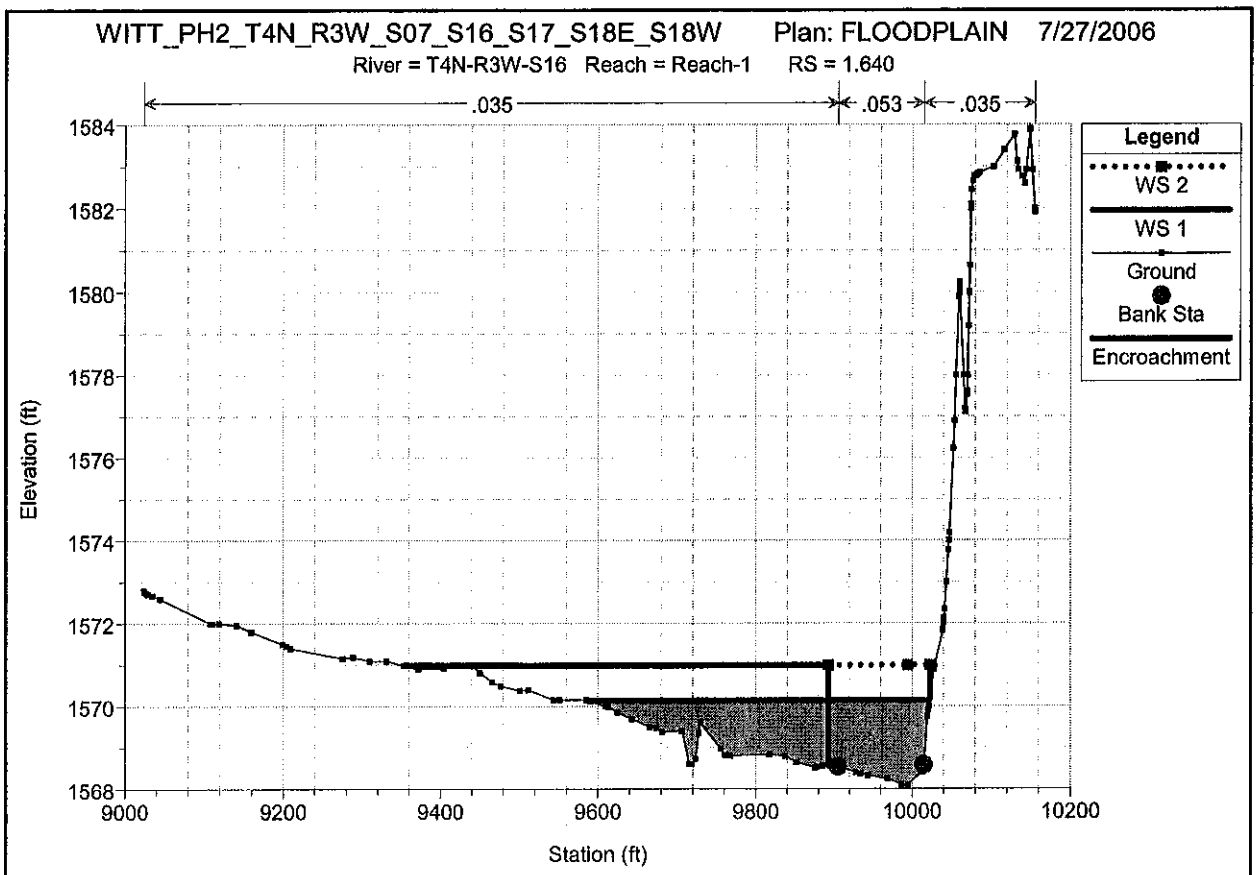

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.165
.034
.058
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1552.0
1551.5
1551.0
1550.5
1550.0
1549.5
1549.0
1548.5
9600
9800
10000
10200
10400
10600
10800
Station (ft)

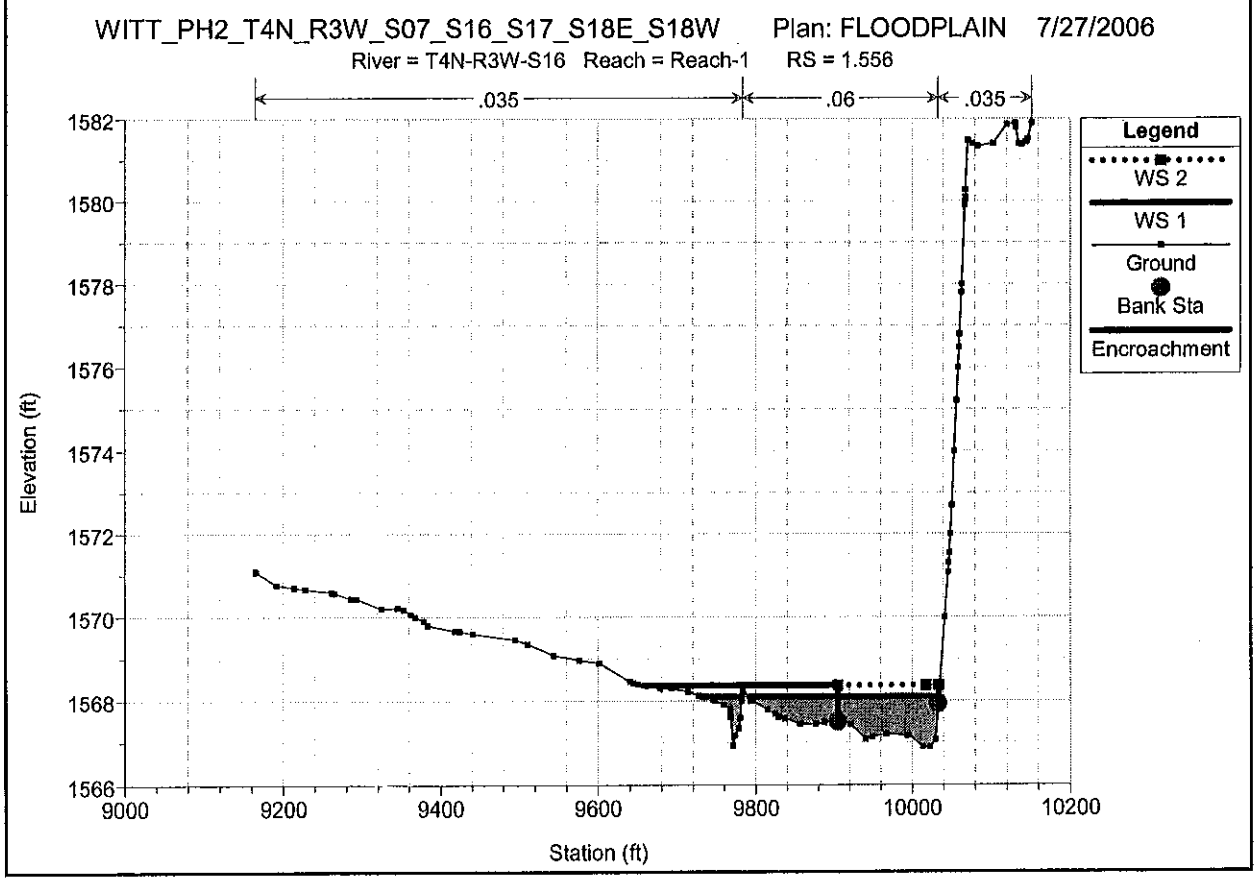

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.092
.034
.058
.034
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1550.0
1549.5
1549.0
1548.5
1548.0
1547.5
1547.0
1546.5
9600
9800
10000
10200
10400
10600
Station (ft)

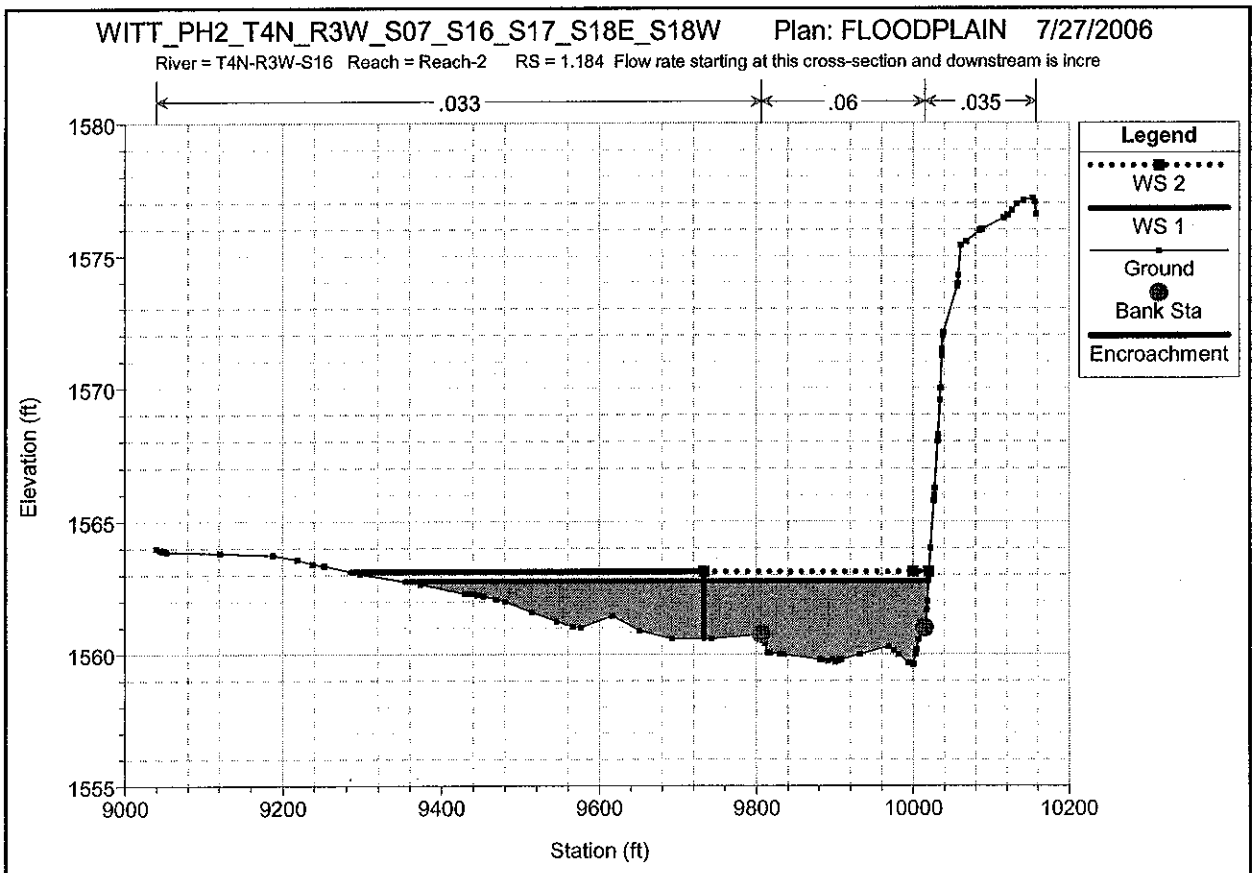

WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2 Plan: FLOODPLAIN 7/27/2006
River = -S10W-REACH-2 Reach = REACH-2 RS = 0.000 Section at ponding area of known WS elev. at 1545.10
.034
.058
Legend
WS 1
Ground
Bank Sta
Elevation (ft)
1545.5
1545.0
1544.5
1544.0
1543.5
1543.0
1542.5
9700
9800
9900
10000
10100
10200
10300
Station (ft)

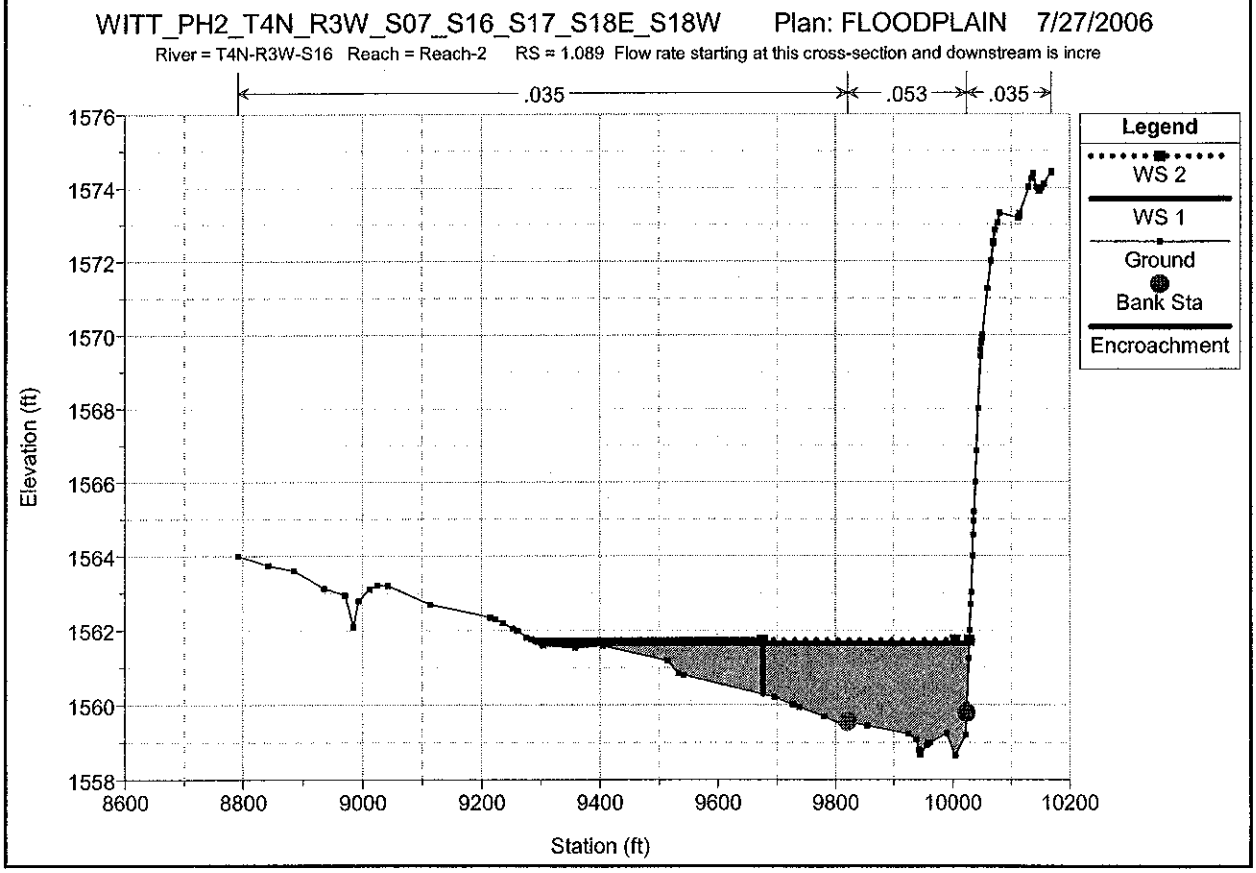

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-1a RS = 1.648 Flow rate starting at this cross-section and downstream is 810cf
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1586
1584
1582
1580
1578
1576
1574
1572
1570
1568
9000
9200
9400
9600
9800
10000
10200
Station (ft)

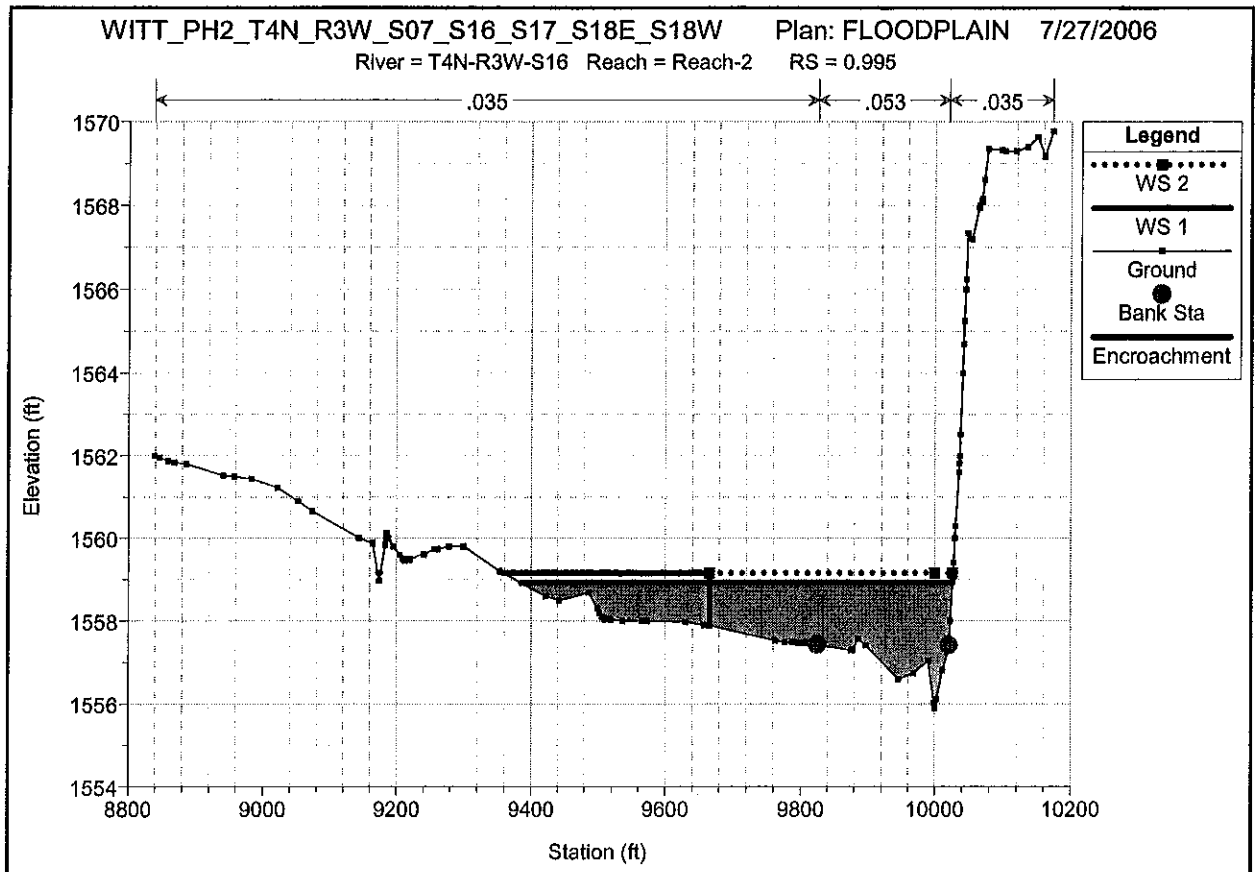

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-1a RS = 1.644
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1584
1582
1580
1578
1576
1574
1572
1570
1568
9000
9200
9400
9600
9800
10000
10200
Station (ft)

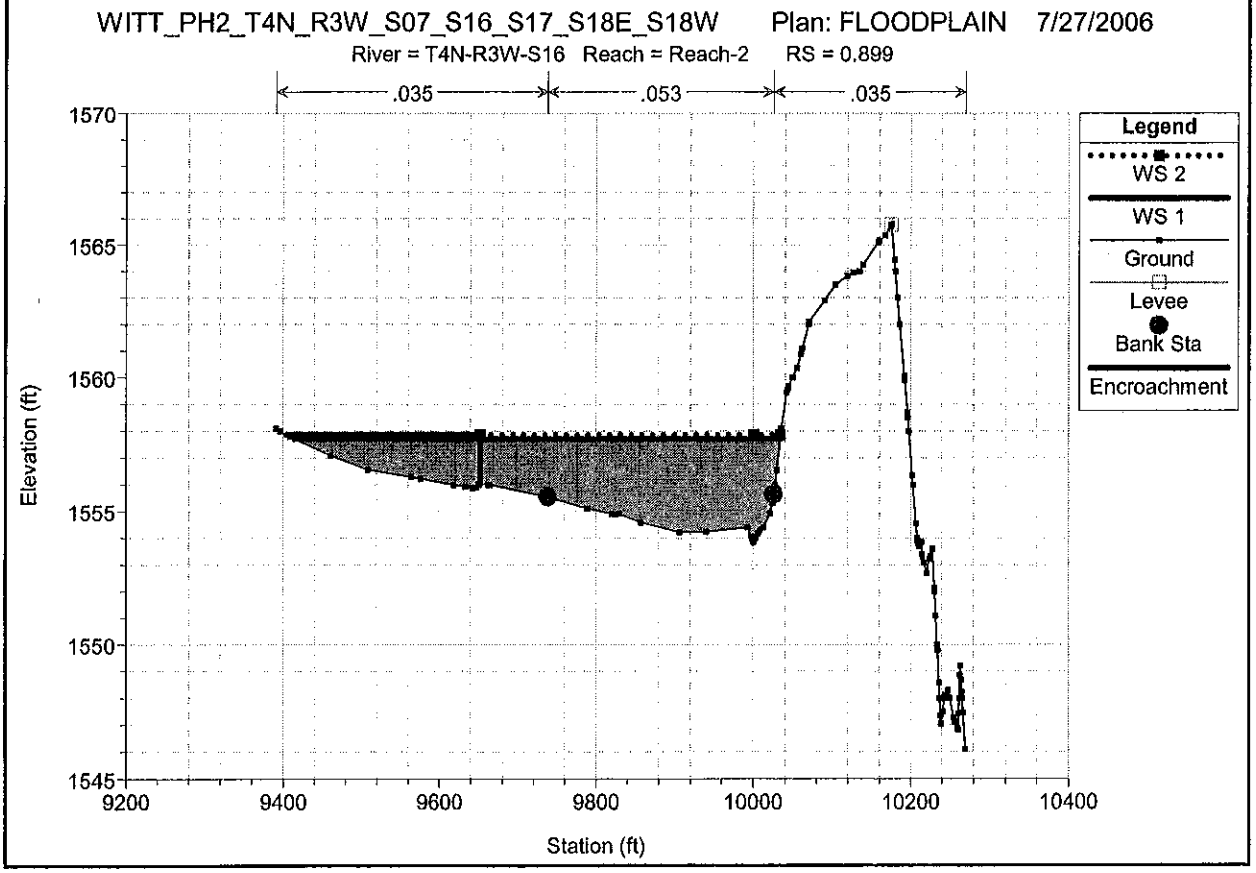

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-1 RS = 1.640
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1584
1582
1580
1578
1576
1574
1572
1570
1568
9000
9200
9400
9600
9800
10000
10200
Station (ft)

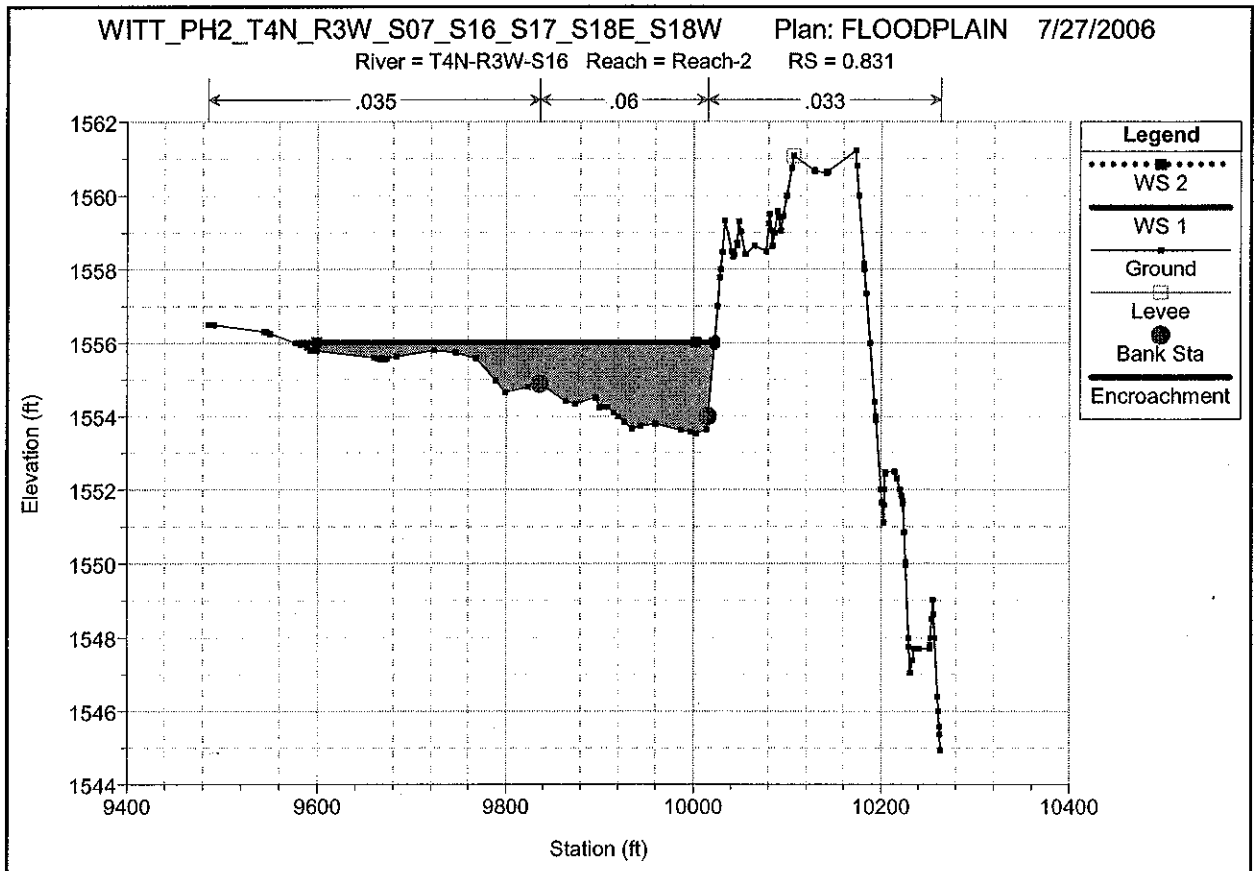

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-1 RS = 1.556
.035
.06
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1582
1580
1578
1576
1574
1572
1570
1568
1566
9000
9200
9400
9600
9800
10000
10200
Station (ft)

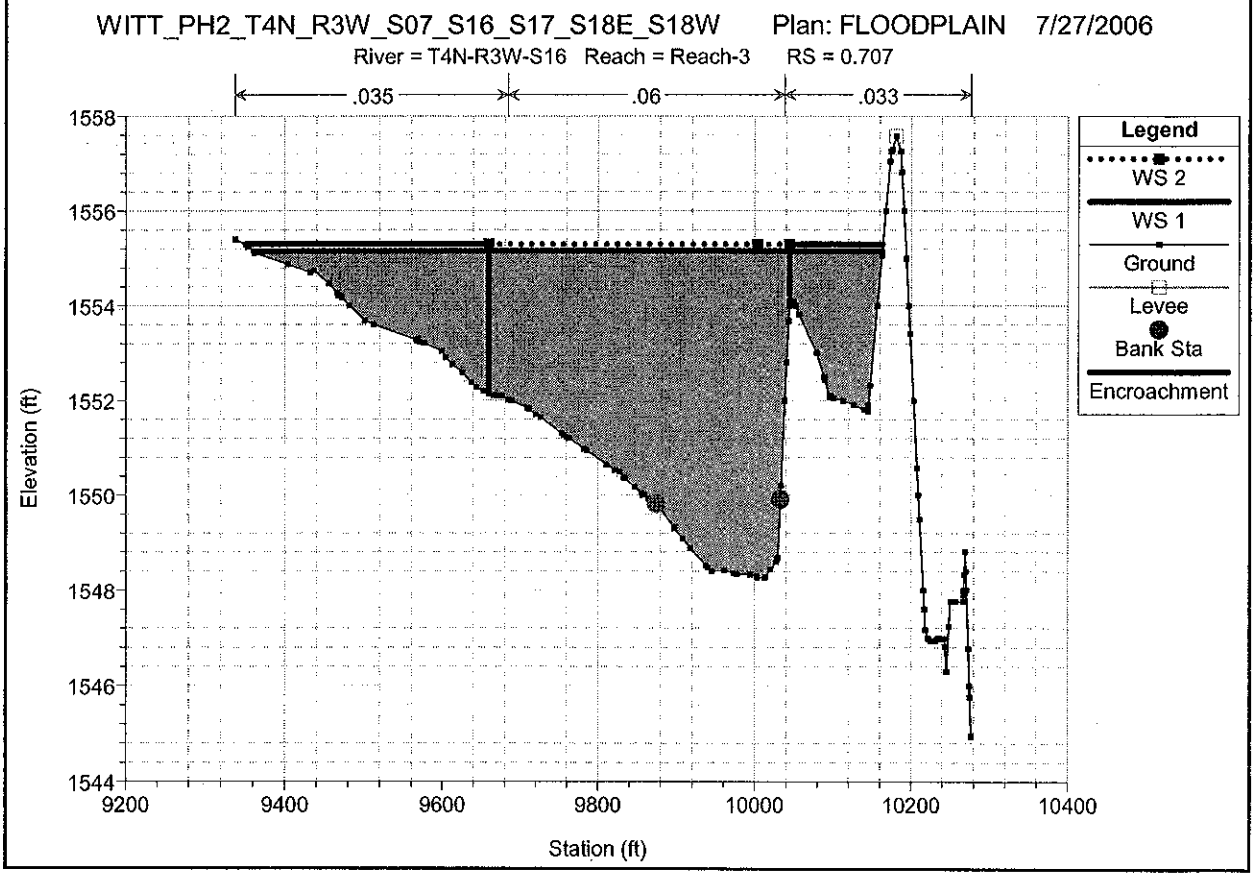

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-2 RS = 1.184 Flow rate starting at this cross-section and downstream is incre
.033
.06
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1580
1575
1570
1565
1560
1555
9000
9200
9400
9600
9800
10000
10200
Station (ft)

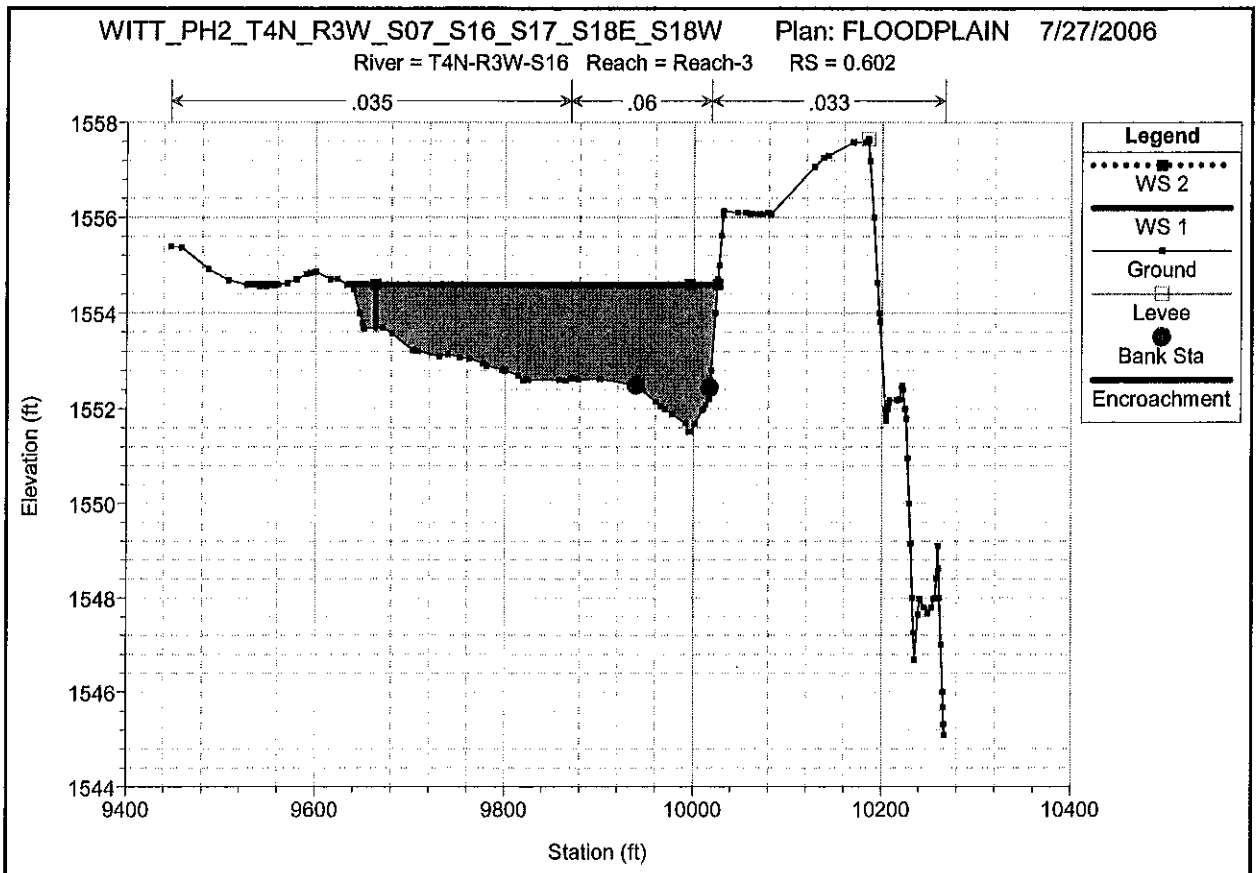

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-2 RS = 1.089 Flow rate starting at this cross-section and downstream is incre
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1576
1574
1572
1570
1568
1566
1564
1562
1560
1558
8600
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

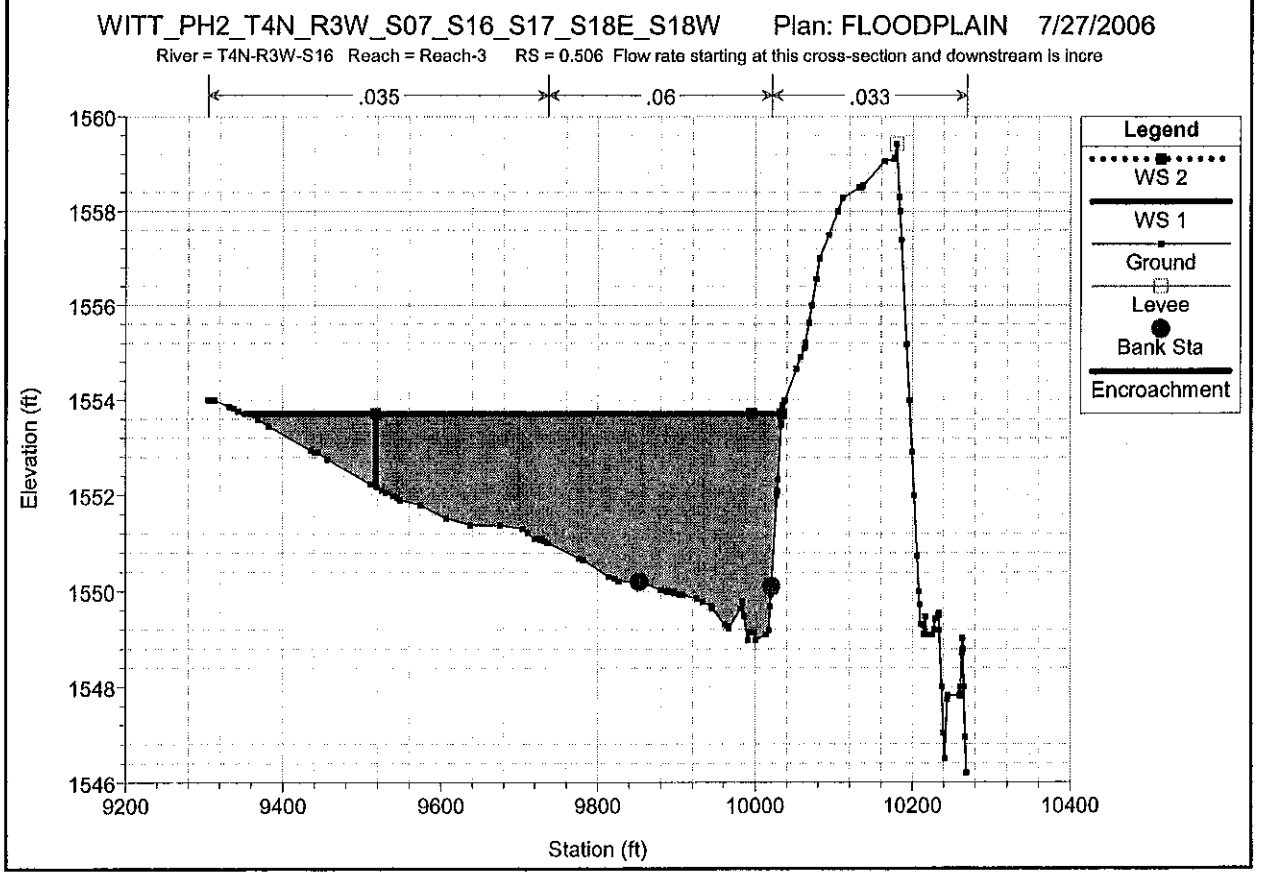

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-2 RS = 0.995
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1570
1568
1566
1564
1562
1560
1558
1556
1554
8800
9000
9200
9400
9600
9800
10000
10200
Station (ft)

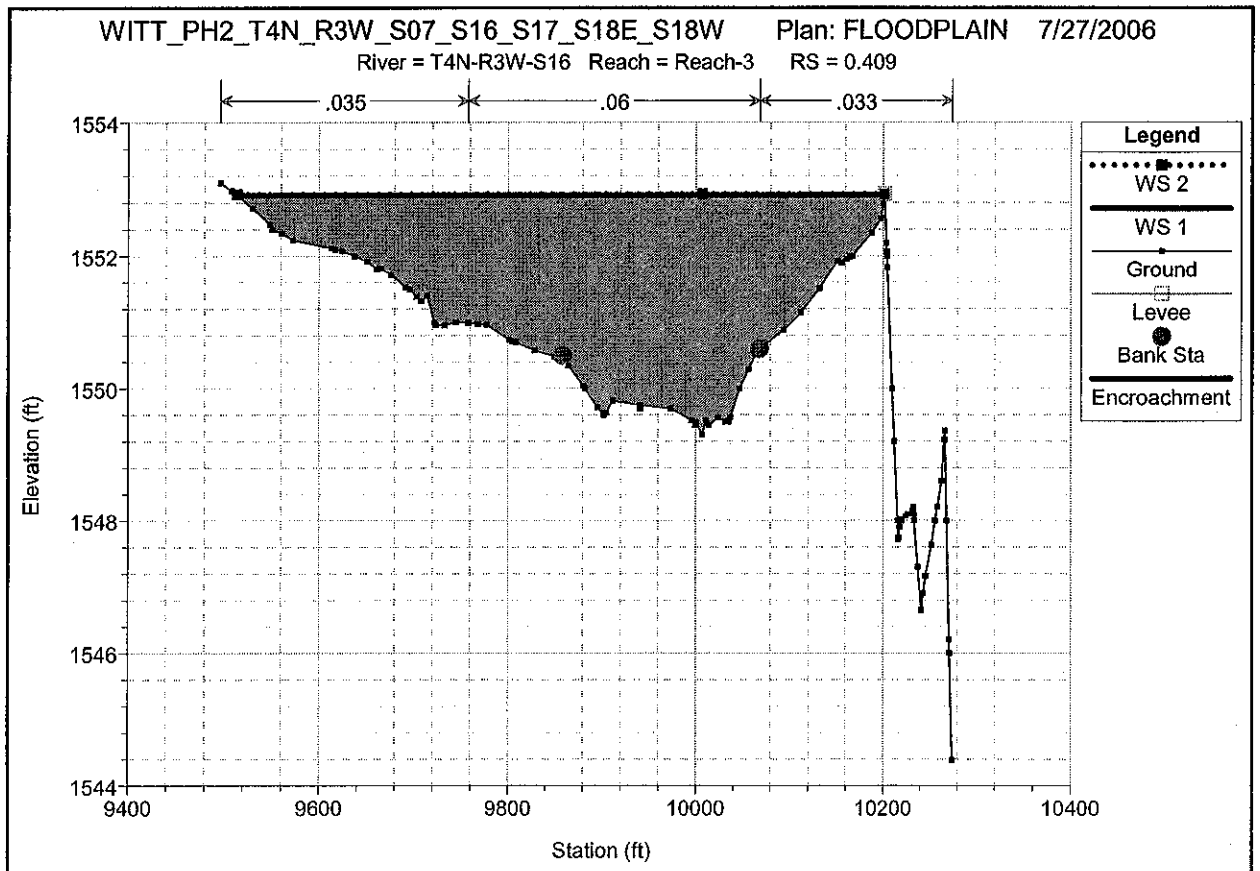

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-2 RS = 0.899
.035
.053
.035
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1570
1565
1560
1555
1550
1545
9200
9400
9600
9800
10000
10200
10400
Station (ft)

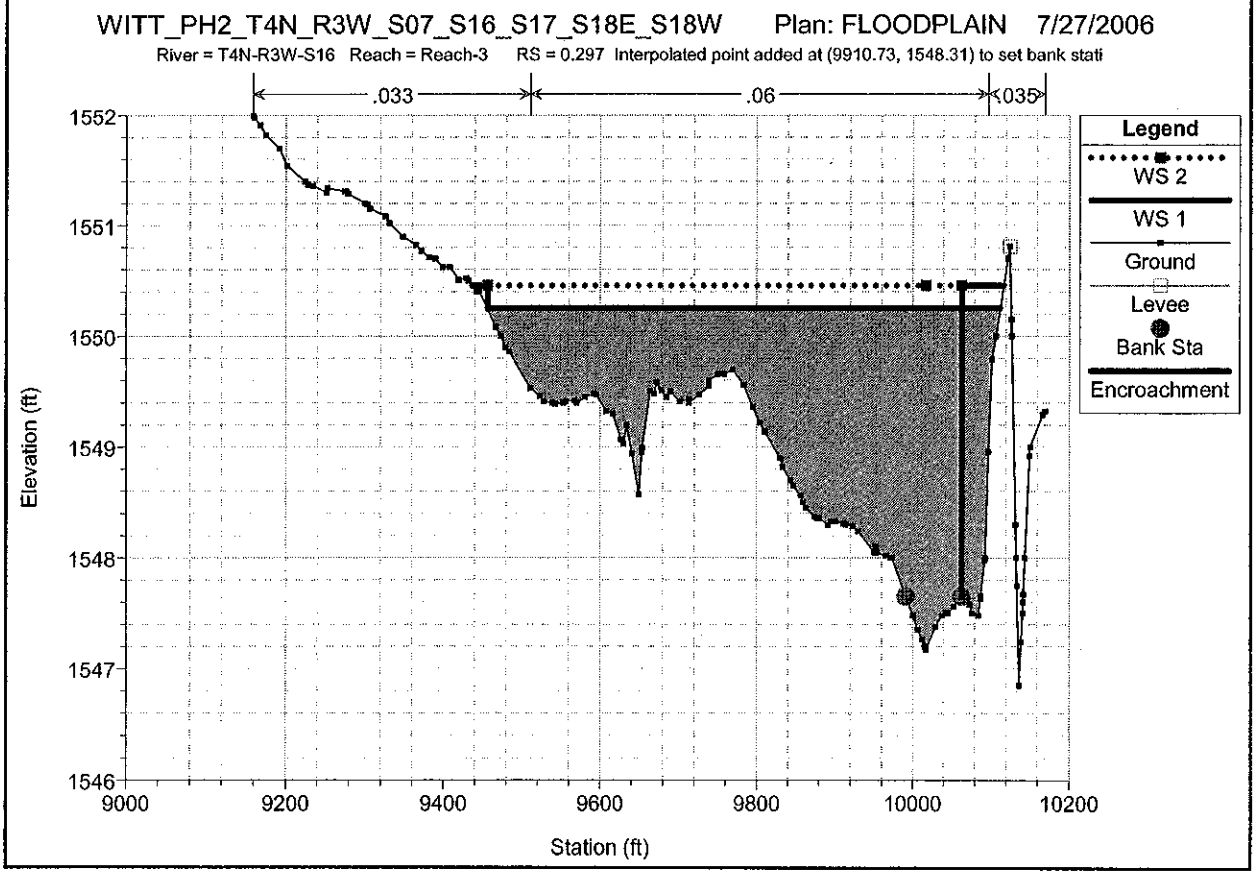

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-2 RS = 0.831
.035
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1562
1560
1558
1556
1554
1552
1550
1548
1546
1544
9400
9600
9800
10000
10200
10400

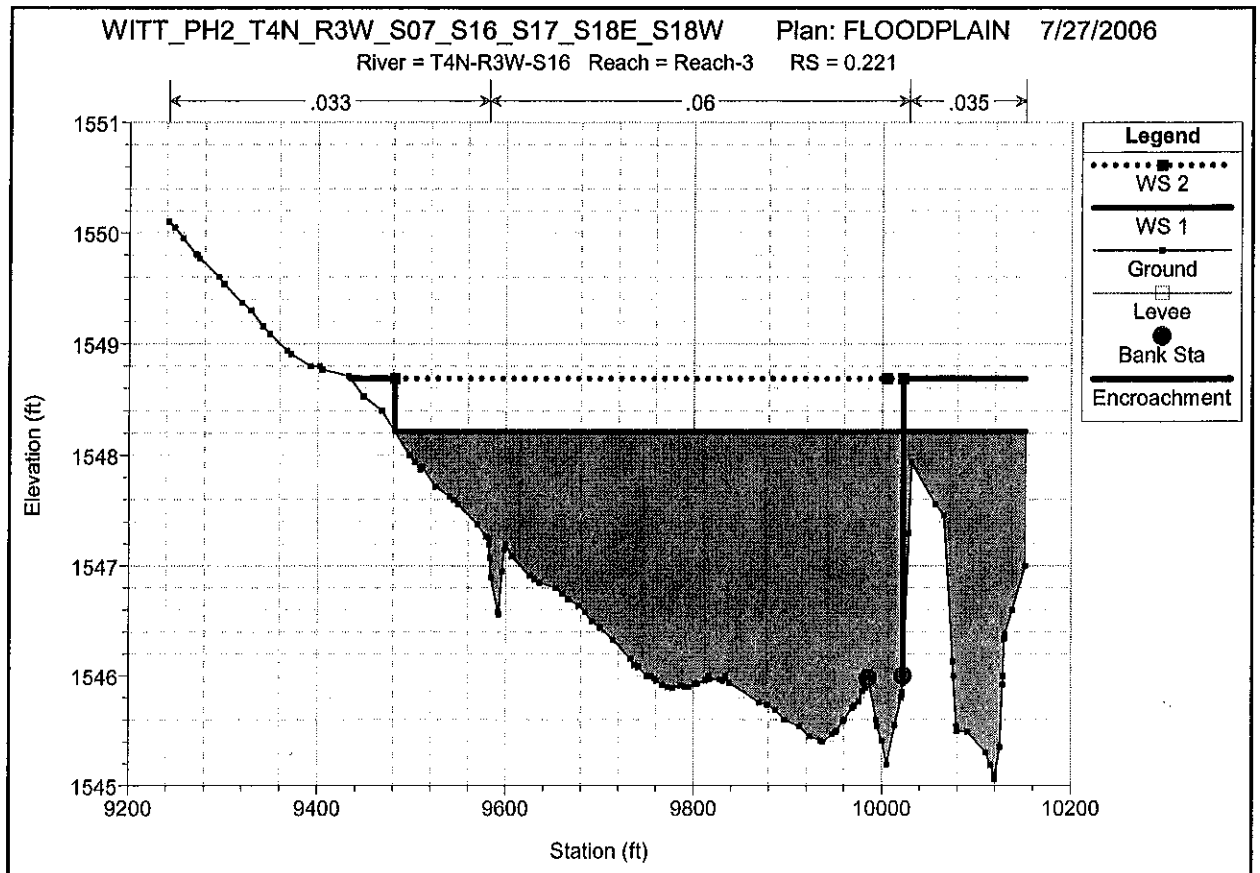

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.707
.035
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
1558
1556
1554
1552
1550
1548
1546
1544
9200
9400
9600
9800
10000
10200
10400

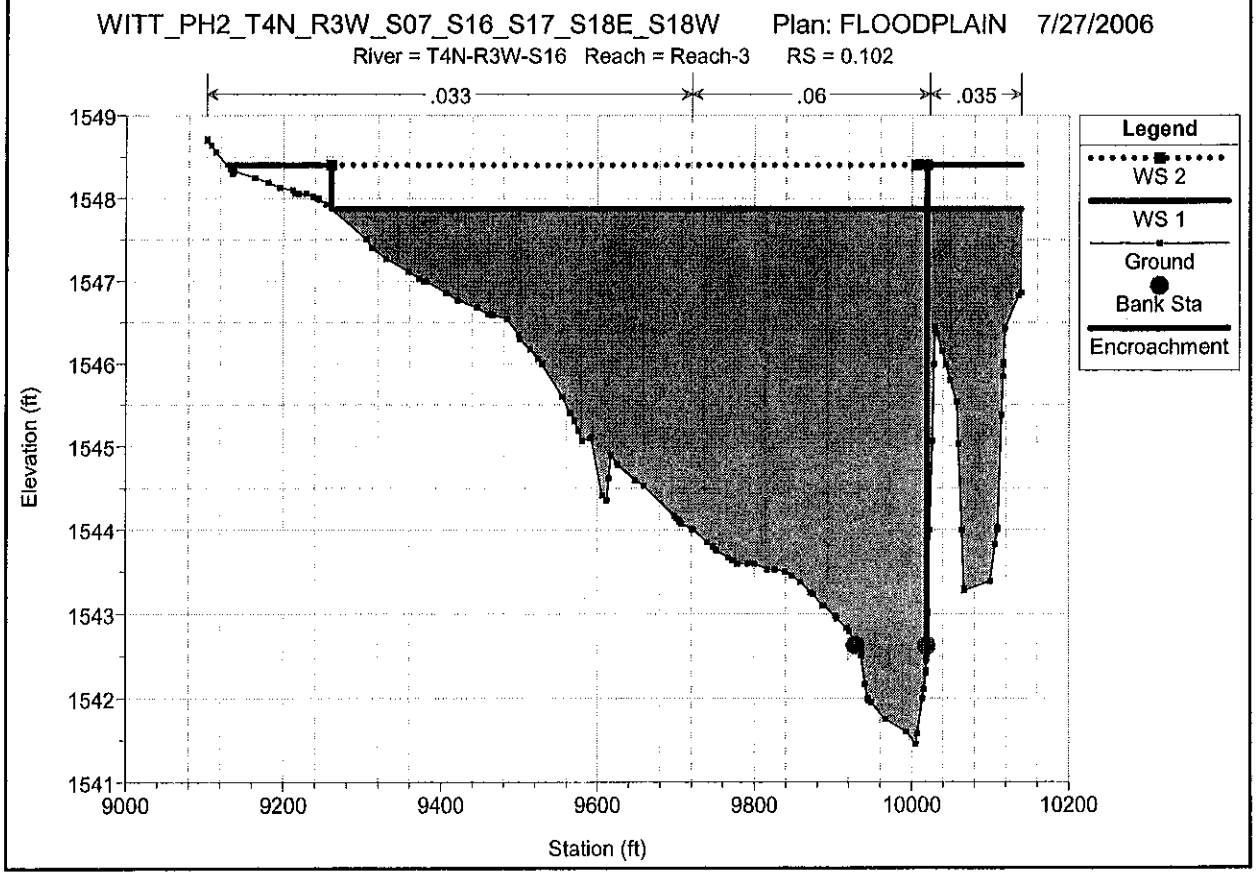

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.602
.035
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1558
1556
1554
1552
1550
1548
1546
1544
9400
9600
9800
10000
10200
10400
Station (ft)

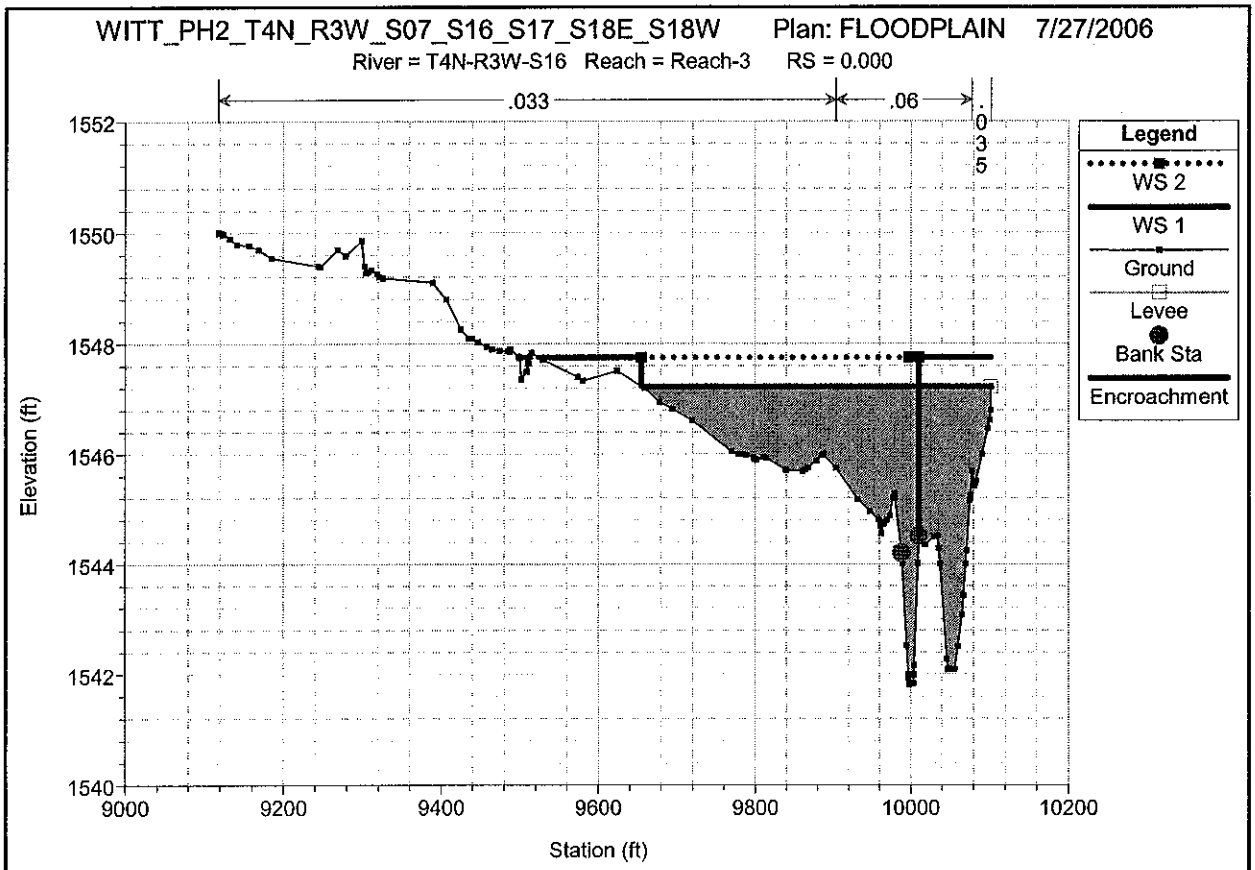

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.506 Flow rate starting at this cross-section and downstream is incre
.035
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1560
1558
1556
1554
1552
1550
1548
1546
9200
9400
9600
9800
10000
10200
10400
Station (ft)

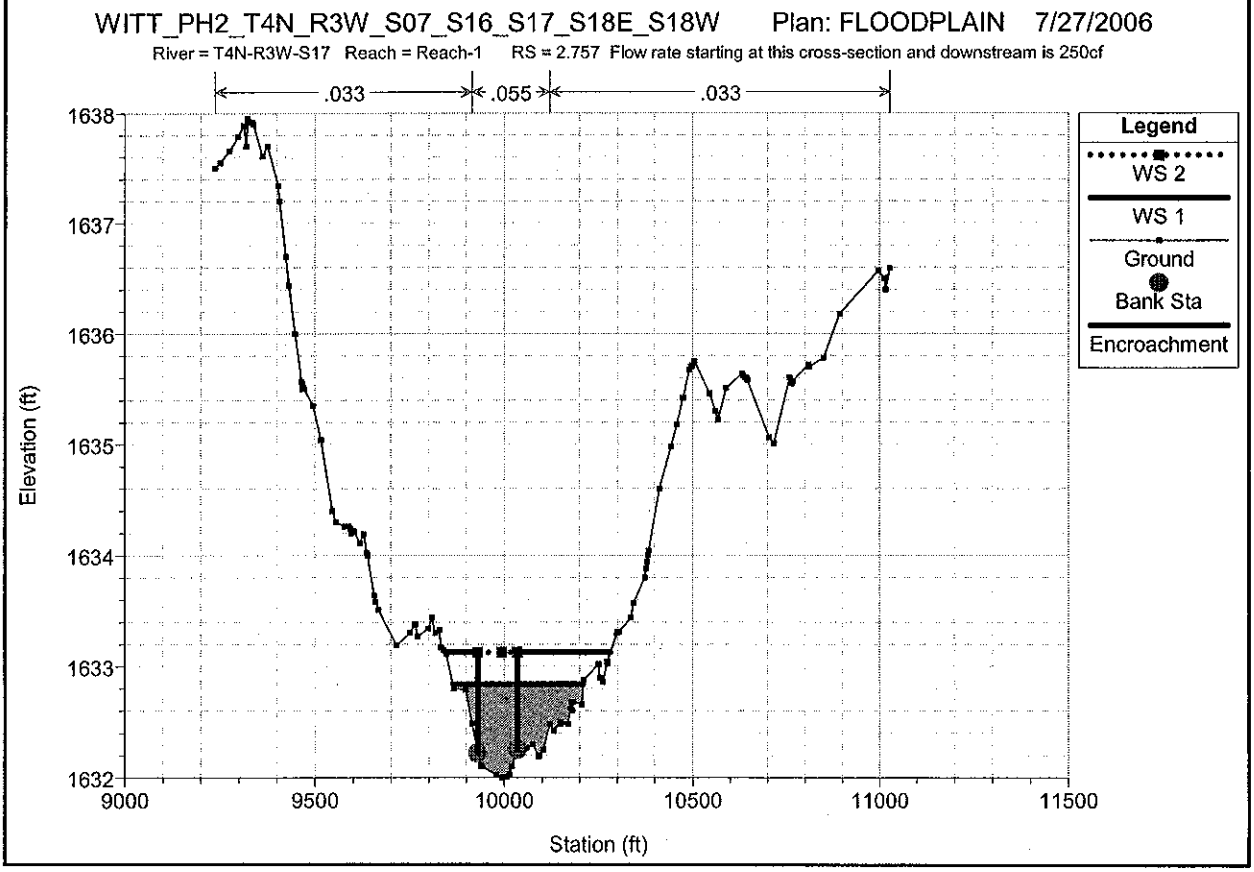

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.409
.035
.06
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1554
1552
1550
1548
1546
1544
9400
9600
9800
10000
10200
10400
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.297 Interpolated point added at (9910.73, 1548.31) to set bank stati
.033
.06
.035
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1552
1551
1550
1549
1548
1547
1546
9000
9200
9400
9600
9800
10000
10200
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.221
.033
.06
.035
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1551
1550
1549
1548
1547
1546
1545
9200
9400
9600
9800
10000
10200
Station (ft)

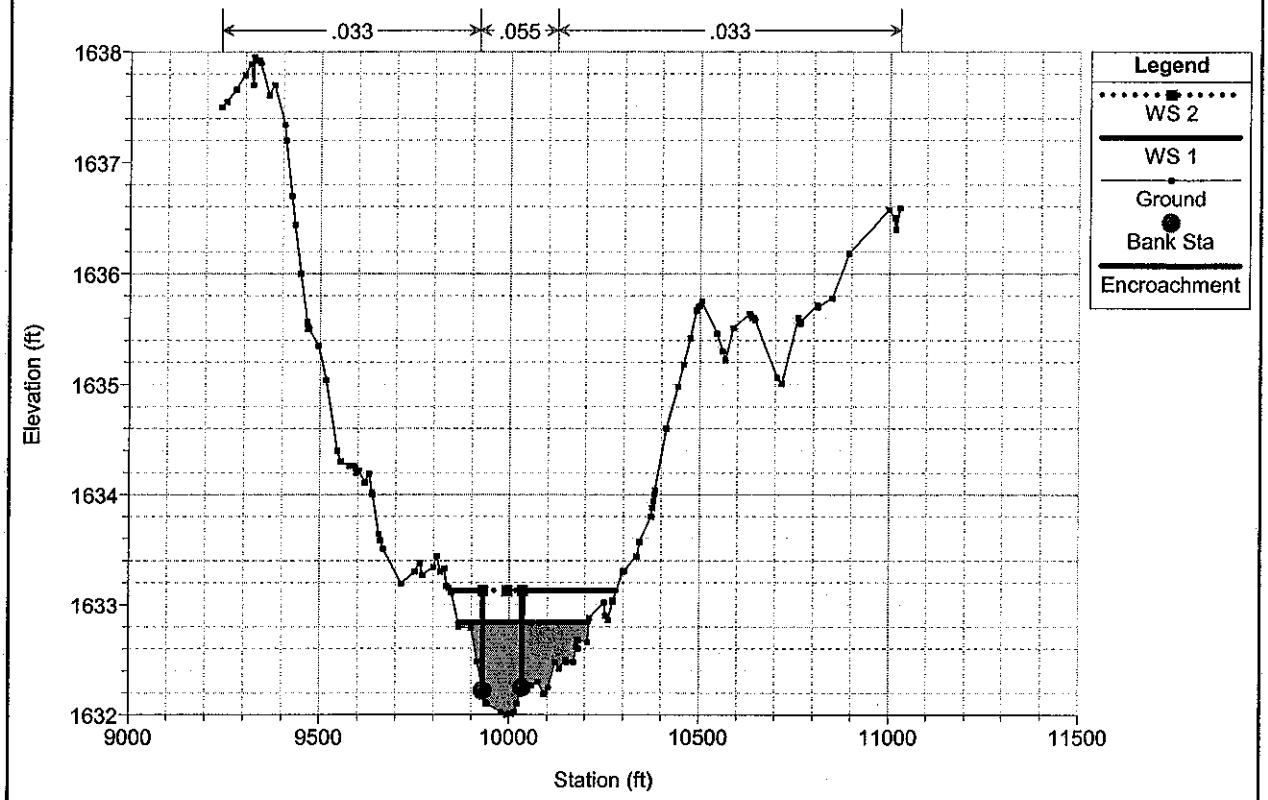

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.102
.033
.06
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1549
1548
1547
1546
1545
1544
1543
1542
1541
9000
9200
9400
9600
9800
10000
10200
Station (ft)

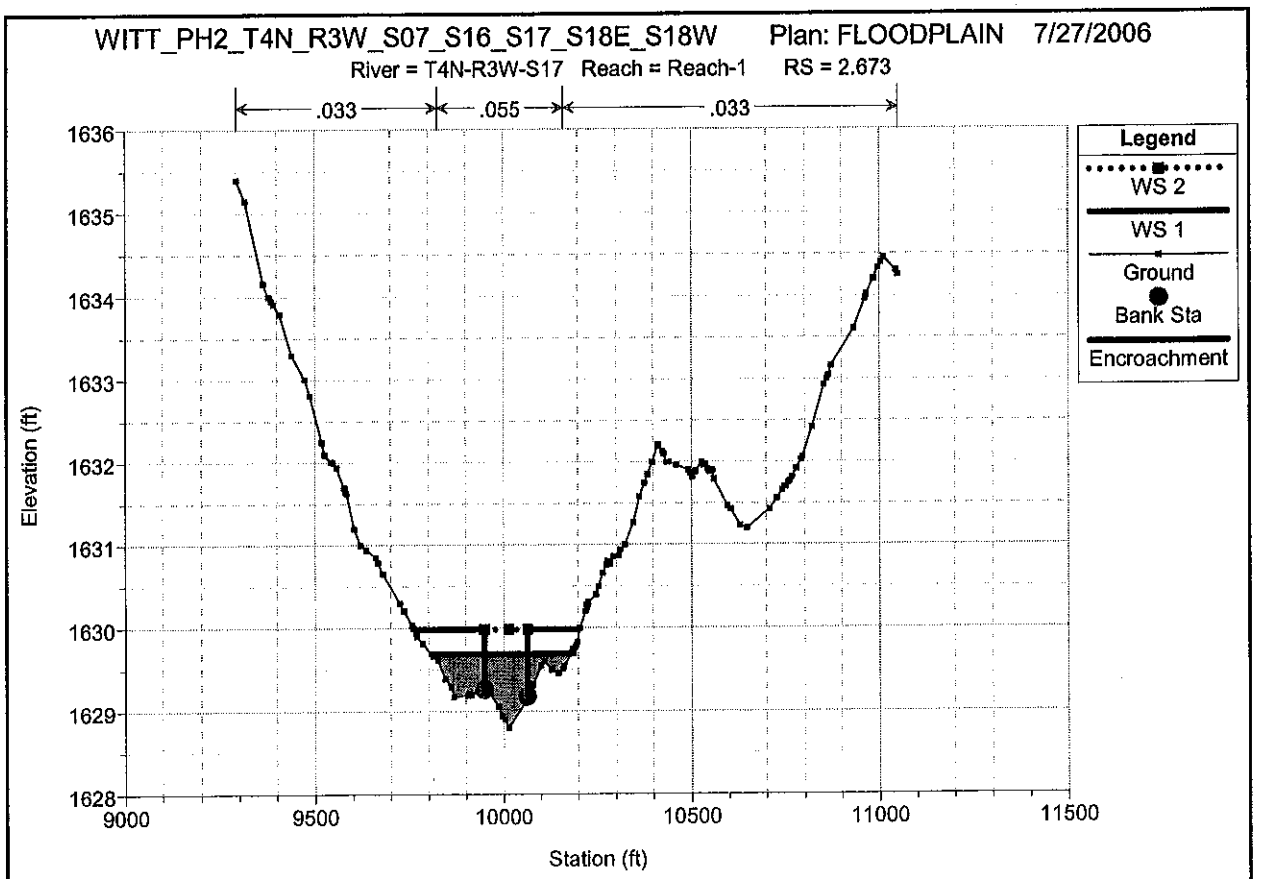

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S16 Reach = Reach-3 RS = 0.000
.033
.06
.035
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1552
1550
1548
1546
1544
1542
1540
9000
9200
9400
9600
9800
10000
10200
Station (ft)

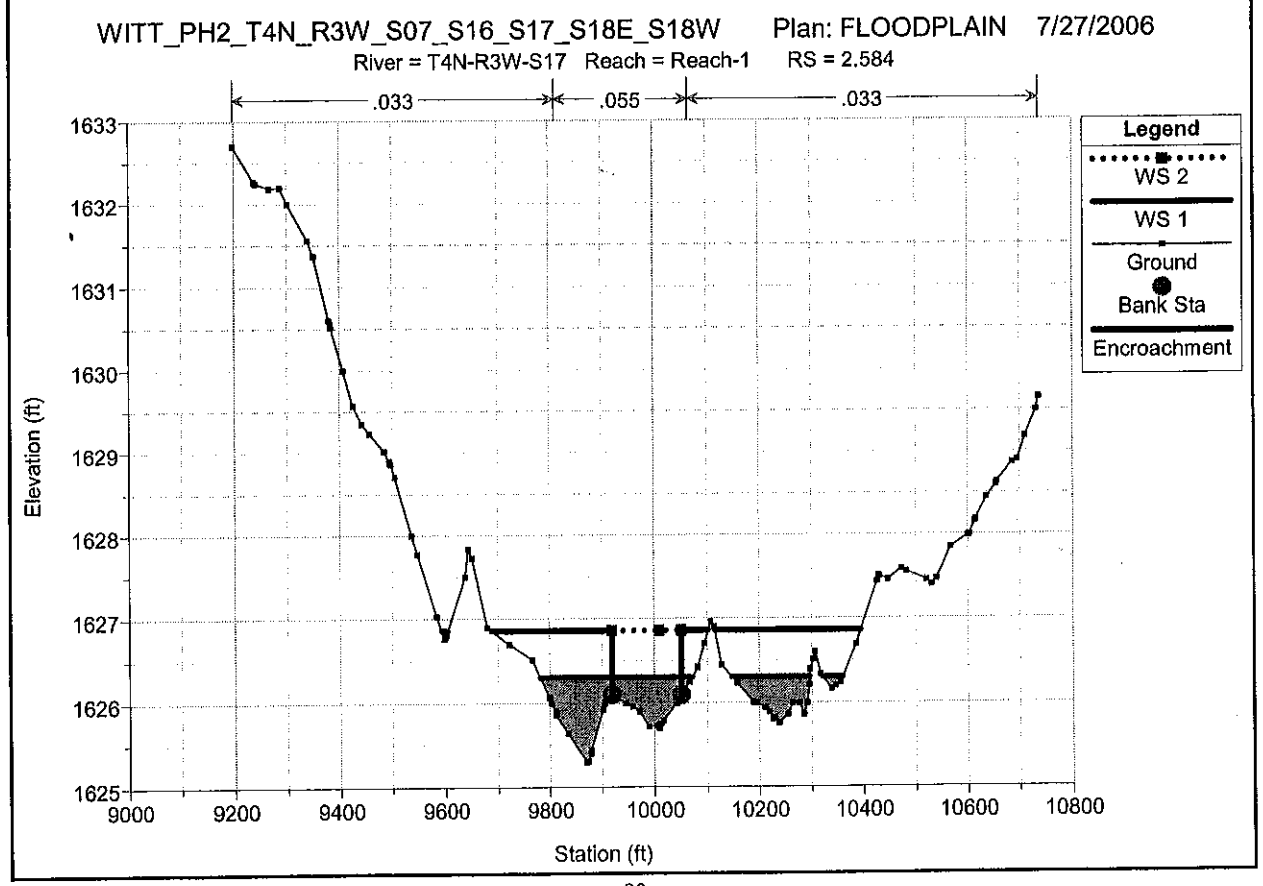

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.757 Flow rate starting at this cross-section and downstream is 250cf
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1638
1637
1636
1635
1634
1633
1632
9000
9500
10000
10500
11000
11500
Station (ft)

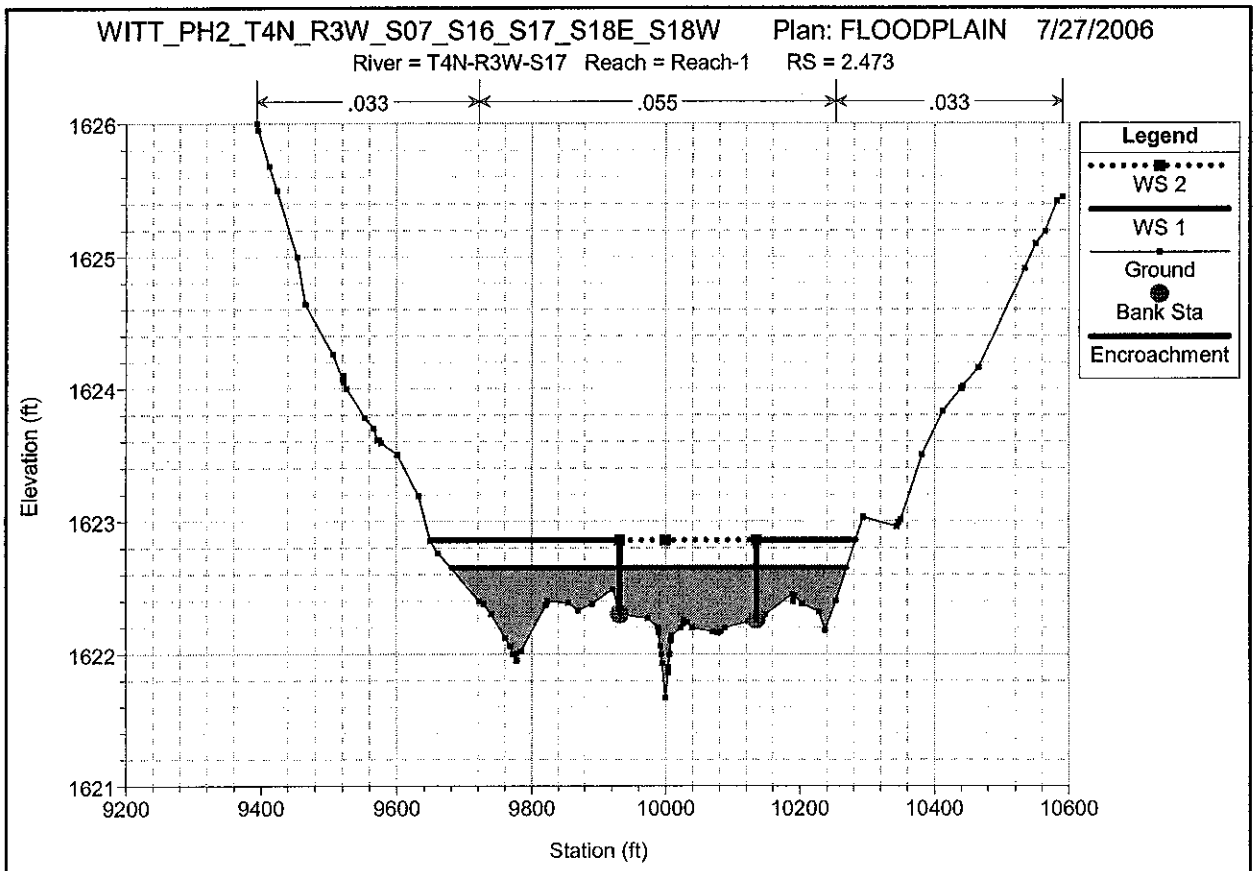
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

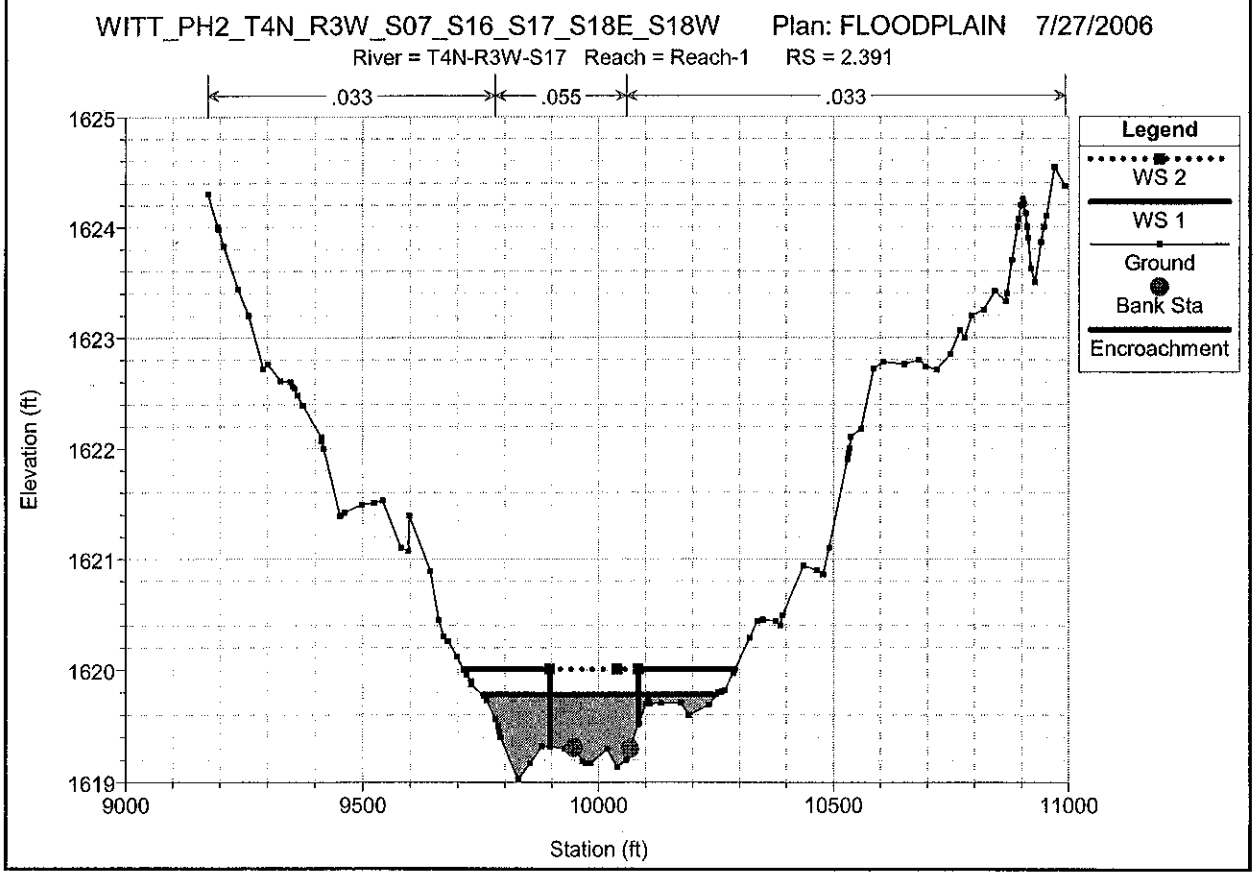
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.757 Flow rate starting at this cross-section and downstream is 250cf

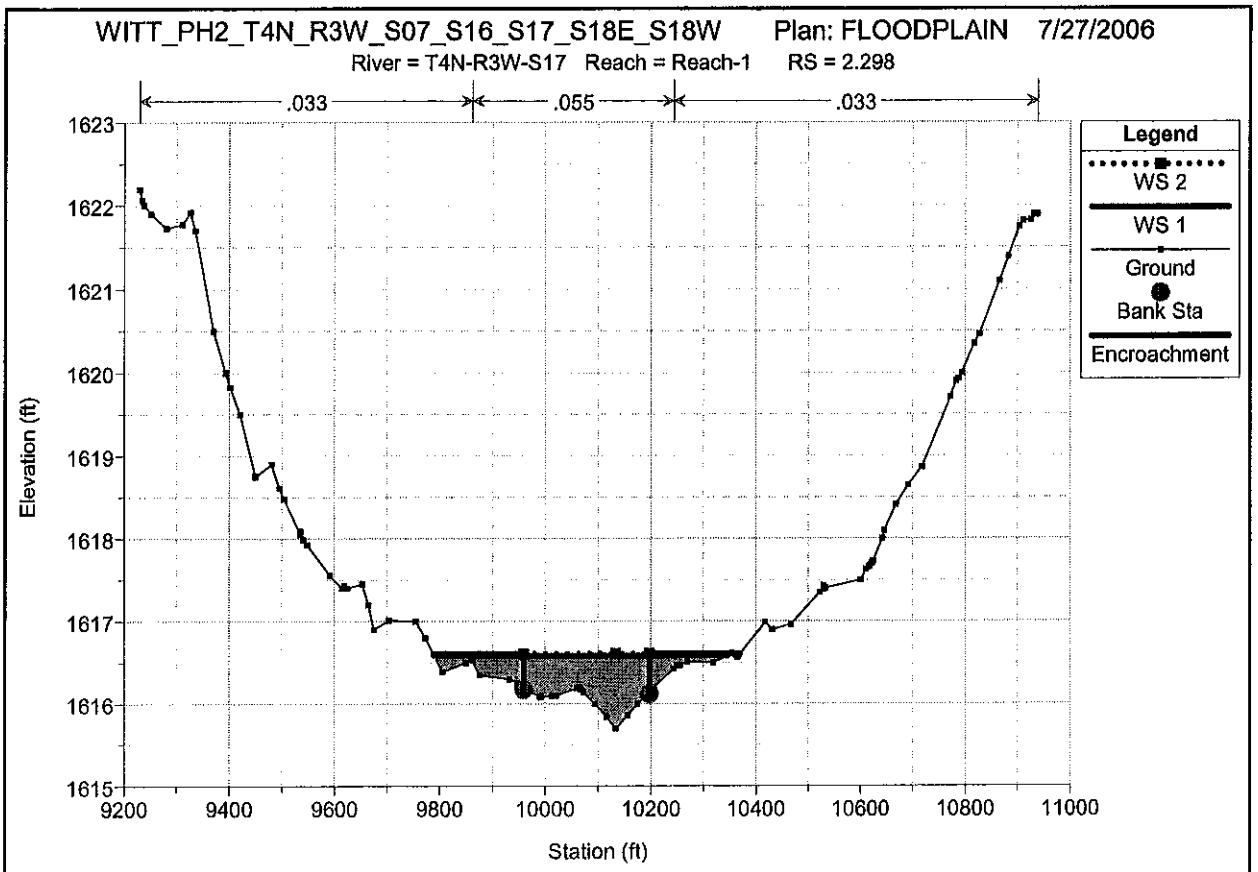


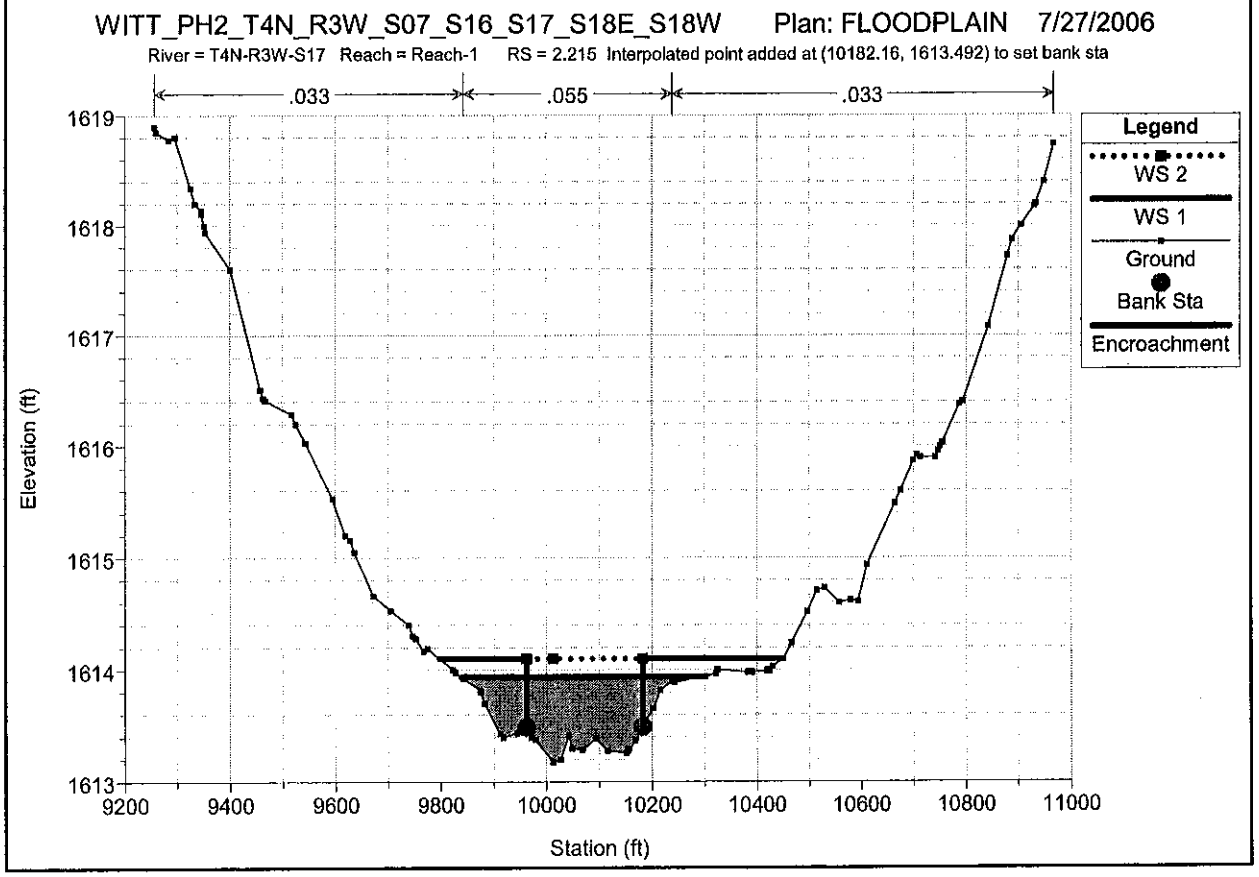

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.673
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1636
1635
1634
1633
1632
1631
1630
1629
1628
9000
9500
10000
10500
11000
11500
Station (ft)

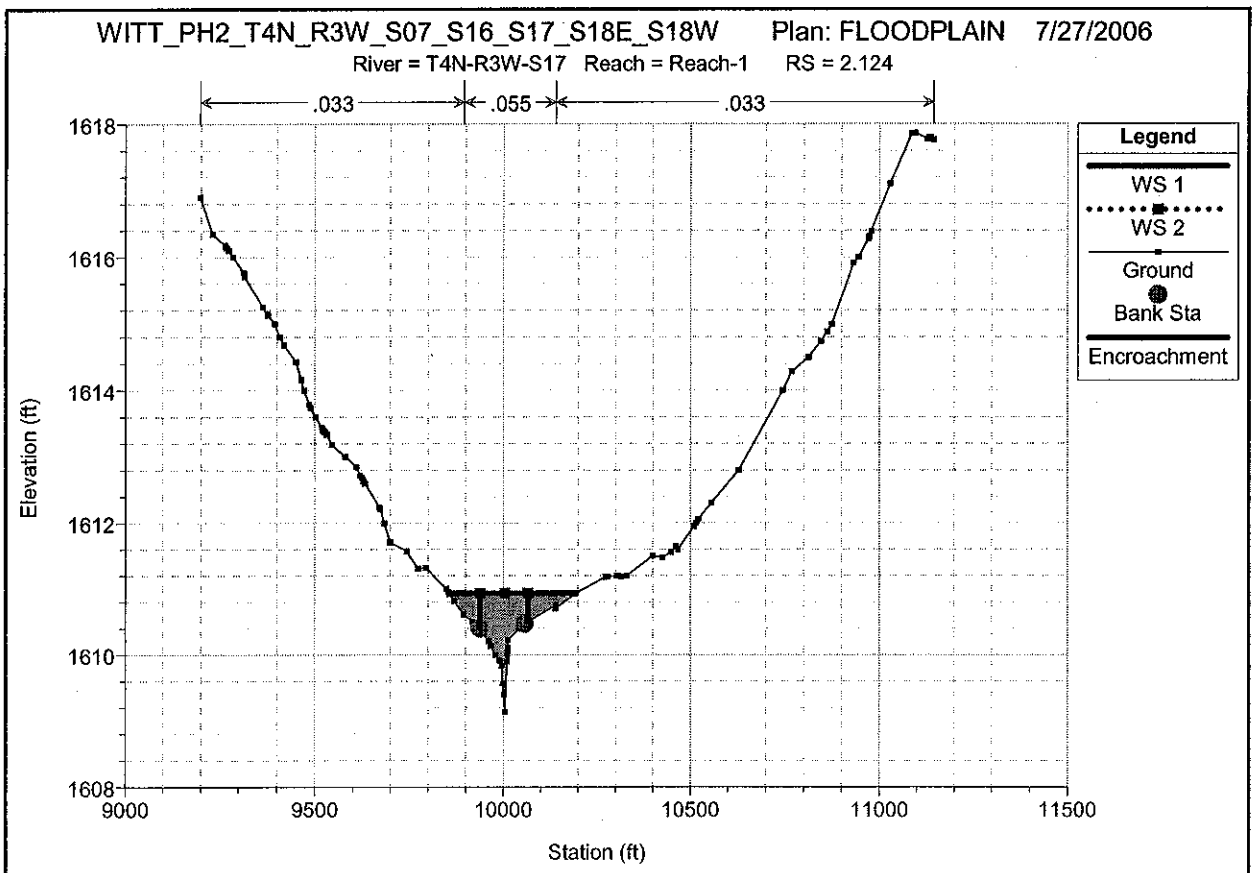

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.584
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1633
1632
1631
1630
1629
1628
1627
1626
1625
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

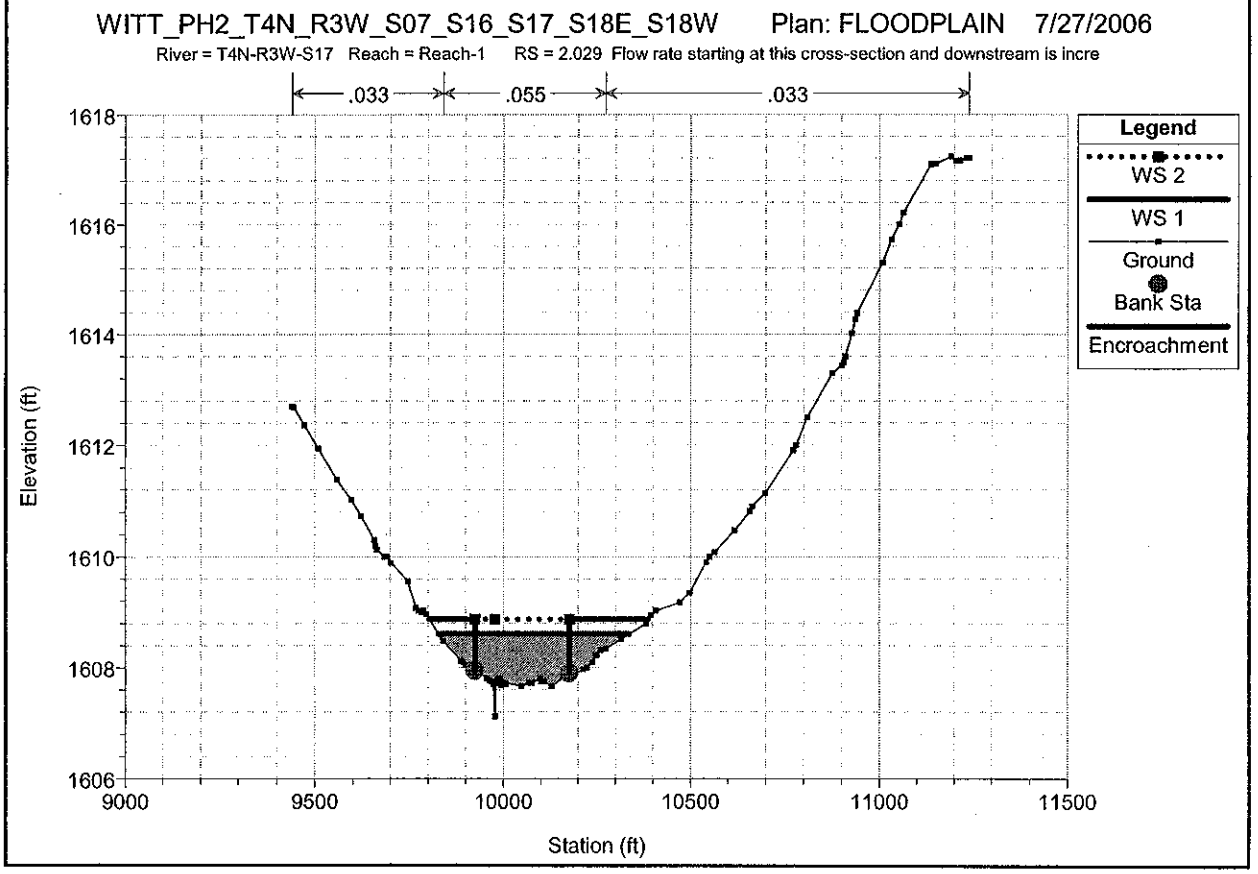

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.473
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1626
1625
1624
1623
1622
1621
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

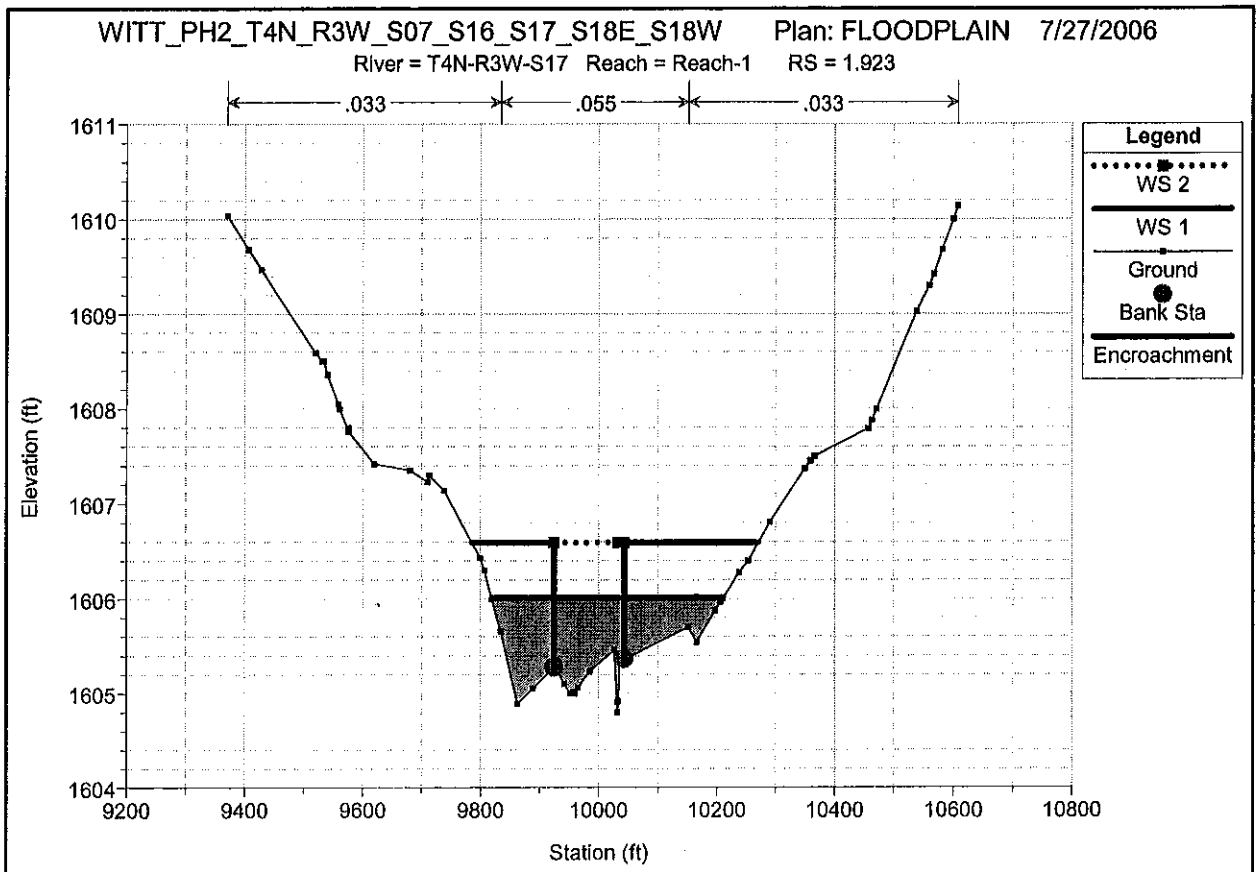

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.391
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1625
1624
1623
1622
1621
1620
1619
9000
9500
10000
10500
11000
Station (ft)

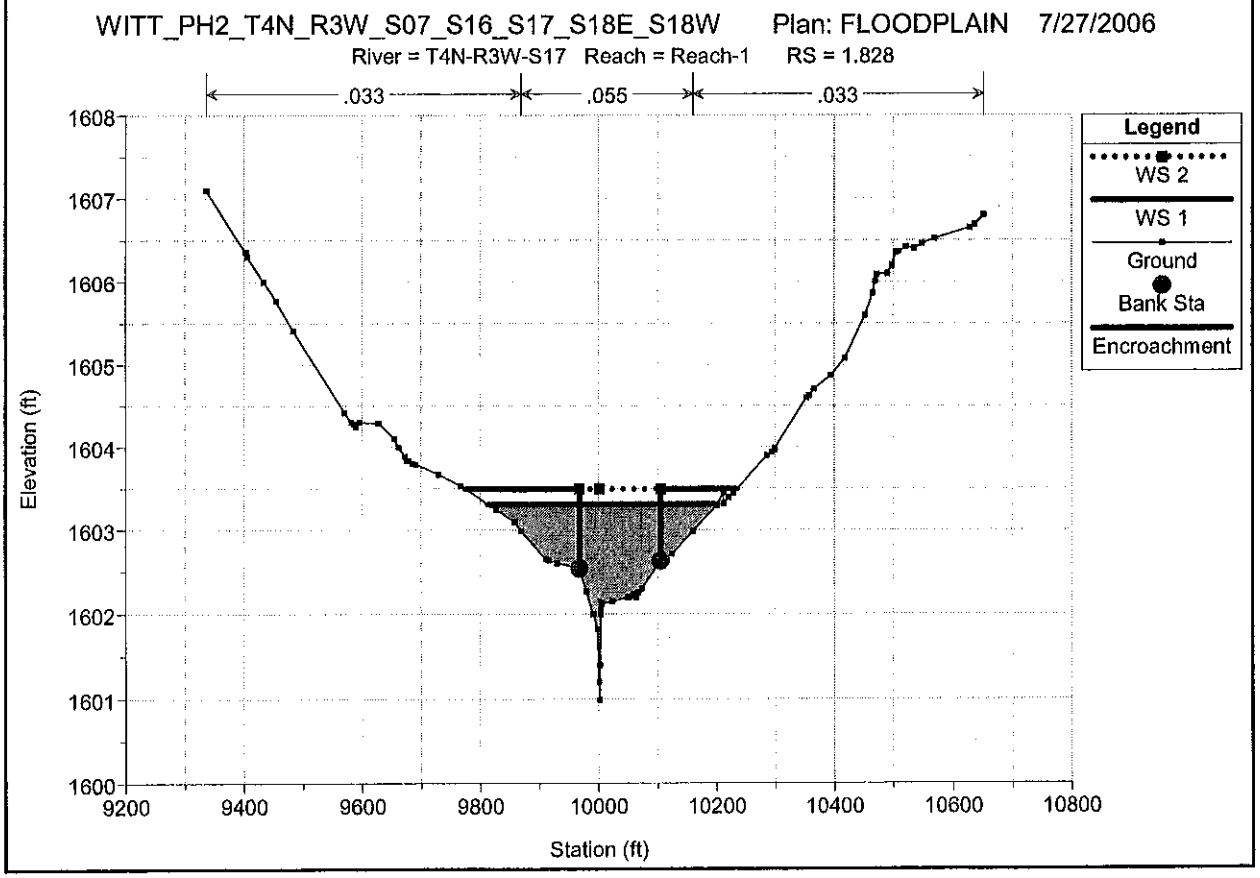

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.298
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1623
1622
1621
1620
1619
1618
1617
1616
1615
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.215 Interpolated point added at (10182.16, 1613.492) to set bank sta
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1619
1618
1617
1616
1615
1614
1613
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.124
.033
.055
.033
Legend
WS 1
WS 2
Ground
Bank Sta
Encroachment
Elevation (ft)
1618
1616
1614
1612
1610
1608
9000
9500
10000
10500
11000
11500
Station (ft)

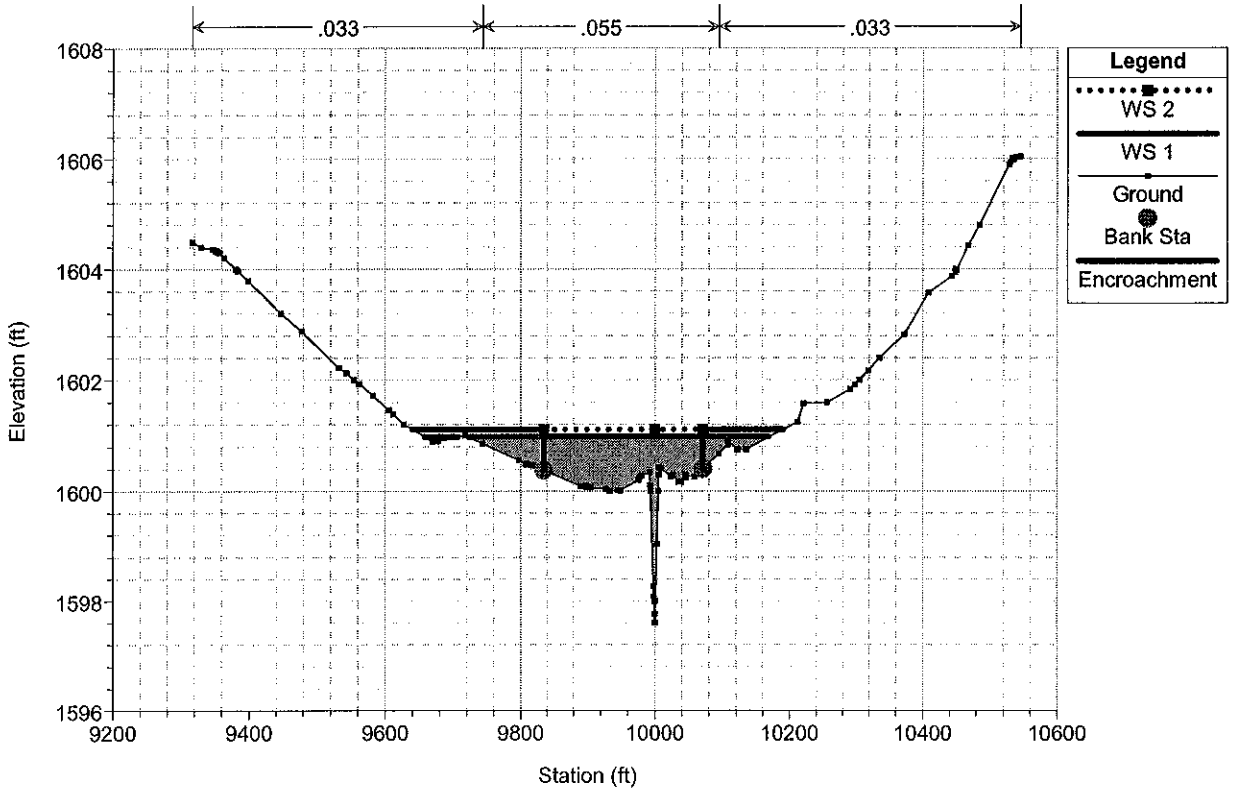

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 2.029 Flow rate starting at this cross-section and downstream is incre
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1618
1616
1614
1612
1610
1608
1606
9000
9500
10000
10500
11000
11500
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 1.923
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1611
1610
1609
1608
1607
1606
1605
1604
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-1 RS = 1.828
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1608
1607
1606
1605
1604
1603
1602
1601
1600
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

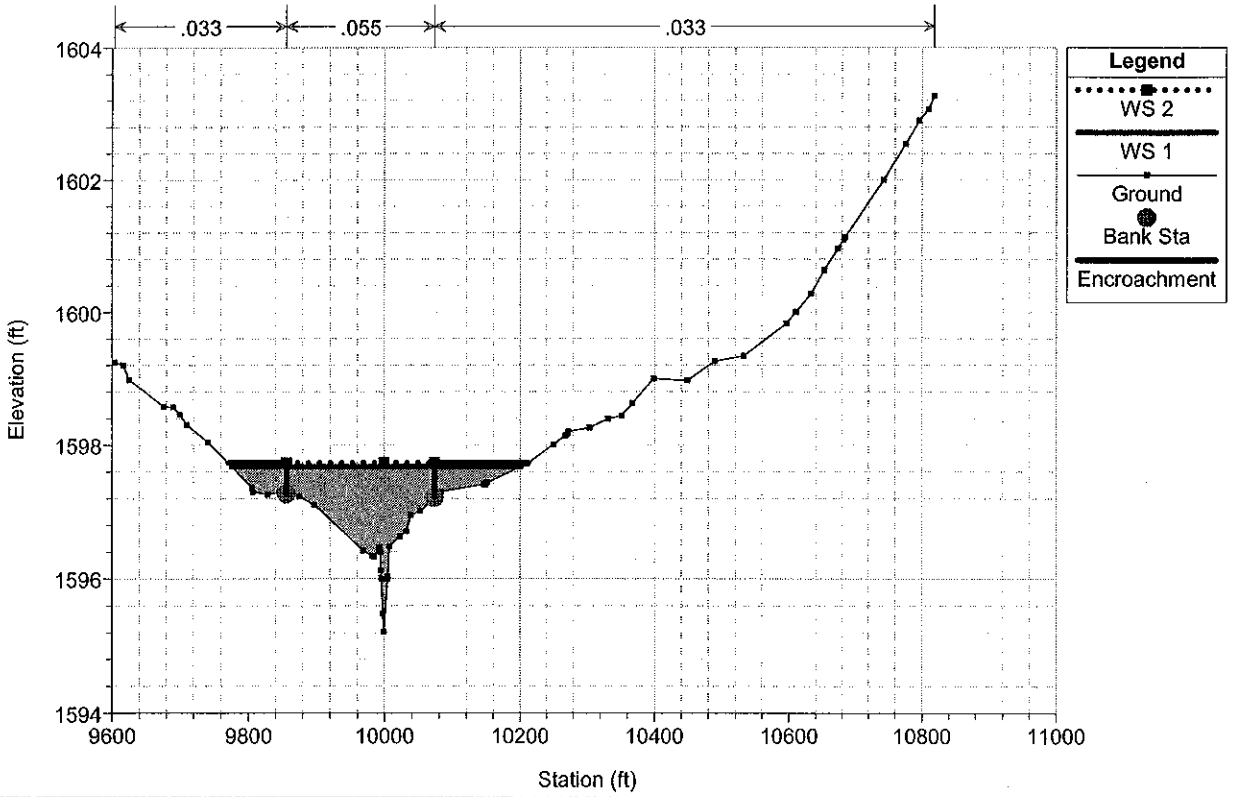
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

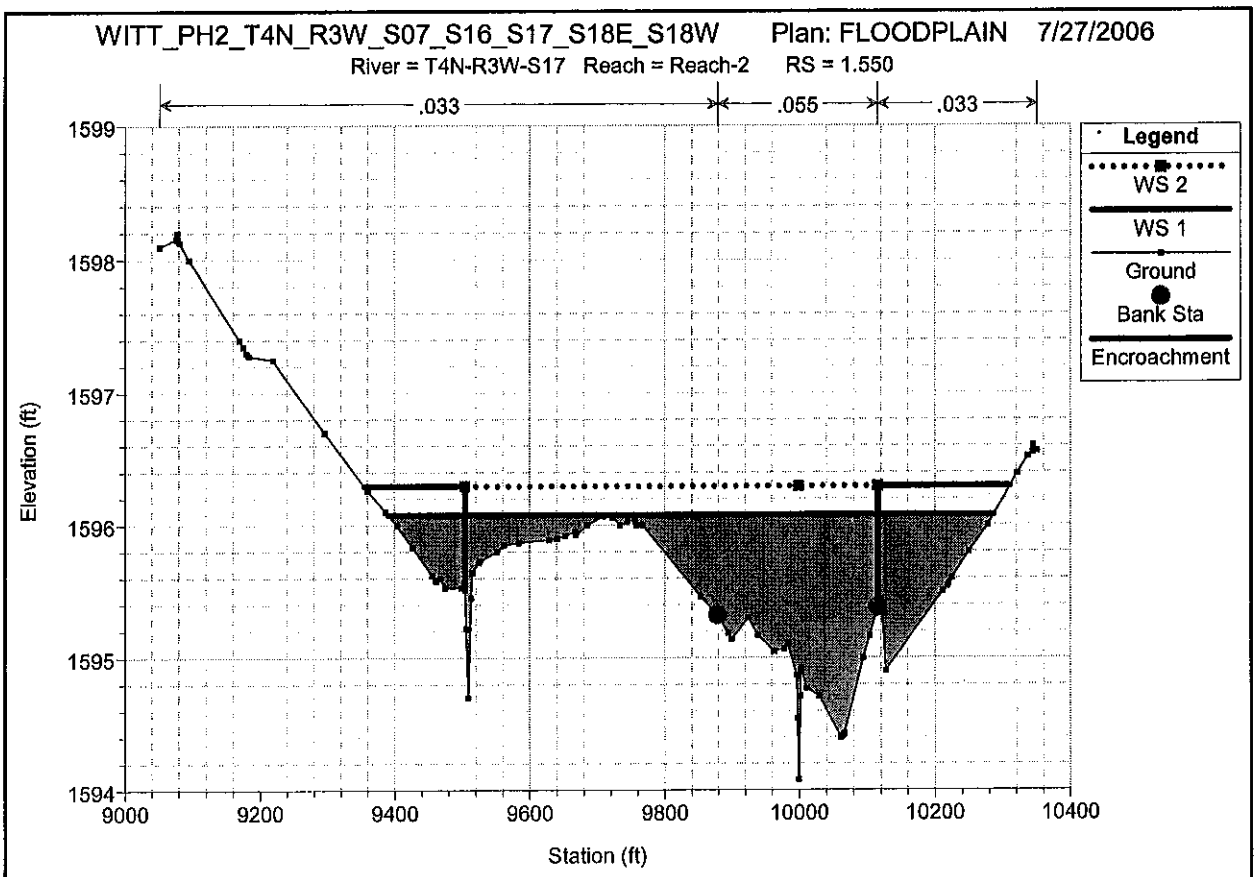
River = T4N-R3W-S17 Reach = Reach-1 RS = 1.744 Levee added-Ridge not overtopped per BFE calcs

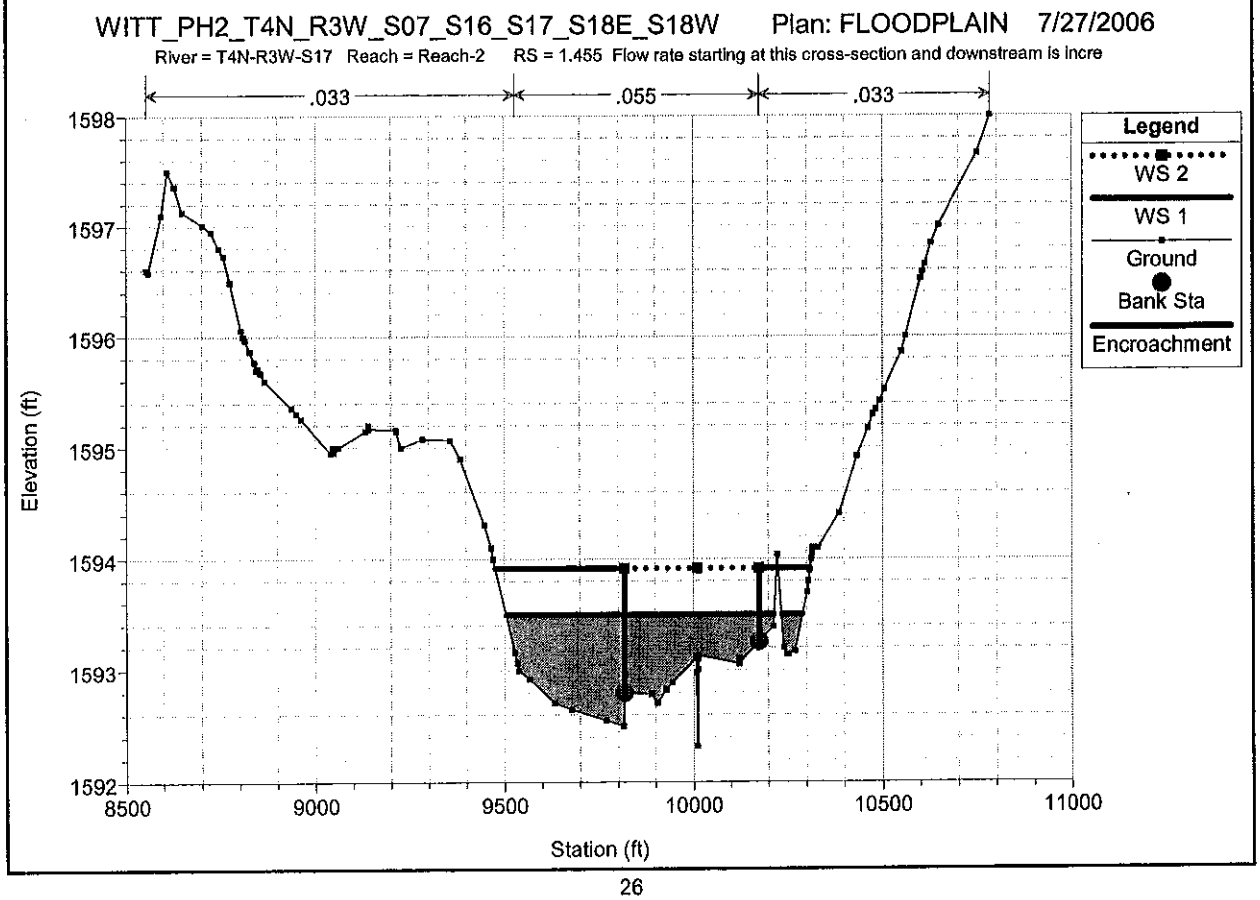


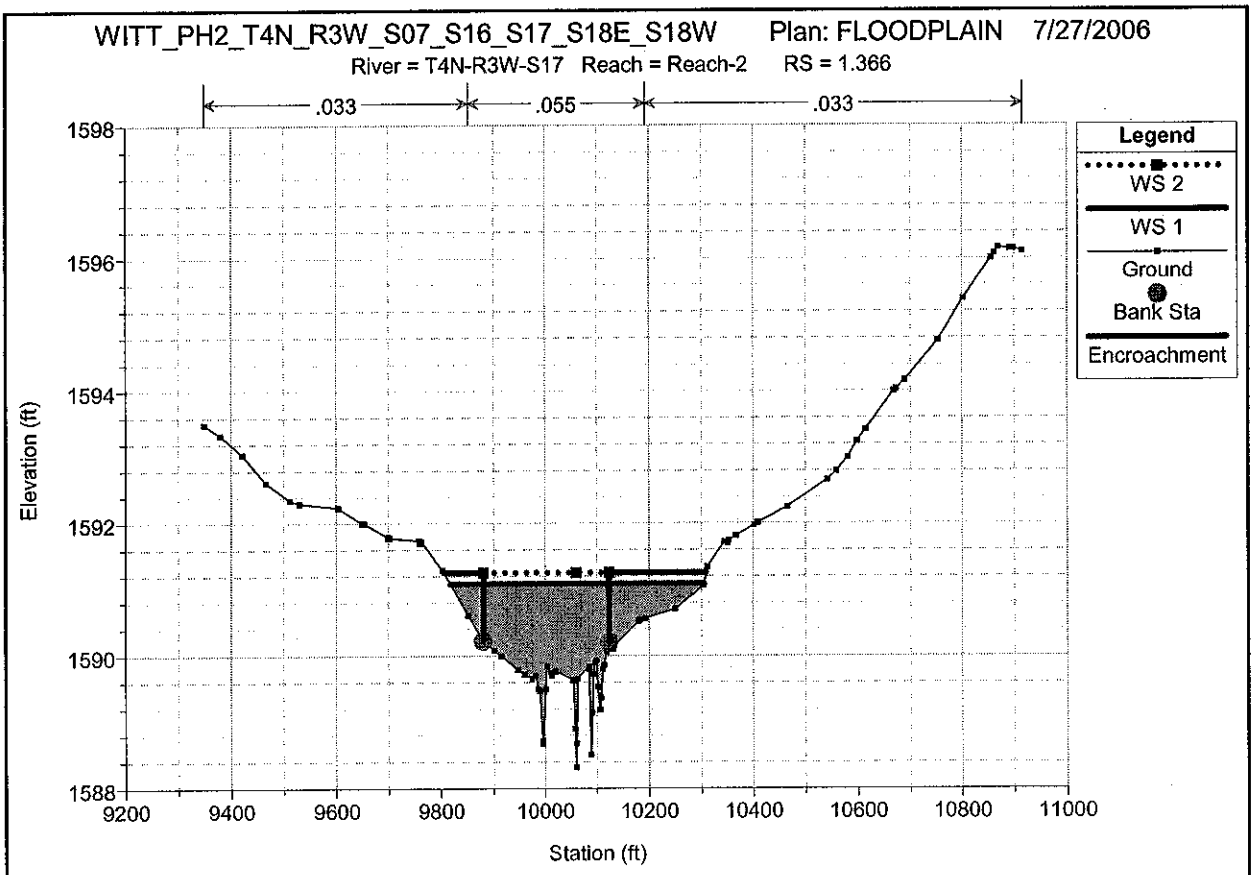
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

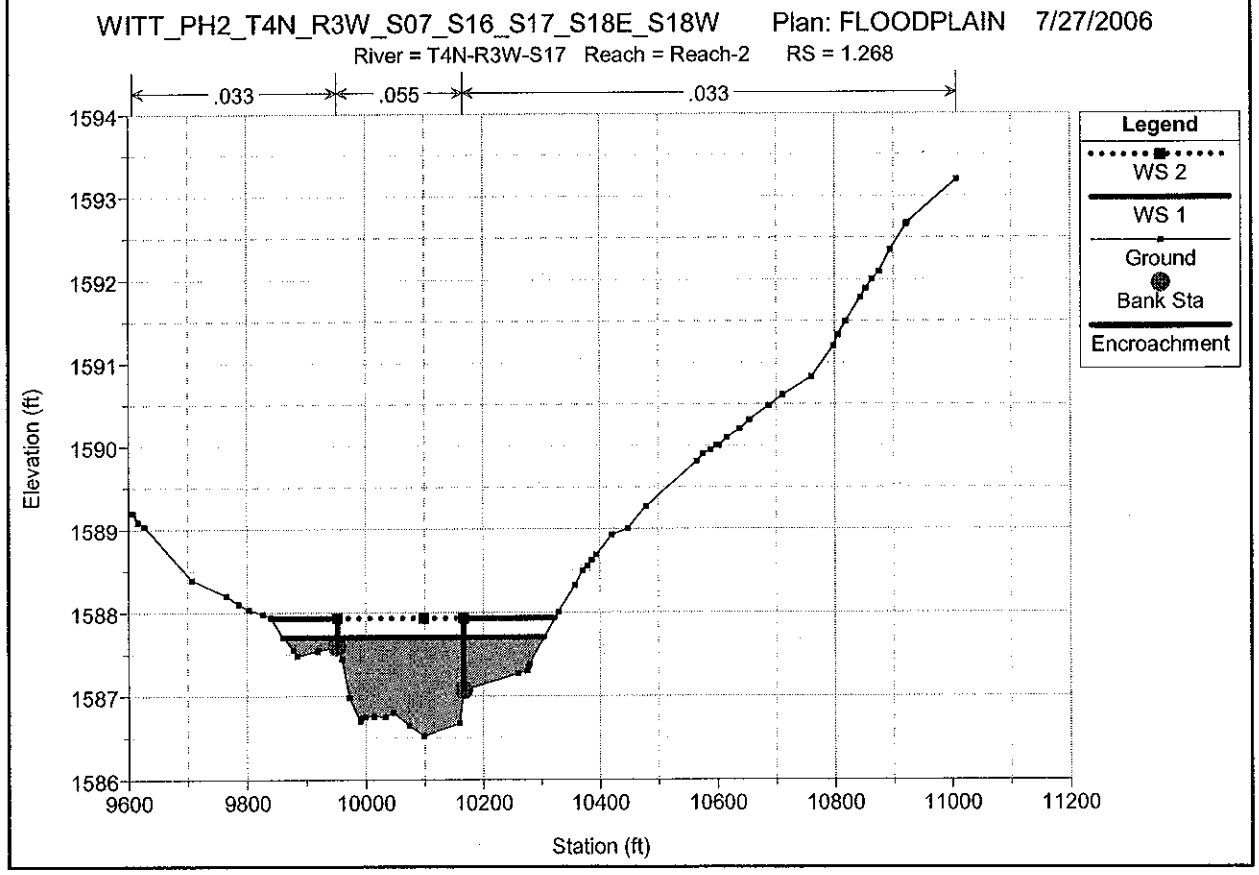
River = T4N-R3W-S17 Reach = Reach-1 RS = 1.627 Levee added-Ridge not overtopped per BFE calcs

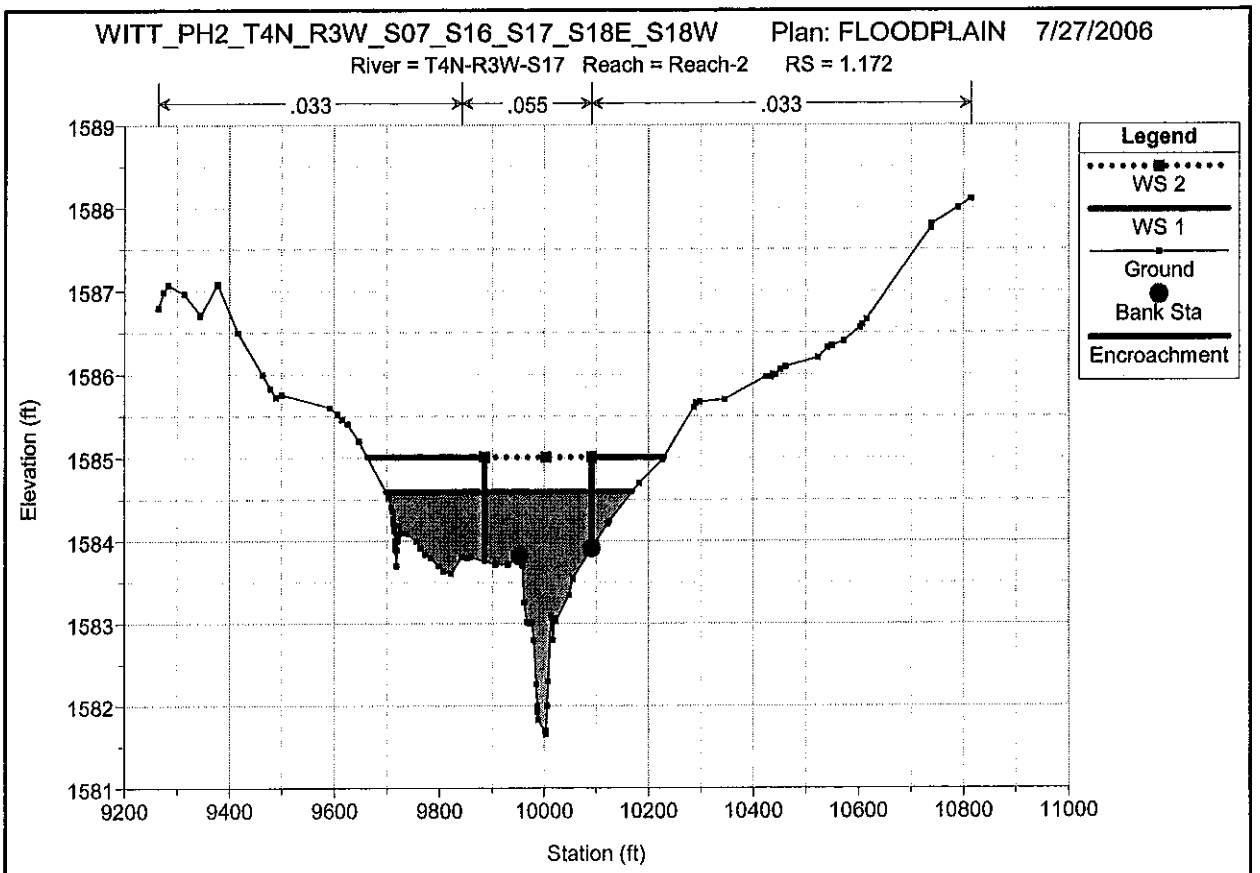


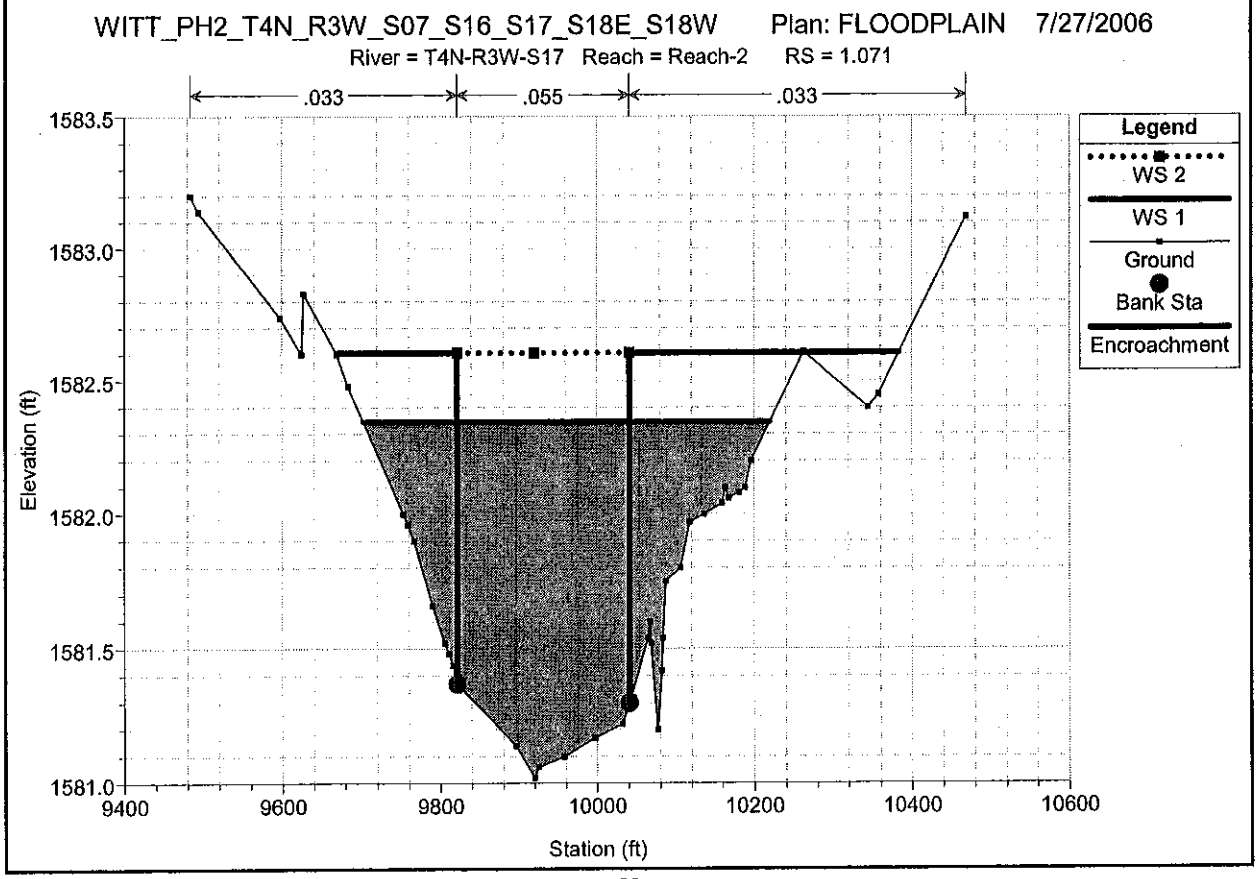

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.550
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1599
1598
1597
1596
1595
1594
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

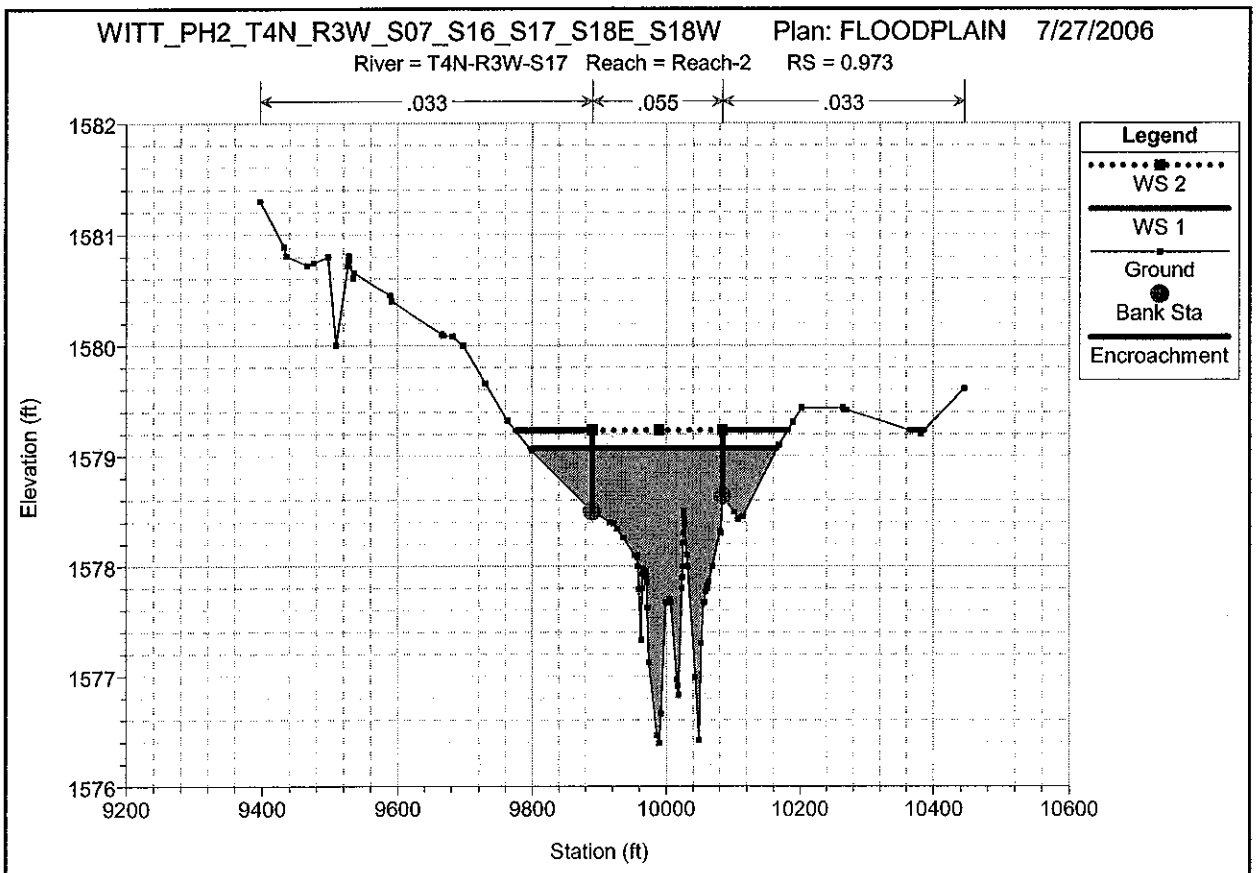

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.455 Flow rate starting at this cross-section and downstream is incre
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1598
1597
1596
1595
1594
1593
1592
8500
9000
9500
10000
10500
11000
Station (ft)

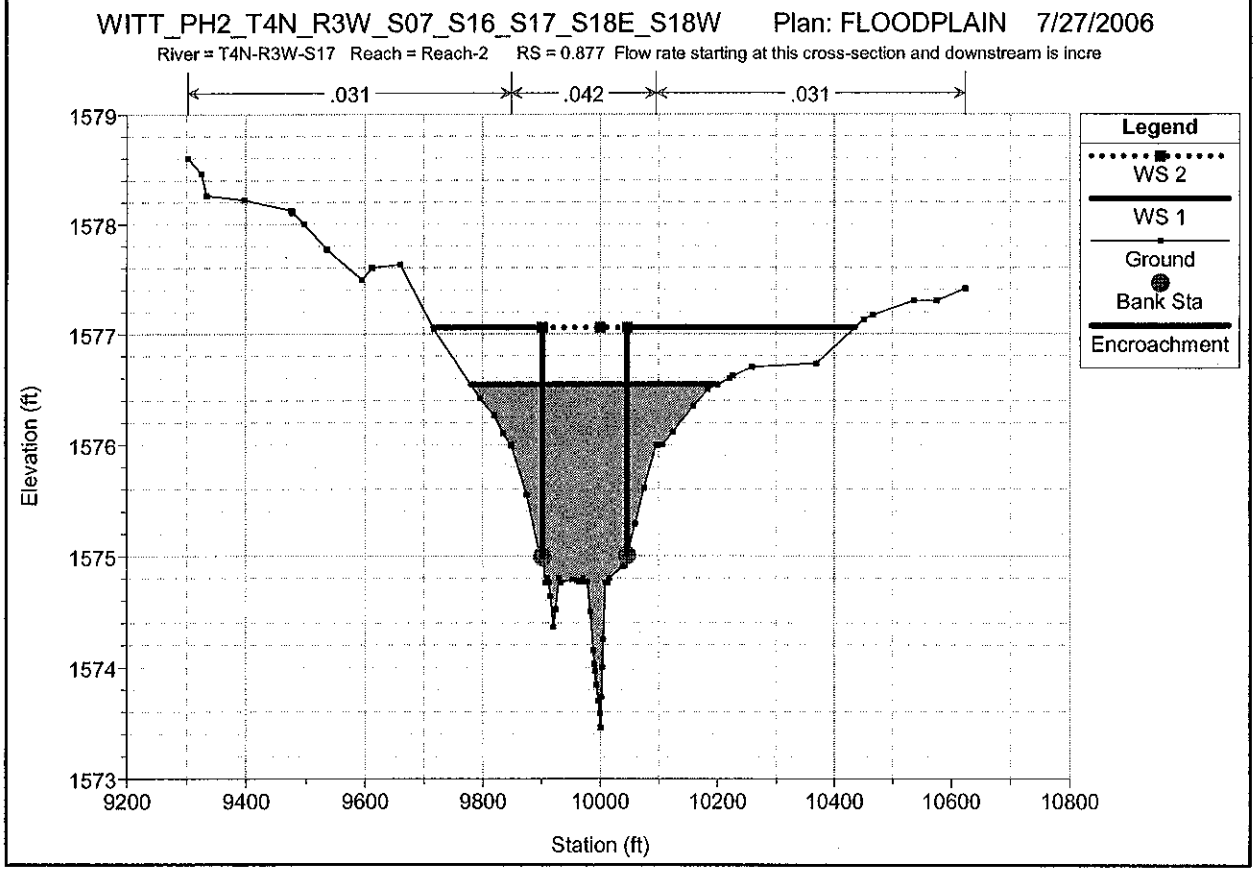

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.366
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1598
1596
1594
1592
1590
1588
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

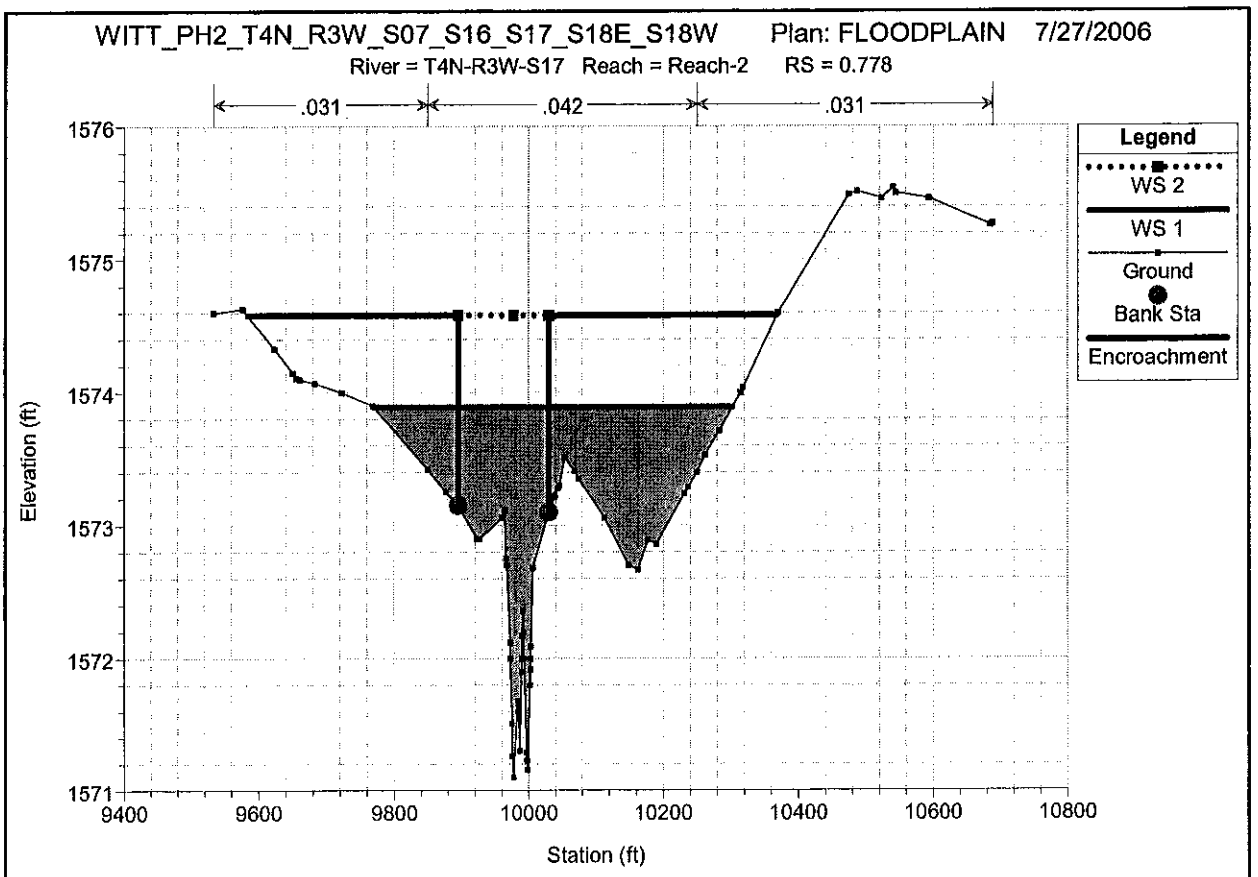

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.268
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1594
1593
1592
1591
1590
1589
1588
1587
1586
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

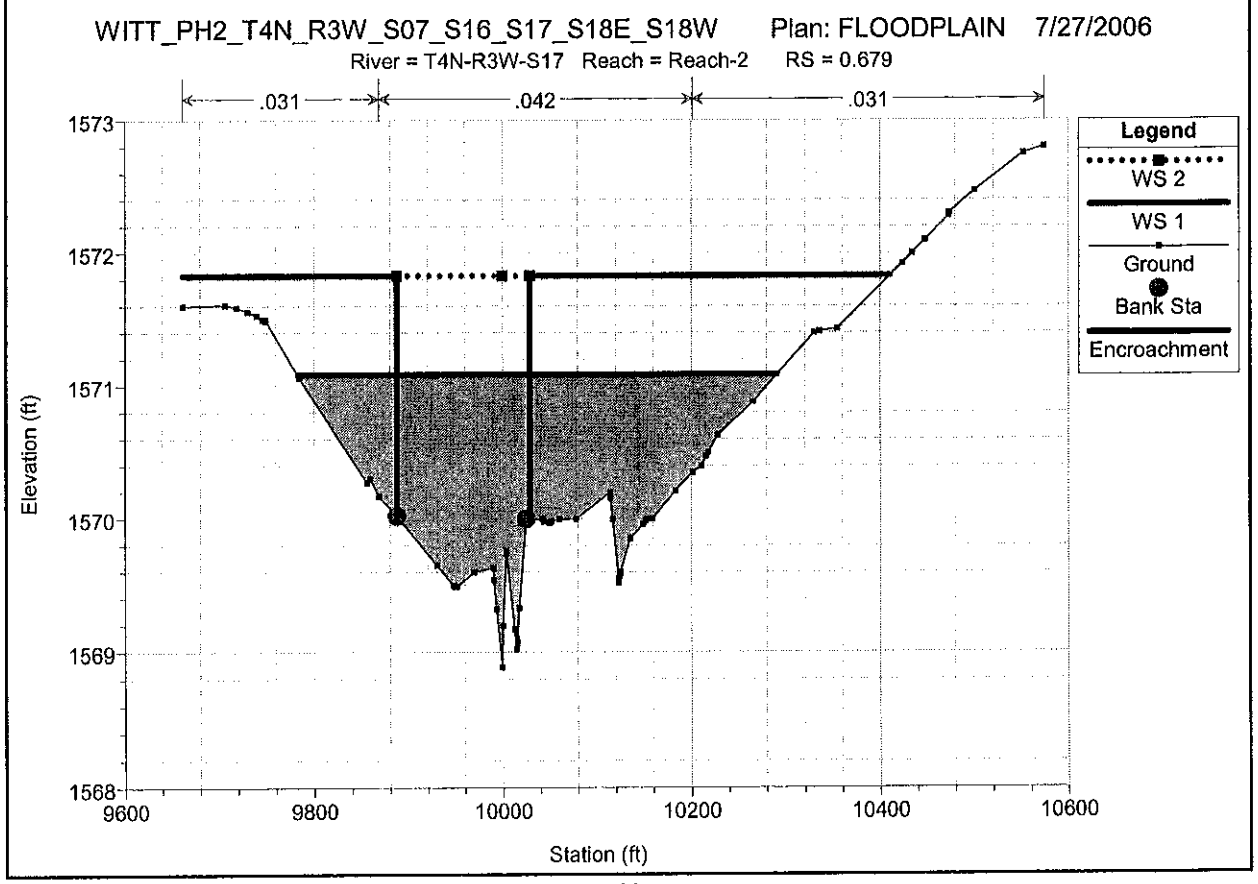

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.172
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1589
1588
1587
1586
1585
1584
1583
1582
1581
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

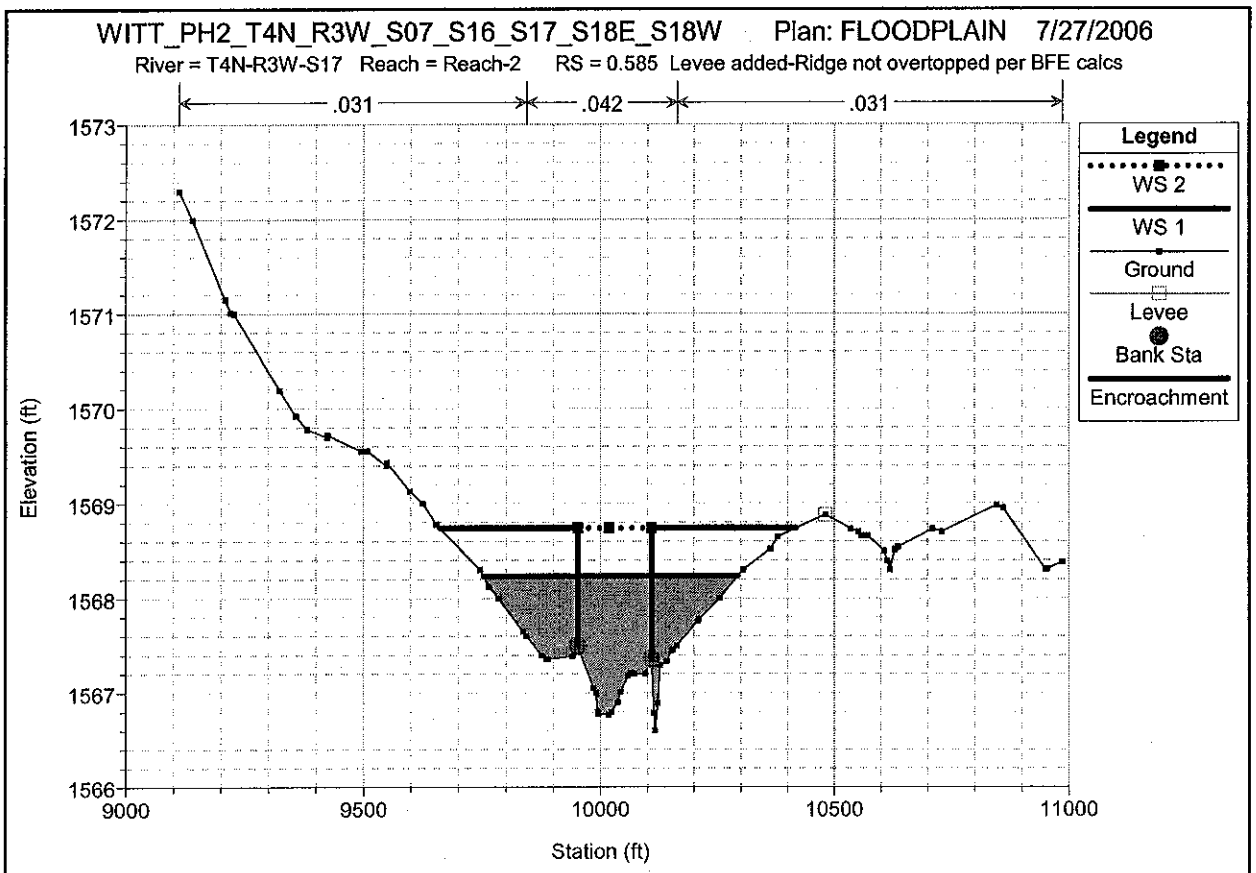

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 1.071
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1583.5
1583.0
1582.5
1582.0
1581.5
1581.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

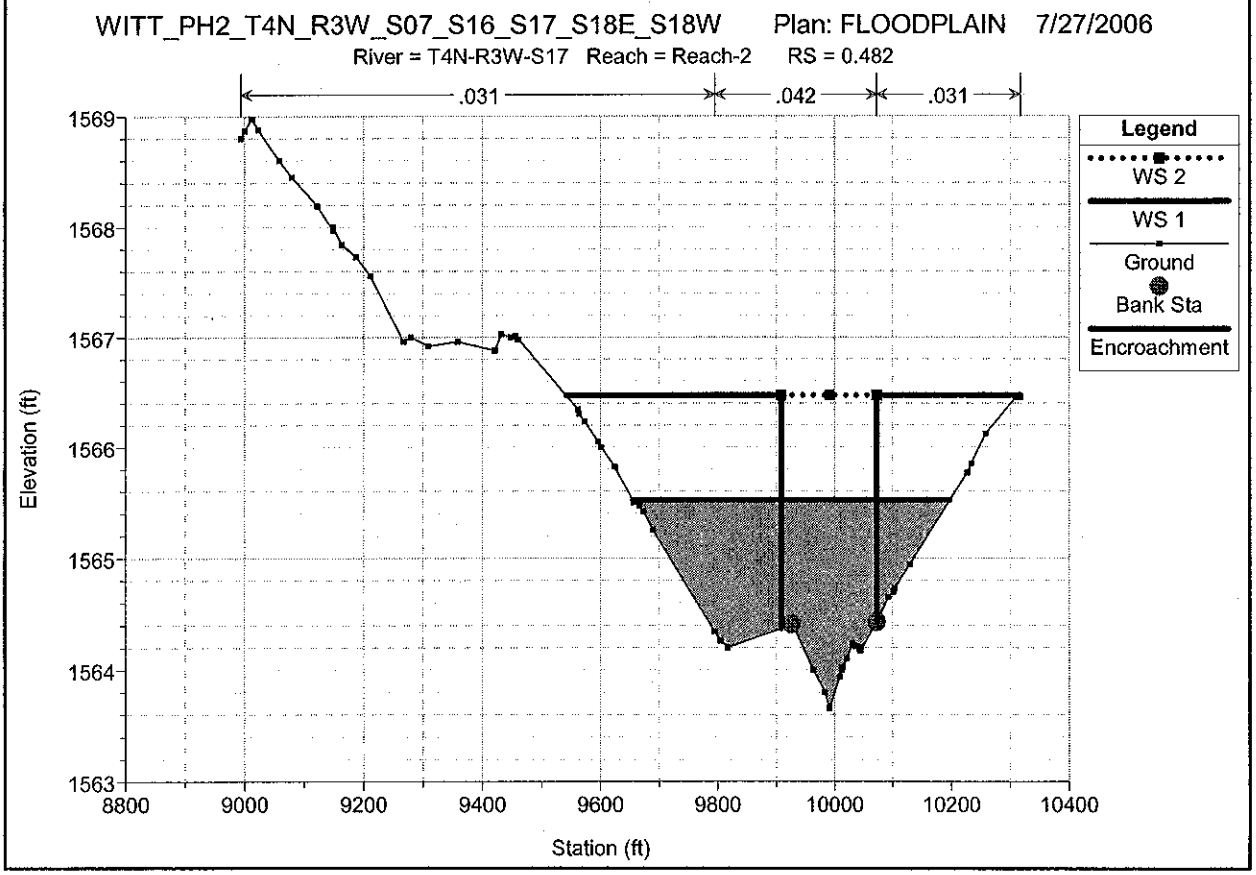

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.973
.033
.055
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1582
1581
1580
1579
1578
1577
1576
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

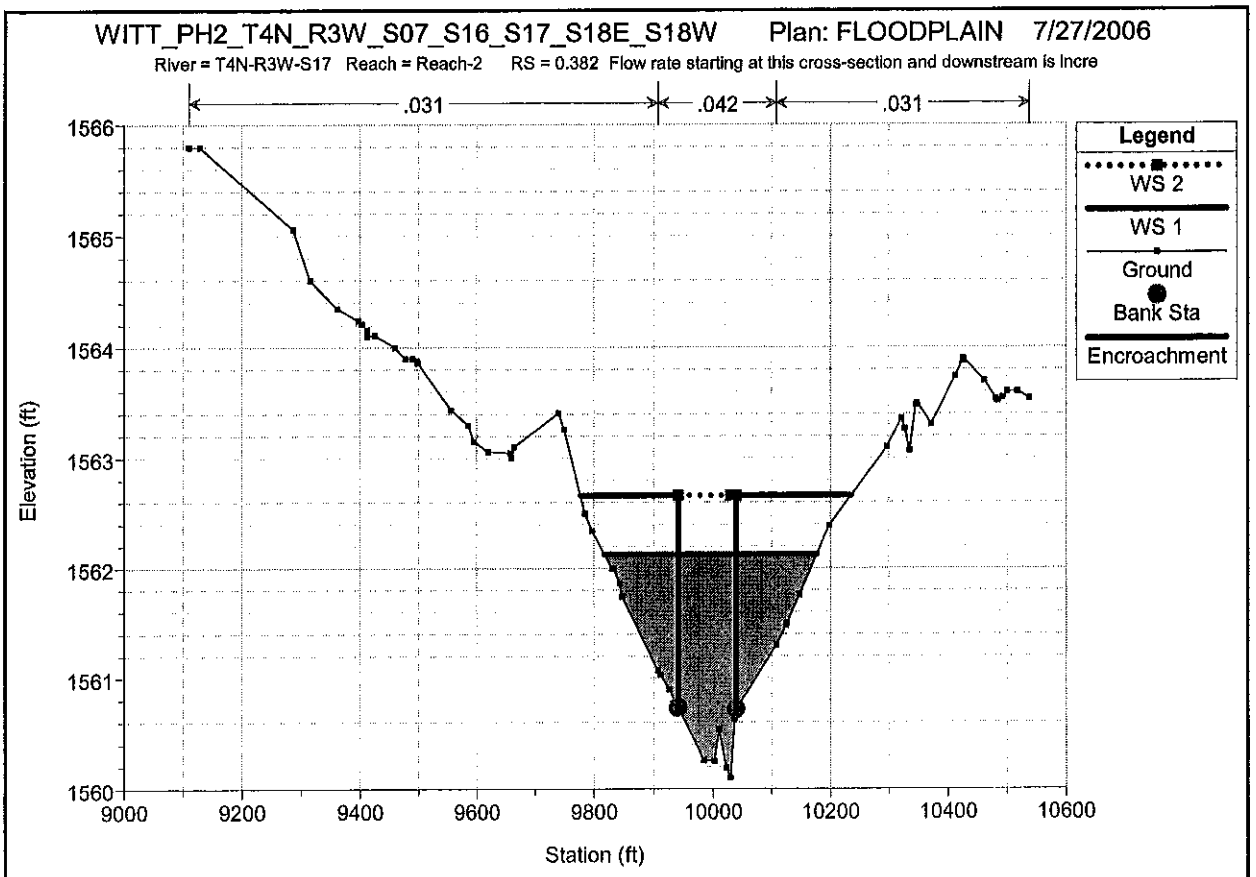

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.877 Flow rate starting at this cross-section and downstream is incre
.031
.042
.031
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1579
1578
1577
1576
1575
1574
1573
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

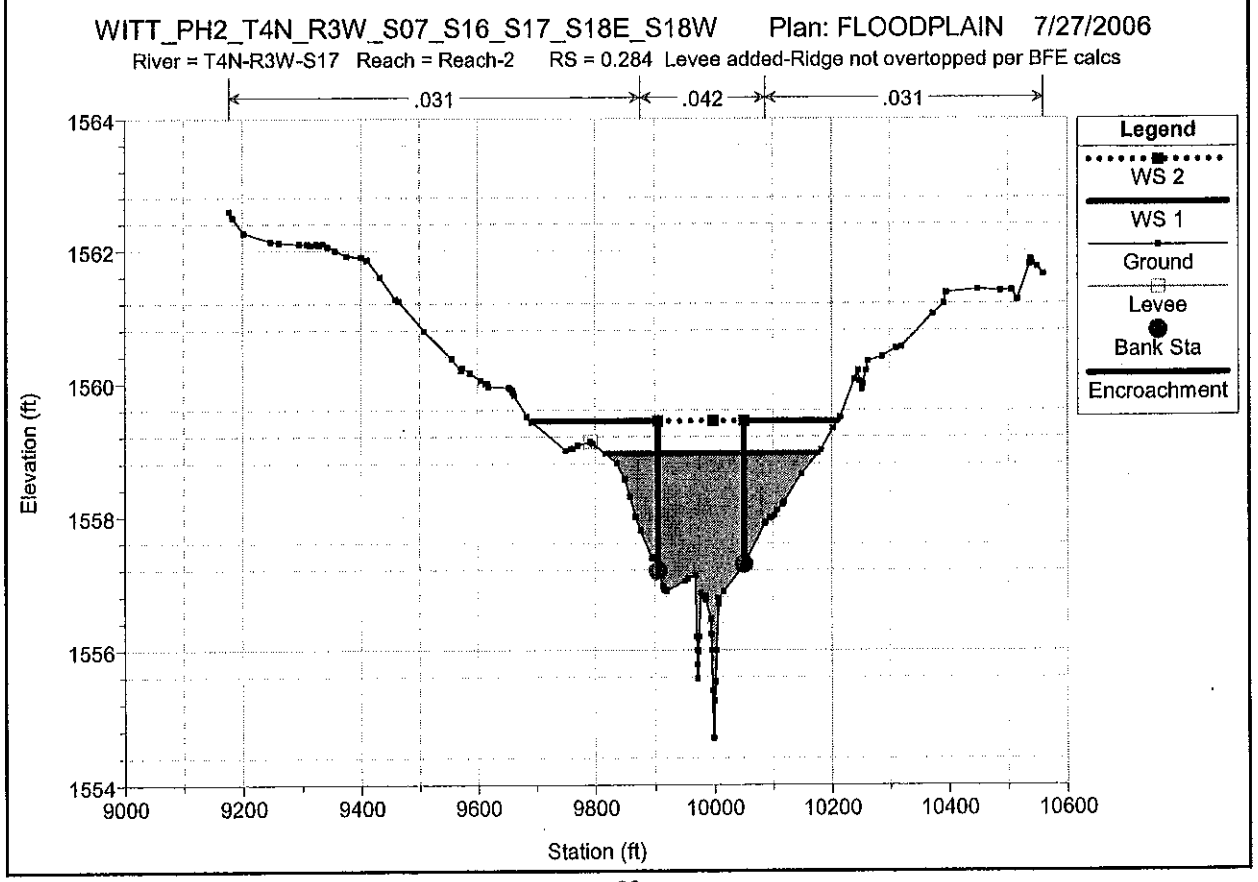

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.778
.031
.042
.031
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1576
1575
1574
1573
1572
1571
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

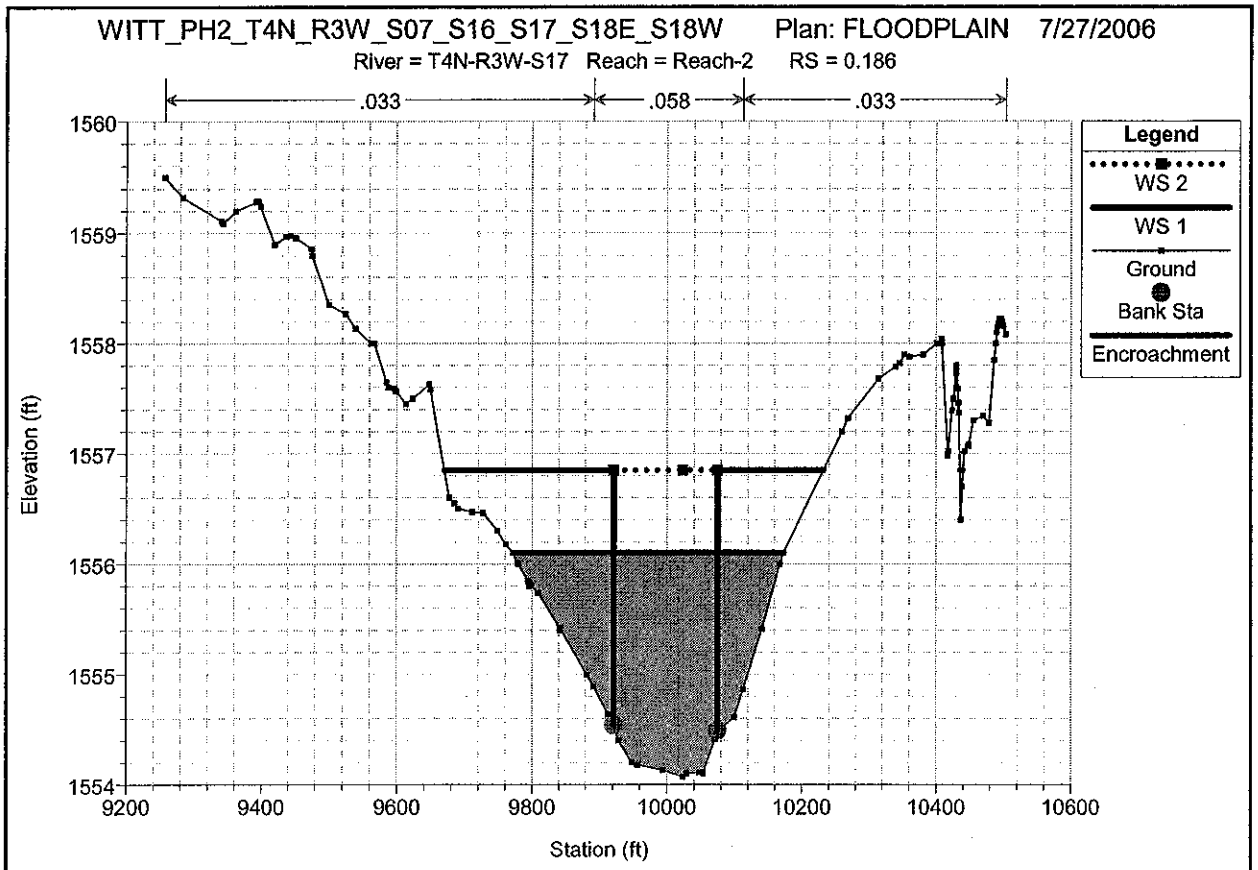

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.679
.031
.042
.031
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1573
1572
1571
1570
1569
1568
9600
9800
10000
10200
10400
10600
Station (ft)

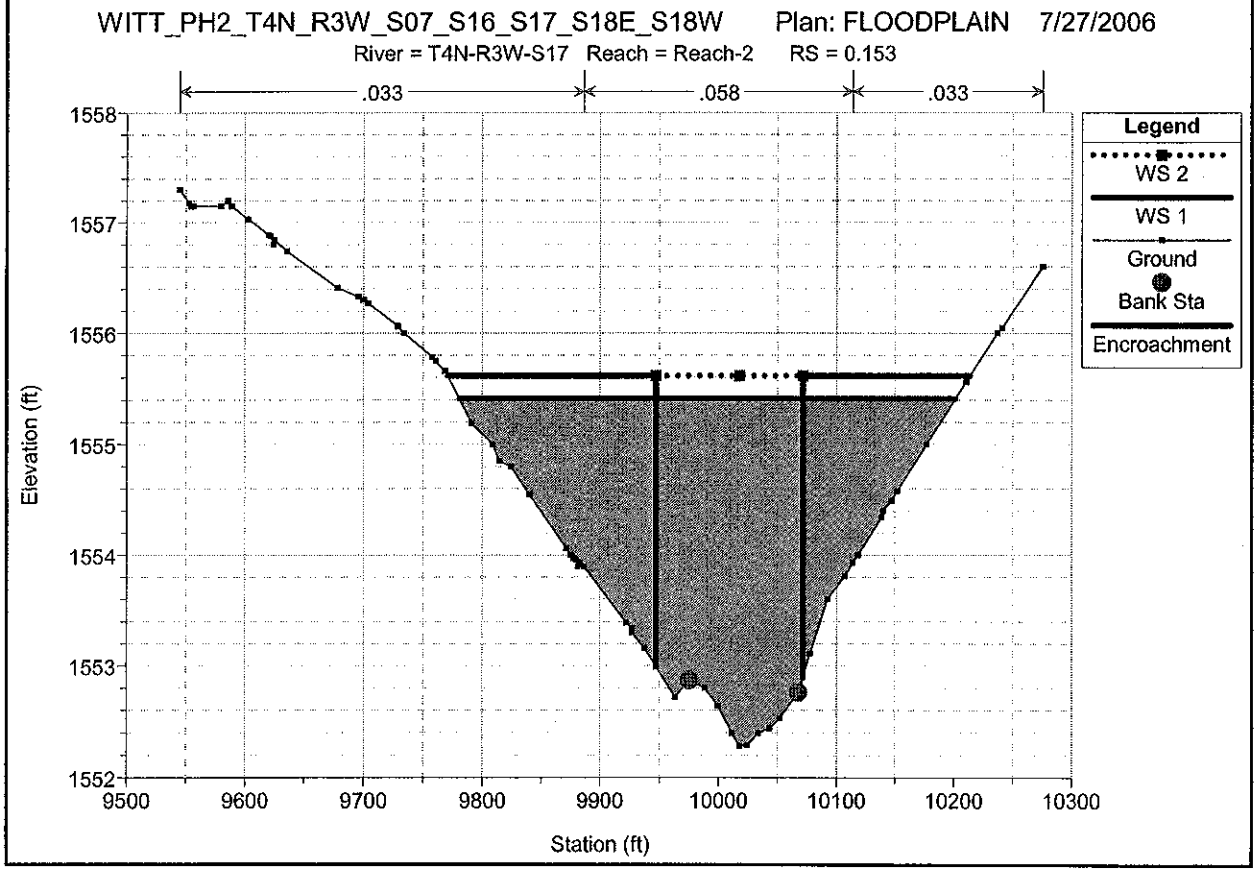

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.585 Levee added-Ridge not overtopped per BFE calcs
.031
.042
.031
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1573
1572
1571
1570
1569
1568
1567
1566
9000
9500
10000
10500
11000
Station (ft)

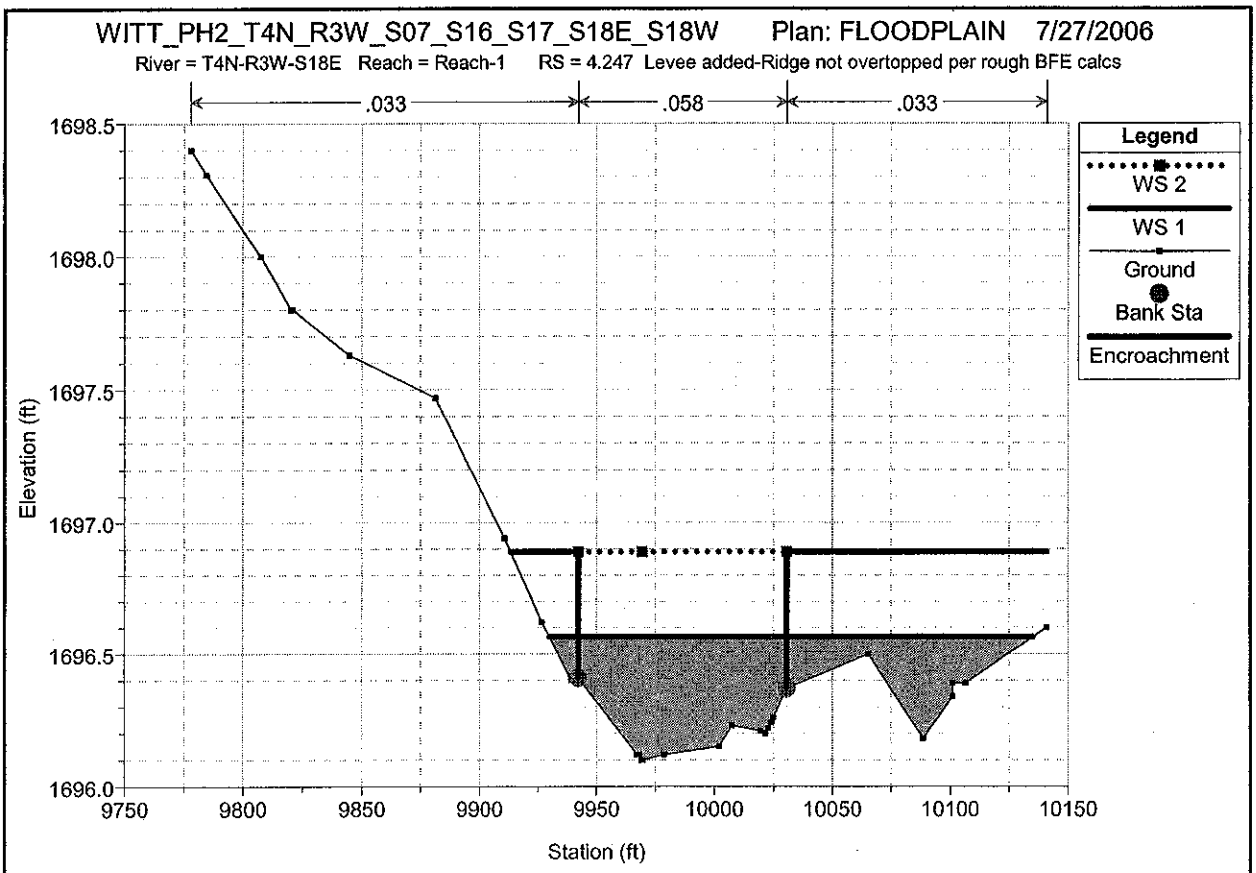

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.482
.031
.042
.031
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1569
1568
1567
1566
1565
1564
1563
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

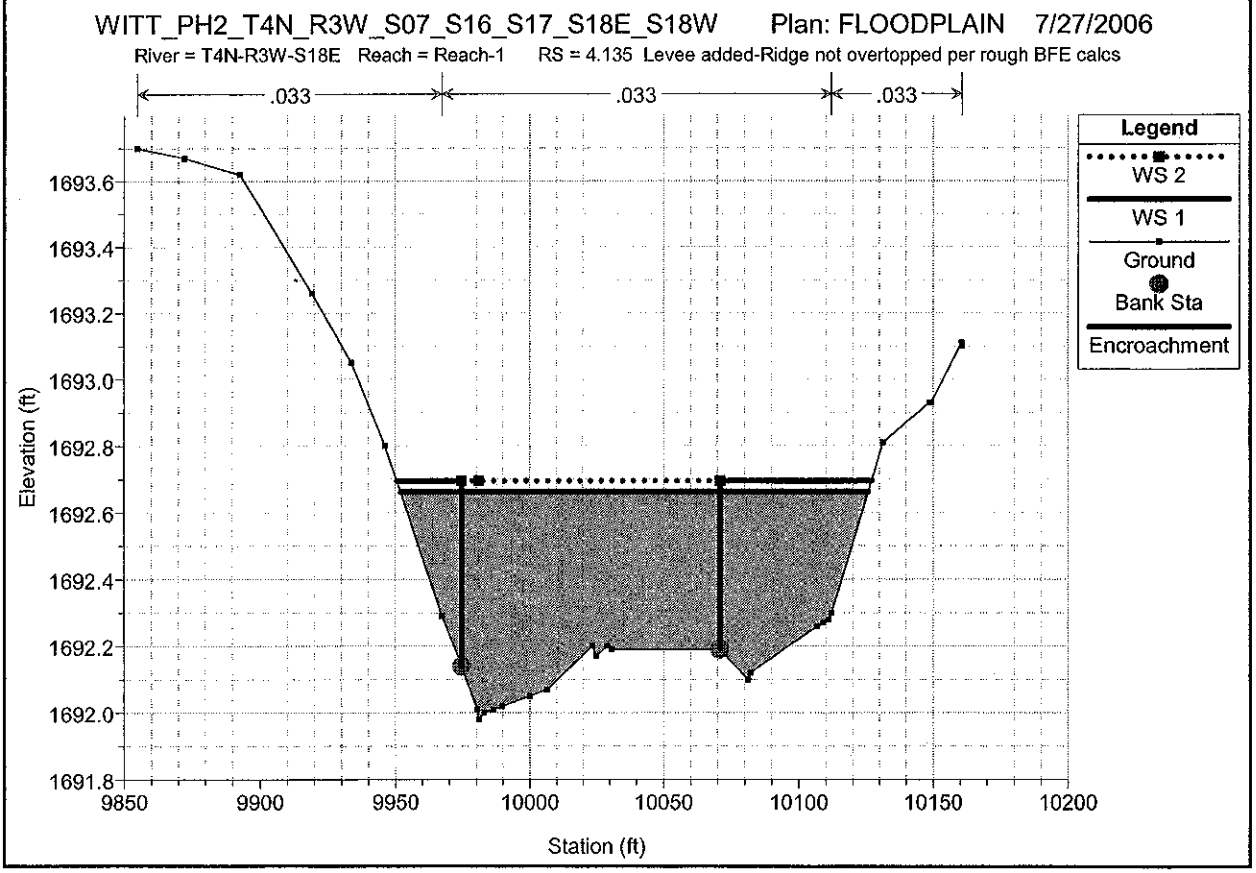

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.382 Flow rate starting at this cross-section and downstream is Incre
.031
.042
.031
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1566
1565
1564
1563
1562
1561
1560
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

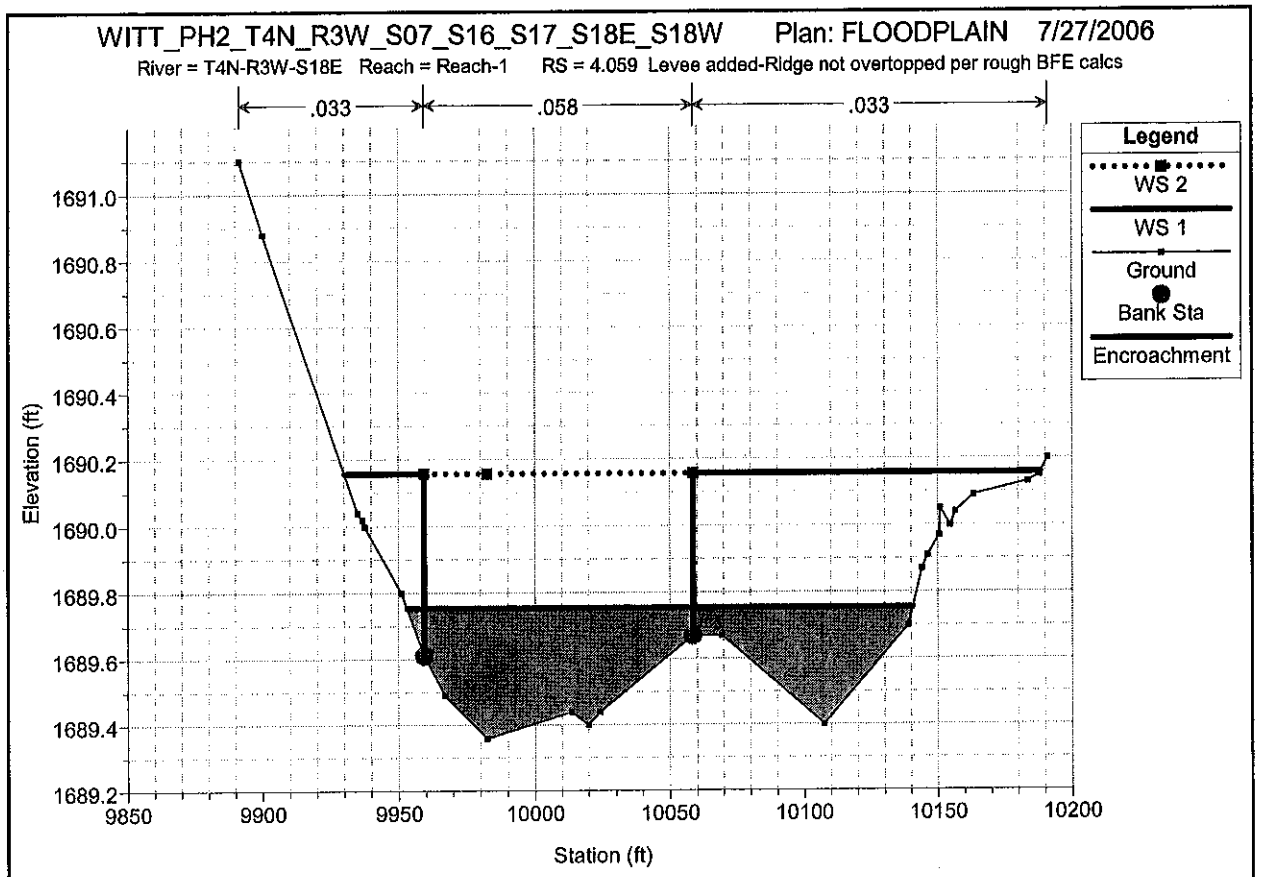

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.284 Levee added-Ridge not overtopped per BFE calcs
.031
.042
.031
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1564
1562
1560
1558
1556
1554
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

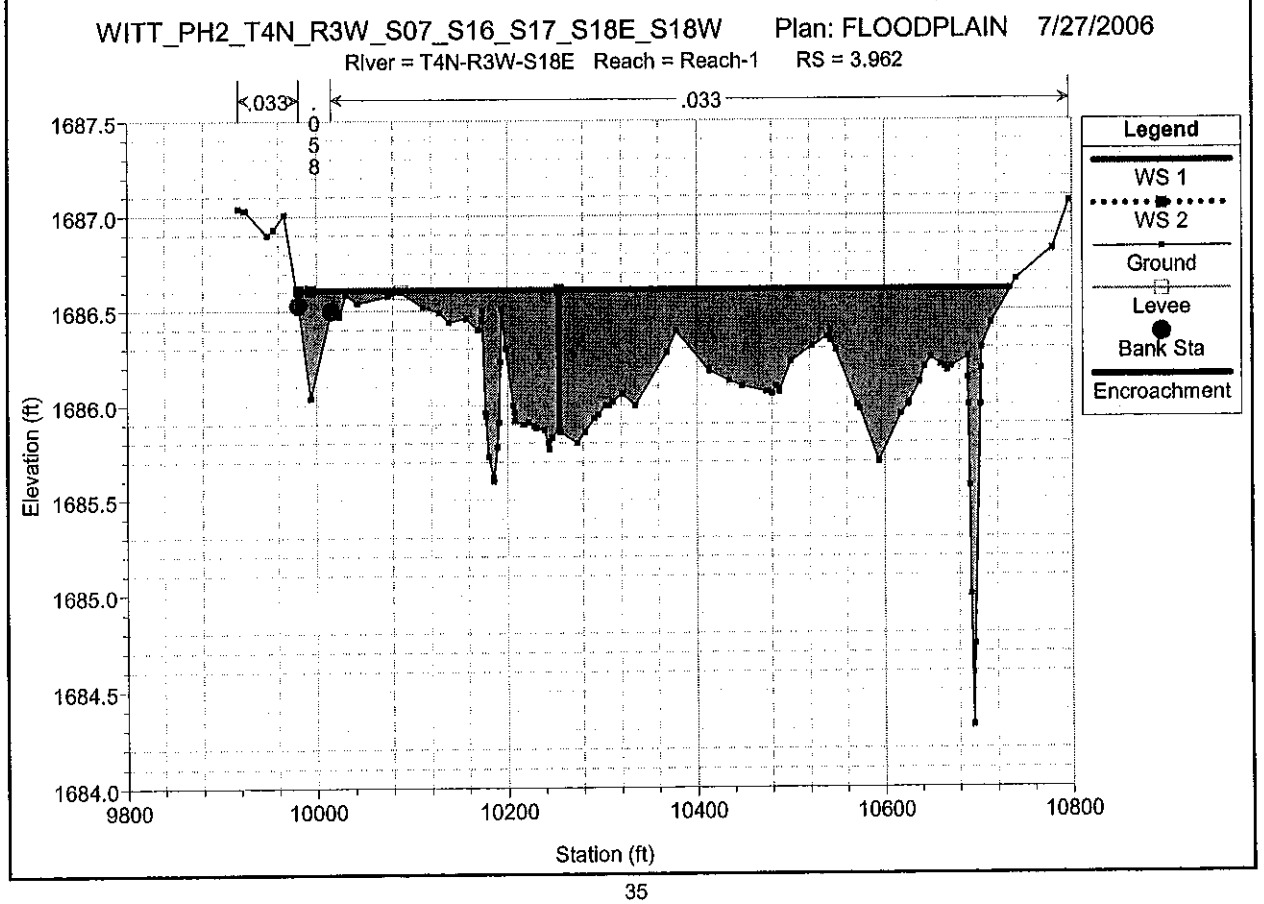

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.186
.033
.058
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1560
1559
1558
1557
1556
1555
1554
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

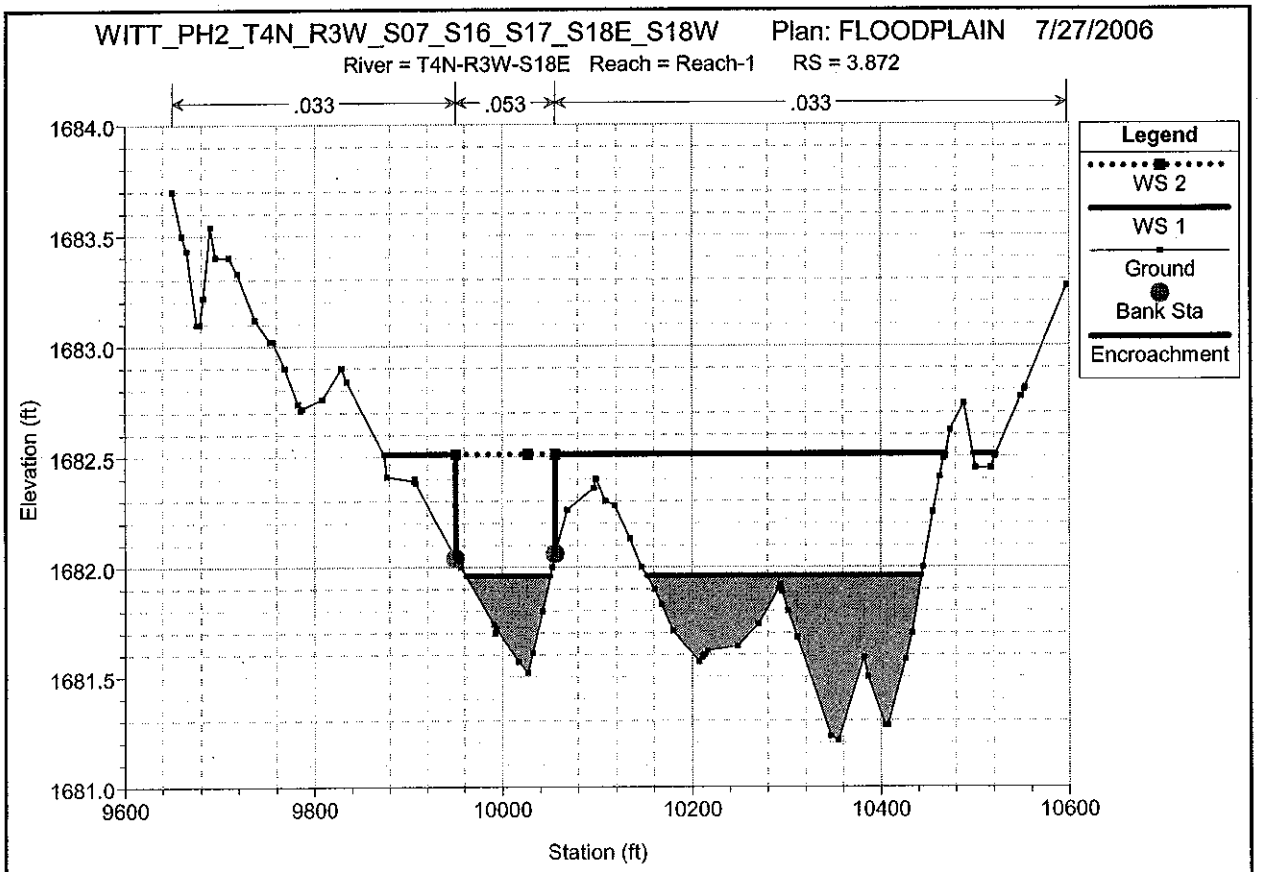

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S17 Reach = Reach-2 RS = 0.153
.033
.058
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1558
1557
1556
1555
1554
1553
1552
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

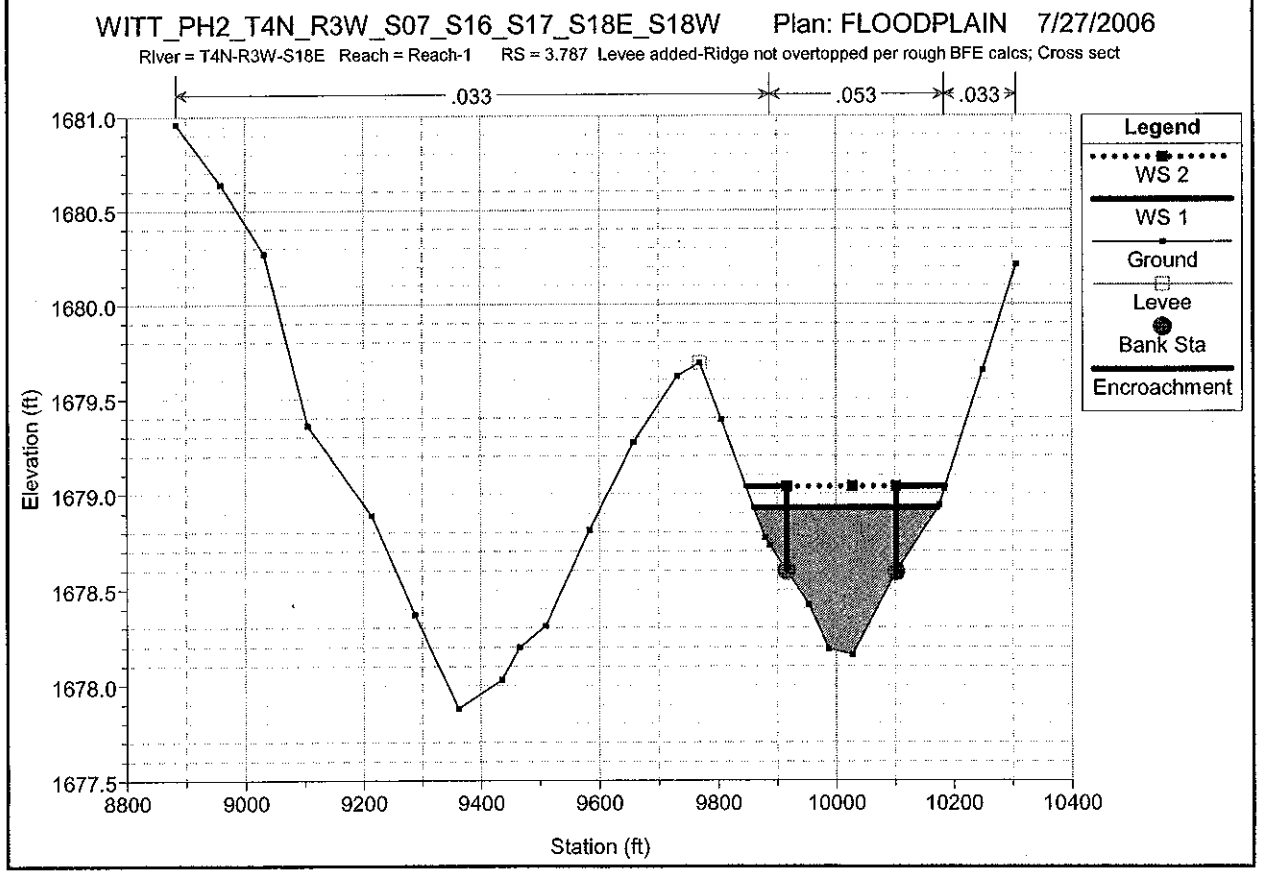

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 4.247 Levee added-Ridge not overtopped per rough BFE calcs
.033
.058
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1698.5
1698.0
1697.5
1697.0
1696.5
1696.0
9750
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

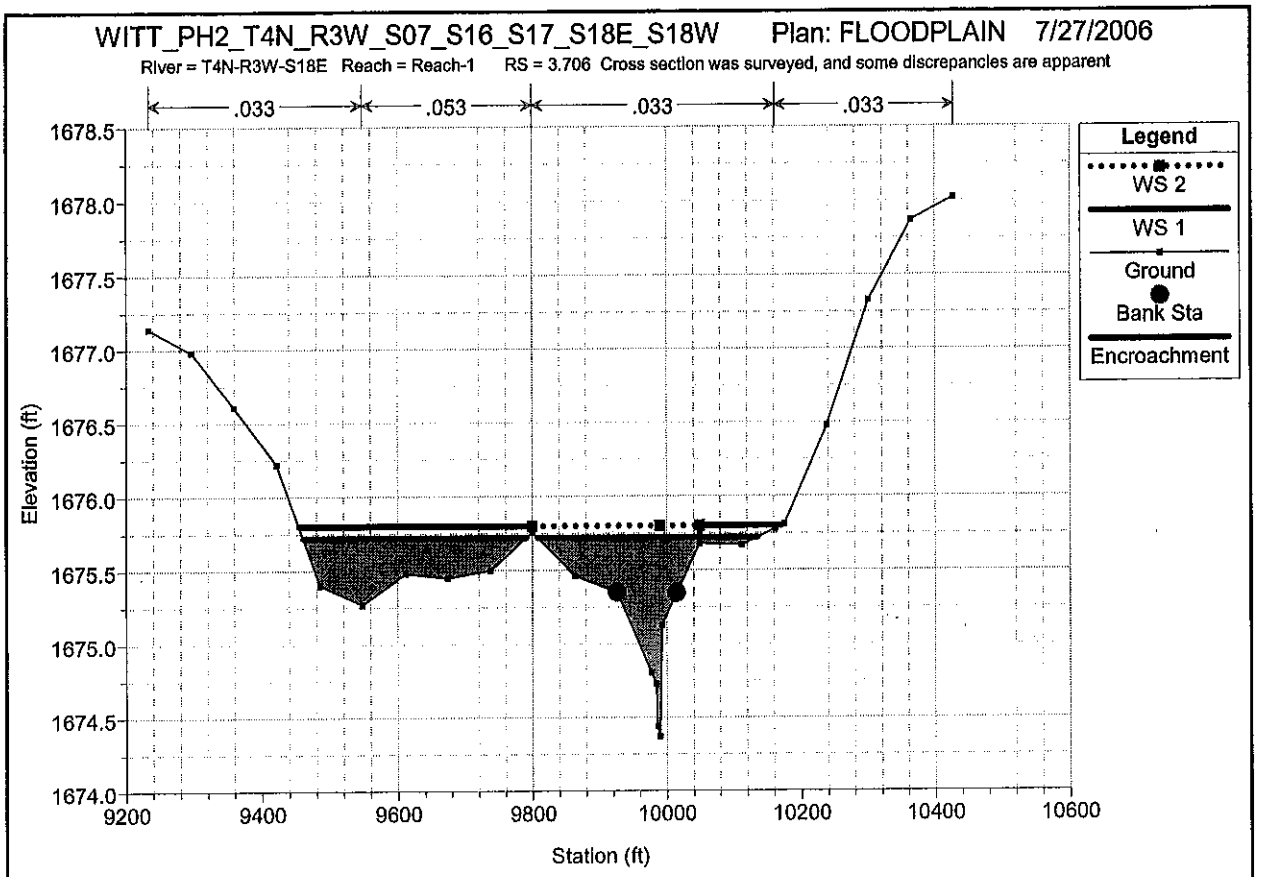

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 4.135 Levee added-Ridge not overtopped per rough BFE calcs
.033
.033
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1693.6
1693.4
1693.2
1693.0
1692.8
1692.6
1692.4
1692.2
1692.0
1691.8
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

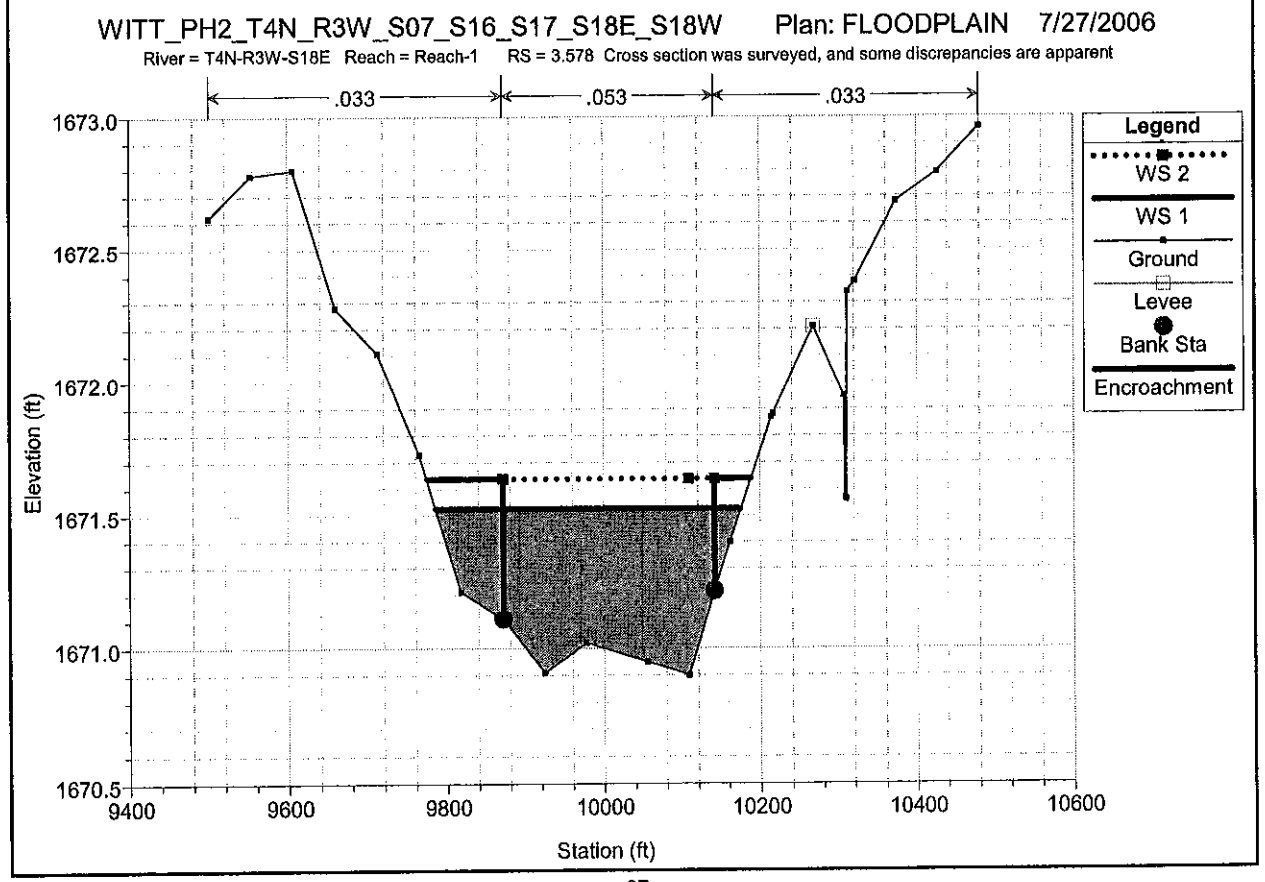

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 4.059 Levee added-Ridge not overtopped per rough BFE calcs
.033
.058
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1691.0
1690.8
1690.6
1690.4
1690.2
1690.0
1689.8
1689.6
1689.4
1689.2
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

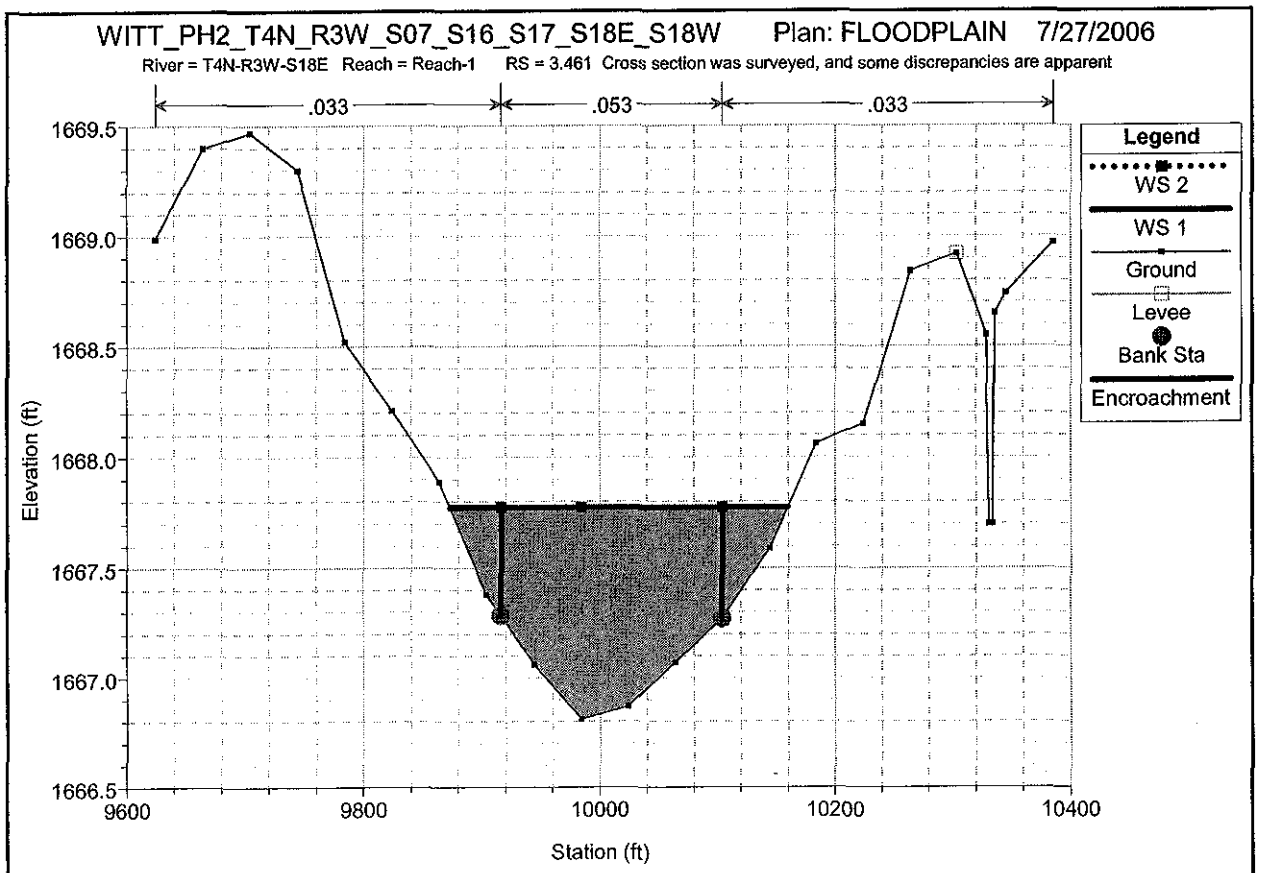

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.962
.033
.058
.033
Legend
WS 1
WS 2
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1687.5
1687.0
1686.5
1686.0
1685.5
1685.0
1684.5
1684.0
9800
10000
10200
10400
10600
10800
Station (ft)

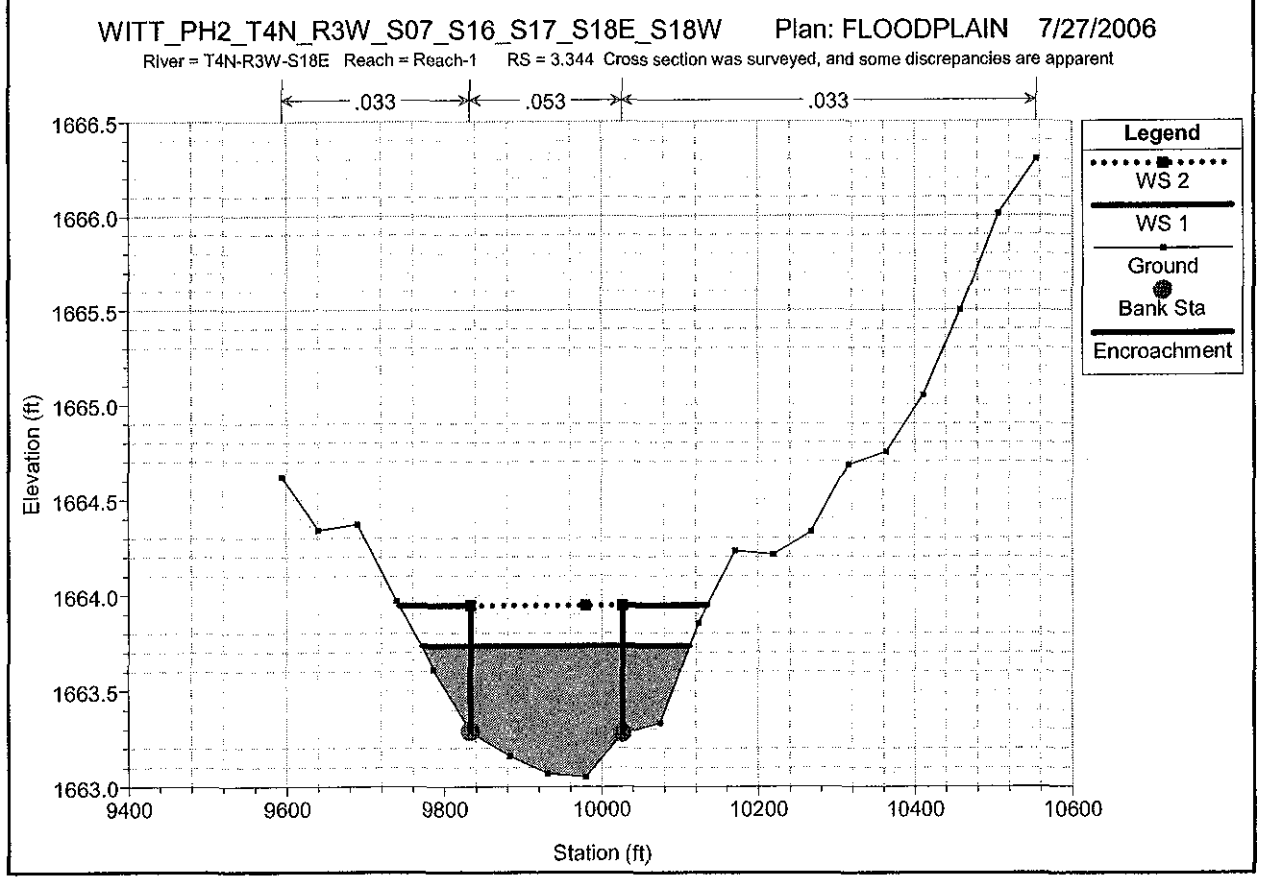

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.872
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1684.0
1683.5
1683.0
1682.5
1682.0
1681.5
1681.0
9600
9800
10000
10200
10400
10600
Station (ft)

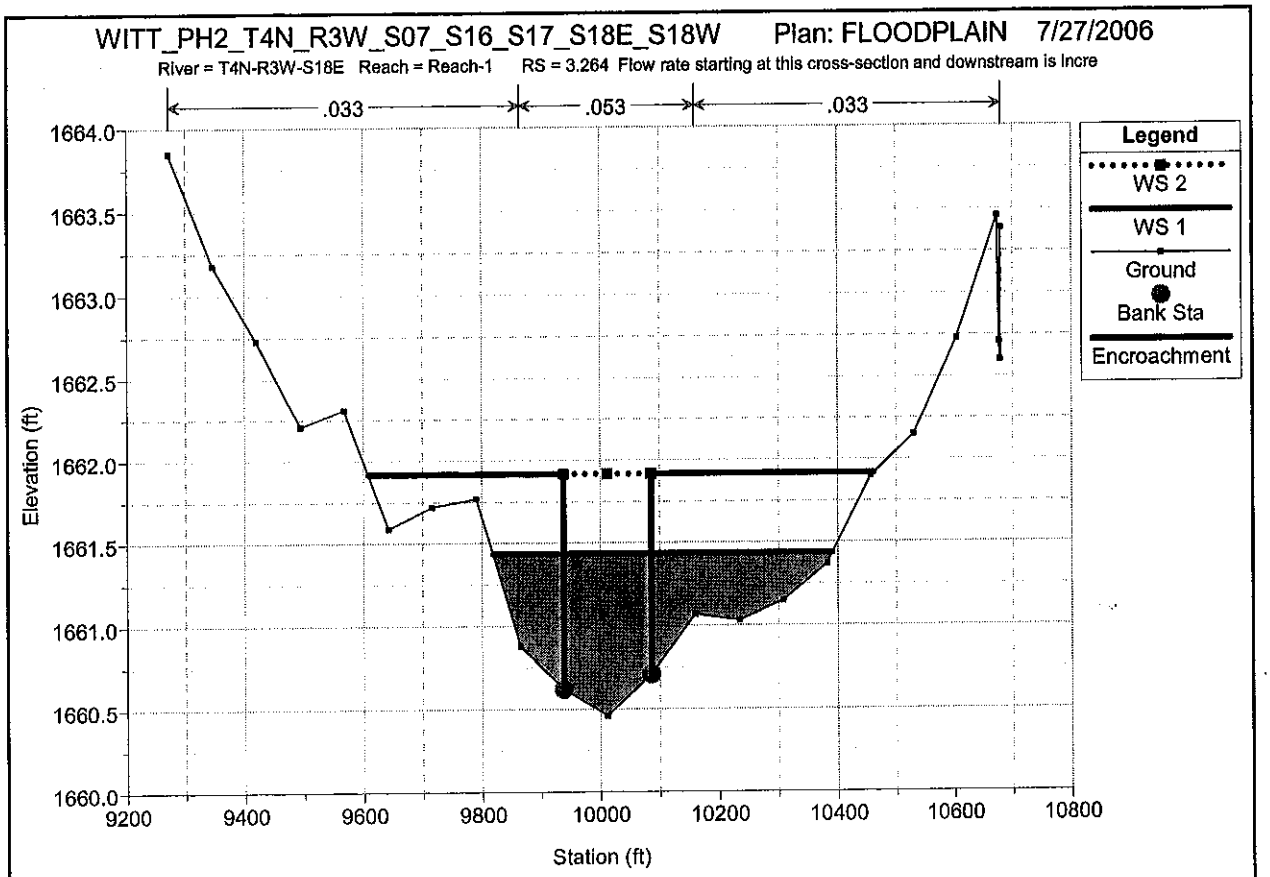

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.787 Levee added-Ridge not overtopped per rough BFE calcs; Cross sect
.033
.053
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1681.0
1680.5
1680.0
1679.5
1679.0
1678.5
1678.0
1677.5
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

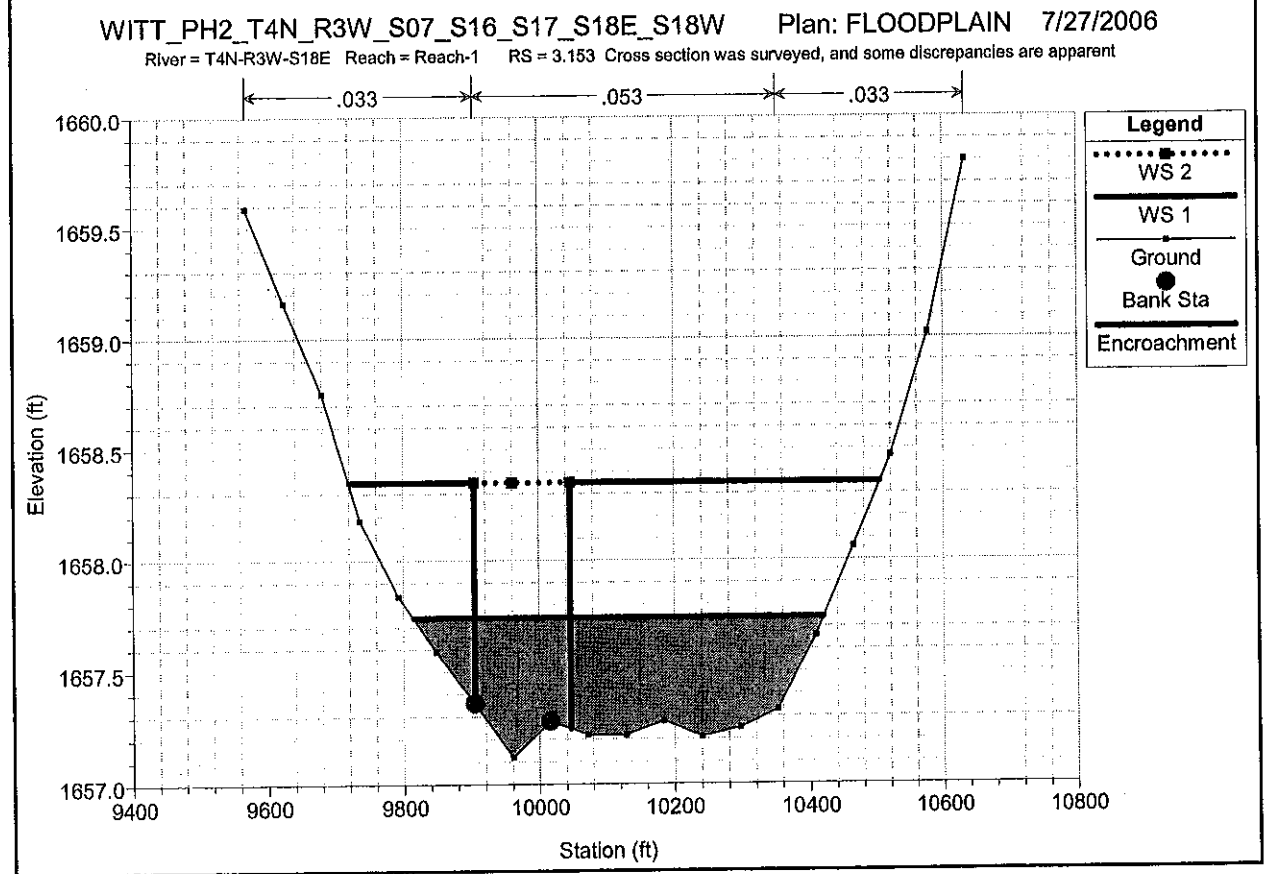

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.706 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1678.5
1678.0
1677.5
1677.0
1676.5
1676.0
1675.5
1675.0
1674.5
1674.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

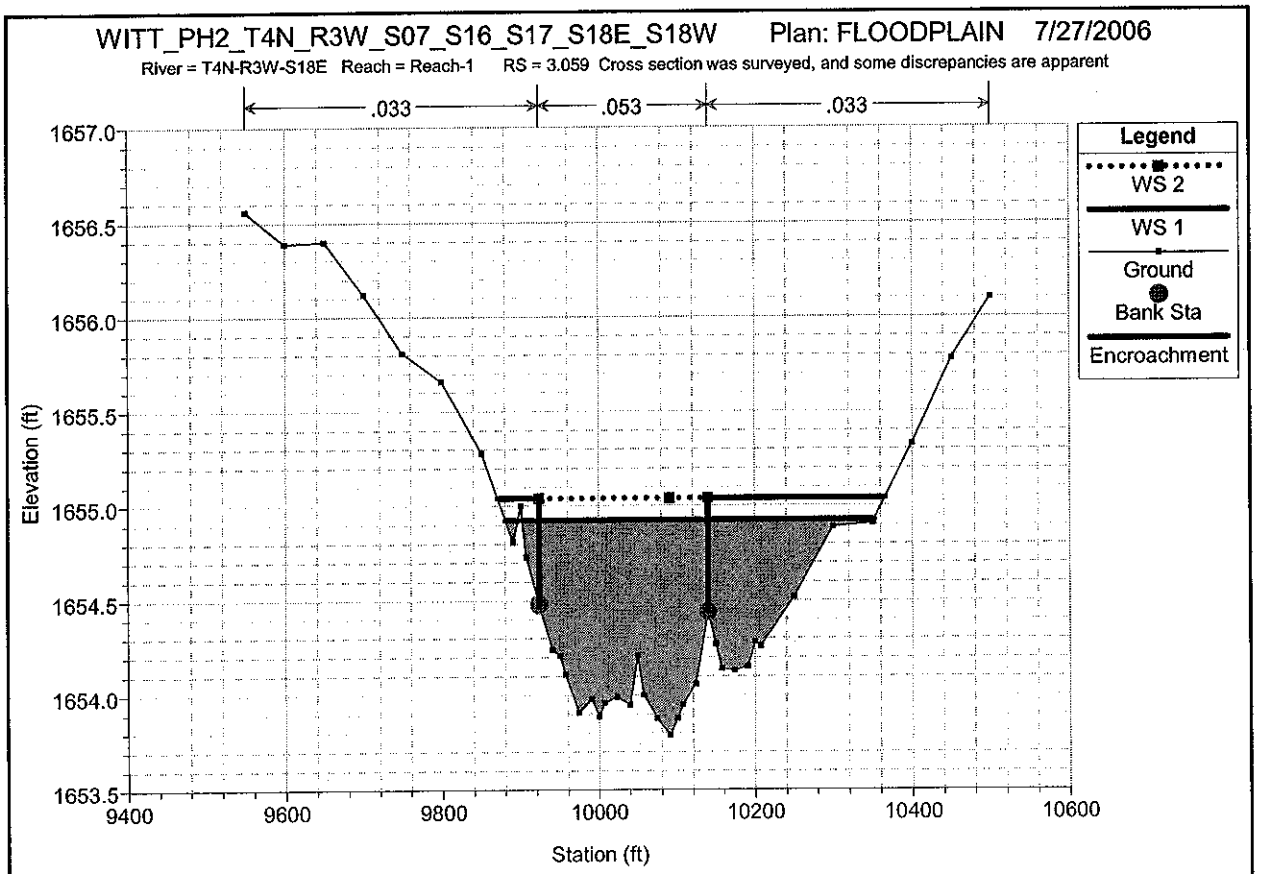

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.578 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1673.0
1672.5
1672.0
1671.5
1671.0
1670.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

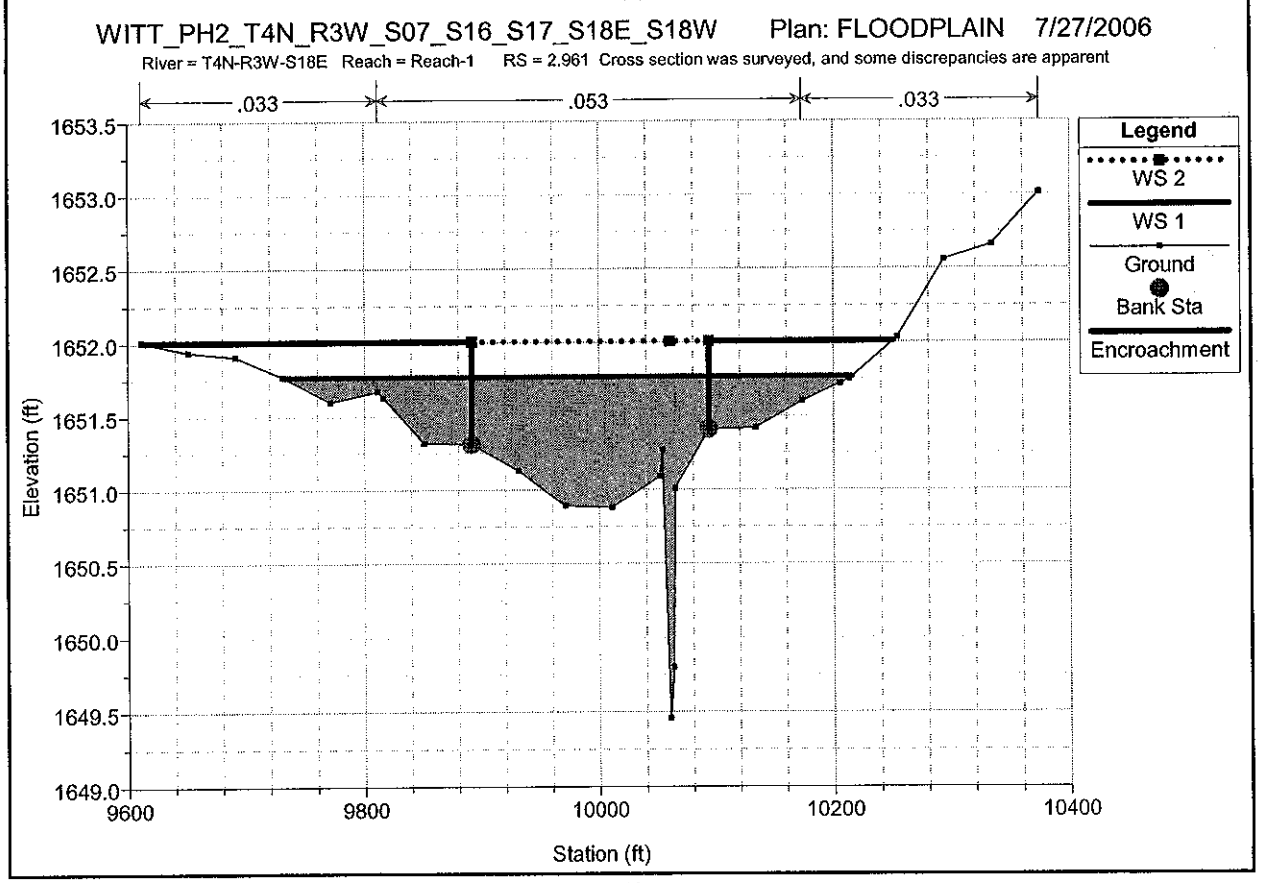

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.461 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1669.5
1669.0
1668.5
1668.0
1667.5
1667.0
1666.5
9600
9800
10000
10200
10400
Station (ft)

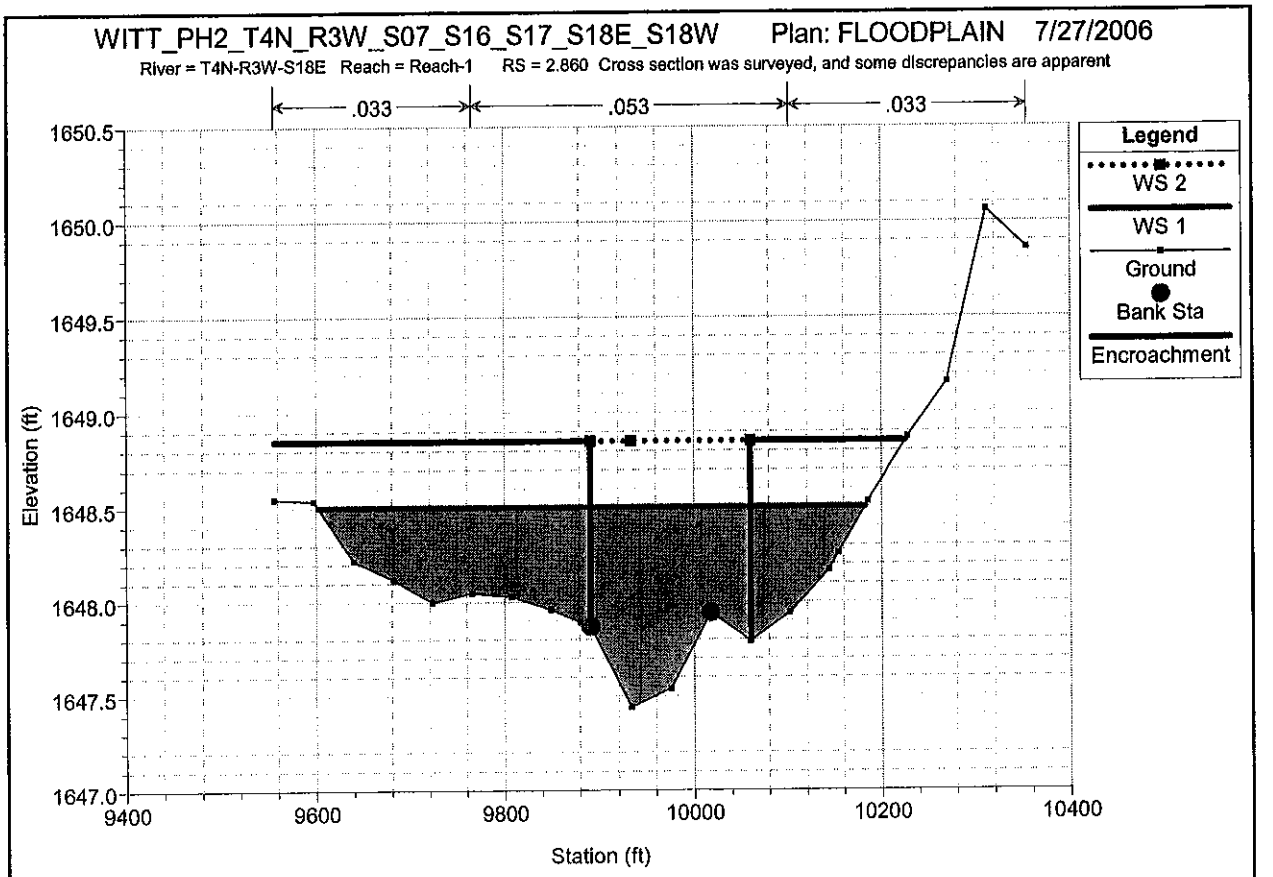

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.344 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1666.5
1666.0
1665.5
1665.0
1664.5
1664.0
1663.5
1663.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

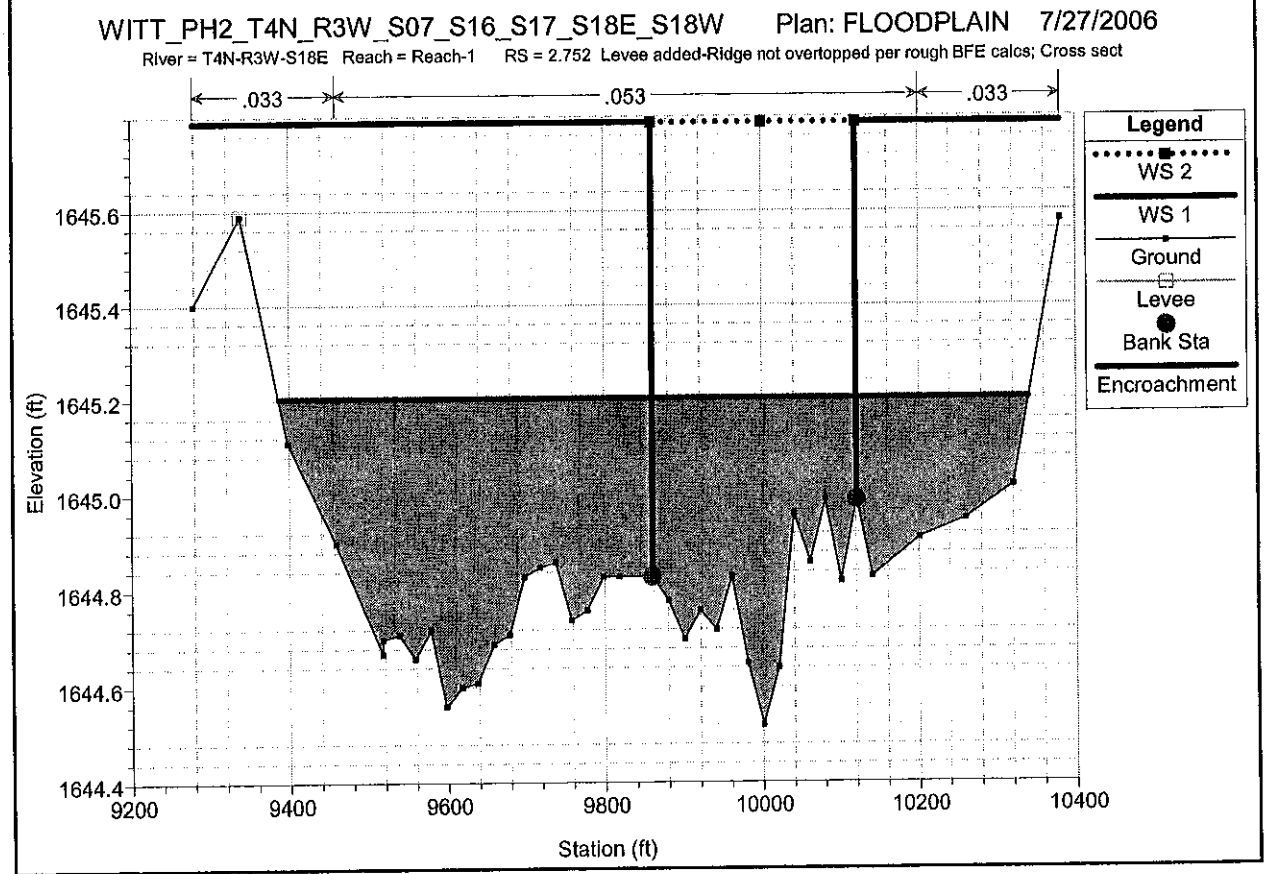

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.264 Flow rate starting at this cross-section and downstream is incre
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1664.0
1663.5
1663.0
1662.5
1662.0
1661.5
1661.0
1660.5
1660.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

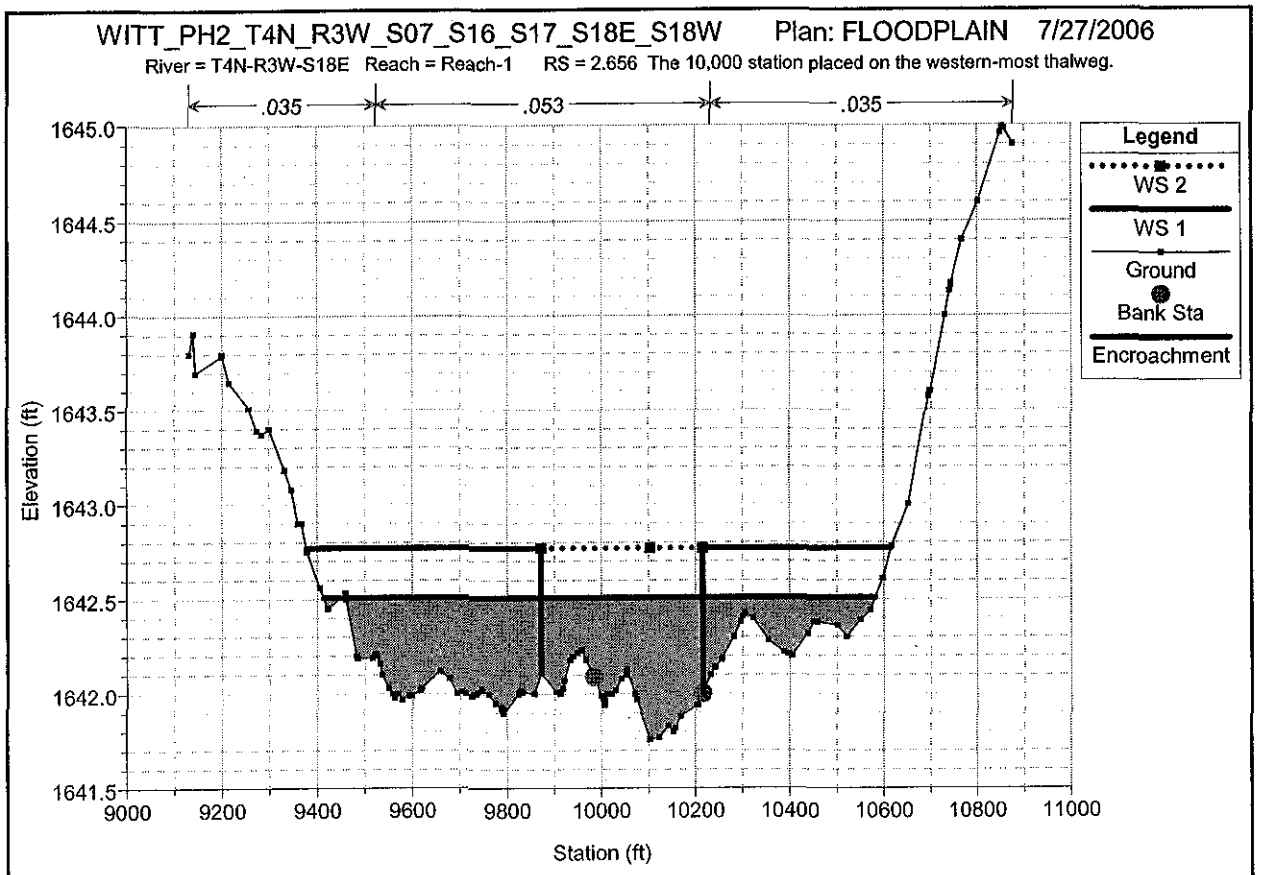

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.153 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1660.0
1659.5
1659.0
1658.5
1658.0
1657.5
1657.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

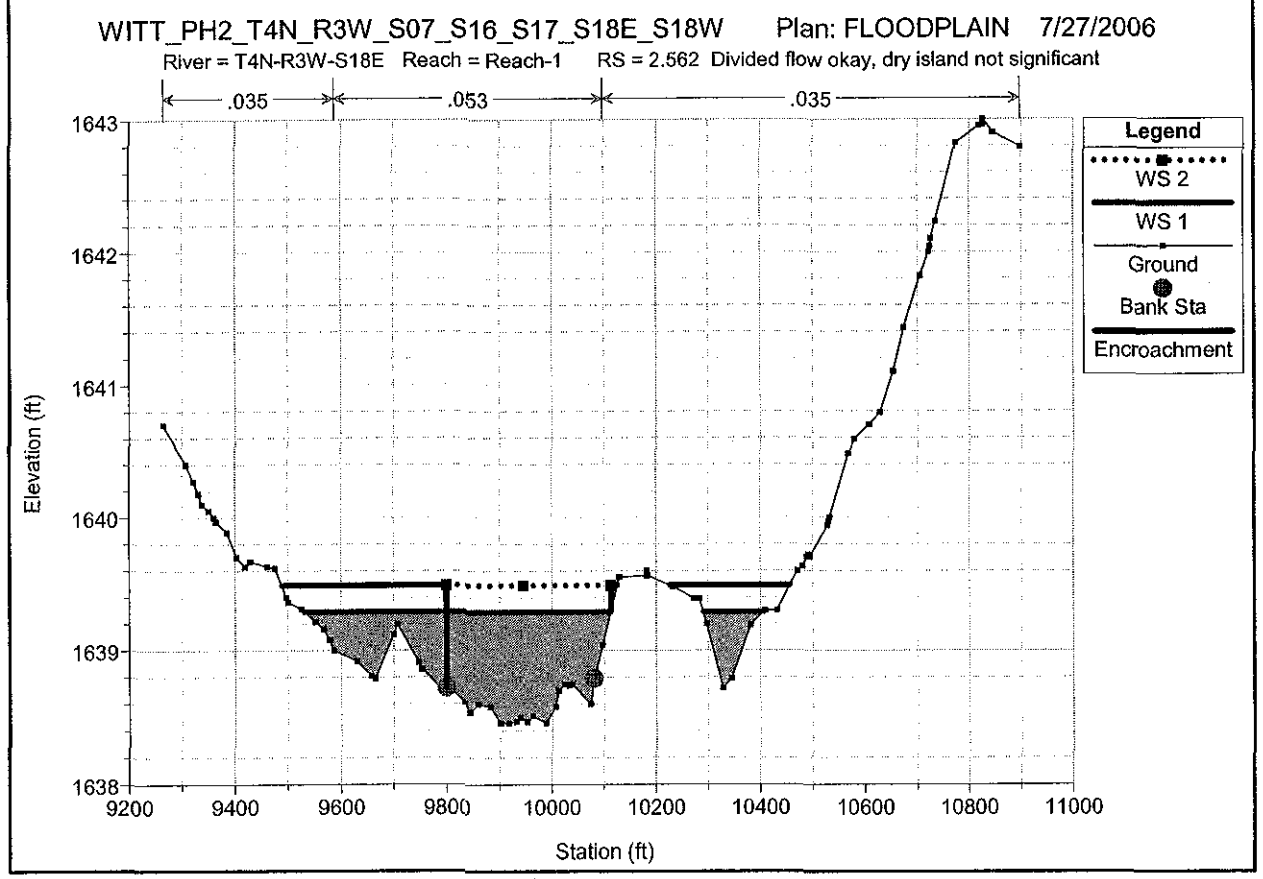

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 3.059 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1657.0
1656.5
1656.0
1655.5
1655.0
1654.5
1654.0
1653.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

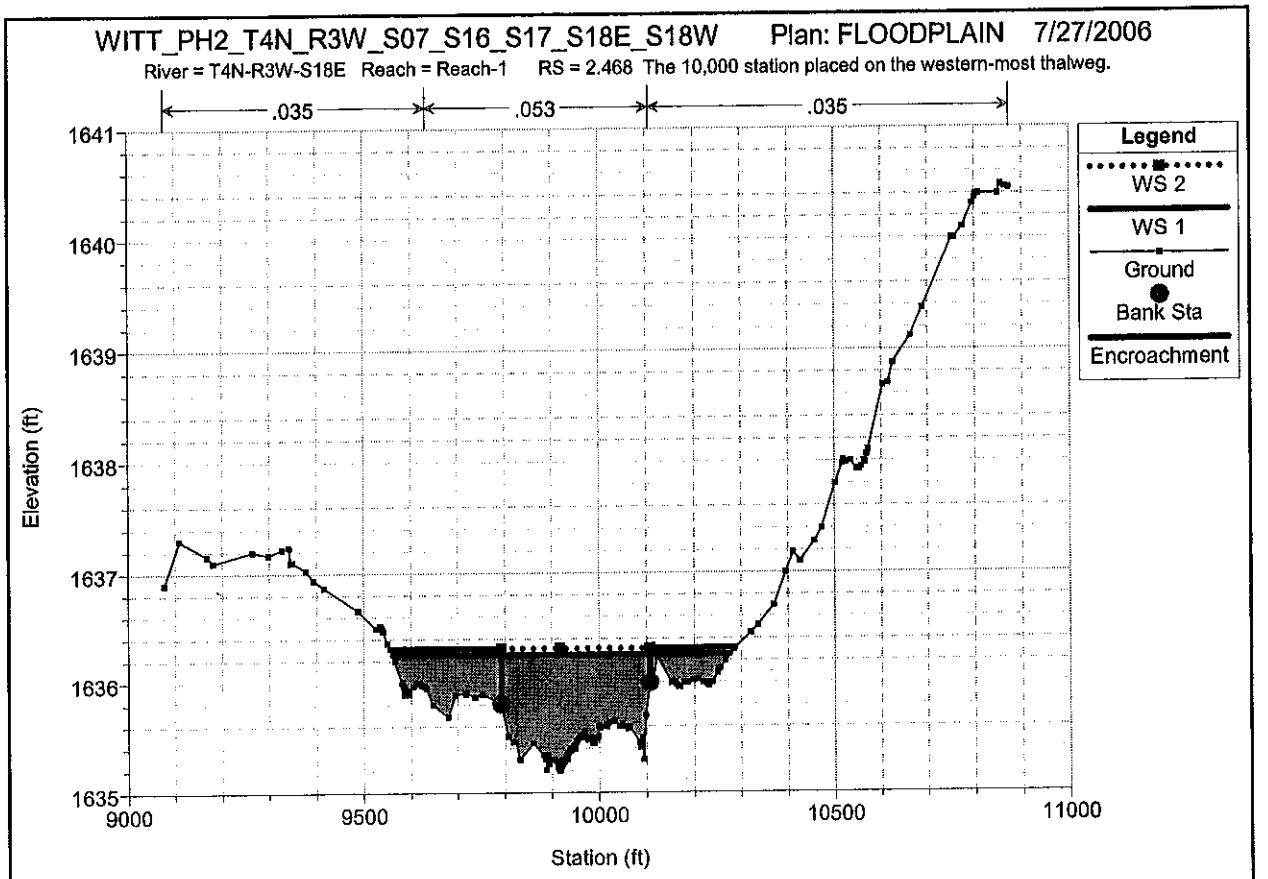

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.961 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1653.5
1653.0
1652.5
1652.0
1651.5
1651.0
1650.5
1650.0
1649.5
1649.0
9600
9800
10000
10200
10400
Station (ft)

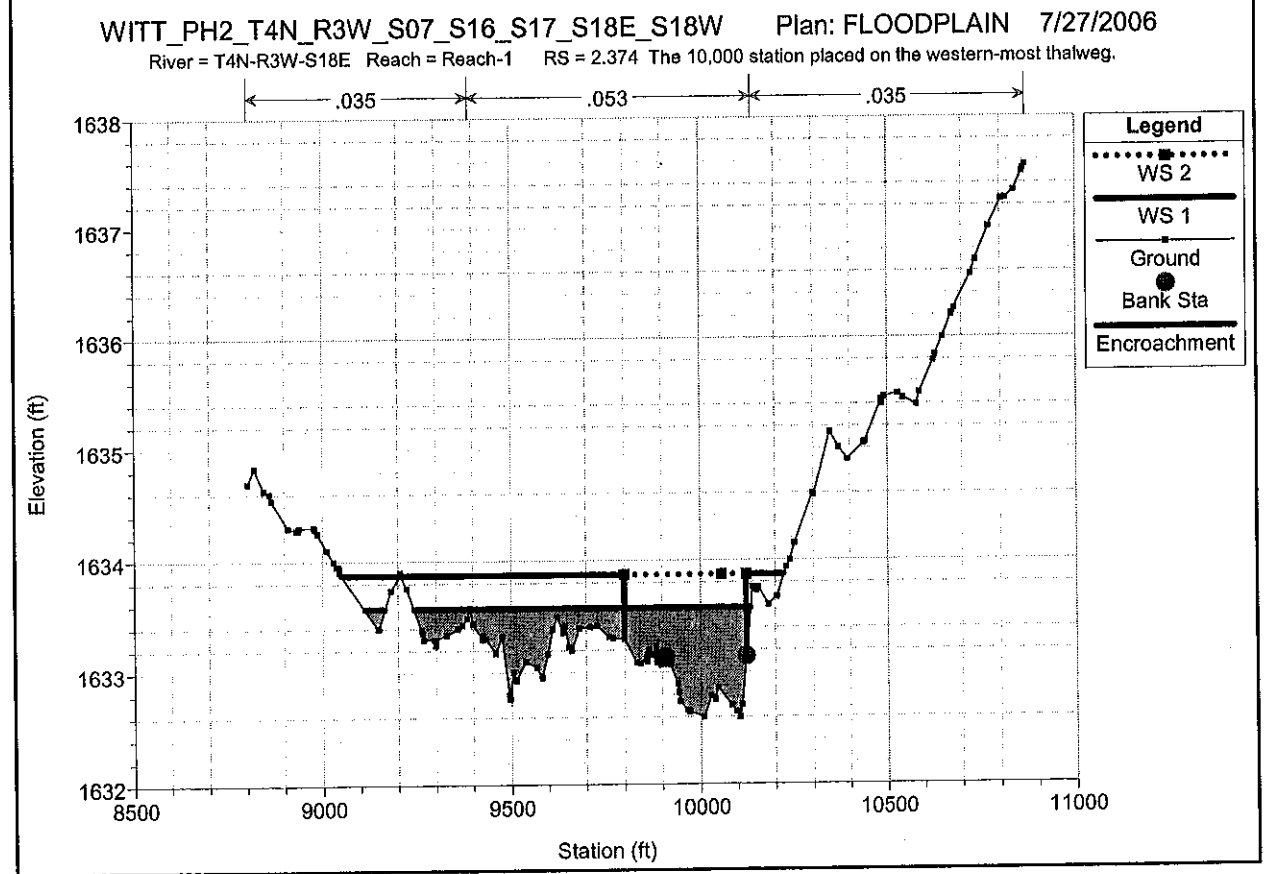

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.860 Cross section was surveyed, and some discrepancies are apparent
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1650.5
1650.0
1649.5
1649.0
1648.5
1648.0
1647.5
1647.0
9400
9600
9800
10000
10200
10400
Station (ft)

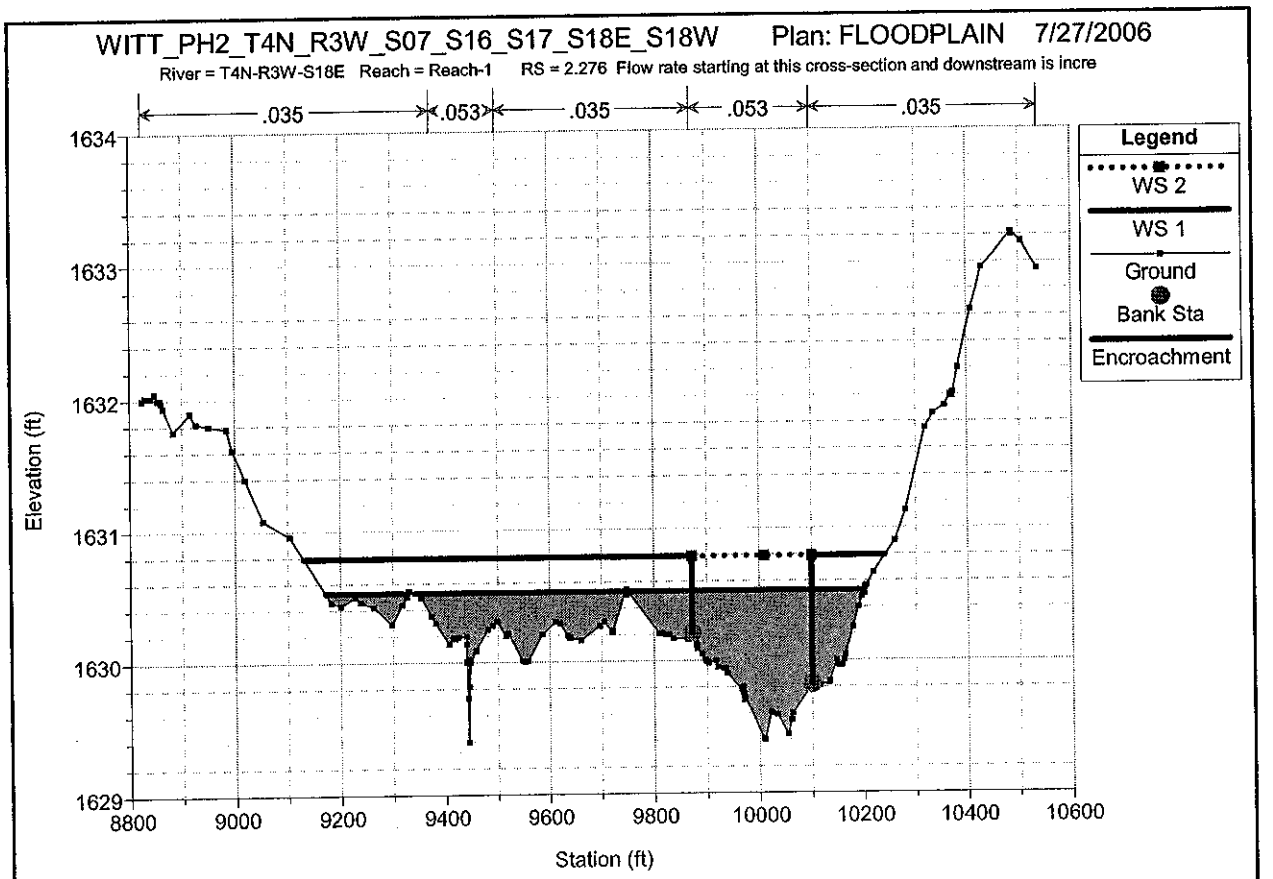

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.752 Levee added-Ridge not overtopped per rough BFE calcs; Cross sect
.033
.053
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1645.6
1645.4
1645.2
1645.0
1644.8
1644.6
1644.4
9200
9400
9600
9800
10000
10200
10400
Station (ft)

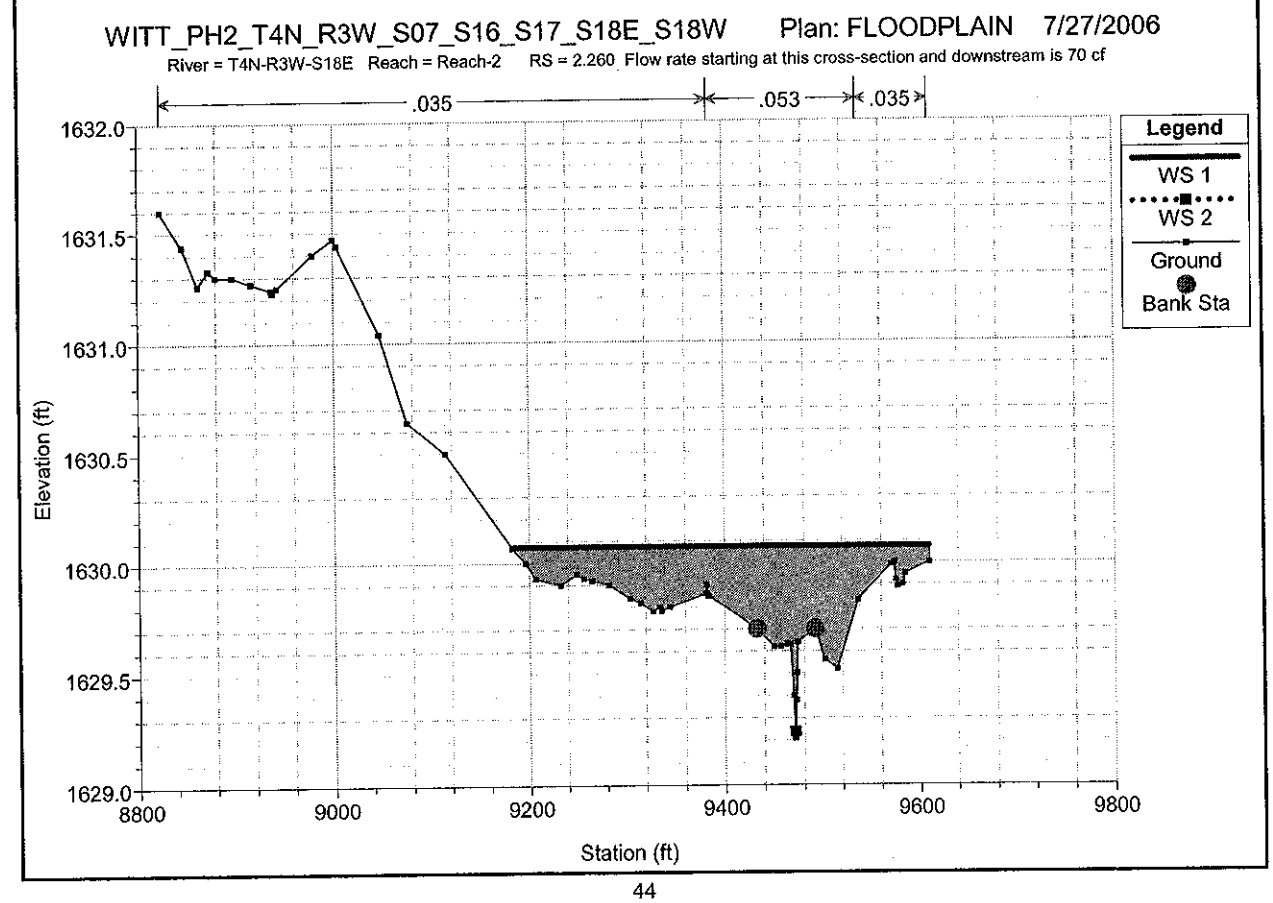

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.656 The 10,000 station placed on the western-most thalweg.
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1645.0
1644.5
1644.0
1643.5
1643.0
1642.5
1642.0
1641.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.562 Divided flow okay, dry island not significant
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1643
1642
1641
1640
1639
1638
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.468 The 10,000 station placed on the western-most thalweg.
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1641
1640
1639
1638
1637
1636
1635
9000
9500
10000
10500
11000
Station (ft)

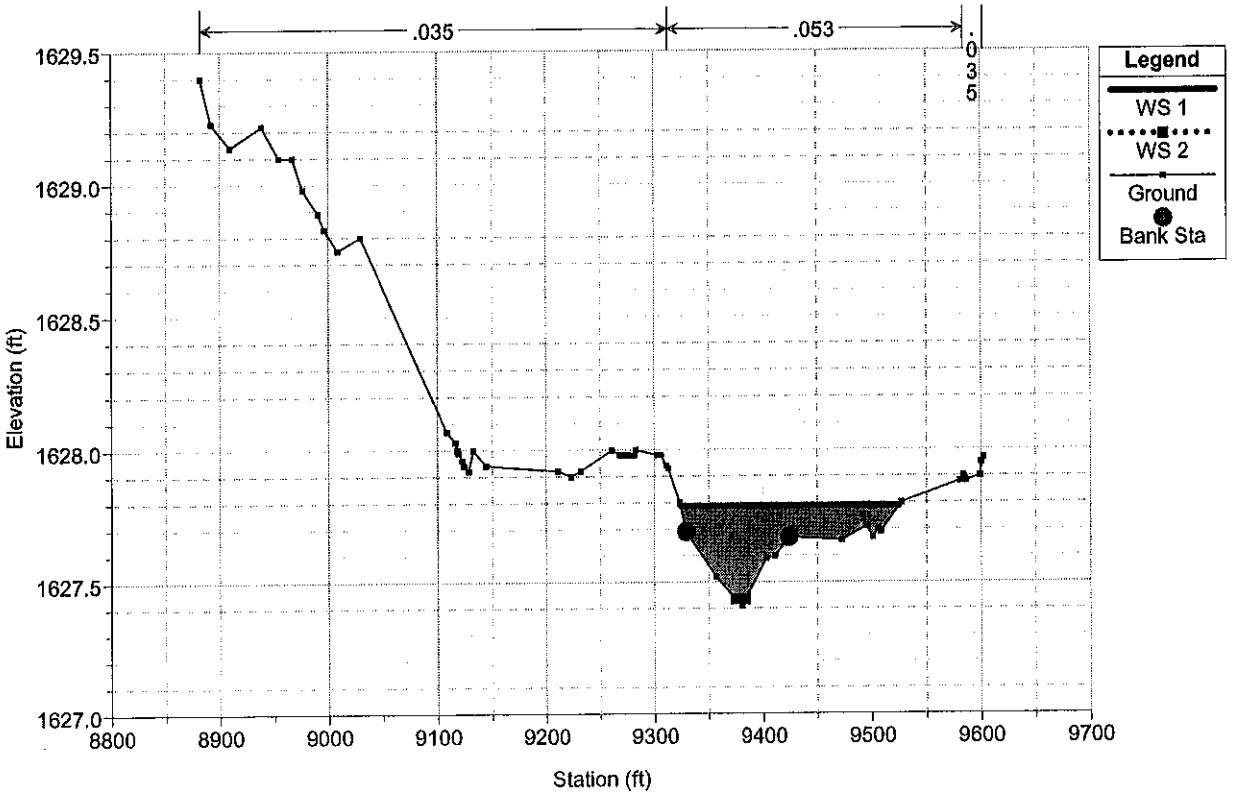

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.374 The 10,000 station placed on the western-most thalweg.
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1638
1637
1636
1635
1634
1633
1632
8500
9000
9500
10000
10500
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-1 RS = 2.276 Flow rate starting at this cross-section and downstream is incre
.035
.053
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1634
1633
1632
1631
1630
1629
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-2 RS = 2.260 Flow rate starting at this cross-section and downstream is 70 cf
.035
.053
.035
Legend
WS 1
WS 2
Ground
Bank Sta
Elevation (ft)
1632.0
1631.5
1631.0
1630.5
1630.0
1629.5
1629.0
8800
9000
9200
9400
9600
9800
Station (ft)

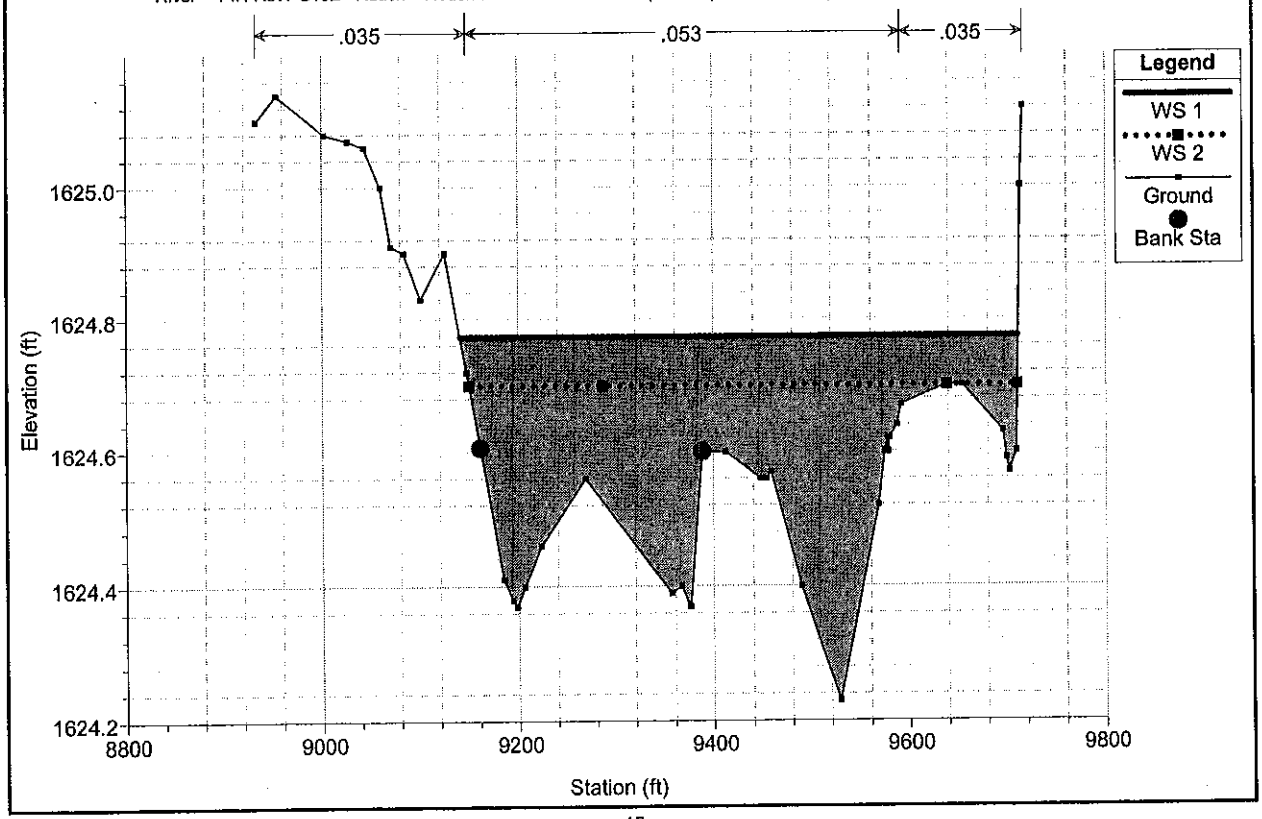
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S18E Reach = Reach-2 RS = 2.175 The West portion of this cross-section is truncated at STA 9602.



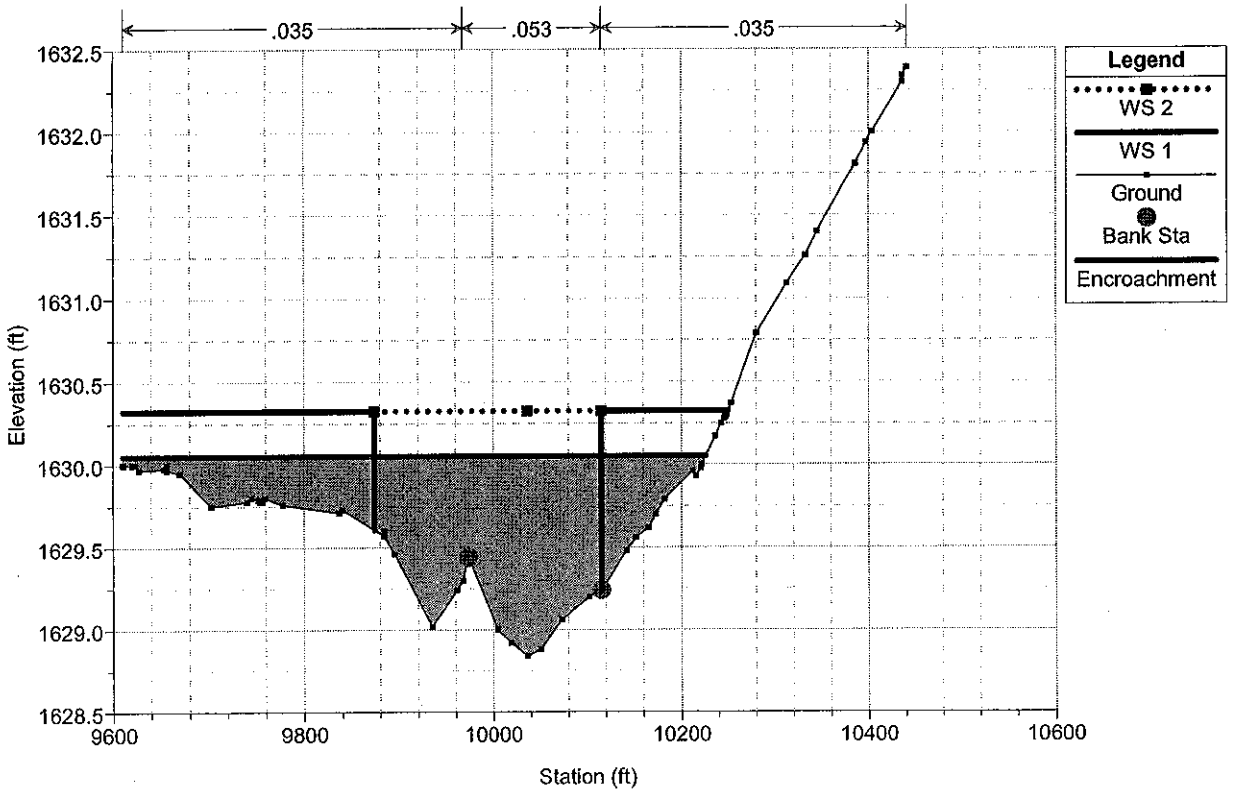
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S18E Reach = Reach-2 RS = 2.081 Interpolated point added at (9160.59,1624.606) to set bank stati



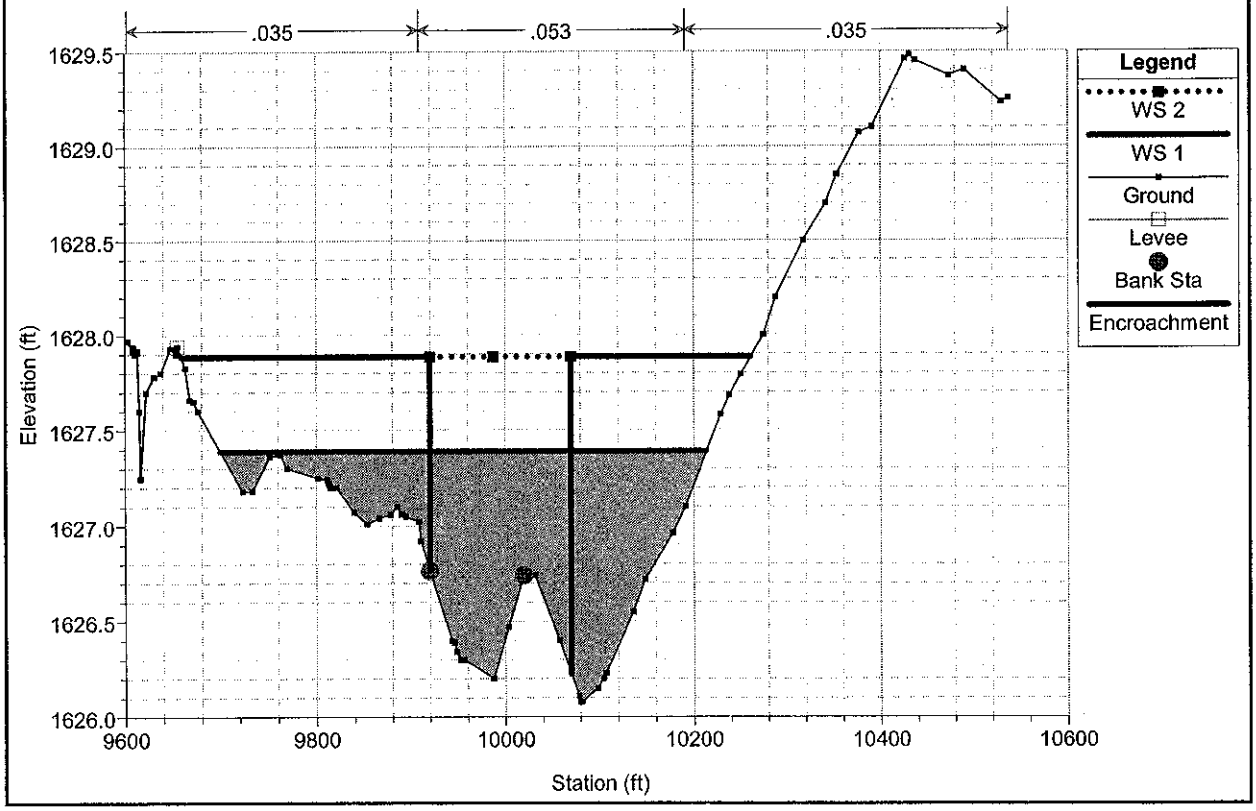
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S18E Reach = Reach-3 RS = 2.260 The East portion of this cross-section is truncated at STA 9610.



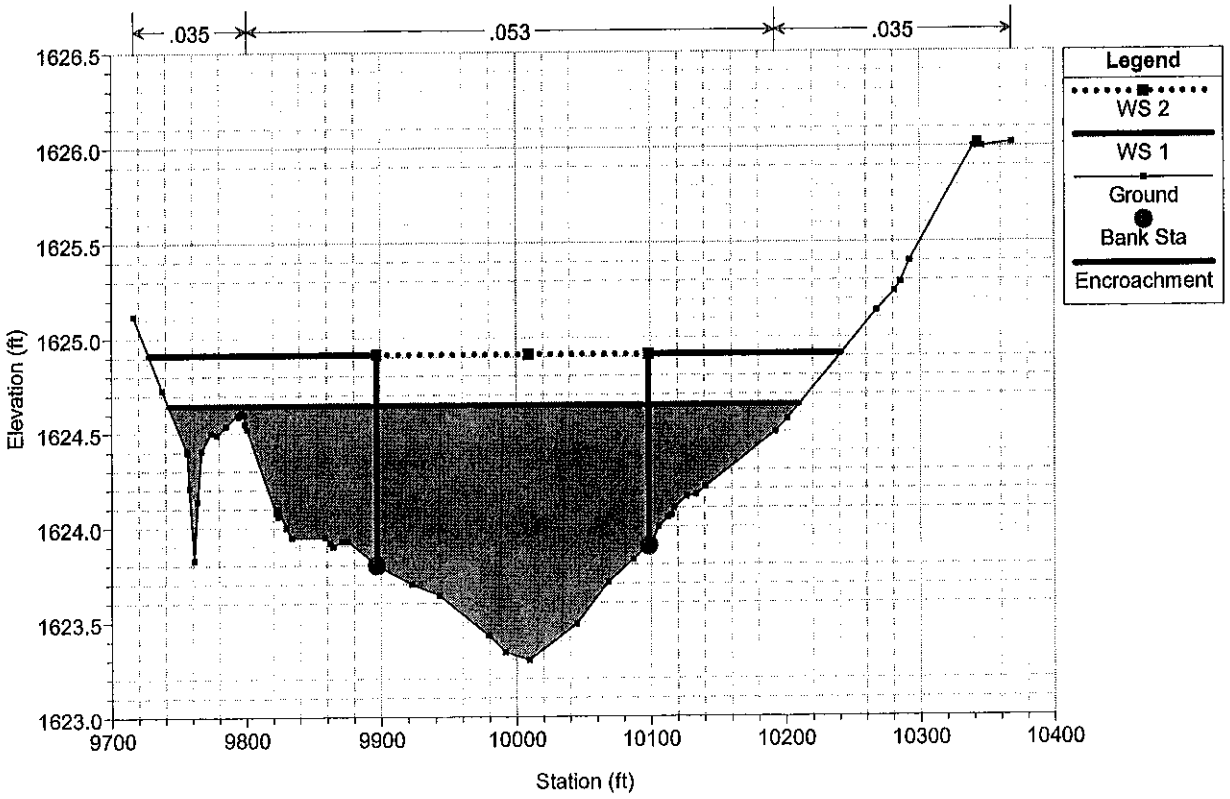
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

River = T4N-R3W-S18E Reach = Reach-3 RS = 2.175 Flow rate starting at this cross-section and downstream is 520cf



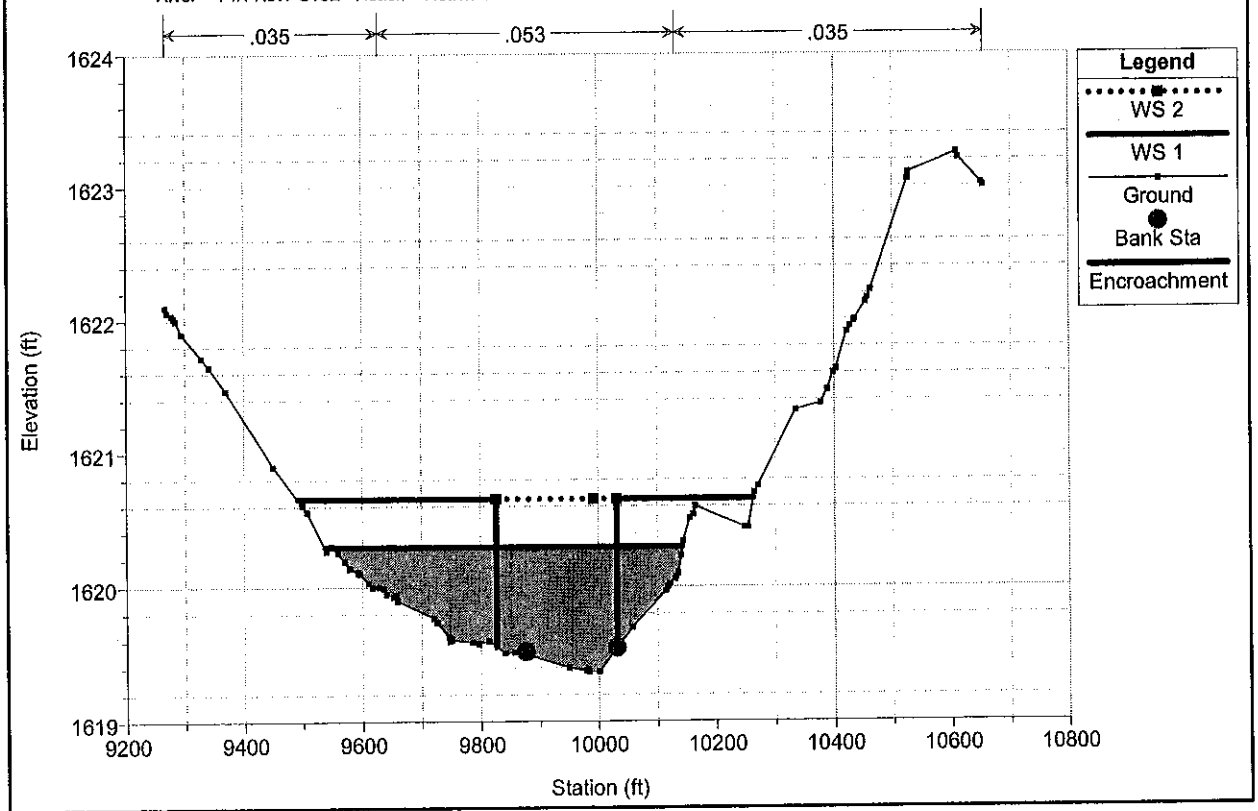
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

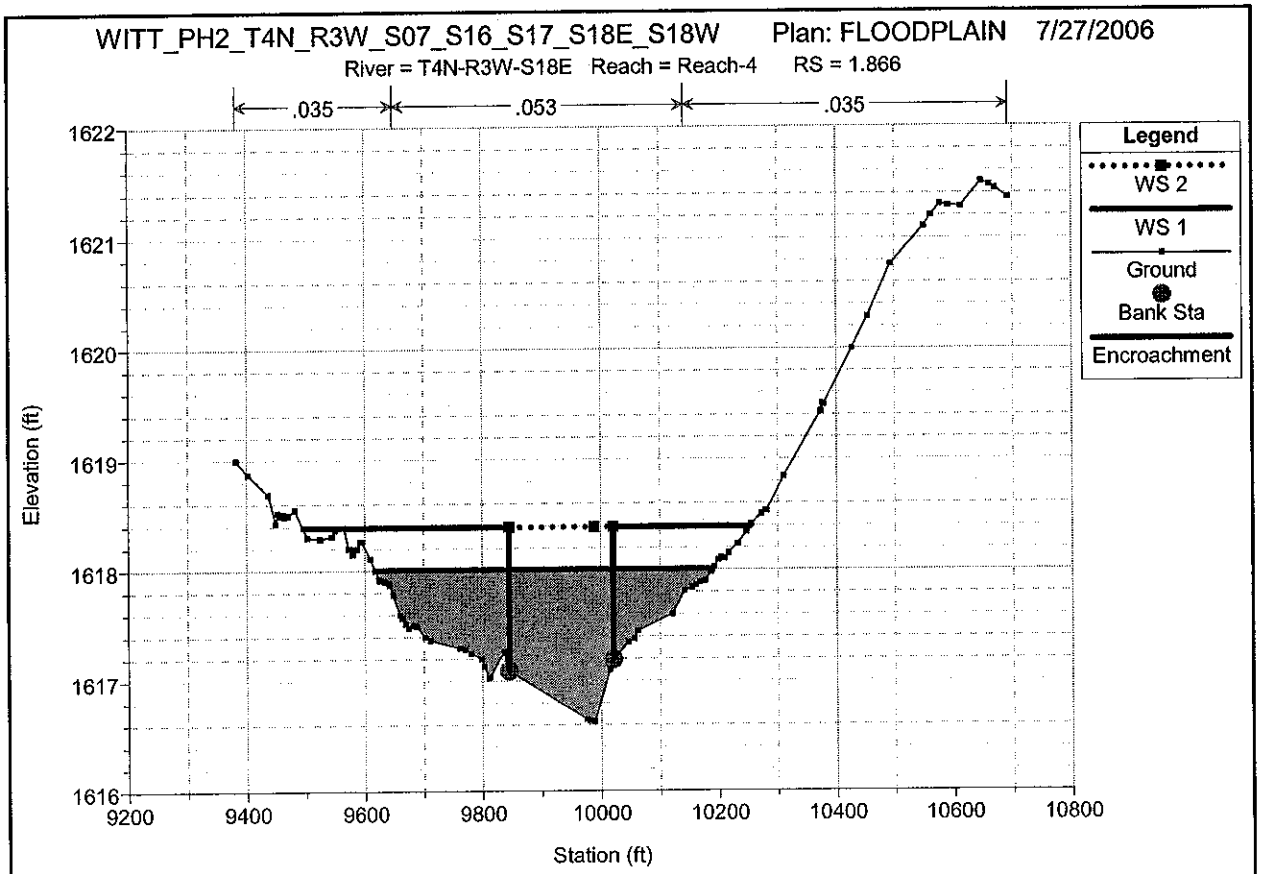
River = T4N-R3W-S18E Reach = Reach-3 RS = 2.081 The East portion of this cross-section is truncated at STA 9716.

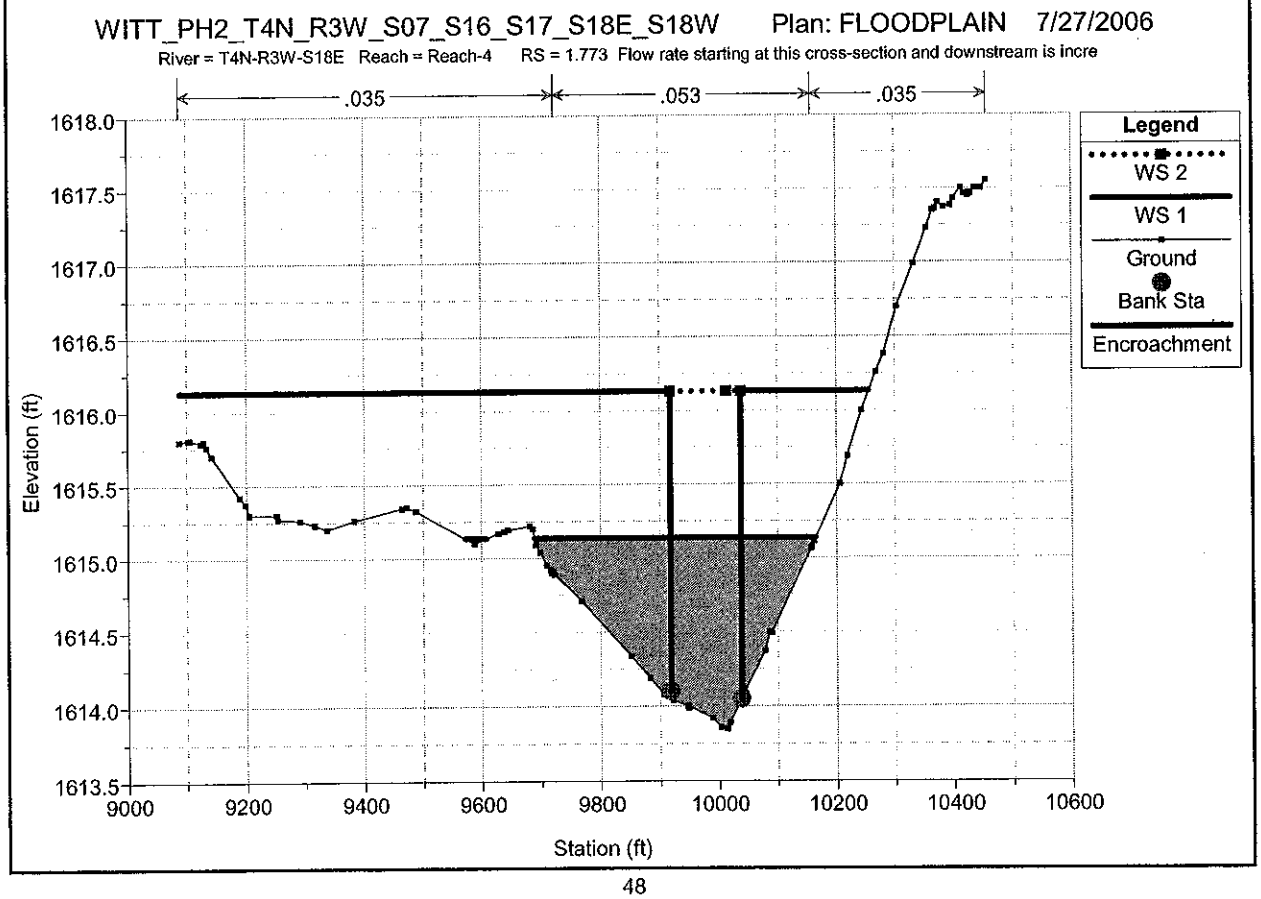


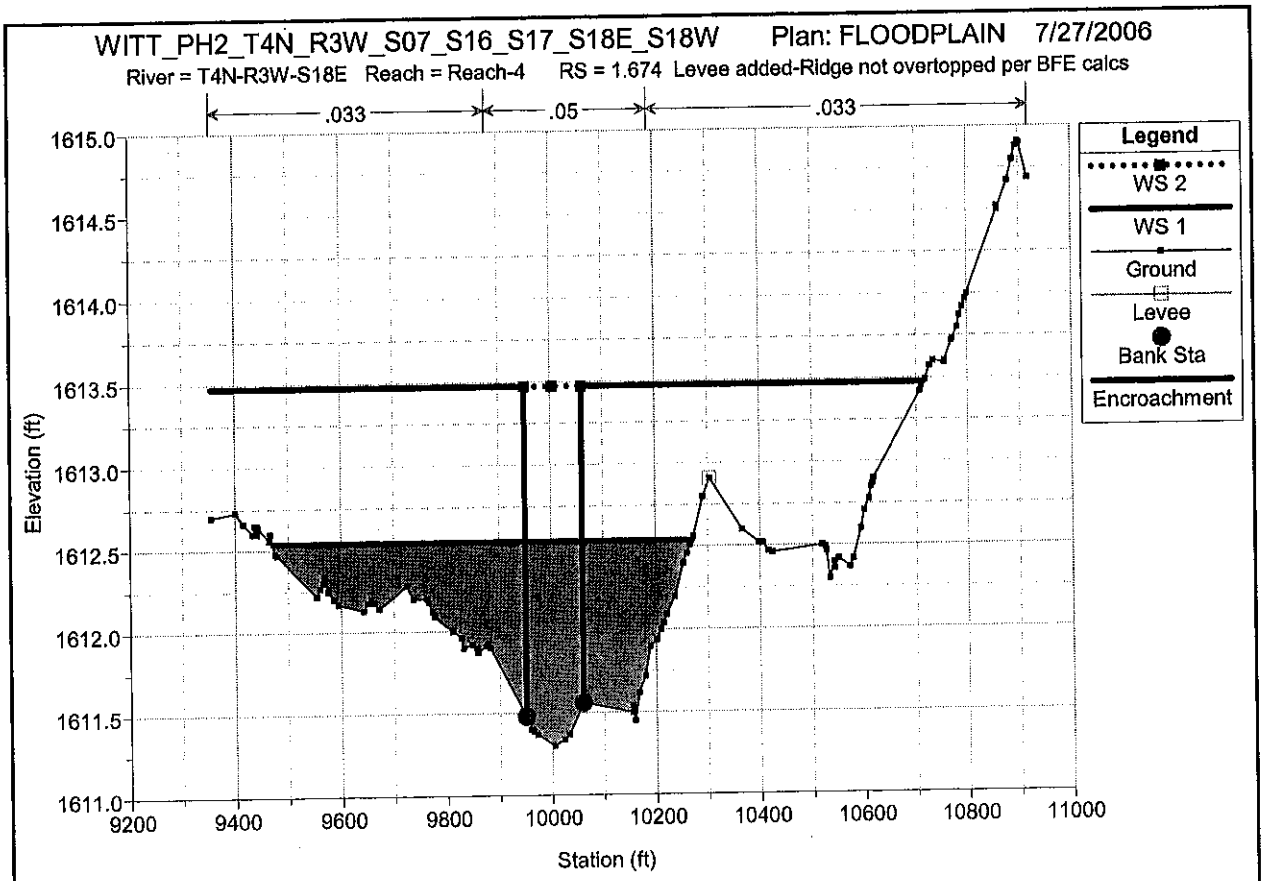
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006

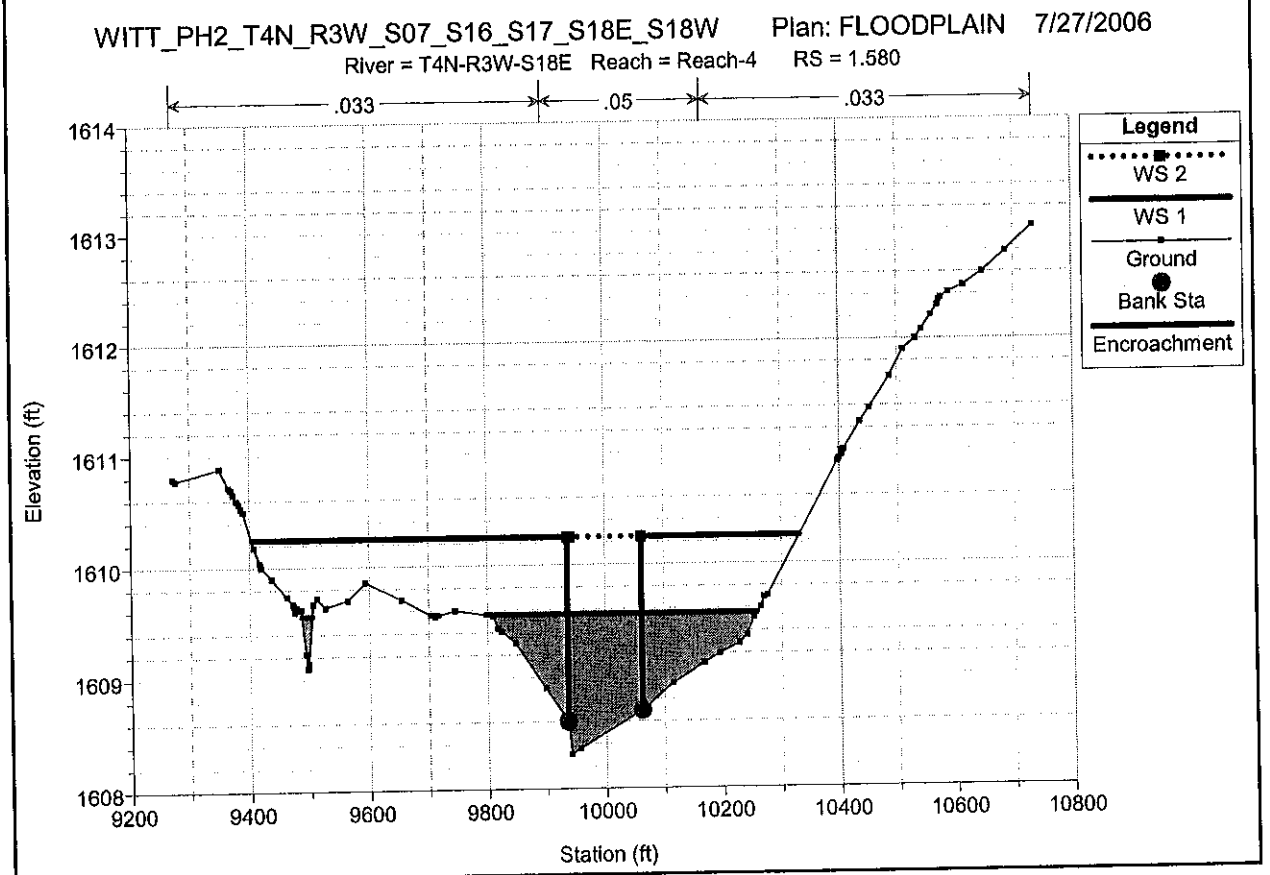
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.945 Flow rate at this cross-section and downstream is 650cfs, this c

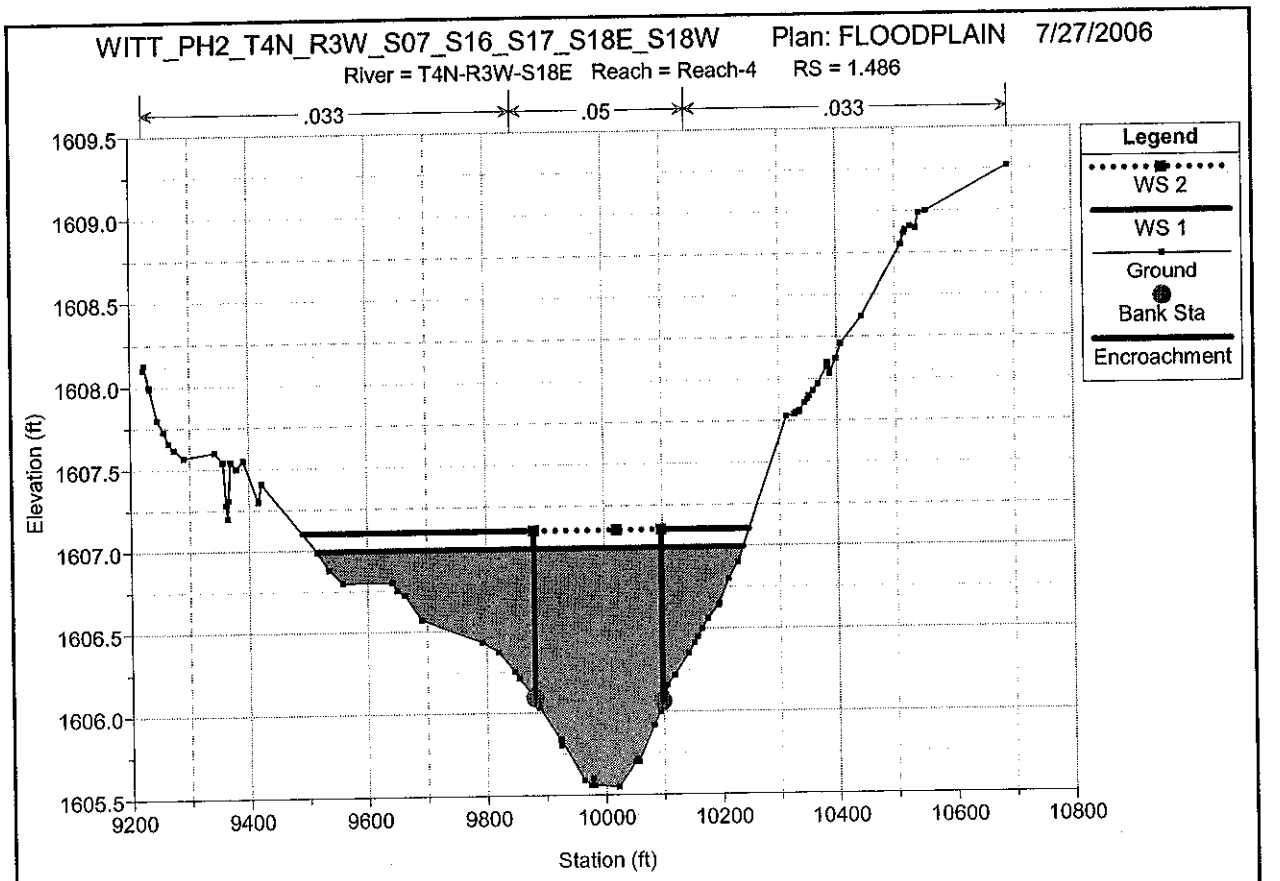


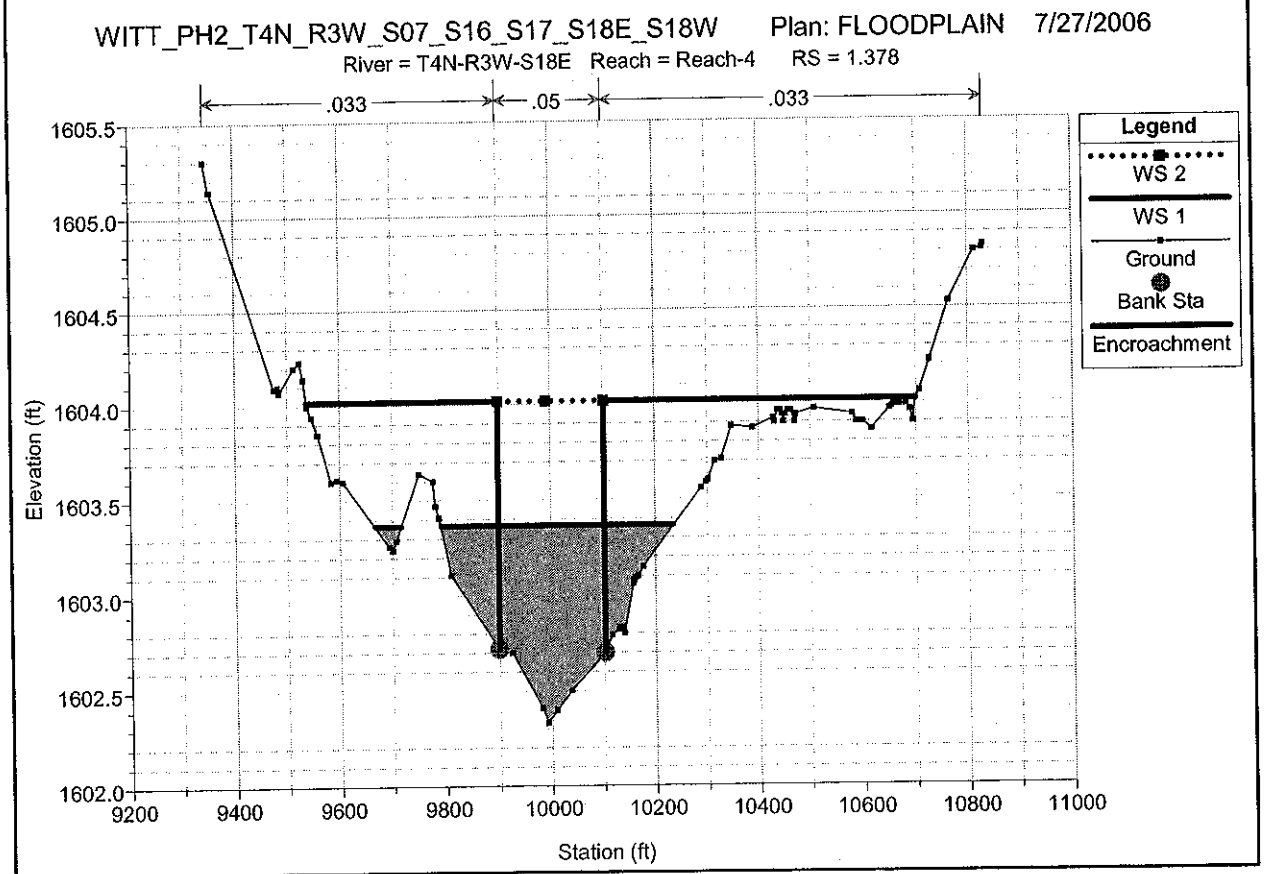

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.866
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1622
1621
1620
1619
1618
1617
1616
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

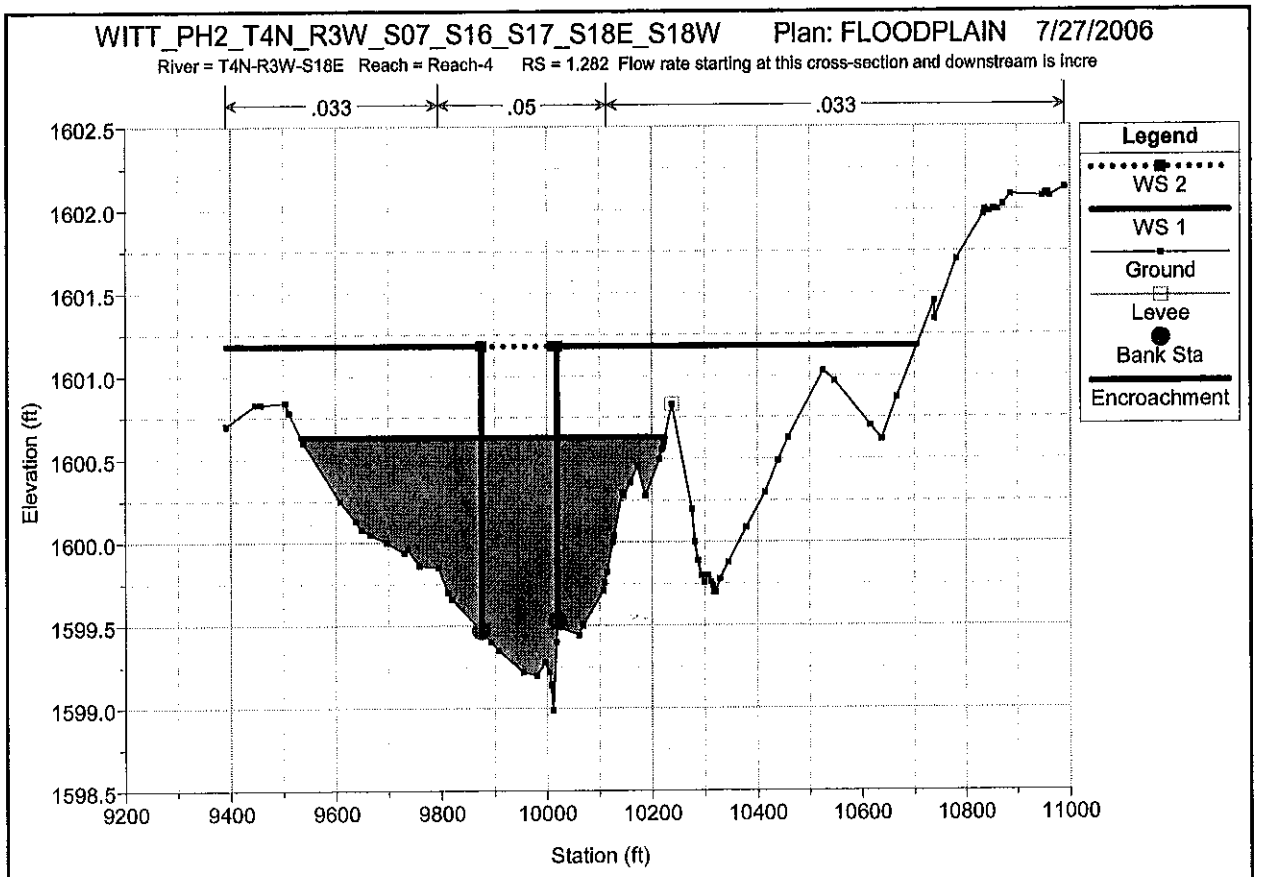

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.773 Flow rate starting at this cross-section and downstream is incre
.035
.053
.035
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1618.0
1617.5
1617.0
1616.5
1616.0
1615.5
1615.0
1614.5
1614.0
1613.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

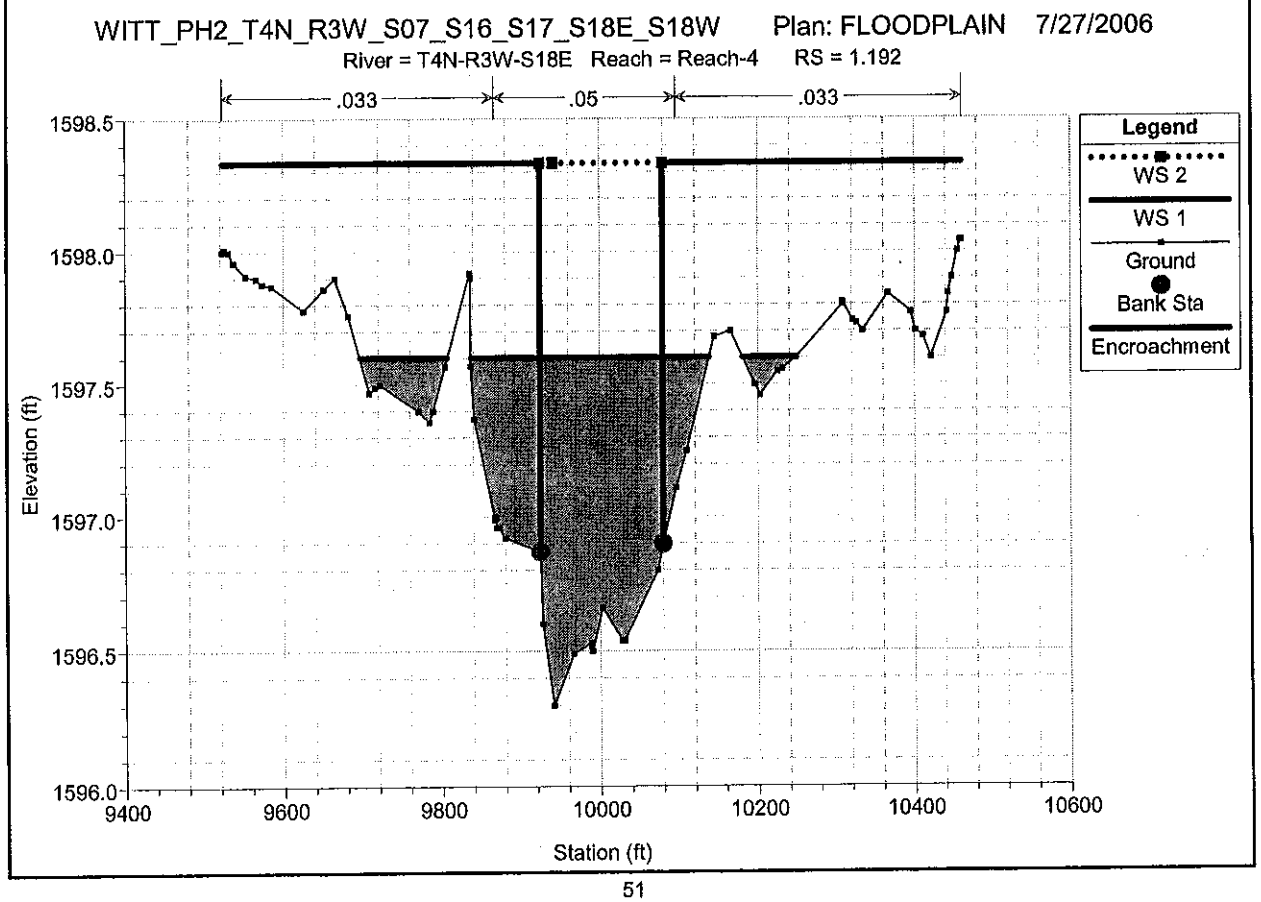

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.674 Levee added-Ridge not overtopped per BFE calcs
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1615.0
1614.5
1614.0
1613.5
1613.0
1612.5
1612.0
1611.5
1611.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

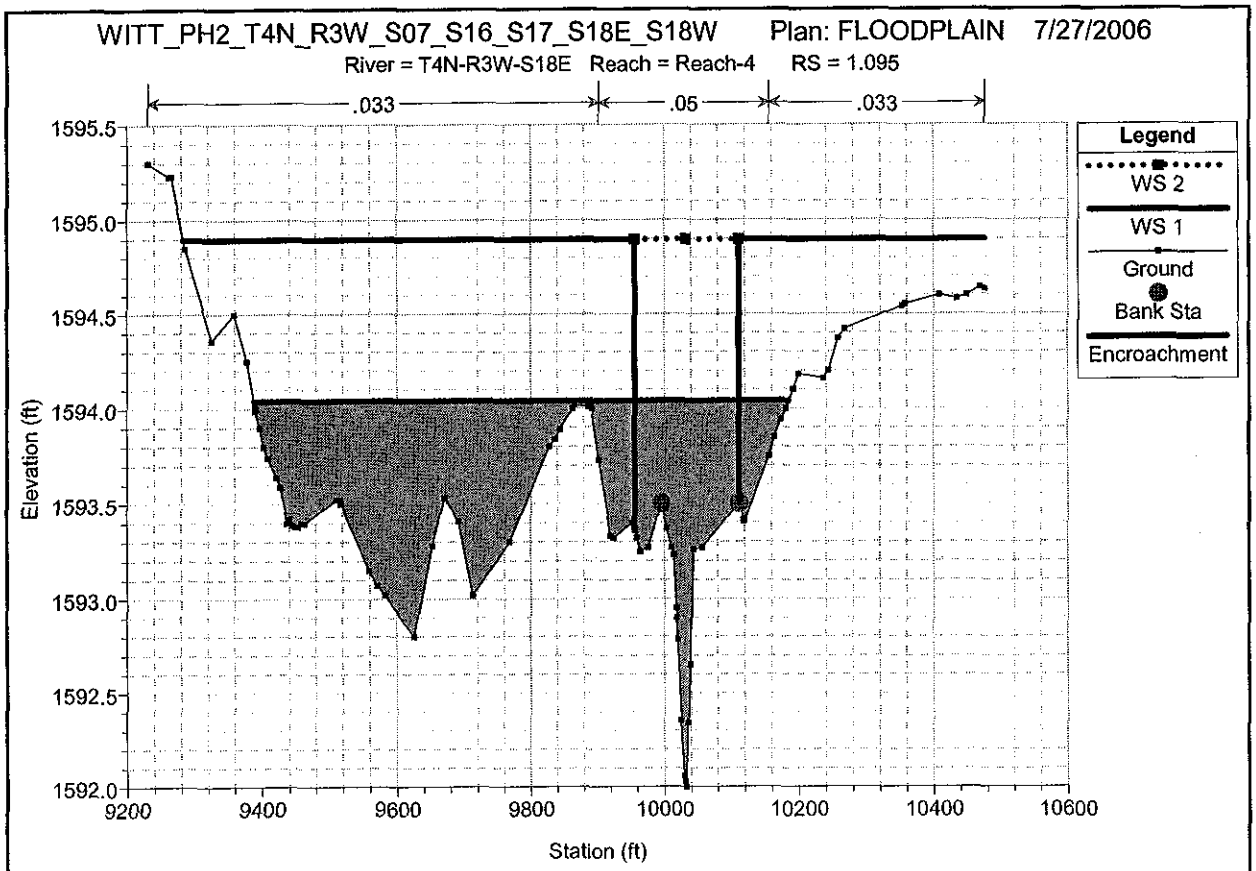

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.580
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1614
1613
1612
1611
1610
1609
1608
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

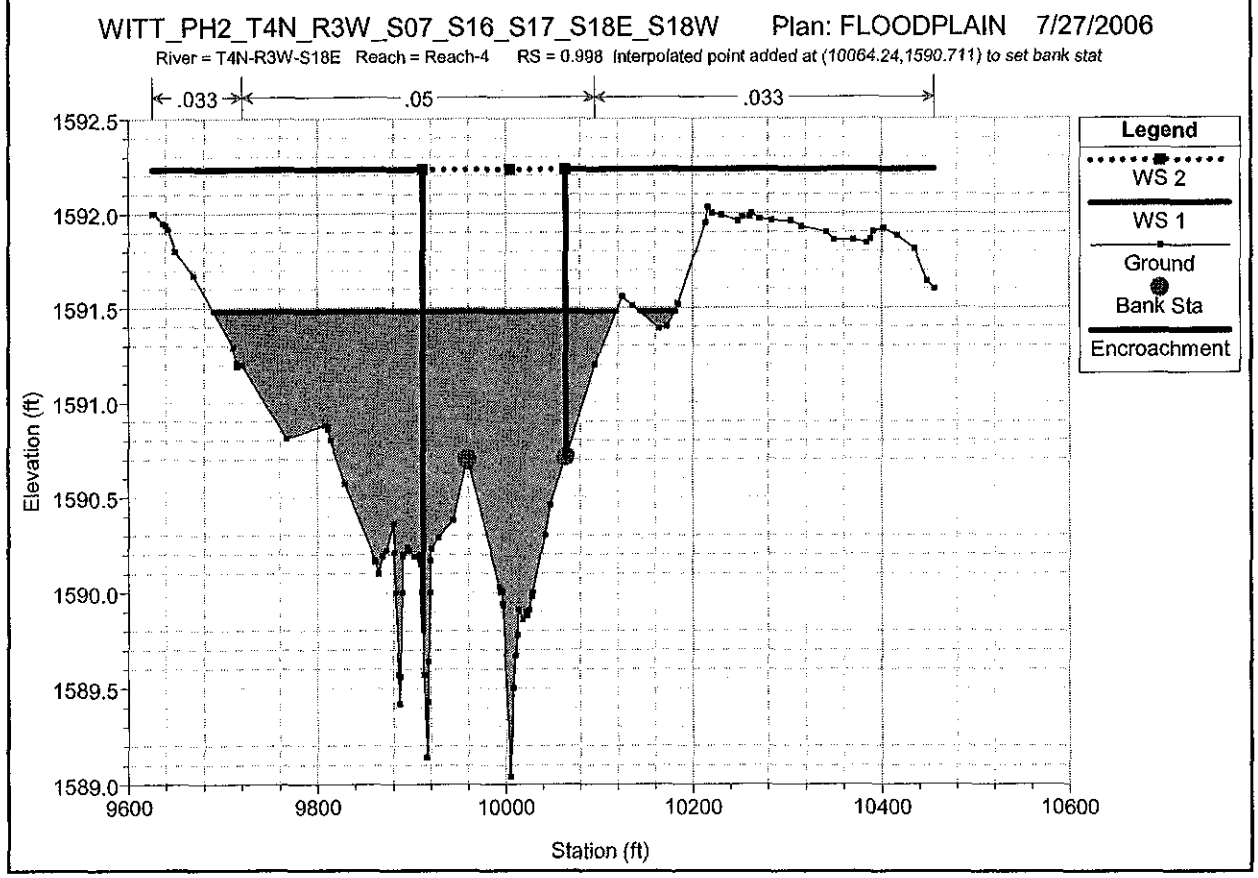

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.486
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1609.5
1609.0
1608.5
1608.0
1607.5
1607.0
1606.5
1606.0
1605.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

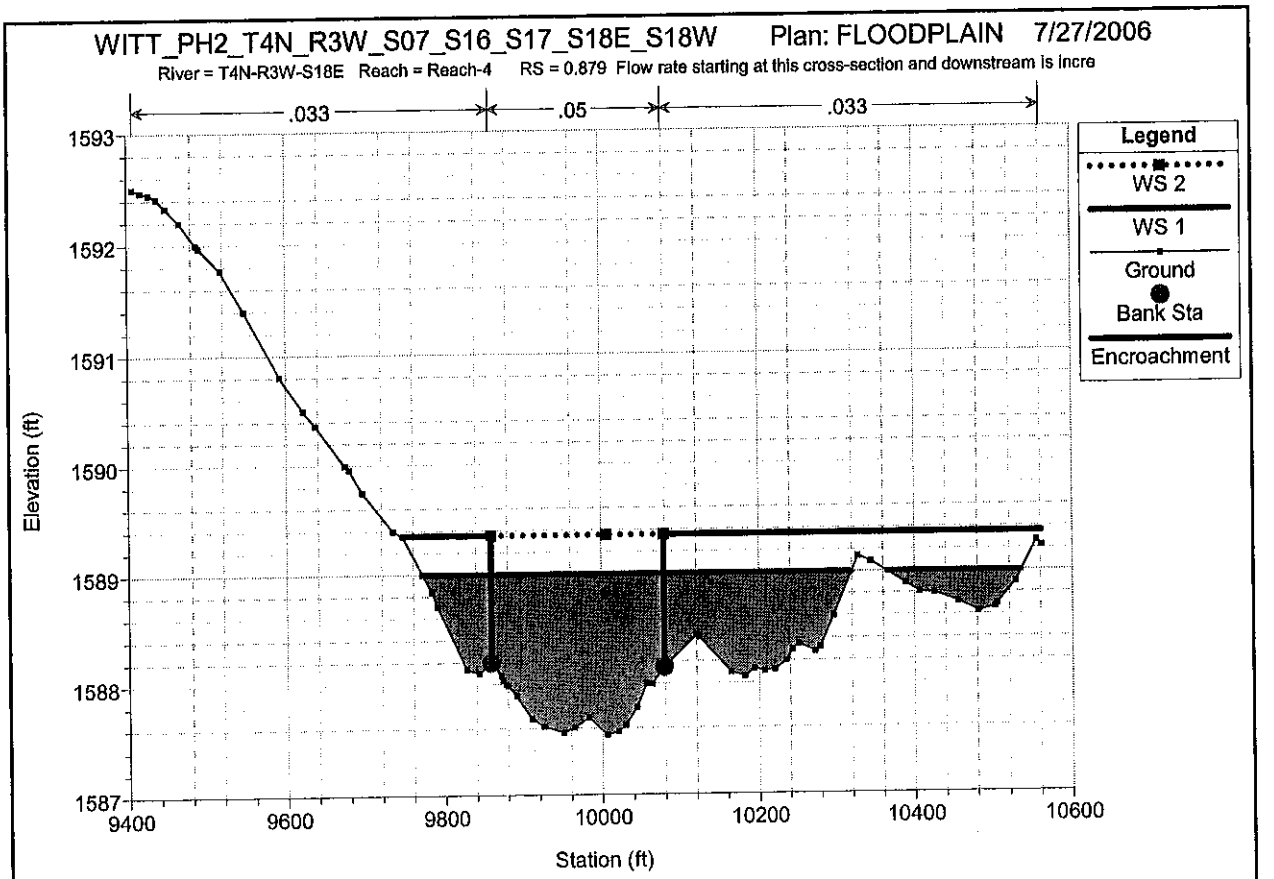

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.378
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1605.5
1605.0
1604.5
1604.0
1603.5
1603.0
1602.5
1602.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

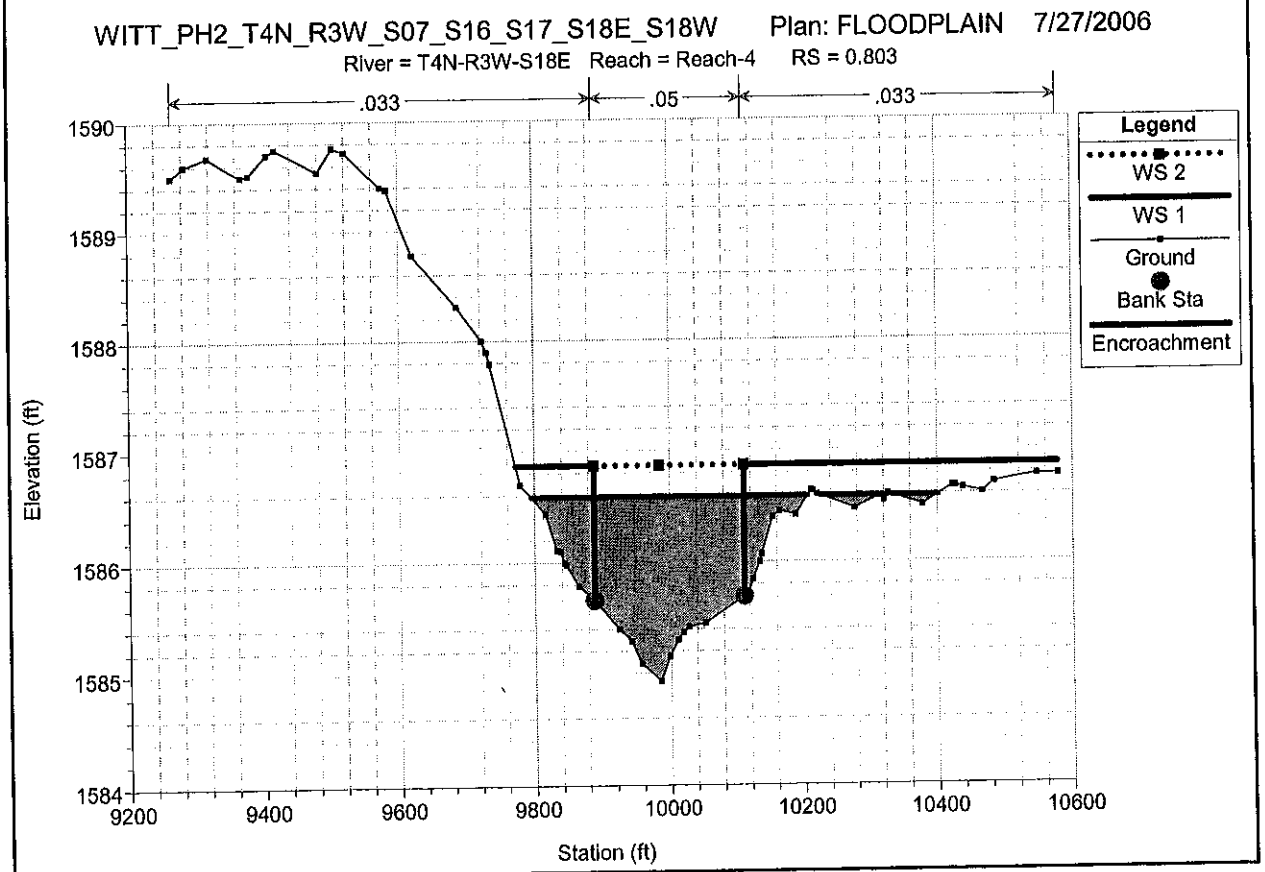

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.282 Flow rate starting at this cross-section and downstream is incre
.033
.05
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1602.5
1602.0
1601.5
1601.0
1600.5
1600.0
1599.5
1599.0
1598.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

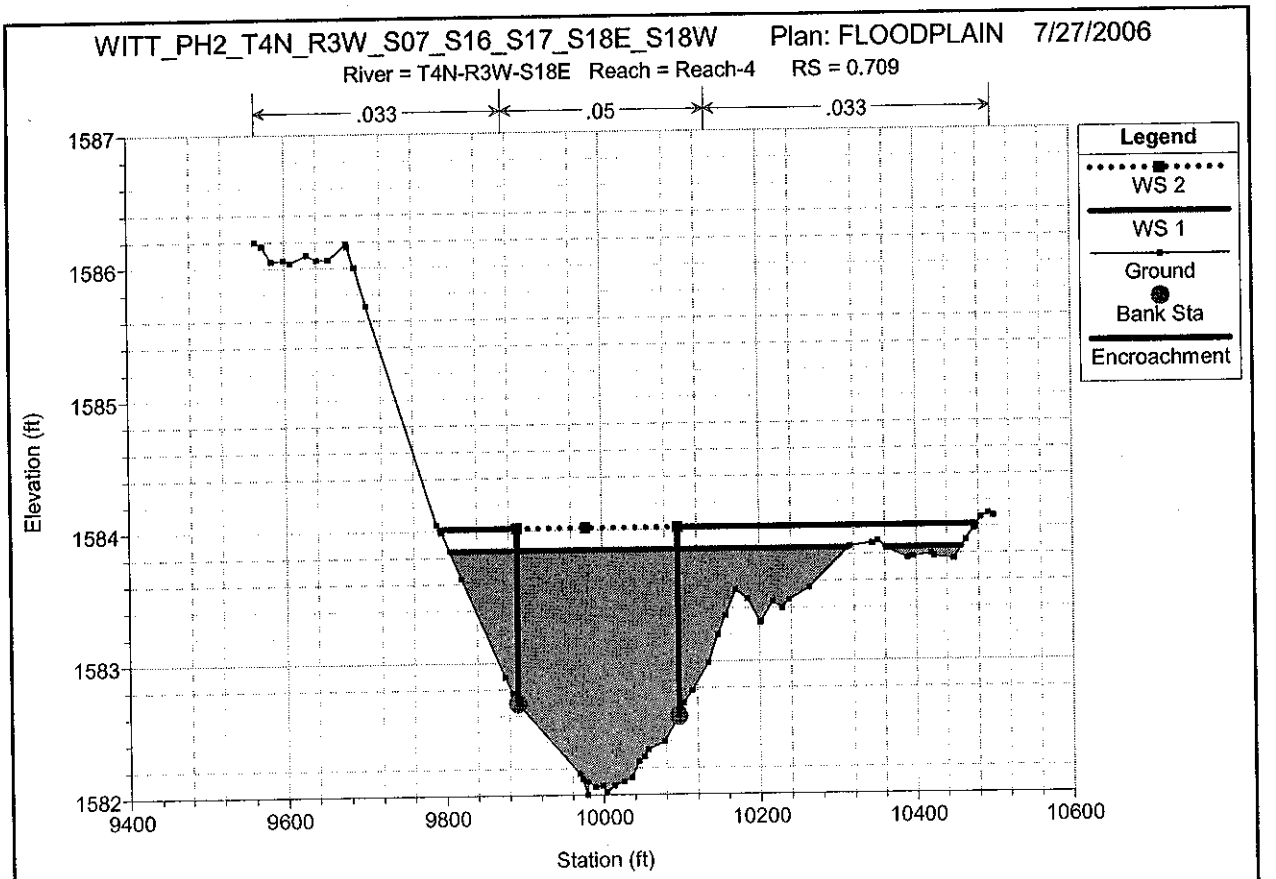

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.192
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1598.5
1598.0
1597.5
1597.0
1596.5
1596.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

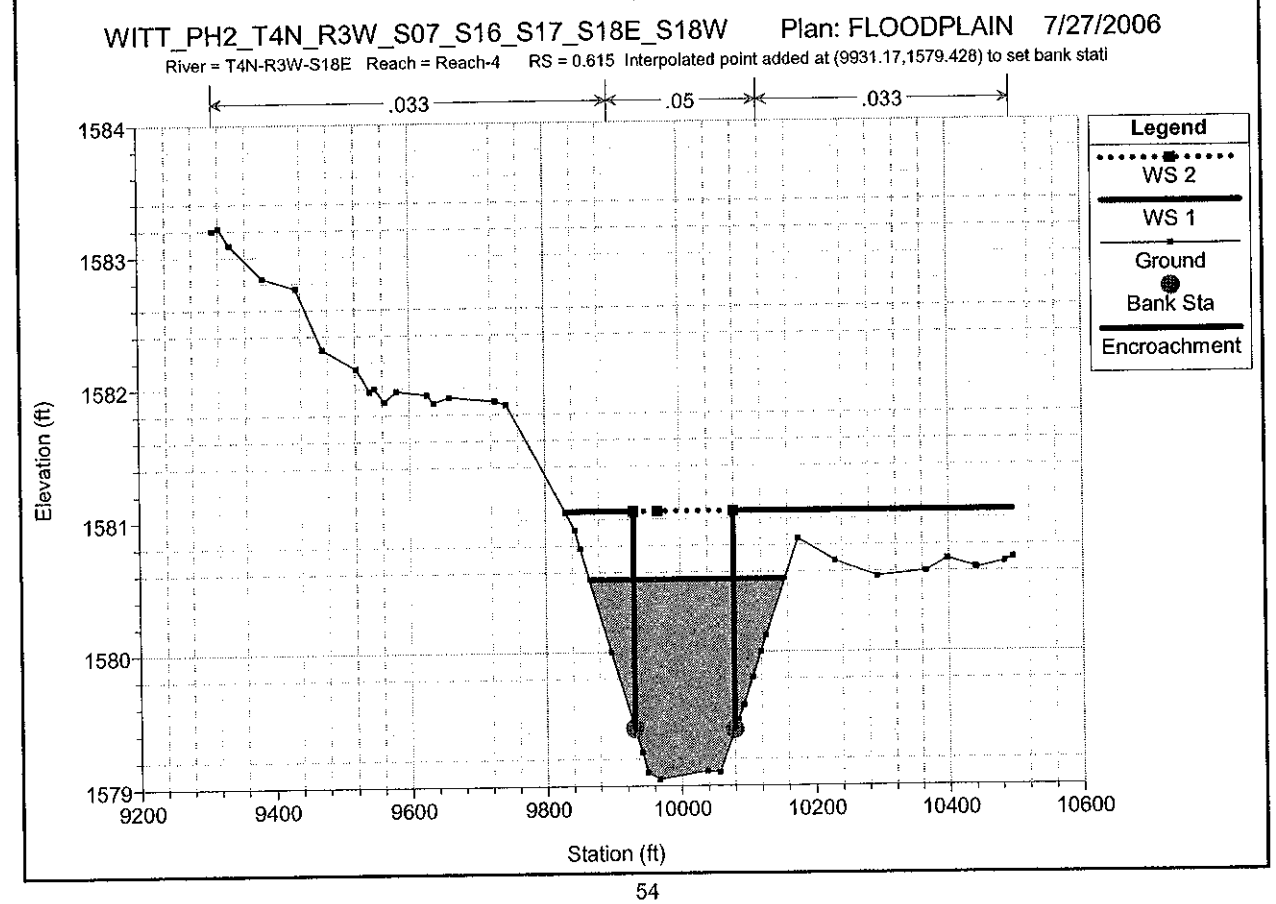

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 1.095
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1595.5
1595.0
1594.5
1594.0
1593.5
1593.0
1592.5
1592.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

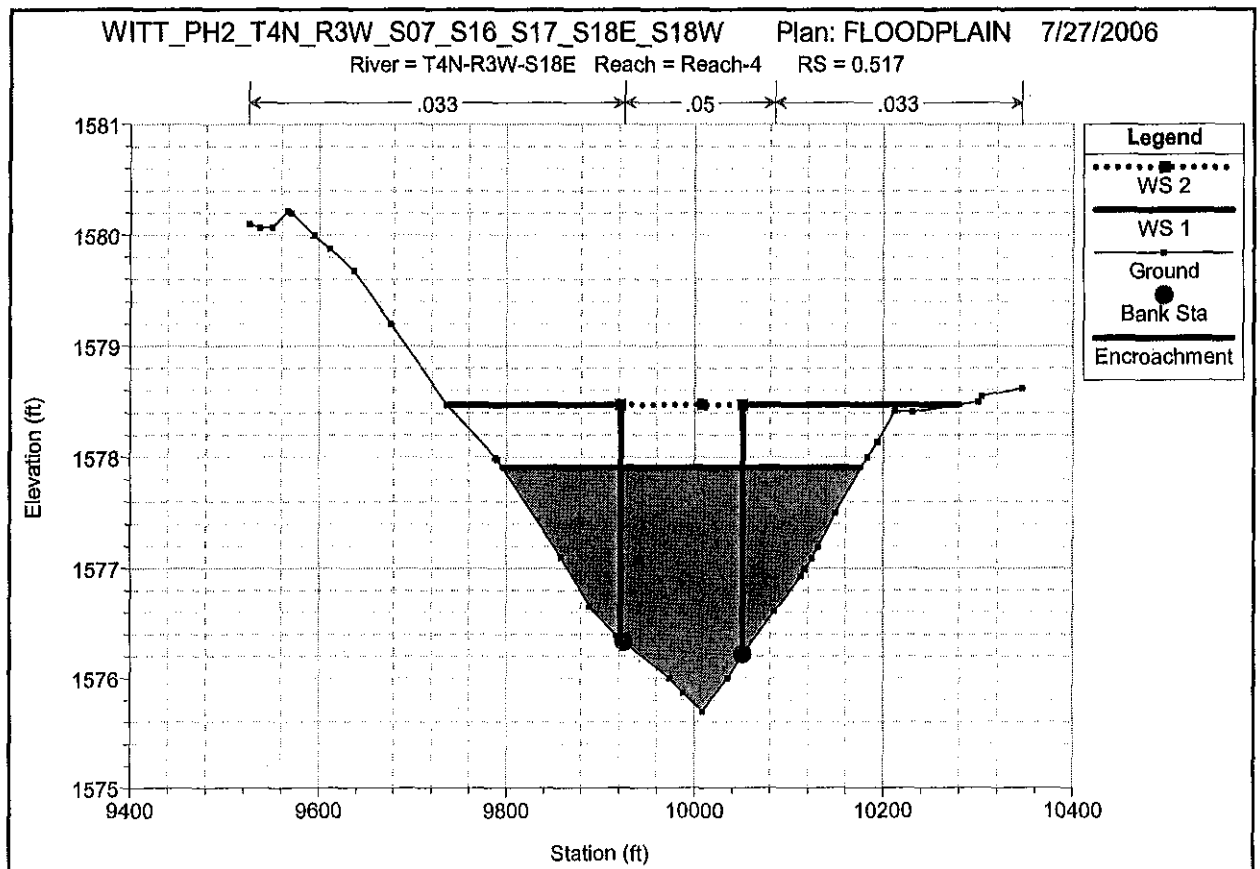

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.998 Interpolated point added at (10064.24,1590.711) to set bank stat
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1592.5
1592.0
1591.5
1591.0
1590.5
1590.0
1589.5
1589.0
9600
9800
10000
10200
10400
10600
Station (ft)

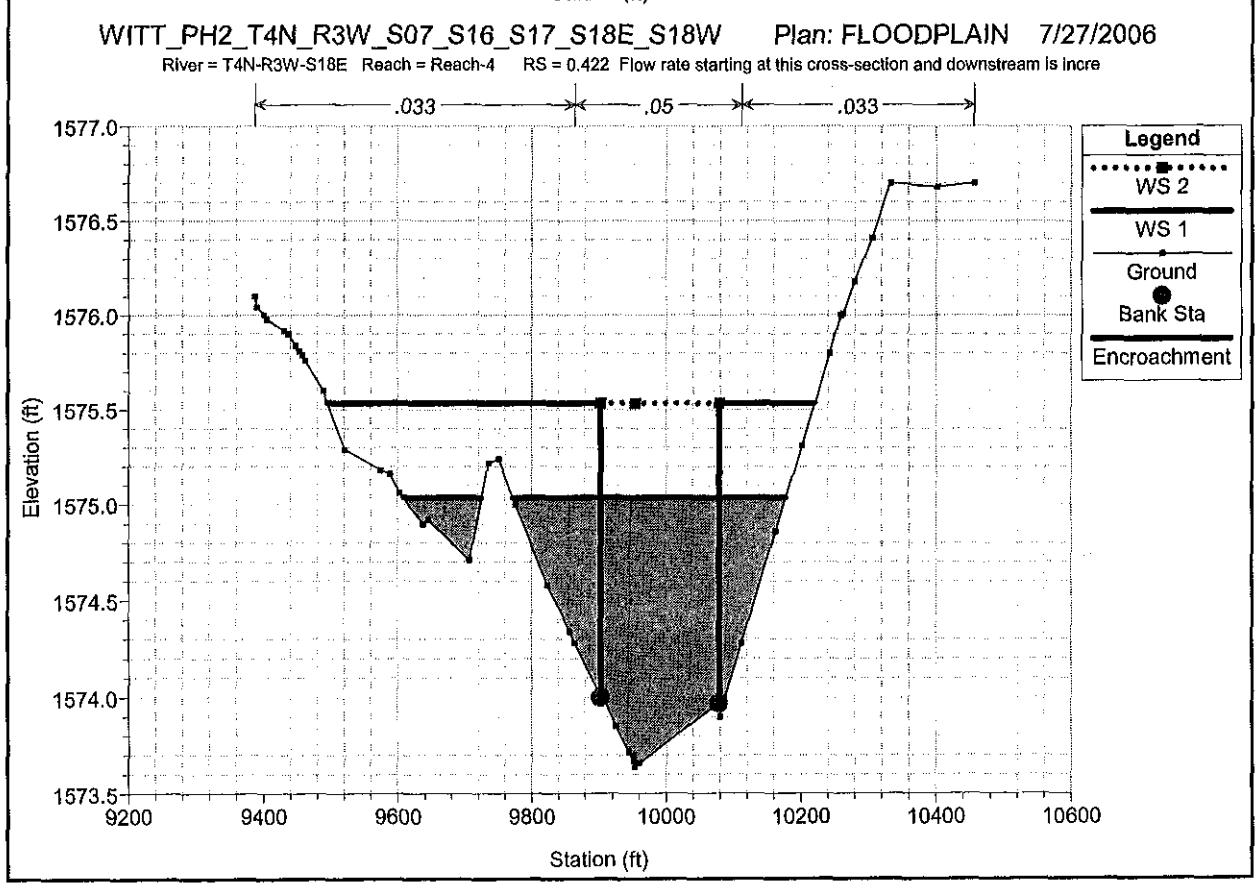

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.879 Flow rate starting at this cross-section and downstream is incre
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1593
1592
1591
1590
1589
1588
1587
9400
9600
9800
10000
10200
10400
10600
Station (ft)

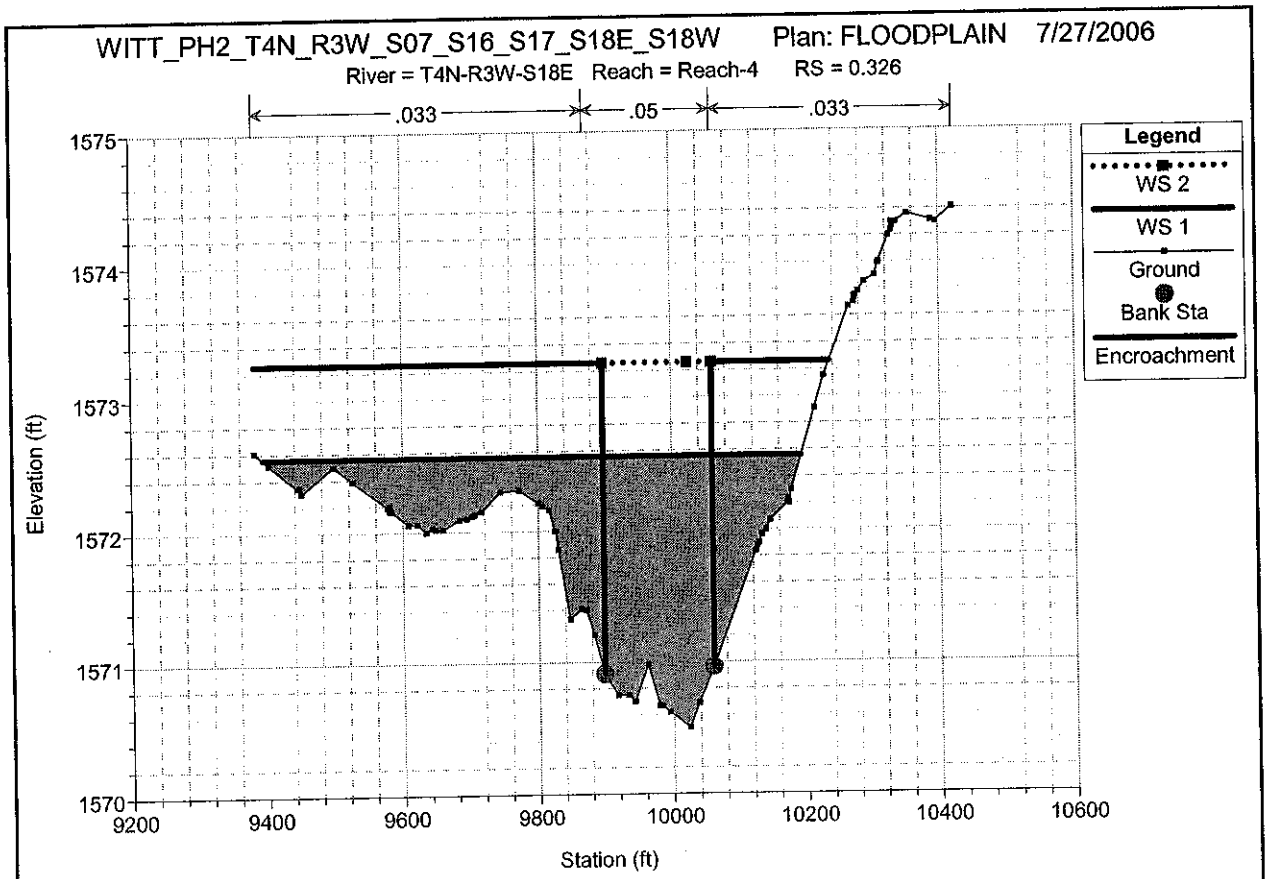

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.803
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1590
1589
1588
1587
1586
1585
1584
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

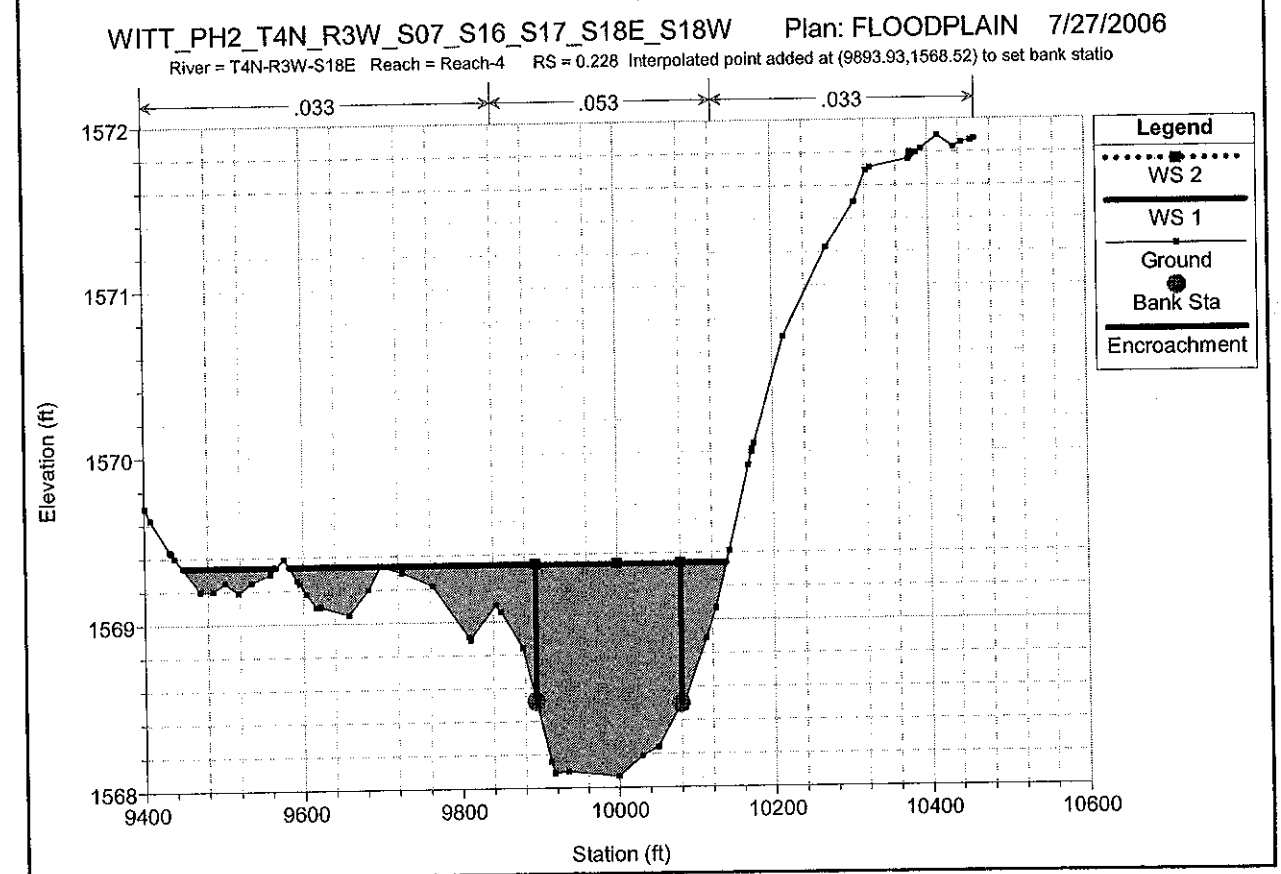

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.709
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1587
1586
1585
1584
1583
1582
9400
9600
9800
10000
10200
10400
10600
Station (ft)

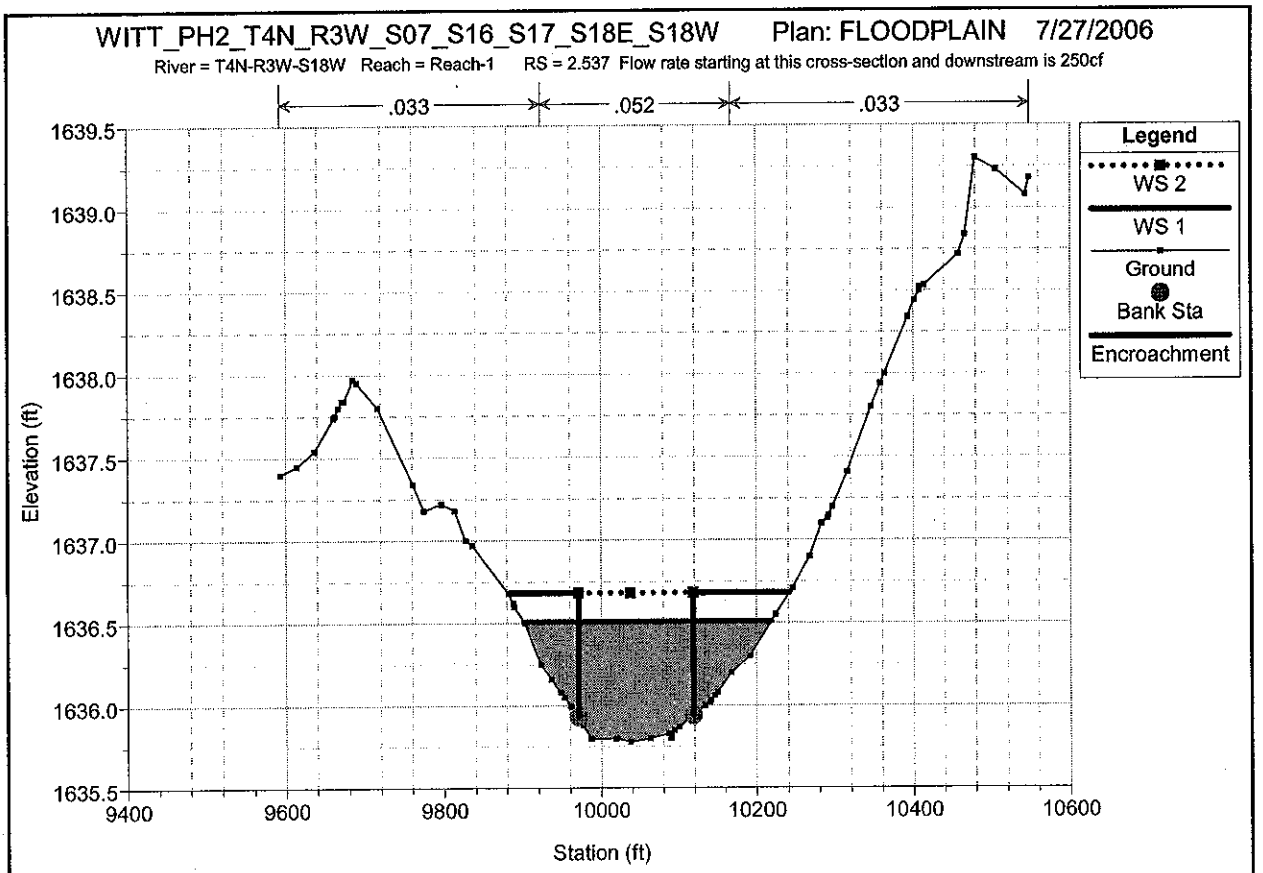

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.615 Interpolated point added at (9931.17,1579.428) to set bank stati
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1584
1583
1582
1581
1580
1579
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

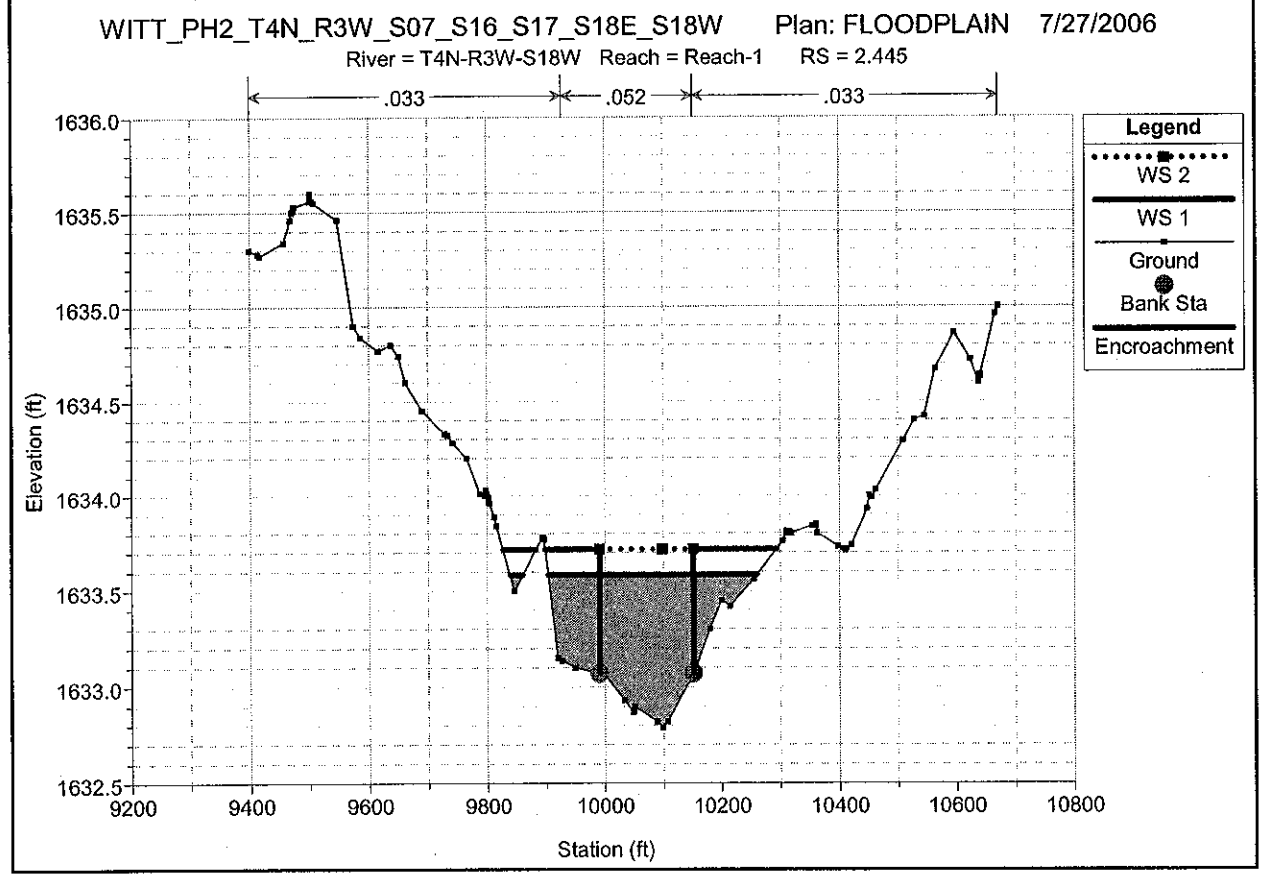

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.517
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1581
1580
1579
1578
1577
1576
1575
9400
9600
9800
10000
10200
10400
Station (ft)

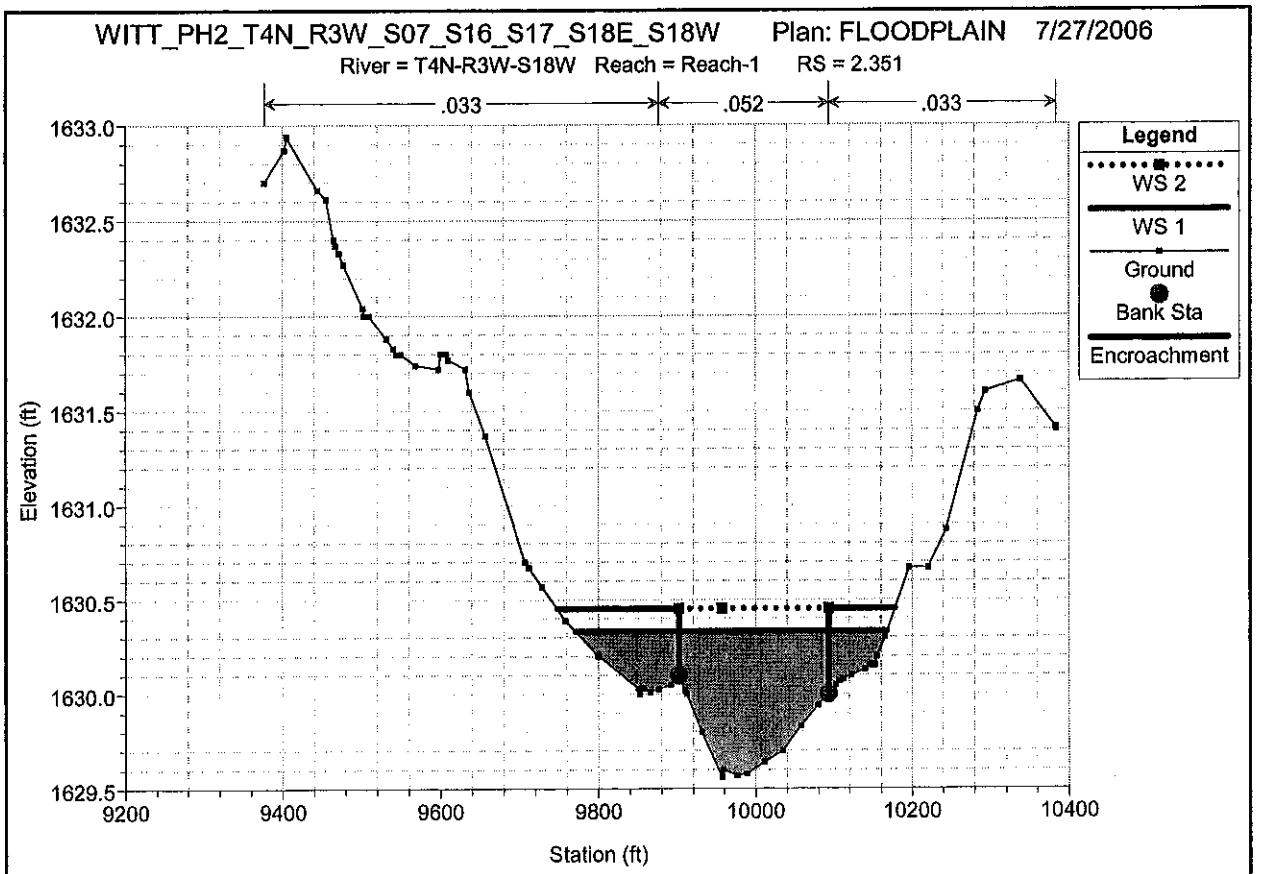

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.422 Flow rate starting at this cross-section and downstream is incre
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1577.0
1576.5
1576.0
1575.5
1575.0
1574.5
1574.0
1573.5
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

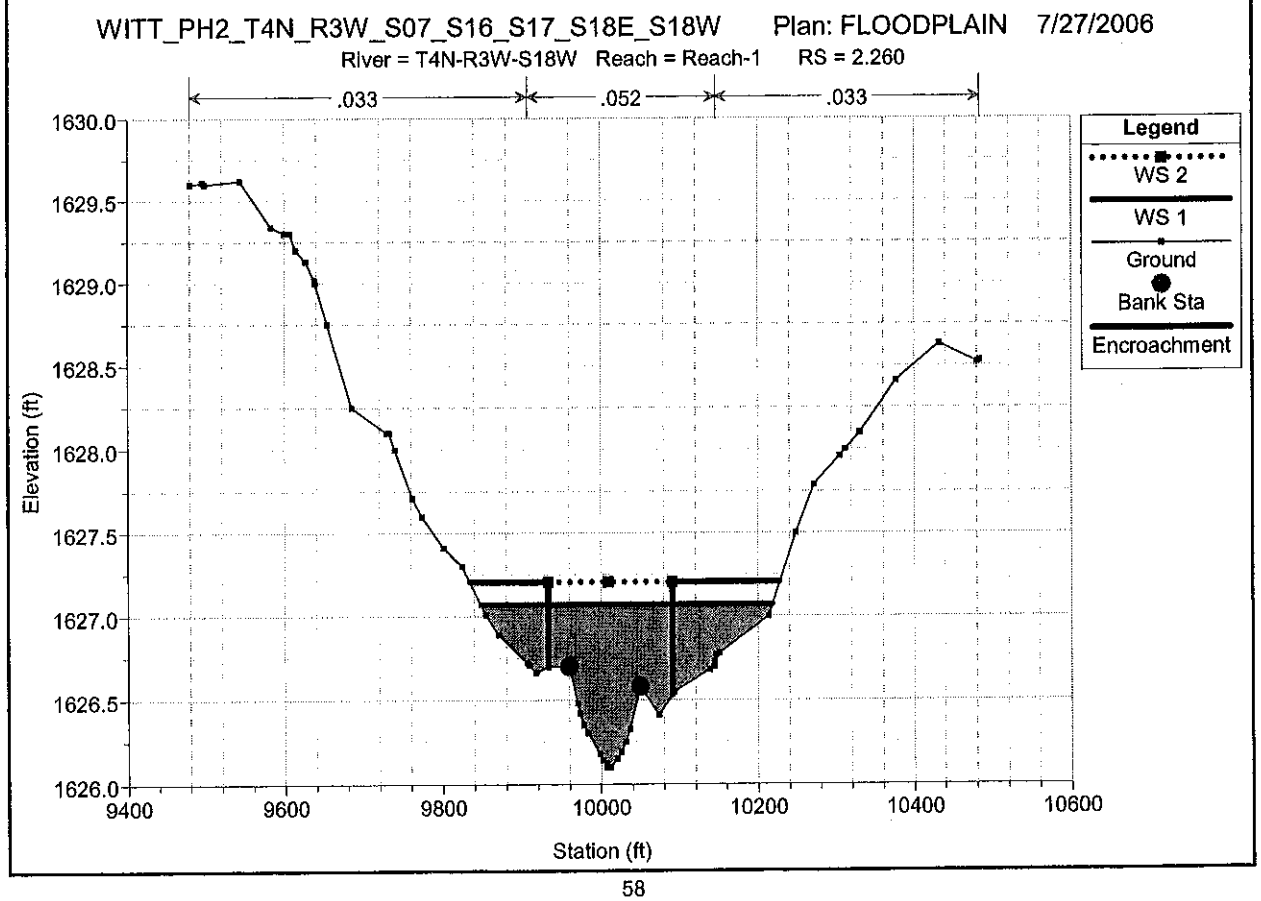

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.326
.033
.05
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1575
1574
1573
1572
1571
1570
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

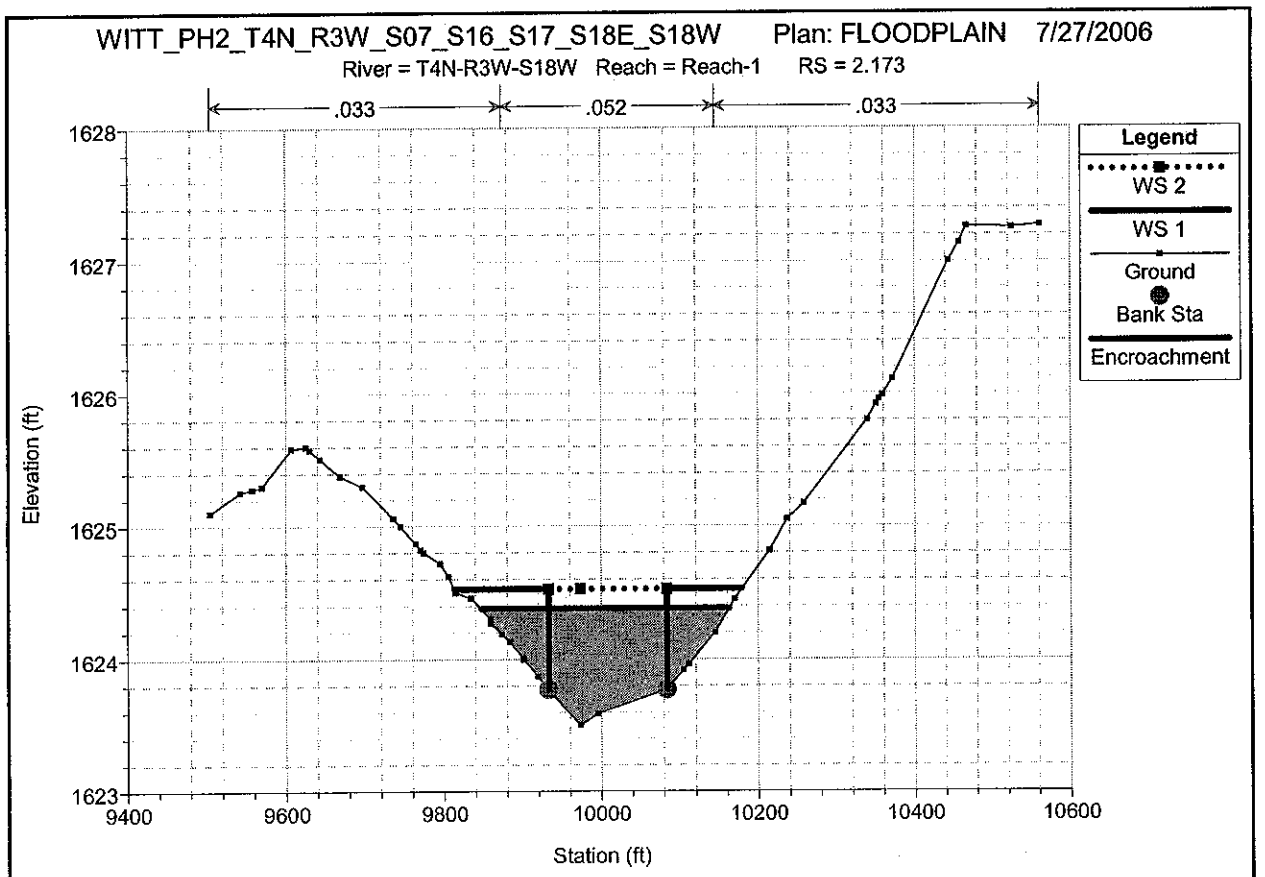

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18E Reach = Reach-4 RS = 0.228 Interpolated point added at (9893.93,1568.52) to set bank statio
.033
.053
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1572
1571
1570
1569
1568
9400
9600
9800
10000
10200
10400
10600
Station (ft)

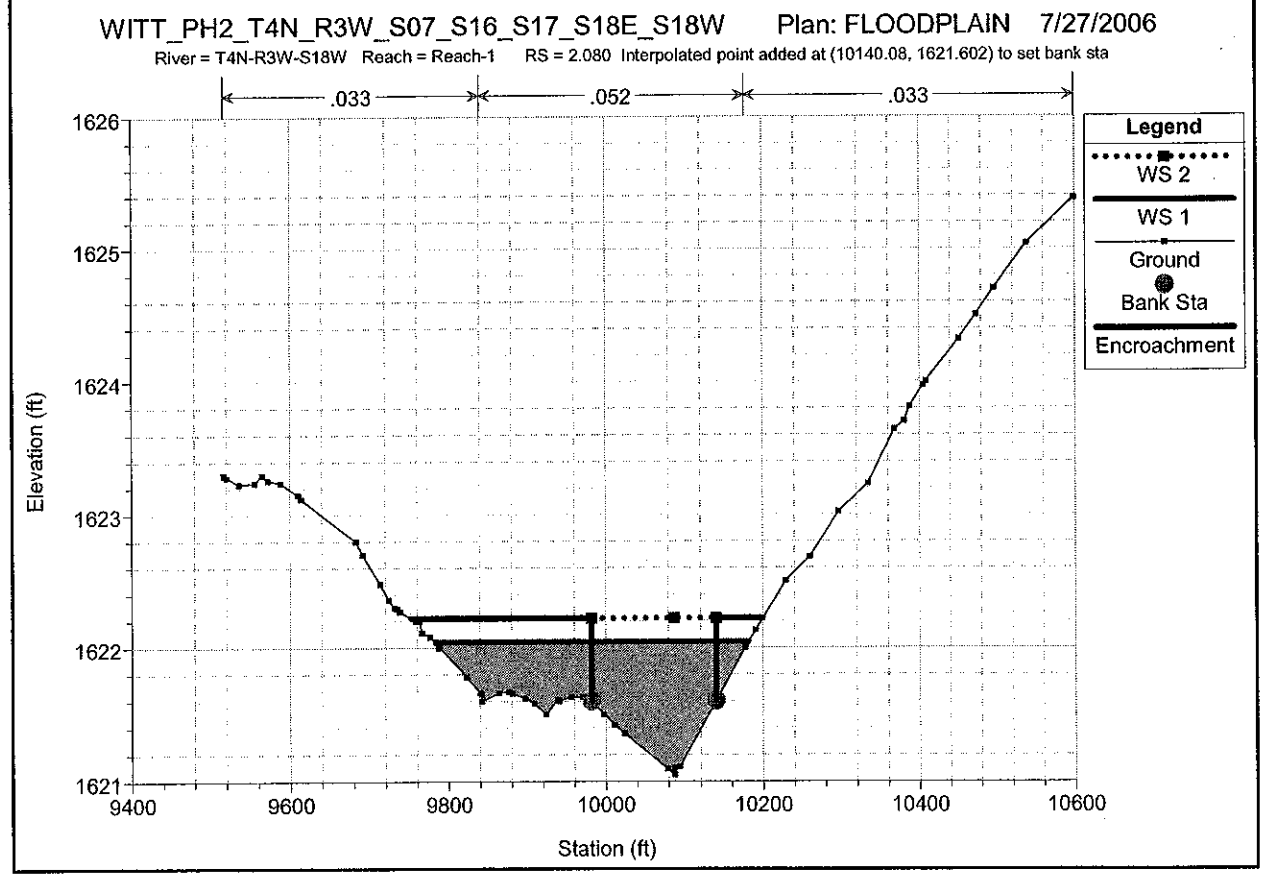

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.537 Flow rate starting at this cross-section and downstream is 250cf
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1639.5
1639.0
1638.5
1638.0
1637.5
1637.0
1636.5
1636.0
1635.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

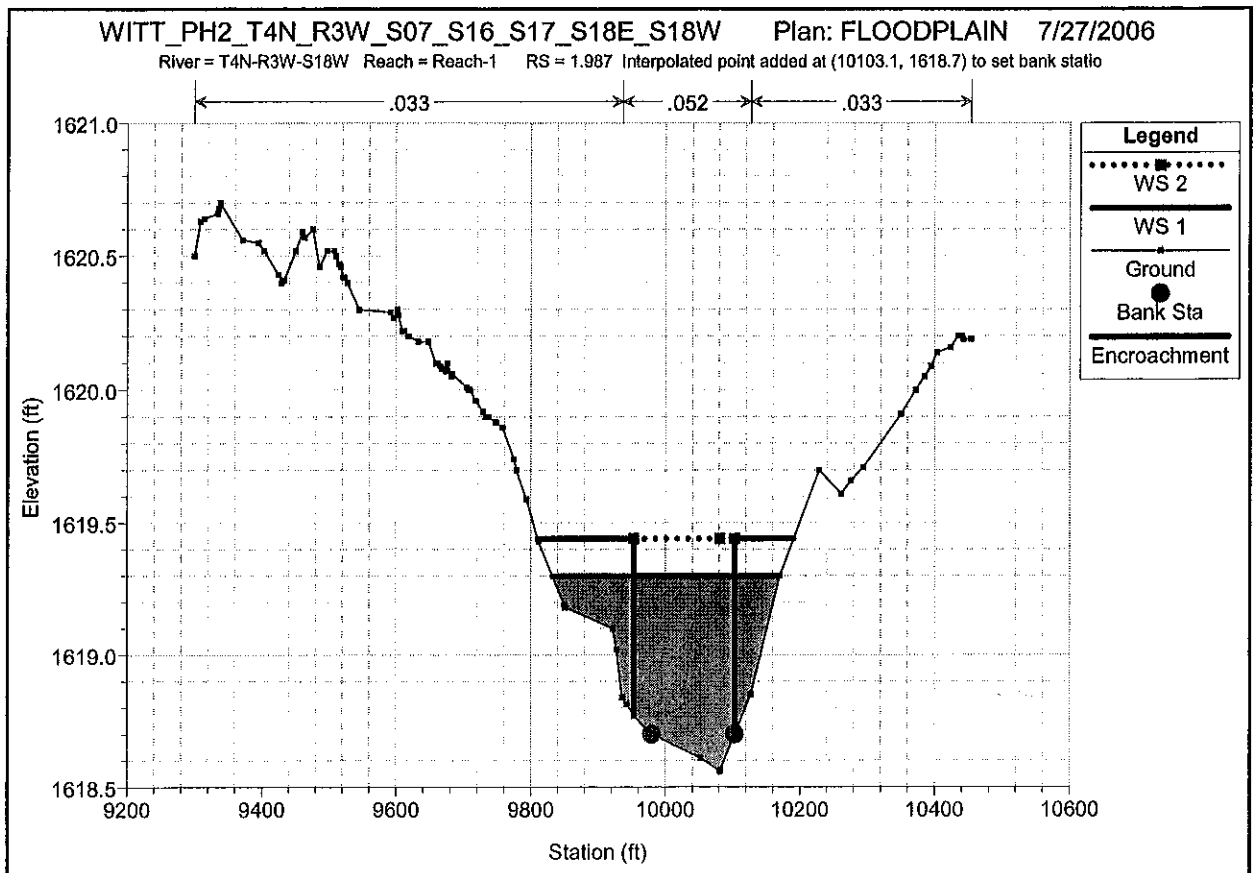

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.445
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1636.0
1635.5
1635.0
1634.5
1634.0
1633.5
1633.0
1632.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

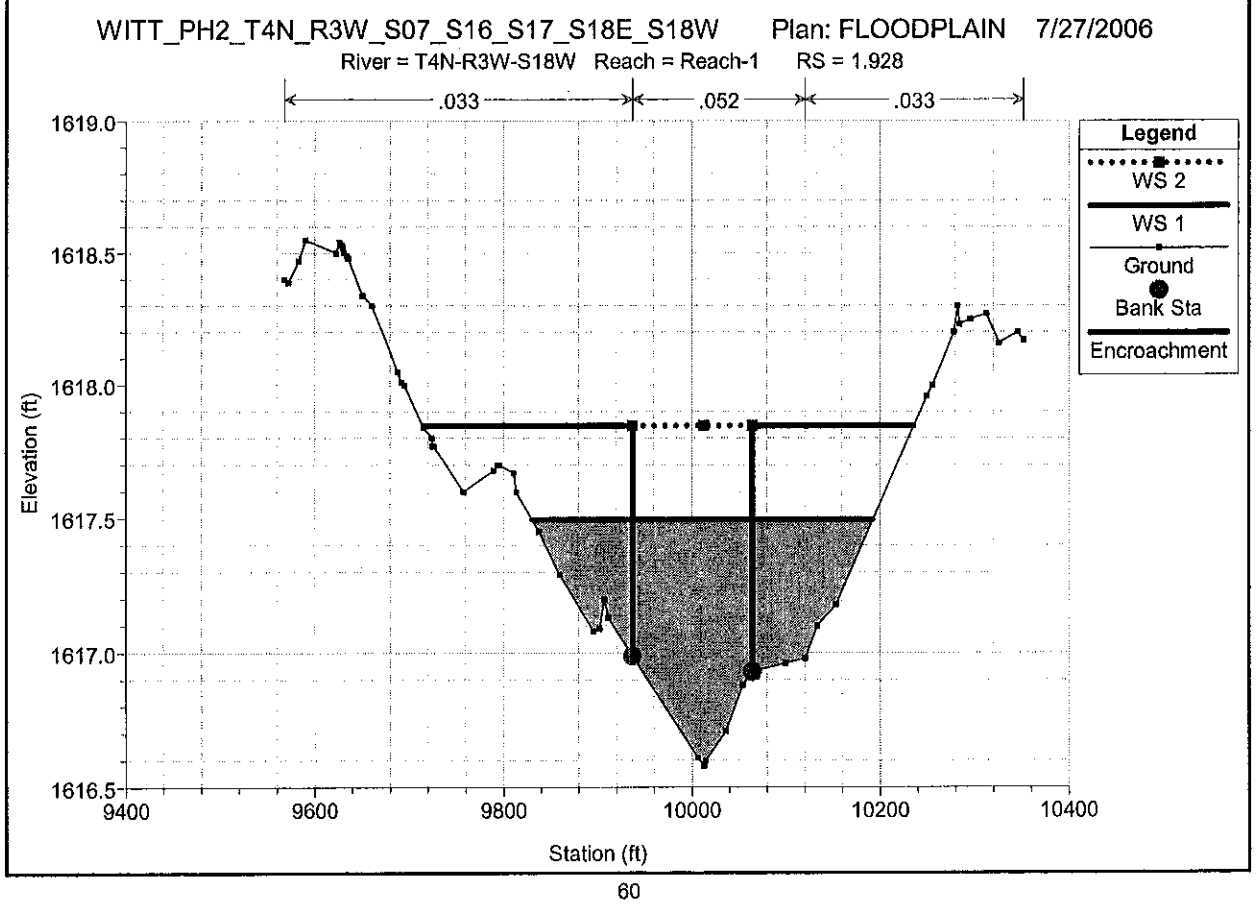

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.351
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1633.0
1632.5
1632.0
1631.5
1631.0
1630.5
1630.0
1629.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)

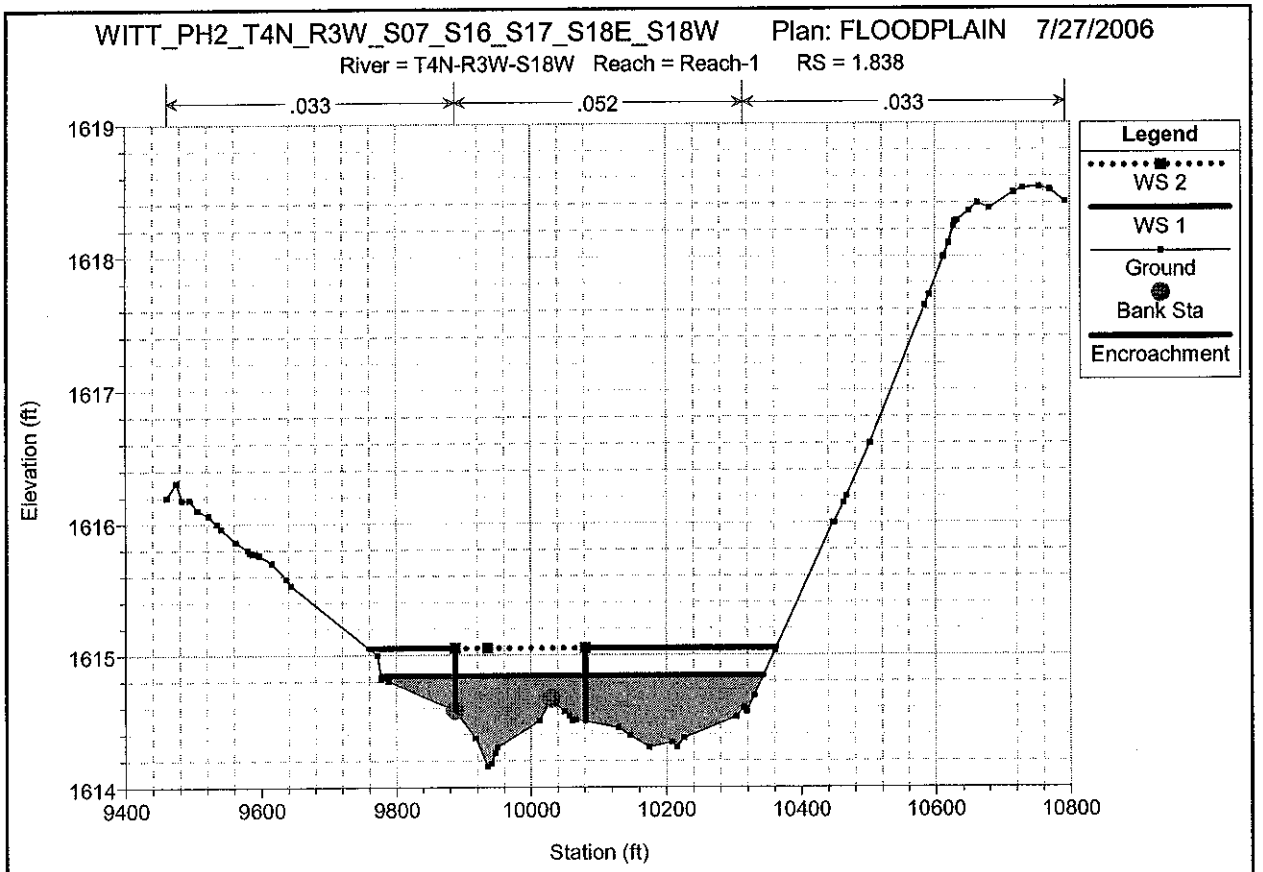

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.260
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1630.0
1629.5
1629.0
1628.5
1628.0
1627.5
1627.0
1626.5
1626.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

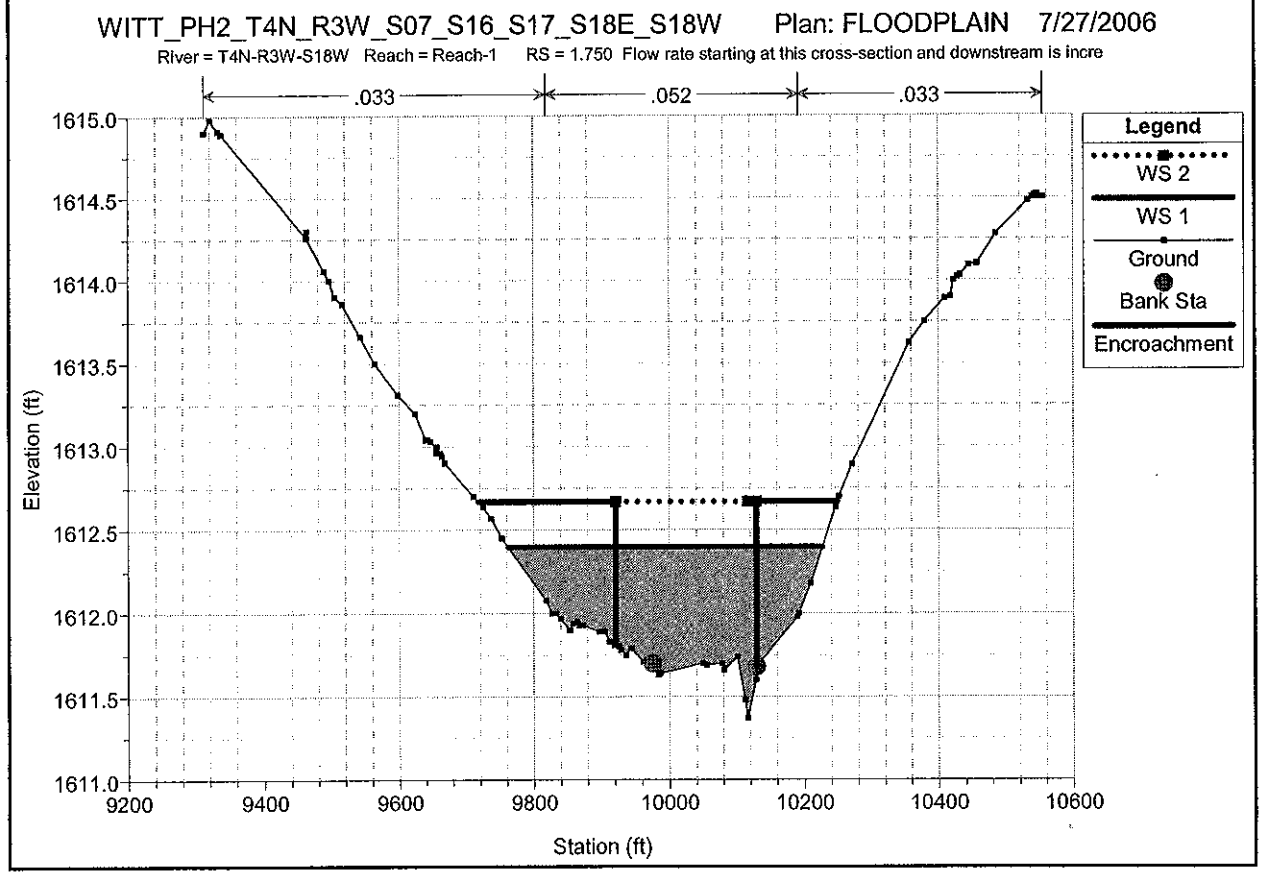

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.173
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1628
1627
1626
1625
1624
1623
9400
9600
9800
10000
10200
10400
10600
Station (ft)

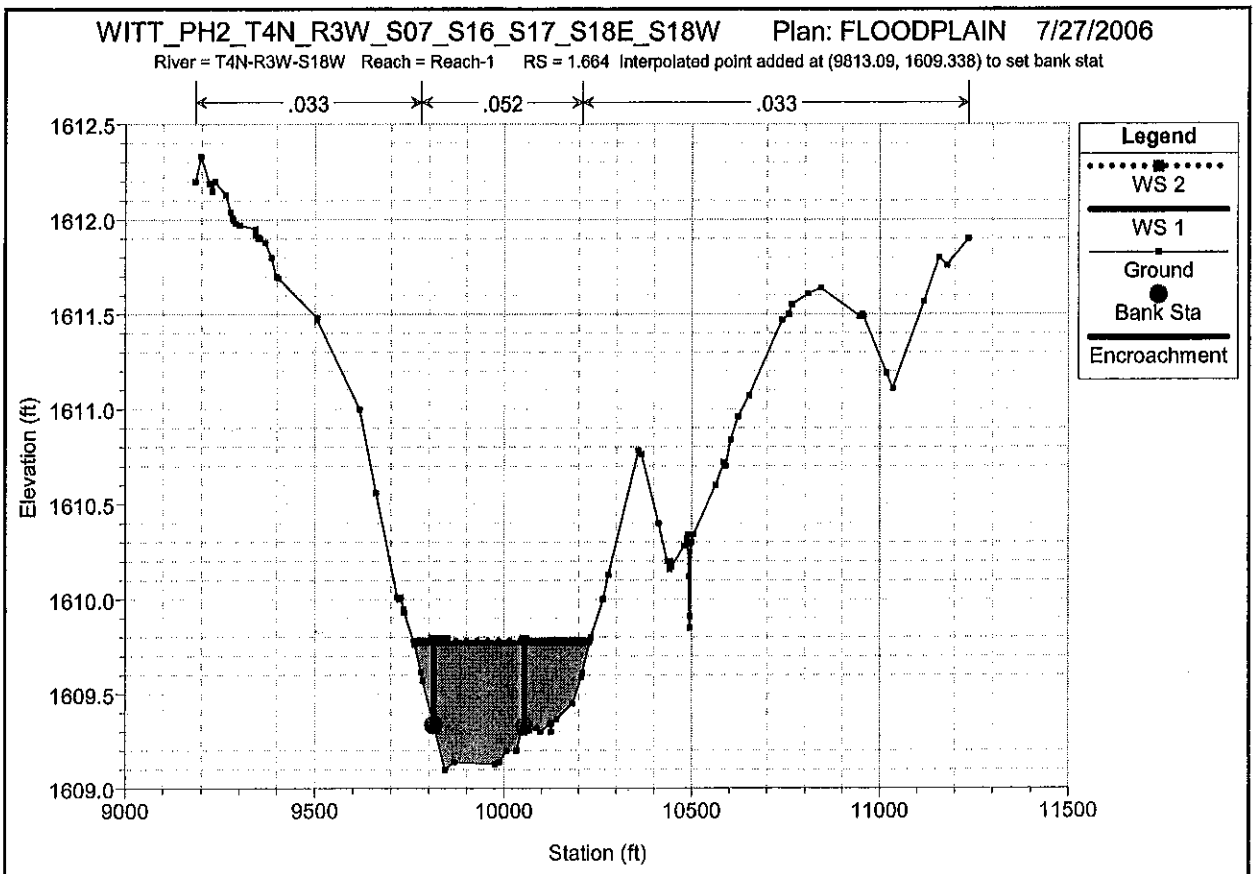

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 2.080 Interpolated point added at (10140.08, 1621.602) to set bank sta
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1626
1625
1624
1623
1622
1621
9400
9600
9800
10000
10200
10400
10600
Station (ft)

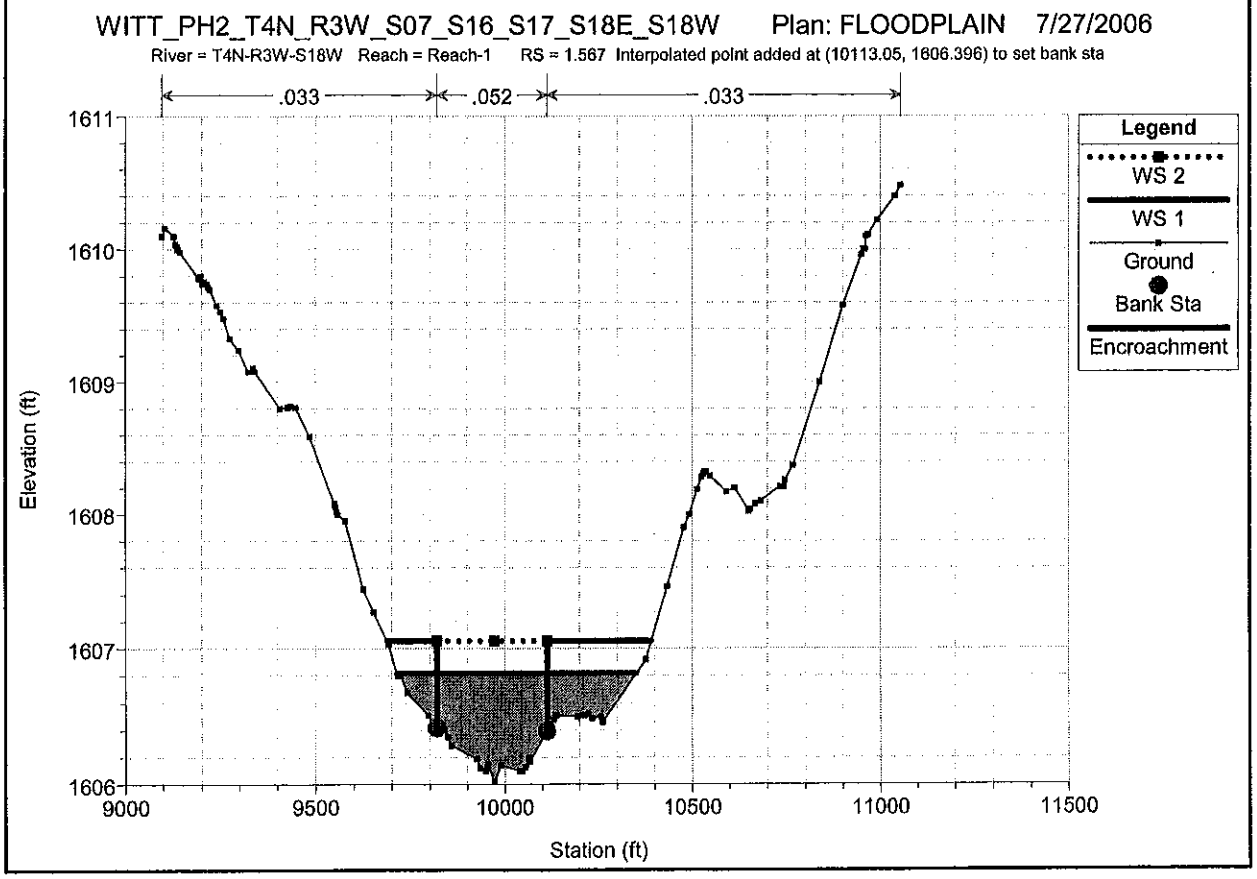

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.987 Interpolated point added at (10103.1, 1618.7) to set bank statio
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1621.0
1620.5
1620.0
1619.5
1619.0
1618.5
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

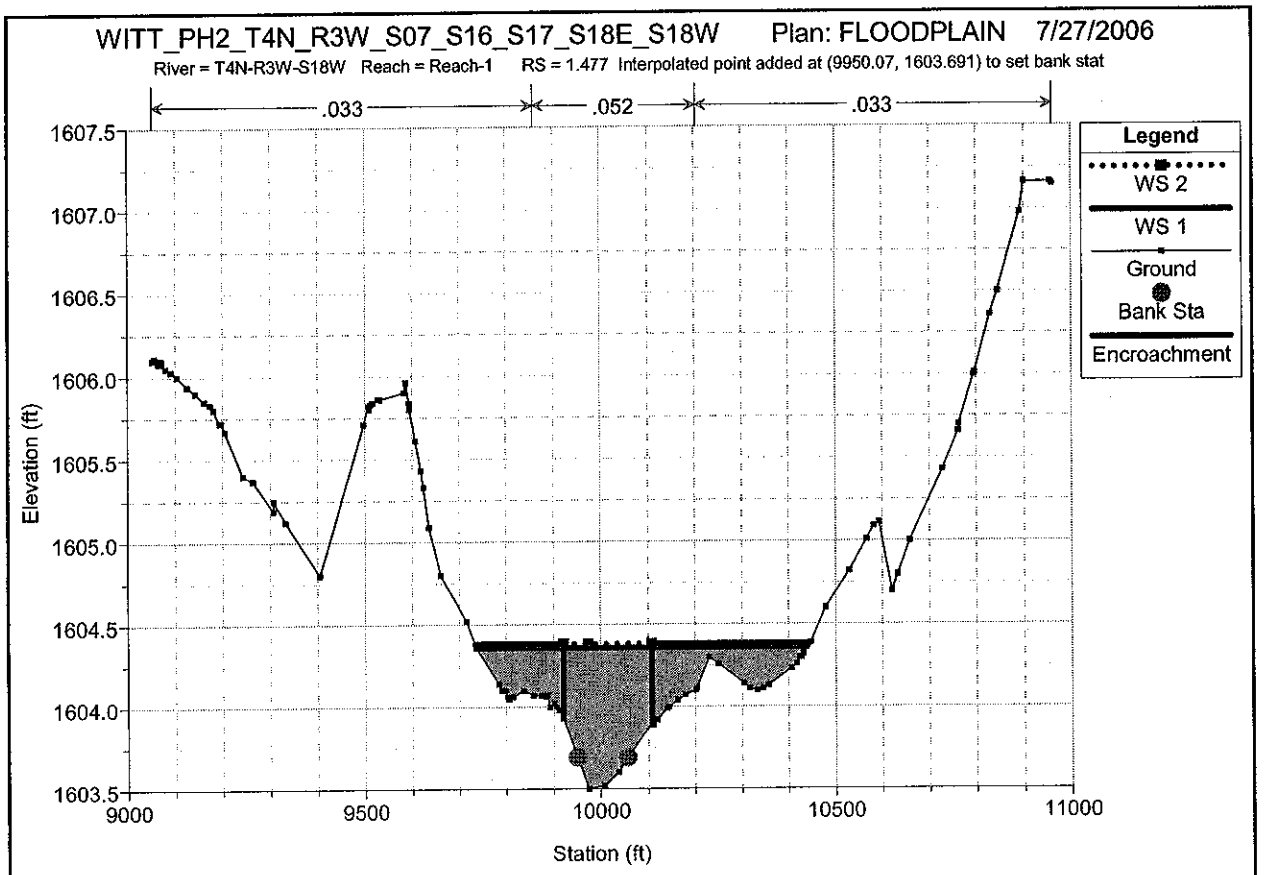

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.928
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1619.0
1618.5
1618.0
1617.5
1617.0
1616.5
9400
9600
9800
10000
10200
10400
Station (ft)

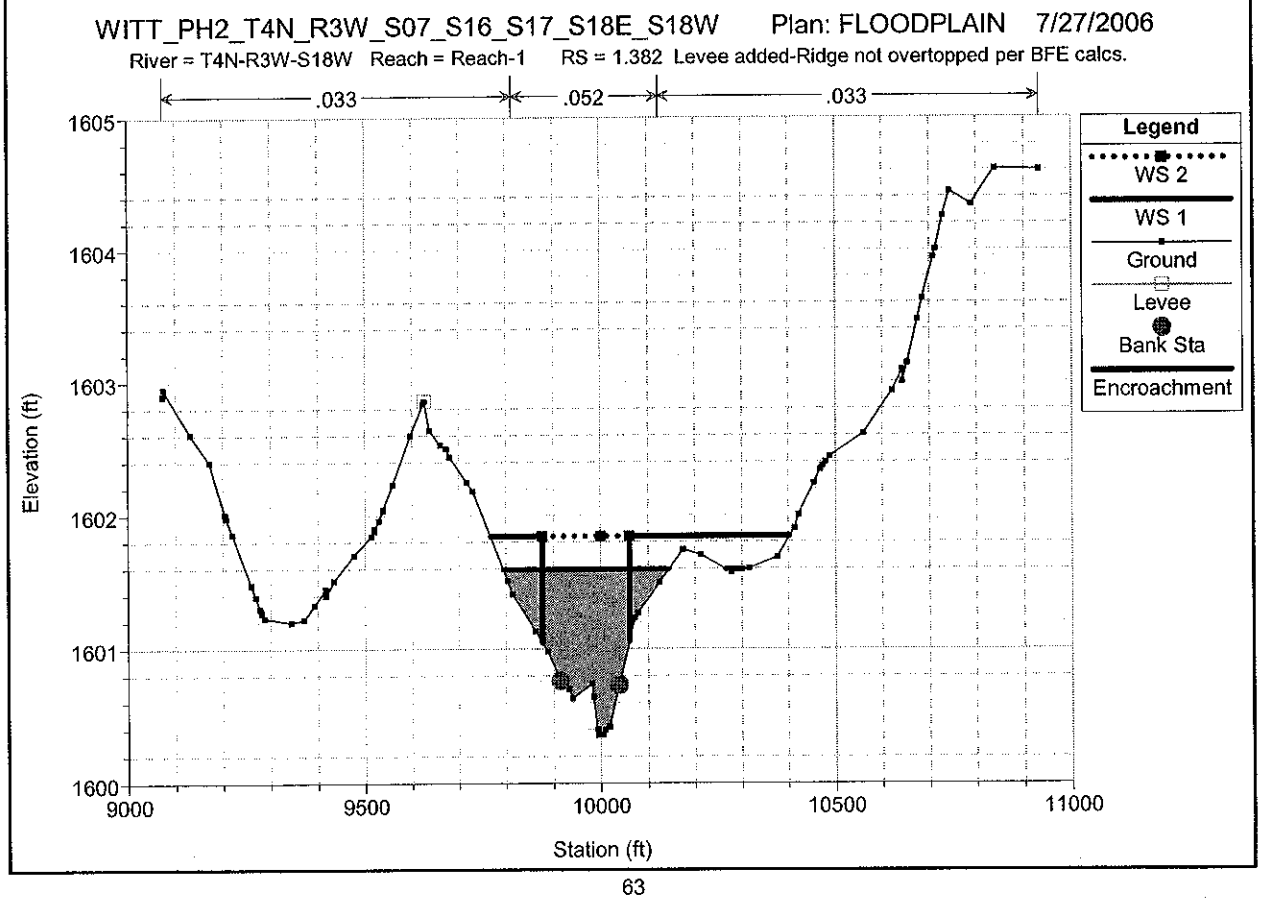

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.838
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1619
1618
1617
1616
1615
1614
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

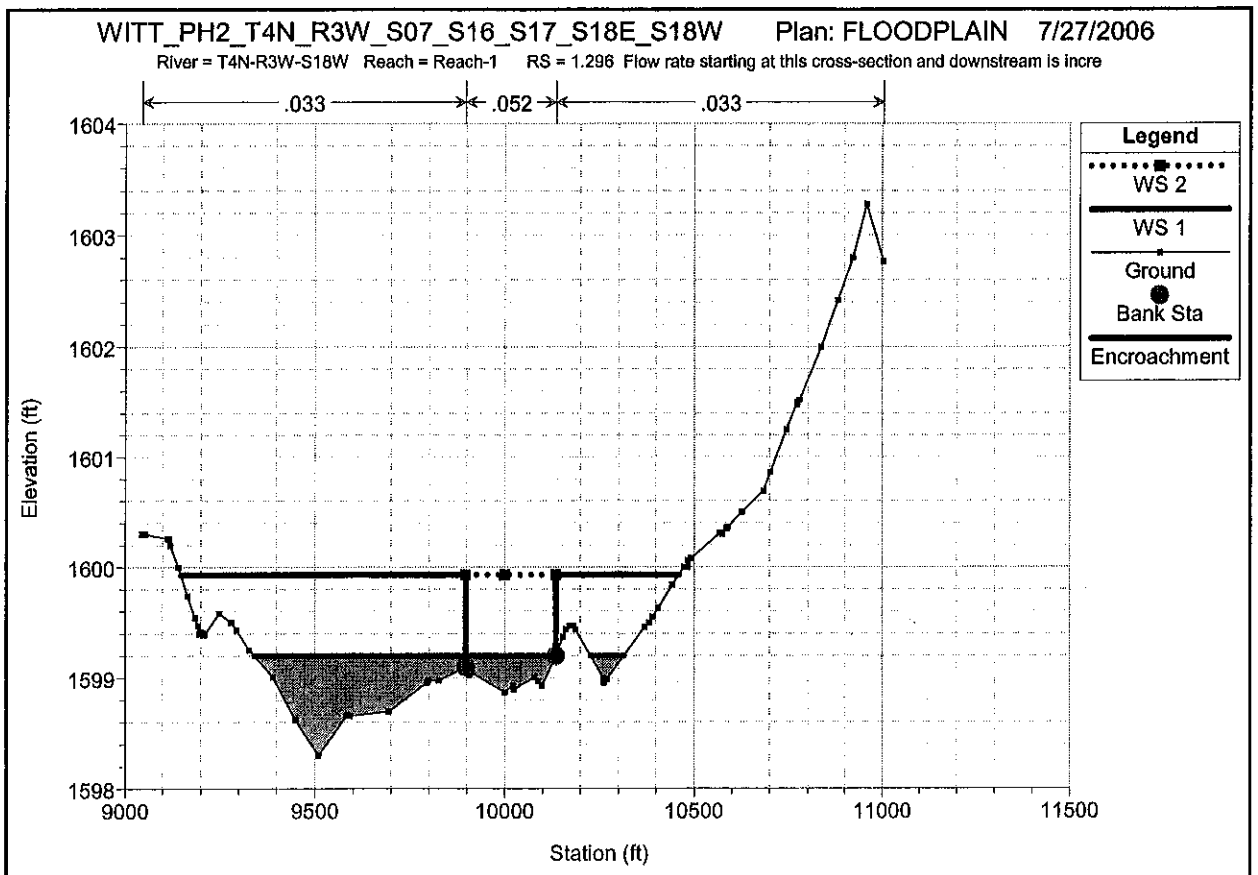

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.750 Flow rate starting at this cross-section and downstream is incre
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1615.0
1614.5
1614.0
1613.5
1613.0
1612.5
1612.0
1611.5
1611.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

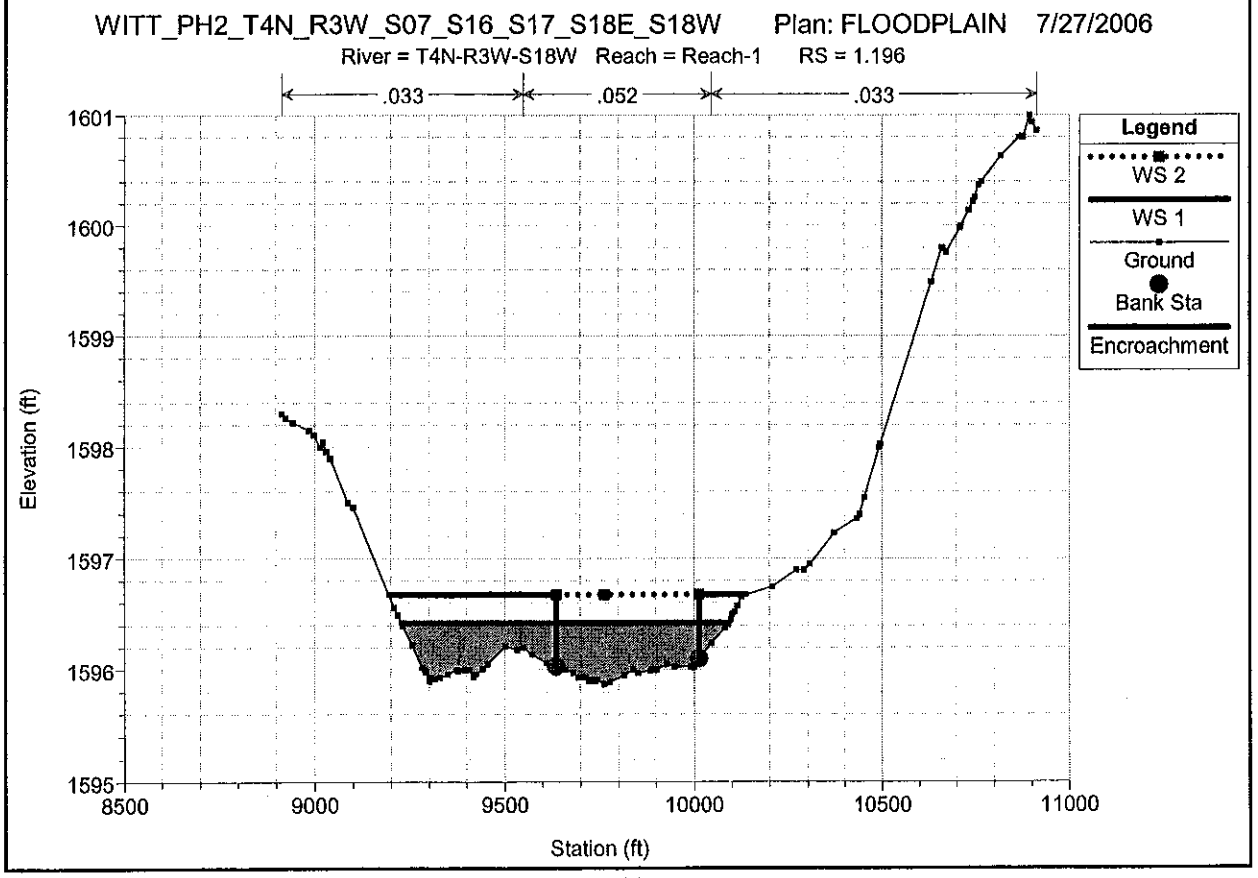

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.664 Interpolated point added at (9813.09, 1609.338) to set bank stat
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1612.5
1612.0
1611.5
1611.0
1610.5
1610.0
1609.5
1609.0
9000
9500
10000
10500
11000
11500
Station (ft)

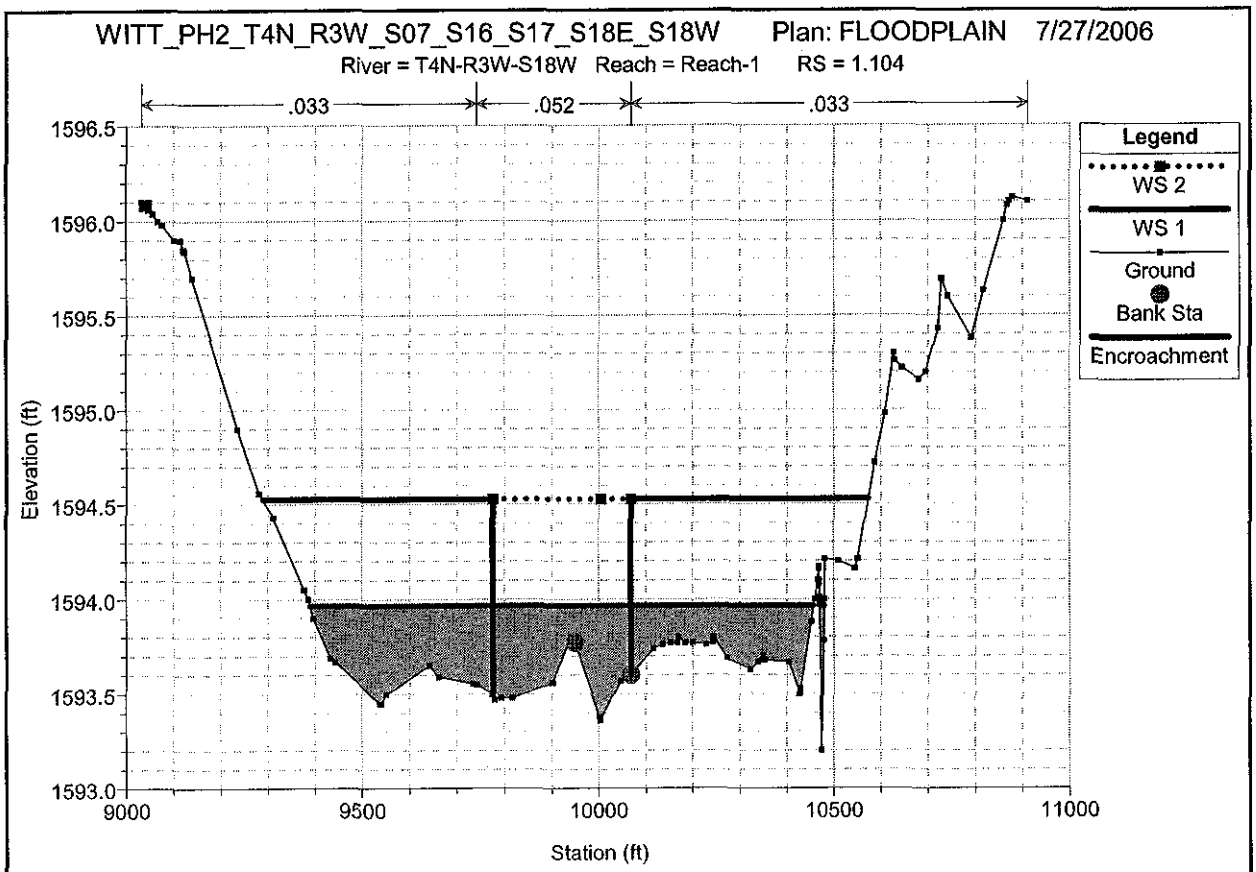

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.567 Interpolated point added at (10113.05, 1606.396) to set bank sta
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1611
1610
1609
1608
1607
1606
9000
9500
10000
10500
11000
11500
Station (ft)

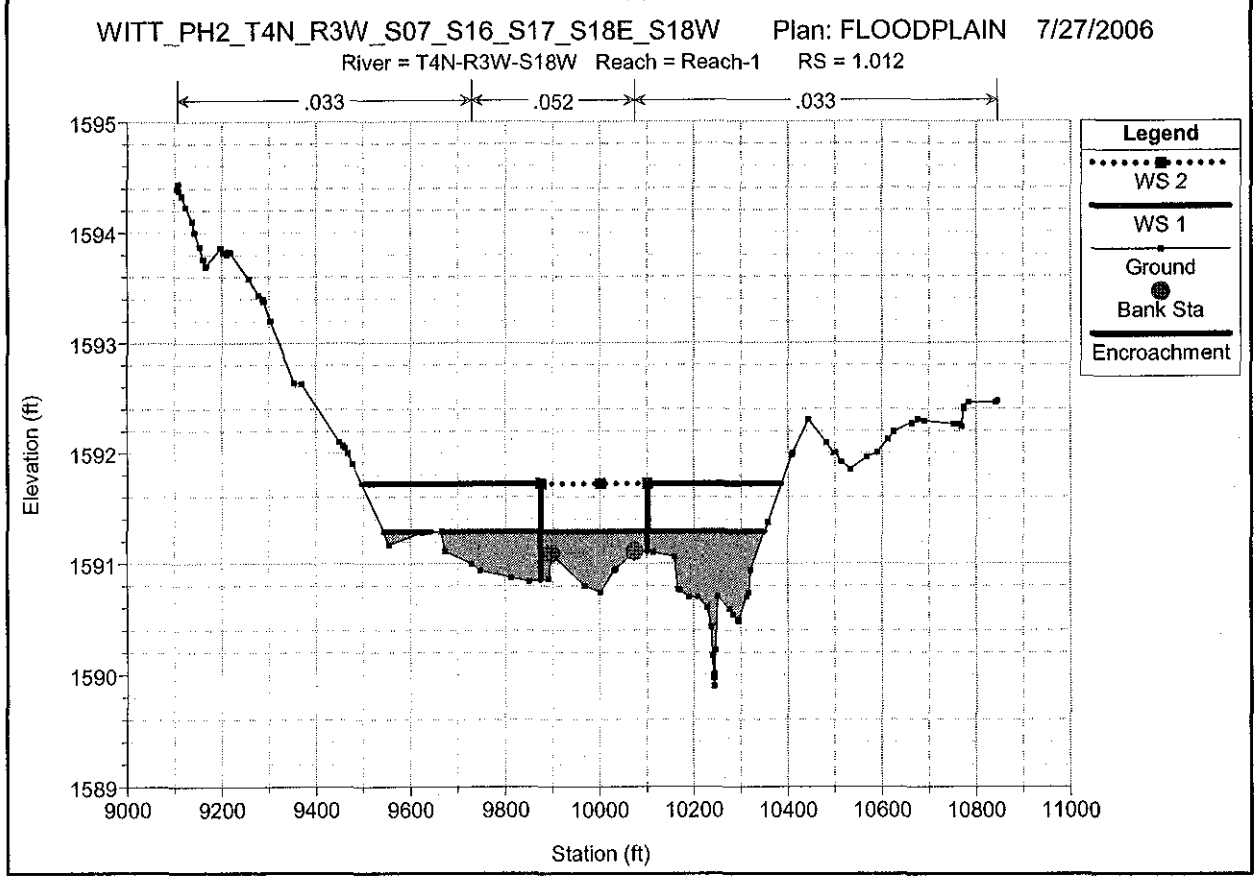

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.477 Interpolated point added at (9950.07, 1603.691) to set bank stat
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1607.5
1607.0
1606.5
1606.0
1605.5
1605.0
1604.5
1604.0
1603.5
9000
9500
10000
10500
11000
Station (ft)

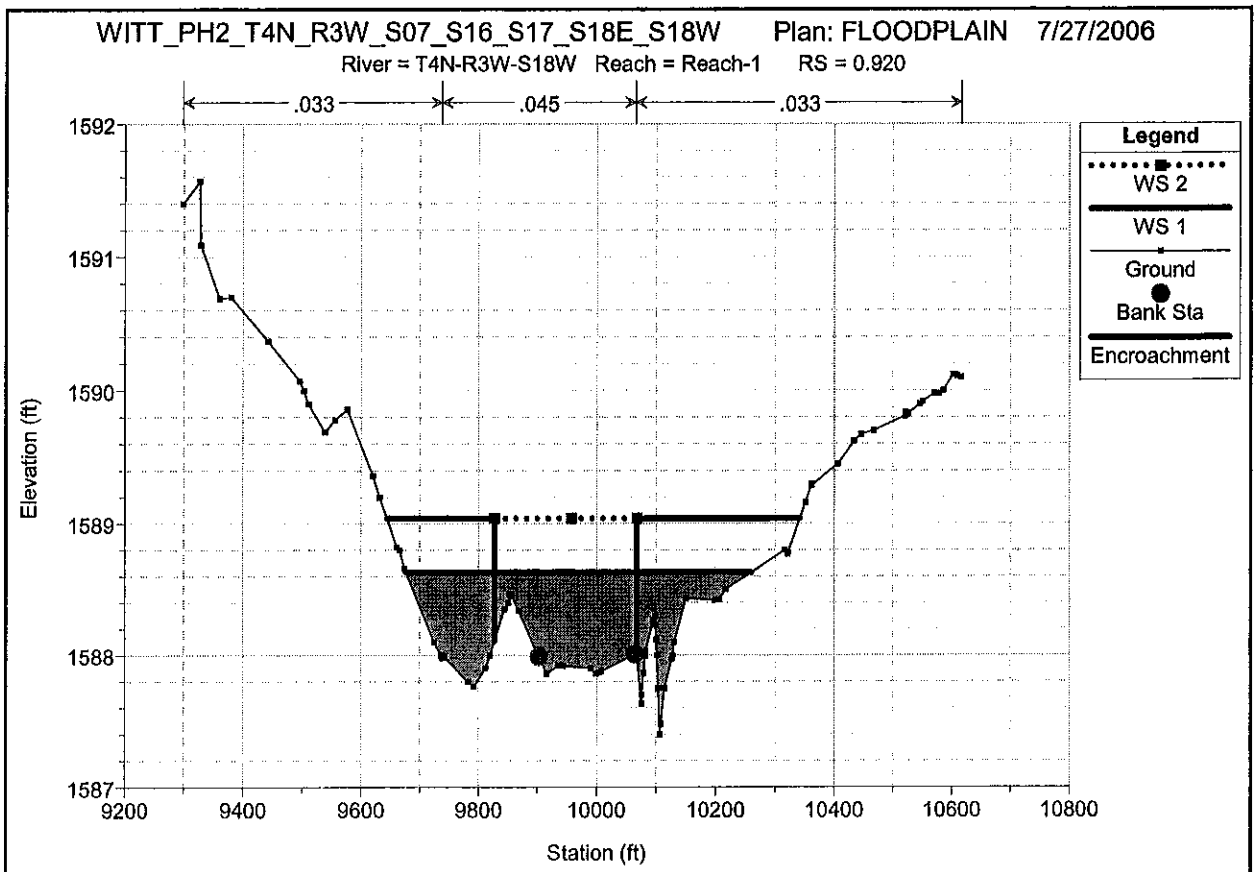

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.382 Levee added-Ridge not overtopped per BFE calcs.
.033
.052
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1605
1604
1603
1602
1601
1600
9000
9500
10000
10500
11000
Station (ft)

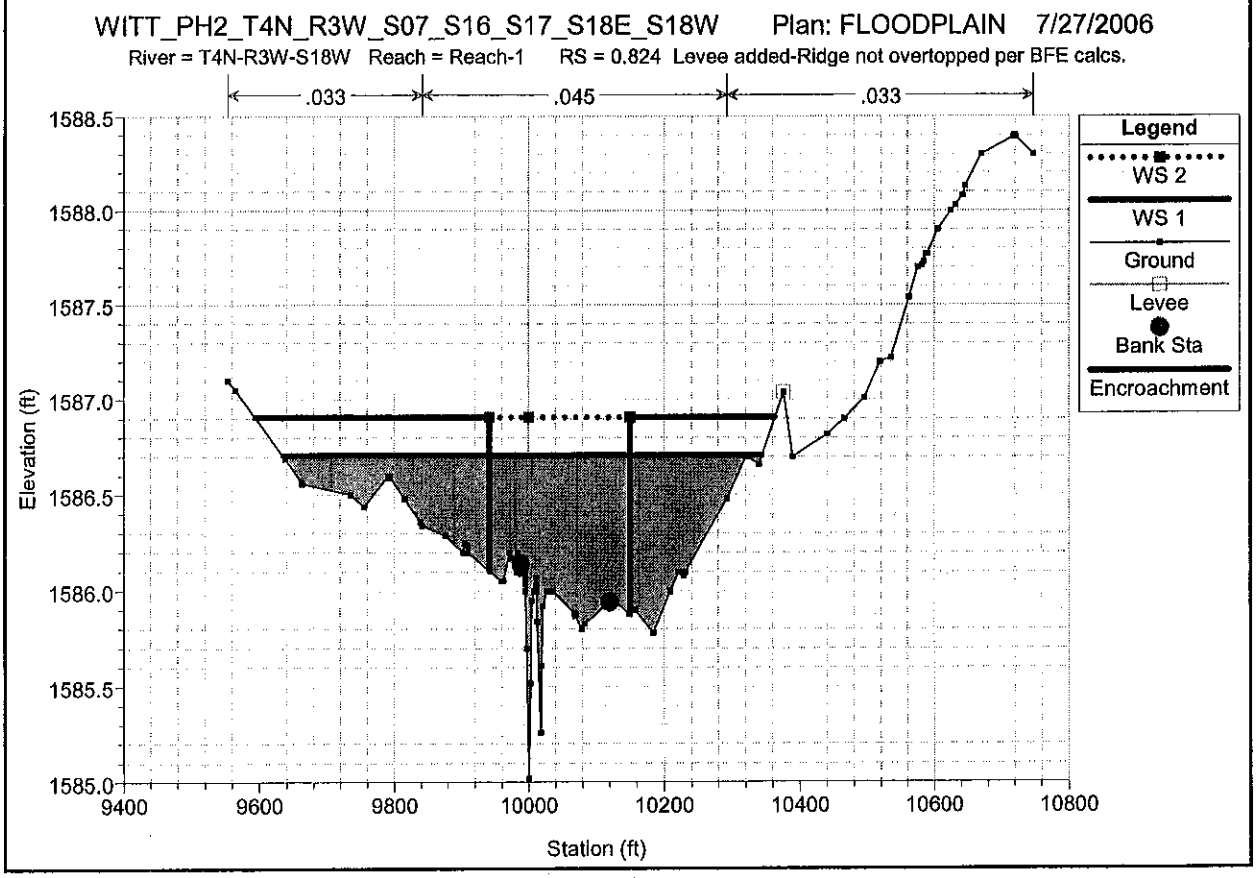

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.296 Flow rate starting at this cross-section and downstream is incre
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1604
1603
1602
1601
1600
1599
1598
9000
9500
10000
10500
11000
11500
Station (ft)

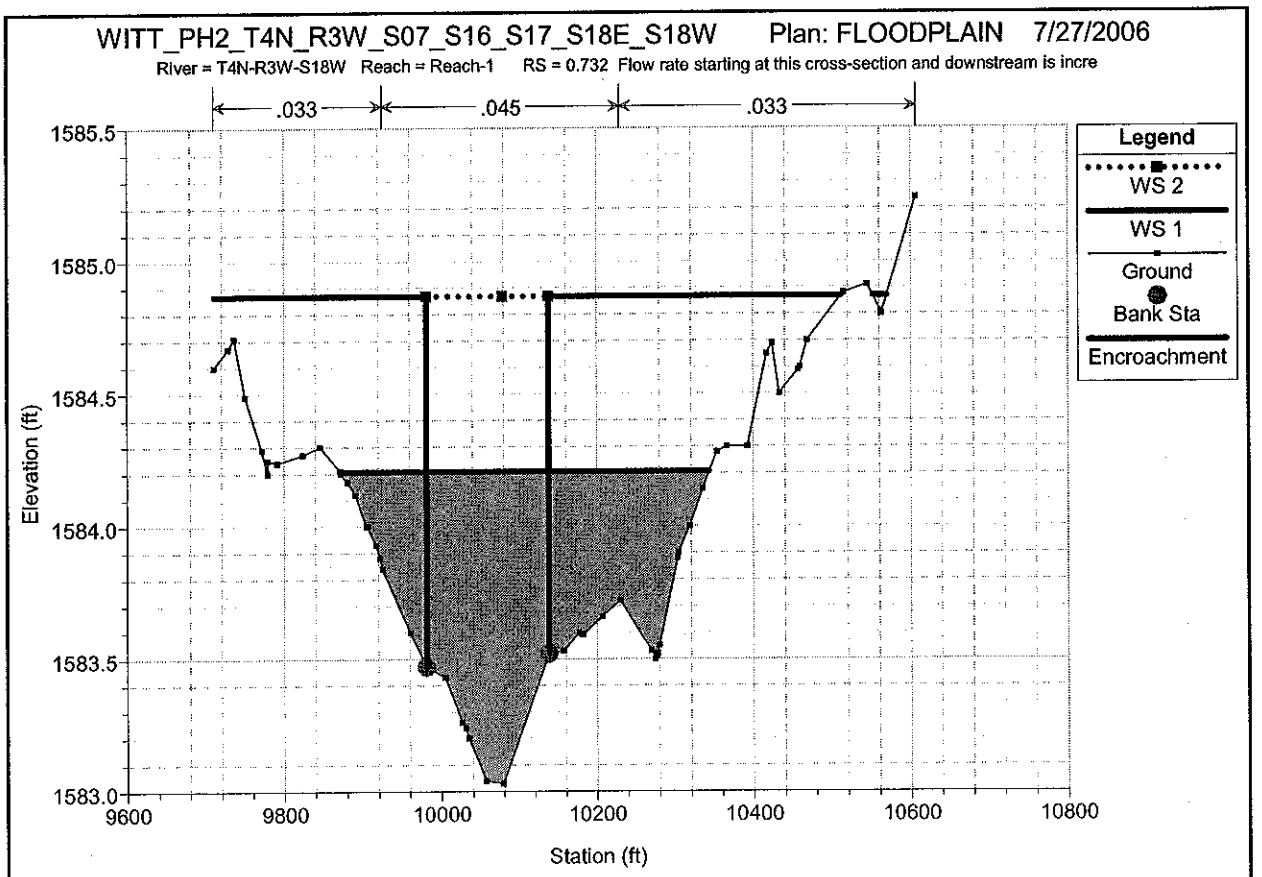

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.196
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1601
1600
1599
1598
1597
1596
1595
8500
9000
9500
10000
10500
11000
Station (ft)

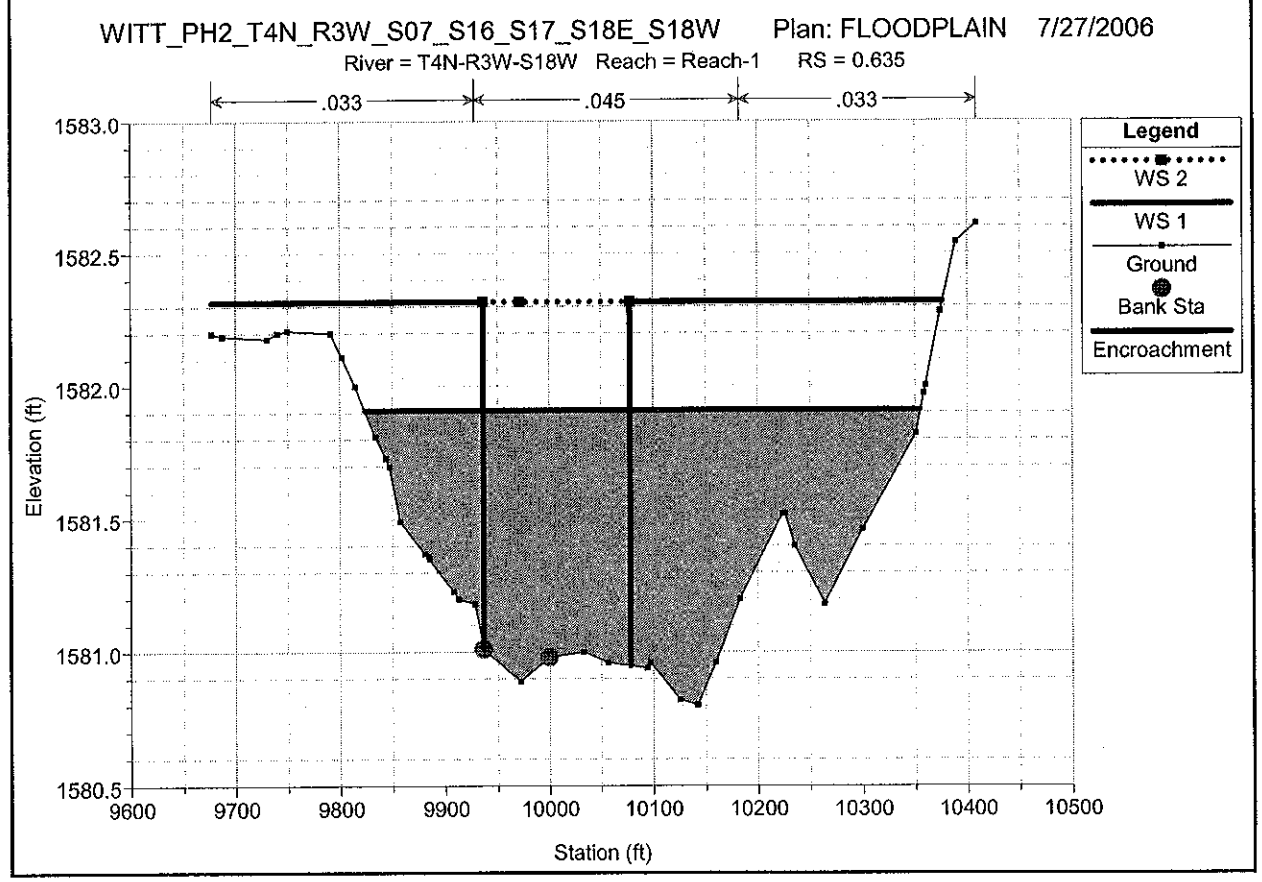

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.104
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1596.5
1596.0
1595.5
1595.0
1594.5
1594.0
1593.5
1593.0
9000
9500
10000
10500
11000
Station (ft)

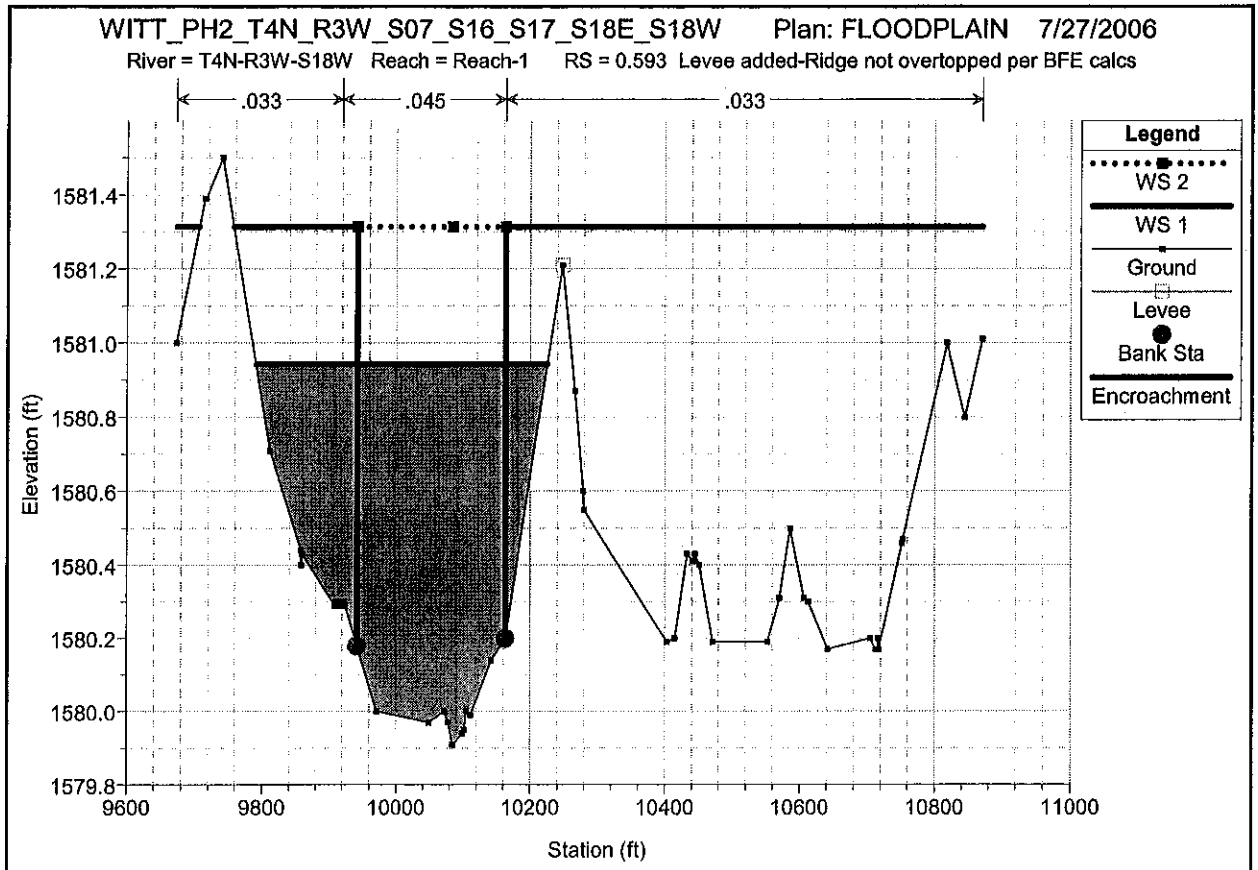

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 1.012
.033
.052
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1595
1594
1593
1592
1591
1590
1589
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

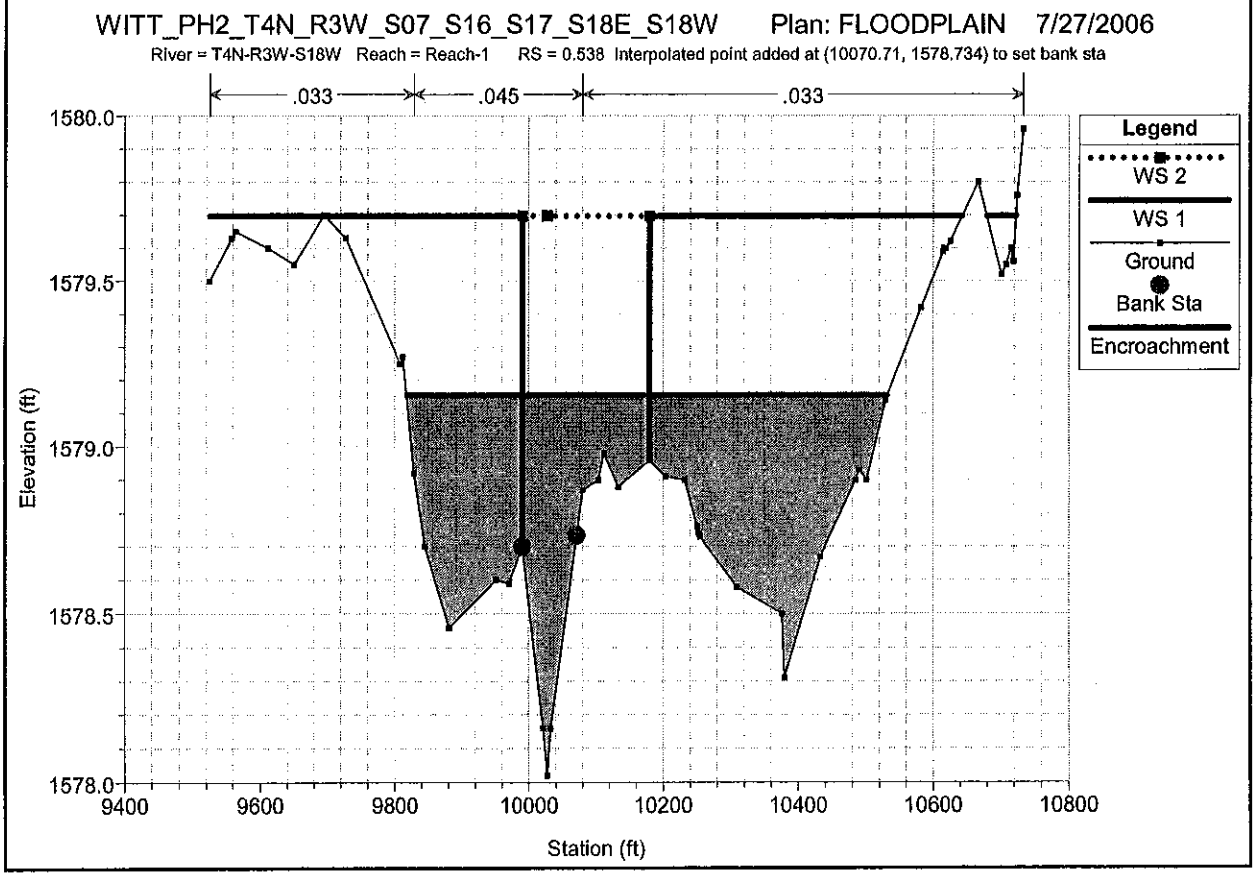

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.920
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1592
1591
1590
1589
1588
1587
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

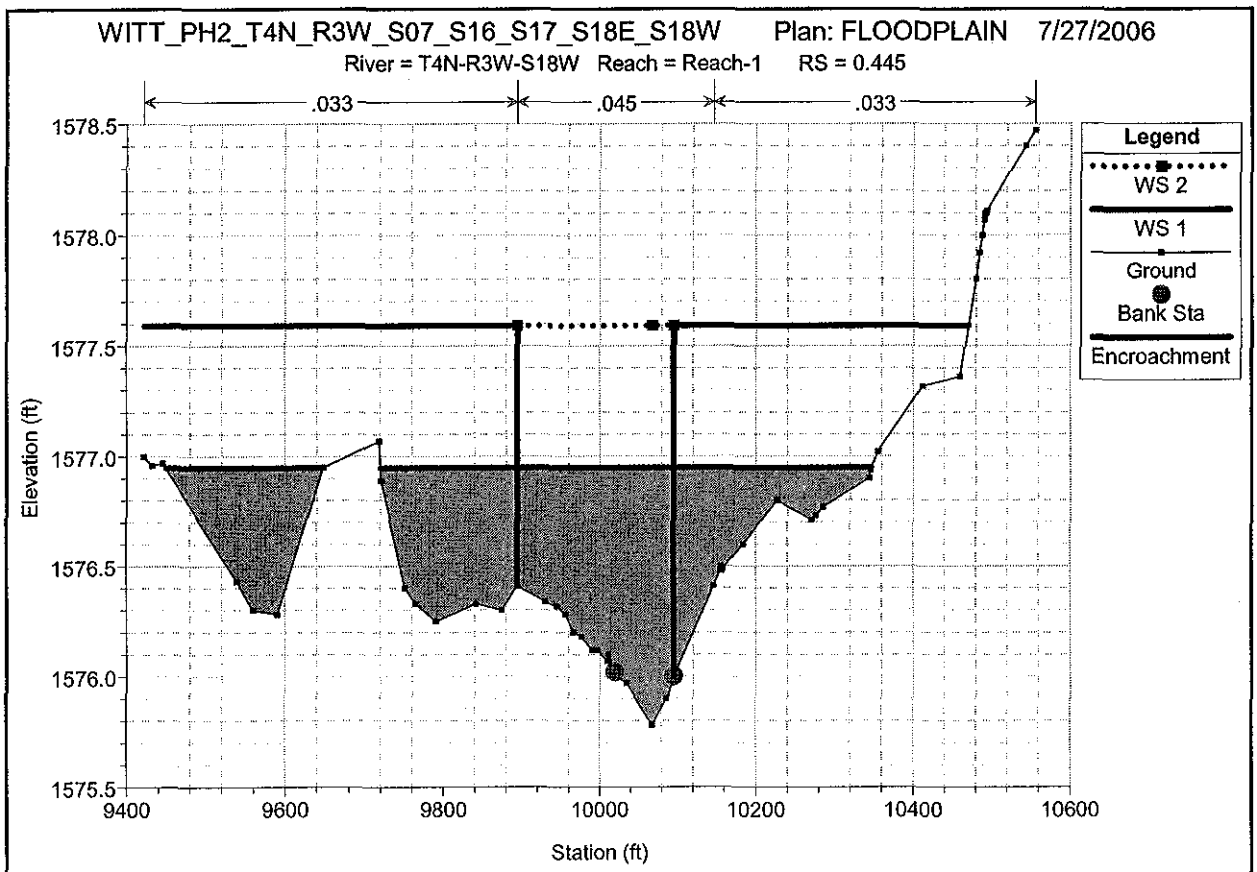

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.824 Levee added-Ridge not overtopped per BFE calcs.
.033
.045
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1588.5
1588.0
1587.5
1587.0
1586.5
1586.0
1585.5
1585.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

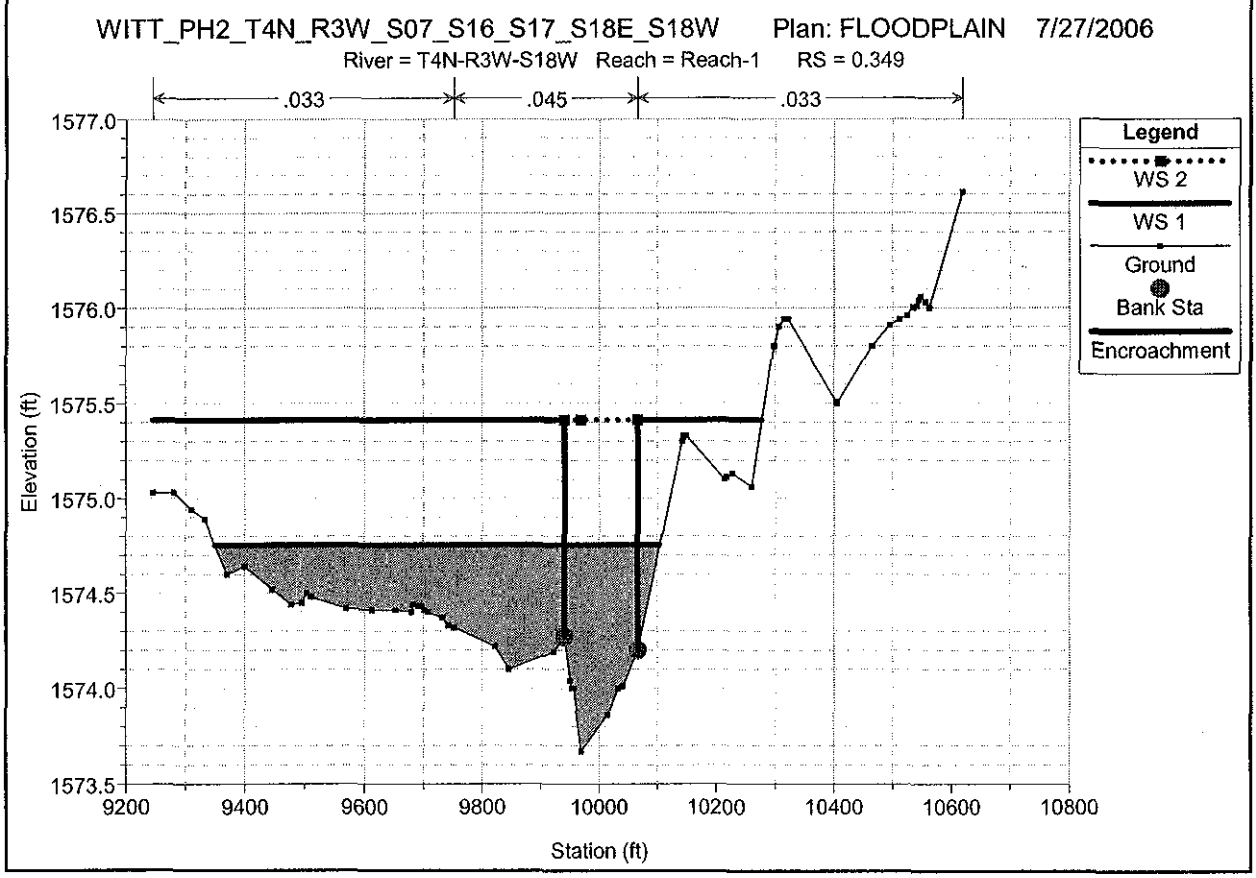

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.732 Flow rate starting at this cross-section and downstream is incre
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1585.5
1585.0
1584.5
1584.0
1583.5
1583.0
9600
9800
10000
10200
10400
10600
10800
Station (ft)

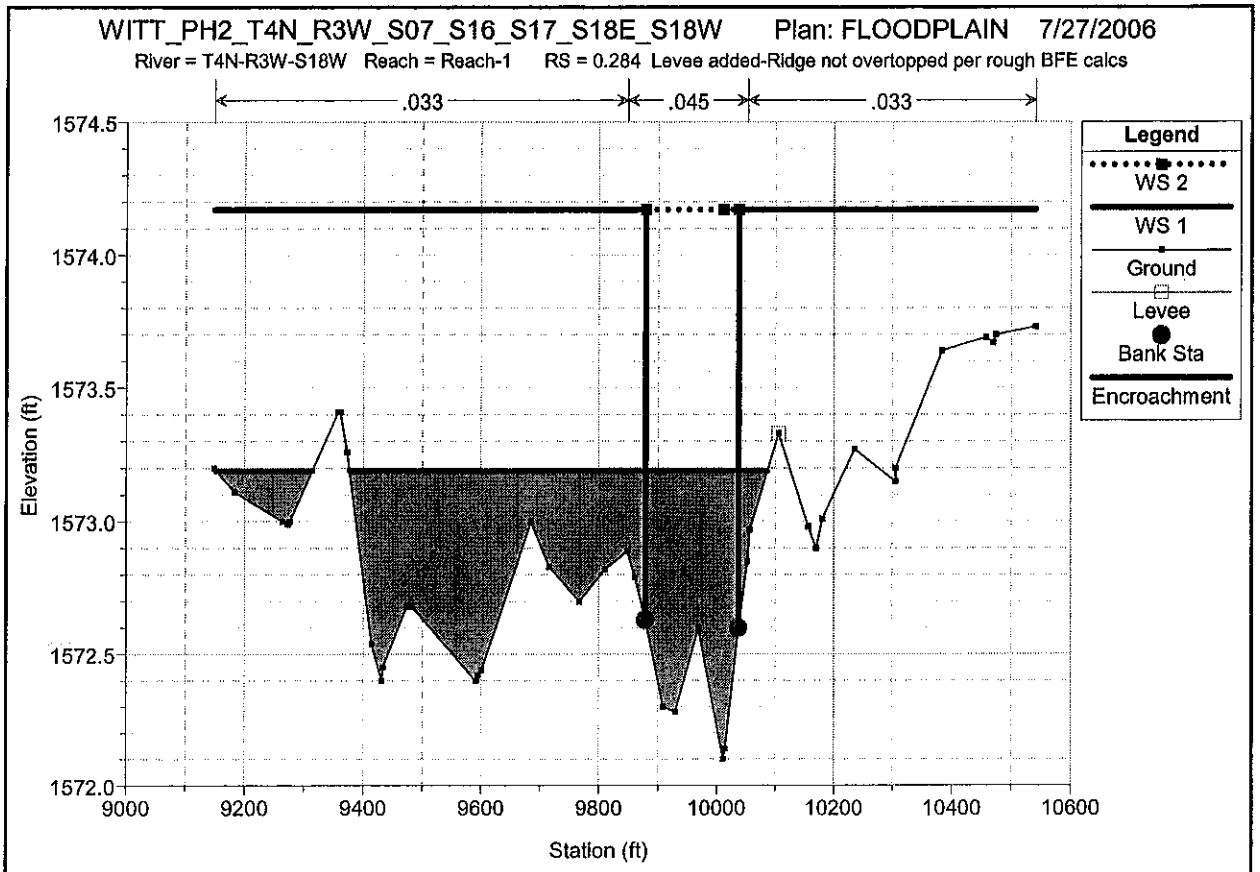

WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.635
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1583.0
1582.5
1582.0
1581.5
1581.0
1580.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.593 Levee added-Ridge not overtopped per BFE calcs
.033
.045
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1581.4
1581.2
1581.0
1580.8
1580.6
1580.4
1580.2
1580.0
1579.8
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.538 Interpolated point added at (10070.71, 1578.734) to set bank sta
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1580.0
1579.5
1579.0
1578.5
1578.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.445
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1578.5
1578.0
1577.5
1577.0
1576.5
1576.0
1575.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.349
.033
.045
.033
Legend
WS 2
WS 1
Ground
Bank Sta
Encroachment
Elevation (ft)
1577.0
1576.5
1576.0
1575.5
1575.0
1574.5
1574.0
1573.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W Plan: FLOODPLAIN 7/27/2006
River = T4N-R3W-S18W Reach = Reach-1 RS = 0.284 Levee added-Ridge not overtopped per rough BFE calcs
.033
.045
.033
Legend
WS 2
WS 1
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
1574.5
1574.0
1573.5
1573.0
1572.5
1572.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

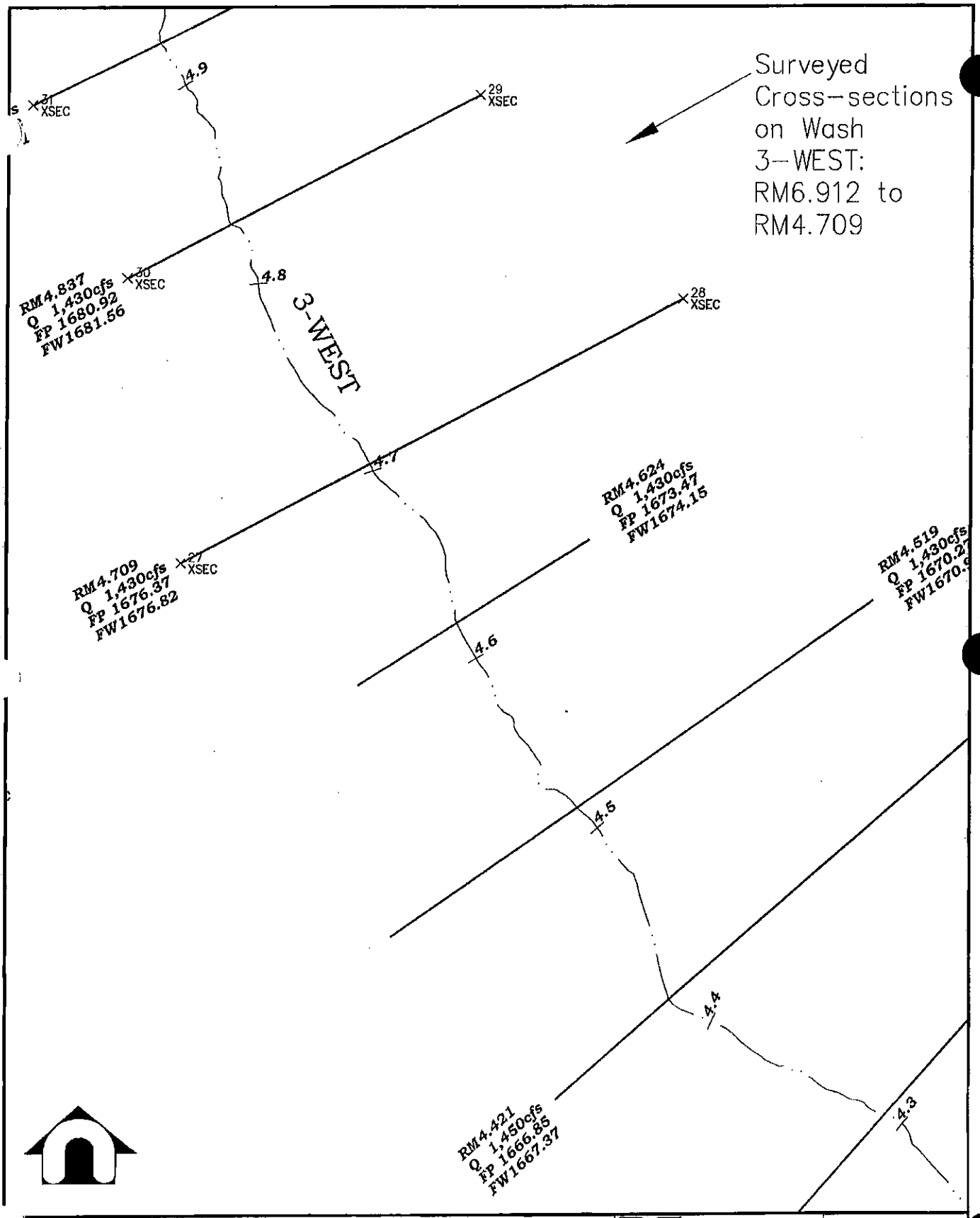
Appendix E.3 Expansion and Contraction Coefficients

The expansion coefficient is set to 0.3 and the contraction coefficient is set to 0.1. There are no structures or obstructions that would require a variation in coefficients. There is sufficient room between structures (residential homes) for flow to go around, therefore it was determined that no variation in expansion and contraction coefficients are necessary.

Appendix E.4 Analysis of Structures

There are no major structures modeled within the project. The only structures within the project are residential homes which were modeled as blocked obstructions.

Appendix E.5.1 Surveyed Cross-Sections



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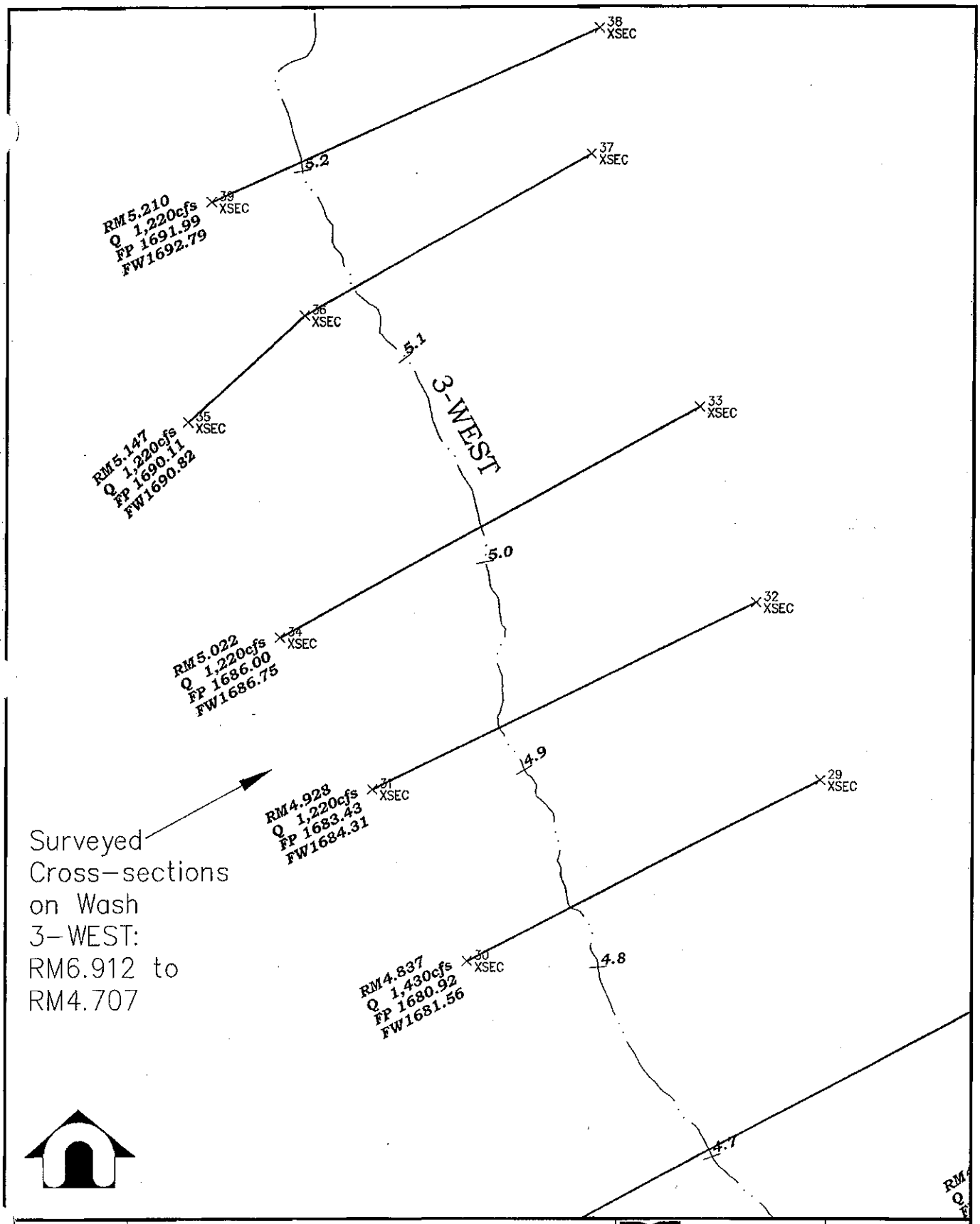
SHEET: 9 OF 9			CHECKED BY: FEB
JOB NO.: MARI0044			DATE: 05/06



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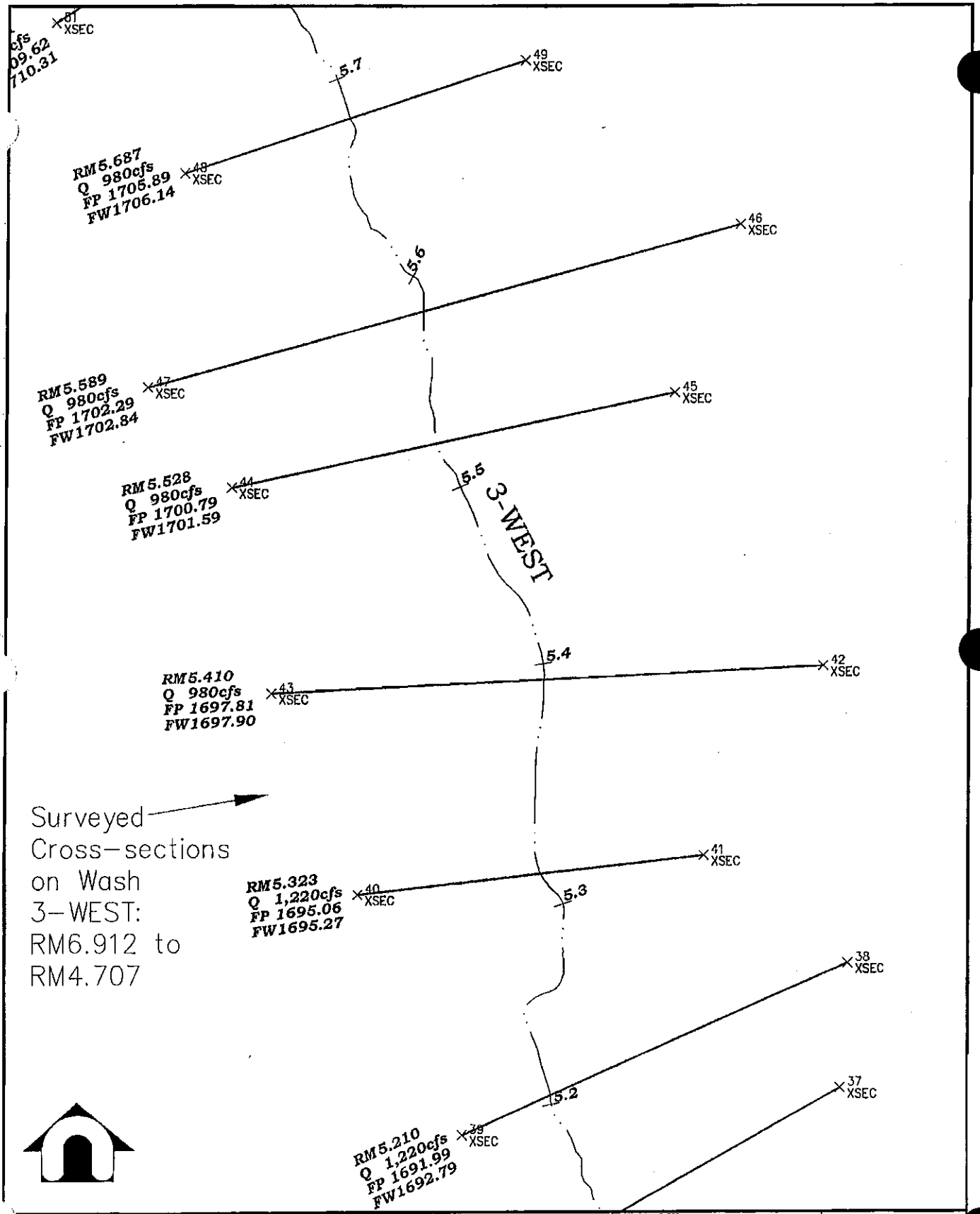

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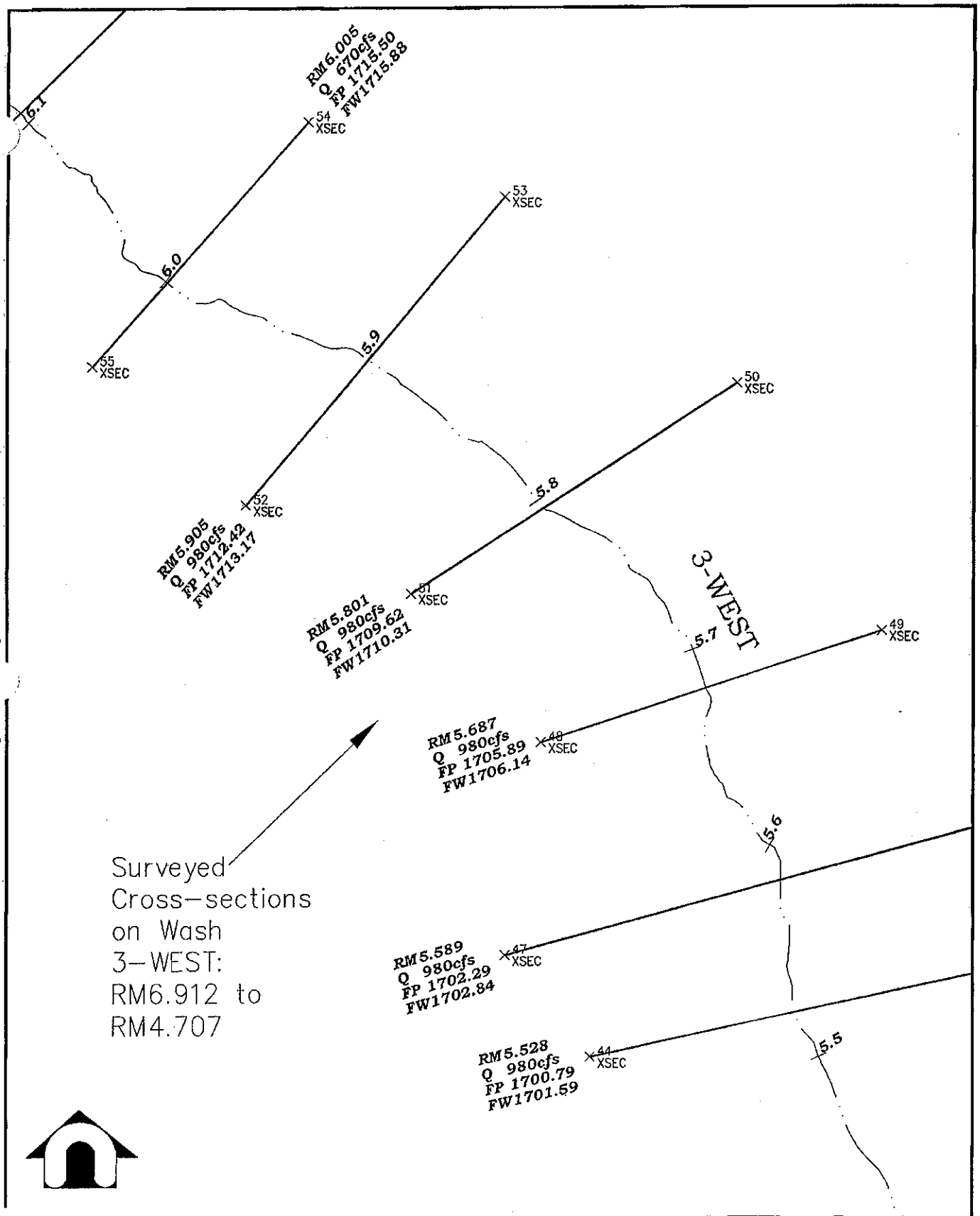

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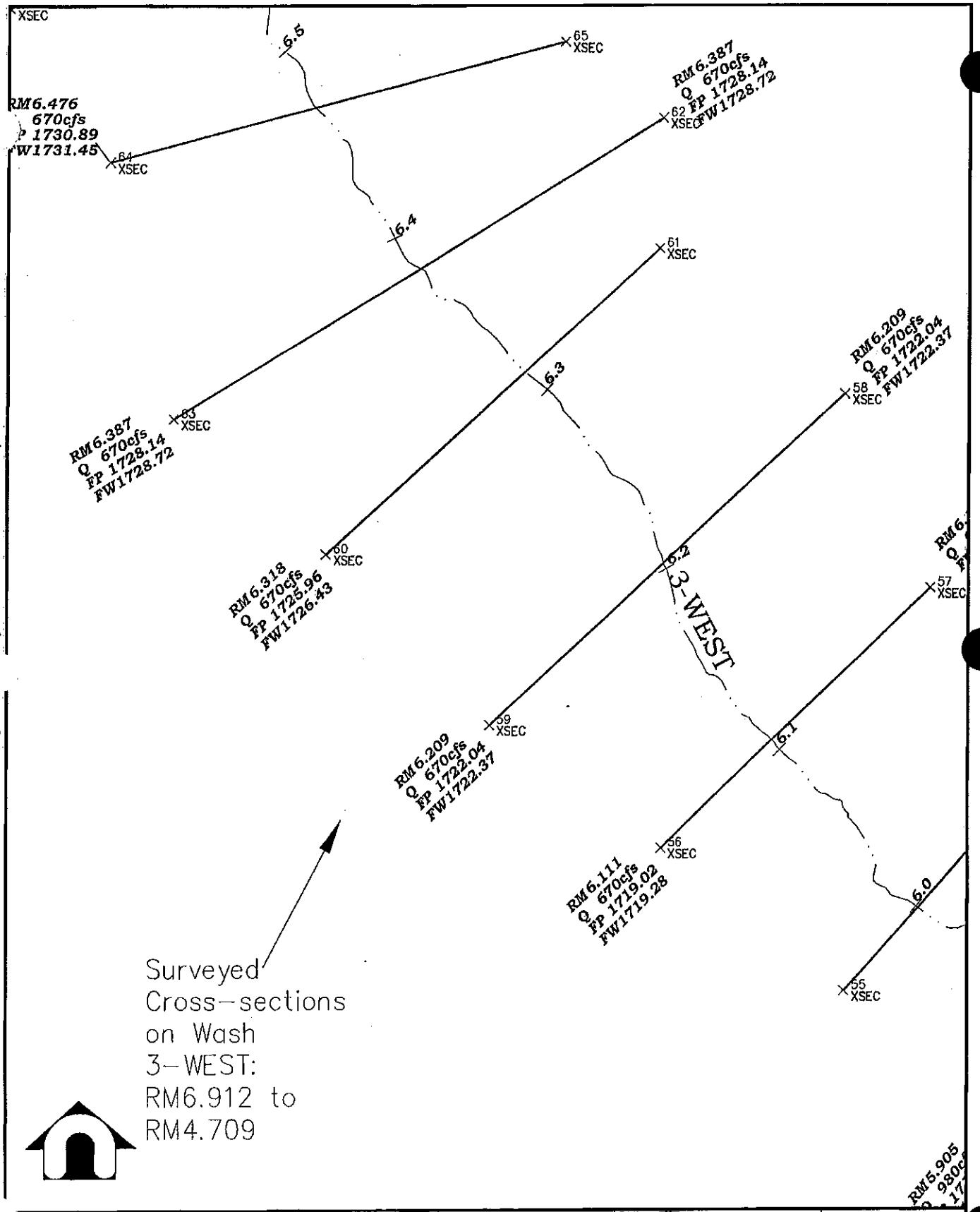

Surveyed Cross-sections on Wash 3-WEST: RM6.912 to RM4.709

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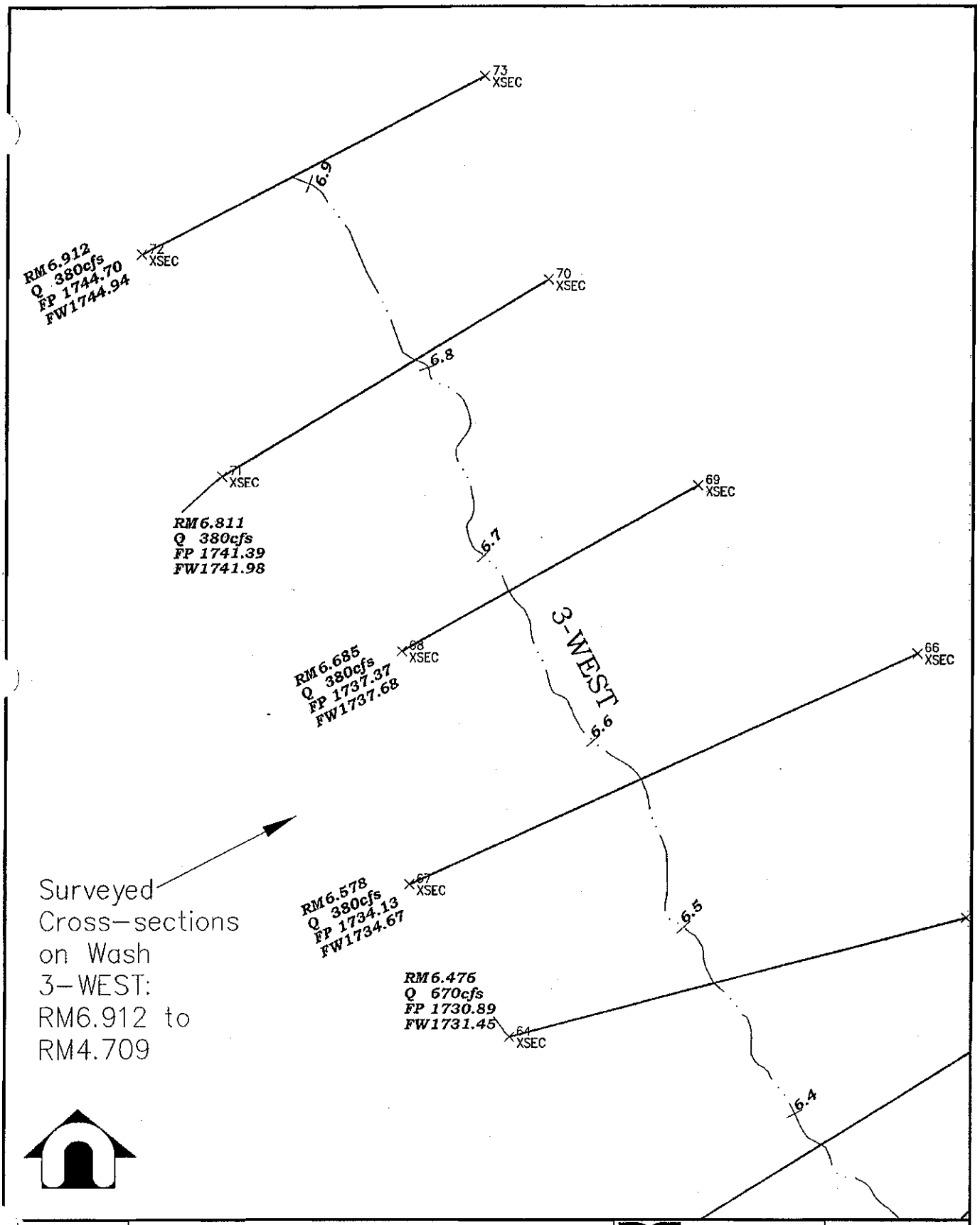

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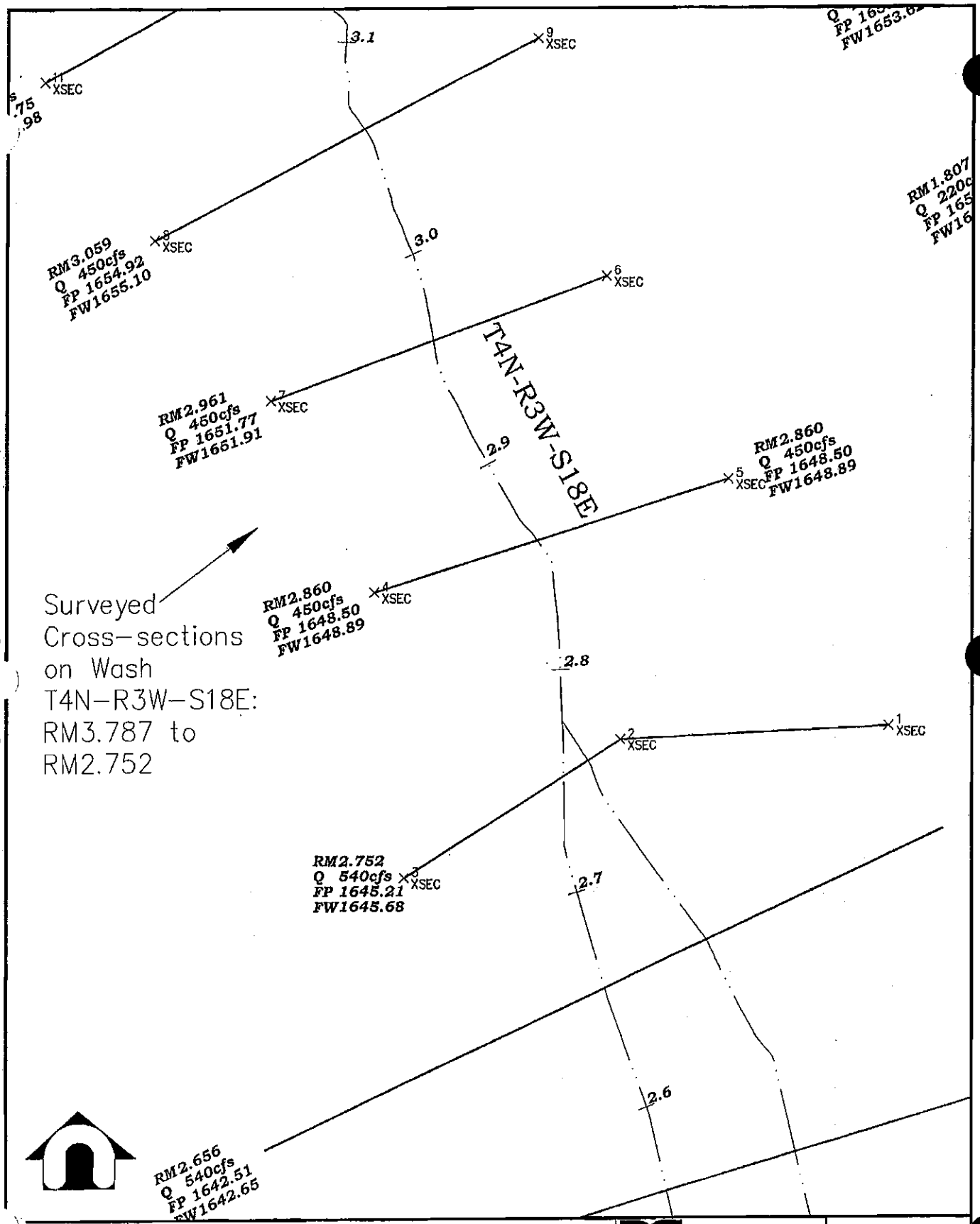

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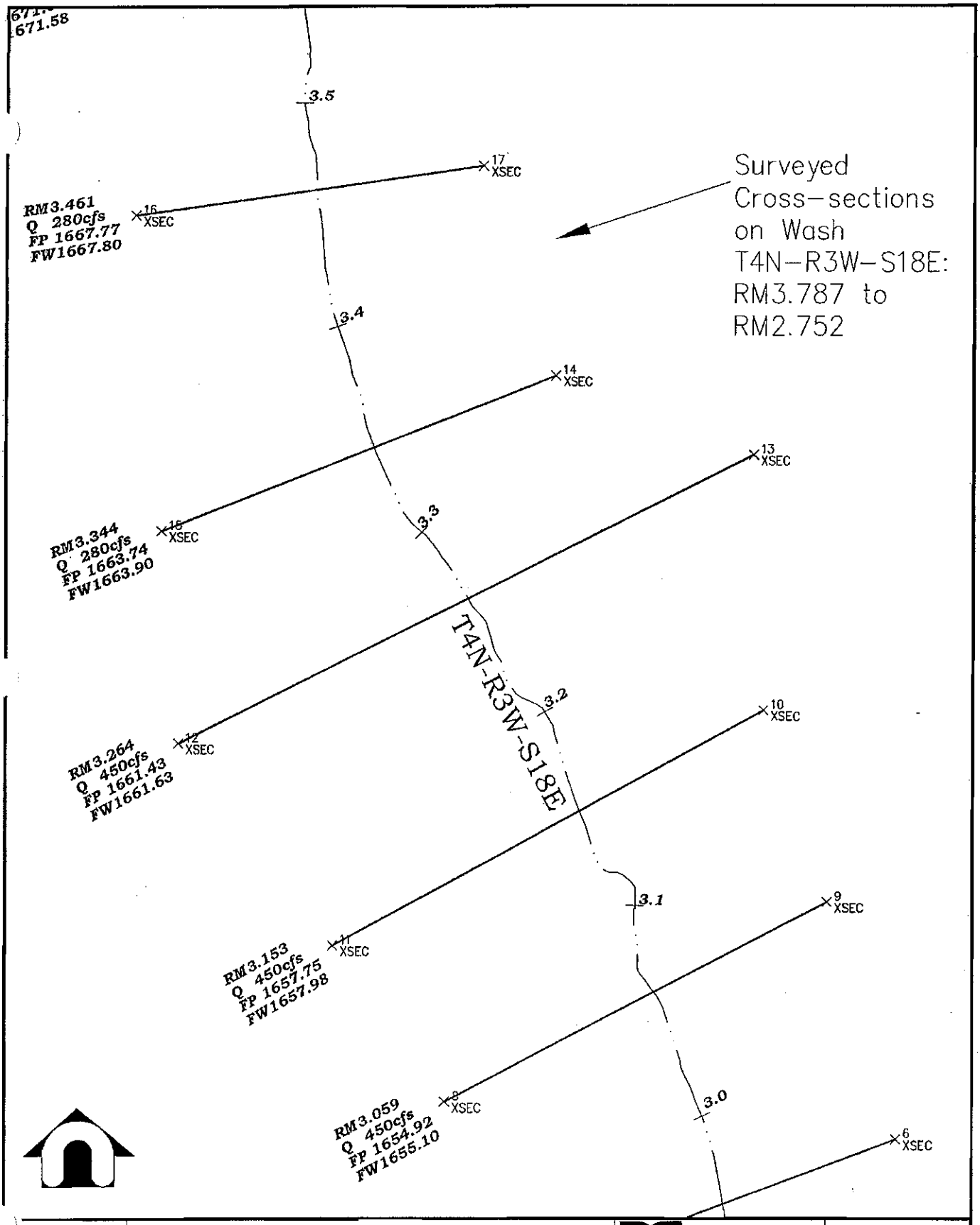

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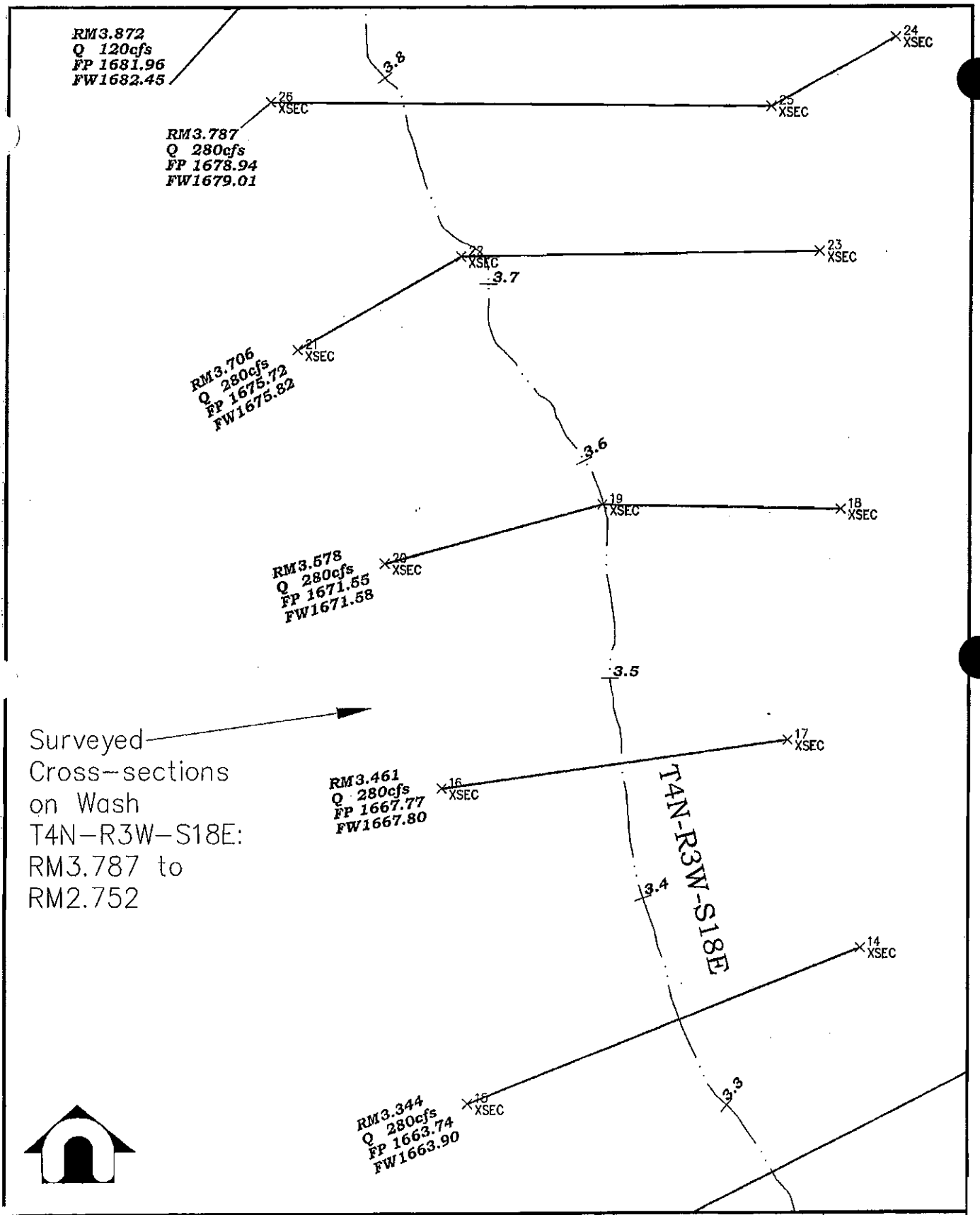

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SHEET: 1 OF 9			CHECKED BY: FEB
JOB NO.: MARI0044			DATE: 05/06

Appendix E.5.2 Miscellaneous Hydraulic Calculations

There are no miscellaneous hydraulic calculations for this project.

Appendix E.5.3 HEC-RAS and CHECK-RAS Output

HEC-RAS Plan: FLOODPLAIN

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S18W	Reach-1	2.537	1	250.00	1635.78	1636.51	1636.26	1636.55	0.006483	1.79	155.31	317.20	0.38
T4N-R3W-S18W	Reach-1	2.537	2	250.00	1635.78	1636.68	1636.27	1636.74	0.005896	1.97	126.79	147.35	0.37
T4N-R3W-S18W	Reach-1	2.445	1	250.00	1632.79	1633.58	1633.31	1633.62	0.005709	1.64	166.22	378.98	0.36
T4N-R3W-S18W	Reach-1	2.445	2	250.00	1632.79	1633.72		1633.78	0.006390	1.95	128.17	161.12	0.39
T4N-R3W-S18W	Reach-1	2.351	1	250.00	1629.56	1630.33	1630.15	1630.38	0.007588	1.74	154.85	397.25	0.40
T4N-R3W-S18W	Reach-1	2.351	2	250.00	1629.56	1630.45	1630.12	1630.51	0.006847	1.86	134.17	199.99	0.39
T4N-R3W-S18W	Reach-1	2.260	1	250.00	1626.10	1627.07		1627.11	0.006107	1.87	162.31	369.95	0.38
T4N-R3W-S18W	Reach-1	2.260	2	250.00	1626.10	1627.21		1627.27	0.006598	2.17	124.07	157.29	0.40
T4N-R3W-S18W	Reach-1	2.173	1	250.00	1623.50	1624.38	1624.08	1624.42	0.005847	1.74	161.91	315.43	0.36
T4N-R3W-S18W	Reach-1	2.173	2	250.00	1623.50	1624.53	1624.09	1624.58	0.005257	1.89	132.36	150.56	0.36
T4N-R3W-S18W	Reach-1	2.080	1	250.00	1621.05	1622.04	1621.75	1622.07	0.004149	1.49	194.78	397.34	0.31
T4N-R3W-S18W	Reach-1	2.080	2	250.00	1621.05	1622.22		1622.27	0.004280	1.74	143.44	158.07	0.32
T4N-R3W-S18W	Reach-1	1.987	1	250.00	1618.56	1619.30	1619.07	1619.35	0.007761	1.92	144.15	337.56	0.41
T4N-R3W-S18W	Reach-1	1.987	2	250.00	1618.56	1619.44	1619.09	1619.51	0.007587	2.15	116.20	149.89	0.42
T4N-R3W-S18W	Reach-1	1.926	1	250.00	1616.58	1617.50		1617.53	0.004590	1.57	173.21	361.79	0.32
T4N-R3W-S18W	Reach-1	1.926	2	250.00	1616.58	1617.85		1617.90	0.003747	1.82	137.17	127.18	0.31
T4N-R3W-S18W	Reach-1	1.838	1	250.00	1614.18	1614.84	1614.65	1614.87	0.008918	1.37	194.70	566.97	0.36
T4N-R3W-S18W	Reach-1	1.838	2	250.00	1614.18	1615.05	1614.82	1615.12	0.010676	2.21	117.45	192.95	0.48
T4N-R3W-S18W	Reach-1	1.750	1	350.00	1611.37	1612.40		1612.43	0.004588	1.59	249.18	464.93	0.32
T4N-R3W-S18W	Reach-1	1.750	2	350.00	1611.37	1612.67		1612.71	0.003624	1.73	205.70	207.63	0.30
T4N-R3W-S18W	Reach-1	1.664	1	350.00	1609.10	1609.77	1609.55	1609.81	0.007463	1.77	218.99	466.13	0.40
T4N-R3W-S18W	Reach-1	1.664	2	350.00	1609.10	1609.78	1609.57	1609.87	0.012893	2.35	149.17	241.67	0.53
T4N-R3W-S18W	Reach-1	1.567	1	350.00	1606.02	1606.82	1606.58	1606.85	0.004384	1.37	266.84	637.75	0.31
T4N-R3W-S18W	Reach-1	1.567	2	350.00	1606.02	1607.06		1607.09	0.002951	1.39	251.21	294.11	0.27
T4N-R3W-S18W	Reach-1	1.477	1	350.00	1603.50	1604.36	1604.20	1604.39	0.006026	1.89	245.42	702.69	0.38
T4N-R3W-S18W	Reach-1	1.477	2	350.00	1603.50	1604.38	1604.16	1604.49	0.012797	2.62	133.60	187.17	0.55
T4N-R3W-S18W	Reach-1	1.382	1	350.00	1600.36	1601.59	1601.21	1601.65	0.005133	2.04	207.79	387.63	0.36
T4N-R3W-S18W	Reach-1	1.382	2	350.00	1600.36	1601.84	1601.20	1601.88	0.002808	1.75	210.79	184.92	0.28
T4N-R3W-S18W	Reach-1	1.296	1	480.00	1598.87	1599.20	1599.04	1599.25	0.005067	0.75	300.98	881.06	0.28
T4N-R3W-S18W	Reach-1	1.296	2	480.00	1598.87	1599.93		1600.00	0.005847	2.11	227.45	238.05	0.38
T4N-R3W-S18W	Reach-1	1.196	1	480.00	1595.87	1596.42	1596.26	1596.46	0.006674	1.37	322.52	863.80	0.38
T4N-R3W-S18W	Reach-1	1.196	2	480.00	1595.87	1596.68	1596.34	1596.73	0.006531	1.82	263.60	376.32	0.38
T4N-R3W-S18W	Reach-1	1.104	1	480.00	1593.36	1593.95	1593.81	1593.98	0.004686	1.12	367.71	1076.81	0.30
T4N-R3W-S18W	Reach-1	1.104	2	480.00	1593.36	1594.53		1594.57	0.003581	1.69	286.21	292.79	0.30
T4N-R3W-S18W	Reach-1	1.012	1	480.00	1590.74	1591.29	1591.14	1591.34	0.007215	1.25	277.36	785.85	0.36
T4N-R3W-S18W	Reach-1	1.012	2	480.00	1590.74	1591.72	1591.45	1591.84	0.011245	2.62	178.22	226.77	0.52
T4N-R3W-S18W	Reach-1	0.920	1	480.00	1587.86	1588.63	1588.31	1588.67	0.004436	1.75	300.04	584.06	0.37
T4N-R3W-S18W	Reach-1	0.920	2	480.00	1587.86	1589.04	1588.54	1589.10	0.003368	2.07	244.97	241.43	0.34
T4N-R3W-S18W	Reach-1	0.824	1	480.00	1585.02	1586.71	1586.39	1586.74	0.003459	1.72	338.93	709.08	0.33
T4N-R3W-S18W	Reach-1	0.824	2	480.00	1585.02	1586.91	1586.49	1587.00	0.005314	2.46	203.21	208.93	0.43
T4N-R3W-S18W	Reach-1	0.732	1	670.00	1583.03	1584.21		1584.30	0.006855	2.65	291.96	472.01	0.49
T4N-R3W-S18W	Reach-1	0.732	2	670.00	1583.03	1584.87		1584.98	0.003493	2.86	252.25	156.13	0.37
T4N-R3W-S18W	Reach-1	0.635	1	670.00	1580.89	1581.91		1581.96	0.003544	1.92	371.54	531.56	0.34
T4N-R3W-S18W	Reach-1	0.635	2	670.00	1580.89	1582.32		1582.51	0.007664	3.52	191.65	141.45	0.53
T4N-R3W-S18W	Reach-1	0.593	1	670.00	1579.91	1580.94	1580.65	1581.02	0.005873	2.39	297.99	434.26	0.44
T4N-R3W-S18W	Reach-1	0.593	2	670.00	1579.91	1581.31	1580.68	1581.40	0.003643	2.35	285.29	220.80	0.36
T4N-R3W-S18W	Reach-1	0.538	1	670.00	1578.02	1579.16	1578.98	1579.22	0.006811	2.28	334.07	714.28	0.46
T4N-R3W-S18W	Reach-1	0.538	2	670.00	1578.02	1579.70		1579.89	0.006365	3.58	191.08	189.18	0.55
T4N-R3W-S18W	Reach-1	0.445	1	670.00	1575.78	1576.95	1576.65	1576.99	0.003298	1.98	425.59	825.20	0.34
T4N-R3W-S18W	Reach-1	0.445	2	670.00	1575.78	1577.59		1577.67	0.002790	2.45	298.93	200.99	0.33
T4N-R3W-S18W	Reach-1	0.349	1	670.00	1573.67	1574.75		1574.82	0.007455	2.52	332.83	754.84	0.49
T4N-R3W-S18W	Reach-1	0.349	2	670.00	1573.67	1575.41		1575.61	0.007027	3.56	188.00	126.32	0.51
T4N-R3W-S18W	Reach-1	0.284	1	670.00	1572.10	1573.19	1572.93	1573.23	0.003777	1.76	404.57	870.85	0.34
T4N-R3W-S18W	Reach-1	0.284	2	670.00	1572.10	1574.17	1573.20	1574.26	0.002438	2.37	282.78	158.30	0.31
T4N-R3W-S18E	Reach-1	4.247	1	120.00	1696.10	1696.57	1696.54	1696.65	0.032871	2.37	50.51	205.37	0.69
T4N-R3W-S18E	Reach-1	4.247	2	120.00	1696.10	1696.69		1696.95	0.009855	1.97	60.96	88.54	0.42

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S18E	Reach-1	4.135	1	120.00	1691.98	1692.66	1692.43	1692.70	0.002931	1.60	79.45	173.94	0.39
T4N-R3W-S18E	Reach-1	4.135	2	120.00	1691.98	1692.70	1692.49	1692.77	0.005197	2.20	54.46	98.32	0.52
T4N-R3W-S18E	Reach-1	4.059	1	120.00	1689.36	1689.75	1689.75	1689.88	0.048195	2.42	44.14	187.48	0.80
T4N-R3W-S18E	Reach-1	4.059	2	120.00	1689.36	1690.16	1689.83	1690.21	0.007942	1.76	68.05	99.23	0.38
T4N-R3W-S18E	Reach-1	3.962	1	120.00	1686.04	1686.61	1686.61	1686.61	0.000214	0.18	323.68	755.75	0.06
T4N-R3W-S18E	Reach-1	3.962	2	120.00	1686.04	1686.61	1686.61	1686.65	0.006509	0.99	80.22	273.49	0.30
T4N-R3W-S18E	Reach-1	3.872	1	120.00	1681.52	1681.96	1681.74	1681.98	0.002168	0.49	124.57	379.71	0.18
T4N-R3W-S18E	Reach-1	3.872	2	120.00	1681.52	1682.51	1682.11	1682.55	0.004540	1.54	78.05	105.38	0.31
T4N-R3W-S18E	Reach-1	3.787	1	280.00	1678.16	1678.93	1678.77	1679.01	0.014576	2.36	130.04	311.99	0.54
T4N-R3W-S18E	Reach-1	3.787	2	280.00	1678.16	1679.04	1678.76	1679.11	0.009942	2.18	128.35	165.30	0.46
T4N-R3W-S18E	Reach-1	3.706	1	280.00	1674.37	1675.72	1675.62	1675.78	0.005151	2.50	185.85	657.44	0.53
T4N-R3W-S18E	Reach-1	3.706	2	280.00	1674.37	1675.80	1675.70	1675.92	0.006606	3.04	114.09	248.96	0.62
T4N-R3W-S18E	Reach-1	3.578	1	280.00	1670.90	1671.53	1671.30	1671.57	0.007285	1.59	176.32	389.58	0.36
T4N-R3W-S18E	Reach-1	3.578	2	280.00	1670.90	1671.64	1671.30	1671.66	0.005609	1.58	177.19	270.43	0.34
T4N-R3W-S18E	Reach-1	3.461	1	280.00	1666.81	1667.77	1667.43	1667.81	0.005270	1.70	169.94	288.20	0.34
T4N-R3W-S18E	Reach-1	3.461	2	280.00	1666.81	1667.77	1667.42	1667.83	0.006924	1.95	143.93	188.03	0.39
T4N-R3W-S18E	Reach-1	3.344	1	280.00	1663.05	1663.79	1663.52	1663.78	0.006155	1.78	156.70	341.40	0.41
T4N-R3W-S18E	Reach-1	3.344	2	280.00	1663.05	1663.95	1663.54	1664.00	0.005539	1.80	155.80	193.57	0.35
T4N-R3W-S18E	Reach-1	3.264	1	450.00	1660.46	1661.44		1661.47	0.004461	1.71	300.08	573.07	0.32
T4N-R3W-S18E	Reach-1	3.264	2	450.00	1660.46	1661.92	1661.22	1662.00	0.004344	2.24	200.97	146.16	0.34
T4N-R3W-S18E	Reach-1	3.153	1	450.00	1657.12	1657.74	1657.55	1657.79	0.010061	1.83	257.03	605.95	0.44
T4N-R3W-S18E	Reach-1	3.153	2	450.00	1657.12	1658.35		1658.48	0.008934	2.86	158.82	141.64	0.47
T4N-R3W-S18E	Reach-1	3.059	1	450.00	1653.79	1654.93	1654.50	1654.98	0.003921	1.63	284.02	465.39	0.30
T4N-R3W-S18E	Reach-1	3.059	2	450.00	1653.79	1655.04	1654.54	1655.11	0.005346	2.08	218.71	216.30	0.38
T4N-R3W-S18E	Reach-1	2.961	1	450.00	1649.46	1651.77		1651.84	0.010344	2.37	219.32	463.95	0.49
T4N-R3W-S18E	Reach-1	2.961	2	450.00	1649.46	1652.01		1652.08	0.008365	2.22	202.62	202.80	0.39
T4N-R3W-S18E	Reach-1	2.860	1	450.00	1647.44	1648.50	1648.22	1648.54	0.004145	1.65	313.45	550.66	0.31
T4N-R3W-S18E	Reach-1	2.860	2	450.00	1647.44	1648.85	1648.30	1648.93	0.005498	2.37	198.25	169.81	0.38
T4N-R3W-S18E	Reach-1	2.752	1	540.00	1644.52	1645.20	1645.03	1645.24	0.008504	1.46	364.37	953.81	0.39
T4N-R3W-S18E	Reach-1	2.752	2	540.00	1644.52	1645.79	1645.29	1645.85	0.005393	2.06	262.15	260.21	0.36
T4N-R3W-S18E	Reach-1	2.656	1	540.00	1641.76	1642.51	1642.28	1642.53	0.005068	1.39	440.49	1157.18	0.32
T4N-R3W-S18E	Reach-1	2.656	2	540.00	1641.76	1642.77		1642.83	0.007063	2.10	268.99	344.51	0.40
T4N-R3W-S18E	Reach-1	2.562	1	540.00	1638.46	1639.29	1639.05	1639.34	0.007463	1.92	321.86	696.46	0.40
T4N-R3W-S18E	Reach-1	2.562	2	540.00	1638.46	1639.49		1639.55	0.006009	2.03	269.40	313.25	0.38
T4N-R3W-S18E	Reach-1	2.469	1	540.00	1635.20	1636.25	1635.95	1636.29	0.005100	1.69	360.40	716.01	0.34
T4N-R3W-S18E	Reach-1	2.469	2	540.00	1635.20	1636.31	1635.92	1636.38	0.006835	2.05	262.99	314.54	0.40
T4N-R3W-S18E	Reach-1	2.374	1	540.00	1632.00	1633.58	1633.30	1633.61	0.005647	1.83	389.46	946.06	0.36
T4N-R3W-S18E	Reach-1	2.374	2	540.00	1632.00	1633.87		1633.92	0.003713	1.82	315.70	322.86	0.31
T4N-R3W-S18E	Reach-1	2.276	1	650.00	1629.40	1630.53		1630.57	0.006170	1.66	395.30	1013.26	0.37
T4N-R3W-S18E	Reach-1	2.276	2	650.00	1629.40	1630.79		1630.91	0.009227	2.75	236.05	226.83	0.48
T4N-R3W-S18E	Reach-2	2.260	1	70.00	1629.21	1630.07	1629.87	1630.08	0.001921	0.72	109.49	428.47	0.19
T4N-R3W-S18E	Reach-2	2.260	2	0.00	1629.21	1629.24	1629.24	1629.24	0.000106	0.02	0.01	0.41	0.02
T4N-R3W-S18E	Reach-2	2.175	1	70.00	1627.41	1627.79	1627.79	1627.87	0.050804	2.44	33.37	201.27	0.88
T4N-R3W-S18E	Reach-2	2.175	2	0.00	1627.41	1627.44	1627.44	1627.44	0.000000	0.00	0.11	8.68	0.00
T4N-R3W-S18E	Reach-2	2.081	1	70.00	1624.37	1624.77	1624.56	1624.78	0.001588	0.51	143.62	570.70	0.16
T4N-R3W-S18E	Reach-2	2.081	2	0.00	1624.37	1624.70	1624.25	1624.70	0.000000	0.00	102.11	545.32	0.00
T4N-R3W-S18E	Reach-3	2.260	1	580.00	1628.84	1630.05	1629.73	1630.10	0.005267	2.02	323.15	615.84	0.38
T4N-R3W-S18E	Reach-3	2.260	2	650.00	1628.84	1630.33		1630.41	0.004019	2.07	292.87	241.56	0.32
T4N-R3W-S18E	Reach-3	2.175	1	580.00	1626.20	1627.39	1627.00	1627.45	0.006499	2.23	295.46	514.11	0.40
T4N-R3W-S18E	Reach-3	2.175	2	650.00	1626.20	1627.88	1627.29	1628.03	0.007459	3.11	213.86	149.67	0.45
T4N-R3W-S18E	Reach-3	2.081	1	580.00	1623.30	1624.65		1624.70	0.004762	2.03	326.37	467.93	0.35
T4N-R3W-S18E	Reach-3	2.081	2	650.00	1623.30	1624.91		1625.00	0.005028	2.40	270.57	201.58	0.37
T4N-R3W-S18E	Reach-4	1.945	1	650.00	1619.37	1620.30	1620.03	1620.35	0.007679	2.23	346.67	802.68	0.42
T4N-R3W-S18E	Reach-4	1.945	2	650.00	1619.37	1620.66	1620.13	1620.76	0.007023	2.69	246.09	204.50	0.43
T4N-R3W-S18E	Reach-4	1.866	1	650.00	1616.63	1618.00		1618.05	0.004072	1.95	403.69	571.75	0.32
T4N-R3W-S18E	Reach-4	1.866	2	650.00	1616.63	1618.39		1618.48	0.004309	2.42	268.59	175.62	0.34

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S18E	Reach-4	1.773	1	810.00	1613.85	1615.14	1614.81	1615.23	0.008489	2.95	346.04	512.42	0.48
T4N-R3W-S18E	Reach-4	1.773	2	810.00	1613.85	1616.13		1616.26	0.004582	3.11	260.13	119.66	0.37
T4N-R3W-S18E	Reach-4	1.674	1	810.00	1611.30	1612.54	1612.17	1612.58	0.003591	1.98	491.20	799.12	0.32
T4N-R3W-S18E	Reach-4	1.674	2	810.00	1611.30	1613.47	1612.56	1613.67	0.005537	3.53	229.34	109.71	0.43
T4N-R3W-S18E	Reach-4	1.580	1	810.00	1608.31	1609.56	1609.40	1609.69	0.011579	3.32	290.58	493.41	0.57
T4N-R3W-S18E	Reach-4	1.580	2	810.00	1608.31	1610.25		1610.46	0.007575	3.68	219.87	128.15	0.49
T4N-R3W-S18E	Reach-4	1.486	1	810.00	1605.55	1608.99		1607.04	0.003130	1.93	487.75	722.58	0.30
T4N-R3W-S18E	Reach-4	1.486	2	810.00	1605.55	1607.10		1607.22	0.005666	2.73	296.36	217.38	0.41
T4N-R3W-S18E	Reach-4	1.378	1	810.00	1602.33	1603.37	1603.28	1603.53	0.017171	3.41	251.89	493.69	0.68
T4N-R3W-S18E	Reach-4	1.378	2	810.00	1602.33	1604.02		1604.13	0.005108	2.72	297.33	202.07	0.40
T4N-R3W-S18E	Reach-4	1.282	1	930.00	1598.99	1600.63	1600.14	1600.68	0.002923	1.98	545.44	691.39	0.30
T4N-R3W-S18E	Reach-4	1.282	2	930.00	1598.99	1601.18	1600.38	1601.36	0.005766	3.41	273.05	143.87	0.44
T4N-R3W-S18E	Reach-4	1.192	1	930.00	1596.30	1597.80	1597.56	1597.84	0.010327	4.22	252.33	481.04	0.73
T4N-R3W-S18E	Reach-4	1.192	2	930.00	1596.30	1598.33	1597.60	1598.51	0.006265	3.39	274.11	155.32	0.45
T4N-R3W-S18E	Reach-4	1.095	1	930.00	1592.00	1594.04	1593.69	1594.09	0.003842	1.89	508.98	797.21	0.32
T4N-R3W-S18E	Reach-4	1.095	2	930.00	1592.00	1594.90		1595.09	0.007178	3.61	282.82	155.09	0.48
T4N-R3W-S18E	Reach-4	0.998	1	930.00	1589.04	1591.48	1591.03	1591.57	0.006135	2.80	391.25	465.90	0.43
T4N-R3W-S18E	Reach-4	0.998	2	930.00	1589.04	1592.23		1592.37	0.004013	3.03	312.01	152.55	0.37
T4N-R3W-S18E	Reach-4	0.879	1	1060.00	1587.54	1589.00	1588.57	1589.06	0.003701	2.09	526.27	717.25	0.33
T4N-R3W-S18E	Reach-4	0.879	2	1060.00	1587.54	1589.36		1589.50	0.005608	3.02	351.09	219.76	0.42
T4N-R3W-S18E	Reach-4	0.803	1	1060.00	1584.93	1586.59	1586.23	1586.73	0.006829	3.19	358.53	578.54	0.51
T4N-R3W-S18E	Reach-4	0.803	2	1060.00	1584.93	1586.87		1587.03	0.006755	3.18	333.10	221.60	0.46
T4N-R3W-S18E	Reach-4	0.709	1	1060.00	1582.00	1583.85		1583.93	0.003927	2.50	479.92	804.06	0.35
T4N-R3W-S18E	Reach-4	0.709	2	1060.00	1582.00	1584.02		1584.16	0.005042	3.00	353.12	205.38	0.40
T4N-R3W-S18E	Reach-4	0.615	1	1060.00	1579.05	1580.54	1580.27	1580.77	0.011791	4.06	288.45	289.16	0.60
T4N-R3W-S18E	Reach-4	0.615	2	1060.00	1579.05	1581.06		1581.27	0.008721	3.72	285.17	148.05	0.47
T4N-R3W-S18E	Reach-4	0.517	1	1060.00	1575.70	1577.91		1577.99	0.003002	2.50	459.78	380.40	0.32
T4N-R3W-S18E	Reach-4	0.517	2	1060.00	1575.70	1578.46		1578.65	0.003892	3.35	316.37	128.60	0.38
T4N-R3W-S18E	Reach-4	0.422	1	1190.00	1573.64	1575.04	1574.83	1575.22	0.012013	3.72	360.84	521.95	0.59
T4N-R3W-S18E	Reach-4	0.422	2	1190.00	1573.64	1575.54		1575.78	0.008734	3.94	301.91	175.47	0.53
T4N-R3W-S18E	Reach-4	0.326	1	1190.00	1570.50	1572.58	1571.82	1572.63	0.002770	2.34	615.58	799.25	0.30
T4N-R3W-S18E	Reach-4	0.326	2	1190.00	1570.50	1573.28	1571.91	1573.39	0.002892	2.91	408.59	181.43	0.32
T4N-R3W-S18E	Reach-4	0.228	1	1190.00	1568.07	1569.34	1569.34	1569.59	0.020135	4.39	325.97	672.43	0.72
T4N-R3W-S18E	Reach-4	0.228	2	1190.00	1568.07	1569.34	1569.28	1569.81	0.031927	5.52	215.86	185.96	0.90
T4N-R3W-S17	Reach-1	2.757	1	250.00	1632.00	1632.84	1632.56	1632.87	0.005560	1.68	165.62	346.88	0.34
T4N-R3W-S17	Reach-1	2.757	2	250.00	1632.00	1633.13		1633.21	0.006743	2.27	110.00	104.31	0.39
T4N-R3W-S17	Reach-1	2.673	1	250.00	1628.80	1629.69	1629.48	1629.74	0.009473	1.90	151.73	372.26	0.43
T4N-R3W-S17	Reach-1	2.673	2	250.00	1628.80	1629.98		1630.06	0.007589	2.26	110.56	115.68	0.41
T4N-R3W-S17	Reach-1	2.584	1	250.00	1625.70	1626.31	1626.11	1626.34	0.005616	1.11	182.02	477.17	0.31
T4N-R3W-S17	Reach-1	2.584	2	250.00	1625.70	1626.86		1626.92	0.005794	1.98	126.07	131.61	0.36
T4N-R3W-S17	Reach-1	2.473	1	250.00	1621.67	1622.65		1622.67	0.007186	1.35	207.83	588.59	0.35
T4N-R3W-S17	Reach-1	2.473	2	250.00	1621.67	1622.86	1622.57	1622.91	0.008237	1.85	134.87	204.02	0.40
T4N-R3W-S17	Reach-1	2.391	1	250.00	1619.14	1619.78	1619.52	1619.81	0.006543	1.54	180.26	499.13	0.36
T4N-R3W-S17	Reach-1	2.391	2	250.00	1619.14	1620.01		1620.08	0.005478	1.77	141.86	189.32	0.35
T4N-R3W-S17	Reach-1	2.298	1	250.00	1615.70	1616.59	1616.37	1616.62	0.006625	1.50	189.70	562.20	0.35
T4N-R3W-S17	Reach-1	2.298	2	250.00	1615.70	1616.61	1616.35	1616.66	0.009091	1.80	139.11	237.79	0.41
T4N-R3W-S17	Reach-1	2.215	1	250.00	1613.18	1613.94	1613.64	1613.97	0.005529	1.47	180.97	463.30	0.33
T4N-R3W-S17	Reach-1	2.215	2	250.00	1613.18	1614.10	1613.66	1614.13	0.003984	1.45	172.52	218.98	0.29
T4N-R3W-S17	Reach-1	2.124	1	250.00	1609.13	1610.93	1610.67	1610.98	0.007161	1.98	151.52	337.04	0.39
T4N-R3W-S17	Reach-1	2.124	2	250.00	1609.13	1610.93		1611.03	0.012290	2.56	98.80	127.79	0.51
T4N-R3W-S17	Reach-1	2.029	1	430.00	1607.12	1608.61	1608.19	1608.64	0.003938	1.62	315.77	508.08	0.29
T4N-R3W-S17	Reach-1	2.029	2	430.00	1607.12	1608.87	1608.21	1608.91	0.002697	1.51	284.83	253.18	0.25
T4N-R3W-S17	Reach-1	1.923	1	430.00	1604.80	1608.01	1605.71	1608.06	0.006469	1.87	244.52	392.98	0.37
T4N-R3W-S17	Reach-1	1.923	2	430.00	1604.80	1608.59	1605.95	1608.70	0.008325	2.62	163.97	118.99	0.39
T4N-R3W-S17	Reach-1	1.828	1	430.00	1600.99	1603.31	1602.89	1603.36	0.004793	1.98	255.37	388.97	0.33
T4N-R3W-S17	Reach-1	1.828	2	430.00	1600.99	1603.49	1602.89	1603.59	0.006081	2.45	175.28	137.27	0.38

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S17	Reach-1	1.744	1	430.00	1597.60	1600.98	1600.58	1601.02	0.005836	1.84	258.88	498.25	0.35
T4N-R3W-S17	Reach-1	1.744	2	430.00	1597.60	1601.11	1600.60	1601.16	0.004839	1.85	232.66	238.00	0.33
T4N-R3W-S17	Reach-1	1.627	1	430.00	1595.21	1597.65	1597.20	1597.72	0.005078	1.80	252.93	425.96	0.33
T4N-R3W-S17	Reach-1	1.627	2	430.00	1595.21	1597.73		1597.80	0.006203	2.06	208.31	216.77	0.37
T4N-R3W-S17	Reach-2	1.550	1	820.00	1594.08	1596.08	1595.60	1596.12	0.003469	1.73	510.09	895.58	0.29
T4N-R3W-S17	Reach-2	1.550	2	820.00	1594.08	1596.30	1595.65	1596.34	0.002823	1.75	498.51	611.17	0.27
T4N-R3W-S17	Reach-2	1.455	1	820.00	1592.32	1593.50	1593.25	1593.56	0.008197	1.59	443.33	766.00	0.39
T4N-R3W-S17	Reach-2	1.455	2	820.00	1592.32	1593.92	1593.53	1594.01	0.006850	2.43	337.10	357.99	0.44
T4N-R3W-S17	Reach-2	1.366	1	820.00	1588.32	1591.09		1591.14	0.003792	2.03	444.22	467.06	0.31
T4N-R3W-S17	Reach-2	1.366	2	820.00	1588.32	1591.25		1591.33	0.003904	2.22	370.07	242.89	0.32
T4N-R3W-S17	Reach-2	1.268	1	820.00	1586.52	1587.70	1587.49	1587.84	0.013505	3.02	277.62	442.21	0.56
T4N-R3W-S17	Reach-2	1.268	2	820.00	1586.52	1587.93	1587.51	1588.09	0.011698	3.25	252.69	214.68	0.53
T4N-R3W-S17	Reach-2	1.172	1	820.00	1581.66	1584.59	1584.09	1584.65	0.003645	2.15	424.05	470.50	0.31
T4N-R3W-S17	Reach-2	1.172	2	820.00	1581.66	1585.01		1585.10	0.003543	2.48	352.28	205.61	0.31
T4N-R3W-S17	Reach-2	1.071	1	820.00	1581.02	1582.35	1581.88	1582.41	0.005163	2.16	394.34	516.55	0.35
T4N-R3W-S17	Reach-2	1.071	2	820.00	1581.02	1582.61	1581.93	1582.71	0.005861	2.61	314.46	219.59	0.38
T4N-R3W-S17	Reach-2	0.973	1	820.00	1576.39	1579.07	1578.65	1579.18	0.007960	2.83	307.43	368.81	0.44
T4N-R3W-S17	Reach-2	0.973	2	820.00	1576.39	1579.24		1579.37	0.007248	2.92	261.01	194.51	0.43
T4N-R3W-S17	Reach-2	0.877	1	1210.00	1573.46	1576.54		1576.69	0.003756	3.33	428.82	422.39	0.43
T4N-R3W-S17	Reach-2	0.877	2	1210.00	1573.46	1577.08		1577.24	0.003081	3.47	348.97	144.43	0.39
T4N-R3W-S17	Reach-2	0.778	1	1210.00	1571.10	1573.89	1573.67	1574.04	0.007660	3.63	407.99	532.58	0.57
T4N-R3W-S17	Reach-2	0.778	2	1210.00	1571.10	1574.58		1574.91	0.007054	4.58	264.09	134.36	0.58
T4N-R3W-S17	Reach-2	0.679	1	1210.00	1568.89	1571.09		1571.19	0.004148	2.95	481.11	508.43	0.43
T4N-R3W-S17	Reach-2	0.679	2	1210.00	1568.89	1571.83	1570.93	1572.08	0.004264	3.90	312.82	141.47	0.46
T4N-R3W-S17	Reach-2	0.585	1	1210.00	1566.77	1568.23	1568.01	1568.38	0.008015	3.48	400.98	540.58	0.57
T4N-R3W-S17	Reach-2	0.585	2	1210.00	1566.77	1568.74	1568.32	1569.08	0.009002	4.65	260.23	156.09	0.64
T4N-R3W-S17	Reach-2	0.462	1	1210.00	1563.66	1565.52	1565.00	1565.61	0.003453	2.64	515.66	642.43	0.39
T4N-R3W-S17	Reach-2	0.462	2	1210.00	1563.66	1566.47		1566.63	0.002607	3.19	384.52	163.76	0.36
T4N-R3W-S17	Reach-2	0.362	1	1600.00	1560.10	1562.13	1561.95	1562.46	0.010639	5.25	364.50	358.82	0.70
T4N-R3W-S17	Reach-2	0.362	2	1600.00	1560.10	1562.67	1562.42	1563.48	0.014809	7.24	221.08	97.53	0.85
T4N-R3W-S17	Reach-2	0.264	1	1600.00	1554.70	1558.95	1558.33	1559.15	0.004303	3.83	476.11	360.25	0.46
T4N-R3W-S17	Reach-2	0.264	2	1600.00	1554.70	1559.44	1558.38	1559.72	0.004028	4.21	380.40	145.08	0.46
T4N-R3W-S17	Reach-2	0.160	1	1600.00	1554.07	1556.10		1556.27	0.007616	3.45	500.87	401.77	0.44
T4N-R3W-S17	Reach-2	0.160	2	1600.00	1554.07	1556.85		1557.09	0.006591	3.92	408.62	153.51	0.42
T4N-R3W-S17	Reach-2	0.153	1	1600.00	1552.28	1555.41		1555.50	0.002659	2.66	694.26	420.91	0.28
T4N-R3W-S17	Reach-2	0.153	2	1600.00	1552.28	1555.62		1555.91	0.006739	4.44	373.22	124.64	0.45
T4N-R3W-S16	Reach-1a	1.648	1	810.00	1568.00	1570.21		1570.26	0.002487	2.00	471.74	444.13	0.27
T4N-R3W-S16	Reach-1a	1.648	2	810.00	1568.00	1571.07		1571.17	0.002259	2.50	329.53	133.41	0.27
T4N-R3W-S16	Reach-1a	1.644	1	810.00	1568.13	1570.17		1570.21	0.002179	1.92	491.37	438.20	0.25
T4N-R3W-S16	Reach-1a	1.644	2	810.00	1568.13	1571.03		1571.12	0.002177	2.49	330.64	130.73	0.27
T4N-R3W-S16	Reach-1	1.640	1	810.00	1568.10	1570.14		1570.18	0.001368	1.55	520.75	434.34	0.20
T4N-R3W-S16	Reach-1	1.640	2	810.00	1568.10	1570.99		1571.08	0.001901	2.36	335.74	129.65	0.25
T4N-R3W-S16	Reach-1	1.556	1	810.00	1566.00	1568.09	1568.09	1568.41	0.044792	4.91	186.70	294.59	0.91
T4N-R3W-S16	Reach-1	1.556	2	810.00	1566.00	1568.37	1568.25	1568.81	0.037247	5.33	152.18	128.88	0.88
T4N-R3W-S16	Reach-2	1.164	1	2000.00	1559.60	1562.75		1562.80	0.001059	1.58	1186.97	665.81	0.17
T4N-R3W-S16	Reach-2	1.164	2	2000.00	1559.60	1563.12		1563.22	0.001670	2.16	835.12	286.12	0.22
T4N-R3W-S16	Reach-2	1.089	1	2710.00	1558.63	1561.64		1561.77	0.003967	3.20	855.37	728.40	0.36
T4N-R3W-S16	Reach-2	1.089	2	2710.00	1558.63	1561.73		1561.92	0.003834	3.22	783.98	352.06	0.36
T4N-R3W-S16	Reach-2	0.995	1	2710.00	1555.90	1558.92	1558.49	1559.12	0.007385	3.67	768.31	841.44	0.47
T4N-R3W-S16	Reach-2	0.995	2	2710.00	1555.90	1559.16		1559.43	0.005663	3.78	685.54	360.70	0.46
T4N-R3W-S16	Reach-2	0.899	1	2710.00	1553.85	1557.72	1556.14	1557.78	0.001297	2.13	1328.41	619.95	0.21
T4N-R3W-S16	Reach-2	0.899	2	2710.00	1553.85	1557.87	1556.12	1557.98	0.001541	2.40	1112.85	382.07	0.24
T4N-R3W-S16	Reach-2	0.831	1	2710.00	1553.54	1556.01	1556.01	1556.52	0.024352	6.05	487.31	446.01	0.76
T4N-R3W-S16	Reach-2	0.831	2	2710.00	1553.54	1556.01	1556.01	1556.52	0.023960	6.01	485.60	423.38	0.76
T4N-R3W-S16	Reach-3	0.707	1	2710.00	1548.26	1555.15	1550.87	1555.17	0.000203	1.22	2618.44	802.68	0.08
T4N-R3W-S16	Reach-3	0.707	2	2710.00	1548.26	1555.30	1550.87	1555.33	0.000312	1.54	1978.21	384.99	0.11

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S16	Reach-3	0.602	1	2710.00	1551.52	1554.59	1553.94	1554.82	0.006354	3.72	694.49	417.98	0.41
T4N-R3W-S16	Reach-3	0.602	2	2710.00	1551.52	1554.59	1553.91	1554.84	0.006263	3.70	679.34	362.44	0.40
T4N-R3W-S16	Reach-3	0.506	1	3140.00	1548.98	1553.72	1551.73	1553.77	0.001017	2.00	1675.28	683.02	0.18
T4N-R3W-S16	Reach-3	0.506	2	3140.00	1548.98	1553.72	1551.73	1553.78	0.001028	2.01	1549.64	515.93	0.18
T4N-R3W-S16	Reach-3	0.400	1	3140.00	1549.30	1552.91	1551.61	1553.00	0.002401	2.59	1299.52	688.88	0.26
T4N-R3W-S16	Reach-3	0.400	2	3140.00	1549.30	1552.93	1551.61	1553.02	0.002345	2.58	1309.08	687.22	0.26
T4N-R3W-S16	Reach-3	0.297	1	3140.00	1547.17	1550.25	1549.84	1550.48	0.009799	4.59	914.33	657.54	0.51
T4N-R3W-S16	Reach-3	0.297	2	3140.00	1547.17	1550.46	1549.98	1550.65	0.008530	4.66	945.12	607.23	0.47
T4N-R3W-S16	Reach-3	0.221	1	3140.00	1545.19	1548.21	1547.27	1548.33	0.003365	2.75	1221.29	670.07	0.30
T4N-R3W-S16	Reach-3	0.221	2	3140.00	1545.19	1548.69	1547.27	1548.79	0.002902	2.72	1249.65	540.31	0.27
T4N-R3W-S16	Reach-3	0.102	1	3140.00	1541.45	1547.88		1547.90	0.000285	1.33	2664.69	879.55	0.10
T4N-R3W-S16	Reach-3	0.102	2	3140.00	1541.45	1548.40		1548.42	0.000225	1.25	2704.26	759.23	0.09
T4N-R3W-S16	Reach-3	0.000	1	3140.00	1541.82	1547.23	1546.59	1547.49	0.006001	5.07	800.62	446.71	0.42
T4N-R3W-S16	Reach-3	0.000	2	3140.00	1541.82	1547.75	1547.23	1548.08	0.006010	5.00	715.91	355.55	0.39
T4N-R3W-S07	Reach-1	1.993	1	220.00	1656.02	1656.99		1657.04	0.008698	1.76	129.04	285.50	0.41
T4N-R3W-S07	Reach-1	1.993	2	220.00	1656.02	1657.04		1657.09	0.008436	1.82	120.82	191.15	0.40
T4N-R3W-S07	Reach-1	1.893	1	220.00	1652.56	1653.31	1653.05	1653.35	0.005747	1.52	135.21	270.90	0.33
T4N-R3W-S07	Reach-1	1.893	2	220.00	1652.56	1653.62	1653.13	1653.67	0.005119	1.84	119.44	128.51	0.33
T4N-R3W-S07	Reach-1	1.807	1	220.00	1650.02	1651.04		1651.07	0.004460	1.52	150.17	300.92	0.30
T4N-R3W-S07	Reach-1	1.807	2	220.00	1650.02	1651.19		1651.24	0.005490	1.88	117.23	127.84	0.35
T4N-R3W-S07	Reach-1	1.710	1	220.00	1646.70	1647.61	1647.40	1647.68	0.011238	2.10	112.33	231.92	0.47
T4N-R3W-S07	Reach-1	1.710	2	220.00	1646.70	1647.72	1647.40	1647.78	0.008600	2.03	108.37	147.50	0.42
T4N-R3W-S07	Reach-1	1.617	1	220.00	1642.74	1644.49		1644.54	0.004084	1.81	139.90	227.29	0.31
T4N-R3W-S07	Reach-1	1.617	2	220.00	1642.74	1644.53	1643.93	1644.59	0.005008	2.04	107.89	96.68	0.34
T4N-R3W-S07	Reach-1	1.524	1	220.00	1640.50	1641.26	1641.11	1641.33	0.012255	2.12	107.92	279.14	0.48
T4N-R3W-S07	Reach-1	1.524	2	220.00	1640.50	1641.54	1641.14	1641.61	0.007578	2.19	103.16	119.02	0.40
T4N-R3W-S07	Reach-1	1.431	1	220.00	1637.10	1638.15	1637.74	1638.18	0.003909	1.52	161.48	248.15	0.29
T4N-R3W-S07	Reach-1	1.431	2	220.00	1637.10	1638.25	1637.78	1638.31	0.005951	2.01	109.35	114.07	0.36
T4N-R3W-S07	Reach-1	1.336	1	220.00	1634.20	1635.26	1635.04	1635.31	0.009055	1.97	122.27	273.62	0.42
T4N-R3W-S07	Reach-1	1.336	2	220.00	1634.20	1635.49	1635.02	1635.54	0.005135	1.80	122.07	134.71	0.33
T4N-R3W-S07	Reach-1	1.241	1	220.00	1630.63	1632.08	1631.85	1632.12	0.004762	1.03	160.43	409.64	0.28
T4N-R3W-S07	Reach-1	1.241	2	220.00	1630.63	1632.47		1632.52	0.007147	1.90	115.88	162.31	0.38
T4N-R3W-S07	Reach-1	1.137	1	220.00	1628.37	1629.29	1629.01	1629.32	0.005975	1.52	141.76	280.31	0.34
T4N-R3W-S07	Reach-1	1.137	2	220.00	1628.37	1629.48	1629.02	1629.51	0.004286	1.53	143.44	178.75	0.30
T4N-R3W-S07	Reach-1	1.051	1	220.00	1625.62	1626.71	1626.40	1626.74	0.005374	1.31	155.28	332.53	0.31
T4N-R3W-S07	Reach-1	1.051	2	220.00	1625.62	1627.03		1627.10	0.006741	2.00	108.43	122.15	0.38
T4N-R3W-S07	Reach-1	0.948	1	310.00	1622.32	1623.40		1623.45	0.007269	2.06	168.25	303.57	0.39
T4N-R3W-S07	Reach-1	0.948	2	310.00	1622.32	1623.76		1623.84	0.005694	2.29	135.55	112.27	0.37
T4N-R3W-S07	Reach-1	0.858	1	310.00	1619.78	1620.62	1620.26	1620.55	0.005399	1.49	212.84	512.51	0.33
T4N-R3W-S07	Reach-1	0.858	2	310.00	1619.78	1620.85		1620.93	0.006819	2.19	141.79	144.44	0.39
T4N-R3W-S07	Reach-1	0.767	1	310.00	1616.80	1617.60	1617.33	1617.64	0.006727	1.72	202.10	441.06	0.37
T4N-R3W-S07	Reach-1	0.767	2	310.00	1616.80	1617.87	1617.39	1617.93	0.005609	1.95	158.99	168.37	0.35
T4N-R3W-S07	Reach-1	0.664	1	310.00	1613.69	1614.97	1614.56	1615.03	0.005227	2.02	184.59	286.66	0.35
T4N-R3W-S07	Reach-1	0.664	2	310.00	1613.69	1614.99	1614.54	1615.08	0.007555	2.45	129.97	126.48	0.42
T4N-R3W-S07	Reach-1	0.581	1	310.00	1609.38	1611.41	1611.11	1611.46	0.008178	2.11	154.03	275.22	0.41
T4N-R3W-S07	Reach-1	0.581	2	310.00	1609.38	1611.62	1611.10	1611.68	0.005179	1.95	159.18	158.90	0.34
T4N-R3W-S07	Reach-1	0.477	1	310.00	1606.60	1608.80	1608.35	1608.83	0.003260	1.58	230.36	360.48	0.27
T4N-R3W-S07	Reach-1	0.477	2	310.00	1606.60	1609.07	1608.37	1609.14	0.004223	2.07	149.57	114.25	0.32
T4N-R3W-S07	Reach-1	0.399	1	390.00	1604.78	1605.99	1605.80	1606.11	0.014607	2.87	152.44	275.04	0.58
T4N-R3W-S07	Reach-1	0.399	2	390.00	1604.78	1606.13	1605.78	1606.26	0.011654	2.83	137.94	143.16	0.51
T4N-R3W-S07	Reach-1	0.317	1	390.00	1601.00	1603.69		1603.73	0.002853	1.71	235.40	272.54	0.26
T4N-R3W-S07	Reach-1	0.317	2	390.00	1601.00	1604.08		1604.12	0.002688	1.93	201.87	121.36	0.26
T4N-R3W-S07	Reach-1	0.180	1	390.00	1596.34	1598.53	1598.53	1598.79	0.034683	4.27	96.60	190.42	0.85
T4N-R3W-S07	Reach-1	0.180	2	390.00	1596.34	1598.56	1598.56	1598.97	0.048015	5.14	75.85	92.36	1.00

HEC-RAS Plan: FLOODPLAIN

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Width Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
T4N-R3W-S18W	Reach-1	2.537	1	0.73	0.49	317.20	155.31	1.61	1636.51	1636.51	
T4N-R3W-S18W	Reach-1	2.537	2	0.90	0.86	147.35	126.79	1.97	1636.68	1636.51	0.17
T4N-R3W-S18W	Reach-1	2.445	1	0.79	0.44	378.98	166.22	1.50	1633.58	1633.58	
T4N-R3W-S18W	Reach-1	2.445	2	0.93	0.80	161.12	128.17	1.95	1633.72	1633.58	0.14
T4N-R3W-S18W	Reach-1	2.351	1	0.77	0.39	397.25	154.85	1.61	1630.33	1630.33	
T4N-R3W-S18W	Reach-1	2.351	2	0.89	0.70	190.99	134.17	1.86	1630.45	1630.33	0.12
T4N-R3W-S18W	Reach-1	2.260	1	0.97	0.44	369.95	162.31	1.54	1627.07	1627.07	
T4N-R3W-S18W	Reach-1	2.260	2	1.11	0.79	157.29	124.07	2.02	1627.21	1627.07	0.14
T4N-R3W-S18W	Reach-1	2.173	1	0.88	0.51	315.43	161.91	1.54	1624.38	1624.38	
T4N-R3W-S18W	Reach-1	2.173	2	1.03	0.88	150.56	132.36	1.89	1624.53	1624.38	0.15
T4N-R3W-S18W	Reach-1	2.080	1	0.99	0.49	397.34	194.78	1.28	1622.04	1622.04	
T4N-R3W-S18W	Reach-1	2.080	2	1.17	0.91	158.07	143.44	1.74	1622.22	1622.04	0.18
T4N-R3W-S18W	Reach-1	1.987	1	0.74	0.43	337.56	144.15	1.73	1619.30	1619.30	
T4N-R3W-S18W	Reach-1	1.987	2	0.88	0.79	149.89	118.20	2.12	1619.44	1619.30	0.14
T4N-R3W-S18W	Reach-1	1.928	1	0.92	0.48	361.79	173.21	1.44	1617.50	1617.50	
T4N-R3W-S18W	Reach-1	1.928	2	1.27	1.08	127.18	137.17	1.82	1617.85	1617.50	0.35
T4N-R3W-S18W	Reach-1	1.838	1	0.68	0.34	566.97	194.76	1.28	1614.84	1614.84	
T4N-R3W-S18W	Reach-1	1.838	2	0.89	0.61	192.95	117.45	2.13	1615.05	1614.84	0.21
T4N-R3W-S18W	Reach-1	1.750	1	1.03	0.54	464.93	249.18	1.40	1612.40	1612.40	
T4N-R3W-S18W	Reach-1	1.750	2	1.30	0.99	207.63	205.70	1.70	1612.67	1612.40	0.27
T4N-R3W-S18W	Reach-1	1.664	1	0.67	0.47	468.13	218.99	1.60	1609.77	1609.77	
T4N-R3W-S18W	Reach-1	1.664	2	0.68	0.62	241.67	149.17	2.35	1609.78	1609.77	0.01
T4N-R3W-S18W	Reach-1	1.567	1	0.80	0.42	637.75	266.84	1.31	1606.82	1606.82	
T4N-R3W-S18W	Reach-1	1.567	2	1.04	0.85	294.11	251.21	1.39	1607.06	1606.82	0.24
T4N-R3W-S18W	Reach-1	1.477	1	0.86	0.35	702.69	245.42	1.43	1604.36	1604.36	
T4N-R3W-S18W	Reach-1	1.477	2	0.88	0.71	187.17	133.80	2.62	1604.38	1604.36	0.03
T4N-R3W-S18W	Reach-1	1.382	1	1.23	0.54	387.63	207.79	1.68	1601.59	1601.59	
T4N-R3W-S18W	Reach-1	1.382	2	1.48	1.14	184.92	210.79	1.66	1601.84	1601.59	0.25
T4N-R3W-S18W	Reach-1	1.296	1	0.90	0.34	881.06	300.98	1.59	1599.20	1599.20	
T4N-R3W-S18W	Reach-1	1.296	2	1.06	0.96	238.05	227.45	2.11	1599.93	1599.20	0.73
T4N-R3W-S18W	Reach-1	1.196	1	0.55	0.37	863.80	322.52	1.49	1596.42	1596.42	
T4N-R3W-S18W	Reach-1	1.196	2	0.81	0.70	376.32	263.90	1.82	1596.66	1596.42	0.25
T4N-R3W-S18W	Reach-1	1.104	1	0.76	0.34	1076.81	367.71	1.31	1593.96	1593.96	
T4N-R3W-S18W	Reach-1	1.104	2	1.17	0.98	292.79	286.21	1.68	1594.53	1593.96	0.56
T4N-R3W-S18W	Reach-1	1.012	1	1.38	0.35	785.85	277.36	1.73	1591.29	1591.29	
T4N-R3W-S18W	Reach-1	1.012	2	0.98	0.79	226.77	178.22	2.69	1591.72	1591.29	0.44
T4N-R3W-S18W	Reach-1	0.920	1	1.23	0.51	584.08	300.04	1.60	1588.63	1588.63	
T4N-R3W-S18W	Reach-1	0.920	2	1.18	1.01	241.43	244.97	1.96	1589.04	1588.63	0.41
T4N-R3W-S18W	Reach-1	0.824	1	1.69	0.48	709.08	338.93	1.42	1586.71	1586.71	
T4N-R3W-S18W	Reach-1	0.824	2	1.89	0.97	208.93	203.21	2.36	1586.91	1586.71	0.20
T4N-R3W-S18W	Reach-1	0.732	1	1.18	0.62	472.01	291.96	2.29	1584.21	1584.21	
T4N-R3W-S18W	Reach-1	0.732	2	1.84	1.62	156.13	252.25	2.66	1584.87	1584.21	0.66
T4N-R3W-S18W	Reach-1	0.635	1	1.11	0.70	531.56	371.54	1.80	1581.91	1581.91	
T4N-R3W-S18W	Reach-1	0.635	2	1.43	1.35	141.45	191.65	3.50	1582.32	1581.91	0.41
T4N-R3W-S18W	Reach-1	0.593	1	1.03	0.69	434.26	297.99	2.25	1580.94	1580.94	
T4N-R3W-S18W	Reach-1	0.593	2	1.40	1.29	220.80	285.29	2.35	1581.31	1580.94	0.37
T4N-R3W-S18W	Reach-1	0.538	1	1.14	0.47	714.28	334.97	2.00	1579.16	1579.16	
T4N-R3W-S18W	Reach-1	0.538	2	1.68	1.01	189.18	191.08	3.51	1579.70	1579.16	0.54
T4N-R3W-S18W	Reach-1	0.445	1	1.17	0.52	825.20	425.59	1.57	1576.95	1576.95	
T4N-R3W-S18W	Reach-1	0.445	2	1.81	1.48	200.99	296.93	2.26	1577.59	1576.95	0.64
T4N-R3W-S18W	Reach-1	0.349	1	1.08	0.44	754.84	332.63	2.01	1574.75	1574.75	
T4N-R3W-S18W	Reach-1	0.349	2	1.74	1.49	126.32	188.00	3.56	1575.41	1574.75	0.66
T4N-R3W-S18W	Reach-1	0.284	1	1.09	0.46	870.85	404.57	1.66	1573.19	1573.19	

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth (ft)	Hydr Depth (ft)	Top Wdth Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
T4N-R3W-S18W	Reach-1	0.284	2	2.07	1.79	158.30	282.78	2.37	1574.17	1573.19	0.98
T4N-R3W-S18E	Reach-1	4.247	1	0.46	0.25	205.37	50.51	2.38	1696.57	1696.57	
T4N-R3W-S18E	Reach-1	4.247	2	0.79	0.69	86.54	60.96	1.97	1696.89	1696.57	0.32
T4N-R3W-S18E	Reach-1	4.135	1	0.68	0.46	173.94	79.45	1.51	1692.66	1692.66	
T4N-R3W-S18E	Reach-1	4.135	2	0.72	0.57	96.32	54.46	2.20	1692.70	1692.66	0.03
T4N-R3W-S18E	Reach-1	4.059	1	0.39	0.24	187.48	44.14	2.72	1689.75	1689.75	
T4N-R3W-S18E	Reach-1	4.059	2	0.80	0.69	99.23	68.05	1.76	1690.16	1689.75	0.40
T4N-R3W-S18E	Reach-1	3.962	1	2.29	0.43	755.75	323.68	0.37	1686.61	1686.61	
T4N-R3W-S18E	Reach-1	3.962	2	1.01	0.29	273.49	80.22	1.50	1686.61	1686.61	0.00
T4N-R3W-S18E	Reach-1	3.872	1	0.75	0.33	379.71	124.57	0.98	1681.96	1681.96	
T4N-R3W-S18E	Reach-1	3.872	2	0.99	0.74	105.36	78.05	1.54	1682.51	1681.96	0.55
T4N-R3W-S18E	Reach-1	3.787	1	1.05	0.42	311.99	130.04	2.15	1678.93	1678.93	
T4N-R3W-S18E	Reach-1	3.787	2	0.88	0.69	185.30	128.35	2.18	1679.04	1678.93	0.11
T4N-R3W-S18E	Reach-1	3.706	1	1.35	0.28	657.44	185.85	1.51	1675.72	1675.72	
T4N-R3W-S18E	Reach-1	3.706	2	1.43	0.46	248.96	114.09	2.45	1675.80	1675.72	0.08
T4N-R3W-S18E	Reach-1	3.578	1	0.63	0.45	389.58	176.32	1.59	1671.53	1671.53	
T4N-R3W-S18E	Reach-1	3.578	2	0.74	0.66	270.43	177.19	1.58	1671.64	1671.53	0.11
T4N-R3W-S18E	Reach-1	3.461	1	0.96	0.59	288.20	169.94	1.65	1667.77	1667.77	
T4N-R3W-S18E	Reach-1	3.461	2	0.96	0.77	188.03	143.93	1.95	1667.77	1667.77	0.00
T4N-R3W-S18E	Reach-1	3.344	1	0.68	0.46	341.40	156.70	1.79	1663.73	1663.73	
T4N-R3W-S18E	Reach-1	3.344	2	0.90	0.80	193.57	155.80	1.80	1663.95	1663.73	0.21
T4N-R3W-S18E	Reach-1	3.264	1	0.97	0.52	573.07	300.08	1.50	1661.44	1661.44	
T4N-R3W-S18E	Reach-1	3.264	2	1.46	1.36	148.16	200.97	2.24	1661.92	1661.44	0.48
T4N-R3W-S18E	Reach-1	3.153	1	0.62	0.42	605.95	257.03	1.75	1657.74	1657.74	
T4N-R3W-S18E	Reach-1	3.153	2	1.23	1.12	141.64	158.82	2.83	1658.35	1657.74	0.61
T4N-R3W-S18E	Reach-1	3.059	1	1.13	0.61	465.39	284.02	1.58	1654.93	1654.93	
T4N-R3W-S18E	Reach-1	3.059	2	1.25	1.01	216.30	218.71	2.06	1655.04	1654.93	0.12
T4N-R3W-S18E	Reach-1	2.961	1	2.31	0.45	483.95	219.32	2.05	1651.77	1651.77	
T4N-R3W-S18E	Reach-1	2.961	2	2.55	1.00	202.80	202.62	2.22	1652.01	1651.77	0.24
T4N-R3W-S18E	Reach-1	2.860	1	1.06	0.54	580.68	313.45	1.44	1648.50	1648.50	
T4N-R3W-S18E	Reach-1	2.860	2	1.41	1.16	168.61	196.25	2.29	1648.85	1648.50	0.35
T4N-R3W-S18E	Reach-1	2.762	1	0.68	0.38	953.81	364.37	1.48	1645.20	1645.20	
T4N-R3W-S18E	Reach-1	2.762	2	1.27	1.01	260.21	262.15	2.08	1645.79	1645.20	0.58
T4N-R3W-S18E	Reach-1	2.656	1	0.75	0.38	1157.16	440.49	1.23	1642.51	1642.51	
T4N-R3W-S18E	Reach-1	2.656	2	1.01	0.78	344.51	268.99	2.01	1642.77	1642.51	0.26
T4N-R3W-S18E	Reach-1	2.562	1	0.83	0.46	696.46	321.86	1.68	1639.29	1639.29	
T4N-R3W-S18E	Reach-1	2.562	2	1.03	0.86	313.25	269.40	2.00	1639.49	1639.29	0.20
T4N-R3W-S18E	Reach-1	2.468	1	1.05	0.50	716.01	360.40	1.50	1636.25	1636.25	
T4N-R3W-S18E	Reach-1	2.468	2	1.11	0.84	314.54	262.99	2.05	1636.31	1636.25	0.06
T4N-R3W-S18E	Reach-1	2.374	1	0.97	0.41	946.06	389.46	1.39	1633.58	1633.58	
T4N-R3W-S18E	Reach-1	2.374	2	1.27	0.98	322.86	315.70	1.71	1633.87	1633.58	0.30
T4N-R3W-S18E	Reach-1	2.276	1	1.13	0.39	1013.26	395.30	1.64	1630.53	1630.53	
T4N-R3W-S18E	Reach-1	2.276	2	1.39	1.04	226.83	236.08	2.75	1630.79	1630.53	0.27
T4N-R3W-S18E	Reach-2	2.260	1	0.86	0.26	428.47	109.48	0.64	1630.07	1630.07	
T4N-R3W-S18E	Reach-2	2.260	2	0.03	0.01	0.41	0.01	0.02	1629.24	1630.07	-0.84
T4N-R3W-S18E	Reach-2	2.175	1	0.38	0.17	201.27	33.37	2.10	1627.79	1627.79	
T4N-R3W-S18E	Reach-2	2.175	2	0.03	0.01	8.68	0.11	0.00	1627.44	1627.79	-0.35
T4N-R3W-S18E	Reach-2	2.081	1	0.54	0.25	570.70	143.62	0.49	1624.77	1624.77	
T4N-R3W-S18E	Reach-2	2.081	2	0.47	0.19	545.32	102.11	0.00	1624.70	1624.77	-0.07
T4N-R3W-S18E	Reach-3	2.260	1	1.21	0.52	615.84	323.15	1.79	1630.05	1630.05	
T4N-R3W-S18E	Reach-3	2.260	2	1.49	1.17	241.56	282.87	2.30	1630.33	1630.05	0.27
T4N-R3W-S18E	Reach-3	2.175	1	1.31	0.58	514.11	296.46	1.95	1627.39	1627.39	
T4N-R3W-S18E	Reach-3	2.175	2	1.68	1.43	149.67	213.86	3.04	1627.88	1627.39	0.50

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Max Ch Dpth (ft)	Hydr Depth (ft)	Top Wdth Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
T4N-R3W-S18E	Reach-3	2.081	1	1.35	0.70	467.93	328.37	1.77	1624.65	1624.65	
T4N-R3W-S18E	Reach-3	2.081	2	1.61	1.34	201.58	270.57	2.40	1624.91	1624.65	0.27
T4N-R3W-S18E	Reach-4	1.945	1	0.93	0.56	602.88	346.67	1.87	1620.30	1620.30	
T4N-R3W-S18E	Reach-4	1.945	2	1.29	1.20	204.50	246.09	2.64	1620.66	1620.30	0.36
T4N-R3W-S18E	Reach-4	1.866	1	1.37	0.71	571.75	403.69	1.61	1618.00	1618.00	
T4N-R3W-S18E	Reach-4	1.866	2	1.76	1.53	175.62	268.59	2.42	1618.39	1618.00	0.39
T4N-R3W-S18E	Reach-4	1.773	1	1.29	0.68	512.42	346.04	2.34	1615.14	1615.14	
T4N-R3W-S18E	Reach-4	1.773	2	2.28	2.17	119.66	260.13	3.11	1616.13	1616.14	1.00
T4N-R3W-S18E	Reach-4	1.674	1	1.24	0.61	799.12	491.20	1.65	1612.54	1612.54	
T4N-R3W-S18E	Reach-4	1.674	2	2.17	2.09	109.71	229.34	3.53	1613.47	1612.54	0.94
T4N-R3W-S18E	Reach-4	1.580	1	1.25	0.59	493.41	290.58	2.79	1609.56	1609.56	
T4N-R3W-S18E	Reach-4	1.580	2	1.94	1.74	126.15	219.87	3.68	1610.25	1609.56	0.69
T4N-R3W-S18E	Reach-4	1.486	1	1.44	0.68	722.58	487.75	1.66	1606.99	1606.99	
T4N-R3W-S18E	Reach-4	1.486	2	1.55	1.36	217.38	296.36	2.73	1607.10	1606.99	0.11
T4N-R3W-S18E	Reach-4	1.378	1	1.03	0.51	493.69	251.89	3.22	1603.37	1603.37	
T4N-R3W-S18E	Reach-4	1.378	2	1.69	1.47	202.07	297.33	2.72	1604.02	1603.37	0.65
T4N-R3W-S18E	Reach-4	1.282	1	1.64	0.79	691.39	545.44	1.71	1600.63	1600.63	
T4N-R3W-S18E	Reach-4	1.282	2	2.19	1.90	143.87	273.05	3.41	1601.18	1600.63	0.55
T4N-R3W-S18E	Reach-4	1.192	1	1.30	0.52	481.04	252.33	3.69	1597.60	1597.60	
T4N-R3W-S18E	Reach-4	1.192	2	2.03	1.76	155.32	274.11	3.39	1598.33	1597.60	0.73
T4N-R3W-S18E	Reach-4	1.095	1	2.04	0.64	797.21	506.98	1.83	1594.04	1594.04	
T4N-R3W-S18E	Reach-4	1.095	2	2.90	1.69	155.09	262.82	3.54	1594.90	1594.04	0.86
T4N-R3W-S18E	Reach-4	0.998	1	2.44	0.84	465.90	391.25	2.38	1591.48	1591.48	
T4N-R3W-S18E	Reach-4	0.998	2	3.19	2.05	152.55	312.01	2.98	1592.23	1591.48	0.75
T4N-R3W-S18E	Reach-4	0.679	1	1.46	0.73	717.25	526.27	2.01	1589.00	1589.00	
T4N-R3W-S18E	Reach-4	0.679	2	1.81	1.60	219.76	351.09	3.02	1589.36	1589.00	0.36
T4N-R3W-S18E	Reach-4	0.803	1	1.66	0.62	578.54	358.53	2.96	1586.59	1586.59	
T4N-R3W-S18E	Reach-4	0.803	2	1.94	1.50	221.60	333.10	3.18	1586.87	1586.59	0.28
T4N-R3W-S18E	Reach-4	0.709	1	1.85	0.79	604.06	479.92	2.21	1583.85	1583.85	
T4N-R3W-S18E	Reach-4	0.709	2	2.02	1.72	205.38	353.12	3.00	1584.02	1583.85	0.17
T4N-R3W-S18E	Reach-4	0.615	1	1.49	1.00	289.16	286.45	3.67	1580.54	1580.54	
T4N-R3W-S18E	Reach-4	0.615	2	2.01	1.93	148.05	285.17	3.72	1581.06	1580.54	0.52
T4N-R3W-S18E	Reach-4	0.517	1	2.21	1.21	380.40	459.78	2.31	1577.91	1577.91	
T4N-R3W-S18E	Reach-4	0.517	2	2.77	2.46	128.60	316.37	3.35	1578.48	1577.91	0.57
T4N-R3W-S18E	Reach-4	0.422	1	1.40	0.69	521.95	360.84	3.30	1575.04	1575.04	
T4N-R3W-S18E	Reach-4	0.422	2	1.90	1.72	175.47	301.91	3.94	1575.54	1575.04	0.50
T4N-R3W-S18E	Reach-4	0.326	1	2.06	0.77	799.25	615.58	1.93	1572.56	1572.56	
T4N-R3W-S18E	Reach-4	0.326	2	2.76	2.53	161.43	408.59	2.91	1573.26	1572.56	0.70
T4N-R3W-S18E	Reach-4	0.228	1	1.27	0.48	672.43	325.97	3.65	1569.34	1569.34	
T4N-R3W-S18E	Reach-4	0.228	2	1.27	1.16	186.96	215.86	5.51	1569.34	1569.34	0.00
T4N-R3W-S17	Reach-1	2.757	1	0.84	0.48	346.88	165.62	1.51	1632.84	1632.84	
T4N-R3W-S17	Reach-1	2.757	2	1.13	1.05	104.31	110.00	2.27	1633.13	1632.84	0.29
T4N-R3W-S17	Reach-1	2.673	1	0.89	0.41	372.26	151.73	1.65	1629.69	1629.69	
T4N-R3W-S17	Reach-1	2.673	2	1.18	0.95	115.68	110.58	2.26	1629.98	1629.69	0.30
T4N-R3W-S17	Reach-1	2.584	1	1.01	0.38	477.17	182.02	1.37	1626.31	1626.31	
T4N-R3W-S17	Reach-1	2.584	2	1.16	0.96	131.61	126.07	1.98	1626.86	1626.31	0.55
T4N-R3W-S17	Reach-1	2.473	1	0.98	0.35	588.59	207.63	1.20	1622.65	1622.65	
T4N-R3W-S17	Reach-1	2.473	2	1.19	0.66	204.02	134.87	1.85	1622.86	1622.65	0.21
T4N-R3W-S17	Reach-1	2.391	1	0.75	0.36	499.13	180.26	1.39	1619.78	1619.78	
T4N-R3W-S17	Reach-1	2.391	2	0.87	0.75	189.32	141.86	1.76	1620.01	1619.78	0.23
T4N-R3W-S17	Reach-1	2.298	1	0.69	0.34	562.20	189.70	1.32	1616.59	1616.59	
T4N-R3W-S17	Reach-1	2.298	2	0.91	0.59	237.79	139.11	1.80	1616.61	1616.59	0.02

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
T4N-R3W-S16	Reach-1	1.556	2	1.47	1.18	128.88	152.18	5.32	1568.37	1568.09	0.28
T4N-R3W-S16	Reach-2	1.184	1	3.15	1.78	665.81	1186.97	1.68	1562.75	1562.75	
T4N-R3W-S16	Reach-2	1.184	2	3.52	2.92	286.12	835.12	2.39	1563.12	1562.75	0.37
T4N-R3W-S16	Reach-2	1.089	1	3.01	1.31	728.40	955.37	2.84	1561.64	1561.64	
T4N-R3W-S16	Reach-2	1.089	2	3.10	2.23	352.06	783.98	3.46	1561.73	1561.64	0.09
T4N-R3W-S16	Reach-2	0.995	1	3.02	1.20	641.44	768.31	3.53	1558.92	1558.92	
T4N-R3W-S16	Reach-2	0.995	2	3.26	1.85	360.70	665.54	4.07	1559.16	1558.92	0.24
T4N-R3W-S16	Reach-2	0.899	1	11.62	2.14	619.95	1328.41	2.04	1557.72	1557.72	
T4N-R3W-S16	Reach-2	0.899	2	4.02	2.91	382.07	1112.85	2.44	1557.87	1557.72	0.15
T4N-R3W-S16	Reach-2	0.831	1	11.07	1.09	446.01	487.31	5.56	1556.01	1556.01	
T4N-R3W-S16	Reach-2	0.831	2	2.47	1.15	423.36	485.60	5.58	1556.01	1556.01	0.00
T4N-R3W-S16	Reach-3	0.707	1	10.20	3.26	802.68	2618.44	1.03	1555.15	1555.15	
T4N-R3W-S16	Reach-3	0.707	2	7.04	5.14	384.99	1978.21	1.37	1555.30	1555.15	0.14
T4N-R3W-S16	Reach-3	0.602	1	9.49	1.66	417.98	694.49	3.90	1554.59	1554.59	
T4N-R3W-S16	Reach-3	0.602	2	3.07	1.87	362.44	679.34	3.99	1554.59	1554.59	0.01
T4N-R3W-S16	Reach-3	0.506	1	7.52	2.45	683.02	1675.28	1.87	1553.72	1553.72	
T4N-R3W-S16	Reach-3	0.506	2	4.74	3.00	515.93	1549.64	2.03	1553.72	1553.72	0.00
T4N-R3W-S16	Reach-3	0.409	1	8.52	1.89	686.98	1299.52	2.42	1552.91	1552.91	
T4N-R3W-S16	Reach-3	0.409	2	3.62	1.90	687.22	1309.08	2.40	1552.93	1552.91	0.01
T4N-R3W-S16	Reach-3	0.297	1	3.40	1.39	657.54	914.33	3.43	1550.25	1550.25	
T4N-R3W-S16	Reach-3	0.297	2	3.29	1.56	607.23	945.12	3.32	1550.46	1550.25	0.20
T4N-R3W-S16	Reach-3	0.221	1	3.15	1.82	670.07	1221.29	2.57	1548.21	1548.21	
T4N-R3W-S16	Reach-3	0.221	2	3.50	2.31	540.31	1249.65	2.51	1548.69	1548.21	0.48
T4N-R3W-S16	Reach-3	0.102	1	6.43	3.03	879.55	2664.69	1.18	1547.88	1547.88	
T4N-R3W-S16	Reach-3	0.102	2	6.95	3.56	759.23	2704.26	1.16	1548.40	1547.88	0.53
T4N-R3W-S16	Reach-3	0.000	1	5.41	1.79	446.71	800.62	3.92	1547.23	1547.23	
T4N-R3W-S16	Reach-3	0.000	2	5.93	2.01	355.55	715.91	4.39	1547.75	1547.23	0.53
T4N-R3W-S07	Reach-1	1.993	1	0.97	0.45	285.50	129.04	1.70	1656.99	1656.99	
T4N-R3W-S07	Reach-1	1.993	2	1.02	0.63	191.15	120.82	1.82	1657.04	1656.99	0.05
T4N-R3W-S07	Reach-1	1.893	1	0.75	0.50	270.90	135.21	1.63	1653.31	1653.31	
T4N-R3W-S07	Reach-1	1.893	2	1.06	0.94	126.51	119.44	1.84	1653.62	1653.31	0.31
T4N-R3W-S07	Reach-1	1.807	1	1.02	0.50	300.92	150.17	1.47	1651.04	1651.04	
T4N-R3W-S07	Reach-1	1.807	2	1.17	0.92	127.84	117.23	1.88	1651.19	1651.04	0.15
T4N-R3W-S07	Reach-1	1.710	1	0.91	0.48	231.92	112.33	1.96	1647.61	1647.61	
T4N-R3W-S07	Reach-1	1.710	2	1.02	0.73	147.50	108.37	2.03	1647.72	1647.61	0.11
T4N-R3W-S07	Reach-1	1.617	1	1.75	0.62	227.29	139.90	1.57	1644.49	1644.49	
T4N-R3W-S07	Reach-1	1.617	2	1.79	1.11	96.88	107.89	2.04	1644.53	1644.49	0.04
T4N-R3W-S07	Reach-1	1.524	1	0.76	0.39	279.14	107.92	2.04	1641.26	1641.26	
T4N-R3W-S07	Reach-1	1.524	2	1.04	0.87	118.02	103.16	2.13	1641.54	1641.26	0.28
T4N-R3W-S07	Reach-1	1.431	1	1.05	0.65	248.15	161.48	1.36	1638.15	1638.15	
T4N-R3W-S07	Reach-1	1.431	2	1.15	0.96	114.07	109.35	2.01	1638.25	1638.15	0.10
T4N-R3W-S07	Reach-1	1.336	1	1.06	0.45	273.62	122.27	1.80	1635.26	1635.26	
T4N-R3W-S07	Reach-1	1.336	2	1.29	0.91	134.71	122.07	1.80	1635.49	1635.26	0.23
T4N-R3W-S07	Reach-1	1.241	1	1.45	0.39	409.64	160.43	1.37	1632.08	1632.08	
T4N-R3W-S07	Reach-1	1.241	2	1.84	0.76	152.31	115.88	1.90	1632.47	1632.08	0.39
T4N-R3W-S07	Reach-1	1.137	1	0.91	0.51	280.31	141.76	1.55	1629.29	1629.29	
T4N-R3W-S07	Reach-1	1.137	2	1.11	0.81	176.75	143.44	1.53	1629.48	1629.29	0.19
T4N-R3W-S07	Reach-1	1.051	1	1.09	0.47	332.53	155.28	1.42	1626.71	1626.71	
T4N-R3W-S07	Reach-1	1.051	2	1.41	0.89	122.15	108.43	2.03	1627.03	1626.71	0.32
T4N-R3W-S07	Reach-1	0.948	1	1.08	0.55	303.57	168.25	1.84	1623.40	1623.40	
T4N-R3W-S07	Reach-1	0.948	2	1.44	1.21	112.27	135.55	2.29	1623.76	1623.40	0.36
T4N-R3W-S07	Reach-1	0.859	1	0.74	0.42	512.51	212.84	1.46	1620.52	1620.52	
T4N-R3W-S07	Reach-1	0.859	2	1.07	0.98	144.44	141.79	2.19	1620.85	1620.52	0.33

HEC-RAS Plan: FLOODPLAIN (Continued)

River	Reach	River Sta	Profile	Max Ch Dpth (ft)	Hydr Depth (ft)	Top Wdth Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
T4N-R3W-S07	Reach-1	0.767	1	0.80	0.46	441.06	202.10	1.53	1617.60	1617.60	
T4N-R3W-S07	Reach-1	0.767	2	1.07	0.96	166.37	158.99	1.95	1617.87	1617.60	0.27
T4N-R3W-S07	Reach-1	0.684	1	1.28	0.69	266.66	184.59	1.68	1614.97	1614.97	
T4N-R3W-S07	Reach-1	0.684	2	1.30	1.03	126.48	129.97	2.39	1614.99	1614.97	0.02
T4N-R3W-S07	Reach-1	0.581	1	2.03	0.56	275.22	154.03	2.01	1611.41	1611.41	
T4N-R3W-S07	Reach-1	0.581	2	2.24	1.01	156.90	159.16	1.95	1611.62	1611.41	0.21
T4N-R3W-S07	Reach-1	0.477	1	2.00	0.64	360.48	230.38	1.35	1608.80	1608.80	
T4N-R3W-S07	Reach-1	0.477	2	2.27	1.31	114.25	149.57	2.07	1609.07	1608.80	0.27
T4N-R3W-S07	Reach-1	0.399	1	1.21	0.55	275.04	152.44	2.66	1605.99	1605.99	
T4N-R3W-S07	Reach-1	0.399	2	1.35	0.96	143.18	137.94	2.83	1606.13	1605.99	0.14
T4N-R3W-S07	Reach-1	0.317	1	2.69	0.86	272.54	235.40	1.66	1603.69	1603.69	
T4N-R3W-S07	Reach-1	0.317	2	3.06	1.66	121.36	201.87	1.93	1604.06	1603.69	0.37
T4N-R3W-S07	Reach-1	0.180	1	2.18	0.51	190.42	96.60	4.04	1598.53	1598.53	
T4N-R3W-S07	Reach-1	0.180	2	2.22	0.82	92.36	75.95	5.14	1598.56	1598.53	0.04

CHECK-RAS Report for Washes:
T4N-R3W-S07
T4N-R3W-S16
T4N-R3W-S17
T4N-R3W-S18E
T4N-R3W-S18W

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.p01
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.nt
Selected profiles: 1,2
Date: 6/8/2006
Time: 9:55:27 AM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
T4N-R3W-S07,Reach-1						
1.993		0.033	0.055	0.033	0.1	0.3
1.893		0.033	0.055	0.033	0.1	0.3
1.807		0.033	0.055	0.033	0.1	0.3
1.71		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
1.617		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
1.524		0.033	0.055	0.033	0.1	0.3
1.431		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
1.336		0.033	0.055	0.055	0.1	0.3
		-----	-----	0.033		
1.241		0.033	0.055	0.055	0.1	0.3
		-----	-----	0.033		
1.137		0.033	0.055	0.055	0.1	0.3
		-----	-----	0.033		
1.051		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.948		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.859		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.767		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.684		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.581		0.033	0.055	0.033	0.1	0.3
.477		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.399		0.033	-----	-----	0.1	0.3
		0.055	-----	-----		
.317		0.033	0.055	0.033	0.1	0.3
T4N-R3W-S16,Reach-1a						
.18		0.033	0.055	0.033	0.1	0.3
1.648		0.035	-----	-----	0.1	0.3
		0.053	-----	-----		
T4N-R3W-S16,Reach-1						
1.644		0.035	-----	-----	0.1	0.3
		0.053	-----	-----		
1.64		0.035	0.053	0.035	0.1	0.3
T4N-R3W-S16,Reach-2						
1.556		0.035	-----	-----	0.1	0.3
		0.06	-----	-----		
1.184		0.033	0.06	0.035	0.1	0.3
1.089		0.035	0.053	0.035	0.1	0.3
.995		0.035	0.053	0.035	0.1	0.3

.899	0.035	0.053	0.035	0.1	0.3
T4N-R3W-S16,Reach-3					
.831	0.035	0.06	0.033	0.1	0.3
.707	0.035	-----	-----	0.1	0.3
	0.06	-----	-----		
.602	0.035	-----	-----	0.1	0.3
	0.06	-----	-----		
.506	0.035	-----	-----	0.1	0.3
	0.06	-----	-----		
.409	0.035	-----	-----	0.1	0.3
	0.06	-----	-----		
.297	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
.221	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
.102	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
T4N-R3W-S17,Reach-1					
0	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
2.757	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.673	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.584	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.473	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.391	0.033	0.055	-----	0.1	0.3
	0.055	0.033	-----		
2.298	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.215	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.124	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
2.029	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.923	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.828	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.744	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
T4N-R3W-S17,Reach-2					
1.627	0.033	0.055	0.033	0.1	0.3
1.55	0.033	0.055	0.033	0.1	0.3
1.455	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.366	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.268	0.033	0.055	0.033	0.1	0.3
1.172	0.033	-----	-----	0.1	0.3
	0.055	-----	-----		
1.071	0.033	0.055	0.033	0.1	0.3
.973	0.033	0.055	0.033	0.1	0.3
.877	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.778	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.679	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.585	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.482	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.382	0.031	-----	-----	0.1	0.3

	0.042	-----	-----		
.284	0.031	-----	-----	0.1	0.3
	0.042	-----	-----		
.186	0.033	-----	-----	0.1	0.3
	0.058	-----	-----		
T4N-R3W-S18E,Reach-1					
.153	0.033	-----	-----	0.1	0.3
	0.058	-----	-----		
4.247	0.033	0.058	0.033	0.1	0.3
4.135	0.033	-----	-----	0.1	0.3
	0.033	-----	-----		
4.059	0.033	0.058	0.033	0.1	0.3
3.962	0.033	0.058	0.033	0.1	0.3
3.872	0.033	0.053	0.033	0.1	0.3
3.787	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
3.706	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
	0.033	-----	-----		
3.578	0.033	0.053	0.033	0.1	0.3
3.461	0.033	0.053	0.033	0.1	0.3
3.344	0.033	0.053	0.033	0.1	0.3
3.264	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
3.153	0.033	0.053	0.053	0.1	0.3
	-----	-----	0.033		
3.059	0.033	0.053	0.033	0.1	0.3
2.961	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
2.86	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
2.752	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
2.656	0.035	0.053	-----	0.1	0.3
	0.053	0.035	-----		
2.562	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
2.468	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
2.374	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
T4N-R3W-S18E,Reach-2					
2.276	0.035	0.053	0.035	0.1	0.3
	0.053	-----	-----		
	0.035	-----	-----		
2.26	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
2.175	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
T4N-R3W-S18E,Reach-3					
2.081	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
2.26	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
2.175	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
T4N-R3W-S18E,Reach-4					
2.081	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
1.945	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
1.866	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
1.773	0.035	-----	-----	0.1	0.3
	0.053	-----	-----		
1.674	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		

1.58	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
1.486	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
1.378	0.033	0.05	0.033	0.1	0.3
1.282	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
1.192	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
1.095	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
.998	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
.879	0.033	0.05	0.033	0.1	0.3
.803	0.033	0.05	0.033	0.1	0.3
.709	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
.615	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
.517	0.033	0.05	0.05	0.1	0.3
	-----	-----	0.033		
.422	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
.326	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
T4N-R3W-S18W,Reach-1					
.228	0.033	-----	-----	0.1	0.3
	0.053	-----	-----		
2.537	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
2.445	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
2.351	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
2.26	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
2.173	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
2.08	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.987	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.928	0.033	0.052	0.052	0.1	0.3
	-----	-----	0.033		
1.838	0.033	0.052	0.052	0.1	0.3
	-----	-----	0.033		
1.75	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.664	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.567	0.033	0.052	0.033	0.1	0.3
1.477	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.382	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.296	0.033	0.052	0.033	0.1	0.3
1.196	0.033	0.052	0.033	0.1	0.3
1.104	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
1.012	0.033	-----	-----	0.1	0.3
	0.052	-----	-----		
.92	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.824	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.732	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		

.635	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.593	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.538	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.445	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.349	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
.284	0.033	-----	0	0.1	0.3
	0.045	-----	0.033		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.031	0.06
Right Overbank n Value:	0	0.055
Channel n Value:	0.033	0.06
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

```
RS:       1.993
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.993
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.993
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.893
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.893
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.893
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.807
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.807
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
```

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RS:       1.807
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.524
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.524
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.524
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.336
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.241
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.137
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.581
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.581
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.581
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       0.317
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.317
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.317
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       0.18
NT RC 01 Left overbank n value is less than 0.035
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         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.18
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.18
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:      1.64
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      1.184
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.184
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.06
         The overbank n values should be reevaluated.

RS:      1.089
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      0.995
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      0.899
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      0.831
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.831
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.06
         The overbank n values should be reevaluated.

RS:      1.627
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.627
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.627
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.
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RS:       1.55
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.55
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.55
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.268
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.268
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.268
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       1.071
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.071
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.071
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       0.973
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.973
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.973
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.055
         The overbank n values should be reevaluated.

RS:       4.247
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       4.247
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NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      4.247
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.058
         The overbank n values should be reevaluated.

RS:      4.135
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      4.059
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      4.059
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      4.059
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.058
         The overbank n values should be reevaluated.

RS:      3.962
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.962
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.962
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.058
         The overbank n values should be reevaluated.

RS:      3.872
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.872
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.872
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      3.578
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.578
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
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         The n value should be reevaluated.

RS:      3.578
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      3.461
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.461
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.461
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      3.344
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.344
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.344
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      3.153
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.059
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.059
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      3.059
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.053
         The overbank n values should be reevaluated.

RS:      1.378
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.378
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
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RS:       1.378
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:       0.879
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.879
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.879
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:       0.803
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.803
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.803
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:       0.517
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.928
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.838
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.567
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.567
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.567
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.052
         The overbank n values should be reevaluated.

RS:       1.296
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NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.296
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.296
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.052
         The overbank n values should be reevaluated.

RS:      1.196
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.196
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.196
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.052
         The overbank n values should be reevaluated.

TRANSITION LOSS COEFFICIENT CHECK
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ROUGHNESS COEFFICIENT AT STRUCTURES
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---END---
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CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.p01
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.xs
Selected profiles: 1;2
Date: 6/8/2006
Time: 9:58:15 AM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
T4N-R3W-S07,Reach-1						
1.993	500	528.39	543	285.5	220	
1.893	434	457.73	436	270.9	220	
1.807	472	509.43	528	300.92	220	
1.71	488	494.68	480	231.92	220	
1.617	488	487.79	478	227.29	220	D
1.524	493	491.44	492	279.14	220	
1.431	510	501.09	492	248.15	220	
1.336	502	502.14	463	273.62	220	
1.241	501	551.91	465	409.64	220	D
1.137	460	453.4	429	280.31	220	
1.051	491	541.85	552	332.5	220	
.948	457	469.76	471	303.67	310	
.859	482	485.56	481	513.6	310	D
.767	464	437.11	426	441.06	310	D
.684	555	548.15	529	266.66	310	
.581	530	544.25	510	275.22	310	
.477	426	413.05	405	360.48	310	
.399	404	432.97	441	275.04	390	
.317	723	727.16	627	272.54	390	
.18	0	0	0	190.42	390	C
T4N-R3W-S16,Reach-1a						
1.648	20	20	20	444.13	810	
1.644	0	0	0	438.2	810	
T4N-R3W-S16,Reach-1						
1.64	430	441.26	443	434.34	810	
1.556	0	0	0	294.59	810	D,C
T4N-R3W-S16,Reach-2						
1.184	497	501.18	500	665.81	2000	
1.089	502	501.28	501	728.4	2710	
.995	504	504.09	504	641.44	2710	
.899	352	358.05	351	619.95	2710	E
.831	0	0	0	446.01	2710	E,C
T4N-R3W-S16,Reach-3						
.707	554	554.39	554	802.68	2710	E
.602	512	510.98	511	417.98	2710	D,E
.506	511	511.92	512	683.04	3140	E
.409	580	588.42	580	687.06	3140	E
.297	396	402.37	394	656.44	3140	E
.221	620	629.2	625	669.93	3140	E
.102	542	537.24	531	879.55	3140	E
0	0	0	0	446.71	3140	E
T4N-R3W-S17,Reach-1						
2.757	433	439.95	441	346.88	250	
2.673	468	474.47	474	372.26	250	
2.584	587	584.74	553	477.17	250	D

2.473	397	432.26	442	588.56	250	
2.391	475	490.07	499	499.35	250	
2.298	447	437.2	415	562.4	250	D
2.215	466	480.01	457	464.1	250	
2.124	547	505.23	406	337.04	250	
2.029	474	558.16	490	508.96	430	
1.923	447	499.57	515	392.96	430	
1.828	455	446.24	411	388.97	430	
1.744	540	617.87	575	496.15	430	D
1.627	0	0	0	425.92	430	
T4N-R3W-S17,Reach-2						
1.55	527	500.36	441	895.61	820	
1.455	392	473.07	497	765.46	820	D
1.366	483	513.97	495	487.5	820	
1.268	473	506.74	519	441.24	820	
1.172	502	535.5	492	471.47	820	
1.071	470	514.91	503	521.44	820	
.973	495	508.78	496	368.81	820	
.877	525	521.65	470	422.39	1210	
.778	503	523.77	507	532.56	1210	
.679	464	497.24	522	508.43	1210	
.585	570	543.27	514	540.58	1210	
.482	497	529.98	514	542.43	1210	
.382	499	516.44	493	358.82	1600	
.284	511	515.32	494	360.25	1600	
.186	177	176.78	176	401.77	1600	
.153	0	0	0	420.91	1600	
T4N-R3W-S18E,Reach-1						
4.247	601	599.33	486	205.37	120	
4.135	403	401.56	320	173.94	120	
4.059	539	511.4	478	187.48	120	C
3.962	473	476.38	465	755.75	120	C
3.872	429	451.6	429	379.71	120	D
3.787	385	396.77	491	311.99	280	
3.706	687	696.73	628	657.44	280	D
3.578	553	616.79	579	389.58	280	
3.461	594	621.56	643	286.2	280	
3.344	399	420.87	426	341.4	280	
3.264	551	584.25	570	573.07	450	
3.153	469	498.02	453	606.26	450	
3.059	475	519.2	536	464.97	450	D
2.961	530	534.17	518	485.24	450	
2.86	541	565.04	569	580.17	450	
2.752	343	510.6	491	954.09	540	
2.656	586	494.36	468	1156.85	540	D
2.562	513	495.52	479	696.46	540	D
2.468	510	497.68	472	716.01	540	
2.374	507	518.21	508	946.06	540	D
2.276	0	0	0	1013.26	650	D
T4N-R3W-S18E,Reach-2						
2.26	344	448.8	386	428.47	70	E
2.175	490	495.69	503	201.27	70	C
2.081	0	0	0	570.7	70	
T4N-R3W-S18E,Reach-3						
2.26	400	448.8	503	615.84	580	E
2.175	490	495.69	503	514.11	580	
2.081	0	0	0	467.93	580	
T4N-R3W-S18E,Reach-4						
1.945	440	418.06	385	602.88	650	D
1.866	450	491.89	393	571.75	650	
1.773	467	518.93	479	512.42	810	D
1.674	450	498.76	506	799.12	810	
1.58	442	493.8	511	493.41	810	D
1.486	534	573.73	607	722.58	810	
1.378	516	508.1	493	493.69	810	D
1.282	436	473.92	491	691.39	930	
1.192	489	512.82	524	481.04	930	D

1.095	535	509.67	490	797.21	930	
.998	443	628.76	493	465.9	930	D
.879	521	402.69	444	717.25	1060	D
.803	504	494.42	482	578.54	1060	D
.709	487	496.18	519	604.06	1060	D
.615	512	520.46	494	289.16	1060	
.517	514	500.64	469	380.4	1060	
.422	511	504.22	500	521.95	1190	D
.326	484	518.89	505	799.25	1190	
.228	0	0	0	672.43	1190	D,C
T4N-R3W-S18W,Reach-1						
2.537	427	483.786	549	317.59	250	
2.445	496	493.864	495	378.39	250	D
2.351	482	481.125	474	397.44	250	
2.26	545	461.922	399	369.8	250	
2.173	484	489.965	483	315.46	250	
2.08	490	493.934	479	397.32	250	
1.987	326	310.929	291	337.84	250	
1.928	437	467.714	500	361.44	250	
1.838	402	461.159	474	567.09	250	
1.75	489	454.822	413	464.83	350	
1.664	473	511.379	586	468.45	350	
1.567	478	479.899	481	637.63	350	
1.477	494	501.458	481	702.53	350	
1.382	484	450.962	441	388.92	350	D
1.296	460	529.224	525	880.78	480	D
1.196	393	483.288	557	864.84	480	
1.104	421	490.446	486	1076.81	480	D
1.012	471	485.919	477	785.85	480	D
.92	545	502.127	422	584.08	480	
.824	497	489.325	477	712.66	480	D
.732	517	510.224	459	472.01	670	D
.635	212	221.385	184	531.56	670	
.593	304	289.303	262	434.26	670	
.538	473	492.206	494	714.28	670	
.445	433	507.373	438	825.2	670	D
.349	286	342.89	298	754.84	670	
.284	0	0	0	870.85	670	D

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

XS JT 01 Junction option is used.
For flood insurance study, this option should be used
if the tributary and main stream can have coincident peaks,
or it may be used for the stream without floodway.
It may also be used if the discharges at different time periods
are known from the rainfall-runoff model.
How to remove the junction is explained under Help.

SPACING CHECK

INEFFECTIVE FLOW CHECK

RS: 3.962
XS IF 01 Right Levee option is used at this river station

```
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.787
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.578
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.461
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.752
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.175
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.674
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.282
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.382
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      0.593
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      0.284
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.431
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.336
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      0.899
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.
```

```
RS:       0.831
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.585
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.284
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.707
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.602
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.506
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.409
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.297
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.221
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.
```

DISCHARGE CHECK

```
XS DC 02 Constant dicharge used for the T4N-R3W-S16,Reach-1a

XS DC 02 Constant dicharge used for the T4N-R3W-S16,Reach-1

XS DC 02 Constant dicharge used for the T4N-R3W-S18E,Reach-2

XS DC 02 Constant dicharge used for the T4N-R3W-S18E,Reach-3
```

LOCATION CHECK

```
RS:       0.317
XS LC 01 Lenchl Up/TopwdthAct Dn = 3.82
         MaxChlDpth Up/MaxChlDpth Dn = 1.23
         TopwdthAct Up/TopwdthAct Dn = 1.43
         This cross section is located too far upstream from the
         critical depth cross section.

RS:       1.64
XS LC 01 Lenchl Up/TopwdthAct Dn = 1.50
         MaxChlDpth Up/MaxChlDpth Dn = 1.71
         TopwdthAct Up/TopwdthAct Dn = 1.47
         This cross section is located too far upstream from the
         critical depth cross section.

RS:       2.26
XS LC 01 Lenchl Up/TopwdthAct Dn = 2.23
         MaxChlDpth Up/MaxChlDpth Dn = 2.26
         TopwdthAct Up/TopwdthAct Dn = 2.13
         This cross section is located too far upstream from the
         critical depth cross section.


BOUNDARY CONDITION CHECK
------------------------

XS BC 02 The name of the stream is T4N-R3W-S16,Reach-3
         Normal S = 0.006 is specified as the downstream boundary
         for profile 1

XS BC 02 The name of the stream is T4N-R3W-S16,Reach-3
         Normal S = 0.006 is specified as the downstream boundary
         for profile 2

XS BC 03 Maximum number of iterations is 0
         It should not be less than 20.


LATERAL WEIRS CHECK
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---END---
```

CHECK-RAS Program: Floodway Check
Encroachment Method, Starting WSEL, Floodway Width, and Surcharge Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.p01
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.fw
Selected profiles: 1;2
Date: 6/8/2006
Time: 9:58:28 AM

SECNO	Method	Surcharge	EncStaL	EncStaR	LStaEff	RStaEff	Structure
T4N-R3W-S07,Reach-1							
1.993					9850.06	10135.56	
1.993	19	0.05	9926.35	10117.5	9926.35	10117.5	
1.893					9838.62	10109.52	
1.893	1	0.3	9907.6	10034.11	9907.6	10034.11	
1.807					9804.98	10105.9	
1.807	19	0.15	9917.66	10045.5	9917.66	10045.5	
1.71					9883.05	10114.97	
1.71	19	0.1	9948.33	10095.83	9948.33	10095.83	
1.617					9859.95	10093.48	
1.617	19	0.04	9936.89	10033.77	9936.89	10033.77	
1.524					9828.84	10107.98	
1.524	19	0.27	9963.83	10081.85	9963.83	10081.85	
1.431					9867.89	10116.04	
1.431	19	0.11	9972.87	10086.94	9972.87	10086.94	
1.336					9903.35	10176.98	
1.336	19	0.22	9931.99	10066.7	9931.99	10066.7	
1.241					9666.93	10108.21	
1.241	19	0.4	9915.33	10067.64	9915.33	10067.64	
1.137					9804.36	10084.67	
1.137	19	0.17	9886.58	10063.33	9886.58	10063.33	
1.051					9715.45	10047.95	
1.051	1	0.36	9897.9	10020.05	9897.9	10020.05	
0.948					9804.3	10107.97	
0.948	19	0.32	9944.67	10056.94	9944.67	10056.94	
0.859					9629.39	10175.94	
0.859	1	0.23	9906.4	10121.1	9906.4	10121.1	
0.767					9709.28	10153.25	
0.767	19	0.27	9855.25	10021.62	9855.25	10021.62	
0.684					9852.07	10118.72	
0.684	19	0.02	9928.03	10054.51	9928.03	10054.51	
0.581					9810.56	10085.78	
0.581	19	0.21	9890.46	10047.36	9890.46	10047.36	
0.477					9823.05	10183.53	
0.477	19	0.27	9938.99	10053.24	9938.99	10053.24	
0.399					9846.06	10121.11	
0.399	1	0.14	9932.6	10075.78	9932.6	10075.78	
0.317					9859.4	10131.94	
0.317	19	0.37	9959.65	10081.01	9959.65	10081.01	
0.18					9922.49	10112.91	
0.18	19	0.04	9961.85	10054.21	9961.85	10054.21	
T4N-R3W-S16,Reach-1a							
1.648					9582.55	10026.69	
1.648	1	0.89	9893.6	10027.01	9893.6	10027.01	
1.644					9585.14	10023.35	
1.644	19	0.89	9892.95	10023.68	9892.95	10023.68	
T4N-R3W-S16,Reach-1							

1.64					9587.94	10022.28
1.64	19	0.89	9892.95	10022.6	9892.95	10022.6
1.556					9731.17	10033.86
1.556	1	0.16	9905	10033.88	9905	10033.88
T4N-R3W-S16,Reach-2						
1.184					9353.68	10019.49
1.184	1	0.2	9672.7	10019.49	9672.7	10019.49
1.089					9299.5	10027.9
1.089	19	0.08	9670.52	10027.9	9670.52	10027.9
0.995					9384.55	10025.99
0.995	19	0.24	9665.29	10025.99	9665.29	10025.99
0.899					9414.04	10033.99
0.899	19	0.15	9651.92	10033.99	9651.92	10033.99
0.831					9576.24	10022.25
0.831	19	0	9598.89	10022.25	9598.89	10022.25
T4N-R3W-S16,Reach-3						
0.707					9360.41	10163.09
0.707	19	0.31	9659.37	10044.36	9659.37	10044.36
0.602					9532.84	10025.77
0.602	19	0.33	9663.35	10025.79	9663.35	10025.79
0.506					9350.56	10033.61
0.506	19	0.19	9675.32	10033.61	9675.32	10033.61
0.409					9513.97	10201.03
0.409	19	0	9675.77	10201.26	9675.77	10201.05
0.297					9456.07	10112.51
0.297	19	0.15	9495.51	10093.55	9495.51	10093.55
0.221					9481.85	10151.78
0.221	19	0.48	9481.82	10022.13	9481.82	10022.13
0.102					9260.16	10139.71
0.102	19	0.53	9260.07	10019.3	9260.07	10019.3
0					9655.36	10102.07
0	19	0.53	9654.78	10010.33	9654.78	10010.33
T4N-R3W-S17,Reach-1						
2.757					9863.91	10210.79
2.757	19	0.29	9930.12	10034.43	9930.12	10034.43
2.673					9808.13	10180.39
2.673	19	0.3	9949.12	10065	9949.12	10065
2.584					9782.06	10360.01
2.584	19	0.55	9919.39	10051	9919.39	10051
2.473					9680.22	10268.78
2.473	19	0.21	9931.37	10135.39	9931.37	10135.39
2.391					9752.55	10251.9
2.391	19	0.23	9895.68	10085	9895.68	10085
2.298					9790.41	10367.56
2.298	1	0.01	9950	10204.68	9950	10204.68
2.215					9838.54	10302.64
2.215	19	0.14	9963.18	10202	9963.18	10202
2.124					9855.82	10192.87
2.124	19	0	9937.45	10065.24	9937.45	10065.24
2.029					9828.46	10337.42
2.029	19	0.26	9923.37	10176.53	9923.37	10176.53
1.923					9818.04	10211.01
1.923	19	0.58	9924.01	10043	9924.01	10043
1.828					9812.77	10201.74
1.828	19	0.18	9967.73	10105	9967.73	10105
1.744					9658.32	10169.32
1.744	1	0.13	9835	10071	9835	10071
1.627					9775.3	10201.22
1.627	19	0.06	9856.34	10073.11	9856.34	10073.11
T4N-R3W-S17,Reach-2						
1.55					9390.64	10286.25
1.55	19	0.22	9504.15	10115.32	9504.15	10115.32
1.455					9504.8	10289.43
1.455	19	0.43	9817.52	10175.51	9817.52	10175.51
1.366					9817.54	10305.03
1.366	19	0.15	9880.69	10123.58	9880.69	10123.58
1.268					9862.86	10304.1

1.268	1	0.27	9951.8	10166.48	9951.8	10166.48
1.172					9697.33	10168.8
1.172	19	0.37	9885.72	10091.33	9885.72	10091.33
1.071					9700.75	10222.19
1.071	19	0.17	9805.79	10064.68	9805.79	10064.68
0.973					9796.66	10165.47
0.973	19	0.17	9889.86	10084.37	9889.86	10084.37
0.877					9779.47	10201.86
0.877	19	0.51	9901.99	10046.42	9901.99	10046.42
0.778					9769.91	10302.47
0.778	19	0.69	9895.64	10030	9895.64	10030
0.679					9782.66	10291.09
0.679	19	0.74	9887.48	10028.95	9887.48	10028.95
0.585					9752.79	10293.37
0.585	19	0.51	9952.37	10109.36	9952.37	10109.36
0.482					9654.67	10197.1
0.482	19	0.95	9908.93	10072.69	9908.93	10072.69
0.382					9817.5	10176.33
0.382	19	0.54	9941.43	10038.96	9941.43	10038.96
0.284					9816.37	10176.62
0.284	19	0.48	9905.34	10050.4	9905.34	10050.4
0.186					9771.44	10173.21
0.186	19	0.77	9921.37	10074.88	9921.37	10074.88
0.153					9780.44	10201.35
0.153	19	0.34	9947.04	10071.68	9947.04	10071.68
T4N-R3W-S18E,Reach-1						
4.247					9929.67	10135.04
4.247	19	0.32	9942.11	10030.65	9942.11	10030.65
4.135					9951.89	10125.83
4.135	19	0.03	9974.55	10070.87	9974.55	10070.87
4.059					9953.07	10140.55
4.059	19	0.4	9959.33	10058.56	9959.33	10058.56
3.962					9978.73	10734.48
3.962	19	0	9981.24	10254.73	9981.24	10254.73
3.872					9961.75	10443.28
3.872	19	0.56	9950.66	10056.02	9950.66	10056.02
3.787					9860.83	10172.82
3.787	19	0.11	9916.24	10101.54	9916.24	10101.54
3.706					9460.53	10135.29
3.706	19	0.08	9800.14	10049.1	9800.14	10049.1
3.578					9785.82	10175.41
3.578	19	0.11	9871.27	10141.7	9871.27	10141.7
3.461					9873.18	10159.38
3.461	19	0.01	9916.08	10104.11	9916.08	10104.11
3.344					9770.69	10112.1
3.344	19	0.2	9833.58	10027.15	9833.58	10027.15
3.264					9817.74	10390.81
3.264	19	0.5	9937.76	10085.92	9937.76	10085.92
3.153					9813.86	10420.11
3.153	19	0.59	9904.51	10046.15	9904.51	10046.15
3.059					9880.69	10351.6
3.059	19	0.14	9923.79	10140.09	9923.79	10140.09
2.961					9731.16	10216.4
2.961	19	0.21	9891.21	10094.01	9891.21	10094.01
2.86					9602.53	10182.7
2.86	19	0.39	9891.37	10059.98	9891.37	10059.98
2.752					9386.15	10340.24
2.752	1	0.54	9860.1	10120.31	9860.1	10120.31
2.656					9413.27	10581.92
2.656	19	0.16	9789.91	10256.87	9789.91	10256.87
2.562					9531.52	10406.13
2.562	1	0.2	9799.6	10112.85	9799.6	10112.85
2.468					9560.3	10276.31
2.468	19	0.06	9792.36	10106.9	9792.36	10106.9
2.374					9111.76	10134.46
2.374	19	0.3	9799.95	10122.81	9799.95	10122.81
2.276					9171.4	10201.26

2.276	19	0.27	9872.53	10099.36	9872.53	10099.36
T4N-R3W-S18E,Reach-2						
2.26					9181.73	9610.2
2.26	0	-0.84	0	0	9470.54	9470.95
2.175					9323.71	9524.98
2.175	0	-0.35	0	0	9374.67	9383.35
2.081					9140.29	9710.99
2.081	0	-0.07	0	0	9149.26	9710.2
T4N-R3W-S18E,Reach-3						
2.26					9610.2	10226.04
2.26	1	0.27	9874	10115.56	9874	10115.56
2.175					9699.67	10213.78
2.175	19	0.5	9920.26	10069.93	9920.26	10069.93
2.081					9742.25	10210.18
2.081	1	0.27	9896.9	10098.48	9896.9	10098.48
T4N-R3W-S18E,Reach-4						
1.945					9536.6	10142.23
1.945	1	0.36	9826.4	10030.9	9826.4	10030.9
1.866					9617.36	10189.1
1.866	19	0.39	9845.14	10020.76	9845.14	10020.76
1.773					9571.48	10164.67
1.773	19	1	9918.25	10037.91	9918.25	10037.91
1.674					9470.6	10269.72
1.674	19	0.94	9950.31	10060.02	9950.31	10060.02
1.58					9485.92	10258.41
1.58	19	0.69	9935.93	10062.08	9935.93	10062.08
1.486					9514.11	10236.69
1.486	19	0.11	9880.11	10097.49	9880.11	10097.49
1.378					9666.32	10235.4
1.378	19	0.65	9899.83	10101.9	9899.83	10101.9
1.282					9533.38	10224.77
1.282	19	0.55	9875.71	10019.58	9875.71	10019.58
1.192					9696.51	10421.47
1.192	19	0.73	9924.36	10079.68	9924.36	10079.68
1.095					9387.86	10185.06
1.095	19	0.86	9955.85	10110.94	9955.85	10110.94
0.998					9690.31	10181.11
0.998	19	0.75	9911.69	10064.24	9911.69	10064.24
0.879					9772	10535.52
0.879	19	0.36	9859.16	10078.92	9859.16	10078.92
0.803					9795.15	10401.1
0.803	19	0.28	9888.37	10109.97	9888.37	10109.97
0.709					9805.74	10458.05
0.709	19	0.16	9890.83	10096.21	9890.83	10096.21
0.615					9865.67	10154.83
0.615	19	0.52	9931.17	10079.22	9931.17	10079.22
0.517					9795.93	10176.33
0.517	19	0.55	9921.77	10050.37	9921.77	10050.37
0.422					9608.45	10177.63
0.422	19	0.53	9903.13	10078.6	9903.13	10078.6
0.326					9392.84	10192.09
0.326	1	0.62	9898.5	10059.93	9898.5	10059.93
0.228					9448.23	10138.7
0.228	19	0	9678.11	10079.89	9678.11	10079.89
T4N-R3W-S18W,Reach-1						
2.537					9901.01	10218.6
2.537	19	0.17	9971.06	10118.41	9971.06	10118.41
2.445					9838.58	10260.5
2.445	19	0.14	9990.39	10151.51	9990.39	10151.51
2.351					9770.72	10168.16
2.351	19	0.12	9902.08	10093.07	9902.08	10093.07
2.26					9848.3	10218.1
2.26	19	0.14	9933.15	10090.44	9933.15	10090.44
2.173					9847.08	10162.54
2.173	19	0.15	9933.03	10083.59	9933.03	10083.59
2.08					9784.03	10181.35
2.08	19	0.18	9982.01	10140.08	9982.01	10140.08

1.987					9832.05	10169.89
1.987	19	0.14	9953.21	10103.1	9953.21	10103.1
1.928					9830.8	10192.23
1.928	19	0.36	9937.18	10064.36	9937.18	10064.36
1.838					9776.55	10343.64
1.838	19	0.21	9888.06	10081.01	9888.06	10081.01
1.75					9762.01	10226.84
1.75	19	0.28	9921.64	10129.27	9921.64	10129.27
1.664					9760.83	10229.27
1.664	19	0	9813.09	10054.76	9813.09	10054.76
1.567					9713.18	10350.81
1.567	19	0.25	9818.94	10113.05	9818.94	10113.05
1.477					9737.53	10440.06
1.477	19	0.01	9920.34	10107.51	9920.34	10107.51
1.382					9794.34	10303.52
1.382	19	0.27	9876.12	10061.04	9876.12	10061.04
1.296					9341.49	10314.12
1.296	19	0.7	9897.07	10135.12	9897.07	10135.12
1.196					9227.56	10092.4
1.196	19	0.19	9549.79	10046.13	9549.79	10046.13
1.104					9389.86	10479.2
1.104	19	0.56	9775.19	10067.98	9775.19	10067.98
1.012					9542.86	10349.74
1.012	19	0.44	9874.33	10101.1	9874.33	10101.1
0.92					9676.2	10260.28
0.92	19	0.41	9826.51	10067.94	9826.51	10067.94
0.824					9634.88	10392.86
0.824	19	0.2	9941.59	10150.52	9941.59	10150.52
0.732					9778.54	10343.44
0.732	19	0.66	9981.49	10137.62	9981.49	10137.62
0.635					9823.58	10355.14
0.635	19	0.41	9936.58	10078.03	9936.58	10078.03
0.593					9790.59	10224.85
0.593	19	0.37	9941.97	10162.77	9941.97	10162.77
0.538					9817.86	10532.14
0.538	19	0.54	9990.61	10179.79	9990.61	10179.79
0.445					9448.95	10346.47
0.445	19	0.64	9893.97	10094.96	9893.97	10094.96
0.349					9349.92	10104.77
0.349	19	0.66	9940.23	10066.55	9940.23	10066.55
0.284					9152.03	10086.14
0.284	19	0.97	9878.83	10037.13	9878.83	10037.13

ENCROACHMENT METHOD CHECK

RS: 2.26
FW EM 01 Floodway encroachment method is not selected at this section.

RS: 2.175
FW EM 01 Floodway encroachment method is not selected at this section.

RS: 2.081
FW EM 01 Floodway encroachment method is not selected at this section.

FLOODWAY WIDTH CHECK

RS: 1.993
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.993
FW FW 03 The right channel bank station may not be at the proper

location.

RS: 1.893
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.807
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.807
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.71
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.617
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.524
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.524
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.431
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.336
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.051
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.948
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.767
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.684
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.581
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.581
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.477
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.399

FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.317
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.317
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.648
FW FW 04 The right station effective of 10026.69 for 1% annual chance floodplain is greater than the right channel bank station (10018.77).
The 1% annual chance floodplain is outside the channel.
However, the right encroachment station (10027.01) is outside of 1% annual chance floodplain.
The right encroachment station should be adjusted.

RS: 1.644
FW FW 04 The right station effective of 10023.35 for 1% annual chance floodplain is greater than the right channel bank station (10015.48).
The 1% annual chance floodplain is outside the channel.
However, the right encroachment station (10023.68) is outside of 1% annual chance floodplain.
The right encroachment station should be adjusted.

RS: 1.64
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.64
FW FW 04 The right station effective of 10022.28 for 1% annual chance floodplain is greater than the right channel bank station (10014.96).
The 1% annual chance floodplain is outside the channel.
However, the right encroachment station (10022.6) is outside of 1% annual chance floodplain.
The right encroachment station should be adjusted.

RS: 1.556
FW FW 04 The right station effective of 10033.86 for 1% annual chance floodplain is greater than the right channel bank station (10033.15).
The 1% annual chance floodplain is outside the channel.
However, the right encroachment station (10033.88) is outside of 1% annual chance floodplain.
The right encroachment station should be adjusted.

RS: 1.089
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.089
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.995
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.995
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.831
FW FW 03 The right channel bank station may not be at the proper location.

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RS:        0.602
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.602
FW FW 04   The right station effective of 10025.77 for 1% annual chance floodplain
           is greater than the right channel bank station (10017.5).
           The 1% annual chance floodplain is outside the channel.
           However, the right encroachment station (10025.79) is outside of 1% annual
           chance floodplain.
           The right encroachment station should be adjusted.

RS:        0.409
FW FW 04   The right station effective of 10201.03 for 1% annual chance floodplain
           is greater than the right channel bank station (10068.46).
           The 1% annual chance floodplain is outside the channel.
           However, the right encroachment station (10201.26) is outside of 1% annual
           chance floodplain.
           The right encroachment station should be adjusted.

RS:        0.297
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.297
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.221
FW FW 04   The left station effective of 9481.85 for 1% annual chance floodplain
           is less than the left channel bank station 9828.61
           The 1% annual chance floodplain is outside the channel.
           However, the left encroachment station (9481.82) is outside of 1% annual
           chance floodplain.
           The left encroachment station should be adjusted.

RS:        0.102
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.102
FW FW 04   The left station effective of 9260.16 for 1% annual chance floodplain
           is less than the left channel bank station 9928.72
           The 1% annual chance floodplain is outside the channel.
           However, the left encroachment station (9260.07) is outside of 1% annual
           chance floodplain.
           The left encroachment station should be adjusted.

RS:        0
FW FW 04   The left station effective of 9655.36 for 1% annual chance floodplain
           is less than the left channel bank station 9988.34
           The 1% annual chance floodplain is outside the channel.
           However, the left encroachment station (9654.78) is outside of 1% annual
           chance floodplain.
           The left encroachment station should be adjusted.

RS:        2.757
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.673
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.584
FW FW 03   The right channel bank station may not be at the proper
           location.
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RS:        2.473
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.391
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.029
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.923
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.828
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        1.627
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.455
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.366
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.172
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        1.071
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.071
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.973
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.877
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.585
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.482
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.284
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.153
FW FW 03   The Left channel bank station may not be at the proper
```

location.

RS: 0.153
FW FW 03 The right channel bank station may not be at the proper location.

RS: 4.135
FW FW 03 The right channel bank station may not be at the proper location.

RS: 4.059
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 3.787
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 3.461
FW FW 03 The right channel bank station may not be at the proper location.

RS: 3.344
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 3.264
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 3.264
FW FW 03 The right channel bank station may not be at the proper location.

RS: 3.059
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.562
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.374
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.276
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.26
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.26
FW FW 06 The left station effective of 9470.54 for the floodway profile is more than the left channel bank station of 9432.79
The left side of the floodway boundary is within the channel.
The left encroachment station of 0 is less than the left channel bank station.
The left encroachment station should be the same as the left channel bank station.

RS: 2.175
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.175
FW FW 06 The left station effective of 9374.67 for the floodway profile is more than the left channel bank station of 9329.26
The left side of the floodway boundary is within the channel.
The left encroachment station of 0 is less than the left channel bank station.
The left encroachment station should be the same as the left channel bank station.

RS: 2.26
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.081
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.866
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.773
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.674
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.58
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.486
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.486
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.378
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.378
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.095
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.998
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.709
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.422
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.422
FW FW 03 The right channel bank station may not be at the proper

location.

RS: 0.326
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.326
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.537
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.445
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.351
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.173
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.08
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.987
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.987
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.477
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.382
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.104
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.012
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.732
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.635
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.593
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.349

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FW FW 03  The right channel bank station may not be at the proper
          location.

SURCHARGE CHECK
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RS:       2.26
FW SC 01  The surcharge value is negative.

RS:       2.175
FW SC 01  The surcharge value is negative.

DISCHARGE CHECK
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RS:       2.26
FW FD 01  The floodway discharge of 0 is not equal to the natural 1% chance
          discharge of 70
          Please justify the use of different discharges for the natural and
floodway profiles.

RS:       2.175
FW FD 01  The floodway discharge of 0 is not equal to the natural 1% chance
          discharge of 70
          Please justify the use of different discharges for the natural and
floodway profiles.

RS:       2.081
FW FD 01  The floodway discharge of 0 is not equal to the natural 1% chance
          discharge of 70
          Please justify the use of different discharges for the natural and
floodway profiles.

RS:       2.26
FW FD 01  The floodway discharge of 650 is not equal to the natural 1% chance
          discharge of 580
          Please justify the use of different discharges for the natural and
floodway profiles.

RS:       2.175
FW FD 01  The floodway discharge of 650 is not equal to the natural 1% chance
          discharge of 580
          Please justify the use of different discharges for the natural and
floodway profiles.

RS:       2.081
FW FD 01  The floodway discharge of 650 is not equal to the natural 1% chance
          discharge of 580
          Please justify the use of different discharges for the natural and
floodway profiles.

STARTING WATER-SURFACE ELEVATION CHECK
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---END---
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HEC-RAS Report for Washes:
T4N-R3W-S07
T4N-R3W-S16
T4N-R3W-S17
T4N-R3W-S18E
T4N-R3W-S18W

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

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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
```

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PROJECT DATA
Project Title: WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W
Project File : WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.prj
Run Date and Time: 7/27/2006 10:38:47 AM

Project in English units

Project Description:
WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY, Contract FCD2004C066, also known as the WITTMANN PHASE 2 ZONE AE FLOODPLAIN DELINEATION STUDY

Prepared
by David Evans and Associates Inc.
Initial modeling in January 2006, updated
in May 2006
Modeled by Frank Brown, P.E., CFM and Nathan Logan,
E.I.T.

HEC-RAS Version 3.1.3 is utilized for floodplain and floodway delineation. Floodway is based upon equal conveyance reduction (RAS Method 4), and refined with set floodway locations (RAS Method 1).
Filename:
WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.PRJ

Vertical datum:
NAVD1988

Topography and aerial photography provided by FCDMC, origin is the Wittmann ADMS/ADMSU (FCD 2002C029), flight dates are 04/18/02, 04/19/02 and 04/23/02 at 1:7200 ratio and 04/23/02 at 1:14400 ratio.

DTM data provided by
Wittmann ADMSU consultant from contract FCD 2002C029.

Manning's 'n' values
were determined by field reconnaissance; see the Technical Data Notebook for more detailed information.

Flow rates are from the Hydrology Computations
Appendix of the Technical Data Notebook; please refer to the Flow Rate Exhibit and the computations for the interpolated and intermediate values.

The
cross-sections RM 3.787 to RM 2.752 on Wash T4N-R3W-S18E were surveyed by DEA; see the survey report in the Technical Data Notebook for more detailed information.
For these surveyed cross sections, some discrepancies are
apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations; therefore, survey takes precedence over the topographic mapping.

Wash T4N-R3W-S18E Reach-2
information: There is no floodway for this reach. The HEC-RAS model contains zero flow in the Reach-2 floodway profile and reports a negative surcharge for all three island cross sections, even though no encroachment stations are set. The negative surcharges should be ignored for Wash T4N-R3W-S18E Reach-2 at RM 2.260, RM 2.175 and RM 2.081.

****

PLAN DATA

Plan Title: FLOODPLAIN
Plan File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.p01

Geometry Title: SOUTHWEST WASHES
Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.g01

Flow Title : FLOODPLAIN
Flow File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.f01

Plan Summary Information:

Number of:	Cross Sections =	139	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

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 =	True	
Left Offset =	0	
Right Offset =	0	

River = T4N-R3W-S07 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.993	2	1	9926.35	10117.5
1.893	2	1	9907.61	10034.11
1.807	2	1	9917.66	10045.5
1.710	2	1	9948.33	10095.83
1.617	2	1	9936.89	10033.77
1.524	2	1	9963.83	10081.85
1.431	2	1	9972.87	10086.94
1.336	2	1	9931.99	10066.7
1.241	2	1	9915.33	10067.64
1.137	2	1	9886.58	10063.33
1.051	2	1	9897.91	10020.05
0.948	2	1	9944.67	10056.94
0.859	2	1	9935.31	10079.75
0.767	2	1	9855.25	10021.62
0.684	2	1	9928.03	10054.51
0.581	2	1	9890.46	10047.36
0.477	2	1	9938.99	10053.24
0.399	2	1	9932.61	10075.78
0.317	2	1	9959.65	10081.01
0.180	2	1	9961.85	10054.21

River = T4N-R3W-S16 Reach = Reach-1

```
RS       Profile            Method  Value1  Value2
1.640    2                       1 9892.95 10022.6
1.556    2                       1    990510033.88

River = T4N-R3W-S16       Reach = Reach-1a
RS       Profile            Method  Value1  Value2
1.648    2                       1  9893.610027.01
1.644    2                       1 9892.9510023.68

River = T4N-R3W-S16       Reach = Reach-2
RS       Profile            Method  Value1  Value2
1.184    2                       1 9733.3710019.49
1.089    2                       1 9675.84 10027.9
0.995    2                       1 9665.2910025.99
0.899    2                       1 9651.9210033.99
0.831    2                       1 9598.8910022.25

River = T4N-R3W-S16       Reach = Reach-3
RS       Profile            Method  Value1  Value2
0.707    2                       1 9659.3710044.36
0.602    2                       1 9663.3510025.79
0.506    2                       1 9517.6810033.61
0.409    2                       1 9513.9710201.26
0.297    2                       1 9456.07 10063.3
0.221    2                       1 9481.8210022.13
0.102    2                       1 9260.07 10019.3
0.000    2                       1 9654.7810010.33

River = T4N-R3W-S17       Reach = Reach-1
RS       Profile            Method  Value1  Value2
2.757    2                       1 9930.1210034.43
2.673    2                       1 9949.12   10065
2.584    2                       1 9919.39   10051
2.473    2                       1 9931.3710135.39
2.391    2                       1 9895.68   10085
2.298    2                       1 9959.7410197.53
2.215    2                       1 9963.1810182.16
2.124    2                       1 9937.4510065.24
2.029    2                       1 9923.3710176.53
1.923    2                       1 9924.01   10043
1.828    2                       1 9967.73   10105
1.744    2                       1    9835   10071
1.627    2                       1 9856.3410073.11

River = T4N-R3W-S17       Reach = Reach-2
RS       Profile            Method  Value1  Value2
1.550    2                       1 9504.1510115.32
1.455    2                       1 9817.5210175.51
1.366    2                       1 9880.6910123.58
1.268    2                       1  9951.810166.48
1.172    2                       1 9885.7210091.33
1.071    2                       1 9821.7210041.31
0.973    2                       1 9889.8610084.37
0.877    2                       1 9901.9910046.42
0.778    2                       1 9895.64   10030
0.679    2                       1 9887.4810028.95
0.585    2                       1 9952.3710109.36
0.482    2                       1 9908.9310072.69
0.382    2                       1 9941.4310038.96
0.284    2                       1 9905.34 10050.4
0.186    2                       1 9921.3710074.88
0.153    2                       1 9947.0410071.68

River = T4N-R3W-S18E      Reach = Reach-1
RS       Profile            Method  Value1  Value2
4.247    2                       1 9942.1110030.65
4.135    2                       1 9974.5510070.87
4.059    2                       1 9959.3310058.56
3.962    2                       1 9981.2410254.73
3.872    2                       1 9950.6610056.02
3.787    2                       1 9916.2410101.54
```

3.706	2	1	9800.14	10049.1
3.578	2	1	9871.27	10141.7
3.461	2	1	9916.08	10104.11
3.344	2	1	9833.58	10027.15
3.264	2	1	9937.76	10085.92
3.153	2	1	9904.51	10046.15
3.059	2	1	9923.79	10140.09
2.961	2	1	9891.21	10094.01
2.860	2	1	9891.37	10059.98
2.752	2	1	9860.11	10120.31
2.656	2	1		987110215.51
2.562	2	1	9799.61	10112.85
2.468	2	1	9792.36	10106.9
2.374	2	1	9799.95	10122.81
2.276	2	1	9872.53	10099.36

River = T4N-R3W-S18E Reach = Reach-3

RS	Profile	Method	Value1	Value2
2.260	2	1		987410115.56
2.175	2	1	9920.26	10069.93
2.081	2	1	9896.91	10098.48

River = T4N-R3W-S18E Reach = Reach-4

RS	Profile	Method	Value1	Value2
1.945	2	1	9826.4	10030.9
1.866	2	1	9845.14	10020.76
1.773	2	1	9918.25	10037.91
1.674	2	1	9950.31	10060.02
1.580	2	1	9935.93	10062.08
1.486	2	1	9880.11	10097.49
1.378	2	1	9899.83	10101.9
1.282	2	1	9875.71	10019.58
1.192	2	1	9924.36	10079.68
1.095	2	1	9955.85	10110.94
0.998	2	1	9911.69	10064.24
0.879	2	1	9859.16	10078.92
0.803	2	1	9888.37	10109.97
0.709	2	1	9890.83	10096.21
0.615	2	1	9931.17	10079.22
0.517	2	1	9921.77	10050.37
0.422	2	1	9903.13	10078.6
0.326	2	1	9898.51	10059.93
0.228	2	1	9893.93	10079.89

River = T4N-R3W-S18W Reach = Reach-1

RS	Profile	Method	Value1	Value2
2.537	2	1	9971.06	10118.41
2.445	2	1	9990.39	10151.51
2.351	2	1	9902.08	10093.07
2.260	2	1	9933.15	10090.44
2.173	2	1	9933.03	10083.59
2.080	2	1	9982.01	10140.08
1.987	2	1	9953.21	10103.1
1.928	2	1	9937.18	10064.36
1.838	2	1	9888.06	10081.01
1.750	2	1	9921.64	10129.27
1.664	2	1	9813.09	10054.76
1.567	2	1	9818.94	10113.05
1.477	2	1	9920.34	10107.51
1.382	2	1	9876.12	10061.04
1.296	2	1	9897.07	10135.12
1.196	2	1	9636.77	10013.09
1.104	2	1	9775.19	10067.98
1.012	2	1	9874.33	10101.1
0.920	2	1	9826.51	10067.94
0.824	2	1	9941.59	10150.52
0.732	2	1	9981.49	10137.62
0.635	2	1	9936.58	10078.03
0.593	2	1	9941.97	10162.77
0.538	2	1	9990.61	10179.79
0.445	2	1	9893.97	10094.96

```
0.349   2                        1 9940.2310066.55
0.284   2                        1 9878.8310037.13

*****************************************************************************

FLOW DATA

Flow Title: FLOODPLAIN
Flow File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.f01

Flow Data (cfs)
*****************************************************************************
* River           Reach           RS      *              1              2 *
* T4N-R3W-S07     Reach-1         1.993   *            220            220 *
* T4N-R3W-S07     Reach-1         0.948   *            310            310 *
* T4N-R3W-S07     Reach-1         0.399   *            390            390 *
* T4N-R3W-S16     Reach-1a        1.648   *            810            810 *
* T4N-R3W-S16     Reach-1         1.640   *            810            810 *
* T4N-R3W-S16     Reach-2         1.184   *           2000           2000 *
* T4N-R3W-S16     Reach-2         1.089   *           2710           2710 *
* T4N-R3W-S16     Reach-3         0.707   *           2710           2710 *
* T4N-R3W-S16     Reach-3         0.506   *           3140           3140 *
* T4N-R3W-S17     Reach-1         2.757   *            250            250 *
* T4N-R3W-S17     Reach-1         2.029   *            430            430 *
* T4N-R3W-S17     Reach-2         1.550   *            820            820 *
* T4N-R3W-S17     Reach-2         0.877   *           1210           1210 *
* T4N-R3W-S17     Reach-2         0.382   *           1600           1600 *
* T4N-R3W-S18E    Reach-1         4.247   *            120            120 *
* T4N-R3W-S18E    Reach-1         3.787   *            280            280 *
* T4N-R3W-S18E    Reach-1         3.264   *            450            450 *
* T4N-R3W-S18E    Reach-1         2.752   *            540            540 *
* T4N-R3W-S18E    Reach-1         2.276   *            650            650 *
* T4N-R3W-S18E    Reach-2         2.260   *             70          .0001 *
* T4N-R3W-S18E    Reach-3         2.260   *            580            650 *
* T4N-R3W-S18E    Reach-4         1.945   *            650            650 *
* T4N-R3W-S18E    Reach-4         1.773   *            810            810 *
* T4N-R3W-S18E    Reach-4         1.282   *            930            930 *
* T4N-R3W-S18E    Reach-4         0.879   *           1060           1060 *
* T4N-R3W-S18E    Reach-4         0.422   *           1190           1190 *
* T4N-R3W-S18W    Reach-1         2.537   *            250            250 *
* T4N-R3W-S18W    Reach-1         1.750   *            350            350 *
* T4N-R3W-S18W    Reach-1         1.296   *            480            480 *
* T4N-R3W-S18W    Reach-1         0.732   *            670            670 *
*****************************************************************************

Boundary Conditions
*****************************************************************************************************
*******
* River           Reach           Profile         *           Upstream
Downstream    *
*****************************************************************************************************
*******
* T4N-R3W-S16     Reach-3         1               *                                   Normal S =
0.006 *
* T4N-R3W-S16     Reach-3         2               *                                   Normal S =
0.006 *
*****************************************************************************************************
*******

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GEOMETRY DATA

Geometry Title: SOUTHWEST WASHES
Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITT_PH2_T4N_R3W_S07_S16_S17_S18E_S18W.g01

Reach Connection Table
*****************************************************************************
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River	Reach	Upstream Boundary	Downstream Boundary
T4N-R3W-S07	Reach-1		J-S17-REACH-2
T4N-R3W-S16	Reach-1a		J-S16-REACH-1
T4N-R3W-S16	Reach-1	J-S16-REACH-1	J-S16-REACH-2
T4N-R3W-S16	Reach-2	J-S16-REACH-2	J-S16-REACH-3
T4N-R3W-S16	Reach-3	J-S16-REACH-3	
T4N-R3W-S17	Reach-1		J-S17-REACH-2
T4N-R3W-S17	Reach-2	J-S17-REACH-2	J-S16-REACH-3
T4N-R3W-S18E	Reach-1		J-18E-REACH-2,3
T4N-R3W-S18E	Reach-2	J-18E-REACH-2,3	J-18W-REACH-
T4N-R3W-S18E	Reach-3	J-18E-REACH-2,3	J-18W-REACH-
T4N-R3W-S18E	Reach-4	J-18W-REACH-	J-S16-REACH-2
T4N-R3W-S18W	Reach-1		J-S16-REACH-1

JUNCTION INFORMATION

Name: J-S16-REACH-2
Description: JUNCTION OF WASH T4N-R3W-S18E WITH WASH T4N-R3W-S16
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S16	Reach-1	to T4N-R3W-S16	Reach-2	1964.37	
T4N-R3W-S18E	Reach-4	to T4N-R3W-S16	Reach-2	1968.3	

Name: J-S16-REACH-3
Description: JUNCTION OF WASH T4N-R3W-S17 WITH WASH T4N-R3W-S16
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S16	Reach-2	to T4N-R3W-S16	Reach-3	654.49	
T4N-R3W-S17	Reach-2	to T4N-R3W-S16	Reach-3	807.84	

Name: J-18E-REACH-2,3
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S18E	Reach-1	to T4N-R3W-S18E	Reach-3	83.44	
T4N-R3W-S18E	Reach-1	to T4N-R3W-S18E	Reach-2	83.44	

Name: J-18W-REACH-
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S18E	Reach-3	to T4N-R3W-S18E	Reach-4	718.24	
T4N-R3W-S18E	Reach-2	to T4N-R3W-S18E	Reach-4	718.24	

Name: J-S16-REACH-1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S16	Reach-1a	to T4N-R3W-S16	Reach-1	20	
T4N-R3W-S18W	Reach-1	to T4N-R3W-S16	Reach-1	1499.52	

Name: J-S17-REACH-2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
T4N-R3W-S17	Reach-1	to T4N-R3W-S17	Reach-2	405.88	
T4N-R3W-S07	Reach-1	to T4N-R3W-S17	Reach-2	439.99	

CROSS SECTION

RIVER: T4N-R3W-S07
REACH: Reach-1 RS: 1.993

INPUT
Description: Flow rate at this cross-section and downstream is 220cfs.
Interpolated point added at (10117.5,1656.55) to set bank station
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550.7	1658.9	9563.85	1659.09	9570.95	1659.16	9581.43	1659.28	9594.42	1659.41
9600.58	1659.5	9646.04	1659.21	9678.57	1659.06	9681.68	1659.01	9691.75	1658.9
9712.12	1658.7	9733.29	1658.34	9734.89	1658.32	9737.16	1658.28	9746	1658.18
9752	1658.1	9753.66	1658.13	9759.19	1658.08	9767.39	1658	9769.37	1658
9791.58	1657.78	9792.04	1657.78	9792.1	1657.8	9792.42	1657.77	9792.5	1657.77
9793.64	1657.76	9794.7	1657.74	9848.07	1657	9875.49	1656.85	9887.32	1656.83
9893.98	1656.84	9913.33	1656.7	9926.35	1656.5	9931.19	1656.52	9941.85	1656.5
9957.86	1656.451	9977.6	1656.39	9979.07	1656.39	10039.67	1656.51	10058.29	1656.6
10062.65	1656.53	10069.54	1656.37	10075.2	1656.26	10082.16	1656.14	10088.32	1656.1
10095.19	1656.02	10117.5	1656.55	10128	1656.81	10134.56	1656.97	10154.85	1657.36
10161.23	1657.51	10161.67	1657.47	10164.07	1657.49	10170.85	1657.51	10177.29	1657.54
10182.27	1657.61	10199.23	1657.64	10201.54	1657.63	10202.08	1657.64	10202.88	1657.64
10206.96	1657.61	10223.12	1657.62	10233.73	1657.64	10237.35	1657.54	10245.29	1657.28
10248.88	1657.1	10265	1657.17	10278.83	1657.31	10284.07	1657.13	10289.46	1657.09
10294.33	1657.11	10302.12	1657.09	10312.35	1657.11	10319.54	1657.12	10323.21	1657.13
10325.48	1657.11	10326.35	1657.07	10333.43	1657.06	10358.07	1657.05	10367.15	1657.02
10372.35	1657.1	10382	1657.37	10426.46	1658.35	10437.79	1658.41	10441.53	1658.43
10448.38	1658.48	10464.87	1658.59	10493.68	1658.75	10504.86	1658.81	10519.67	1658.93
10564.66	1659.16	10615.62	1659.48	10628.92	1659.48	10634.07	1659.51	10680.27	1659.8
10693.38	1659.72	10728.58	1659.63	10742.07	1659.57				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550.7	.033	9926.35	.055	10117.5	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926.35	10117.5	500	528.39	543	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1657.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.055	0.033
W.S. Elev (ft)	1656.99	Reach Len. (ft)	500.00	528.39	543.00
Crit W.S. (ft)		Flow Area (sq ft)	13.87	111.18	3.99
E.G. Slope (ft/ft)	0.008698	Area (sq ft)	13.87	111.18	3.99
Q Total (cfs)	220.00	Flow (cfs)	18.69	195.19	6.12
Top Width (ft)	285.50	Top Width (ft)	76.29	191.15	18.06
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)	1.35	1.76	1.53
Max Chl Dpth (ft)	0.97	Hydr. Depth (ft)	0.18	0.58	0.22
Conv. Total (cfs)	2358.9	Conv. (cfs)	200.4	2092.8	65.7
Length Wtd. (ft)	525.48	Wetted Per. (ft)	76.30	191.16	18.06
Min Ch El (ft)	1656.02	Shear (lb/sq ft)	0.10	0.32	0.12
Alpha	1.02	Stream Power (lb/ft s)	0.13	0.55	0.18
Frctn Loss (ft)	3.68	Cum Volume (acre-ft)	10.34	23.28	4.15
C & E Loss (ft)	0.00	Cum SA (acres)	25.07	28.37	12.16

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 OUTPUT Profile #2

E.G. Elev (ft)	1657.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.055	
W.S. Elev (ft)	1657.04	Reach Len. (ft)	500.00	528.39	543.00

```
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  120.82  *          *
* E.G. Slope (ft/ft)      *0.008436  * Area (sq ft)            *          *  120.82  *          *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)          *  191.15  * Top Width (ft)          *          *  191.15  *          *
* Vel Total (ft/s)        *    1.82  * Avg. Vel. (ft/s)        *          *    1.82  *          *
* Max Chl Dpth (ft)       *    1.02  * Hydr. Depth (ft)        *          *    0.63  *          *
* Conv. Total (cfs)       *  2395.2  * Conv. (cfs)             *          *  2395.2  *          *
* Length Wtd. (ft)        *  528.39  * Wetted Per. (ft)        *          *  192.19  *          *
* Min Ch El (ft)          * 1656.02  * Shear (lb/sq ft)        *          *    0.33  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.60  *          *
* Frctn Loss (ft)         *    3.42  * Cum Volume (acre-ft)    *    1.64  *   29.79  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.82  *   28.51  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9738.53   * 9926.35   *    18.69 *    13.87 *    76.30 *     8.50 *
0.18 *     1.35 *
* 2         * Chan      * 9926.35   * 10117.50  *   195.19 *   111.18 *   191.16 *    88.72 *
0.58 *     1.76 *
* 3         * ROB       * 10117.50  * 10429.79  *     6.12 *     3.99 *    18.06 *     2.78 *
0.22 *     1.53 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9926.35   * 10117.50  *   220.00 *   120.82 *   192.19 *   100.00 *
0.63 *     1.82 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S07
REACH: Reach-1            RS: 1.893

INPUT
Description:
Station Elevation Data    num=     101
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9481.47  1656.3 9491.62 1656.19 9494.64 1656.15    9496 1656.12 9507.08  1656.2
 9510.06  1656.2 9516.39 1656.28  9531.7  1656.4 9542.71 1656.48 9550.48 1656.43
  9560.8  1656.4 9571.27  1656.3 9578.88 1656.18 9590.06    1656 9595.56 1655.92
 9596.38  1655.9 9597.59 1655.89 9605.23 1655.74 9622.57 1655.42 9645.58    1655
 9647.77 1654.92 9650.38 1654.87 9663.29 1654.85 9688.38 1654.75 9708.62  1654.7
 9709.29 1654.67 9744.33 1654.22 9745.36  1654.2 9745.61 1654.21 9747.62  1654.2
 9750.21 1654.18 9752.88 1654.17 9755.02 1654.16 9764.57 1654.18 9781.16  1654.2
 9784.82 1654.09 9785.66 1654.06 9786.75    1654 9790.94 1653.97 9791.05    1654
 9791.73 1653.97 9861.44 1652.99 9864.61 1652.94 9885.061652.753  9888.7 1652.72
```

```
 9895.71  1652.7  9907.6 1652.65 9920.44 1652.56 9927.14 1652.57  9946.5 1652.63
  9947.3  1652.6 9958.64 1652.66 9961.41 1652.64 9963.32 1652.61 9964.72 1652.61
 9971.29  1652.7 9981.63 1652.72 9992.86 1652.78 9998.98 1652.8110021.27 1652.69
10034.11  1652.710052.38 1652.8510067.79 1652.9210074.081652.94710086.52    1653
10117.61 1653.4210130.37  1653.610142.81 1653.8210143.41 1653.8210143.91 1653.84
10144.63 1653.8210146.24  1653.810147.49 1653.82 10193.9 1653.94 10196.6 1653.94
10197.72 1653.9510200.66    1654 10208.4 1654.1210214.42 1654.2110224.86 1654.37
10229.92 1654.4410233.98  1654.5 10235.9 1654.5310240.52 1654.5710246.71 1654.69
10255.71 1654.83 10265.5  1654.910294.83 1655.1810322.96 1655.5310338.11 1655.71
10360.87    165610371.17  1656.110378.26 1656.2210420.04 1656.7510453.25 1657.16
10492.72 1657.5610510.77  1657.810512.62 1657.7710514.58 1657.7810553.51 1657.89
 10553.6 1657.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9481.47    .033  9907.6    .05510034.11    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9907.610034.11              434  457.73     436             .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)         * 1653.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)         * 1653.31  * Reach Len. (ft)         *  434.00  *  457.73  *  436.00  *
* Crit W.S. (ft)         * 1653.06  * Flow Area (sq ft)       *   28.11  *   80.60  *   26.49  *
* E.G. Slope (ft/ft)     *0.005747  * Area (sq ft)            *   28.11  *   80.60  *   26.49  *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *   52.75  *  122.23  *   45.03  *
* Top Width (ft)         *  270.90  * Top Width (ft)          *   68.98  *  126.51  *   75.41  *
* Vel Total (ft/s)       *    1.63  * Avg. Vel. (ft/s)        *    1.88  *    1.52  *    1.70  *
* Max Chl Dpth (ft)      *    0.75  * Hydr. Depth (ft)        *    0.41  *    0.64  *    0.35  *
* Conv. Total (cfs)      *  2902.1  * Conv. (cfs)             *   695.8  *  1612.3  *   593.9  *
* Length Wtd. (ft)       *  448.90  * Wetted Per. (ft)        *   68.98  *  126.51  *   75.42  *
* Min Ch El (ft)         * 1652.56  * Shear (lb/sq ft)        *    0.15  *    0.23  *    0.13  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    0.27  *    0.35  *    0.21  *
* Frctn Loss (ft)        *    2.27  * Cum Volume (acre-ft)    *   10.10  *   22.12  *    3.96  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   24.23  *   26.45  *   11.57  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)         * 1653.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1653.62  * Reach Len. (ft)         *  434.00  *  457.73  *  436.00  *
* Crit W.S. (ft)         * 1653.13  * Flow Area (sq ft)       *          *  119.44  *          *
* E.G. Slope (ft/ft)     *0.005119  * Area (sq ft)            *          *  119.44  *          *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)         *  126.51  * Top Width (ft)          *          *  126.51  *          *
* Vel Total (ft/s)       *    1.84  * Avg. Vel. (ft/s)        *          *    1.84  *          *
* Max Chl Dpth (ft)      *    1.06  * Hydr. Depth (ft)        *          *    0.94  *          *
* Conv. Total (cfs)      *  3075.0  * Conv. (cfs)             *          *  3075.0  *          *
* Length Wtd. (ft)       *  457.73  * Wetted Per. (ft)        *          *  128.40  *          *
* Min Ch El (ft)         * 1652.56  * Shear (lb/sq ft)        *          *    0.30  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.55  *          *
* Frctn Loss (ft)        *    2.43  * Cum Volume (acre-ft)    *    1.64  *   28.33  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    0.82  *   26.58  *          *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9694.54   * 9907.60   *    52.75 *    28.11 *    68.98 *    23.98 *
0.41 *     1.88 *
* 2         * Chan      * 9907.60   * 10034.11  *   122.23 *    80.60 *   126.51 *    55.56 *
0.64 *     1.52 *
* 3         * ROB       * 10034.11  * 10293.86  *    45.03 *    26.49 *    75.42 *    20.47 *
0.35 *     1.70 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9907.60   * 10034.11  *   220.00 *   119.44 *   128.40 *   100.00 *
0.94 *     1.84 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 1.807

INPUT
Description:
Station Elevation Data    num=     123
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9406.12  1654.2 9413.73 1654.16 9428.17    1654 9429.26    1654 9444.59 1653.84
 9444.88  1653.8 9445.83 1653.84 9450.05 1653.88 9464.47 1653.99 9465.05    1654
 9465.57    1654 9473.48 1654.07 9473.96 1654.07 9474.87 1654.08 9478.16    1654
 9478.32    1654 9508.18 1653.44 9512.74 1653.37 9518.83 1653.39 9519.59  1653.4
 9523.18 1653.35 9526.73 1653.31 9532.97 1653.26 9549.02  1653.1  9563.3 1653.04
 9575.14 1653.02 9581.92 1653.02 9597.82 1652.92 9600.46  1652.9 9601.48 1652.92
 9604.35 1652.93 9623.26 1652.92 9639.12 1653.07 9641.53  1653.1 9657.57 1652.84
 9666.43 1652.72 9669.76 1652.67 9683.52  1652.5 9696.59 1652.33 9702.34 1652.26
 9705.56 1652.19 9718.83    1652 9720.03    1652 9742.34 1651.79 9757.02 1651.64
 9772.06  1651.5 9778.42 1651.39 9792.64 1651.23 9805.56 1651.03 9808.04    1651
 9816.76  1650.9 9816.95 1650.88  9817.8 1650.87 9821.46 1650.88 9825.06 1650.88
 9851.66  1650.8 9862.161650.748 9867.81 1650.72 9885.58 1650.56  9890.7 1650.54
 9901.71 1650.42 9907.82  1650.4 9917.66 1650.47 9918.42 1650.47 9920.92 1650.45
 9924.24 1650.44 9928.91  1650.4 9937.85 1650.35 9955.41 1650.24 9994.92 1650.02
10024.09 1650.37 10045.5  1650.610048.771650.63910050.58 1650.6610062.96 1650.72
10071.71 1650.7810083.95 1650.8110092.54  1650.9 10097.8 1650.9410101.44 1650.98
10106.74 1651.0510112.54 1651.1210116.84  1651.210120.18 1651.2110145.38 1651.44
10182.69 1651.7210187.42 1651.7210196.65 1651.8410202.42 1651.9310207.08    1652
10212.13 1652.0910214.38  1652.110218.05 1652.1410233.72 1652.2410234.33 1652.23
10237.58 1652.2610264.18  1652.710269.68 1652.6210278.35 1652.5810281.13  1652.6
10283.39 1652.61 10297.8  1652.710306.28 1652.77 10320.7 1652.9210345.01 1653.18
10346.46  1653.210349.13  1653.210352.98 1653.3110384.51    16541 0387.09 1654.06
10408.85  1654.510411.99  1654.610425.06 1654.8210431.91 1654.9510448.18 1655.12
 10482.2  1654.810489.83 1654.6210493.77 1654.5510514.03  1654.4 10518.3  1654.4
10528.91 1654.3510537.69 1654.3810559.35 1654.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9406.12    .033 9917.66    .055 10045.5    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9917.66 10045.5              472  509.43     528            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1651.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1651.04  * Reach Len. (ft)        *  472.00  *  509.43  *  528.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *   37.50  *   98.13  *   14.53  *
* E.G. Slope (ft/ft)      *0.004480  * Area (sq ft)           *   37.50  *   98.13  *   14.53  *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *   54.29  *  148.77  *   16.95  *
* Top Width (ft)          *  300.92  * Top Width (ft)          *  112.68  *  127.84  *   60.40  *
* Vel Total (ft/s)        *    1.47  * Avg. Vel. (ft/s)        *    1.45  *    1.52  *    1.17  *
* Max Chl Dpth (ft)       *    1.02  * Hydr. Depth (ft)        *    0.33  *    0.77  *    0.24  *
* Conv. Total (cfs)       *  3286.8  * Conv. (cfs)             *   811.0  *  2222.6  *   253.2  *
* Length Wtd. (ft)        *  503.92  * Wetted Per. (ft)        *  112.68  *  127.84  *   60.40  *
* Min Ch El (ft)          * 1650.02  * Shear (lb/sq ft)        *    0.09  *    0.21  *    0.07  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.13  *    0.33  *    0.08  *
* Frctn Loss (ft)         *    3.39  * Cum Volume (acre-ft)    *    9.77  *   21.18  *    3.76  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   23.33  *   25.11  *   10.89  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1651.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1651.19  * Reach Len. (ft)        *  472.00  *  509.43  *  528.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  117.23  *          *
* E.G. Slope (ft/ft)      *0.005490  * Area (sq ft)           *          *  117.23  *          *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)          *  127.84  * Top Width (ft)          *          *  127.84  *          *
* Vel Total (ft/s)        *    1.88  * Avg. Vel. (ft/s)        *          *    1.88  *          *
* Max Chl Dpth (ft)       *    1.17  * Hydr. Depth (ft)        *          *    0.92  *          *
* Conv. Total (cfs)       *  2969.3  * Conv. (cfs)             *          *  2969.3  *          *
* Length Wtd. (ft)        *  509.43  * Wetted Per. (ft)        *          *  129.15  *          *
* Min Ch El (ft)          * 1650.02  * Shear (lb/sq ft)        *          *    0.31  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.58  *          *
* Frctn Loss (ft)         *    3.46  * Cum Volume (acre-ft)    *    1.64  *   27.09  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.82  *   25.24  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9661.89   * 9917.66   *    54.29 *    37.50 *   112.68 *    24.68 *
0.33 *     1.45 *
* 2        * Chan      * 9917.66   * 10045.50  *   148.77 *    98.13 *   127.84 *    67.62 *
0.77 *     1.52 *
* 3        * ROB       * 10045.50  * 10302.42  *    16.95 *    14.53 *    60.40 *     7.70 *
0.24 *     1.17 *
*****************************************************************************************
******************

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.

  Profile #2
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9917.66   * 10045.50  *   220.00 *   117.23 *   129.15 *   100.00 *
0.92 *     1.88 *
*****************************************************************************************
******************
```

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: T4N-R3W-S07
REACH: Reach-1 RS: 1.710

INPUT
Description: Interpolated point added at (10095.83,1647.187) to set bank station
Station Elevation Data num= 96

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9440.28    1651 9461.15 1650.78  9462.5 1650.75 9474.53 1650.67 9479.21  1650.6
 9507.73 1650.58 9528.47 1650.13 9536.07    1650 9536.41    1650 9543.13 1649.88
 9547.15 1649.84 9549.92 1649.81 9550.89 1649.83 9555.03  1649.8 9559.65 1649.84
 9574.09 1649.98  9575.8    1650  9577.2 1650.02 9599.75  1650.3  9620.9 1650.11
 9644.05 1650.07 9644.88 1650.07  9646.7 1650.05 9649.75    1650 9675.01 1649.57
 9684.62 1649.41 9725.47 1649.48 9728.02 1649.47 9737.75  1648.9 9742.71 1648.72
 9756.54 1648.36  9775.9 1648.34 9781.84 1648.39 9783.66  1648.4 9794.15 1648.26
 9811.87    1648 9814.84 1647.96 9817.95 1647.91 9849.28  1647.8 9859.95 1647.73
 9871.24 1647.68 9879.431647.639 9883.63 1647.61 9886.73  1647.6 9888.77 1647.54
 9890.07 1647.52  9896.7 1647.41 9910.24 1647.44  9914.2  1647.4 9921.66 1647.35
 9934.85 1647.25 9948.33 1647.18 9956.54  1647.1  9966.3    1647 9983.83 1646.84
  9988.1 1646.9410024.64 1647.1310030.61 1647.17 10039.7  1647.210052.06 1646.97
10058.78 1646.8310062.45 1646.7510064.62  1646.710078.78  1646.710079.17 1646.72
10084.62 1646.9110095.831647.187 10110.31647.54510111.73 1647.5810112.98 1647.59
10113.75  1647.610117.22 1647.6410145.87  1647.910148.85 1647.9510148.94 1647.95
10151.28    164810157.67 1648.1210163.51 1648.2410180.66 1648.5810188.11 1648.68
10223.53  1648.810250.49 1649.2510262.95 1649.5210269.81 1649.5510294.69 1649.84
10309.15    1650 10310.9    165010312.41 1650.0210312.78 1650.0210313.54 1650.03
10331.34  1650.210335.55 1650.1710347.08 1650.2410353.34 1650.1610353.78 1650.15
10356.13  1650.2
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9440.28    .033 9910.24    .055 10110.3    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.3310095.83              488  494.68     480              .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1647.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.050  *    0.055  *   0.055  *
* W.S. Elev (ft)         * 1647.61  * Reach Len. (ft)         *  488.00  *   494.68  *  480.00  *
* Crit W.S. (ft)         * 1647.40  * Flow Area (sq ft)       *   15.85  *    92.76  *    3.72  *
* E.G. Slope (ft/ft)     *0.011236  * Area (sq ft)            *   15.85  *    92.76  *    3.72  *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *   20.90  *   194.98  *    4.11  *
* Top Width (ft)         *  231.92  * Top Width (ft)          *   65.28  *   147.50  *   19.14  *
* Vel Total (ft/s)       *    1.96  * Avg. Vel. (ft/s)        *    1.32  *     2.10  *    1.11  *
* Max Chl Dpth (ft)      *    0.91  * Hydr. Depth (ft)        *    0.24  *     0.63  *    0.19  *
* Conv. Total (cfs)      *  2075.5  * Conv. (cfs)             *   197.2  *   1839.5  *    38.8  *
* Length Wtd. (ft)       *  493.71  * Wetted Per. (ft)        *   65.29  *   147.52  *   19.14  *
* Min Ch El (ft)         * 1646.70  * Shear (lb/sq ft)        *    0.17  *     0.44  *    0.14  *
* Alpha                  *    1.07  * Stream Power (lb/ft s)   *    0.22  *     0.93  *    0.15  *
* Frctn Loss (ft)        *    3.14  * Cum Volume (acre-ft)     *    9.48  *    20.06  *    3.64  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *   22.36  *    23.50  *   10.41  *
```

```
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1647.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *          *    0.055 *          *
* W.S. Elev (ft)         * 1647.72  * Reach Len. (ft)        *  488.00  *   494.68 *   480.00 *
* Crit W.S. (ft)         * 1647.40  * Flow Area (sq ft)      *          *   108.37 *          *
* E.G. Slope (ft/ft)     *0.008600  * Area (sq ft)           *          *   108.37 *          *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *          *   220.00 *          *
* Top Width (ft)         *  147.50  * Top Width (ft)          *          *   147.50 *          *
* Vel Total (ft/s)       *    2.03  * Avg. Vel. (ft/s)        *          *     2.03 *          *
* Max Chl Dpth (ft)      *    1.02  * Hydr. Depth (ft)        *          *     0.73 *          *
* Conv. Total (cfs)      *  2372.4  * Conv. (cfs)             *          *   2372.4 *          *
* Length Wtd. (ft)       *  494.68  * Wetted Per. (ft)        *          *   148.59 *          *
* Min Ch El (ft)         * 1646.70  * Shear (lb/sq ft)        *          *     0.39 *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *     0.79 *          *
* Frctn Loss (ft)        *    3.19  * Cum Volume (acre-ft)    *     1.64 *    25.77 *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *     0.82 *    23.63 *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9694.31   * 9948.33   *    20.90 *    15.85 *    65.29 *     9.50 *
0.24 *     1.32 *
* 2        * Chan      * 9948.33   * 10095.83  *   194.98 *    92.76 *   147.52 *    88.63 *
0.63 *     2.10 *
* 3        * ROB       * 10095.83  * 10225.98  *     4.11 *     3.72 *    19.14 *     1.87 *
0.19 *     1.11 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9948.33   * 10095.83  *   220.00 *   108.37 *   148.59 *   100.00 *
0.73 *     2.03 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 1.617
```

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9497.49	1647.3	9510.27	1647.32	9512.62	1647.33	9514.37	1647.3	9574.26	1646.64
9594.5	1646.9	9605.02	1647.08	9619.28	1646.72	9632.94	1646.36	9644.02	1646.08
9651.1	1646	9658.83	1646	9670.6	1645.93	9677.63	1645.91	9696.1	1645.9
9702.6	1645.86	9710.16	1645.79	9752.44	1645.07	9763.19	1644.8	9766.67	1644.84
9803.26	1644.77	9826.62	1644.54	9830.94	1644.55	9836.24	1644.5	9845.96	1644.54
9847.91	1644.535	9858.56	1644.51	9859.45	1644.5	9859.99	1644.49	9863.2	1644.4
9873.62	1644.23	9879.43	1644.12	9881.82	1644.11	9883.17	1644.11	9889.17	1644.1
9904.34	1644	9932.44	1644	9936.89	1644.02	9937.85	1644.02	9938.62	1644
9939.33	1644	9944.86	1643.92	9951.95	1643.83	9973.04	1643.5	9987.66	1643.2
9997.54	1642.97	10007.58	1642.74	10010.76	1642.84	10014.23	1642.91	10025.51	1643.52
10033.77	1644	10039.45	1644.31	10041.34	1644.46	10043.14	1644.41	10046.39	1644.47
10051.77	1644.51	10072.58	1644.41	10074.38	1644.38	10082.13	1644.33	10108.25	1644.7
10142.01	1645.17	10199.2	1646	10199.41	1646	10220.4	1646.32	10225.18	1646.4
10230.67	1646.48	10264.74	1646.89	10268.47	1646.93	10276.8	1646.92	10278.9	1646.9
10284.95	1646.86	10293.82	1646.61	10303.76	1646.41				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9497.49	.033	9859.45	.055	10051.77	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9936.89	10033.77	488	487.79	478	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1644.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.055	0.055	0.043
W.S. Elev (ft)	1644.49	Reach Len. (ft)	488.00	487.79	478.00
Crit W.S. (ft)		Flow Area (sq ft)	30.15	104.39	5.35
E.G. Slope (ft/ft)	0.004084	Area (sq ft)	30.15	104.39	5.35
Q Total (cfs)	220.00	Flow (cfs)	27.88	189.38	2.74
Top Width (ft)	227.29	Top Width (ft)	76.94	96.88	53.47
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)	0.92	1.81	0.51
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)	0.39	1.08	0.10
Conv. Total (cfs)	3442.4	Conv. (cfs)	436.3	2963.2	42.9
Length Wtd. (ft)	487.53	Wetted Per. (ft)	76.94	96.93	53.49
Min Ch El (ft)	1642.74	Shear (lb/sq ft)	0.10	0.27	0.03
Alpha	1.19	Stream Power (lb/ft s)	0.09	0.50	0.01
Frctn Loss (ft)	3.20	Cum Volume (acre-ft)	9.22	18.94	3.59
C & E Loss (ft)	0.00	Cum SA (acres)	21.57	22.11	10.01

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1644.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.055	
W.S. Elev (ft)	1644.53	Reach Len. (ft)	488.00	487.79	478.00
Crit W.S. (ft)	1643.93	Flow Area (sq ft)		107.89	
E.G. Slope (ft/ft)	0.005008	Area (sq ft)		107.89	
Q Total (cfs)	220.00	Flow (cfs)		220.00	
Top Width (ft)	96.88	Top Width (ft)		96.88	
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)		2.04	
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)		1.11	
Conv. Total (cfs)	3108.6	Conv. (cfs)		3108.6	
Length Wtd. (ft)	487.79	Wetted Per. (ft)		97.96	
Min Ch El (ft)	1642.74	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)		0.70	
Frctn Loss (ft)	2.97	Cum Volume (acre-ft)	1.64	24.54	
C & E Loss (ft)	0.00	Cum SA (acres)	0.82	22.24	

```
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9717.19   * 9936.89   *    27.88 *    30.15 *    76.94 *    12.67 *
0.39 *     0.92 *
* 2         * Chan      * 9936.89   * 10033.77  *   189.38 *   104.39 *    96.93 *    86.08 *
1.08 *     1.81 *
* 3         * ROB       * 10033.77  * 10168.76  *     2.74 *     5.35 *    53.49 *     1.25 *
0.10 *     0.51 *
*****************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9936.89   * 10033.77  *   220.00 *   107.89 *    97.96 *   100.00 *
1.11 *     2.04 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 1.524

INPUT
Description: Interpolated point added at (9963.83, 1640.807) to set bank station
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9590.28  1642.9 9599.66 1642.89 9615.67 1642.78 9650.65 1642.63  9658.2 1642.93
 9674.77  1642.6 9682.93 1642.53 9690.18 1642.53 9734.12 1642.44 9763.78 1642.29
 9777.93  1642.2 9778.57 1642.23 9784.98 1642.11 9791.13    1642 9794.18 1641.94
 9799.69  1641.9 9800.07 1641.86 9800.93 1641.84 9824.69 1641.36 9832.04 1641.19
 9835.81  1641.2 9856.44 1641.12 9869.58 1640.77 9873.41 1640.74 9898.78 1641.18
 9904.84  1641.2 9920.33 1641.09 9928.591641.045 9949.78 1640.93 9963.831640.807
 9988.63 1640.59  9995.2 1640.51 9995.26  1640.5 9995.27 1640.5110000.33 1640.54
10038.01 1640.6410041.13 1640.65 10041.6  1640.710081.85 1640.8210085.631640.884
10150.67 1641.9910151.33    164210151.59    164210157.72 1642.06 10158.9 1642.07
10160.84  1642.110186.94 1642.2910221.19 1642.5910223.69 1642.5510230.88 1642.49
10271.44  1643.210271.79 1643.2510272.44 1643.2510272.57  1643.310277.15 1643.38
10282.07 1643.2510316.09 1642.4710318.19 1642.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9590.28    .033 9963.83    .05510081.85    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.8310081.85              493  491.44     492            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1641.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1641.26  * Reach Len. (ft)         *  493.00  *  491.44  *  492.00  *
* Crit W.S. (ft)          * 1641.11  * Flow Area (sq ft)       *   31.71  *   70.40  *    5.80  *
* E.G. Slope (ft/ft)      *0.012255  * Area (sq ft)            *   31.71  *   70.40  *    5.80  *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *   60.18  *  149.21  *   10.61  *
* Top Width (ft)          *  279.14  * Top Width (ft)          *  134.99  *  118.02  *   26.13  *
* Vel Total (ft/s)        *    2.04  * Avg. Vel. (ft/s)        *    1.90  *    2.12  *    1.83  *
* Max Chl Dpth (ft)       *    0.76  * Hydr. Depth (ft)        *    0.23  *    0.60  *    0.22  *
* Conv. Total (cfs)       *  1987.3  * Conv. (cfs)             *   543.6  *  1347.8  *   95.8  *
* Length Wtd. (ft)        *  491.91  * Wetted Per. (ft)        *  135.00  *  118.03  *   26.13  *
* Min Ch El (ft)          * 1640.50  * Shear (lb/sq ft)        *    0.18  *    0.46  *    0.17  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.34  *    0.97  *    0.31  *
* Frctn Loss (ft)         *    3.14  * Cum Volume (acre-ft)    *    8.88  *   17.96  *    3.53  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   20.38  *   20.91  *    9.57  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1641.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1641.54  * Reach Len. (ft)         *  493.00  *  491.44  *  492.00  *
* Crit W.S. (ft)          * 1641.14  * Flow Area (sq ft)       *          *  103.16  *          *
* E.G. Slope (ft/ft)      *0.007578  * Area (sq ft)            *          *  103.16  *          *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)          *  118.02  * Top Width (ft)          *          *  118.02  *          *
* Vel Total (ft/s)        *    2.13  * Avg. Vel. (ft/s)        *          *    2.13  *          *
* Max Chl Dpth (ft)       *    1.04  * Hydr. Depth (ft)        *          *    0.87  *          *
* Conv. Total (cfs)       *  2527.2  * Conv. (cfs)             *          *  2527.2  *          *
* Length Wtd. (ft)        *  491.44  * Wetted Per. (ft)        *          *  119.49  *          *
* Min Ch El (ft)          * 1640.50  * Shear (lb/sq ft)        *          *    0.41  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.87  *          *
* Frctn Loss (ft)         *    3.29  * Cum Volume (acre-ft)    *    1.64  *   23.36  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.82  *   21.04  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *    (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9777.06   * 9963.83   *    60.18 *    31.71 *   135.00 *    27.36 *
0.23 *     1.90 *
* 2        * Chan      * 9963.83   * 10081.85  *   149.21 *    70.40 *   118.03 *    67.82 *
0.60 *     2.12 *
* 3        * ROB       * 10081.85  * 10200.02  *    10.61 *     5.80 *    26.13 *     4.82 *
0.22 *     1.83 *
*****************************************************************************************
******************

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.

  Profile #2
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9963.83   * 10081.85  *   220.00 *   103.16 *   119.49 *   100.00 *
0.87 *     2.13 *
*****************************************************************************************
******************
```

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: T4N-R3W-S07
REACH: Reach-1 RS: 1.431

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Interpolated
point added at (10086.94,1637.649) to set bank station. Reset
0.055 n-value to 3/10/06 station pts.

Station Elevation Data num= 79

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9160.11  1638.8 9178.66 1638.63  9211.6 1638.72 9224.19 1638.66 9245.73 1638.52
 9269.57  1638.6 9299.63  1638.9  9327.8 1638.99 9377.97 1638.95 9380.84 1638.96
 9408.17  1638.7 9452.35 1638.31 9452.45 1638.31 9461.34 1638.22 9481.53 1638.01
 9481.97    1638 9482.19    1638  9511.3 1637.71 9512.47 1637.71 9514.76  1637.7
 9555.67 1637.75 9586.65 1637.82 9602.94 1637.81 9609.79 1637.87 9633.88  1637.9
 9645.16 1637.96 9646.22 1637.97 9654.55 1637.97 9663.35    1638 9673.03    1638
 9696.74 1638.18 9709.37 1638.26 9710.77 1638.33 9719.54  1638.3 9728.19  1638.3
 9742.94 1638.19 9757.24 1638.19  9804.8 1638.47 9814.28  1638.5 9820.25  1638.5
 9859.91 1638.23 9866.79 1638.17 9874.75    1638 9889.36  1637.7 9889.58 1637.69
 9903.69 1637.58 9903.981637.578 9932.97 1637.34    9958  1637.6 9972.87 1637.64
10006.73 1637.2710014.45 1637.1210039.79 1637.1210055.67  1637.110061.96 1637.22
10065.29 1637.2610074.271637.42210086.941637.64910104.81 1637.9710122.61 1638.25
10125.99  1638.310129.42 1638.3310133.22 1638.3610139.19  1638.410140.51 1638.39
10190.69 1638.9510198.78 1639.0310229.98 1639.2210234.87  1639.310240.42 1639.28
10255.86  1639.510273.48 1639.5410304.06 1639.8710312.39  1639.910313.21 1639.92
10313.72 1639.9210324.65  1639.910331.51  1639.910344.54 1639.72
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9160.11    .033 9874.75    .05510104.81    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.8710086.94              510  501.09     492            .1        .3
Left Levee      Station= 9820.25      Elevation=  1638.5
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1638.18  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.055  *   0.055  *   0.053  *
* W.S. Elev (ft)         * 1638.15  * Reach Len. (ft)         *  510.00  *  501.09  *  492.00  *
* Crit W.S. (ft)         * 1637.74  * Flow Area (sq ft)       *   57.02  *   97.44  *    7.02  *
* E.G. Slope (ft/ft)     *0.003909  * Area (sq ft)            *   57.02  *   97.44  *    7.02  *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *   66.34  *  148.18  *    5.48  *
* Top Width (ft)         *  248.15  * Top Width (ft)          *  104.98  *  114.07  *   29.10  *
* Vel Total (ft/s)       *    1.36  * Avg. Vel. (ft/s)        *    1.16  *    1.52  *    0.78  *
* Max Chl Dpth (ft)      *    1.05  * Hydr. Depth (ft)        *    0.54  *    0.85  *    0.24  *
* Conv. Total (cfs)      *  3518.6  * Conv. (cfs)             *  1061.0  *  2369.9  *    87.7  *
* Length Wtd. (ft)       *  501.76  * Wetted Per. (ft)        *  104.99  *  114.08  *   29.10  *
* Min Ch El (ft)         * 1637.10  * Shear (lb/sq ft)        *    0.13  *    0.21  *    0.06  *
* Alpha                  *    1.07  * Stream Power (lb/ft s)  *    0.15  *    0.32  *    0.05  *
* Frctn Loss (ft)        *    2.86  * Cum Volume (acre-ft)    *    8.37  *   17.02  *    3.46  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   19.02  *   19.60  *    9.26  *
```

```
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1638.31  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1638.25  * Reach Len. (ft)        *  510.00  *  501.09  *  492.00  *
* Crit W.S. (ft)         * 1637.78  * Flow Area (sq ft)      *          *  109.35  *          *
* E.G. Slope (ft/ft)     *0.005951  * Area (sq ft)           *          *  109.35  *          *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)         *  114.07  * Top Width (ft)          *          *  114.07  *          *
* Vel Total (ft/s)       *    2.01  * Avg. Vel. (ft/s)        *          *    2.01  *          *
* Max Chl Dpth (ft)      *    1.15  * Hydr. Depth (ft)        *          *    0.96  *          *
* Conv. Total (cfs)      *  2851.7  * Conv. (cfs)             *          *  2851.7  *          *
* Length Wtd. (ft)       *  501.09  * Wetted Per. (ft)        *          *  115.29  *          *
* Min Ch El (ft)         * 1637.10  * Shear (lb/sq ft)        *          *    0.35  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.71  *          *
* Frctn Loss (ft)        *    2.77  * Cum Volume (acre-ft)    *    1.64  *   22.16  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    0.82  *   19.73  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9820.25   * 9972.87   *    66.34 *    57.02 *   104.99 *    30.15 *
0.54 *     1.16 *
* 2        * Chan      * 9972.87   * 10086.94  *   148.18 *    97.44 *   114.08 *    67.35 *
0.85 *     1.52 *
* 3        * ROB       * 10086.94  * 10215.74  *     5.48 *     7.02 *    29.10 *     2.49 *
0.24 *     0.78 *
*****************************************************************************************
******************

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

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9972.87   * 10086.94  *   220.00 *   109.35 *   115.29 *   100.00 *
0.96 *     2.01 *
*****************************************************************************************
******************
```

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: T4N-R3W-S07
REACH: Reach-1 RS: 1.336

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9321.93	1637	9344.77	1636.89	9348.81	1636.88	9349.14	1636.88	9350.04	1636.87
9410.21	1636.5	9410.31	1636.46	9410.92	1636.46	9412.53	1636.5	9414.55	1636.44
9468.24	1636.31	9473.57	1636.28	9475.03	1636.26	9499.68	1636	9512.32	1635.88
9521.02	1635.79	9526.22	1635.73	9529.22	1635.69	9533.5	1635.6	9559.34	1635.1
9570.67	1634.9	9593.17	1634.99	9617.37	1635	9623.74	1635.14	9653.55	1634.96
9674.17	1634.96	9702.14	1634.7	9724.32	1634.59	9736.56	1634.63	9779.93	1634.89
9797.83	1634.91	9822.49	1635	9856.5	1635.1	9866.21	1635.12	9868.18	1635.26
9882.53	1635.42	9893.22	1635.4	9914.58	1635.1	9931.99	1634.9	9934.55	1634.874
9954.82	1634.67	9990.85	1634.27	9995.94	1634.2	10001.59	1634.29	10025.47	1634.58
10057.42	1634.86	10058.77	1634.87	10066.7	1634.9	10071.81	1634.9	10083.29	1634.86
10085.24	1634.88	10097.81	1634.92	10109.58	1634.98	10128.96	1635.1	10133.91	1635.05
10173.4	1635.15	10174.22	1635.15	10174.36	1635.16	10183.47	1635.5	10214.84	1635.78
10215.35	1635.78	10216.1	1635.8	10217.63	1635.81	10232.75	1636	10236.56	1636.02
10249.18	1636.06	10266.72	1636.3	10294.55	1636.61	10295.25	1636.6	10307.14	1636.22
10335.32	1636.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9321.93	.033	9931.99	.055	10109.58	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9931.99	10066.7	502	502.14	463	.1	.3

Left Levee Station= 9882.53 Elevation= 1635.42

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1635.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.055	0.045
W.S. Elev (ft)	1635.26	Reach Len. (ft)	502.00	502.14	463.00
Crit W.S. (ft)	1635.04	Flow Area (sq ft)	5.37	90.41	26.49
E.G. Slope (ft/ft)	0.009055	Area (sq ft)	5.37	90.41	26.49
Q Total (cfs)	220.00	Flow (cfs)	7.54	178.17	34.29
Top Width (ft)	273.62	Top Width (ft)	28.64	134.71	110.28
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	1.40	1.97	1.29
Max Chl Dpth (ft)	1.06	Hydr. Depth (ft)	0.19	0.67	0.24
Conv. Total (cfs)	2311.9	Conv. (cfs)	79.3	1872.4	360.3
Length Wtd. (ft)	497.95	Wetted Per. (ft)	28.64	134.72	110.28
Min Ch El (ft)	1634.20	Shear (lb/sq ft)	0.11	0.38	0.14
Alpha	1.07	Stream Power (lb/ft s)	0.15	0.75	0.18
Frctn Loss (ft)	3.19	Cum Volume (acre-ft)	8.01	15.93	3.27
C & E Loss (ft)	0.01	Cum SA (acres)	18.24	18.17	8.48

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 OUTPUT Profile #2

E.G. Elev (ft)	1635.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.055	

```
* W.S. Elev (ft)          * 1635.49  * Reach Len. (ft)         *  502.00  *  502.14  *  463.00  *
* Crit W.S. (ft)          * 1635.02  * Flow Area (sq ft)       *          *  122.07  *          *
* E.G. Slope (ft/ft)      *0.005135  * Area (sq ft)            *          *  122.07  *          *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)          *  134.71  * Top Width (ft)          *          *  134.71  *          *
* Vel Total (ft/s)        *    1.80  * Avg. Vel. (ft/s)        *          *    1.80  *          *
* Max Chl Dpth (ft)       *    1.29  * Hydr. Depth (ft)        *          *    0.91  *          *
* Conv. Total (cfs)       *  3070.0  * Conv. (cfs)             *          *  3070.0  *          *
* Length Wtd. (ft)        *  502.14  * Wetted Per. (ft)        *          *  135.90  *          *
* Min Ch El (ft)          * 1634.20  * Shear (lb/sq ft)        *          *    0.29  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.52  *          *
* Frctn Loss (ft)         *    3.02  * Cum Volume (acre-ft)    *    1.64  *   20.83  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.82  *   18.30  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9882.53   * 9931.99   *     7.54 *     5.37 *    28.64 *     3.43 *
0.19 *     1.40 *
* 2         * Chan      * 9931.99   * 10066.70  *   178.17 *    90.41 *   134.72 *    80.99 *
0.67 *     1.97 *
* 3         * ROB       * 10066.70  * 10201.01  *    34.29 *    26.49 *   110.28 *    15.58 *
0.24 *     1.29 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9931.99   * 10066.70  *   220.00 *   122.07 *   135.90 *   100.00 *
0.91 *     1.80 *
*****************************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 1.241

INPUT
Description:
Station Elevation Data    num=     114
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*******************************************************************************
 9356.07  1634.1 9359.28 1634.11 9362.51  1634.1 9363.05 1634.11 9366.98 1634.07
 9373.39    1634 9397.43 1633.77 9411.49 1633.63 9417.92 1633.57 9423.51 1633.55
 9445.22  1633.5 9455.88 1633.43  9459.8  1633.4 9460.58 1633.37 9490.27 1633.05
 9499.37    1633 9518.01 1632.85 9548.85 1632.83 9554.31 1632.85 9568.67 1632.89
 9573.58  1632.8 9592.69 1632.63 9602.95 1632.51 9621.47 1632.63 9633.11 1632.62
 9643.62  1632.5 9671.57    1632  9698.2  1631.6 9703.64 1631.52 9708.16  1631.5
 9716.53 1631.53 9760.04 1631.56 9786.57 1631.55 9805.83  1631.5 9807.76 1631.54
 9811.76 1631.57 9868.32 1631.96  9875.1 1631.97 9876.07    1632 9877.34 1631.96
 9888.26 1631.99 9896.38 1632.03 9897.391632.039 9915.33  1632.2 9917.27 1632.14
 9919.44 1632.11 9920.88 1632.06 9922.08    1632 9944.03 1630.63  9947.4 1630.95
 9955.78 1631.46 9961.48 1631.76 9978.64  1631.8 9981.52 1631.66 9984.21 1631.66
 9990.68 1631.78 9992.83 1631.76 9994.68  1631.8 9999.16 1631.7510006.38 1631.73
10011.21 1631.7210014.35 1631.7210018.01  1631.710020.09 1631.7210025.38 1631.78
10035.86 1631.8810045.64 1631.9810046.99    163210048.49    163210051.87 1632.02
10056.72 1632.0310059.08    1632 10060.1 1632.0510067.64 1632.2310067.95 1632.22
10070.54 1632.06 10071.3    163210080.66 1631.3510081.42 1631.2710083.45  1631.1
10090.59 1631.98   10091    163210096.57 1632.1910097.04 1632.18 10099.7    1632
10100.83 1631.9310103.75  1631.710105.99 1631.8810107.26    1632 10112.3 1632.44
10128.46  1632.710132.091632.73410135.82 1632.77   10137 1632.7810137.86  1632.8
10141.12 1632.8310172.66  1632.710187.06 1633.0410188.59 1633.0710198.63 1633.28
10222.79 1633.6410241.57  1633.810260.46    163410279.42 1634.1810286.14 1634.24
10288.69 1634.2710290.04  1634.310290.11 1634.2910291.05 1634.2810292.07 1634.28
10293.25 1634.2710294.66  1634.3 10296.5 1634.2510298.23 1634.23

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9356.07    .033 9915.33    .055 10112.3    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.3310067.64               501  551.91     465            .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1632.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.033  *   0.055  *   0.055  *
* W.S. Elev (ft)          * 1632.08  * Reach Len. (ft)         *  501.00  *  551.91  *  465.00  *
* Crit W.S. (ft)          * 1631.85  * Flow Area (sq ft)       *   90.22  *   58.07  *   12.13  *
* E.G. Slope (ft/ft)      *0.004762  * Area (sq ft)            *   90.22  *   58.07  *   12.13  *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *  147.93  *   59.83  *   12.24  *
* Top Width (ft)          *  409.64  * Top Width (ft)          *  235.37  *  141.26  *   33.00  *
* Vel Total (ft/s)        *    1.37  * Avg. Vel. (ft/s)        *    1.64  *    1.03  *    1.01  *
* Max Chl Dpth (ft)       *    1.45  * Hydr. Depth (ft)        *    0.38  *    0.41  *    0.37  *
* Conv. Total (cfs)       *  3188.1  * Conv. (cfs)             *  2143.7  *   867.1  *   177.4  *
* Length Wtd. (ft)        *  526.01  * Wetted Per. (ft)        *  235.38  *  141.35  *   33.13  *
* Min Ch El (ft)          * 1630.63  * Shear (lb/sq ft)        *    0.11  *    0.12  *    0.11  *
* Alpha                   *    1.14  * Stream Power (lb/ft s)  *    0.19  *    0.13  *    0.11  *
* Frctn Loss (ft)         *    2.80  * Cum Volume (acre-ft)    *    7.46  *   15.08  *    3.07  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   16.72  *   16.58  *    7.71  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1632.52  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1632.47  * Reach Len. (ft)         *  501.00  *  551.91  *  465.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  115.88  *          *
* E.G. Slope (ft/ft)      *0.007147  * Area (sq ft)            *          *  115.88  *          *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)          *  152.31  * Top Width (ft)          *          *  152.31  *          *
* Vel Total (ft/s)        *    1.90  * Avg. Vel. (ft/s)        *          *    1.90  *          *
* Max Chl Dpth (ft)       *    1.84  * Hydr. Depth (ft)        *          *    0.76  *          *
* Conv. Total (cfs)       *  2602.3  * Conv. (cfs)             *          *  2602.3  *          *
* Length Wtd. (ft)        *  551.91  * Wetted Per. (ft)        *          *  152.91  *          *
* Min Ch El (ft)          * 1630.63  * Shear (lb/sq ft)        *          *    0.34  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.64  *          *
```

```
* Frctn Loss (ft)        *    3.01  * Cum Volume (acre-ft)   *    1.64  *   19.46  *          *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    0.82  *   16.65  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9635.70   * 9915.33   *   147.93 *    90.22 *   235.38 *    67.24 *
0.38 *     1.64 *
* 2         * Chan      * 9915.33   * 10067.64  *    59.83 *    58.07 *   141.35 *    27.20 *
0.41 *     1.03 *
* 3         * ROB       * 10067.64  * 10182.94  *    12.24 *    12.13 *    33.13 *     5.56 *
0.37 *     1.01 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9915.33   * 10067.64  *   220.00 *   115.88 *   152.91 *   100.00 *
0.76 *     1.90 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 1.137

INPUT
Description: Interpolated point added at (10063.33,1629.034) to set bank station
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9565.14  1630.6 9586.97 1630.58 9589.14 1630.58 9631.71 1630.82 9631.87 1630.83
 9659.47  1630.7 9677.36 1630.29 9713.57 1630.19 9720.87  1630.2 9722.78 1630.15
  9728.8    1630 9737.76 1629.74 9748.51 1629.48 9755.52 1629.54 9776.77 1629.87
 9780.49  1629.8 9784.99  1629.7 9817.66    1629 9832.45 1628.83 9840.32  1628.7
  9860.91628.885  9873.6    1629 9886.58 1629.04 9938.68 1628.39 9941:65 1628.37
 9943.44 1628.37 9981.24  1628.7 9984.67 1628.6810013.85 1628.5510025.32 1628.62
10039.27 1628.7610063.331629.03410069.13  1629.1 10082.5 1629.25 10088.1 1629.34
10088.971629.34310125.05 1629.4810133.89 1629.6410148.45  1629.9   10152 1629.93
10160.31 1629.9810162.69    163010163.23    163010172.21  1630.110174.67 1630.09
10188.51 1630.3710226.07 1630.1110226.67  1630.110271.16 1631.0110276.63 1631.06
10284.85 1631.1510288.07 1631.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9565.14    .033 9886.58    .05510069.13    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
9886.5810063.33              460   453.4     429              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1629.32  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.033  *   0.055  *   0.043  *
* W.S. Elev (ft)         * 1629.29  * Reach Len. (ft)         *  460.00  *  453.40  *  429.00  *
* Crit W.S. (ft)         * 1629.01  * Flow Area (sq ft)       *   29.38  *  109.61  *    2.77  *
* E.G. Slope (ft/ft)     *0.005975  * Area (sq ft)            *   29.38  *  109.61  *    2.77  *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *   51.49  *  166.45  *    2.06  *
* Top Width (ft)         *  280.31  * Top Width (ft)          *   82.22  *  176.75  *   21.34  *
* Vel Total (ft/s)       *    1.55  * Avg. Vel. (ft/s)        *    1.75  *    1.52  *    0.74  *
* Max Chl Dpth (ft)      *    0.91  * Hydr. Depth (ft)        *    0.36  *    0.62  *    0.13  *
* Conv. Total (cfs)      *  2846.2  * Conv. (cfs)             *   666.1  *  2153.4  *    26.7  *
* Length Wtd. (ft)       *  456.36  * Wetted Per. (ft)        *   82.22  *  176.76  *   21.34  *
* Min Ch El (ft)         * 1628.37  * Shear (lb/sq ft)        *    0.13  *    0.23  *    0.05  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)   *    0.23  *    0.35  *    0.04  *
* Frctn Loss (ft)        *    2.58  * Cum Volume (acre-ft)     *    6.77  *   14.02  *    2.99  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   14.89  *   14.56  *    7.42  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1629.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1629.48  * Reach Len. (ft)         *  460.00  *  453.40  *  429.00  *
* Crit W.S. (ft)         * 1629.02  * Flow Area (sq ft)       *          *  143.44  *          *
* E.G. Slope (ft/ft)     *0.004286  * Area (sq ft)            *          *  143.44  *          *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)         *  176.75  * Top Width (ft)          *          *  176.75  *          *
* Vel Total (ft/s)       *    1.53  * Avg. Vel. (ft/s)        *          *    1.53  *          *
* Max Chl Dpth (ft)      *    1.11  * Hydr. Depth (ft)        *          *    0.81  *          *
* Conv. Total (cfs)      *  3360.5  * Conv. (cfs)             *          *  3360.5  *          *
* Length Wtd. (ft)       *  454.81  * Wetted Per. (ft)        *          *  177.64  *          *
* Min Ch El (ft)         * 1628.37  * Shear (lb/sq ft)        *          *    0.22  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    0.33  *          *
* Frctn Loss (ft)        *    2.41  * Cum Volume (acre-ft)     *    1.64  *   17.82  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *    0.82  *   14.56  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9725.86   * 9886.58   *    51.49 *    29.38 *    82.22 *    23.40 *
0.36 *     1.75 *
* 2        * Chan      * 9886.58   * 10063.33  *   166.45 *   109.61 *   176.76 *    75.66 *
0.62 *     1.52 *
* 3        * ROB       * 10063.33  * 10175.70  *     2.06 *     2.77 *    21.34 *     0.94 *
0.13 *     0.74 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9886.58   * 10063.33  *   220.00 *   143.44 *   177.64 *   100.00 *
0.81 *     1.53 *
*************************************************************************************************
******************
```

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: T4N-R3W-S07
REACH: Reach-1 RS: 1.051

INPUT
Description:
Station Elevation Data num= 81

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9554.69  1627.3  9570.4  1627.3 9583.66 1627.38 9614.14  1627.2 9628.02 1627.14
 9670.19    1627 9680.49 1626.95 9721.14 1626.67 9722.72 1626.61 9738.35 1626.62
 9763.82  1626.7 9796.75  1626.4 9810.39 1626.31 9811.991626.298 9823.68 1626.21
 9827.61 1626.12 9829.38  1626.1 9833.98 1626.03 9836.91    1626 9840.12 1625.96
 9844.47 1625.91 9864.29  1625.7 9870.83 1625.74 9890.42 1625.84  9897.9 1625.87
 9914.93    1626 9914.96    1626 9926.08 1626.08 9929.82 1626.28 9930.94 1626.29
  9933.2  1626.3 9946.84  1626.3 9952.16 1626.26 9953.17 1626.26 9974.27 1626.19
 9975.75  1626.2  9977.4  1626.2 9990.21 1626.37 9990.82 1626.33 9996.08    1626
 9997.37 1625.9310002.19 1625.6210007.23 1625.9410008.07    162610010.14  1626.1
10011.69 1626.2210017.49 1626.3210020.051626.35810035.52 1626.5910067.83  1626.9
10074.58    162710108.88 1627.2310114.81 1627.3610119.57 1627.4410121.83 1627.48
10125.78  1627.610128.22 1627.6610144.45 1627.9110144.75 1627.9410146.24 1627.91
10155.48  1627.810158.68 1627.7910162.78 1627.7910167.93  1627.810173.84 1627.84
10179.59  1627.910183.53  1627.910183.99 1627.9210187.48 1627.9710191.38    1628
10195.24    162810204.01 1628.0610216.95 1628.2310223.49 1628.2910229.15 1628.34
10241.45  1628.510267.82 1628.8110271.47 1628.8610291.68 1628.6610297.11 1628.51
10298.97  1628.5
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9554.69    .033 9796.75    .05510035.52    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.8410020.05              491  541.85     552             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1626.74  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.054  *   0.055  *   0.052  *
* W.S. Elev (ft)         * 1626.71  * Reach Len. (ft)         *  491.00  *  541.85  *  552.00  *
* Crit W.S. (ft)         * 1626.40  * Flow Area (sq ft)       *  111.34  *   39.56  *    4.38  *
* E.G. Slope (ft/ft)     *0.005374  * Area (sq ft)            *  111.34  *   39.56  *    4.38  *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *  164.92  *   51.96  *    3.12  *
* Top Width (ft)         *  332.53  * Top Width (ft)          *  231.41  *   73.21  *   27.91  *
* Vel Total (ft/s)       *    1.42  * Avg. Vel. (ft/s)        *    1.48  *    1.31  *    0.71  *
* Max Chl Dpth (ft)      *    1.09  * Hydr. Depth (ft)        *    0.48  *    0.54  *    0.16  *
* Conv. Total (cfs)      *  3001.1  * Conv. (cfs)             *  2249.7  *   708.8  *   42.6  *
* Length Wtd. (ft)       *  516.74  * Wetted Per. (ft)        *  231.42  *   73.26  *   27.91  *
* Min Ch El (ft)         * 1625.62  * Shear (lb/sq ft)        *    0.16  *    0.18  *    0.05  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.24  *    0.24  *    0.04  *
* Frctn Loss (ft)        *    3.30  * Cum Volume (acre-ft)    *    6.03  *   13.24  *    2.95  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   13.24  *   13.26  *    7.18  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
```

E.G. Elev (ft)	1627.10	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.06	Wt. n-Val.	0.055	0.055		
W.S. Elev (ft)	1627.03	Reach Len. (ft)	491.00	541.85	552.00	
Crit W.S. (ft)		Flow Area (sq ft)	45.35	63.08		
E.G. Slope (ft/ft)	0.006741	Area (sq ft)	45.35	63.08		
Q Total (cfs)	220.00	Flow (cfs)	94.12	125.88		
Top Width (ft)	122.15	Top Width (ft)	48.94	73.21		
Vel Total (ft/s)	2.03	Avg. Vel. (ft/s)	2.08	2.00		
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)	0.93	0.86		
Conv. Total (cfs)	2679.6	Conv. (cfs)	1146.4	1533.2		
Length Wtd. (ft)	532.82	Wetted Per. (ft)	50.11	73.93		
Min Ch El (ft)	1625.62	Shear (lb/sq ft)	0.38	0.36		
Alpha	1.00	Stream Power (lb/ft s)	0.79	0.72		
Frctn Loss (ft)	3.25	Cum Volume (acre-ft)	1.40	16.74		
C & E Loss (ft)	0.00	Cum SA (acres)	0.56	13.26		

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9554.69	9750.77	1.47	2.56	35.34	0.67	0.07	0.57
2	LOB	9750.77	9946.84	163.45	108.77	196.09	74.29	0.55	1.50
3	Chan	9946.84	10020.05	51.96	39.56	73.26	23.62	0.54	1.31
4	ROB	10020.05	10159.51	3.12	4.38	27.91	1.42	0.16	0.71

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9750.77	9946.84	94.12	45.35	50.11	42.78	0.93	2.08
2	Chan	9946.84	10020.05	125.88	63.08	73.93	57.22	0.86	2.00

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.
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: T4N-R3W-S07
REACH: Reach-1 RS: 0.948

INPUT
Description: Flow rate at this cross-section and downstream is increased to 310cfs.

```
Interpolated point added at (10056.94,1622.863) to set
             bank station
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9672.46  1624.4 9687.12 1624.45 9690.84 1624.45 9729.46  1624.2  9733.8  1624.1
 9736.69 1624.09 9742.72 1624.02 9744.89    1624 9761.57 1623.82 9778.77  1623.7
 9785.77 1623.68 9810.09 1623.31 9825.91 1623.18 9844.02 1623.04 9850.79    1623
 9877.85    1623 9892.99 1622.83  9903.61622.761 9914.69 1622.69 9944.67 1622.86
 9948.43  1622.8 9961.26  1622.7 9984.67 1622.3210016.58 1622.42 10016.8  1622.4
10017.03 1622.4210021.19 1622.4710049.68 1622.7810056.941622.86310077.371623.098
10088.88 1623.2310094.43  1623.310141.32 1623.6410143.14 1623.9110198.69 1623.76
10200.15  1623.810205.83 1623.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9672.46    .033 9877.85    .05510077.37    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.6710056.94               457  469.76     471             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1623.45  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.047  *   0.055  *   0.049  *
* W.S. Elev (ft)          * 1623.40  * Reach Len. (ft)         *  457.00  *  469.76  *  471.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   61.02  *   94.63  *   12.61  *
* E.G. Slope (ft/ft)      *0.007269  * Area (sq ft)            *   61.02  *   94.63  *   12.61  *
* Q Total (cfs)           *  310.00  * Flow (cfs)              *  100.47  *  194.47  *   15.06  *
* Top Width (ft)          *  303.57  * Top Width (ft)          *  140.34  *  112.27  *   50.96  *
* Vel Total (ft/s)        *    1.84  * Avg. Vel. (ft/s)        *    1.65  *    2.06  *    1.19  *
* Max Chl Dpth (ft)       *    1.08  * Hydr. Depth (ft)        *    0.43  *    0.84  *    0.25  *
* Conv. Total (cfs)       *  3636.1  * Conv. (cfs)             *  1178.4  *  2281.0  *   176.6  *
* Length Wtd. (ft)        *  464.69  * Wetted Per. (ft)        *  140.34  *  112.28  *   50.96  *
* Min Ch El (ft)          * 1622.32  * Shear (lb/sq ft)        *    0.20  *    0.38  *    0.11  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.32  *    0.79  *    0.13  *
* Frctn Loss (ft)         *    2.89  * Cum Volume (acre-ft)    *    5.05  *   12.41  *    2.84  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   11.14  *   12.11  *    6.68  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1623.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1623.76  * Reach Len. (ft)         *  457.00  *  469.76  *  471.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  135.55  *          *
* E.G. Slope (ft/ft)      *0.005694  * Area (sq ft)            *          *  135.55  *          *
* Q Total (cfs)           *  310.00  * Flow (cfs)              *          *  310.00  *          *
* Top Width (ft)          *  112.27  * Top Width (ft)          *          *  112.27  *          *
* Vel Total (ft/s)        *    2.29  * Avg. Vel. (ft/s)        *          *    2.29  *          *
* Max Chl Dpth (ft)       *    1.44  * Hydr. Depth (ft)        *          *    1.21  *          *
* Conv. Total (cfs)       *  4108.2  * Conv. (cfs)             *          *  4108.2  *          *
* Length Wtd. (ft)        *  469.76  * Wetted Per. (ft)        *          *  114.08  *          *
* Min Ch El (ft)          * 1622.32  * Shear (lb/sq ft)        *          *    0.42  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.97  *          *
* Frctn Loss (ft)         *    2.92  * Cum Volume (acre-ft)    *    1.14  *   15.51  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.28  *   12.11  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9672.46   * 9808.56   *     0.05 *     0.14 *     4.24 *     0.02 *
0.03 *     0.38 *
* 2         * LOB       * 9808.56   * 9944.67   *   100.42 *    60.88 *   136.11 *    32.39 *
0.45 *     1.65 *
* 3         * Chan      * 9944.67   * 10056.94  *   194.47 *    94.63 *   112.28 *    62.73 *
0.84 *     2.06 *
* 4         * ROB       * 10056.94  * 10131.38  *    15.06 *    12.61 *    50.96 *     4.86 *
0.25 *     1.19 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9944.67   * 10056.94  *   310.00 *   135.55 *   114.08 *   100.00 *
1.21 *     2.29 *
*****************************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 0.859

INPUT
Description:
Station Elevation Data    num=      90
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9292.86    1622 9294.51 1622.01 9302.15 1622.02 9303.29 1622.02  9304.3 1622.02
 9305.21    1622 9306.01 1622.03 9306.74 1622.03 9307.39 1622.03 9307.98 1622.03
 9308.52    1622 9309.01 1622.03 9309.45 1622.03 9309.86 1622.03 9310.24 1622.03
 9310.58    1622 9315.12 1622.02 9316.61 1622.01 9318.88    1622 9347.35 1621.84
 9351.75  1621.8 9355.01 1621.81 9364.34 1621.78  9370.3 1621.77 9376.25 1621.76
 9398.15  1621.7 9408.66 1621.67 9418.09 1621.63 9448.29 1621.69 9451.51 1621.68
 9494.59  1621.3 9504.59  1621.2 9515.38  1621.2 9562.58 1621.03  9576.7 1621.01
 9595.88    1621 9620.99 1620.65 9624.78 1620.59 9629.33 1620.52 9652.91 1620.23
 9661.15  1620.1 9670.76    1620  9682.3 1619.86 9688.57 1619.79 9713.05 1619.85
 9726.55  1619.9 9743.39    1620 9749.29 1620.03 9778.33  1620.2 9791.68 1620.33
 9828.37  1620.4 9831.12 1620.38 9835.47  1620.4 9856.43 1620.53 9866.57 1620.57
 9895.67  1620.5 9896.72  1620.5  9906.4 1620.38 9935.31    1620 9939.01 1619.96
  9939.6    1620 9939.66 1619.95 9939.79 1619.95 9940.06 1619.95 9962.25 1619.87
 9969.77  1619.8 9977.32 1619.82 9984.08 1619.79 9989.81 1619.78 9994.79 1619.78
 9999.83  1619.810005.84  1619.810023.16 1619.8610047.06 1619.8910049.61  1619.9
10050.34  1619.910052.38  1619.910054.59  1619.910056.91  1619.910061.52 1619.92
10079.75    162010085.43 1620.0210113.92 1620.17 10121.1 1620.2510130.55 1620.27
10142.85  1620.310179.07 1620.5410188.67  1620.910211.21 1620.8510214.46 1620.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9292.86    .033 9895.67    .05510179.07    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.3110079.75              482  485.56     481             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
```

```
* E.G. Elev (ft)          * 1620.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.034  *   0.055  *   0.055  *
* W.S. Elev (ft)          * 1620.52  * Reach Len. (ft)        *  482.00  *  485.56  *  481.00  *
* Crit W.S. (ft)          * 1620.26  * Flow Area (sq ft)      *   93.24  *   93.57  *   26.03  *
* E.G. Slope (ft/ft)      *0.005399  * Area (sq ft)           *   93.24  *   93.57  *   26.03  *
* Q Total (cfs)           *  310.00  * Flow (cfs)             *  149.30  *  139.05  *   21.65  *
* Top Width (ft)          *  512.51  * Top Width (ft)         *  272.09  *  144.44  *   95.99  *
* Vel Total (ft/s)        *    1.46  * Avg. Vel. (ft/s)       *    1.60  *    1.49  *    0.83  *
* Max Chl Dpth (ft)       *    0.74  * Hydr. Depth (ft)       *    0.34  *    0.65  *    0.27  *
* Conv. Total (cfs)       *  4219.1  * Conv. (cfs)            *  2032.0  *  1892.5  *   294.6  *
* Length Wtd. (ft)        *  483.83  * Wetted Per. (ft)       *  272.10  *  144.46  *   95.99  *
* Min Ch El (ft)          * 1619.78  * Shear (lb/sq ft)       *    0.12  *    0.22  *    0.09  *
* Alpha                   *    1.07  * Stream Power (lb/ft s) *    0.18  *    0.32  *    0.08  *
* Frctn Loss (ft)         *    2.91  * Cum Volume (acre-ft)   *    4.25  *   11.39  *    2.64  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    8.98  *   10.72  *    5.89  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1620.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1620.85  * Reach Len. (ft)        *  482.00  *  485.56  *  481.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  141.79  *          *
* E.G. Slope (ft/ft)      *0.006819  * Area (sq ft)           *          *  141.79  *          *
* Q Total (cfs)           *  310.00  * Flow (cfs)             *          *  310.00  *          *
* Top Width (ft)          *  144.44  * Top Width (ft)         *          *  144.44  *          *
* Vel Total (ft/s)        *    2.19  * Avg. Vel. (ft/s)       *          *    2.19  *          *
* Max Chl Dpth (ft)       *    1.07  * Hydr. Depth (ft)       *          *    0.98  *          *
* Conv. Total (cfs)       *  3754.0  * Conv. (cfs)            *          *  3754.0  *          *
* Length Wtd. (ft)        *  485.56  * Wetted Per. (ft)       *          *  146.16  *          *
* Min Ch El (ft)          * 1619.78  * Shear (lb/sq ft)       *          *    0.41  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.90  *          *
* Frctn Loss (ft)         *    3.00  * Cum Volume (acre-ft)   *    1.14  *   14.01  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    0.28  *   10.72  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9614.09   * 9935.31   *   149.30 *    93.24 *   272.10 *    48.16 *
0.34 *     1.60 *
* 2        * Chan      * 9935.31   * 10079.75  *   139.05 *    93.57 *   144.46 *    44.86 *
0.65 *     1.49 *
* 3        * ROB       * 10079.75  * 10147.11  *    20.63 *    23.31 *    67.36 *     6.66 *
0.35 *     0.89 *
* 4        * ROB       * 10147.11  * 10214.46  *     1.01 *     2.72 *    28.63 *     0.33 *
0.09 *     0.37 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9935.31    * 10079.75   *   310.00 *   141.79 *   146.16 *   100.00 *
0.98 *     2.19 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 0.767

INPUT
Description:
Station Elevation Data     num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9449.71    1620 9450.99 1620.04 9453.22 1620.04  9456.5    1620 9456.93    1620
 9485.29  1619.5 9490.29 1619.46  9495.5 1619.37 9498.56 1619.34 9499.43  1619.3
 9501.65 1619.34 9504.43 1619.41 9514.93 1619.44 9527.02 1619.47 9534.18  1619.3
 9539.12 1619.19 9574.28 1618.85  9575.2 1618.84  9576.2  1618.8 9583.64 1618.76
 9589.36 1618.81 9604.35  1618.7 9615.79 1618.41 9616.25  1618.4 9624.25  1618.1
 9625.32 1618.03  9632.6 1618.01 9666.04    1618 9667.37 1618.01 9667.48 1618.01
 9676.71    1618 9691.63 1617.84  9699.3 1617.77 9705.96 1617.68 9710.64 1617.57
 9720.22  1617.5 9729.02 1617.52 9746.05 1617.47 9759.34 1617.28  9765.4 1617.23
 9780.81  1617.2 9796.35  1617.1 9808.29 1617.05 9824.051617.054  9847.5 1617.06
 9855.25 1617.06 9880.69  1616.9 9892.91  1616.9 9913.05 1616.85 9920.03 1616.84
 9929.27  1616.8 9946.12  1616.8 9968.72 1616.94 9981.57 1616.99 9995.67 1616.99
10021.62    161710032.92 1617.0110036.93 1617.0310042.36 1617.06 10081.61617.351
10088.19  1617.410120.45 1617.5410138.54 1617.5610143.78 1617.6310145.54 1617.57
10176.74  1617.710189.89 1617.9810191.67 1618.0110191.92 1618.0210192.77 1618.02
10227.77  1618.310231.53 1618.2710247.39 1618.4310277.53  1618.710278.67 1618.68

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9449.71    .033 9759.34    .055 10081.6    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9855.2510021.62               464  437.11     426              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1617.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.053  *   0.055  *   0.052  *
* W.S. Elev (ft)         * 1617.60  * Reach Len. (ft)         *  464.00  *  437.11  *  426.00  *
* Crit W.S. (ft)         * 1617.33  * Flow Area (sq ft)       *   53.35  *  114.18  *   34.56  *
* E.G. Slope (ft/ft)     *0.006727  * Area (sq ft)            *   53.35  *  114.18  *   34.56  *
* Q Total (cfs)          *  310.00  * Flow (cfs)              *   70.69  *  196.87  *   42.45  *
* Top Width (ft)         *  441.06  * Top Width (ft)          *  145.97  *  166.37  *  128.71  *
* Vel Total (ft/s)       *    1.53  * Avg. Vel. (ft/s)        *    1.32  *    1.72  *    1.23  *
* Max Chl Dpth (ft)      *    0.80  * Hydr. Depth (ft)        *    0.37  *    0.69  *    0.27  *
* Conv. Total (cfs)      *  3779.6  * Conv. (cfs)             *   861.8  *  2400.2  *   517.5  *
* Length Wtd. (ft)       *  442.06  * Wetted Per. (ft)        *  145.98  *  166.37  *  128.71  *
* Min Ch El (ft)         * 1616.80  * Shear (lb/sq ft)        *    0.15  *    0.29  *    0.11  *
* Alpha                  *    1.06  * Stream Power (lb/ft s)  *    0.20  *    0.50  *    0.14  *
* Frctn Loss (ft)        *    2.61  * Cum Volume (acre-ft)    *    3.43  *   10.23  *    2.30  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    6.66  *    8.99  *    4.65  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1617.93  * Element                 *  Left OB *  Channel * Right OB *
```

```
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1617.87  * Reach Len. (ft)        *  464.00  *  437.11  *  426.00  *
* Crit W.S. (ft)         * 1617.39  * Flow Area (sq ft)      *          *  158.99  *          *
* E.G. Slope (ft/ft)     *0.005609  * Area (sq ft)           *          *  158.99  *          *
* Q Total (cfs)          *  310.00  * Flow (cfs)              *          *  310.00  *          *
* Top Width (ft)         *  166.37  * Top Width (ft)          *          *  166.37  *          *
* Vel Total (ft/s)       *    1.95  * Avg. Vel. (ft/s)        *          *    1.95  *          *
* Max Chl Dpth (ft)      *    1.07  * Hydr. Depth (ft)        *          *    0.96  *          *
* Conv. Total (cfs)      *  4139.3  * Conv. (cfs)             *          *  4139.3  *          *
* Length Wtd. (ft)       *  438.92  * Wetted Per. (ft)        *          *  168.05  *          *
* Min Ch El (ft)         * 1616.80  * Shear (lb/sq ft)        *          *    0.33  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.65  *          *
* Frctn Loss (ft)        *    2.84  * Cum Volume (acre-ft)    *    1.14  *   12.33  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    0.28  *    8.99  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9652.48   * 9855.25   *    70.69 *    53.35 *   145.98 *    22.80 *
0.37 *     1.32 *
* 2         * Chan      * 9855.25   * 10021.62  *   196.87 *   114.18 *   166.37 *    63.51 *
0.69 *     1.72 *
* 3         * ROB       * 10021.62  * 10150.14  *    42.44 *    34.54 *   125.61 *    13.69 *
0.28 *     1.23 *
* 4         * ROB       * 10150.14  * 10278.67  *     0.00 *     0.02 *     3.10 *     0.00 *
0.01 *     0.13 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9855.25   * 10021.62  *   310.00 *   158.99 *   168.05 *   100.00 *
0.96 *     1.95 *
*****************************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 0.684

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9387.39  1617.2 9445.48 1617.47  9461.8 1617.44 9468.77  1617.5 9478.72 1617.46
 9535.13  1617.3 9548.56 1617.16 9597.07 1616.83 9617.89  1616.7 9648.24  1616.5
 9675.34  1616.3  9693.9 1616.13 9704.68    1616 9720.04 1615.82  9759.6 1615.36
 9778.25  1615.2 9806.96 1615.31 9816.32 1615.31 9825.42 1615.34 9830.19 1615.27
```

```
  9843.2  1615.1 9852.161614.973  9885.5  1614.5 9894.85 1614.44 9897.36 1614.42
 9905.61 1614.37 9912.77  1614.3 9952.25 1614.09 9965.97 1614.01 9966.97    1614
 9990.06  1613.8 9999.67 1613.7610010.96 1613.6910019.22 1613.7910034.41    1614
10036.31    161410037.75 1614.0410054.51 1614.2710061.94  1614.410085.24  1614.6
10107.33  1614.810119.09 1614.98 10119.81614.99310155.72 1615.6310179.61 1615.84
10196.97 1615.9410206.45    161610225.62 1616.1110232.29 1616.1510234.32 1616.17
10236.97 1616.1910242.14  1616.210275.24 1616.0510278.32 1616.0510280.48 1616.06
10283.21 1616.08

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9387.39    .033 9852.16    .055 10119.8    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.2510054.51              555  548.15     529            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1615.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.055  *   0.055  *   0.055  *
* W.S. Elev (ft)          * 1614.97  * Reach Len. (ft)         *  555.00  *  548.15  *  529.00  *
* Crit W.S. (ft)          * 1614.56  * Flow Area (sq ft)       *   54.14  *  107.59  *   22.86  *
* E.G. Slope (ft/ft)      *0.005227  * Area (sq ft)            *   54.14  *  107.59  *   22.86  *
* Q Total (cfs)           *  310.00  * Flow (cfs)              *   70.20  *  217.38  *   22.42  *
* Top Width (ft)          *  266.66  * Top Width (ft)          *  100.18  *  102.26  *   64.21  *
* Vel Total (ft/s)        *    1.68  * Avg. Vel. (ft/s)        *    1.30  *    2.02  *    0.98  *
* Max Chl Dpth (ft)       *    1.28  * Hydr. Depth (ft)        *    0.54  *    1.05  *    0.36  *
* Conv. Total (cfs)       *  4287.9  * Conv. (cfs)             *   971.0  *  3006.8  *   310.1  *
* Length Wtd. (ft)        *  548.01  * Wetted Per. (ft)        *  100.19  *  102.27  *   64.22  *
* Min Ch El (ft)          * 1613.69  * Shear (lb/sq ft)        *    0.18  *    0.34  *    0.12  *
* Alpha                   *    1.17  * Stream Power (lb/ft s)  *    0.23  *    0.69  *    0.11  *
* Frctn Loss (ft)         *    3.54  * Cum Volume (acre-ft)    *    2.86  *    9.12  *    2.02  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    5.35  *    7.64  *    3.70  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1615.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.055  *   0.055  *          *
* W.S. Elev (ft)          * 1614.99  * Reach Len. (ft)         *  555.00  *  548.15  *  529.00  *
* Crit W.S. (ft)          * 1614.54  * Flow Area (sq ft)       *   20.34  *  109.62  *          *
* E.G. Slope (ft/ft)      *0.007555  * Area (sq ft)            *   20.34  *  109.62  *          *
* Q Total (cfs)           *  310.00  * Flow (cfs)              *   41.63  *  268.37  *          *
* Top Width (ft)          *  126.48  * Top Width (ft)          *   24.22  *  102.26  *          *
* Vel Total (ft/s)        *    2.39  * Avg. Vel. (ft/s)        *    2.05  *    2.45  *          *
* Max Chl Dpth (ft)       *    1.30  * Hydr. Depth (ft)        *    0.84  *    1.07  *          *
* Conv. Total (cfs)       *  3566.6  * Conv. (cfs)             *   479.0  *  3087.6  *          *
* Length Wtd. (ft)        *  548.61  * Wetted Per. (ft)        *   25.00  *  102.99  *          *
* Min Ch El (ft)          * 1613.69  * Shear (lb/sq ft)        *    0.38  *    0.50  *          *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.79  *    1.23  *          *
* Frctn Loss (ft)         *    3.40  * Cum Volume (acre-ft)    *    1.04  *   10.99  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.15  *    7.64  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9669.82   * 9952.25   *    70.20 *    54.14 *   100.19 *    22.64 *
0.54 *     1.30 *
```

```
* 2          * Chan       * 9952.25   * 10054.51  *   217.38 *   107.59 *   102.27 *    70.12 *
1.05 *     2.02 *
* 3          * ROB        * 10054.51  * 10168.86  *    22.42 *    22.86 *    64.22 *     7.23 *
0.36 *     0.98 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos        * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *            * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB        * 9669.82   * 9952.25   *    41.63 *    20.34 *    25.00 *    13.43 *
0.84 *     2.05 *
* 2          * Chan       * 9952.25   * 10054.51  *   268.37 *   109.62 *   102.99 *    86.57 *
1.07 *     2.45 *
*****************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 0.581

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9303.68    1615 9351.77 1614.73 9359.33 1614.86 9407.04 1614.45 9448.22 1614.33
 9471.78  1614.1 9476.06    1614 9486.23 1613.88 9502.83 1613.69 9510.96  1613.6
 9516.49  1613.5 9540.24 1613.32 9578.41 1612.72 9630.53 1612.06 9641.96 1612.02
  9651.5    1612 9652.01    1612 9659.88 1611.97 9724.58 1611.75 9734.52 1611.72
 9743.04  1611.7 9815.62 1611.39 9838.86 1611.26 9851.53 1611.22 9886.13 1610.96
 9890.461610.923 9928.73  1610.6 9947.65 1610.53 9959.62 1610.61 9984.85 1610.57
 9996.93 1610.59 9997.74  1610.3  9998.7    161010000.08 1609.61 10000.6 1609.38
10001.02 1609.5510001.86    161010002.41 1610.1910002.77 1610.3410005.43 1610.33
10047.361610.89410098.28 1611.5810109.36  1611.810116.71 1611.8510129.67    1612
10199.62 1612.8410237.83  1613.410288.79 1613.3110289.39 1613.32 10289.8 1613.32
10290.93 1613.31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9303.68    .033 9890.46    .05510047.36    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9890.4610047.36              530  544.25     510             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1611.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1611.41  * Reach Len. (ft)         *  530.00  *  544.25  *  510.00  *
* Crit W.S. (ft)          * 1611.11  * Flow Area (sq ft)       *   17.41  *  126.68  *    9.94  *
* E.G. Slope (ft/ft)      *0.008178  * Area (sq ft)            *   17.41  *  126.68  *    9.94  *
* Q Total (cfs)           *  310.00  * Flow (cfs)              *   25.66  *  267.89  *   16.44  *
* Top Width (ft)          *  275.22  * Top Width (ft)          *   79.90  *  156.90  *   38.42  *
* Vel Total (ft/s)        *    2.01  * Avg. Vel. (ft/s)        *    1.47  *    2.11  *    1.65  *
* Max Chl Dpth (ft)       *    2.03  * Hydr. Depth (ft)        *    0.22  *    0.81  *    0.26  *
* Conv. Total (cfs)       *  3427.9  * Conv. (cfs)             *   283.8  *  2962.3  *   181.8  *
* Length Wtd. (ft)        *  537.95  * Wetted Per. (ft)        *   79.90  *  157.31  *   38.43  *
```

Min Ch El (ft)	1609.38	Shear (lb/sq ft)	0.11	0.41	0.13
Alpha	1.03	Stream Power (lb/ft s)	0.16	0.87	0.22
Frctn Loss (ft)	2.64	Cum Volume (acre-ft)	2.41	7.65	1.82
C & E Loss (ft)	0.01	Cum SA (acres)	4.21	6.01	3.08

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1611.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.055	
W.S. Elev (ft)	1611.62	Reach Len. (ft)	530.00	544.25	510.00
Crit W.S. (ft)	1611.10	Flow Area (sq ft)		159.16	
E.G. Slope (ft/ft)	0.005179	Area (sq ft)		159.16	
Q Total (cfs)	310.00	Flow (cfs)		310.00	
Top Width (ft)	156.90	Top Width (ft)		156.90	
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)		1.95	
Max Chl Dpth (ft)	2.24	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	4307.8	Conv. (cfs)		4307.8	
Length Wtd. (ft)	544.25	Wetted Per. (ft)		158.73	
Min Ch El (ft)	1609.38	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)		0.63	
Frctn Loss (ft)	2.54	Cum Volume (acre-ft)	0.91	9.29	
C & E Loss (ft)	0.00	Cum SA (acres)		6.01	

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 parabolic search method failed to converge on critical depth. The program will try the
cross section slice/secant method to find critical depth.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9597.07	9890.46	25.66	17.41	79.90	8.28	0.22	1.47
2 Chan	9890.46	10047.36	267.89	126.68	157.31	86.42	0.81	2.11
3 ROB	10047.36	10169.14	16.44	9.94	38.43	5.30	0.26	1.65

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9890.46	10047.36	310.00	159.16	158.73	100.00	1.01	1.95

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 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: T4N-R3W-S07
REACH: Reach-1 RS: 0.477

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9414.79	1611	9454.85	1611.01	9478.7	1611.11	9523.82	1611.05	9549.69	1610.92
9570.46	1610.8	9638.66	1610.44	9641.26	1610.42	9644.44	1610.39	9645.3	1610.4
9651.12	1610.4	9659.35	1610.33	9672.69	1610.24	9704.02	1610	9704.33	1610
9716.4	1609.9	9724.08	1609.85	9797.6	1609.06	9825.83	1608.77	9836.75	1608.66
9878.16	1608.3	9893.55	1608.18	9910.47	1608.114	9926.77	1608.05	9938.99	1608
9941.09	1607.99	9968.5	1607.8	9982.97	1607.79	9986.19	1607.7	9992.57	1607.57
9995.09	1607.09	9997.27	1606.81	10000.65	1607.44	10001.85	1607.68	10004.28	1607.7
10017.35	1607.73	10047.19	1607.91	10053.24	1607.93	10064.09	1608	10064.48	1608
10099.73	1608.27	10111.72	1608.35	10117.71	1608.41	10129.19	1608.43	10140.99	1608.48
10149.45	1608.51	10209.95	1609.03	10239.75	1609.41	10284.56	1609.78	10316.68	1610
10324.56	1610.03	10330.2	1610.06						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9414.79	.033	9878.16	.055	10129.19	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9938.99	10053.24	426	413.05	405	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1608.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.050	0.055	0.051
W.S. Elev (ft)	1608.80	Reach Len. (ft)	426.00	413.05	405.00
Crit W.S. (ft)	1608.35	Flow Area (sq ft)	54.90	118.25	57.23
E.G. Slope (ft/ft)	0.003260	Area (sq ft)	54.90	118.25	57.23
Q Total (cfs)	310.00	Flow (cfs)	62.81	186.46	60.73
Top Width (ft)	360.48	Top Width (ft)	115.94	114.25	130.29
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)	1.14	1.58	1.06
Max Chl Dpth (ft)	2.00	Hydr. Depth (ft)	0.47	1.03	0.44
Conv. Total (cfs)	5429.6	Conv. (cfs)	1100.1	3265.8	1063.6
Length Wtd. (ft)	413.93	Wetted Per. (ft)	115.94	114.40	130.30
Min Ch El (ft)	1606.80	Shear (lb/sq ft)	0.10	0.21	0.09
Alpha	1.09	Stream Power (lb/ft s)	0.11	0.33	0.09
Frctn Loss (ft)	2.71	Cum Volume (acre-ft)	1.97	6.12	1.43
C & E Loss (ft)	0.01	Cum SA (acres)	3.01	4.32	2.09

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1609.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.055	
W.S. Elev (ft)	1609.07	Reach Len. (ft)	426.00	413.05	405.00
Crit W.S. (ft)	1608.37	Flow Area (sq ft)		149.57	
E.G. Slope (ft/ft)	0.004223	Area (sq ft)		149.57	
Q Total (cfs)	310.00	Flow (cfs)		310.00	
Top Width (ft)	114.25	Top Width (ft)		114.25	
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)		2.07	
Max Chl Dpth (ft)	2.27	Hydr. Depth (ft)		1.31	
Conv. Total (cfs)	4770.1	Conv. (cfs)		4770.1	

```
* Length Wtd. (ft)        *  413.05  * Wetted Per. (ft)        *          *  116.62  *          *
* Min Ch El (ft)          * 1606.80  * Shear (lb/sq ft)        *          *    0.34  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.70  *          *
* Frctn Loss (ft)         *    2.88  * Cum Volume (acre-ft)    *    0.91  *    7.37  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *    4.32  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9676.89   * 9938.99   *    62.81 *    54.90 *   115.94 *    20.26 *
0.47 *     1.14 *
* 2         * Chan      * 9938.99   * 10053.24  *   186.46 *   118.25 *   114.40 *    60.15 *
1.03 *     1.58 *
* 3         * ROB       * 10053.24  * 10191.72  *    60.73 *    57.23 *   130.30 *    19.59 *
0.44 *     1.06 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9938.99   * 10053.24  *   310.00 *   149.57 *   116.62 *   100.00 *
1.31 *     2.07 *
*****************************************************************************************************
******************

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: T4N-R3W-S07
REACH: Reach-1            RS: 0.399

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Flow rate at
             this cross-section and downstream is increased to 390cfs.
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9267.5  1608.9 9276.83 1608.88 9301.43 1608.86 9367.01 1608.47 9377.51 1608.39
 9385.03 1608.35 9445.27    1608 9446.66 1607.99 9469.72  1607.9 9512.59 1607.52
 9535.03 1607.39 9544.76 1607.33 9564.78 1607.24 9610.64  1607.3 9630.52 1607.43
 9659.56 1607.21 9709.22 1607.16  9735.7 1607.03 9801.58  1606.3  9805.3 1606.26
 9823.39 1606.09 9824.17 1606.08 9825.22 1606.08 9831.66  1606.1  9839.3 1606.03
 9844.95    1606  9870.5 1605.84 9879.04 1605.78 9913.911605.598  9932.6  1605.5
  9953.1 1605.21 9994.34 1604.78 9998.42 1605.2710046.83  1605.110050.96 1605.16
10075.78 1605.4510113.791605.91610114.95 1605.9310115.16  1605.910121.55    1606
10202.44 1606.8310203.98 1606.8510206.23 1606.8710207.08  1606.910296.98 1607.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

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************************************************
  9267.5    .033  9870.5    .05510113.79    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9932.610075.78              404  432.97     441            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1606.11  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.054  *   0.055  *   0.055  *
* W.S. Elev (ft)         * 1605.99  * Reach Len. (ft)         *  404.00  *  432.97  *  441.00  *
* Crit W.S. (ft)         * 1605.80  * Flow Area (sq ft)       *   22.33  *  117.95  *   12.16  *
* E.G. Slope (ft/ft)     *0.014607  * Area (sq ft)            *   22.33  *  117.95  *   12.16  *
* Q Total (cfs)          *  390.00  * Flow (cfs)              *   33.71  *  338.38  *   17.91  *
* Top Width (ft)         *  275.04  * Top Width (ft)          *   86.54  *  143.18  *   45.33  *
* Vel Total (ft/s)       *    2.56  * Avg. Vel. (ft/s)        *    1.51  *    2.87  *    1.47  *
* Max Chl Dpth (ft)      *    1.21  * Hydr. Depth (ft)        *    0.26  *    0.82  *    0.27  *
* Conv. Total (cfs)      *  3226.9  * Conv. (cfs)             *   278.9  *  2799.8  *   148.2  *
* Length Wtd. (ft)       *  429.15  * Wetted Per. (ft)        *   86.54  *  143.22  *   45.33  *
* Min Ch El (ft)         * 1604.78  * Shear (lb/sq ft)        *    0.24  *    0.75  *    0.24  *
* Alpha                  *    1.14  * Stream Power (lb/ft s)  *    0.36  *    2.15  *    0.36  *
* Frctn Loss (ft)        *    2.36  * Cum Volume (acre-ft)    *    1.59  *    5.00  *    1.10  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    2.02  *    3.10  *    1.28  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1606.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1606.13  * Reach Len. (ft)         *  404.00  *  432.97  *  441.00  *
* Crit W.S. (ft)         * 1605.78  * Flow Area (sq ft)       *          *  137.94  *          *
* E.G. Slope (ft/ft)     *0.011654  * Area (sq ft)            *          *  137.94  *          *
* Q Total (cfs)          *  390.00  * Flow (cfs)              *          *  390.00  *          *
* Top Width (ft)         *  143.18  * Top Width (ft)          *          *  143.18  *          *
* Vel Total (ft/s)       *    2.83  * Avg. Vel. (ft/s)        *          *    2.83  *          *
* Max Chl Dpth (ft)      *    1.35  * Hydr. Depth (ft)        *          *    0.96  *          *
* Conv. Total (cfs)      *  3612.7  * Conv. (cfs)             *          *  3612.7  *          *
* Length Wtd. (ft)       *  432.97  * Wetted Per. (ft)        *          *  144.53  *          *
* Min Ch El (ft)         * 1604.78  * Shear (lb/sq ft)        *          *    0.69  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    1.96  *          *
* Frctn Loss (ft)        *    2.12  * Cum Volume (acre-ft)    *    0.91  *    6.00  *          *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *          *    3.10  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9600.05   * 9932.60   *    33.71 *    22.33 *    86.54 *     8.64 *
0.26 *     1.51 *
* 2        * Chan      * 9932.60   * 10075.78  *   338.38 *   117.95 *   143.22 *    86.76 *
0.82 *     2.87 *
* 3        * ROB       * 10075.78  * 10186.38  *    17.91 *    12.16 *    45.33 *     4.59 *
0.27 *     1.47 *
*****************************************************************************************
******************

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9932.60	10075.78	390.00	137.94	144.53	100.00	0.96	2.83

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.

CROSS SECTION

RIVER: T4N-R3W-S07
REACH: Reach-1 RS: 0.317

INPUT
Description: Interpolated point added at 10081.01, 1602.65) to set bank station
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9254.5	1606.4	9264.26	1606.39	9268.53	1606.4	9318.19	1606.66	9336.93	1606.66
9344.87	1606.7	9369.28	1606.45	9404.24	1606.15	9416.95	1606.03	9420.91	1606
9422.52	1606	9427.34	1605.95	9465.05	1605.64	9482.27	1605.51	9517.67	1605.25
9589.56	1604.7	9611.07	1604.57	9612.13	1604.57	9612.89	1604.56	9613.85	1604.56
9616.26	1604.6	9619.19	1604.56	9680.94	1604.41	9708.48	1604.44	9743.82	1604.21
9770.54	1604.1	9776.55	1604.03	9779.41	1603.98	9781.96	1603.97	9801.39	1603.92
9842.51	1603.8	9849.87	1603.74	9857.35	1603.71	9920.31	1603.028	9922.92	1603
9928.54	1602.9	9932.1	1602.9	9939.93	1602.85	9941.84	1602.82	9959.65	1602.68
9986.92	1602.5	9987.35	1602.35	9988.22	1602.06	9988.38	1602	9988.5	1601.95
9990.08	1601	9995.78	1601.95	9996.09	1602	9996.3	1602.03	9998.51	1602.43
10000.59	1602.4	10018.28	1602.47	10065.76	1602.33	10081.01	1602.65	10099.58	1603.04
10101.78	1603.09	4 10112.3	1603.35	10138.47	1603.8	10159.38	1604	10159.59	1604
10202.26	1604.67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9254.5	.033	9959.65	.055	10081.01	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9959.65	10081.01	723	727.16	627	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1603.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.055	0.033
W.S. Elev (ft)	1603.69	Reach Len. (ft)	723.00	727.16	627.00
Crit W.S. (ft)		Flow Area (sq ft)	53.50	156.67	25.23
E.G. Slope (ft/ft)	0.002853	Area (sq ft)	53.50	156.67	25.23
Q Total (cfs)	390.00	Flow (cfs)	84.65	267.35	37.99
Top Width (ft)	272.54	Top Width (ft)	100.25	121.36	50.93
Vel Total (ft/s)	1.66	Avg. Vel. (ft/s)	1.58	1.71	1.51
Max Chl Dpth (ft)	2.69	Hydr. Depth (ft)	0.53	1.29	0.50
Conv. Total (cfs)	7301.0	Conv. (cfs)	1584.7	5005.0	711.2
Length Wtd. (ft)	713.99	Wetted Per. (ft)	100.26	121.84	50.94
Min Ch El (ft)	1601.00	Shear (lb/sq ft)	0.10	0.23	0.09
Alpha	1.01	Stream Power (lb/ft s)	0.15	0.39	0.13
Frctn Loss (ft)	4.92	Cum Volume (acre-ft)	1.24	3.63	0.92
C & E Loss (ft)	0.02	Cum SA (acres)	1.16	1.78	0.79

```
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)        * 1604.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.06  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)        * 1604.06  * Reach Len. (ft)         *  723.00  *  727.16  *  627.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)       *          *  201.87  *          *
* E.G. Slope (ft/ft)    *0.002688  * Area (sq ft)            *          *  201.87  *          *
* Q Total (cfs)         *  390.00  * Flow (cfs)              *          *  390.00  *          *
* Top Width (ft)        *  121.36  * Top Width (ft)          *          *  121.36  *          *
* Vel Total (ft/s)      *    1.93  * Avg. Vel. (ft/s)         *          *    1.93  *          *
* Max Chl Dpth (ft)     *    3.06  * Hydr. Depth (ft)         *          *    1.66  *          *
* Conv. Total (cfs)     *  7521.8  * Conv. (cfs)              *          *  7521.8  *          *
* Length Wtd. (ft)      *  727.16  * Wetted Per. (ft)         *          *  124.63  *          *
* Min Ch El (ft)        * 1601.00  * Shear (lb/sq ft)         *          *    0.27  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s)   *          *    0.53  *          *
* Frctn Loss (ft)       *    5.11  * Cum Volume (acre-ft)     *    0.91  *    4.31  *          *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)           *          *    1.78  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9607.08   * 9959.65   *    84.65 *    53.50 *   100.26 *    21.71 *
0.53 *     1.58 *
* 2        * Chan      * 9959.65   * 10081.01  *   267.35 *   156.67 *   121.84 *    68.55 *
1.29 *     1.71 *
* 3        * ROB       * 10081.01  * 10141.63  *    37.99 *    25.23 *    50.94 *     9.74 *
0.50 *     1.51 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9959.65   * 10081.01  *   390.00 *   201.87 *   124.63 *   100.00 *
1.66 *     1.93 *
*****************************************************************************************
******************

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.

CROSS SECTION
```

RIVER: T4N-R3W-S07
REACH: Reach-1 RS: 0.180

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9368.06	1601.6	9386.12	1601.62	9390.38	1601.62	9486.03	1601.34	9486.44	1601.36
9572.05	1600.6	9585.15	1600.45	9588.93	1600.4	9590.63	1600.38	9619.38	1600
9629.37	1599.9	9635.49	1599.8	9636.93	1599.77	9643.18	1599.73	9645.71	1599.72
9650.67	1599.68	9651.16	1599.68	9652.37	1599.69	9661.65	1599.75	9663.34	1599.8
9671.74	1599.84	9675.21	1599.86	9678.2	1599.43	9679.31	1599.24	9681.37	1599.6
9681.96	1599.79	9683.35	1599.81	9684.34	1599.81	9684.73	1599.8	9685.21	1599.81
9690.95	1599.8	9713.97	1599.69	9716.53	1599.7	9718.93	1599.65	9730.53	1599.49
9741.81	1599.59	9809.64	1599.7	9816.02	1599.83	9819.87	1599.86	9823.61	1599.94
9824.14	1599.86	9843.72	1599.7	9851.93	1599.62	9869.82	1599.22	9897.62	1598.62
9908.01	1598.6	9940.78	1598.43	9942.34	1598.398	9955.65	1598.12	9961.85	1598.03
9963.09	1598	9963.94	1598	9969.54	1597.95	9971.29	1597.93	9971.88	1597.93
9972.16	1597.9	9972.89	1597.93	9976.71	1597.91	9977.92	1597.91	9981.25	1597.9
9984.51	1597.87	9986.18	1597.49	9992.91	1596.34	9996.02	1597.45	9997.72	1597.3
9999.21	1597.08	9999.75	1596.85	10000.21	1597.05	10001.53	1597.6	10002.5	1597.9
10014.05	1597.89	10018.5	1597.89	10022.15	1597.71	10025.74	1597.65	10046.06	1598
10048.32	1598.01	10054.21	1598.05	10063.74	1598.11	10077.77	1598.16	10096.33	1598.33
10119.3	1598.61	10189.68	1599.09	10217.99	1599.15	10279.78	1599.25		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9368.06	.033	9961.85	.055	10054.21	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9961.85	10054.21	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1598.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.033	0.055	0.033
W.S. Elev (ft)	1598.53	Reach Len. (ft)	439.99	439.99	439.99
Crit W.S. (ft)	1598.53	Flow Area (sq ft)	7.37	72.59	16.64
E.G. Slope (ft/ft)	0.034663	Area (sq ft)	7.37	72.59	16.64
Q Total (cfs)	390.00	Flow (cfs)	20.22	309.59	60.19
Top Width (ft)	190.42	Top Width (ft)	39.36	92.36	58.70
Vel Total (ft/s)	4.04	Avg. Vel. (ft/s)	2.74	4.27	3.62
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)	0.19	0.79	0.28
Conv. Total (cfs)	2094.7	Conv. (cfs)	108.6	1662.9	323.3
Length Wtd. (ft)	439.99	Wetted Per. (ft)	39.37	92.97	58.71
Min Ch El (ft)	1596.34	Shear (lb/sq ft)	0.41	1.69	0.61
Alpha	1.03	Stream Power (lb/ft s)	1.11	7.21	2.22
Frctn Loss (ft)	2.51	Cum Volume (acre-ft)	0.73	1.72	0.61
C & E Loss (ft)	0.07	Cum SA (acres)			

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 OUTPUT Profile #2

E.G. Elev (ft)	1598.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.055	

```
* W.S. Elev (ft)          * 1598.56  * Reach Len. (ft)         *  439.99  *  439.99  *  439.99  *
* Crit W.S. (ft)          * 1598.56  * Flow Area (sq ft)       *          *   75.95  *          *
* E.G. Slope (ft/ft)      *0.048015  * Area (sq ft)            *          *   75.95  *          *
* Q Total (cfs)           *  390.00  * Flow (cfs)              *          *  390.00  *          *
* Top Width (ft)          *   92.36  * Top Width (ft)          *          *   92.36  *          *
* Vel Total (ft/s)        *    5.14  * Avg. Vel. (ft/s)        *          *    5.14  *          *
* Max Chl Dpth (ft)       *    2.22  * Hydr. Depth (ft)        *          *    0.82  *          *
* Conv. Total (cfs)       *  1779.8  * Conv. (cfs)             *          *  1779.8  *          *
* Length Wtd. (ft)        *  439.99  * Wetted Per. (ft)        *          *   94.01  *          *
* Min Ch El (ft)          * 1596.34  * Shear (lb/sq ft)        *          *    2.42  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   12.43  *          *
* Frctn Loss (ft)         *    2.17  * Cum Volume (acre-ft)    *    0.91  *    2.00  *          *
* C & E Loss (ft)         *    0.11  * Cum SA (acres)          *          *          *          *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9664.96   * 9961.85   *    20.22 *     7.37 *    39.37 *     5.18 *
0.19 *     2.74 *
* 2        * Chan      * 9961.85   * 10054.21  *   309.59 *    72.59 *    92.97 *    79.38 *
0.79 *     4.27 *
* 3        * ROB       * 10054.21  * 10167.00  *    60.19 *    16.64 *    58.71 *    15.43 *
0.28 *     3.62 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9961.85   * 10054.21  *   390.00 *    75.95 *    94.01 *   100.00 *
0.82 *     5.14 *
*****************************************************************************************************
******************
```

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.
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: T4N-R3W-S16
REACH: Reach-1a RS: 1.648

INPUT
Description: Flow rate starting at this cross-section and downstream is 810cfs.
Station Elevation Data num= 127

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9023.4	1572.6	9026.52	1572.58	9047.81	1572.28	9050.82	1572.25	9057.82	1572.2
9071.53	1572.1	9089.01	1572	9103.21	1571.96	9105.9	1571.95	9108.76	1571.93
9114.03	1571.9	9116.82	1571.94	9120.17	1571.94	9148.06	1571.96	9158.51	1571.95
9183.74	1571.7	9261.8	1571.62	9275.76	1571.55	9284.09	1571.57	9320.48	1571.28
9330.49	1571.2	9332.07	1571.2	9370.03	1571.08	9374.37	1571.06	9412.94	1571.19
9423.09	1571.1	9446.9	1571.2	9452.67	1571.13	9486.18	1570.68	9495.41	1570.54
9496.31	1570.5	9539.49	1570.25	9541.55	1570.24	9574.41	1570.25	9582.89	1570.21
9600.07	1570.1	9617.34	1570.02	9622.54	1570	9632.02	1569.97	9642.45	1569.93
9678.62	1569.6	9682.62	1569.58	9685.67	1569.53	9696.01	1569.39	9700.54	1569.29
9703.58	1569.2	9709.09	1569.06	9709.44	1569.06	9710.14	1569.1	9710.38	1569.14
9715.27	1569.1	9717.02	1569.03	9719.27	1569.04	9729.17	1568.64	9731.33	1568.82
9736.27	1569.2	9737.74	1569.26	9758.36	1569.34	9776.14	1569.3	9780.45	1569.31
9836.73	1569.1	9875.32	1568.76	9876.42	1568.75	9899.46	1568.86	9904.74	1568.83
9905.44	1568.8	9911.49	1568.78	9933.83	1568.56	9942.08	1568.59	9968.2	1568.52
9987.88	1568.4	9995.23	1568.31	10004.04	1568.05	10005	1568.05	10011.91	1568.05
10012.5	1568	10013.1	1568.05	10013.43	1568.06	10013.51	1568.05	10018.77	1569.2
10019.3	1569.3	10019.44	1569.35	10020.37	1569.47	10024.98	1570	10029.9	1570.61
10037.64	1571.5	10040.66	1571.88	10041.13	1572	10043.6	1572.63	10047.03	1574
10049.97	1575.2	10051.83	1576	10056.27	1577.86	10056.64	1578	10057.06	1578.17
10061.58	1580	10066.24	1582	10066.25	1582	10068.97	1583.31	10070.11	1583.1
10070.41	1583.1	10073.11	1582.63	10074.77	1582.56	10083.53	1582.84	10088.79	1582.8
10098.16	1583.09	10099.15	1583.09	10101.52	1582.99	10103.11	1583.05	10116.45	1583.5
10128.24	1583.79	10128.46	1583.81	10128.57	1583.81	10133.49	1583.16	10133.91	1583.1
10134.34	1583.1	10140.85	1583.02	10145.56	1583.91	10145.79	1583.97	10146.07	1584
10146.54	1584.09	10146.76	1584.12	10147.03	1584.03	10147.14	1584	10148.26	1583.7
10153.66	1582	10154.6	1581.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9023.4	.035	9758.36	.053	10018.77	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9904.74	10018.77	20	20	20	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1570.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.046	0.053	0.035
W.S. Elev (ft)	1570.21	Reach Len. (ft)	20.00	20.00	20.00
Crit W.S. (ft)		Flow Area (sq ft)	272.26	195.72	3.76
E.G. Slope (ft/ft)	0.002487	Area (sq ft)	272.26	195.72	3.76
Q Total (cfs)	810.00	Flow (cfs)	413.21	391.98	4.81
Top Width (ft)	444.13	Top Width (ft)	322.19	114.03	7.92
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)	1.52	2.00	1.28

* Max Chl Dpth (ft)	*	2.21	* Hydr. Depth (ft)	*	0.85	*	1.72	*	0.47 *
* Conv. Total (cfs)	*	16242.4	* Conv. (cfs)	*	8285.9	*	7860.0	*	96.5 *
* Length Wtd. (ft)	*	20.00	* Wetted Per. (ft)	*	322.23	*	114.17	*	7.99 *
* Min Ch El (ft)	*	1568.00	* Shear (lb/sq ft)	*	0.13	*	0.27	*	0.07 *
* Alpha	*	1.06	* Stream Power (lb/ft s)	*	0.20	*	0.53	*	0.09 *
* Frctn Loss (ft)	*	0.05	* Cum Volume (acre-ft)	*	0.27	*	0.18	*	0.00 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.15	*	0.05	*	0.00 *

CROSS SECTION OUTPUT Profile #2

* E.G. Elev (ft)	*	1571.17	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.09	* Wt. n-Val.	*	0.053	*	0.053	*	0.035 *
* W.S. Elev (ft)	*	1571.07	* Reach Len. (ft)	*	20.00	*	20.00	*	20.00 *
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	24.81	*	293.88	*	10.84 *
* E.G. Slope (ft/ft)	*	0.002259	* Area (sq ft)	*	24.81	*	293.88	*	10.84 *
* Q Total (cfs)	*	810.00	* Flow (cfs)	*	49.89	*	735.57	*	24.54 *
* Top Width (ft)	*	133.41	* Top Width (ft)	*	11.14	*	114.03	*	8.24 *
* Vel Total (ft/s)	*	2.46	* Avg. Vel. (ft/s)	*	2.01	*	2.50	*	2.26 *
* Max Chl Dpth (ft)	*	3.07	* Hydr. Depth (ft)	*	2.23	*	2.58	*	1.32 *
* Conv. Total (cfs)	*	17041.7	* Conv. (cfs)	*	1049.7	*	15475.7	*	516.3 *
* Length Wtd. (ft)	*	20.00	* Wetted Per. (ft)	*	13.38	*	114.17	*	9.13 *
* Min Ch El (ft)	*	1568.00	* Shear (lb/sq ft)	*	0.26	*	0.36	*	0.17 *
* Alpha	*	1.01	* Stream Power (lb/ft s)	*	0.53	*	0.91	*	0.38 *
* Frctn Loss (ft)	*	0.04	* Cum Volume (acre-ft)	*	0.03	*	0.27	*	0.01 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.01	*	0.05	*	0.00 *

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9464.07	9904.74	413.21	272.26	322.23	51.01	0.85	1.52
* 2	Chan	9904.74	10018.77	391.98	195.72	114.17	48.39	1.72	2.00
* 3	ROB	10018.77	10086.68	4.81	3.76	7.99	0.59	0.47	1.28

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9464.07	9904.74	49.89	24.81	13.38	6.16	2.23	2.01
* 2	Chan	9904.74	10018.77	735.57	293.88	114.17	90.81	2.58	2.50
* 3	ROB	10018.77	10086.68	24.54	10.84	9.13	3.03	1.32	2.26

CROSS SECTION

RIVER: T4N-R3W-S16
REACH: Reach-1a RS: 1.644

INPUT
Description:
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9023.57  1572.7 9025.59 1572.67 9037.76  1572.5 9039.48 1572.49 9043.48 1572.46
 9051.32  1572.4 9066.09 1572.31 9102.96    1572 9103.79    1572 9115.15 1571.95
 9154.73  1571.9 9158.75 1571.93 9159.72 1571.93 9193.93 1571.57 9235.55 1571.53
 9275.59  1571.4 9302.96 1571.37 9332.56 1571.22 9351.71 1571.14 9371.37    1571
  9383.4 1570.99 9416.99 1571.17 9420.53 1571.17 9431.52    1571 9459.15  1570.7
 9468.01 1570.56 9494.66 1570.32 9505.02 1570.25 9527.41 1570.31  9542.4  1570.2
 9566.63 1570.19 9581.27  1570.2 9594.59 1570.09 9602.82 1570.04 9606.06    1570
 9610.45 1570.02 9615.98    1570 9629.25 1569.94 9632.33 1569.93  9636.9  1569.9
 9644.98 1569.81 9679.01 1569.41 9681.34 1569.41 9706.49 1569.44 9708.51  1569.2
 9712.05 1568.77 9715.48 1568.84 9718.38 1568.93 9722.76 1568.85 9727.04  1569.3
 9730.16 1569.53 9746.16 1569.11 9771.91 1569.06 9798.98 1569.08 9836.98  1568.9
 9864.07 1568.69 9875.95 1568.63  9899.4 1568.73 9904.66 1568.72 9919.64  1568.6
 9933.34 1568.47 9935.34 1568.48 9968.64 1568.39 9993.73 1568.18 9994.86  1568.2
 9996.22 1568.13 9996.36 1568.1310000.12 1568.1310013.73 1568.2110015.48  1568.7
10018.96  1569.610021.53 1569.9310022.07    1570 10026.4 1570.5710037.02  1571.7
10038.08 1571.92 10038.4    157210044.13  1573.4 10046.2 1573.9410046.42    1574
10046.73 1574.1110047.18 1574.24 10047.9 1574.5310049.74 1574.9110050.07  1574.9
10052.76 1575.7910053.93    157610055.52 1576.3810057.93 1576.7110058.05  1576.8
10059.86 1578.0710062.21  1579.310062.94    158010063.87 1580.7110065.24  1581.8
10065.71  1582.310065.72  1582.310065.74 1582.3110068.97 1583.4710072.31    1583
10074.35 1582.5910075.15 1582.44 10075.4  1582.510077.85  1582.510095.55  1582.9
10097.12 1582.8810099.65 1582.9610100.61 1582.9510102.34 1583.0110102.52    1583
10102.96 1582.9910103.25    1583 10105.7 1583.0910128.65  1583.610128.67  1583.6
10128.99 1583.5610133.96 1583.0310138.91 1582.8210141.36  1582.810145.65  1583.6
10147.58 1583.97 10147.6    158410148.28  1583.810154.12    158210154.77  1581.8

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val      Sta   n Val
***********************************************
 9023.57    .035 9746.16    .05310015.48    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9904.6610015.48                 0       0       0              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1570.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.048  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1570.17  * Reach Len. (ft)         *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  290.18  *  196.40  *    4.79  *
* E.G. Slope (ft/ft)      *0.002179  * Area (sq ft)            *  290.18  *  196.40  *    4.79  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *  427.01  *  376.24  *    6.74  *
* Top Width (ft)          *  438.20  * Top Width (ft)          *  319.52  *  110.82  *    7.87  *
* Vel Total (ft/s)        *    1.65  * Avg. Vel. (ft/s)        *    1.47  *    1.92  *    1.41  *
* Max Chl Dpth (ft)       *    2.04  * Hydr. Depth (ft)        *    0.91  *    1.77  *    0.61  *
* Conv. Total (cfs)       * 17352.4  * Conv. (cfs)             *  9147.8  *  8060.2  *   144.5  *
* Length Wtd. (ft)        *   20.00  * Wetted Per. (ft)        *  319.60  *  110.89  *    8.02  *
* Min Ch El (ft)          * 1568.13  * Shear (lb/sq ft)        *    0.12  *    0.24  *    0.08  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.18  *    0.46  *    0.11  *
* Frctn Loss (ft)         *    0.03  * Cum Volume (acre-ft)    *    0.14  *    0.09  *    0.00  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1571.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.053  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1571.03  * Reach Len. (ft)         *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   27.03  *  291.77  *   11.84  *
* E.G. Slope (ft/ft)      *0.002177  * Area (sq ft)            *   27.03  *  291.77  *   11.84  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *   54.74  *  727.44  *   27.82  *
* Top Width (ft)          *  130.73  * Top Width (ft)          *   11.71  *  110.82  *    8.20  *
* Vel Total (ft/s)        *    2.45  * Avg. Vel. (ft/s)        *    2.02  *    2.49  *    2.35  *
* Max Chl Dpth (ft)       *    2.90  * Hydr. Depth (ft)        *    2.31  *    2.63  *    1.44  *
* Conv. Total (cfs)       * 17359.6  * Conv. (cfs)             *  1173.1  * 15590.1  *   596.3  *
* Length Wtd. (ft)        *   20.00  * Wetted Per. (ft)        *   14.04  *  110.89  *    9.17  *
* Min Ch El (ft)          * 1568.13  * Shear (lb/sq ft)        *    0.26  *    0.36  *    0.18  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.53  *    0.89  *    0.41  *
* Frctn Loss (ft)         *    0.04  * Cum Volume (acre-ft)    *    0.01  *    0.13  *    0.01  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *          *          *          *
*****************************************************************************************
```

```
  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9464.12   * 9904.66   *   427.01 *   290.18 *   319.60 *    52.72 *
0.91 *     1.47 *
* 2         * Chan      * 9904.66   * 10015.48  *   376.24 *   196.40 *   110.89 *    46.45 *
1.77 *     1.92 *
* 3         * ROB       * 10015.48  * 10085.13  *     6.74 *     4.79 *     8.02 *     0.83 *
0.61 *     1.41 *
*****************************************************************************************
******************

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9464.12   * 9904.66   *    54.74 *    27.03 *    14.04 *     6.76 *
2.31 *     2.02 *
* 2         * Chan      * 9904.66   * 10015.48  *   727.44 *   291.77 *   110.89 *    89.81 *
2.63 *     2.49 *
* 3         * ROB       * 10015.48  * 10085.13  *    27.82 *    11.84 *     9.17 *     3.44 *
1.44 *     2.35 *
*****************************************************************************************
******************

CROSS SECTION


RIVER: T4N-R3W-S16
REACH: Reach-1            RS: 1.640

INPUT
Description:
Station Elevation Data    num=     126
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9023.75  1572.8 9024.67 1572.77 9027.72 1572.73 9028.15 1572.72 9029.15 1572.71
 9034.81 1572.68 9044.49  1572.6  9108.4    1572 9110.52 1571.99 9119.23    1572
 9141.12 1571.96 9159.51  1571.8 9199.31  1571.5 9204.12 1571.45 9209.31  1571.4
 9275.43 1571.15 9288.74 1571.18 9309.59 1571.09 9330.87 1571.09 9372.15  1570.9
 9372.27 1570.92 9404.03 1570.92 9439.24    1571 9450.33 1570.81 9465.79 1570.59
 9476.73 1570.49 9501.33 1570.38 9511.88  1570.4 9543.86 1570.15 9551.42 1570.16
 9585.09 1570.16 9590.43 1570.12 9609.42    1570 9610.34    1570 9612.79 1569.98
 9624.72 1569.85 9642.62 1569.69  9665.4  1569.5 9673.75 1569.49 9680.92 1569.38
  9705.9 1569.41 9706.48 1569.41 9706.78  1569.4 9715.66  1568.6 9717.94  1568.6
 9723.57 1568.73 9727.55 1569.36 9729.84  1569.6 9755.78 1568.97 9761.14 1568.82
 9767.68 1568.81 9817.51 1568.84 9837.23  1568.8 9851.29 1568.65 9875.47 1568.52
 9878.03 1568.53 9885.63 1568.56 9905.45 1568.54 9927.94  1568.4 9934.19 1568.37
 9944.02 1568.32  9969.1 1568.25 9986.42 1568.11 9994.57  1568.110012.26 1568.41
10013.93 1568.4510014.96 1568.5810019.14 1569.7610019.88  1569.910021.26    1570
10027.87  1570.9 10038.6 1571.8210038.76 1571.8510039.66    157210039.71 1572.01
10040.17 1572.03 10040.5 1572.1310041.14 1572.3510043.43    157310046.17 1573.77
10046.95    157410047.51 1574.1910052.44 1576.2310053.93  1576.910055.76    1578
10059.55 1579.8910059.57  1579.910059.73 1579.9710059.87    158010060.01 1580.04
10060.14 1580.1310060.29 1580.2410060.34  1580.210065.53    157810067.261577.203
10067.44 1577.1210067.88 1577.1410069.47 1577.5310069.71 1577.62 10070.4    1578
10071.58 1579.1910072.42    158010073.04 1580.6410074.32    158210074.39  1582.1
10074.69 1582.4510076.99 1582.6610078.14 1582.7810080.86 1582.7910081.09  1582.8
10081.28 1582.8110082.47 1582.8310084.82 1582.8510102.73 1582.9910115.94  1583.4
10129.05 1583.7610132.18 1583.1310134.01 1582.9310138.29 1582.76 10141.9  1582.6
10143.64 1582.9210148.53 1583.8710148.54 1583.8910151.72 1582.92 10154.7    1582
10154.95 1581.92
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9023.75    .035 9905.45    .05310014.96    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9905.4510014.96              430  441.26     443              .1        .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1570.18  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1570.14  * Reach Len. (ft)         *  430.00  *  441.26  *  443.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  315.18  *  200.96  *    4.61  *
* E.G. Slope (ft/ft)      *0.001368  * Area (sq ft)            *  315.18  *  200.96  *    4.61  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *  492.42  *  312.35  *    5.23  *
* Top Width (ft)          *  434.34  * Top Width (ft)          *  317.51  *  109.51  *    7.32  *
* Vel Total (ft/s)        *    1.56  * Avg. Vel. (ft/s)        *    1.56  *    1.55  *    1.13  *
* Max Chl Dpth (ft)       *    2.04  * Hydr. Depth (ft)        *    0.99  *    1.84  *    0.63  *
* Conv. Total (cfs)       * 21897.9  * Conv. (cfs)            * 13312.4  *  8444.2  *   141.3  *
* Length Wtd. (ft)        *  436.19  * Wetted Per. (ft)        *  317.63  *  109.52  *    7.51  *
* Min Ch El (ft)          * 1568.10  * Shear (lb/sq ft)        *    0.08  *    0.16  *    0.05  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.13  *    0.24  *    0.06  *
* Frctn Loss (ft)         *    1.73  * Cum Volume (acre-ft)    *   17.21  *   17.15  *    0.15  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    2.39  *    1.20  *    0.04  *
*********************************************************************************************

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 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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1571.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1570.99  * Reach Len. (ft)         *  430.00  *  441.26  *  443.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   30.54  *  294.10  *   11.10  *
* E.G. Slope (ft/ft)      *0.001901  * Area (sq ft)            *   30.54  *  294.10  *   11.10  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *   91.06  *  694.65  *   24.28  *
* Top Width (ft)          *  129.65  * Top Width (ft)          *   12.50  *  109.51  *    7.64  *
* Vel Total (ft/s)        *    2.41  * Avg. Vel. (ft/s)        *    2.98  *    2.36  *    2.19  *
* Max Chl Dpth (ft)       *    2.89  * Hydr. Depth (ft)        *    2.44  *    2.69  *    1.45  *
* Conv. Total (cfs)       * 18575.4  * Conv. (cfs)            *  2088.3  * 15930.2  *   556.9  *
* Length Wtd. (ft)        *  440.65  * Wetted Per. (ft)        *   14.94  *  109.52  *    8.64  *
* Min Ch El (ft)          * 1568.10  * Shear (lb/sq ft)        *    0.24  *    0.32  *    0.15  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.72  *    0.75  *    0.33  *
* Frctn Loss (ft)         *    2.23  * Cum Volume (acre-ft)    *    4.18  *   20.32  *    0.22  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    0.06  *    1.20  *    0.04  *
*********************************************************************************************

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 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.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9464.60   * 9905.45   *   492.42 *   315.18 *   317.63 *    60.79 *
0.99 *     1.56 *
* 2        * Chan      * 9905.45   * 10014.96  *   312.35 *   200.96 *   109.52 *    38.56 *
1.84 *     1.55 *
* 3        * ROB       * 10014.96  * 10084.96  *     5.23 *     4.61 *     7.51 *     0.65 *
0.63 *     1.13 *
*********************************************************************************************
******************
```

```
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.
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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9464.60   * 9905.45   *    91.06 *    30.54 *    14.94 *    11.24 *
2.44 *     2.98 *
* 2         * Chan      * 9905.45   * 10014.96  *   694.65 *   294.10 *   109.52 *    85.76 *
2.69 *     2.36 *
* 3         * ROB       * 10014.96  * 10084.96  *    24.28 *    11.10 *     8.64 *     3.00 *
1.45 *     2.19 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S16
REACH: Reach-1            RS: 1.556

INPUT
Description:
Station Elevation Data    num=     105
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9165.12  1571.1 9165.58 1571.08 9191.52 1570.77 9213.86  1570.7 9228.01 1570.66
  9261.3  1570.6 9262.23 1570.58 9265.25 1570.57 9285.75 1570.44 9292.62 1570.44
 9324.91  1570.2 9345.68 1570.22 9353.76 1570.18 9362.25 1570.07 9367.51    1570
 9378.76  1569.9 9383.36  1569.8 9418.28 1569.67 9422.62 1569.67 9424.65 1569.66
 9441.45  1569.6 9495.37 1569.46 9511.04 1569.35 9543.76 1569.08 9576.71 1568.97
 9601.91  1568.9 9640.51 1568.45 9644.88 1568.42  9650.7 1568.39 9678.56  1568.3
 9692.56  1568.3 9713.98 1568.22 9727.62 1568.11 9746.03 1568.02 9747.98    1568
 9759.65  1567.9 9767.22 1567.81  9767.3 1567.81 9767.67 1567.72 9767.97  1567.6
 9770.91 1566.93 9773.57 1567.17 9778.64 1567.34 9780.19 1567.59 9781.89    1568
 9782.53 1568.11 9782.92 1568.21 9783.28 1568.29 9793.57 1568.01 9794.25    1568
 9795.71    1568 9814.86 1567.79 9824.76 1567.69 9828.37  1567.6 9830.08 1567.63
 9837.171567.582 9856.39 1567.45 9876.54 1567.45 9887.38 1567.49    9905  1567.5
 9912.53 1567.54  9921.3 1567.43 9940.58 1567.09  9949.5 1567.14 9967.52  1567.2
 9994.29 1567.16 9996.33 1567.1610013.61  1566.9 10022.7  1566.910029.85 1567.07
10033.15 1567.9310033.43    156810033.94 1568.1110041.68    157010045.96 1571.08
10047.01 1571.3110047.74 1571.5510048.68    157210050.67  1572.7 10053.7    1574
10057.07 1575.2110058.95    157610060.04 1576.4810060.72  1576.810062.87  1577.8
10063.29    157810067.23  1579.910067.43    1580 10067.7  1580.110067.96 1580.27
10070.54 1581.48 10071.61581.46710076.26 1581.4110083.39 1581.3410102.91  1581.4
10119.62 1581.8610130.63 1581.8910130.64 1581.8910131.22  1581.810135.56  1581.4
10138.96 1581.3810143.57 1581.4410145.35 1581.4710146.02 1581.51 10151.3  1581.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9165.12    .035 9783.28     .0610033.15    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990510033.15                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1568.41  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.32	Wt. n-Val.	0.053	0.060	0.035	
W.S. Elev (ft)	1568.09	Reach Len. (ft)	1964.37	1964.37	1964.37	
Crit W.S. (ft)	1568.09	Flow Area (sq ft)	70.19	116.45	0.06	
E.G. Slope (ft/ft)	0.044792	Area (sq ft)	70.19	116.45	0.06	
Q Total (cfs)	810.00	Flow (cfs)	237.61	572.30	0.09	
Top Width (ft)	294.59	Top Width (ft)	165.73	128.15	0.71	
Vel Total (ft/s)	4.34	Avg. Vel. (ft/s)	3.39	4.91	1.62	
Max Chl Dpth (ft)	1.19	Hydr. Depth (ft)	0.42	0.91	0.08	
Conv. Total (cfs)	3827.2	Conv. (cfs)	1122.7	2704.1	0.4	
Length Wtd. (ft)	1964.37	Wetted Per. (ft)	165.94	128.27	0.73	
Min Ch El (ft)	1566.90	Shear (lb/sq ft)	1.18	2.54	0.21	
Alpha	1.09	Stream Power (lb/ft s)	4.00	12.48	0.34	
Frctn Loss (ft)	3.64	Cum Volume (acre-ft)	15.31	15.54	0.12	
C & E Loss (ft)	0.08	Cum SA (acres)				

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 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 OUTPUT Profile #2

E.G. Elev (ft)	1568.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.060	0.035
W.S. Elev (ft)	1568.37	Reach Len. (ft)	1964.37	1964.37	1964.37
Crit W.S. (ft)	1568.25	Flow Area (sq ft)		151.92	0.26
E.G. Slope (ft/ft)	0.037247	Area (sq ft)		151.92	0.26
Q Total (cfs)	810.00	Flow (cfs)		809.16	0.84
Top Width (ft)	128.88	Top Width (ft)		128.15	0.73
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)		5.33	3.27
Max Chl Dpth (ft)	1.47	Hydr. Depth (ft)		1.19	0.35
Conv. Total (cfs)	4197.0	Conv. (cfs)		4192.6	4.4
Length Wtd. (ft)	1964.37	Wetted Per. (ft)		129.14	1.02
Min Ch El (ft)	1566.90	Shear (lb/sq ft)		2.74	0.59
Alpha	1.00	Stream Power (lb/ft s)		14.57	1.92
Frctn Loss (ft)	5.49	Cum Volume (acre-ft)	4.03	18.06	0.17
C & E Loss (ft)	0.10	Cum SA (acres)			

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9535.06	9905.00	237.61	70.19	165.94	29.33	0.42	3.39
2	Chan	9905.00	10033.15	572.30	116.45	128.27	70.65	0.91	4.91
3	ROB	10033.15	10092.22	0.09	0.06	0.73	0.01	0.08	1.62

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 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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9905.00   * 10033.15  *   809.16 *   151.92 *   129.14 *    99.90 *
1.19 *     5.33 *
* 2         * ROB       * 10033.15  * 10092.22  *     0.84 *     0.26 *     1.02 *     0.10 *
0.35 *     3.27 *
*****************************************************************************************************
******************

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: T4N-R3W-S16
REACH: Reach-2            RS: 1.184

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 2,000cfs.
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9039.64     1564 9039.86     1564 9044.56 1563.94 9047.55 1563.91 9047.62  1563.9
 9049.79  1563.9 9052.63 1563.88 9121.43 1563.82 9187.98 1563.74 9219.02 1563.57
 9238.07  1563.4  9252.5 1563.35 9297.62 1563.03 9374.06 1562.65 9430.01  1562.3
 9430.36 1562.29 9432.05 1562.29 9434.99 1562.28 9439.55  1562.3 9445.59 1562.24
 9453.17  1562.2 9468.79 1562.08 9480.47    1562 9514.16  1561.6  9545.3 1561.25
 9566.18 1561.05 9576.52 1561.01 9616.42 1561.46 9650.81  1560.9 9692.75 1560.59
 9742.73 1560.59 9801.781560.748 9806.19 1560.76 9810.37  1560.4 9813.76 1560.06
 9816.85 1560.04  9829.5    1560 9834.98    1560 9880.86 1559.81 9884.05 1559.79
 9891.53 1559.75 9896.93  1559.8 9900.31 1559.71 9902.54 1559.74 9903.01 1559.75
 9903.56 1559.75 9905.28  1559.8 9906.55 1559.79 9908.15  1559.8 9931.91    1560
 9968.82  1560.3 9975.61 1560.14 9981.68    1560 9994.64 1559.69 9996.25 1559.66
 10000.4  1559.610000.93 1559.6410003.04    156010004.13 1560.1910006.84 1560.56
10014.62    156110015.81 1561.0210016.19 1561.1910017.291561.67710018.02    1562
10020.05 1563.0410022.21    156410026.21 1565.7610026.76    156610027.32 1566.25
10031.14    156810031.35  1568.110031.69 1568.2510033.71 1569.5510034.46    1570
10036.28 1571.2210036.35  1571.410036.58 1571.4910037.54    157210037.67 1572.04
10037.69 1572.0510038.46  1572.110056.37 1573.86 10056.6 1573.8710056.75 1573.93
10057.64 1574.2410060.85  1575.410068.04 1575.5410085.38 1575.9710087.76 1576.01
10088.03 1576.0110088.19    157610116.23 1576.4410121.29 1576.54 10126.6 1576.72
10133.24 1576.9610141.07  1577.1 10153.4 1577.1810156.47 1577.0410157.56 1576.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9039.64    .033 9806.19     .0610014.62    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9806.1910014.62              497  501.18     500            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)          * 1562.80  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.033  *   0.060  *   0.035  *
```

W.S. Elev (ft)	1562.75	Reach Len. (ft)	497.00	501.18	500.00	
Crit W.S. (ft)		Flow Area (sq ft)	608.77	572.83	5.36	
E.G. Slope (ft/ft)	0.001059	Area (sq ft)	608.77	572.83	5.36	
Q Total (cfs)	2000.00	Flow (cfs)	1087.07	905.42	7.51	
Top Width (ft)	665.81	Top Width (ft)	452.51	208.43	4.87	
Vel Total (ft/s)	1.68	Avg. Vel. (ft/s)	1.79	1.58	1.40	
Max Chl Dpth (ft)	3.15	Hydr. Depth (ft)	1.35	2.75	1.10	
Conv. Total (cfs)	61458.5	Conv. (cfs)	33404.7	27822.9	230.9	
Length Wtd. (ft)	499.22	Wetted Per. (ft)	452.53	208.56	5.26	
Min Ch El (ft)	1559.60	Shear (lb/sq ft)	0.09	0.18	0.07	
Alpha	1.01	Stream Power (lb/ft s)	0.16	0.29	0.09	
Frctn Loss (ft)	1.01	Cum Volume (acre-ft)	28.72	33.67	2.69	
C & E Loss (ft)	0.01	Cum SA (acres)	17.88	9.37	0.25	

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1563.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.033	0.060	0.035
W.S. Elev (ft)	1563.12	Reach Len. (ft)	497.00	501.18	500.00
Crit W.S. (ft)		Flow Area (sq ft)	178.70	649.26	7.15
E.G. Slope (ft/ft)	0.001670	Area (sq ft)	178.70	649.26	7.15
Q Total (cfs)	2000.00	Flow (cfs)	584.72	1400.72	14.56
Top Width (ft)	286.12	Top Width (ft)	72.82	208.43	4.87
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	3.27	2.16	2.04
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)	2.45	3.12	1.47
Conv. Total (cfs)	48948.1	Conv. (cfs)	14310.6	34281.3	356.2
Length Wtd. (ft)	499.72	Wetted Per. (ft)	75.35	208.56	5.62
Min Ch El (ft)	1559.60	Shear (lb/sq ft)	0.25	0.32	0.13
Alpha	1.12	Stream Power (lb/ft s)	0.81	0.70	0.27
Frctn Loss (ft)	1.29	Cum Volume (acre-ft)	16.92	35.45	0.61
C & E Loss (ft)	0.01	Cum SA (acres)	5.73	9.37	0.25

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9039.64	9422.92	6.10	13.45	69.24	0.31	0.19	0.45
2	LOB	9422.92	9806.19	1080.96	595.32	383.29	54.05	1.55	1.82
3	Chan	9806.19	10014.62	905.42	572.83	208.56	45.27	2.75	1.58
4	ROB	10014.62	10086.09	7.51	5.36	5.26	0.38	1.10	1.40

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.

Profile #2

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9422.92    * 9806.19    *   584.72 *   178.70 *    75.35 *    29.24 *
2.45 *     3.27 *
* 2         * Chan      * 9806.19    * 10014.62   *  1400.72 *   649.26 *   208.56 *    70.04 *
3.12 *     2.16 *
* 3         * ROB       * 10014.62   * 10086.09   *    14.56 *     7.15 *     5.62 *     0.73 *
1.47 *     2.04 *
*****************************************************************************************************
******************

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: T4N-R3W-S16
REACH: Reach-2            RS: 1.089

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 2,710cfs.
Station Elevation Data    num=     102
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8791.49    1564    8842 1563.74 8885.55  1563.6 8935.38 1563.12 8970.93 1562.94
 8984.18  1562.1 8984.39  1562.1 8984.39 1562.09 8984.46  1562.1 8992.71 1562.79
 9011.38  1563.1 9024.52 1563.21 9042.34 1563.19 9114.04 1562.69 9214.13 1562.34
 9222.88  1562.3 9235.52  1562.2 9252.88 1562.05 9259.47    1562 9261.38 1561.98
 9276.22  1561.8 9283.29 1561.75 9284.44 1561.75 9290.08 1561.72 9294.08 1561.69
 9304.14  1561.6 9358.21 1561.54 9404.59 1561.59 9514.34 1561.18 9533.06 1560.84
 9542.45  1560.8  9695.3 1560.21 9726.83 1560.01 9729.43    1560 9738.65 1559.94
 9780.22  1559.7 9814.34 1559.45 9820.71 1559.55 9854.351559.446 9924.17 1559.23
 9938.16 1559.07 9942.63  1558.8 9944.66 1558.67 9954.75 1558.92 9956.47 1558.96
 9956.75 1558.97 9956.82    1559 9956.95 1558.97 9957.46 1558.97 9958.33 1558.98
 9958.89 1558.99 9961.84    1559 9988.56 1559.2410003.72 1558.63 10004.5 1558.66
10021.83  1559.210023.46 1559.7910023.93    156010026.83 1561.2410028.86    1562
10030.55  1562.7 10031.2 1563.0210033.31    156410034.66 1564.5610035.46 1564.94
10036.17  1565.210038.29    156610040.58 1566.8410043.48    156810047.35 1569.43
10047.88  1569.610048.93 1569.7910049.25 1569.8310049.881569.90110050.76    1570
10059.56 1571.2610065.62    1572   10069 1572.4810069.43 1572.5410072.05 1572.84
10076.31 1573.04 10080.6  1573.310111.55 1573.1710112.65 1573.17 10113.1  1573.2
10113.33 1573.2110114.12  1573.310129.65    157410129.96 1574.0210134.32 1574.25
10136.62 1574.3510137.35  1574.410143.35 1574.0110145.56 1573.9910146.37 1573.95
10147.31  1573.910148.17  1573.910150.28 1573.9710151.31    157410155.91 1574.09
10167.96 1574.4410168.03  1574.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8791.49    .035 9820.71    .05310023.46    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9820.7110023.46               502  501.28     501             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1561.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1561.64  * Reach Len. (ft)        *  502.00  *  501.28  *  501.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *  456.73  *  494.64  *    4.00  *
* E.G. Slope (ft/ft)      *0.003967  * Area (sq ft)           *  456.73  *  494.64  *    4.00  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)             * 1118.37  * 1582.18  *    9.45  *
* Top Width (ft)          *  728.40  * Top Width (ft)          *  521.21  *  202.75  *    4.44  *
* Vel Total (ft/s)        *    2.84  * Avg. Vel. (ft/s)        *    2.45  *    3.20  *    2.36  *
* Max Chl Dpth (ft)       *    3.01  * Hydr. Depth (ft)        *    0.88  *    2.44  *    0.90  *
* Conv. Total (cfs)       * 43025.5  * Conv. (cfs)            * 17755.8  * 25119.6  *   150.0  *
* Length Wtd. (ft)        *  501.61  * Wetted Per. (ft)        *  521.22  *  202.90  *    4.81  *
* Min Ch El (ft)          * 1558.63  * Shear (lb/sq ft)        *    0.22  *    0.60  *    0.21  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.53  *    1.93  *    0.49  *
```

```
* Frctn Loss (ft)        *    2.65  * Cum Volume (acre-ft)   *   22.64  *   27.53  *    2.64  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)        *   12.33  *    7.00  *    0.20  *
*****************************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1561.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.19  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)         * 1561.73  * Reach Len. (ft)         *  502.00  *  501.28  *  501.00  *
* Crit W.S. (ft)         *           * Flow Area (sq ft)       *  267.46  *  512.14  *    4.38  *
* E.G. Slope (ft/ft)     *0.003834  * Area (sq ft)            *  267.46  *  512.14  *    4.38  *
* Q Total (cfs)          * 2710.00  * Flow (cfs)              * 1051.12  * 1648.19  *   10.69  *
* Top Width (ft)         *  352.06  * Top Width (ft)           *  144.87  *  202.75  *    4.44  *
* Vel Total (ft/s)       *    3.46  * Avg. Vel. (ft/s)         *    3.93  *    3.22  *    2.44  *
* Max Chl Dpth (ft)      *    3.10  * Hydr. Depth (ft)         *    1.85  *    2.53  *    0.99  *
* Conv. Total (cfs)      * 43766.1  * Conv. (cfs)             * 16975.4  * 26618.1  *   172.7  *
* Length Wtd. (ft)       *  501.57  * Wetted Per. (ft)         *  146.32  *  202.90  *    4.90  *
* Min Ch El (ft)         * 1558.63  * Shear (lb/sq ft)         *    0.44  *    0.60  *    0.21  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)   *    1.72  *    1.94  *    0.52  *
* Frctn Loss (ft)        *    2.49  * Cum Volume (acre-ft)     *   14.37  *   28.77  *    0.55  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *    4.49  *    7.00  *    0.20  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 8791.49   * 9306.10   *     0.04 *     0.18 *     6.60 *     0.00 *
0.03 *     0.24 *
* 2        * LOB       * 9306.10   * 9820.71   *  1118.33 *   456.55 *   514.62 *    41.27 *
0.89 *     2.45 *
* 3        * Chan      * 9820.71   * 10023.46  *  1582.18 *   494.64 *   202.90 *    58.38 *
2.44 *     3.20 *
* 4        * ROB       * 10023.46  * 10095.75  *     9.45 *     4.00 *     4.81 *     0.35 *
0.90 *     2.36 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9306.10   * 9820.71   *  1051.12 *   267.46 *   146.32 *    38.79 *
1.85 *     3.93 *
* 2        * Chan      * 9820.71   * 10023.46  *  1648.19 *   512.14 *   202.90 *    60.82 *
2.53 *     3.22 *
* 3        * ROB       * 10023.46  * 10095.75  *    10.69 *     4.38 *     4.90 *     0.39 *
0.99 *     2.44 *
*****************************************************************************************************
******************
```

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: T4N-R3W-S16
REACH: Reach-2 RS: 0.995

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8838.36	1562	8838.71	1562	8845.74	1561.95	8858.43	1561.88	8867.98	1561.84
8886.16	1561.8	8940.68	1561.52	8957.28	1561.49	8982.6	1561.44	9021.77	1561.23
9052.24	1560.9	9072.9	1560.66	9143.34	1560.01	9143.89	1560	9163.47	1559.89
9163.95	1559.9	9164.25	1559.87	9173.42	1558.98	9182.37	1559.84	9183.74	1560
9183.97	1560.1	9184.21	1560.13	9184.97	1560.11	9187.14	1560	9194.65	1559.8
9204.76	1559.6	9208.89	1559.51	9209.96	1559.49	9211.79	1559.46	9214.21	1559.47
9215.66	1559.5	9218.11	1559.48	9219.35	1559.49	9220.27	1559.5	9239.7	1559.63
9240.68	1559.6	9255.97	1559.74	9261.1	1559.74	9278.22	1559.8	9299.13	1559.8
9299.92	1559.81	9352.24	1559.21	9354.21	1559.19	9421.59	1558.6	9442	1558.49
9485.84	1558.69	9498.78	1558.31	9501.54	1558.19	9505.3	1558.1	9509.43	1558.04
9511.45	1558.06	9515.79	1558.07	9518.91	1558.04	9536.15	1558	9565.68	1558.01
9573.05	1558	9629.95	1557.98	9656.54	1557.9	9665.29	1557.89	9762.33	1557.54
9776.6	1557.5	9787.27	1557.5	9796	1557.48	9803.2	1557.48	9806.25	1557.49
9808.51	1557.48	9825.19	1557.434	9874.58	1557.3	9876.98	1557.31	9877.61	1557.32
9885.69	1557.58	9896.93	1557.42	9945.82	1556.6	9967.86	1556.74	9990	1557.05
9998.79	1556.03	9999.06	1556	9999.4	1555.9	9999.61	1555.96	10000.19	1556
10002.55	1556.12	10010.99	1556.81	10019.84	1557.31	10020.74	1557.42	10022.7	1558
10027.72	1559.41	10029.54	1560	10030.34	1560.31	10035.23	1561.61	10035.86	1561.82
10036.3	1562	10037.56	1562.52	10040.75	1564	10042.06	1564.69	10043.11	1565.25
10044.88	1566	10045.48	1566.24	10047.62	1567.34	10053.77	1567.21	10063.91	1567.95
10064.67	1567.98	10064.79	1568	10067.79	1568.12	10068.37	1568.11	10068.58	1568.16
10071.52	1568.61	10076.86	1569.35	10096.5	1569.32	10102.07	1569.31	10118.14	1569.3
10134.55	1569.41	10149.91	1569.64	10150.21	1569.64	10160.2	1569.21	10160.41	1569.16
10160.51	1569.16	10172.79	1569.78						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8838.36	.035	9825.19	.053	10020.74	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9825.19	10020.74	504	504.09	504	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1559.12	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.19	Wt. n-Val.	0.035	0.053	0.035	
W.S. Elev (ft)	1558.92	Reach Len. (ft)	504.00	504.09	504.00	
Crit W.S. (ft)	1558.49	Flow Area (sq ft)	395.91	368.50	3.90	
E.G. Slope (ft/ft)	0.007385	Area (sq ft)	395.91	368.50	3.90	
Q Total (cfs)	2710.00	Flow (cfs)	1344.86	1353.77	11.37	
Top Width (ft)	641.44	Top Width (ft)	440.64	195.55	5.25	
Vel Total (ft/s)	3.53	Avg. Vel. (ft/s)	3.40	3.67	2.92	
Max Chl Dpth (ft)	3.02	Hydr. Depth (ft)	0.90	1.88	0.74	
Conv. Total (cfs)	31536.1	Conv. (cfs)	15650.0	15753.8	132.3	
Length Wtd. (ft)	504.05	Wetted Per. (ft)	440.66	195.70	5.46	
Min Ch El (ft)	1555.90	Shear (lb/sq ft)	0.41	0.87	0.33	
Alpha	1.01	Stream Power (lb/ft s)	1.41	3.19	0.96	
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)	17.73	22.56	2.59	
C & E Loss (ft)	0.04	Cum SA (acres)	6.79	4.71	0.14	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1559.43	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.26	Wt. n-Val.	0.035	0.053	0.035	
W.S. Elev (ft)	1559.16	Reach Len. (ft)	504.00	504.09	504.00	

Crit W.S. (ft)		Flow Area (sq ft)	245.53	414.86	5.15	
E.G. Slope (ft/ft)	0.006663	Area (sq ft)	245.53	414.86	5.15	
Q Total (cfs)	2710.00	Flow (cfs)	1126.58	1566.76	16.66	
Top Width (ft)	360.70	Top Width (ft)	159.90	195.55	5.25	
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)	4.59	3.78	3.24	
Max Chl Dpth (ft)	3.26	Hydr. Depth (ft)	1.54	2.12	0.98	
Conv. Total (cfs)	33198.6	Conv. (cfs)	13801.1	19193.5	204.1	
Length Wtd. (ft)	504.06	Wetted Per. (ft)	161.17	195.70	5.70	
Min Ch El (ft)	1555.90	Shear (lb/sq ft)	0.63	0.88	0.38	
Alpha	1.03	Stream Power (lb/ft s)	2.91	3.33	1.22	
Frctn Loss (ft)	1.42	Cum Volume (acre-ft)	11.42	23.44	0.49	
C & E Loss (ft)	0.05	Cum SA (acres)	2.73	4.71	0.14	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9331.78	9825.19	1344.86	395.91	440.66	49.63	0.90	3.40
2	Chan	9825.19	10020.74	1353.77	368.50	195.70	49.95	1.88	3.67
3	ROB	10020.74	10096.77	11.37	3.90	5.46	0.42	0.74	2.92

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9331.78	9825.19	1126.58	245.53	161.17	41.57	1.54	4.59
2	Chan	9825.19	10020.74	1566.76	414.86	195.70	57.81	2.12	3.78
3	ROB	10020.74	10096.77	16.66	5.15	5.70	0.61	0.98	3.24

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.
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: T4N-R3W-S16
REACH: Reach-2 RS: 0.899

INPUT
Description:
Station Elevation Data num= 131

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*****************************************************************************
 9391.09  1558.1 9396.56    1558 9408.53 1557.79 9460.54 1557.09 9508.36 1556.56
 9563.41  1556.3 9575.91 1556.22 9618.41    1556 9633.65 1555.92 9642.27 1555.87
 9646.67  1555.9 9649.57    1556 9650.38 1556.02 9651.92 1556.05 9661.76    1556
 9662.57    1556 9664.22 1555.99 9738.27 1555.55 9788.85 1555.11 9820.07 1554.91
 9825.11  1554.9 9829.05 1554.92 9857.07  1554.6 9906.39 1554.22 9940.58 1554.24
 9992.77  1554.4 9997.71 1554.07 9998.51    1554 9999.85  1553.910000.47 1553.85
10002.29    155410002.31    155410002.35    155410002.64 1554.0210006.01 1554.18
10008.51  1554.310012.65 1554.4110020.91 1554.9210024.44 1555.3210025.73 1555.65
10027.49    155610029.61 1556.5410034.86 1557.9510035.02 1557.9710035.15    1558
10035.46  1558.110041.82 1559.4610042.19 1559.5410043.18 1559.6210044.17 1559.68
10049.54    156010055.22 1560.3710055.29 1560.37 10060.1 1560.8910060.18  1560.9
10061.77  1561.110069.57    156210070.14  1562.110070.19 1562.1110090.11 1562.91
10104.03  1563.510119.26 1563.8310126.54 1563.9610126.66 1563.9710134.36    1564
10134.42    156410139.02 1564.27 10158.2 1565.1110159.74 1565.1810166.81 1565.37
10173.73  1565.710174.53 1565.74   10175 1565.7910178.95 1564.4510180.22    1564
10183.17    156310186.22    156210192.09 1560.0510192.23    156010192.52 1559.91
10196.26  1558.710196.27 1558.6510196.59 1558.5110197.87    155810202.24 1556.36
10203.12    155610207.27 1554.5510208.67 1553.9910208.77 1553.9610209.21 1553.81
10210.76  1553.710211.15 1553.7710211.19  1553.810213.89 1553.8610214.62  1553.4
10215.14  1553.310217.35 1553.0810220.78  1552.710223.78 1553.2410225.84 1553.35
10228.34  1553.610230.65 1552.1310230.84    155210232.31 1551.0910234.04    1550
10234.46  1549.810236.21 1548.5810237.15    154810238.29 1547.3610238.78 1547.05
10241.14  1547.510242.92    154810243.06 1548.0410243.22 1548.0810243.44 1548.13
10247.85  1548.310250.17 1548.0210250.37    154810255.37 1547.2810256.73 1547.11
10259.83  1546.910260.81 1546.82 10261.5 1547.4310262.15    154810263.22 1548.85
10263.61  1549.210264.62 1548.6810265.49 1548.2410266.02    154810267.09 1547.46
10269.81  1546.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9391.09    .035 9738.27    .05310025.73    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9738.2710025.73              352  358.05     351             .1       .3
Right Levee    Station=   10175      Elevation= 1565.79

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1557.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)         * 1557.72  * Reach Len. (ft)         *  352.00  *  358.05  *  351.00  *
* Crit W.S. (ft)         * 1556.14  * Flow Area (sq ft)       *  438.97  *  880.48  *    8.97  *
* E.G. Slope (ft/ft)     *0.001297  * Area (sq ft)            *  438.97  *  880.48  *    8.97  *
* Q Total (cfs)          * 2710.00  * Flow (cfs)              *  821.35  * 1874.46  *   14.19  *
* Top Width (ft)         *  619.95  * Top Width (ft)          *  324.23  *  287.46  *    8.26  *
* Vel Total (ft/s)       *    2.04  * Avg. Vel. (ft/s)        *    1.87  *    2.13  *    1.58  *
* Max Chl Dpth (ft)      *   11.62  * Hydr. Depth (ft)        *    1.35  *    3.06  *    1.09  *
* Conv. Total (cfs)      * 75249.2  * Conv. (cfs)             * 22806.7  * 52048.4  *   394.0  *
* Length Wtd. (ft)       *  356.45  * Wetted Per. (ft)        *  324.25  *  287.58  *    8.52  *
* Min Ch El (ft)         * 1553.85  * Shear (lb/sq ft)        *    0.11  *    0.25  *    0.09  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    0.21  *    0.53  *    0.13  *
* Frctn Loss (ft)        *    1.22  * Cum Volume (acre-ft)    *   12.90  *   15.33  *    2.52  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)          *    2.36  *    1.92  *    0.06  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1557.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.035  *   0.053  *   0.035  *
* W.S. Elev (ft)         * 1557.87  * Reach Len. (ft)         *  352.00  *  358.05  *  351.00  *
* Crit W.S. (ft)         * 1556.12  * Flow Area (sq ft)       *  178.17  *  924.44  *   10.23  *
```

E.G. Slope (ft/ft)	0.001541	Area (sq ft)	178.17	924.44	10.23	
Q Total (cfs)	2710.00	Flow (cfs)	474.67	2216.29	19.04	
Top Width (ft)	382.07	Top Width (ft)	86.35	287.46	8.26	
Vel Total (ft/s)	2.44	Avg. Vel. (ft/s)	2.66	2.40	1.86	
Max Chl Dpth (ft)	4.02	Hydr. Depth (ft)	2.06	3.22	1.24	
Conv. Total (cfs)	69027.4	Conv. (cfs)	12090.4	56452.0	485.0	
Length Wtd. (ft)	356.82	Wetted Per. (ft)	88.17	287.58	8.67	
Min Ch El (ft)	1553.85	Shear (lb/sq ft)	0.19	0.31	0.11	
Alpha	1.01	Stream Power (lb/ft s)	0.52	0.74	0.21	
Frctn Loss (ft)	1.40	Cum Volume (acre-ft)	8.97	15.69	0.40	
C & E Loss (ft)	0.04	Cum SA (acres)	1.31	1.92	0.06	

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

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9391.09	9564.68	168.71	129.75	150.65	6.23	0.86	1.30
2	LOB	9564.68	9738.27	652.65	309.22	173.59	24.08	1.78	2.11
3	Chan	9738.27	10025.73	1874.45	880.48	287.58	69.17	3.06	2.13
4	ROB	10025.73	10175.00	14.19	8.97	8.52	0.52	1.09	1.58

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

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9564.68	9738.27	474.67	178.17	88.17	17.52	2.06	2.66
2	Chan	9738.27	10025.73	2216.29	924.44	287.58	81.78	3.22	2.40
3	ROB	10025.73	10175.00	19.04	10.23	8.67	0.70	1.24	1.86

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

CROSS SECTION

RIVER: T4N-R3W-S16
REACH: Reach-2 RS: 0.831

INPUT
Description:
Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9485.32	1556.5	9491.18	1556.49	9544.02	1556.3	9544.85	1556.3	9545.86	1556.29
9546.63	1556.3	9550.22	1556.25	9577.08	1556	9582.12	1555.95	9588.89	1555.88
9592.64	1555.8	9594.99	1555.81	9595.67	1555.79	9596.84	1555.79	9598.56	1555.79
9660.14	1555.6	9663.31	1555.58	9665.47	1555.57	9666.82	1555.56	9667.84	1555.56
9668.28	1555.6	9669.03	1555.57	9670.92	1555.57	9673.35	1555.58	9682.97	1555.64
9723.49	1555.8	9746.55	1555.74	9768.28	1555.58	9788.59	1554.98	9798.78	1554.66
9823.2	1554.8	9836.22	1554.89	9864.03	1554.41	9874.11	1554.34	9896.39	1554.52
9896.39	1554.5	9896.4	1554.52	9900.27	1554.23	9903.04	1554.25	9909.11	1554.25
9915.58	1554.1	9920.01	1554	9926.64	1553.85	9935.12	1553.67	9944.47	1553.74
9959.86	1553.8	9986.75	1553.62	9996.78	1553.58	10002.37	1553.54	10013.78	1553.64
10014.63	1553.9	10015.15	1554	10021.76	1555.88	10022.22	1556	10022.65	1556.12
10025.51	1557	10027.85	1557.77	10028.69	1558	10030.5	1558.48	10033.13	1559.32
10040.53	1558.5	10041.94	1558.36	10043.05	1558.4	10046.29	1558.67	10046.47	1558.72
10048.49	1559.3	10050.26	1559.03	10055.34	1558.43	10055.41	1558.43	10064.85	1558.65
10077.54	1558.5	10079.89	1559.24	10080.72	1559.5	10082.27	1559.06	10083.99	1558.65
10085.95	1559	10089.28	1559.57	10090.36	1559.41	10092.69	1559.06	10095.05	1559.45
10099.17	1560	10104.11	1560.74	10106.04	1561.07	10127.65	1560.68	10128.97	1560.66
10141.32	1560.6	10141.75	1560.65	10143.11	1560.66	10172.65	1561.21	10173.8	1560.8
10176.22	1560	10181.47	1558.17	10181.94	1558	10183.78	1557.34	10187.79	1556
10192.76	1554.4	10193.85	1554	10194.16	1553.89	10199.87	1552	10200.88	1551.66
10202.69	1551.1	10203.18	1551.59	10203.5	1552	10203.96	1552.44	10204	1552.48
10214.13	1552.5	10214.68	1552.48	10216.6	1552.31	10220.21	1552	10221.63	1551.84
10223.17	1551.7	10223.19	1551.67	10223.28	1551.61	10224.57	1550.85	10225.98	1550.04
10226.05	1550	10226.11	1549.96	10229.43	1548	10229.88	1547.75	10231.05	1547.04
10233.77	1547.4	10235.57	1547.7	10240.54	1547.7	10252.09	1547.7	10252.37	1547.8
10252.91	1548	10254.09	1548.51	10255.29	1549.03	10256.05	1548.63	10257.2	1548
10260.39	1546.4	10261.27	1546	10262.17	1545.57	10262.61	1545.36	10263.39	1544.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9485.32	.035	9836.22	.061	10015.15	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9836.22	10015.15	0	0	0	.1	.3

Right Levee Station=10106.04 Elevation= 1561.07

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1556.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.035	0.060	0.033
W.S. Elev (ft)	1556.01	Reach Len. (ft)	654.49	654.49	654.49
Crit W.S. (ft)	1556.01	Flow Area (sq ft)	129.39	350.83	7.09
E.G. Slope (ft/ft)	0.024352	Area (sq ft)	129.39	350.83	7.09
Q Total (cfs)	2710.00	Flow (cfs)	538.36	2123.14	48.51
Top Width (ft)	446.01	Top Width (ft)	259.98	178.93	7.10
Vel Total (ft/s)	5.56	Avg. Vel. (ft/s)	4.16	6.05	6.84
Max Chl Dpth (ft)	11.07	Hydr. Depth (ft)	0.50	1.96	1.00
Conv. Total (cfs)	17366.0	Conv. (cfs)	3449.8	13605.3	310.8
Length Wtd. (ft)	654.49	Wetted Per. (ft)	260.00	179.04	7.38
Min Ch El (ft)	1553.54	Shear (lb/sq ft)	0.76	2.98	1.46
Alpha	1.07	Stream Power (lb/ft s)	3.15	18.03	10.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	10.60	10.27	2.46
C & E Loss (ft)	0.03	Cum SA (acres)			

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, water surface was used.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1556.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.035	0.060	0.033
W.S. Elev (ft)	1556.01	Reach Len. (ft)	654.49	654.49	654.49
Crit W.S. (ft)	1556.01	Flow Area (sq ft)	127.23	351.26	7.11
E.G. Slope (ft/ft)	0.023960	Area (sq ft)	127.23	351.26	7.11
Q Total (cfs)	2710.00	Flow (cfs)	551.36	2110.34	48.30
Top Width (ft)	423.36	Top Width (ft)	237.33	178.93	7.10
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)	4.33	6.01	6.80
Max Chl Dpth (ft)	2.47	Hydr. Depth (ft)	0.54	1.96	1.00
Conv. Total (cfs)	17507.6	Conv. (cfs)	3562.0	13633.6	312.0
Length Wtd. (ft)	654.49	Wetted Per. (ft)	237.57	179.04	7.38
Min Ch El (ft)	1553.54	Shear (lb/sq ft)	0.80	2.93	1.44
Alpha	1.05	Stream Power (lb/ft s)	3.47	17.63	9.79
Frctn Loss (ft)	0.66	Cum. Volume (acre-ft)	7.73	10.44	0.33
C & E Loss (ft)	0.14	Cum SA (acres)			

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, water surface was used.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9485.32	9660.77	56.78	22.19	84.53	2.10	0.26	2.56
2	LOB	9660.77	9836.22	481.58	107.20	175.47	17.77	0.61	4.49
3	Chan	9836.22	10015.15	2123.14	350.83	179.04	78.34	1.96	6.05
4	ROB	10015.15	10106.04	48.51	7.09	7.38	1.79	1.00	6.84

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,
water surface was used.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9485.32	9660.77	57.72	19.60	62.10	2.13	0.32	2.95
2	LOB	9660.77	9836.22	493.64	107.63	175.47	18.22	0.61	4.59
3	Chan	9836.22	10015.15	2110.34	351.26	179.04	77.87	1.96	6.01
4	ROB	10015.15	10106.04	48.30	7.11	7.38	1.78	1.00	6.80

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,
water surface was used.

CROSS SECTION

RIVER: T4N-R3W-S16
REACH: Reach-3 RS: 0.707

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9337.86	1555.4	9352.06	1555.28	9354.44	1555.24	9362.61	1555.12	9403.98	1554.88
9431.71	1554.7	9436.2	1554.74	9455.74	1554.47	9465.83	1554.27	9466.32	1554.27
9467.21	1554.2	9470.15	1554.21	9471.83	1554.17	9481.88	1554	9501.07	1553.69
9512.52	1553.6	9565.86	1553.28	9567.19	1553.26	9567.74	1553.26	9568.02	1553.26
9568.32	1553.3	9568.87	1553.25	9570.23	1553.24	9576.01	1553.21	9599.29	1553.04
9604.89	1552.9	9613.17	1552.76	9626.06	1552.59	9637.69	1552.38	9643.67	1552.28
9653.01	1552.2	9659.77	1552.14	9666.14	1552.11	9666.72	1552.11	9670.36	1552.09
9676.35	1552.1	9683.87	1552.01	9688.44	1552	9709.06	1551.84	9710.54	1551.83
9720.4	1551.7	9726.44	1551.65	9753.57	1551.31	9756.92	1551.27	9759.83	1551.22
9762.89	1551.2	9782.5	1550.98	9786.05	1550.95	9810.82	1550.65	9822.05	1550.53
9827.59	1550.5	9832.85	1550.38	9834.07	1550.36	9847.27	1550.17	9855.94	1550.04
9857.44	1550	9859.2	1550	9864.89	1549.93	9875.37	1549.81	9897.36	1549.32
9897.36	1549.3	9908.16	1549.09	9917.54	1548.88	9937.02	1548.52	9939.46	1548.47
9945.45	1548.4	9961.05	1548.42	9972.89	1548.36	9977.51	1548.34	9994.6	1548.33
10003.28	1548.3	10003.56	1548.26	10003.65	1548.26	10013.41	1548.27	10020.36	1548.44
10027.63	1548.6	10028.33	1548.65	10029.67	1548.69	10032.79	1549.91	10033.05	1550
10033.6	1550.2	10038.27	1552	10040.41	1552.81	10043.15	1553.68	10043.75	1554
10044.34	1554.1	10044.36	1554.26	10049.54	1554.08	10051.84	1554	10056.35	1553.82
10078.96	1553	10088.52	1552.5	10089.37	1552.44	10095.36	1552.07	10095.67	1552.09
10097.47	1552.1	10100.83	1552.05	10113.4	1552	10126.88	1551.91	10139.77	1551.81

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10142.95  1551.8 10144.6  1551.910144.95 1551.7710145.25 1551.8310147.64 1552.31
10156.62    1554 10162.6 1555.0610167.56    155610172.87 1557.0410174.08 1557.25
10176.12  1557.310180.92 1557.5810186.84 1557.2510188.18 1556.8210190.92    1556
10194.03    155510197.06    1554 10198.9 1553.41 10203.4    1552 10207.8 1550.57
10209.61    155010211.15 1549.4910215.83    154810217.03 1547.61 10218.4 1547.17
10221.84    154710223.09 1546.9810224.84 1546.9510232.01 1546.9510233.77 1546.98
10236.24    154710236.76 1546.9910237.29 1546.9910242.89 1546.9910243.64 1546.82
10245.59  1546.310248.38 1547.2410250.42 1547.7610257.37 1547.7610266.94 1547.76
10267.36  1547.910267.62    154810268.42 1548.3310269.64 1548.8110270.36  1548.4
10271.17    154810273.43 1546.7710274.83    154610275.26 1545.7710276.82 1544.95

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9337.86    .035 9683.87     .0610038.27    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9875.3710032.79               554  554.39     554            .1        .3
Right Levee     Station=10180.92      Elevation= 1557.58

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1555.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *   0.051  *   0.060  *   0.035  *
* W.S. Elev (ft)          * 1555.15  * Reach Len. (ft)        *  554.00  *  554.39  *  554.00  *
* Crit W.S. (ft)          * 1550.87  * Flow Area (sq ft)      * 1282.13  * 1016.50  *  319.81  *
* E.G. Slope (ft/ft)      *0.000203  * Area (sq ft)           * 1282.13  * 1016.50  *  319.81  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)             * 1111.09  * 1241.39  *  357.52  *
* Top Width (ft)          *  802.68  * Top Width (ft)         *  514.96  *  157.42  *  130.30  *
* Vel Total (ft/s)        *    1.03  * Avg. Vel. (ft/s)       *    0.87  *    1.22  *    1.12  *
* Max Chl Dpth (ft)       *   10.20  * Hydr. Depth (ft)       *    2.49  *    6.46  *    2.45  *
* Conv. Total (cfs)       *190343.6  * Conv. (cfs)            * 78040.1  * 87192.2  * 25111.3  *
* Length Wtd. (ft)        *  554.14  * Wetted Per. (ft)       *  515.00  *  157.69  *  131.59  *
* Min Ch El (ft)          * 1548.26  * Shear (lb/sq ft)       *    0.03  *    0.08  *    0.03  *
* Alpha                   *    1.08  * Stream Power (lb/ft s) *    0.03  *    0.10  *    0.03  *
* Frctn Loss (ft)         *    0.32  * Cum Volume (acre-ft)   *   74.89  *   36.48  *   14.82  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *   40.42  *    9.17  *    6.97  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1555.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.057  *   0.060  *   0.050  *
* W.S. Elev (ft)          * 1555.30  * Reach Len. (ft)        *  554.00  *  554.39  *  554.00  *
* Crit W.S. (ft)          * 1550.87  * Flow Area (sq ft)      *  901.97  * 1038.98  *   37.27  *
* E.G. Slope (ft/ft)      *0.000312  * Area (sq ft)           *  901.97  * 1038.98  *   37.27  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)             * 1070.53  * 1597.35  *   42.12  *
* Top Width (ft)          *  384.99  * Top Width (ft)         *  216.00  *  157.42  *   11.57  *
* Vel Total (ft/s)        *    1.37  * Avg. Vel. (ft/s)       *    1.19  *    1.54  *    1.13  *
* Max Chl Dpth (ft)       *    7.04  * Hydr. Depth (ft)       *    4.18  *    6.60  *    3.22  *
* Conv. Total (cfs)       *153419.8  * Conv. (cfs)            * 60605.2  * 90430.0  *  2384.7  *
* Length Wtd. (ft)        *  554.17  * Wetted Per. (ft)       *  219.17  *  157.69  *   13.50  *
* Min Ch El (ft)          * 1548.26  * Shear (lb/sq ft)       *    0.08  *    0.13  *    0.05  *
* Alpha                   *    1.05  * Stream Power (lb/ft s) *    0.10  *    0.20  *    0.06  *
* Frctn Loss (ft)         *    0.46  * Cum Volume (acre-ft)   *   80.68  *   37.75  *    2.89  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *   35.87  *    9.17  *    1.99  *
*****************************************************************************************

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,
         water surface was used.

  Profile #1
```

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9337.86   * 9606.62   *   166.12 *   269.71 *   246.23 *     6.13 *
1.10 *     0.62 *
* 2        * LOB       * 9606.62   * 9875.37   *   944.97 *  1012.42 *   268.78 *    34.87 *
3.77 *     0.93 *
* 3        * Chan      * 9875.37   * 10032.79  *  1241.39 *  1016.50 *   157.69 *    45.81 *
6.46 *     1.22 *
* 4        * ROB       * 10032.79  * 10180.92  *   357.52 *   319.81 *   131.59 *    13.19 *
2.45 *     1.12 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9606.62   * 9875.37   *  1070.53 *   901.97 *   219.17 *    39.50 *
4.18 *     1.19 *
* 2        * Chan      * 9875.37   * 10032.79  *  1597.35 *  1038.98 *   157.69 *    58.94 *
6.60 *     1.54 *
* 3        * ROB       * 10032.79  * 10180.92  *    42.12 *    37.27 *    13.50 *     1.55 *
3.22 *     1.13 *
*****************************************************************************************
******************

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,
         water surface was used.

CROSS SECTION


RIVER: T4N-R3W-S16
REACH: Reach-3            RS: 0.602

INPUT
Description:
Station Elevation Data    num=     141
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9446.59  1555.4 9457.65 1555.37 9486.25 1554.92 9507.78 1554.68 9527.23 1554.59
 9528.67  1554.6 9541.07 1554.56 9548.18 1554.56 9555.39 1554.58 9556.59 1554.59
 9556.72  1554.6 9556.89 1554.59 9557.28 1554.58 9570.25 1554.62 9579.61 1554.71
 9580.11  1554.7 9589.64 1554.81 9594.23 1554.84 9599.46 1554.86 9599.93 1554.86
  9615.8  1554.7 9623.31 1554.71 9633.26 1554.59 9640.18  1554.5 9646.83 1554.01
 9646.89    1554  9649.8 1553.79 9651.25 1553.68 9651.38 1553.68 9670.51  1553.7
  9680.6 1553.57 9702.14 1553.23 9706.13 1553.21 9707.59 1553.21  9730.8  1553.1
  9739.4 1553.15 9751.78 1553.08 9762.18 1553.06  9776.5 1552.95 9780.28  1552.9
 9797.14 1552.82 9798.59 1552.83 9799.81 1552.81 9814.26  1552.7 9820.22  1552.6
 9822.66 1552.62 9825.23 1552.61 9858.07 1552.61 9864.21  1552.6 9869.41 1552.64
 9871.39 1552.64 9874.14 1552.64  9878.2 1552.62 9901.23 1552.63 9939.29  1552.5
 9960.22 1552.15 9965.28 1552.06 9969.69    1552 9977.25 1551.89 9991.28  1551.7
 9994.75 1551.52 9997.11 1551.5210001.14 1551.6910009.27 1551.9710010.66    1552
10013.14 1552.0910016.54 1552.2110016.721552.25510016.751552.263 10016.81552.275
 10017.5 1552.45   100181552.57510018.081552.59510018.94 1552.8110023.35    1554
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10026.241554.70110027.47    155510029.82 1555.6210031.42 1556.0410031.74 1556.13
10046.59  1556.110055.29  1556.110059.44 1556.0710061.48 1556.0810067.68 1556.07
10073.19 1556.07 10078.7  1556.1 10081.5 1556.06 10082.2 1556.0810128.08 1557.07
10137.48 1557.2610142.99  1557.310168.97 1557.5810181.74 1557.5810184.21 1557.62
10184.77  1557.610184.95 1557.6510186.49 1557.1910190.78    155610195.11 1554.63
10197.14    155410197.71 1553.8210203.65    155210203.99 1551.8910204.43 1551.76
10204.54  1551.810206.64    155210207.96 1552.1310208.61 1552.19 10215.8 1552.19
10219.28  1552.2 10221.6 1552.4610221.93 1552.49 10222.6  1552.410225.18    1552
10225.41    155210226.49 1551.7910227.84 1550.9610229.57    155010231.09 1549.15
10232.96    154810234.27 1547.2610235.23 1546.6910239.04 1547.65 10240.5 1547.98
10245.71  1547.810249.08 1547.6810252.85  1547.8 10255.4 1547.9810257.02 1547.98
10257.02    154810257.05    154810257.81 1548.4110259.64  1549.110260.54 1548.61
10261.58    154810263.35 1547.01 10265.1    154610265.74 1545.6810266.34 1545.32
10266.71  1545.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9446.59    .035 9869.41     .0610018.94    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.29 10017.5              512  510.98     511            .1        .3
Right Levee     Station=10184.95      Elevation= 1557.65

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1554.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.24  * Wt. n-Val.              *   0.041  *   0.060  *   0.041  *
* W.S. Elev (ft)          * 1554.59  * Reach Len. (ft)         *  512.00  *  510.98  *  511.00  *
* Crit W.S. (ft)          * 1553.94  * Flow Area (sq ft)       *  483.09  *  202.66  *    8.74  *
* E.G. Slope (ft/ft)      *0.006354  * Area (sq ft)            *  483.09  *  202.66  *    8.74  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)              * 1928.12  *  754.45  *   27.43  *
* Top Width (ft)          *  417.98  * Top Width (ft)          *  331.50  *   78.21  *    8.27  *
* Vel Total (ft/s)        *    3.90  * Avg. Vel. (ft/s)        *    3.99  *    3.72  *    3.14  *
* Max Chl Dpth (ft)       *    9.49  * Hydr. Depth (ft)        *    1.46  *    2.59  *    1.06  *
* Conv. Total (cfs)       * 33996.3  * Conv. (cfs)             * 24187.8  *  9464.5  *   344.0  *
* Length Wtd. (ft)        *  511.62  * Wetted Per. (ft)        *  331.54  *   78.26  *    8.54  *
* Min Ch El (ft)          * 1551.52  * Shear (lb/sq ft)        *    0.58  *    1.03  *    0.41  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    2.31  *    3.82  *    1.27  *
* Frctn Loss (ft)         *    1.00  * Cum Volume (acre-ft)    *   63.67  *   28.73  *   12.73  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *   35.04  *    7.67  *    6.09  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1554.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.041  *   0.060  *   0.041  *
* W.S. Elev (ft)          * 1554.59  * Reach Len. (ft)         *  512.00  *  510.98  *  511.00  *
* Crit W.S. (ft)          * 1553.91  * Flow Area (sq ft)       *  467.48  *  203.08  *    8.78  *
* E.G. Slope (ft/ft)      *0.006263  * Area (sq ft)            *  467.48  *  203.08  *    8.78  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)              * 1930.98  *  751.60  *   27.42  *
* Top Width (ft)          *  362.44  * Top Width (ft)          *  275.94  *   78.21  *    8.29  *
* Vel Total (ft/s)        *    3.99  * Avg. Vel. (ft/s)        *    4.13  *    3.70  *    3.12  *
* Max Chl Dpth (ft)       *    3.07  * Hydr. Depth (ft)        *    1.69  *    2.60  *    1.06  *
* Conv. Total (cfs)       * 34243.3  * Conv. (cfs)             * 24399.6  *  9497.2  *   346.5  *
* Length Wtd. (ft)        *  511.62  * Wetted Per. (ft)        *  276.85  *   78.26  *    8.56  *
* Min Ch El (ft)          * 1551.52  * Shear (lb/sq ft)        *    0.66  *    1.01  *    0.40  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    2.73  *    3.76  *    1.25  *
* Frctn Loss (ft)         *    1.00  * Cum Volume (acre-ft)    *   71.97  *   29.85  *    2.60  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)          *   32.75  *    7.67  *    1.87  *
*****************************************************************************************
```

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.
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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9446.59	9692.94	104.38	46.82	85.18	3.85	0.55	2.23
2 LOB	9692.94	9939.29	1823.74	436.28	246.36	67.30	1.77	4.18
3 Chan	9939.29	10017.50	754.46	202.66	78.26	27.84	2.59	3.72
4 ROB	10017.50	10184.95	27.43	8.74	8.54	1.01	1.06	3.14

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

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9446.59	9692.94	97.95	29.88	30.49	3.61	1.01	3.28
2 LOB	9692.94	9939.29	1833.03	437.60	246.36	67.64	1.78	4.19
3 Chan	9939.29	10017.50	751.60	203.08	78.26	27.73	2.60	3.70
4 ROB	10017.50	10184.95	27.42	8.78	8.56	1.01	1.06	3.12

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

CROSS SECTION

RIVER: T4N-R3W-S16
REACH: Reach-3 RS: 0.506

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 3,140cfs.
Station Elevation Data num= 137

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9304.63	1554	9305.59	1554	9308.26	1553.99	9311.01	1553.99	9313.05	1554
9331.12	1553.86	9333.08	1553.85	9337.95	1553.82	9343.9	1553.76	9368.51	1553.6
9381.78	1553.45	9435.42	1552.94	9440.6	1552.9	9444.85	1552.9	9456.65	1552.75
9511.36	1552.24	9519.4	1552.17	9525.43	1552.1	9530.63	1552.06	9539.3	1551.99
9544.68	1551.95	9547.99	1551.91	9574.23	1551.8	9606.6	1551.52	9637.42	1551.38
9675.32	1551.38	9704.24	1551.3	9711.24	1551.22	9719.51	1551.09	9719.9	1551.09
9726.77	1551.07	9729.21	1551.1	9732.03	1551.05	9736.72	1551.012	9776.28	1550.69
9780.67	1550.66	9781.53	1550.66	9814.41	1550.3	9821.94	1550.26	9826.86	1550.21
9853.03	1550.2	9879.86	1550.03	9887.56	1550	9888.99	1550.01	9890.43	1550
9892.92	1549.99	9896.78	1549.97	9896.86	1550	9903.58	1549.94	9907.68	1549.93
9926.02	1549.85	9933.36	1549.78	9944.38	1549.7	9945.26	1549.65	9945.61	1549.64
9961.86	1549.32	9964.98	1549.28	9966.58	1549.24	9981.58	1549.64	9983.92	1549.79
9985.74	1549.5	9990.66	1548.98	9992.98	1549.14	9998.39	1549.14	10000.51	1548.98
10013.95	1549.1	10017.3	1549.19	10019.17	1549.69	10020.03	1549.94	10020.25	1550
10020.51	1550.11	0027.51	1552	10027.85	1552.09	10028.73	1552.34	10032.69	1553.47
10032.85	1553.51	0034.29	1553.9	10036.8	1553.98	10037.12	1554	10051.9	1554.66
10057.45	1554.91	0062.86	1555.11	0063.71	1555.22	10067.9	1555.63	10071.8	1556
10077.27	1556.56	10081.6	1557	10093.39	1557.5	10104.5	1558	10110.8	1558.29
10131.56	1558.51	0134.26	1558.51	10136.32	1558.54	10163.53	1559.06	10164.5	1559.06
10176.3	1559.11	0177.09	1559.14	10180.13	1559.43	10183.61	1558.31	0184.53	1558
10186.4	1557.41	0193.08	1555.18	10196.68	1554	10199.98	1552.91	10202.79	1552
10206.5	1550.75	10208.72	1550	10209.57	1549.73	10210.95	1549.32	10213.67	1549.3
10215.08	1549.11	0216.93	1549.47	10218.29	1549.11	0225.76	1549.11	0227.69	1549.2
10229.03	1549.43	10232.8	1549.5	10233.4	1549.53	10233.61	1549.53	10233.74	1549.5
10233.75	1549.54	10234.43	1549.19	10237.44	1548	10239.63	1547.04	10241.01	1546.5
10244.57	1547.74	10244.86	1547.83	10260.69	1547.83	10261.38	1547.81	0261.43	1547.86
10261.93	1548	10263.44	1548.72	10264.05	1549.02	10264.48	1548.81	0265.75	1548
10267.63	1546.95	10269.05	1546.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9304.63	.035	9736.72	.06	10020.51	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9853.03	10020.51	511	511.92	512	.1	.3

Right Levee Station=10180.13 Elevation= 1559.43

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1553.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.044	0.060	0.033
W.S. Elev (ft)	1553.72	Reach Len. (ft)	511.00	511.92	512.00
Crit W.S. (ft)	1551.73	Flow Area (sq ft)	973.89	677.50	23.88
E.G. Slope (ft/ft)	0.001017	Area (sq ft)	973.89	677.50	23.88
Q Total (cfs)	3140.00	Flow (cfs)	1733.08	1356.98	49.94
Top Width (ft)	683.02	Top Width (ft)	502.45	167.48	13.10
Vel Total (ft/s)	1.87	Avg. Vel. (ft/s)	1.78	2.00	2.09
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)	1.94	4.05	1.82
Conv. Total (cfs)	98486.3	Conv. (cfs)	54358.3	42561.8	1566.3
Length Wtd. (ft)	511.53	Wetted Per. (ft)	502.46	167.69	13.59
Min Ch El (ft)	1548.98	Shear (lb/sq ft)	0.12	0.26	0.11
Alpha	1.01	Stream Power (lb/ft s)	0.22	0.51	0.23
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	55.10	23.56	12.54
C & E Loss (ft)	0.00	Cum SA (acres)	30.14	6.23	5.97

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.

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

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1553.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.044	0.060	0.033
W.S. Elev (ft)	1553.72	Reach Len. (ft)	511.00	511.92	512.00
Crit W.S. (ft)	1551.73	Flow Area (sq ft)	848.12	677.63	23.89

```
* E.G. Slope (ft/ft)      *0.001028  * Area (sq ft)            *  848.12  *  677.63  *   23.89  *
* Q Total (cfs)           * 3140.00  * Flow (cfs)              * 1724.75  * 1365.01  *   50.24  *
* Top Width (ft)          *  515.93  * Top Width (ft)          *  335.35  *  167.48  *   13.10  *
* Vel Total (ft/s)        *    2.03  * Avg. Vel. (ft/s)        *    2.03  *    2.01  *    2.10  *
* Max Chl Dpth (ft)       *    4.74  * Hydr. Depth (ft)        *    2.53  *    4.05  *    1.82  *
* Conv. Total (cfs)       * 97936.8  * Conv. (cfs)             * 53795.1  * 42574.6  *  1567.1  *
* Length Wtd. (ft)        *  511.53  * Wetted Per. (ft)        *  336.89  *  167.69  *   13.59  *
* Min Ch El (ft)          * 1548.98  * Shear (lb/sq ft)        *    0.16  *    0.26  *    0.11  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.33  *    0.52  *    0.24  *
* Frctn Loss (ft)         *    0.76  * Cum Volume (acre-ft)    *   64.24  *   24.68  *    2.41  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   29.15  *    6.23  *    1.74  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9304.63   * 9578.83   *   305.01 *   234.44 *   228.26 *     9.71 *
1.03 *     1.30 *
* 2        * LOB       * 9578.83   * 9853.03   *  1428.08 *   739.45 *   274.21 *    45.48 *
2.70 *     1.93 *
* 3        * Chan      * 9853.03   * 10020.51  *  1356.98 *   677.50 *   167.69 *    43.22 *
4.05 *     2.00 *
* 4        * ROB       * 10020.51  * 10180.13  *    49.94 *    23.88 *    13.59 *     1.59 *
1.82 *     2.09 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9304.63   * 9578.83   *   211.60 *   108.47 *    62.68 *     6.74 *
1.77 *     1.95 *
* 2        * LOB       * 9578.83   * 9853.03   *  1513.15 *   739.65 *   274.21 *    48.19 *
2.70 *     2.05 *
* 3        * Chan      * 9853.03   * 10020.51  *  1365.01 *   677.63 *   167.69 *    43.47 *
4.05 *     2.01 *
* 4        * ROB       * 10020.51  * 10180.13  *    50.24 *    23.89 *    13.59 *     1.60 *
1.82 *     2.10 *
*****************************************************************************************************
******************

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: T4N-R3W-S16
```

REACH: Reach-3 RS: 0.409

INPUT
Description:
Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9496.56	1553.1	9508.13	1552.98	9530.27	1552.72	9548.35	1552.48	9550.8	1552.4
9560.84	1552.34	9572.26	1552.24	9612.78	1552.12	9617.28	1552.1	9624.54	1552.08
9637.98	1552	9650.85	1551.92	9661.05	1551.8	9664.7	1551.81	9675.77	1551.71
9691.55	1551.53	9696.18	1551.5	9703.28	1551.39	9708.48	1551.32	9714.28	1551.41
9722.39	1551	9723.77	1550.96	9733.33	1550.96	9744.78	1551.01	9757.82	1551
9758.43	1551	9768.02	1550.98	9777.02	1550.97	9801.1	1550.74	9804.15	1550.72
9808.16	1550.7	9828.47	1550.58	9849.88	1550.49	9853.9	1550.48	9858.92	1550.5
9864.54	1550.35	9880.42	1550.04	9882.11	1550	9882.43	1550	9895.39	1549.72
9902.08	1549.6	9904.28	1549.63	9911.67	1549.82	9940.77	1549.75	9940.85	1549.75
9940.88	1549.7	9940.89	1549.75	9941.03	1549.75	9973.09	1549.7	9995.33	1549.52
9999.44	1549.4510000.64		1549.4910007.01		1549.310010.78		1549.5110014.19		1549.45
10023.77	1549.5610031.87		1549.510034.67		1549.510034.94		1549.50910036.84		1549.57
10047.13	155010056.45		1550.2910063.46		1550.5110068.46		1550.610093.64		1550.89
10111.91	1551.1510131.87		1551.5110151.15		1551.9310155.34		1551.910160.93		1551.96
10163.81	155210164.18		155210164.24		1551.9910166.66		155210187.22		1552.35
10197.39	1552.5610199.52		1552.7910201.26		1552.9310203.52		1552.210203.83		1552.07
10204.07	155210204.58		1551.8310209.97		1550	10212.3	1549.210215.88		1548
10216.68	1547.7410216.75		1547.7210217.01		1547.7410218.04		1547.9	10219.7	1548.02
10219.91	154810219.94		154810224.81		1548.0710227.08		1548.110231.65		1548.14
10232.3	1548.1510232.69		1548.1310232.73		1548.210233.03		1548.110233.59		1548
10237.61	1547.310241.28		1546.6510243.16		1546.910245.52		1547.1610252.11		1547.63
10256.2	154810258.63		1548.2110263.03		1548.610265.75		1549.2310266.24		1549.36
10266.47	1549.2210268.31		154810271.07		1546.210271.38		154610273.89		1544.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9496.56	.035	9757.82	.0610068.46		.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9858.9	210068.46	580	588.42	580	.1	.3

Right Levee Station=10201.26 Elevation= 1552.93

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1553.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.047	0.060	0.033
W.S. Elev (ft)	1552.91	Reach Len. (ft)	580.00	588.42	580.00
Crit W.S. (ft)	1551.61	Flow Area (sq ft)	468.62	652.02	178.87
E.G. Slope (ft/ft)	0.002401	Area (sq ft)	468.62	652.02	178.87
Q Total (cfs)	3140.00	Flow (cfs)	972.26	1685.90	481.85
Top Width (ft)	686.98	Top Width (ft)	344.89	209.54	132.56
Vel Total (ft/s)	2.42	Avg. Vel. (ft/s)	2.07	2.59	2.69
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)	1.36	3.11	1.35
Conv. Total (cfs)	64078.7	Conv. (cfs)	19841.1	34404.5	9833.2
Length Wtd. (ft)	583.58	Wetted Per. (ft)	344.91	209.65	132.59
Min Ch El (ft)	1549.30	Shear (lb/sq ft)	0.20	0.47	0.20
Alpha	1.03	Stream Power (lb/ft s)	0.42	1.21	0.54
Frctn Loss (ft)	2.51	Cum Volume (acre-ft)	46.64	15.75	11.35
C & E Loss (ft)	0.01	Cum SA (acres)	25.17	4.01	5.11

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

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1553.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.047	0.060	0.033

* W.S. Elev (ft)	* 1552.93	* Reach Len. (ft)	* 580.00	* 588.42	* 580.00	*
* Crit W.S. (ft)	* 1551.61	* Flow Area (sq ft)	* 473.42	* 654.94	* 180.72	*
* E.G. Slope (ft/ft)	*0.002345	* Area (sq ft)	* 473.42	* 654.94	* 180.72	*
* Q Total (cfs)	* 3140.00	* Flow (cfs)	* 977.34	* 1678.64	* 484.02	*
* Top Width (ft)	* 687.22	* Top Width (ft)	* 344.95	* 209.54	* 132.73	*
* Vel Total (ft/s)	* 2.40	* Avg. Vel. (ft/s)	* 2.06	* 2.56	* 2.68	*
* Max Chl Dpth (ft)	* 3.62	* Hydr. Depth (ft)	* 1.37	* 3.13	* 1.36	*
* Conv. Total (cfs)	* 64836.0	* Conv. (cfs)	* 20180.6	* 34661.3	* 9994.2	*
* Length Wtd. (ft)	* 583.60	* Wetted Per. (ft)	* 344.99	* 209.65	* 132.77	*
* Min Ch El (ft)	* 1549.30	* Shear (lb/sq ft)	* 0.20	* 0.46	* 0.20	*
* Alpha	* 1.03	* Stream Power (lb/ft s)	* 0.41	* 1.17	* 0.53	*
* Frctn Loss (ft)	* 2.36	* Cum Volume (acre-ft)	* 56.49	* 16.85	* 1.20	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 25.16	* 4.01	* 0.88	*

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.
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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9496.56	9677.74	175.45	113.81	163.71	5.59	0.70	1.54
* 2	LOB	9677.74	9858.92	796.80	354.81	181.20	25.38	1.96	2.25
* 3	Chan	9858.92	10068.46	1685.90	652.02	209.65	53.69	3.11	2.59
* 4	ROB	10068.46	10201.26	481.85	178.87	132.59	15.35	1.35	2.69

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.
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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9496.56	9677.74	179.37	116.09	163.79	5.71	0.71	1.55
* 2	LOB	9677.74	9858.92	797.97	357.33	181.20	25.41	1.97	2.23
* 3	Chan	9858.92	10068.46	1678.64	654.94	209.65	53.46	3.13	2.56
* 4	ROB	10068.46	10201.26	484.02	180.72	132.77	15.41	1.36	2.68

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.

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

CROSS SECTION

RIVER: T4N-R3W-S16
REACH: Reach-3 RS: 0.297

INPUT
Description: Interpolated point added at (9910.73, 1548.31) to set bank station
Station Elevation Data num= 145

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9159.37	1552	9160.51	1551.98	9167.81	1551.91	9174.56	1551.82	9191.81	1551.7
9201.34	1551.54	9223.94	1551.4	9227.87	1551.37	9234.05	1551.36	9251.42	1551.3
9252.68	1551.34	9274.27	1551.31	9276.99	1551.31	9279.07	1551.29	9300.3	1551.2
9303.22	1551.19	9306.35	1551.15	9325.64	1551.08	9330.91	1551.02	9348.22	1550.9
9365	1550.82	9371.88	1550.77	9381.83	1550.71	9389.85	1550.7	9399.07	1550.62
9407.98	1550.62	9418.93	1550.51	9428.71	1550.52	9431.79	1550.5	9441.59	1550.4
9444.76	1550.41	9466.53	1550.08	9473.07	1550	9478.47	1549.9	9483.4	1549.86
9510.44	1549.53	9522.71	1549.46	9528.46	1549.41	9538.6	1549.4	9542.31	1549.39
9552.75	1549.4	9555.61	1549.409	9556.06	1549.41	9566.8	1549.42	9569.73	1549.4
9580.58	1549.45	9591.87	1549.48	9595.13	1549.47	9607.53	1549.32	9615.88	1549.3
9626.46	1549.07	9627.45	1549.06	9629.82	1549.03	9633.27	1549.2	9640.28	1548.94
9649.35	1548.57	9652.96	1548.95	9653.35	1548.99	9663.2	1549.5	9668.57	1549.48
9671.33	1549.58	9677.78	1549.51	9684.63	1549.45	9689.71	1549.5	9701.16	1549.41
9712.6	1549.43	9713.45	1549.43	9713.46	1549.4	9725.98	1549.47	9726.17	1549.47
9738.37	1549.55	9738.52	1549.6	9750.14	1549.66	9758.14	1549.66	9769.68	1549.7
9783.57	1549.56	9794.9	1549.36	9804.13	1549.22	9810.5	1549.14	9830.13	1548.9
9832.88	1548.82	9843.07	1548.7	9846.17	1548.65	9855.83	1548.56	9859.22	1548.5
9862.73	1548.45	9874.47	1548.37	9877.39	1548.36	9880.41	1548.36	9891.35	1548.3
9894.57	1548.33	9900.48	1548.33	9910.73	1548.31	9913.85	1548.3	9922.57	1548.29
9929.7	1548.24	9950.5	1548.05	9952.1	1548.1	9954.16	1548.05	9964.44	1548.02
9966.74	1548.02	9971.85	1548	9973.38	1548	9991.67	1547.65	10000.63	1547.48
10006.74	1547.35	10012.71	1547.26	10015.44	1547.2	10017.3	1547.17	10029.82	1547.38
10037.84	1547.48	10042.55	1547.51	10045.48	1547.51	10052.94	1547.56	10063.3	1547.65
10070.67	1547.64	10073.49	1547.58	10076.31	1547.51	10084.32	1547.48	10087.22	1547.63
10087.67	1547.66	10092.95	1547.98	10093.55	1547.99	10093.57	1548	10097.64	1548.96
10102.08	1549.79	10107.24	1550	10107.32	1550	10122.55	1550.7	10125.05	1550.81
10126.98	1550.15	10127.41	1550	10132.49	1548.31	10133.25	1548	10133.99	1547.75
10136.64	1546.85	10139.15	1547.24	10141.28	1547.5	10141.7	1547.6	10142.04	1547.67
10144.2	1548	10149.93	1548.92	10150.59	1549	10166.19	1549.29	10169.55	1549.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9159.37	.033	9510.44	.06	10097.64	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9991.67	10063.3	396	402.37	394	.1	.3

Right Levee Station=10125.05 Elevation= 1550.81

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1550.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.059	0.060	0.059
W.S. Elev (ft)	1550.25	Reach Len. (ft)	396.00	402.37	394.00
Crit W.S. (ft)	1549.64	Flow Area (sq ft)	619.48	201.56	93.29
E.G. Slope (ft/ft)	0.009799	Area (sq ft)	619.48	201.56	93.29
Q Total (cfs)	3140.00	Flow (cfs)	1745.75	984.75	409.50
Top Width (ft)	657.54	Top Width (ft)	536.43	71.63	49.48
Vel Total (ft/s)	3.43	Avg. Vel. (ft/s)	2.82	4.89	4.39
Max Chl Dpth (ft)	3.40	Hydr. Depth (ft)	1.15	2.81	1.89
Conv. Total (cfs)	31721.0	Conv. (cfs)	17636.0	9948.1	4136.9
Length Wtd. (ft)	396.88	Wetted Per. (ft)	536.54	71.64	49.70
Min Ch El (ft)	1547.17	Shear (lb/sq ft)	0.71	1.72	1.15
Alpha	1.22	Stream Power (lb/ft s)	1.99	8.41	5.04
Frctn Loss (ft)	2.12	Cum Volume (acre-ft)	39.40	9.99	9.54
C & E Loss (ft)	0.03	Cum SA (acres)	19.30	2.11	3.90

```
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1550.65  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.20  * Wt. n-Val.              *   0.059  *   0.060  *          *
* W.S. Elev (ft)         * 1550.46  * Reach Len. (ft)        *  396.00  *  402.37  *  394.00  *
* Crit W.S. (ft)         * 1549.98  * Flow Area (sq ft)      *  728.93  *  216.19  *          *
* E.G. Slope (ft/ft)     *0.008530  * Area (sq ft)           *  728.93  *  216.19  *          *
* Q Total (cfs)          * 3140.00  * Flow (cfs)             * 2133.42  * 1006.58  *          *
* Top Width (ft)         *  607.23  * Top Width (ft)         *  535.60  *   71.63  *          *
* Vel Total (ft/s)       *    3.32  * Avg. Vel. (ft/s)       *    2.93  *    4.66  *          *
* Max Chl Dpth (ft)      *    3.29  * Hydr. Depth (ft)       *    1.36  *    3.02  *          *
* Conv. Total (cfs)      * 33997.3  * Conv. (cfs)            * 23098.9  * 10898.4  *          *
* Length Wtd. (ft)       *  397.34  * Wetted Per. (ft)       *  535.93  *   74.44  *          *
* Min Ch El (ft)         * 1547.17  * Shear (lb/sq ft)       *    0.72  *    1.55  *          *
* Alpha                  *    1.16  * Stream Power (lb/ft s) *    2.12  *    7.20  *          *
* Frctn Loss (ft)        *    1.84  * Cum Volume (acre-ft)   *   48.48  *   10.97  *          *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *   19.30  *    2.11  *          *
*****************************************************************************************

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

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9159.37   * 9575.52   *   162.92 *    74.59 *   120.28 *     5.19 *
0.62 *     2.18 *
* 2        * LOB       * 9575.52   * 9991.67   *  1582.83 *   544.89 *   416.26 *    50.41 *
1.31 *     2.90 *
* 3        * Chan      * 9991.67   * 10063.30  *   984.75 *   201.56 *    71.64 *    31.36 *
2.81 *     4.89 *
* 4        * ROB       * 10063.30  * 10125.05  *   409.50 *    93.29 *    49.70 *    13.04 *
1.89 *     4.39 *
*****************************************************************************************
******************

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

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9159.37   * 9575.52   *   247.64 *    99.00 *   119.67 *     7.89 *
0.83 *     2.50 *
* 2          * LOB       * 9575.52   * 9991.67   *  1885.78 *   629.93 *   416.26 *    60.06 *
1.51 *     2.99 *
* 3          * Chan      * 9991.67   * 10063.30  *  1006.58 *   216.19 *    74.44 *    32.06 *
3.02 *     4.66 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S16
REACH: Reach-3            RS: 0.221

INPUT
Description:
Station Elevation Data    num=     132
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9241.53  1550.1 9248.08 1550.05 9256.67 1549.95 9270.03 1549.81  9271.6  1549.8
 9274.23 1549.77 9294.79  1549.6 9300.14 1549.54 9319.08 1549.37 9329.11  1549.3
  9341.5 1549.16    9349 1549.09 9367.67 1548.94 9371.58 1548.91 9392.22  1548.8
 9401.57  1548.8 9404.72 1548.77 9432.56 1548.71 9448.22 1548.53 9467.92  1548.4
 9497.57    1548 9497.66    1548 9502.88 1547.94 9508.89 1547.88  9510.7  1547.9
 9525.35 1547.72 9540.16 1547.63 9544.43  1547.6 9548.84 1547.56 9569.91 1547.38
 9578.71 1547.27 9581.65 1547.25  9582.1 1547.19 9582.881547.076 9584.08  1546.9
 9591.73 1546.58 9592.44 1546.56 9595.73 1546.95 9598.08 1547.15 9599.63  1547.2
 9606.18 1547.09 9625.94 1546.91 9630.51 1546.88 9636.08 1546.85 9652.83  1546.8
 9660.46 1546.75 9666.52  1546.7 9677.67 1546.64 9684.46 1546.58 9691.88  1546.5
 9700.67 1546.44 9713.89 1546.33 9732.89 1546.16 9736.56  1546.1 9740.61 1546.09
 9740.71 1546.09 9741.02 1546.08 9741.57 1546.08 9750.05    1546 9755.21    1546
 9758.23 1545.98 9760.58 1545.96  9766.9 1545.92 9772.81  1545.9 9777.89 1545.89
 9785.62 1545.91 9787.12 1545.91 9790.91  1545.9 9795.52  1545.9 9800.98 1545.93
 9803.79 1545.93 9812.32 1545.96 9813.72 1545.97 9815.98    1546 9816.97 1545.97
 9828.61 1545.97 9831.14 1545.96 9833.77    1546 9837.86 1545.94  9869.2 1545.76
 9878.06 1545.74 9886.96 1545.69  9896.8  1545.6  9912.4 1545.54 9923.15 1545.45
 9935.03 1545.41 9936.92  1545.4 9947.22 1545.47 9950.71 1545.49 9951.67  1545.5
 9958.79 1545.59 9959.77  1545.6 9968.47 1545.71 9970.58 1545.73 9975.39 1545.77
 9979.26 1545.86 9981.93  1545.9 9982.37 1545.89  9983.4 1545.92 9985.33 1545.98
 9985.34 1545.98 9993.94  1545.6 9994.63 1545.54 9999.91 1545.4110004.67 1545.19
10013.55 1545.55 10020.2 1545.810021.36 1545.8310021.45 1545.8510021.94 1545.93
10022.13    154610028.21 1547.310030.96 1547.9410056.18 1547.5610065.07 1547.46
10074.59 1546.13 10075.5    154610078.75 1545.54   10079 1545.510090.62 1545.49
10110.16 1545.310115.361545.18710119.33 1545.110119.35 1545.0610119.41 1545.06
10125.17 1545.3510127.62 1545.9210127.98    154610129.54 1546.3410129.79 1546.38
10137.87 1546.610151.78    1547

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9241.53    .033 9581.65     .0610028.21    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.3310022.13              620   629.2     625            .1        .3
Right Levee     Station=10030.96      Elevation= 1547.94

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1548.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.11  * Wt. n-Val.              *   0.059  *   0.060  *   0.036  *
* W.S. Elev (ft)         * 1548.21  * Reach Len. (ft)         *  620.00  *  629.20  *  625.00  *
* Crit W.S. (ft)         * 1547.27  * Flow Area (sq ft)       *  894.10  *   97.73  *  229.46  *
```

E.G. Slope (ft/ft)	0.003365	Area (sq ft)	894.10	97.73	229.46	
Q Total (cfs)	3140.00	Flow (cfs)	2063.97	269.00	807.04	
Top Width (ft)	670.07	Top Width (ft)	503.62	36.80	129.65	
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)	2.31	2.75	3.52	
Max Chl Dpth (ft)	3.15	Hydr. Depth (ft)	1.78	2.66	1.77	
Conv. Total (cfs)	54126.9	Conv. (cfs)	35578.4	4636.9	13911.6	
Length Wtd. (ft)	622.50	Wetted Per. (ft)	503.71	36.85	131.37	
Min Ch El (ft)	1545.19	Shear (lb/sq ft)	0.37	0.56	0.37	
Alpha	1.11	Stream Power (lb/ft s)	0.86	1.53	1.29	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	32.52	8.60	8.08	
C & E Loss (ft)	0.03	Cum SA (acres)	14.57	1.61	3.09	

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 OUTPUT Profile #2

E.G. Elev (ft)	1548.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.058	0.060	
W.S. Elev (ft)	1548.69	Reach Len. (ft)	620.00	629.20	625.00
Crit W.S. (ft)	1547.27	Flow Area (sq ft)	1134.36	115.29	
E.G. Slope (ft/ft)	0.002902	Area (sq ft)	1134.36	115.29	
Q Total (cfs)	3140.00	Flow (cfs)	2826.09	313.91	
Top Width (ft)	540.31	Top Width (ft)	503.51	36.80	
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	2.49	2.72	
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	2.25	3.13	
Conv. Total (cfs)	58284.8	Conv. (cfs)	52458.0	5826.8	
Length Wtd. (ft)	621.54	Wetted Per. (ft)	504.07	39.54	
Min Ch El (ft)	1545.19	Shear (lb/sq ft)	0.41	0.53	
Alpha	1.00	Stream Power (lb/ft s)	1.02	1.44	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	40.01	9.44	
C & E Loss (ft)	0.02	Cum SA (acres)	14.58	1.61	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9241.53	9613.43	149.98	90.70	131.79	4.78	0.69	1.65
2	LOB	9613.43	9985.33	1913.98	803.40	371.91	60.95	2.16	2.38
3	Chan	9985.33	10022.13	269.00	97.73	36.85	8.57	2.66	2.75
4	ROB	10022.13	10030.96	19.85	11.14	9.04	0.63	1.26	1.78
5	ROB	10030.96	10091.37	205.14	75.68	60.55	6.53	1.25	2.71
6	ROB	10091.37	10151.78	582.05	142.64	61.78	18.54	2.36	4.08

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9241.53	9613.43	340.12	153.50	132.16	10.83	1.17	2.22
* 2	LOB	9613.43	9985.33	2485.97	980.86	371.91	79.17	2.64	2.53
* 3	Chan	9985.33	10022.13	313.91	115.29	39.54	10.00	3.13	2.72

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: T4N-R3W-S16
REACH: Reach-3 RS: 0.102

INPUT
Description:
Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9102.3	1548.7	9102.38	1548.72	9108.07	1548.64	9113.72	1548.56	9132.71	1548.35
9135.48	1548.3	9136.79	1548.33	9163.58	1548.25	9180.32	1548.19	9195.54	1548.13
9211.71	1548.1	9214.8	1548.06	9219.5	1548.06	9228	1548.06	9237.21	1548.02
9242.67	1548	9244.07	1548	9244.79	1547.99	9253.61	1547.93	9304.84	1547.51
9311.57	1547.4	9330.05	1547.27	9358.69	1547.12	9372.54	1547.03	9378.43	1547
9381.89	1547	9406.67	1546.86	9421.47	1546.77	9445.94	1546.68	9459.82	1546.6
9462.9	1546.6	9464.39	1546.59	9466.82	1546.59	9484.6	1546.54	9499.38	1546.35
9500.77	1546.3	9513.75	1546.18	9524.12	1546.06	9528.89	1546	9554.88	1545.6
9564.44	1545.4	9565.88	1545.41	9570.22	1545.31	9575.44	1545.19	9580.67	1545.07
9590.75	1545.1	9591.69	1545.11	9605.96	1544.41	9611.96	1544.35	9614.29	1544.62
9617.04	1544.9	9625.38	1544.79	9625.62	1544.78	9625.67	1544.78	9625.82	1544.78
9647.42	1544.6	9659.51	1544.53	9697.81	1544.17	9700.6	1544.14	9703.38	1544.12
9704.5	1544.1	9707.09	1544.08	9720.65	1544.01	9723.07	1544	9739.67	1543.85
9747.54	1543.8	9751.73	1543.76	9767.07	1543.67	9771.43	1543.64	9774.19	1543.64
9778.59	1543.6	9791.79	1543.6	9800.38	1543.6	9816.13	1543.53	9826.42	1543.53
9839.5	1543.5	9847.92	1543.46	9858.65	1543.38	9871.25	1543.26	9874.82	1543.24
9886.5	1543.1	9888.48	1543.1	9903.38	1542.98	9905.01	1542.95	9917.71	1542.84
9920.6	1542.8	9928.72	1542.63	9932.69	1542.59	9935.79	1542.51	9940.79	1542.17
9944.22	1542	9944.46	1541.99	9944.93	1541.97	9948.56	1541.95	9966.38	1541.75
9993.43	1541.6	10005.42	1541.45	10007.29	1541.58	10013.97	1542	10015.62	1542.11
10018.54	1542.3	10018.62	1542.335	10018.88	1542.45	10019	1542.499	10019.31	1542.621
10020.24	1543.002	10020.31	1543.03	10023.01	1544	10025.94	1545.07	10028.18	1546
10029.29	1546.41	10029.35	1546.45	10031.9	1546.37	10038.59	1546.16	10042.96	1546
10048.71	1545.8	10057.26	1545.54	10059.27	1545.03	10063.67	1544	10066.61	1543.3
10066.69	1543.28	10067.67	1543.28	10100.27	1543.39	10106.4	1543.83	10109.14	1544
10109.55	1544.02	10109.76	1544.03	10114.67	1545.38	10116.36	1545.85	10116.96	1546
10117.02	1546.02	10118.58	1546.43	10136.37	1546.83	10139.71	1546.86		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9102.3	.033	9720.65	.06	10023.01	.035

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.72 10019.3              542  537.24     531            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1547.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.02  * Wt. n-Val.              *   0.047  *   0.060  *   0.036  *
* W.S. Elev (ft)         * 1547.88  * Reach Len. (ft)         *  542.00  *  537.24  *  531.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       * 1759.88  *  544.75  *  360.06  *
* E.G. Slope (ft/ft)     *0.000265  * Area (sq ft)            * 1759.88  *  544.75  *  360.06  *
* Q Total (cfs)          * 3140.00  * Flow (cfs)              * 1916.41  *  725.06  *  498.53  *
* Top Width (ft)         *  879.55  * Top Width (ft)          *  668.56  *   90.58  *  120.41  *
* Vel Total (ft/s)       *    1.18  * Avg. Vel. (ft/s)        *    1.09  *    1.33  *    1.38  *
* Max Chl Dpth (ft)      *    6.43  * Hydr. Depth (ft)        *    2.63  *    6.01  *    2.99  *
* Conv. Total (cfs)      *193052.8  * Conv. (cfs)             *117824.3  * 44577.8  * 30650.7  *
* Length Wtd. (ft)       *  538.11  * Wetted Per. (ft)        *  668.63  *   90.69  *  122.77  *
* Min Ch El (ft)         * 1541.45  * Shear (lb/sq ft)        *    0.04  *    0.10  *    0.05  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.05  *    0.13  *    0.07  *
* Frctn Loss (ft)        *    0.39  * Cum Volume (acre-ft)    *   13.63  *    3.96  *    3.85  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    6.23  *    0.69  *    1.29  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1548.42  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.02  * Wt. n-Val.              *   0.046  *   0.060  *          *
* W.S. Elev (ft)         * 1548.40  * Reach Len. (ft)         *  542.00  *  537.24  *  531.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       * 2111.83  *  592.42  *          *
* E.G. Slope (ft/ft)     *0.000225  * Area (sq ft)            * 2111.83  *  592.42  *          *
* Q Total (cfs)          * 3140.00  * Flow (cfs)              * 2401.77  *  738.23  *          *
* Top Width (ft)         *  759.23  * Top Width (ft)          *  668.65  *   90.58  *          *
* Vel Total (ft/s)       *    1.16  * Avg. Vel. (ft/s)        *    1.14  *    1.25  *          *
* Max Chl Dpth (ft)      *    6.95  * Hydr. Depth (ft)        *    3.16  *    6.54  *          *
* Conv. Total (cfs)      *209264.1  * Conv. (cfs)             *160065.0  * 49199.1  *          *
* Length Wtd. (ft)       *  541.03  * Wetted Per. (ft)        *  669.25  *   96.47  *          *
* Min Ch El (ft)         * 1541.45  * Shear (lb/sq ft)        *    0.04  *    0.09  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    0.05  *    0.11  *          *
* Frctn Loss (ft)        *    0.34  * Cum Volume (acre-ft)    *   16.91  *    4.33  *          *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *    6.24  *    0.69  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9102.30   * 9515.51   *   138.23 *   224.07 *   255.36 *     4.40 *
0.88 *     0.62 *
* 2        * LOB       * 9515.51   * 9928.72   *  1778.18 *  1535.81 *   413.28 *    56.63 *
3.72 *     1.16 *
* 3        * Chan      * 9928.72   * 10019.30  *   725.06 *   544.75 *    90.69 *    23.09 *
6.01 *     1.33 *
* 4        * ROB       * 10019.30  * 10079.50  *   239.39 *   177.91 *    61.20 *     7.62 *
2.96 *     1.35 *
* 5        * ROB       * 10079.50  * 10139.71  *   259.14 *   182.16 *    61.57 *     8.25 *
3.03 *     1.42 *
*****************************************************************************************
******************

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9102.30	9515.51	286.15	358.52	255.97	9.11	1.40	0.80
2	LOB	9515.51	9928.72	2115.62	1753.31	413.28	67.38	4.24	1.21
3	Chan	9928.72	10019.30	738.23	592.42	96.47	23.51	6.54	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: T4N-R3W-S16
REACH: Reach-3 RS: 0.000

INPUT
Description:
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9118.23	1550	9118.53	1550.02	9121.17	1550	9123.48	1549.98	9124	1549.99
9132.42	1549.9	9141.86	1549.79	9157.03	1549.78	9168.74	1549.7	9185.12	1549.55
9244.87	1549.4	9246.64	1549.39	9268.22	1549.7	9278.89	1549.59	9299.07	1549.86
9302.93	1549.4	9304.36	1549.27	9307	1549.29	9311.16	1549.33	9318.38	1549.26
9321.13	1549.2	9326.39	1549.18	9389.56	1549.1	9406.32	1548.8	9425.24	1548.26
9435.2	1548.1	9439.22	1548.09	9446.65	1548.03	9458.3	1547.95	9464.88	1547.9
9474.71	1547.87	9485.25	1547.87	9487.18	1547.86	9487.96	1547.9	9498.27	1547.77
9499.62	1547.76	9499.77	1547.74	9501.83	1547.36	9508.11	1547.5	9510.62	1547.64
9513.04	1547.77	9514.56	1547.84	9529.03	1547.71	9573.93	1547.4	9580.55	1547.33
9623.51	1547.51	9623.67	1547.51	9658.5	1547.2	9678.15	1546.95	9694.6	1546.82
9719.22	1546.62	9769.11	1546.05	9778.02	1546	9785.03	1546	9788.74	1545.98
9797.53	1545.94	9798.92	1545.91	9801.58	1545.9	9809.84	1545.94	9813.62	1545.93
9838.33	1545.72	9839.67	1545.71	9860.99	1545.7	9864.11	1545.73	9867.61	1545.76
9878.17	1545.88	9885.18	1545.98	9887.16	1546	9887.55	1545.98	9903.44	1545.75
9931.52	1545.18	9947.45	1544.959	9959.17	1544.8	9960.9	1544.69	9962.08	1544.56
9965	1544.72	9966.27	1544.75	9969.27	1544.8	9972.88	1544.88	9977.52	1545.21
9979.02	1545.29	9979.96	1545.19	9988.34	1544.2	9989.05	1544.08	9989.3	1544
9995.13	1542.52	9997	1542	9997.23	1541.9	9997.68	1541.82	9998.66	1541.83
10000.72	1541.84	10003.58	1541.84	10003.84	1542	10003.87	1541.98	10004.29	1542.17
10008.96	1544	10009.03	1544.02	10010.33	1544.5	10011.9	1544.48	10012.5	1544.48
10012.51	1544.47	10018.32	1544.35	10029.67	1544.5	10034.7	1544.52	10035.89	1544.29
10037.29	1544	10046.05	1542.28	10047.06	1542.1	10047.21	1542.08	10048.97	1542.1
10049.42	1542.11	10056.21	1542.09	10060.17	1542.5	10065.45	1543.08	10067.06	1543.43
10069.84	1544	10071.31	1544.24	10075.31	1545.152	10075.41	1545.175	10075.51	1545.198
10075.71	1545.244	10075.81	1545.267	10077.7	1545.7	10080.59	1545.506	10081.57	1545.44
10081.74	1545.43	10082.58	1545.48	10083.29	1545.52	10090.94	1546	10097.98	1546.47
10100.48	1546.62	10101.6	1546.8	10102.07	1547.22				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9118.23	.033	9903.44	.06	10077.7	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.34	10010.33	0	0	0	.1	.3

Right Levee Station=10102.07 Elevation= 1547.22

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1547.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.044	0.060	0.058
W.S. Elev (ft)	1547.23	Reach Len. (ft)			
Crit W.S. (ft)	1546.59	Flow Area (sq ft)	431.12	97.99	271.51
E.G. Slope (ft/ft)	0.006001	Area (sq ft)	431.12	97.99	271.51
Q Total (cfs)	3140.00	Flow (cfs)	1451.64	496.61	1191.75
Top Width (ft)	446.71	Top Width (ft)	332.98	21.99	91.74
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)	3.37	5.07	4.39
Max Chl Dpth (ft)	5.41	Hydr. Depth (ft)	1.29	4.46	2.96
Conv. Total (cfs)	40532.2	Conv. (cfs)	18738.2	6410.4	15383.6
Length Wtd. (ft)		Wetted Per. (ft)	333.09	22.82	92.55
Min Ch El (ft)	1541.82	Shear (lb/sq ft)	0.48	1.61	1.10
Alpha	1.08	Stream Power (lb/ft s)	1.63	8.15	4.82
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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1548.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.042	0.060	
W.S. Elev (ft)	1547.75	Reach Len. (ft)			
Crit W.S. (ft)	1547.23	Flow Area (sq ft)	606.37	109.54	
E.G. Slope (ft/ft)	0.006010	Area (sq ft)	606.37	109.54	
Q Total (cfs)	3140.00	Flow (cfs)	2592.47	547.53	
Top Width (ft)	355.55	Top Width (ft)	333.56	21.99	
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	4.28	5.00	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)	1.82	4.98	
Conv. Total (cfs)	40504.7	Conv. (cfs)	33441.8	7062.9	
Length Wtd. (ft)		Wetted Per. (ft)	334.19	26.08	
Min Ch El (ft)	1541.82	Shear (lb/sq ft)	0.68	1.58	
Alpha	1.01	Stream Power (lb/ft s)	2.91	7.88	
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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9553.29	9988.34	1451.64	431.12	333.09	46.23	1.29	3.37
2	Chan	9988.34	10010.33	496.61	97.99	22.82	15.82	4.46	5.07
3	ROB	10010.33	10056.20	727.82	163.29	46.11	23.18	3.56	4.46
4	ROB	10056.20	10102.07	463.93	108.22	46.43	14.77	2.36	4.29

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

Profile #2

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9553.29   * 9988.34   *  2592.47 *   606.37 *   334.19 *    82.56 *
1.82 *     4.28 *
* 2         * Chan      * 9988.34   * 10010.33  *   547.53 *   109.54 *    26.08 *    17.44 *
4.98 *     5.00 *
*****************************************************************************************
******************
```

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: T4N-R3W-S17
REACH: Reach-1 RS: 2.757

INPUT
Description: Flow rate starting at this cross-section and downstream is 250cfs.
Station Elevation Data num= 132

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9238.38  1637.5 9251.75 1637.55 9275.48 1637.66 9297.84 1637.79 9313.55 1637.89
 9319.22  1637.7 9322.48 1637.95 9323.35 1637.93 9324.48 1637.92 9334.07 1637.92
 9337.85  1637.9 9361.13 1637.61 9375.69  1637.7 9403.33 1637.34 9407.36  1637.2
 9423.52  1636.7 9432.12 1636.44 9448.28    1636  9465.4 1635.57 9466.44 1635.55
 9467.13  1635.5 9468.85 1635.52 9471.26  1635.5 9495.84 1635.35 9516.26 1635.04
 9545.63  1634.4 9555.31  1634.3  9577.6 1634.26 9589.01 1634.26 9593.29 1634.24
 9595.58  1634.2 9601.93 1634.22 9618.17 1634.11 9629.12 1634.19 9636.81 1634.02
 9638.21    1634 9655.41 1633.64 9659.59 1633.58 9666.72 1633.51 9714.84 1633.19
 9750.66  1633.3 9763.71 1633.38 9770.88 1633.27 9799.74 1633.34 9808.54 1633.44
 9817.86  1633.3    9829 1633.33 9833.17 1633.17  9840.5 1633.15  9846.8 1633.11
 9866.24  1632.8 9898.95 1632.79  9915.61632.485 9930.12 1632.22 9938.06 1632.11
 9939.85  1632.1 9942.14  1632.1 9978.25 1632.03 9978.32 1632.03 9993.85    1632
10000.82 1632.0110007.68 1632.01 10012.9 1632.0310019.59  1632.110028.63  1632.2
   100341632.24610034.43 1632.25 10034.81632.247 10037.9 1632.22 10047.9 1632.25
10057.62 1632.2710074.75  1632.310091.13 1632.1910093.11  1632.210102.95 1632.25
 10120.6 1632.4810130.96 1632.4210148.86  1632.510151.61 1632.4810169.36 1632.48
10175.95 1632.62 10177.9 1632.6810180.98  1632.610182.52 1632.6810206.62 1632.66
 10211.8 1632.8810250.36 1633.0210253.93  1632.910261.56 1632.8610272.91 1633.03
10273.63 1633.0410274.33 1633.04 10299.1  1633.310301.05 1633.3110303.52 1633.31
10336.18 1633.4410342.97 1633.5710373.12  1633.810376.03 1633.8810378.69 1633.94
10381.22    163410383.38 1634.0410412.28  1634.610443.11 1634.9810458.26 1635.18
10475.31 1635.4210490.66 1635.6710495.22  1635.7 10498.3 1635.7110504.18 1635.75
10545.25 1635.4610560.62  1635.310566.92 1635.2210589.32 1635.51 10631.2 1635.64
10634.05 1635.6210638.63  1635.610642.78  1635.6 10645.9 1635.5810703.94 1635.06
10716.25 1635.0110759.04  1635.610764.67 1635.55 10766.4 1635.5710809.19 1635.72
10810.36  1635.710848.68 1635.7810892.46 1636.1810996.42 1636.5711013.18  1636.5
11016.42  1636.411026.81 1636.59
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9238.38    .033  9915.6    .055 10120.6    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9930.1210034.43               433  439.95     441              .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)        * 1632.87  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.04  * Wt. n-Val.           *   0.049  *   0.055  *   0.047  *
* W.S. Elev (ft)        * 1632.84  * Reach Len. (ft)      *  433.00  *  439.95  *  441.00  *
* Crit W.S. (ft)        * 1632.56  * Flow Area (sq ft)    *   11.78  *   79.71  *   74.13  *
* E.G. Slope (ft/ft)    *0.005560  * Area (sq ft)         *   11.78  *   79.71  *   74.13  *
* Q Total (cfs)         *  250.00  * Flow (cfs)           *   11.99  *  134.22  *  103.79  *
* Top Width (ft)        *  346.88  * Top Width (ft)        *   66.21  *  104.31  *  176.36  *
* Vel Total (ft/s)      *    1.51  * Avg. Vel. (ft/s)     *    1.02  *    1.68  *    1.40  *
* Max Chl Dpth (ft)     *    0.84  * Hydr. Depth (ft)     *    0.18  *    0.76  *    0.42  *
* Conv. Total (cfs)     *  3352.8  * Conv. (cfs)          *   160.8  *  1800.0  *  1392.0  *
* Length Wtd. (ft)      *  438.99  * Wetted Per. (ft)     *   66.21  *  104.31  *  176.37  *
```

```
* Min Ch El (ft)          * 1632.00  * Shear (lb/sq ft)        *    0.06  *    0.27  *    0.15  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.06  *    0.45  *    0.20  *
* Frctn Loss (ft)         *    3.13  * Cum Volume (acre-ft)    *    7.70  *   19.03  *    5.49  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   18.48  *   23.62  *   18.83  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1633.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1633.13  * Reach Len. (ft)        *  433.00  *  439.95  *  441.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  110.00  *          *
* E.G. Slope (ft/ft)      *0.006743  * Area (sq ft)           *          *  110.00  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *          *  250.00  *          *
* Top Width (ft)          *  104.31  * Top Width (ft)          *          *  104.31  *          *
* Vel Total (ft/s)        *    2.27  * Avg. Vel. (ft/s)        *          *    2.27  *          *
* Max Chl Dpth (ft)       *    1.13  * Hydr. Depth (ft)        *          *    1.05  *          *
* Conv. Total (cfs)       *  3044.5  * Conv. (cfs)             *          *  3044.5  *          *
* Length Wtd. (ft)        *  439.95  * Wetted Per. (ft)        *          *  106.10  *          *
* Min Ch El (ft)          * 1632.00  * Shear (lb/sq ft)        *          *    0.44  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.99  *          *
* Frctn Loss (ft)         *    3.14  * Cum Volume (acre-ft)    *    1.20  *   24.34  *    0.15  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.52  *   23.62  *    0.28  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9584.25   * 9930.12   *    11.99 *    11.78 *    66.21 *     4.80 *
0.18 *     1.02 *
* 2        * Chan      * 9930.12   * 10034.43  *   134.22 *    79.71 *   104.31 *    53.69 *
0.76 *     1.68 *
* 3        * ROB       * 10034.43  * 10530.62  *   103.79 *    74.13 *   176.37 *    41.52 *
0.42 *     1.40 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9930.12   * 10034.43  *   250.00 *   110.00 *   106.10 *   100.00 *
1.05 *     2.27 *
*****************************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-1            RS: 2.673
```

INPUT
Description:
Station Elevation Data num= 149

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9292.95	1635.4	9315.79	1635.15	9363.59	1634.16	9377.59	1634	9380.12	1634
9385.26	1633.95	9390.65	1633.91	9407.82	1633.79	9439.24	1633.3	9473.68	1633.01
9487.18	1632.81	9518.63	1632.25	9524.99	1632.1	9542.39	1632.01	9548.1	1632
9557.4	1631.94	9557.94	1631.94	9577	1631.7	9578.97	1631.69	9580.2	1631.65
9583.09	1631.63	9604.07	1631.2	9620.64	1631	9635.64	1630.94	9660.92	1630.85
9667.15	1630.79	9679.98	1630.65	9725.66	1630.3	9736.45	1630.21	9756.87	1630.03
9759.79	1630	9768.25	1629.93	9769.8	1629.9	9784.85	1629.81	9813.21	1629.66
9825	1629.62	9844.56	1629.39	9859.73	1629.3	9860.9	1629.29	9867.48	1629.17
9904.76	1629.19	9908.28	1629.21	9914.82	1629.2	9949.12	1629.261	9954.04	1629.27
9986.24	1629.06	9995.54	1628.94	10002.48	1628.91	10013.34	1628.81	10058.45	1629.11
100651	629.178	10065.18	1629.18	10073	1629.26	100751	629.281	10077.41	629.306
10078.41	629.316	10079.41	629.32	610079.62	1629.32	810101.37	1629.55	10109.29	1629.6
10129.67	1629.51	0147.77	1629.46	10158.31	1629.51	10161.56	1629.53	610183.27	1629.71
10183.63	1629.75	10187.13	1629.71	0191.26	1629.77	10194.82	1629.81	0197.71	1629.83
10203.99	1630	10219.17	1630.21	0221.47	1630.28	10223.18	1630.25	10226.39	1630.29
10226.78	1630.31	10247.05	1630.41	0254.18	1630.5	10264.7	1630.66	10274.39	1630.76
10276.7	1630.81	0278.41	1630.81	0283.79	1630.77	10292.48	1630.86	10307.01	1630.87
10310.95	1630.94	10324.14	1631	10345.54	1631.27	10363.07	1631.58	10376.14	1631.75
10384.47	1631.85	10397.67	1632	10410.46	1632.19	10412.28	1632.21	10413.27	1632.21
10424.63	1632.13	10428.04	1632.11	0435.32	1632	10441.35	1632	10460.77	1631.96
10492.08	1631.91	0497.43	1631.86	10502.26	1631.82	10508.95	1631.88	10511.15	1631.89
10526.66	1632	10528.76	1631.98	10532.25	1631.96	10536.37	1631.97	10542.48	1631.92
10544.24	1631.91	0547.62	1631.91	0548.04	1631.89	10549.31	1631.88	10555.75	1631.9
10559.3	1631.79	10595.43	1631.47	10604.95	1631.43	10630.33	1631.23	10648.27	1631.2
10708.04	1631.43	10727.4	1631.56	10740.59	1631.66	10747.17	1631.7	10750.05	1631.7
10756.17	1631.75	10760.42	1631.77	10767.31	1631.82	10778.32	1631.92	10790.68	1632.03
10794.39	1632.06	10819.33	1632.42	10851.97	1632.93	10858.9	1633	10863.39	1633.04
10865.01	1633.05	10865.23	1633.05	10872.12	1633.16	10931.36	1633.6	10961.84	1633.96
10963.46	1633.99	10964.65	1633	10965.55	1634.02	10985.31	1634.2	10995.69	1634.33
11004.47	1634.4	11010.83	1634.46	11044.12	1634.3	11049.03	1634.25		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9292.95	.033	9825	.055	10161.56	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9949.12	10065	468	474.47	474	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1629.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.055	0.055	0.054
W.S. Elev (ft)	1629.69	Reach Len. (ft)	468.00	474.47	474.00
Crit W.S. (ft)	1629.48	Flow Area (sq ft)	52.25	76.25	23.23
E.G. Slope (ft/ft)	0.009473	Area (sq ft)	52.25	76.25	23.23
Q Total (cfs)	250.00	Flow (cfs)	75.94	151.67	22.39
Top Width (ft)	372.26	Top Width (ft)	140.99	115.88	115.39
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.45	1.99	0.96
Max Chl Dpth (ft)	0.89	Hydr. Depth (ft)	0.37	0.66	0.20
Conv. Total (cfs)	2568.6	Conv. (cfs)	780.3	1558.3	230.0
Length Wtd. (ft)	471.94	Wetted Per. (ft)	140.99	115.88	115.39
Min Ch El (ft)	1628.80	Shear (lb/sq ft)	0.22	0.39	0.12
Alpha	1.15	Stream Power (lb/ft s)	0.32	0.77	0.11
Frctn Loss (ft)	3.38	Cum Volume (acre-ft)	7.38	18.25	4.99
C & E Loss (ft)	0.01	Cum SA (acres)	17.45	22.51	17.35

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 OUTPUT Profile #2

E.G. Elev (ft)	1630.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.055	
W.S. Elev (ft)	1629.98	Reach Len. (ft)	468.00	474.47	474.00

```
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  110.56  *          *
* E.G. Slope (ft/ft)      *0.007589  * Area (sq ft)           *          *  110.56  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *          *  250.00  *          *
* Top Width (ft)          *  115.88  * Top Width (ft)          *          *  115.88  *          *
* Vel Total (ft/s)        *    2.26  * Avg. Vel. (ft/s)        *          *    2.26  *          *
* Max Chl Dpth (ft)       *    1.18  * Hydr. Depth (ft)        *          *    0.95  *          *
* Conv. Total (cfs)       *  2869.8  * Conv. (cfs)             *          *  2869.8  *          *
* Length Wtd. (ft)        *  474.47  * Wetted Per. (ft)        *          *  117.41  *          *
* Min Ch El (ft)          * 1628.80  * Shear (lb/sq ft)        *          *    0.45  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.01  *          *
* Frctn Loss (ft)         *    3.13  * Cum Volume (acre-ft)    *    1.20  *   23.23  *    0.15  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.52  *   22.51  *    0.28  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9621.04   * 9949.12   *    75.94 *    52.25 *   140.99 *    30.38 *
0.37 *     1.45 *
* 2        * Chan      * 9949.12   * 10065.00  *   151.67 *    76.25 *   115.88 *    60.67 *
0.66 *     1.99 *
* 3        * ROB       * 10065.00  * 10557.02  *    22.39 *    23.23 *   115.39 *     8.95 *
0.20 *     0.96 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9949.12   * 10065.00  *   250.00 *   110.56 *   117.41 *   100.00 *
0.95 *     2.26 *
*****************************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-1            RS: 2.584

INPUT
Description:
Station Elevation Data    num=     119
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9197.77  1632.7 9237.99 1632.27 9240.65 1632.25 9266.47 1632.19 9287.68  1632.2
 9301.59    1632 9301.81    1632 9339.74 1631.56 9350.65 1631.37 9379.67  1630.6
 9382.34 1630.56 9383.26 1630.54 9383.69 1630.52 9406.63    1630  9424.9 1629.57
 9441.73 1629.35 9456.75 1629.23 9484.53 1629.02 9493.39  1628.9 9495.05 1628.88
 9497.14 1628.86 9504.51 1628.71 9536.09    1628 9547.11 1627.78  9583.6 1627.03
  9598.4 1626.77 9601.25  1626.8 9638.52  1627.5 9644.38 1627.84 9651.38 1627.73
 9680.26  1626.9 9720.81  1626.7 9722.17  1626.7 9767.25 1626.51 9800.09 1626.06
  9803.5    1626 9812.15  1625.9  9812.2 1625.86 9834.75 1625.64 9870.61  1625.3
 9873.82 1625.31 9878.38  1625.4  9879.1 1625.44 9901.541625.925 9905.01    1626
```

```
  9905.3 1626.01 9911.46 1626.12 9919.39  1626.1 9944.55    1626 9957.91 1625.96
 9970.62  1625.9  9989.9 1625.7210004.29 1625.7310006.89 1625.7310008.24 1625.74
10009.65  1625.710010.81 1625.7510012.81 1625.7610016.77 1625.7910041.42    1626
10042.15    1626   100511626.092 10052.51626.108   100531626.113   100561626.144
10056.681626.15110066.15 1626.2510081.21 1626.4210094.871626.70510107.09 1626.96
 10113.6  1626.910126.95 1626.45 10157.6 1626.2310187.71 1626.0110190.15    1626
10195.17    162610211.16 1625.9410219.34 1625.8910225.58  1625.810229.45 1625.82
10237.84 1625.7610254.17 1625.8610263.02    162610275.81    162610284.45 1625.86
10290.28    162610294.62 1626.2110296.25  1626.410302.04 1626.5110305.19  1626.6
10316.74 1626.3410337.84 1626.16   10346  1626.210355.58 1626.2410385.25 1626.69
10426.44 1627.4410428.84 1627.51 10430.1  1627.510446.52 1627.4610472.45 1627.59
10482.06 1627.5610521.14 1627.45   10531  1627.410539.72 1627.4710567.72 1627.85
10600.36 1627.9910602.63 1627.9910603.19    162810613.12 1628.1610613.34 1628.16
10614.79 1628.1810635.66 1628.4510653.38  1628.610654.77 1628.6310685.68 1628.87
10695.21  1628.910710.29 1629.1810730.58  1629.510736.33 1629.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9197.77    .033 9812.15    .05510066.15    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9919.39   10051              587  584.74     553              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1626.34  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.054   *   0.055   *   0.033   *
* W.S. Elev (ft)          * 1626.31  * Reach Len. (ft)         *  587.00   *  584.74   *  553.00   *
* Crit W.S. (ft)          * 1626.11  * Flow Area (sq ft)       *   75.42   *   53.28   *   53.33   *
* E.G. Slope (ft/ft)      *0.005616  * Area (sq ft)            *   75.42   *   53.28   *   53.33   *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *  111.91   *   59.02   *   79.07   *
* Top Width (ft)          *  477.17  * Top Width (ft)          *  137.33   *  131.61   *  208.23   *
* Vel Total (ft/s)        *    1.37  * Avg. Vel. (ft/s)        *    1.48   *    1.11   *    1.48   *
* Max Chl Dpth (ft)       *    1.01  * Hydr. Depth (ft)        *    0.55   *    0.40   *    0.26   *
* Conv. Total (cfs)       *  3336.1  * Conv. (cfs)             *  1493.3   *   787.6   *  1055.2   *
* Length Wtd. (ft)        *  578.16  * Wetted Per. (ft)        *  137.36   *  131.61   *  208.25   *
* Min Ch El (ft)          * 1625.70  * Shear (lb/sq ft)        *    0.19   *    0.14   *    0.09   *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.29   *    0.16   *    0.13   *
* Frctn Loss (ft)         *    3.66  * Cum Volume (acre-ft)    *    6.70   *   17.54   *    4.58   *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   15.95   *   21.16   *   15.59   *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1626.92  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *           *   0.055   *           *
* W.S. Elev (ft)          * 1626.86  * Reach Len. (ft)         *  587.00   *  584.74   *  553.00   *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *           *  126.07   *           *
* E.G. Slope (ft/ft)      *0.005794  * Area (sq ft)            *           *  126.07   *           *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *           *  250.00   *           *
* Top Width (ft)          *  131.61  * Top Width (ft)          *           *  131.61   *           *
* Vel Total (ft/s)        *    1.98  * Avg. Vel. (ft/s)        *           *    1.98   *           *
* Max Chl Dpth (ft)       *    1.16  * Hydr. Depth (ft)        *           *    0.96   *           *
* Conv. Total (cfs)       *  3284.3  * Conv. (cfs)             *           *  3284.3   *           *
* Length Wtd. (ft)        *  584.74  * Wetted Per. (ft)        *           *  133.14   *           *
* Min Ch El (ft)          * 1625.70  * Shear (lb/sq ft)        *           *    0.34   *           *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *           *    0.68   *           *
* Frctn Loss (ft)         *    4.01  * Cum Volume (acre-ft)    *    1.20   *   21.94   *    0.15   *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.52   *   21.16   *    0.28   *
*****************************************************************************************

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.

  Profile #1
```

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9558.58   * 9919.39   *   111.91 *    75.42 *   137.36 *    44.76 *
0.55 *     1.48 *
* 2        * Chan      * 9919.39   * 10051.00  *    59.02 *    53.28 *   131.61 *    23.61 *
0.40 *     1.11 *
* 3        * ROB       * 10051.00  * 10393.67  *    79.07 *    53.33 *   208.25 *    31.63 *
0.26 *     1.48 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9919.39   * 10051.00  *   250.00 *   126.07 *   133.14 *   100.00 *
0.96 *     1.98 *
*****************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-1            RS: 2.473

INPUT
Description:
Station Elevation Data    num=      93
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9393.24    1626 9395.72 1625.95 9412.24 1625.68 9423.93  1625.5 9453.83    1625
 9465.54 1624.64 9505.88 1624.26 9520.77 1624.07 9521.34 1624.06 9521.58  1624.1
 9522.11 1624.05 9526.45    1624 9553.09 1623.78 9566.07  1623.7 9571.46 1623.61
 9574.63 1623.61 9577.38 1623.59 9601.05  1623.5  9632.1 1623.19 9649.15 1622.85
 9661.15 1622.76 9721.63  1622.4 9728.72 1622.38 9740.04  1622.3 9760.81 1622.12
 9768.47 1622.06 9771.82    1622 9776.861621.952 9777.09 1621.95 9777.36 1622.01
  9782.8 1622.02 9820.83 1622.37 9822.81  1622.4 9854.81 1622.39 9869.62 1622.33
 9890.77 1622.38 9921.65 1622.49 9931.37  1622.3 9973.28 1622.27  9988.6  1622.2
 9989.16 1622.16 9991.87 1622.06 9993.18    1622 9994.61 1621.93 9999.53 1621.67
10003.75 1621.8610003.95  1621.910005.59    162210007.15  1622.110007.82 1622.12
10008.59 1622.1410008.69 1622.1410022.28  1622.210025.85 1622.2310027.54 1622.26
10028.01 1622.2410032.23 1622.2410039.09  1622.210070.31 1622.1710077.12 1622.16
10077.38 1622.1610081.33 1622.1710087.62  1622.210123.011622.24410135.39 1622.26
   10137 1622.2610137.44 1622.26   101391622.266   101421622.277   101451622.288
   101481622.299 10188.1 1622.4510190.06  1622.410191.46 1622.4410203.42 1622.38
10227.84 1622.3210236.65 1622.1810252.71  1622.4 10293.8 1623.0310343.43 1622.96
 10346.3 1622.9910349.83 1623.0110381.16  1623.510412.48 1623.8310439.61    1624
10440.92    162410442.34 1624.0210465.62 1624.1610533.64 1624.9110550.04  1625.1
   10564 1625.1910581.98 1625.4210590.68 1625.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9393.24    .033 9721.63    .05510252.71    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
        9931.3710135.39                397  432.26     442              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1622.67  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.               *   0.054  *   0.055  *   0.054  *
* W.S. Elev (ft)          * 1622.65  * Reach Len. (ft)          *  397.00  *  432.26  *  442.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *   78.09  *   91.94  *   37.61  *
* E.G. Slope (ft/ft)      *0.007186  * Area (sq ft)             *   78.09  *   91.94  *   37.61  *
* Q Total (cfs)           *  250.00  * Flow (cfs)               *   87.51  *  123.75  *   38.74  *
* Top Width (ft)          *  588.59  * Top Width (ft)           *  251.17  *  204.02  *  133.40  *
* Vel Total (ft/s)        *    1.20  * Avg. Vel. (ft/s)         *    1.12  *    1.35  *    1.03  *
* Max Chl Dpth (ft)       *    0.98  * Hydr. Depth (ft)         *    0.31  *    0.45  *    0.28  *
* Conv. Total (cfs)       *  2949.1  * Conv. (cfs)              *  1032.3  *  1459.8  *   457.0  *
* Length Wtd. (ft)        *  418.41  * Wetted Per. (ft)         *  251.18  *  204.05  *  133.41  *
* Min Ch El (ft)          * 1621.67  * Shear (lb/sq ft)         *    0.14  *    0.20  *    0.13  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)    *    0.16  *    0.27  *    0.13  *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)      *    5.66  *   16.57  *    4.00  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *   13.33  *   18.91  *   13.43  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1622.91  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.               *          *   0.055  *          *
* W.S. Elev (ft)          * 1622.86  * Reach Len. (ft)          *  397.00  *  432.26  *  442.00  *
* Crit W.S. (ft)          * 1622.57  * Flow Area (sq ft)        *          *  134.87  *          *
* E.G. Slope (ft/ft)      *0.008237  * Area (sq ft)             *          *  134.87  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)               *          *  250.00  *          *
* Top Width (ft)          *  204.02  * Top Width (ft)           *          *  204.02  *          *
* Vel Total (ft/s)        *    1.85  * Avg. Vel. (ft/s)         *          *    1.85  *          *
* Max Chl Dpth (ft)       *    1.19  * Hydr. Depth (ft)         *          *    0.66  *          *
* Conv. Total (cfs)       *  2754.6  * Conv. (cfs)              *          *  2754.6  *          *
* Length Wtd. (ft)        *  428.70  * Wetted Per. (ft)         *          *  205.20  *          *
* Min Ch El (ft)          * 1621.67  * Shear (lb/sq ft)         *          *    0.34  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *    0.63  *          *
* Frctn Loss (ft)         *    2.85  * Cum Volume (acre-ft)      *    1.20  *   20.19  *    0.15  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *    0.52  *   18.91  *    0.28  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9662.31   * 9931.37   *    87.51 *    78.09 *   251.18 *    35.00 *
0.31 *     1.12 *
* 2        * Chan      * 9931.37   * 10135.39  *   123.75 *    91.94 *   204.05 *    49.50 *
0.45 *     1.35 *
* 3        * ROB       * 10135.39  * 10363.04  *    38.74 *    37.61 *   133.41 *    15.50 *
0.28 *     1.03 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*          *          * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan     * 9931.37   * 10135.39  *   250.00 *   134.87 *   205.20 *   100.00 *
0.66 *     1.85 *
*****************************************************************************************
******************
```

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.

CROSS SECTION

RIVER: T4N-R3W-S17
REACH: Reach-1 RS: 2.391

INPUT
Description:
Station Elevation Data num= 121

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9174.06  1624.3 9195.06    1624 9196.59 1623.98 9207.39 1623.83 9237.47 1623.44
 9260.18  1623.2 9291.01 1622.72  9301.1 1622.76 9327.32 1622.61 9349.27  1622.6
 9353.53 1622.56 9357.11 1622.54 9363.51 1622.48 9375.09 1622.39 9413.44  1622.1
 9413.71 1622.07 9418.21    1622 9451.93 1621.39 9454.67  1621.4 9461.47 1621.42
 9498.11 1621.49 9523.16 1621.51 9541.76 1621.53 9580.35  1621.1 9595.99 1621.07
 9597.99 1621.39    9642 1620.89 9660.18 1620.45  9669.8  1620.3  9679.1 1620.26
 9698.37 1620.12 9712.74    1620 9718.41 1619.96 9727.81  1619.9 9728.22 1619.87
 9755.18 1619.77 9762.03 1619.73    9780 1619.56 9785.21  1619.5 9787.981619.449
 9790.67  1619.4 9827.76 1619.03 9853.22 1619.17  9878.3 1619.32 9895.68 1619.32
 9927.95  1619.3 9948.07 1619.31 9966.14 1619.19 9974.32 1619.17 9984.26 1619.17
10018.68  1619.310039.64 1619.1410058.31  1619.2   10060 1619.22 10066.11619.292
 10066.71619.299   100671619.302   100681619.314   100851619.516 10085.81619.525
10085.941619.527 10100.6  1619.710105.88 1619.7510108.08  1619.7 10133.61619.704
10175.18 1619.7110192.21  1619.6 10234.6 1619.69 10255.8  1619.810259.45  1619.8
10262.62 1619.8110268.36 1619.82 10286.9 1619.97 10290.4    162010322.02 1620.29
10338.88 1620.4410351.18 1620.4510377.81 1620.4410387.25  1620.410392.84 1620.49
 10436.7 1620.9410464.67  1620.910478.04 1620.8610490.42  1621.110528.91  1621.9
10531.42 1621.95 10532.3 1621.9810533.71    162210536.55  1622.110558.71 1622.18
10585.45 1622.7210605.92 1622.7810650.99 1622.7610681.06  1622.810695.92 1622.74
10718.72 1622.7110748.27 1622.85 10769.8 1623.0710779.34    162310793.86  1623.2
10819.82 1623.2510842.53 1623.4210865.95 1623.33 10868.5  1623.410878.82  1623.7
10890.04    162410892.44 1624.0710897.32  1624.210900.07  1624.210902.15 1624.25
10904.41 1624.2110907.93 1624.1210911.63    1624 10913.4  1623.910919.79 1623.62
10927.74  1623.510940.59 1623.8610946.59    162410952.89  1624.110969.65 1624.54
10992.83 1624.37
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9174.06    .033    9780    .055   10060    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.07   10067              475  490.07     499             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1619.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.055  *   0.053  *   0.033  *
* W.S. Elev (ft)         * 1619.78  * Reach Len. (ft)         *  475.00  *  490.07  *  499.00  *
* Crit W.S. (ft)         * 1619.52  * Flow Area (sq ft)       *   90.02  *   66.94  *   23.31  *
* E.G. Slope (ft/ft)     *0.006543  * Area (sq ft)            *   90.02  *   66.94  *   23.31  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *  125.49  *  103.16  *   21.35  *
* Top Width (ft)         *  499.13  * Top Width (ft)          *  195.39  *  118.93  *  184.80  *
* Vel Total (ft/s)       *    1.39  * Avg. Vel. (ft/s)        *    1.39  *    1.54  *    0.92  *
* Max Chl Dpth (ft)      *    0.75  * Hydr. Depth (ft)        *    0.46  *    0.56  *    0.13  *
* Conv. Total (cfs)      *  3090.7  * Conv. (cfs)             *  1551.4  *  1275.3  *   263.9  *
* Length Wtd. (ft)       *  486.05  * Wetted Per. (ft)        *  195.40  *  118.93  *  184.81  *
* Min Ch El (ft)         * 1619.14  * Shear (lb/sq ft)        *    0.19  *    0.23  *    0.05  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)  *    0.26  *    0.35  *    0.05  *
* Frctn Loss (ft)        *    3.20  * Cum Volume (acre-ft)    *    4.90  *   15.78  *    3.69  *
```

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *   11.30  *   17.30  *   11.81  *
*****************************************************************************************
```

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.

CROSS SECTION OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)         * 1620.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.055  *   0.053  *   0.033  *
* W.S. Elev (ft)         * 1620.01  * Reach Len. (ft)         *  475.00  *  490.07  *  499.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   36.74  *   94.31  *   10.81  *
* E.G. Slope (ft/ft)     *0.005478  * Area (sq ft)            *   36.74  *   94.31  *   10.81  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   57.49  *  167.34  *   25.17  *
* Top Width (ft)         *  189.32  * Top Width (ft)          *   52.39  *  118.93  *   18.00  *
* Vel Total (ft/s)       *    1.76  * Avg. Vel. (ft/s)         *    1.56  *    1.77  *    2.33  *
* Max Chl Dpth (ft)      *    0.87  * Hydr. Depth (ft)         *    0.70  *    0.79  *    0.60  *
* Conv. Total (cfs)      *  3377.6  * Conv. (cfs)              *   776.7  *  2260.8  *   340.1  *
* Length Wtd. (ft)       *  488.79  * Wetted Per. (ft)         *   53.08  *  118.93  *   18.49  *
* Min Ch El (ft)         * 1619.14  * Shear (lb/sq ft)         *    0.24  *    0.27  *    0.20  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)   *    0.37  *    0.48  *    0.47  *
* Frctn Loss (ft)        *    3.39  * Cum Volume (acre-ft)     *    1.04  *   19.05  *    0.10  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *    0.29  *   17.30  *    0.18  *
*****************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9561.06   * 9948.07   *   125.49 *    90.02 *   195.40 *    50.20 *
0.46 *     1.39 *
* 2        * Chan      * 9948.07   * 10067.00  *   103.16 *    66.94 *   118.93 *    41.26 *
0.56 *     1.54 *
* 3        * ROB       * 10067.00  * 10529.92  *    21.35 *    23.31 *   184.81 *     8.54 *
0.13 *     0.92 *
*****************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9561.06   * 9948.07   *    57.49 *    36.74 *    53.08 *    23.00 *
0.70 *     1.56 *
* 2        * Chan      * 9948.07   * 10067.00  *   167.34 *    94.31 *   118.93 *    66.93 *
0.79 *     1.77 *
* 3        * ROB       * 10067.00  * 10529.92  *    25.17 *    10.81 *    18.49 *    10.07 *
0.60 *     2.33 *
*****************************************************************************************
******************
```

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: T4N-R3W-S17
REACH: Reach-1 RS: 2.298

```
INPUT
Description:
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9229.2  1622.2 9233.63 1622.07 9236.47 1622.01 9236.78    1622 9237.43    1622
 9251.82  1621.9 9280.75 1621.73 9310.91 1621.78 9325.93 1621.92 9335.17  1621.7
 9370.41  1620.5 9392.64 1620.01 9392.92    1620 9393.11    1620  9401.6 1619.83
 9420.61  1619.5 9449.06 1618.76 9449.33 1618.75 9449.87 1618.75 9480.31  1618.9
 9495.38 1618.61 9504.23 1618.48  9533.7 1618.07 9534.56 1618.06 9534.78  1618.1
 9535.17 1618.05 9540.43 1617.99 9547.76 1617.93  9590.6 1617.56 9614.76  1617.4
 9618.88 1617.43 9625.14  1617.4 9652.78 1617.45 9664.28  1617.2 9674.65  1616.9
 9703.48 1617.01 9754.29    1617  9773.5  1616.8 9805.86 1616.39    9850  1616.5
  9861.8 1616.53 9875.17 1616.35 9932.69  1616.3    99481616.249    99501616.242
 9950.53 1616.24    99521616.229    99541616.214 9959.74 1616.17 9990.38 1616.09
 9992.57 1616.0810012.51  1616.110020.98  1616.110059.42 1616.19 10062.5 1616.19
 10065.4 1616.1810066.44  1616.210068.39 1616.1710072.55 1616.14 10093.7    1616
10115.88 1615.8410133.06  1615.710155.63 1615.8610174.58    161610188.22 1616.07
10196.63 1616.1110197.53 1616.1210204.68  1616.210242.31 1616.43 10248.5 1616.47
10254.51 1616.4710268.56 1616.5110318.29  1616.510354.22 1616.6110365.58 1616.57
10417.93 1616.9910431.56  1616.910467.12 1616.9610521.35 1617.35 10528.7 1617.43
10529.32 1617.3910532.43  1617.410600.71  1617.510610.62 1617.6310615.15 1617.66
10617.93 1617.67 10620.4  1617.7 10622.5 1617.7110624.53 1617.7310642.03    1618
10645.76  1618.110668.73 1618.4110691.79 1618.6510718.12 1618.8610771.59 1619.71
 10782.4  1619.910787.19 1619.9310793.19    1620 10816.5 1620.3510826.73 1620.46
10865.03  1621.110881.84 1621.39 10903.3 1621.75 10911.2 1621.8210925.07 1621.83
10930.72  1621.910934.12 1621.8910938.13  1621.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9229.2    .033  9861.8    .05510242.31    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7410197.53              447   437.2     415             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1616.62  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.050  *   0.055  *   0.049  *
* W.S. Elev (ft)         * 1616.59  * Reach Len. (ft)         *  447.00  *  437.20  *  415.00  *
* Crit W.S. (ft)         * 1616.37  * Flow Area (sq ft)       *   34.61  *  133.74  *   21.35  *
* E.G. Slope (ft/ft)     *0.006625  * Area (sq ft)            *   34.61  *  133.74  *   21.35  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   31.32  *  200.38  *   18.30  *
* Top Width (ft)         *  562.20  * Top Width (ft)          *  169.31  *  237.79  *  155.09  *
* Vel Total (ft/s)       *    1.32  * Avg. Vel. (ft/s)        *    0.90  *    1.50  *    0.86  *
* Max Chl Dpth (ft)      *    0.89  * Hydr. Depth (ft)        *    0.20  *    0.56  *    0.14  *
* Conv. Total (cfs)      *  3071.4  * Conv. (cfs)             *   384.8  *  2461.8  *   224.8  *
* Length Wtd. (ft)       *  437.39  * Wetted Per. (ft)        *  169.32  *  237.79  *  155.10  *
* Min Ch El (ft)         * 1615.70  * Shear (lb/sq ft)        *    0.08  *    0.23  *    0.06  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)  *    0.08  *    0.35  *    0.05  *
* Frctn Loss (ft)        *    2.64  * Cum Volume (acre-ft)    *    4.22  *   14.65  *    3.43  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    9.31  *   15.30  *    9.86  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1616.66  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1616.61  * Reach Len. (ft)         *  447.00  *  437.20  *  415.00  *
* Crit W.S. (ft)         * 1616.35  * Flow Area (sq ft)       *          *  139.11  *          *
* E.G. Slope (ft/ft)     *0.009091  * Area (sq ft)            *          *  139.11  *          *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *          *  250.00  *          *
* Top Width (ft)         *  237.79  * Top Width (ft)          *          *  237.79  *          *
* Vel Total (ft/s)       *    1.80  * Avg. Vel. (ft/s)        *          *    1.80  *          *
* Max Chl Dpth (ft)      *    0.91  * Hydr. Depth (ft)        *          *    0.59  *          *
```

```
* Conv. Total (cfs)      *  2622.0  * Conv. (cfs)              *          *  2622.0  *          *
* Length Wtd. (ft)       *  437.20  * Wetted Per. (ft)         *          *  238.72  *          *
* Min Ch El (ft)         * 1615.70  * Shear (lb/sq ft)         *          *    0.33  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    0.59  *          *
* Frctn Loss (ft)        *    2.52  * Cum Volume (acre-ft)     *    0.84  *   17.74  *    0.04  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *          *   15.30  *    0.08  *
*******************************************************************************************

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.

  Profile #1
*******************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9594.47   * 9959.74   *    31.32 *    34.61 *   169.32 *    12.53 *
0.20 *     0.90 *
* 2         * Chan      * 9959.74   * 10197.53  *   200.38 *   133.74 *   237.79 *    80.15 *
0.56 *     1.50 *
* 3         * ROB       * 10197.53  * 10567.83  *    18.30 *    21.35 *   155.10 *     7.32 *
0.14 *     0.86 *
*******************************************************************************************
******************

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.

  Profile #2
*******************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9959.74   * 10197.53  *   250.00 *   139.11 *   238.72 *   100.00 *
0.59 *     1.80 *
*******************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S17
REACH: Reach-1            RS: 2.215

INPUT
Description: Interpolated point added at (10182.16, 1613.492) to set bank
             station
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9257.1  1618.9 9259.66 1618.85 9283.19 1618.78 9295.74  1618.8 9324.85 1618.34
 9332.99  1618.2 9344.46 1618.14 9344.65 1618.11  9350.1    1618 9352.81 1617.94
 9400.62  1617.6 9457.25 1616.51 9462.58 1616.43 9466.07 1616.41 9516.06 1616.29
 9524.43  1616.2 9543.01 1616.03 9593.84 1615.53  9618.6  1615.2 9628.06 1615.16
 9636.04 1615.05 9671.76 1614.66  9704.6 1614.53 9739.37  1614.4 9746.49  1614.3
 9751.79 1614.28 9767.03 1614.17 9775.41 1614.19  9823.1    1614  9827.5 1613.98
 9843.221613.925 9873.86 1613.82 9875.66  1613.8 9882.53  1613.7 9912.08 1613.43
 9917.89  1613.4 9944.16 1613.44 9963.18 1613.49 9971.65  1613.4 9979.74 1613.38
10012.63 1613.1810026.66  1613.210041.94 1613.4210048.77  1613.310068.17 1613.29
```

```
10092.77 1613.3910115.37 1613.2810151.45 1613.2610153.68  1613.310155.71 1613.28
10167.54 1613.3710182.161613.492   102021613.658 10202.3 1613.66 10215.2 1613.82
10237.41  1613.910241.94 1613.8910288.97 1613.9410290.06 1613.9410301.68 1613.94
10321.36 1613.9710324.57    161410382.47 1613.9810390.43 1613.9810419.74 1613.99
10420.38    161410423.45 1613.9910430.08 1614.0310449.62  1614.110465.91 1614.24
10496.31 1614.5210513.52 1614.7110528.78 1614.7310557.46  1614.610579.51 1614.62
10593.58 1614.6110610.32 1614.94 10664.4 1615.49 10675.4  1615.610699.99 1615.87
10707.25 1615.9210713.37  1615.910740.92  1615.910746.27 1615.9610750.38    1616
10754.64 1616.0310787.23 1616.3810793.59  1616.4 10841.7 1617.0810878.34 1617.72
10887.69 1617.8710904.73    161810905.28    161810929.94 1618.1810931.68  1618.2
10947.97  1618.410966.06 1618.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9257.1    .033 9843.22    .05510237.41    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.1810182.16               466  480.01     457             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1613.97  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.055  *   0.055  *   0.054  *
* W.S. Elev (ft)          * 1613.94  * Reach Len. (ft)        *  466.00  *  480.01  *  457.00  *
* Crit W.S. (ft)          * 1613.64  * Flow Area (sq ft)      *   40.54  *  137.20  *   13.13  *
* E.G. Slope (ft/ft)      *0.005529  * Area (sq ft)           *   40.54  *  137.20  *   13.13  *
* Q Total (cfs)           *  250.00  * Flow (cfs)             *   39.45  *  201.81  *    8.74  *
* Top Width (ft)          *  463.30  * Top Width (ft)         *  124.40  *  218.98  *  119.92  *
* Vel Total (ft/s)        *    1.31  * Avg. Vel. (ft/s)       *    0.97  *    1.47  *    0.67  *
* Max Chl Dpth (ft)       *    0.76  * Hydr. Depth (ft)       *    0.33  *    0.63  *    0.11  *
* Conv. Total (cfs)       *  3362.3  * Conv. (cfs)            *   530.6  *  2714.2  *   117.5  *
* Length Wtd. (ft)        *  476.13  * Wetted Per. (ft)       *  124.40  *  218.99  *  119.92  *
* Min Ch El (ft)          * 1613.18  * Shear (lb/sq ft)       *    0.11  *    0.22  *    0.04  *
* Alpha                   *    1.11  * Stream Power (lb/ft s) *    0.11  *    0.32  *    0.03  *
* Frctn Loss (ft)         *    2.98  * Cum Volume (acre-ft)   *    3.83  *   13.29  *    3.27  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    7.80  *   13.00  *    8.55  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1614.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1614.10  * Reach Len. (ft)        *  466.00  *  480.01  *  457.00  *
* Crit W.S. (ft)          * 1613.66  * Flow Area (sq ft)      *          *  172.52  *          *
* E.G. Slope (ft/ft)      *0.003984  * Area (sq ft)           *          *  172.52  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)             *          *  250.00  *          *
* Top Width (ft)          *  218.98  * Top Width (ft)         *          *  218.98  *          *
* Vel Total (ft/s)        *    1.45  * Avg. Vel. (ft/s)       *          *    1.45  *          *
* Max Chl Dpth (ft)       *    0.92  * Hydr. Depth (ft)       *          *    0.79  *          *
* Conv. Total (cfs)       *  3960.9  * Conv. (cfs)            *          *  3960.9  *          *
* Length Wtd. (ft)        *  479.73  * Wetted Per. (ft)       *          *  220.21  *          *
* Min Ch El (ft)          * 1613.18  * Shear (lb/sq ft)       *          *    0.19  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.28  *          *
* Frctn Loss (ft)         *    3.10  * Cum Volume (acre-ft)   *    0.84  *   16.17  *    0.04  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *          *   13.00  *    0.08  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9610.14   * 9963.18   *    39.45 *    40.54 *   124.40 *    15.78 *
0.33 *     0.97 *
* 2         * Chan      * 9963.18   * 10182.16  *   201.81 *   137.20 *   218.99 *    80.72 *
0.63 *     1.47 *
* 3         * ROB       * 10182.16  * 10574.11  *     8.74 *    13.13 *   119.92 *     3.50 *
0.11 *     0.67 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9963.18   * 10182.16  *   250.00 *   172.52 *   220.21 *   100.00 *
0.79 *     1.45 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-1            RS: 2.124

INPUT
Description:
Station Elevation Data    num=     113
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9197.9  1616.9 9230.66 1616.35 9263.64 1616.18 9264.22 1616.17 9267.33 1616.14
 9273.61  1616.1 9285.75    1616 9312.11 1615.77 9315.69 1615.74 9316.16  1615.7
 9362.94 1615.25 9375.56 1615.14 9376.54 1615.13 9376.71 1615.13 9394.47    1615
 9406.67  1614.8 9418.51 1614.68 9449.66 1614.43 9463.61 1614.16 9470.78    1614
 9485.87 1613.79 9488.74 1613.74 9502.12  1613.6 9519.04 1613.44 9521.46  1613.4
 9524.04 1613.39 9525.71 1613.38 9530.98 1613.34 9544.99 1613.19 9580.35    1613
  9609.6 1612.85 9619.73 1612.72 9624.56 1612.68 9628.03 1612.64 9632.41  1612.6
 9670.27 1612.24 9671.45 1612.23 9672.62 1612.21 9683.59    1612 9698.84 1611.72
 9699.15 1611.72 9699.34 1611.71 9699.47 1611.71 9699.57  1611.7 9700.93  1611.7
 9743.52 1611.57 9774.05 1611.31 9794.82 1611.32 9848.55    1611 9853.31 1610.95
 9856.77 1610.92 9869.891610.814 9895.02 1610.61  9917.8  1610.5 9937.45  1610.4
 9961.23  1610.2 9967.02 1610.13 9979.52    1610 9988.61 1609.92 9992.31  1609.9
 9995.61 1609.83 9997.76 1609.5610000.96 1609.3910003.94 1609.1310010.01  1609.9
10010.79    161010011.01 1610.0310011.48  1610.1 10012.6 1610.2210042.04  1610.4
10051.37 1610.4110057.09 1610.47 10138.9 1610.7510138.92 1610.7510138.92  1610.7
 10193.3 1610.9310273.24 1611.18 10278.81611.18410304.27  1611.210315.04 1611.19
10330.53  1611.210398.68  1611.510426.02 1611.4810449.19 1611.5610461.76 1611.64
10467.34  1611.6 10509.9 1611.9510515.12    161210520.74 1612.0510556.16  1612.3
10629.07  1612.810744.61    161410768.07 1614.2810813.11  1614.5 10844.7 1614.74
10861.09 1614.8810873.29 1614.9910931.04 1615.9110943.66    161610944.18    1616
10969.95 1616.28 10971.4  1616.310971.99  1616.310972.57 1616.3210972.76 1616.32
10977.08 1616.3911027.76  1617.111085.74 1617.8511095.46 1617.8611126.61 1617.77
11131.52  1617.811136.49  1617.811143.45 1617.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
  9197.9    .033 9895.02    .055 10138.9    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.4510057.09              547  505.23     406             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1610.98  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.050  *   0.055  *   0.051  *
* W.S. Elev (ft)         * 1610.93  * Reach Len. (ft)         *  547.00  *  505.23  *  406.00  *
* Crit W.S. (ft)         * 1610.67  * Flow Area (sq ft)       *   24.14  *   95.18  *   32.20  *
* E.G. Slope (ft/ft)     *0.007161  * Area (sq ft)            *   24.14  *   95.18  *   32.20  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   30.00  *  186.73  *   33.27  *
* Top Width (ft)         *  337.04  * Top Width (ft)          *   81.63  *  119.64  *  135.78  *
* Vel Total (ft/s)       *    1.65  * Avg. Vel. (ft/s)        *    1.24  *    1.96  *    1.03  *
* Max Chl Dpth (ft)      *    1.80  * Hydr. Depth (ft)        *    0.30  *    0.80  *    0.24  *
* Conv. Total (cfs)      *  2954.2  * Conv. (cfs)             *   354.6  *  2206.5  *   393.1  *
* Length Wtd. (ft)       *  494.85  * Wetted Per. (ft)        *   81.63  *  119.75  *  135.83  *
* Min Ch El (ft)         * 1609.13  * Shear (lb/sq ft)        *    0.13  *    0.36  *    0.11  *
* Alpha                  *    1.18  * Stream Power (lb/ft s)  *    0.16  *    0.70  *    0.11  *
* Frctn Loss (ft)        *    2.34  * Cum Volume (acre-ft)    *    3.49  *   12.01  *    3.03  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    6.70  *   11.14  *    7.21  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1611.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *          *   0.055  *   0.055  *
* W.S. Elev (ft)         * 1610.93  * Reach Len. (ft)         *  547.00  *  505.23  *  406.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *   95.18  *    3.62  *
* E.G. Slope (ft/ft)     *0.012290  * Area (sq ft)            *          *   95.18  *    3.62  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *          *  243.90  *    6.10  *
* Top Width (ft)         *  127.79  * Top Width (ft)          *          *  119.64  *    8.15  *
* Vel Total (ft/s)       *    2.53  * Avg. Vel. (ft/s)        *          *    2.56  *    1.69  *
* Max Chl Dpth (ft)      *    1.80  * Hydr. Depth (ft)        *          *    0.80  *    0.44  *
* Conv. Total (cfs)      *  2255.1  * Conv. (cfs)             *          *  2200.1  *    55.0  *
* Length Wtd. (ft)       *  504.34  * Wetted Per. (ft)        *          *  120.27  *    8.58  *
* Min Ch El (ft)         * 1609.13  * Shear (lb/sq ft)        *          *    0.61  *    0.32  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *          *    1.56  *    0.55  *
* Frctn Loss (ft)        *    2.10  * Cum Volume (acre-ft)    *    0.84  *   14.70  *    0.02  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *          *   11.14  *    0.04  *
*****************************************************************************************

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 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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9567.68   * 9937.45   *    30.00 *    24.14 *    81.63 *    12.00 *
0.30 *     1.24 *
* 2        * Chan      * 9937.45   * 10057.09  *   186.73 *    95.18 *   119.75 *    74.69 *
0.80 *     1.96 *
* 3        * ROB       * 10057.09  * 10600.27  *    33.27 *    32.20 *   135.83 *    13.31 *
0.24 *     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.
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.
```

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9937.45   * 10057.09  *   243.90 *    95.18 *   120.27 *    97.56 *
0.80 *     2.56 *
* 2         * ROB       * 10057.09  * 10600.27  *     6.10 *     3.62 *     8.58 *     2.44 *
0.44 *     1.69 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-1            RS: 2.029

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 430cfs.
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9439.94  1612.7 9444.46 1612.68 9472.02 1612.36 9509.28 1611.94 9558.28 1611.38
 9595.22 1611.02 9622.57 1610.73 9656.09  1610.3 9659.23 1610.19 9663.65 1610.13
 9684.16    1610 9691.79    1610    9702 1609.89 9746.26 1609.56 9768.25 1609.08
 9776.05 1609.03 9784.36    1609 9787.82 1609.03 9795.91 1608.96 9840.72 1608.48
 9887.98 1608.12 9892.97  1608.1 9899.01 1608.05 9909.15    1608 9910.04    1608
 9917.45    1608 9923.37 1607.94 9954.63 1607.81  9962.8 1607.77 9967.45 1607.75
 9973.36  1607.7 9977.31 1607.12 9979.73 1607.72 9983.88 1607.77 9986.75 1607.81
 9990.46  1607.8 9992.09 1607.76 9993.43 1607.6910004.88 1607.7110005.48 1607.71
10005.83  1607.7   10006 1607.7210047.91 1607.6710067.41 1607.7310076.11 1607.73
10098.44  1607.810101.25 1607.7610103.56 1607.7610108.75 1607.7510129.14 1607.67
10176.53  1607.9 10180.8 1607.8910187.88 1607.8810212.88 1607.9710223.23    1608
10237.78  1608.110247.43 1608.2210249.29 1608.2310260.07 1608.3210273.67 1608.34
10314.551608.51410381.78  1608.810395.03 1608.9510407.92 1609.0310472.35 1609.18
10497.64 1609.3510541.83  1609.9 10552.2    161010564.61 1610.0810617.75 1610.47
10657.94 1610.8210664.22  1610.910697.88 1611.1410772.41 1611.9110779.52    1612
10809.33  1612.510809.42  1612.510875.45  1613.310900.24 1613.4410904.73  1613.5
10909.05 1613.5910909.24  1613.610926.43 1614.0210936.04 1614.2710940.41 1614.38
11007.85  1615.311031.79 1615.7211051.59    161611063.19 1616.21 11137.1 1617.09
11149.04  1617.1 11189.9 1617.2311203.78 1617.1611208.19 1617.1511214.89 1617.16
11232.39  1617.211238.04  1617.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9439.94    .033 9840.72    .05510273.67    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9923.3710176.53               474  558.16     490            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1608.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.055  *   0.055  *   0.053  *
* W.S. Elev (ft)         * 1608.61  * Reach Len. (ft)         *  474.00  *  558.16  *  490.00  *
* Crit W.S. (ft)         * 1608.19  * Flow Area (sq ft)       *   36.08  *  218.51  *   61.18  *
* E.G. Slope (ft/ft)     *0.003838  * Area (sq ft)            *   36.08  *  218.51  *   61.18  *
* Q Total (cfs)          *  430.00  * Flow (cfs)              *   33.83  *  331.43  *   64.74  *
* Top Width (ft)         *  508.96  * Top Width (ft)          *   94.91  *  253.16  *  160.89  *
* Vel Total (ft/s)       *    1.36  * Avg. Vel. (ft/s)        *    0.94  *    1.52  *    1.06  *
```

* Max Chl Dpth (ft)	*	1.49	* Hydr. Depth (ft)	*	0.38	*	0.86	*	0.38	*
* Conv. Total (cfs)	*	6940.9	* Conv. (cfs)	*	546.0	*	5349.9	*	1045.0	*
* Length Wtd. (ft)	*	526.81	* Wetted Per. (ft)	*	94.92	*	253.28	*	160.89	*
* Min Ch El (ft)	*	1607.12	* Shear (lb/sq ft)	*	0.09	*	0.21	*	0.09	*
* Alpha	*	1.08	* Stream Power (lb/ft s)	*	0.09	*	0.31	*	0.10	*
* Frctn Loss (ft)	*	2.58	* Cum Volume (acre-ft)	*	3.11	*	10.19	*	2.60	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	5.59	*	8.98	*	5.83	*

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 OUTPUT Profile #2

* E.G. Elev (ft)	*	1608.91	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.04	* Wt. n-Val.	*		*	0.055	*		*
* W.S. Elev (ft)	*	1608.87	* Reach Len. (ft)	*	474.00	*	558.16	*	490.00	*
* Crit W.S. (ft)	*	1608.21	* Flow Area (sq ft)	*		*	284.83	*		*
* E.G. Slope (ft/ft)	*	0.002697	* Area (sq ft)	*		*	284.83	*		*
* Q Total (cfs)	*	430.00	* Flow (cfs)	*		*	430.00	*		*
* Top Width (ft)	*	253.16	* Top Width (ft)	*		*	253.16	*		*
* Vel Total (ft/s)	*	1.51	* Avg. Vel. (ft/s)	*		*	1.51	*		*
* Max Chl Dpth (ft)	*	1.75	* Hydr. Depth (ft)	*		*	1.13	*		*
* Conv. Total (cfs)	*	8279.9	* Conv. (cfs)	*		*	8279.9	*		*
* Length Wtd. (ft)	*	558.16	* Wetted Per. (ft)	*		*	255.19	*		*
* Min Ch El (ft)	*	1607.12	* Shear (lb/sq ft)	*		*	0.19	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	0.28	*		*
* Frctn Loss (ft)	*	2.20	* Cum Volume (acre-ft)	*	0.84	*	12.50	*		*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*		*	8.98	*		*

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.
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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9681.66	9923.37	33.83	36.08	94.92	7.87	0.38	0.94
* 2	Chan	9923.37	10176.53	331.43	218.51	253.28	77.08	0.86	1.52
* 3	ROB	10176.53	10707.29	64.74	61.18	160.89	15.06	0.38	1.06

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9923.37	10176.53	430.00	284.83	255.19	100.00	1.13	1.51

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.

CROSS SECTION

RIVER: T4N-R3W-S17
REACH: Reach-1 RS: 1.923

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9370.39	1610.04	9406	1609.68	9427.34	1609.47	9519.33	1608.59	9530.09	1608.5
9533.55	1608.5	9539.42	1608.36	9557.47	1608.05	9560.22	1608	9574.65	1607.78
9575.32	1607.8	9575.79	1607.76	9619.22	1607.42	9680.43	1607.35	9709.83	1607.23
9713.06	1607.3	9737.92	1607.14	9799	1606.43	9806.49	1606.3	9818.58	1606
9833.67	1605.66	9862.18	1604.89	9888.21	605.054	9924.01	1605.28	9927.23	1605.27
9941.2	1605.1	9951.45	1605	9954.32	1605	9955.41	1605.01	9956.1	1605.02
9959.25	1605	9964.43	1605.06	9984.52	1605.24	10026.46	1605.46	10030.58	1604.91
10031.77	1604.8	10032.94	1604.92	10035.32	1605.36	10035.87	1605.35	100431	1605.368
10043.85	1605.37	10151.75	1605.7	10165.44	1605.54	10196.91	605.874	10205.9	1605.97
10209.68	1606	10237.65	1606.28	10253.4	1606.4	10290.27	1606.81	10349.58	1607.37
10358.24	1607.45	10359.12	1607.46	10365.34	1607.5	10457.45	1607.79	10463.23	1607.88
10471.61	1608	10538.71	1609.03	10558.9	1609.3	10566.35	1609.42	10580.86	1609.68
10599.85	1610	10600.19	1610	10607.73	1610.14				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9370.39	.033	9833.67	.055	10151.75	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.01	10043	447	499.57	515	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1606.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.055	0.055	0.049
W.S. Elev (ft)	1606.01	Reach Len. (ft)	447.00	499.57	515.00
Crit W.S. (ft)	1605.71	Flow Area (sq ft)	81.22	95.18	68.12
E.G. Slope (ft/ft)	0.006469	Area (sq ft)	81.22	95.18	68.12
Q Total (cfs)	430.00	Flow (cfs)	158.32	178.14	93.55
Top Width (ft)	392.96	Top Width (ft)	105.97	118.99	168.01
Vel Total (ft/s)	1.76	Avg. Vel. (ft/s)	1.95	1.87	1.37
Max Chl Dpth (ft)	1.21	Hydr. Depth (ft)	0.77	0.80	0.41
Conv. Total (cfs)	5346.2	Conv. (cfs)	1968.3	2214.8	1163.1
Length Wtd. (ft)	486.74	Wetted Per. (ft)	105.98	119.08	168.01
Min Ch El (ft)	1604.80	Shear (lb/sq ft)	0.31	0.32	0.16
Alpha	1.05	Stream Power (lb/ft s)	0.60	0.60	0.22
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	2.47	8.18	1.87
C & E Loss (ft)	0.00	Cum SA (acres)	4.50	6.59	3.98

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 OUTPUT Profile #2

E.G. Elev (ft)	1606.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.055	
W.S. Elev (ft)	1606.59	Reach Len. (ft)	447.00	499.57	515.00
Crit W.S. (ft)	1605.95	Flow Area (sq ft)		163.97	
E.G. Slope (ft/ft)	0.006325	Area (sq ft)		163.97	
Q Total (cfs)	430.00	Flow (cfs)		430.00	
Top Width (ft)	118.99	Top Width (ft)		118.99	
Vel Total (ft/s)	2.62	Avg. Vel. (ft/s)		2.62	
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)		1.38	
Conv. Total (cfs)	5406.6	Conv. (cfs)		5406.6	
Length Wtd. (ft)	499.57	Wetted Per. (ft)		121.62	
Min Ch El (ft)	1604.80	Shear (lb/sq ft)		0.53	
Alpha	1.00	Stream Power (lb/ft s)		1.40	

```
* Frctn Loss (ft)        *    3.10  * Cum Volume (acre-ft)   *    0.84  *    9.62  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *          *    6.59  *          *
*****************************************************************************************
```

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.

```
  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9647.20   * 9924.01   *   158.32 *    81.22 *   105.98 *    36.82 *
0.77 *     1.95 *
* 2         * Chan      * 9924.01   * 10043.00  *   178.14 *    95.18 *   119.08 *    41.43 *
0.80 *     1.87 *
* 3         * ROB       * 10043.00  * 10325.37  *    93.55 *    68.12 *   168.01 *    21.76 *
0.41 *     1.37 *
*****************************************************************************************
******************
```

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9924.01   * 10043.00  *   430.00 *   163.97 *   121.62 *   100.00 *
1.38 *     2.62 *
*****************************************************************************************
******************
```

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: T4N-R3W-S17
REACH: Reach-1 RS: 1.828

INPUT
Description:
Station Elevation Data num= 84

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9336.29  1607.1 9402.18 1606.36 9403.85 1606.35 9405.27  1606.3 9432.73    1606
 9454.76 1605.77 9483.39 1605.41 9570.24 1604.42 9582.07  1604.3 9586.06 1604.28
 9589.45 1604.25 9595.52  1604.3 9627.16 1604.29 9654.64  1604.1 9661.68    1604
 9672.85 1603.89 9676.07 1603.84 9679.11 1603.84 9685.05  1603.8 9690.54 1603.79
 9729.45 1603.67 9767.34 1603.53 9826.941603.244 9857.54  1603.1 9868.72 1602.99
 9910.89 1602.65 9911.33 1602.65 9916.04 1602.64 9929.77  1602.6 9967.73 1602.54
 9978.94 1602.27 9990.42    1602 9991.45    1602 9998.19 1601.8210000.94  1601.2
10002.16 1600.9910002.64  1601.4 10004.1    1602 10004.2 1602.0510004.35 1602.14
 10004.9 1602.1210023.59 1602.1510048.65  1602.210051.44  1602.210057.34 1602.22
10059.46 1602.23 10061.1 1602.2410063.26  1602.210067.19 1602.26 10072.8  1602.3
   101051602.63210105.74 1602.64 10124.7 1602.72 10160.41602.992 10200.9  1603.3
 10211.4 1603.4510212.21 1603.3210220.37 1603.3910228.24 1603.4410285.44  1603.9
10294.23 1603.9410299.54 1603.9710299.84 1603.9910352.41  1604.610356.97 1604.63
10364.79 1604.7110394.02 1604.8710417.82 1605.0810451.77  1605.610465.04 1605.86
10469.46 1606.0110472.15 1606.0910490.34  1606.110497.73  1606.2 10504.4 1606.35
10506.01 1606.3610508.11 1606.3610521.37 1606.4210534.61  1606.410547.72 1606.46
10567.98 1606.5210628.42 1606.6510636.12 1606.6910651.37  1606.8
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9336.29    .033 9868.72    .055 10160.4    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.73   10105              455  446.24     411            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1603.36  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.053  *   0.055  *   0.052  *
* W.S. Elev (ft)          * 1603.31  * Reach Len. (ft)        *  455.00  *  446.24  *  411.00  *
* Crit W.S. (ft)          * 1602.89  * Flow Area (sq ft)      *   69.60  *  150.28  *   35.49  *
* E.G. Slope (ft/ft)      *0.004793  * Area (sq ft)           *   69.60  *  150.28  *   35.49  *
* Q Total (cfs)           *  430.00  * Flow (cfs)              *   91.00  *  297.99  *   41.01  *
* Top Width (ft)          *  388.97  * Top Width (ft)          *  154.96  *  137.27  *   96.74  *
* Vel Total (ft/s)        *    1.68  * Avg. Vel. (ft/s)        *    1.31  *    1.98  *    1.16  *
* Max Chl Dpth (ft)       *    2.32  * Hydr. Depth (ft)        *    0.45  *    1.09  *    0.37  *
* Conv. Total (cfs)       *  6211.1  * Conv. (cfs)             *  1314.5  *  4304.3  *   592.3  *
* Length Wtd. (ft)        *  444.90  * Wetted Per. (ft)        *  154.96  *  137.68  *   96.74  *
* Min Ch El (ft)          * 1600.99  * Shear (lb/sq ft)        *    0.13  *    0.33  *    0.11  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    0.18  *    0.65  *    0.13  *
* Frctn Loss (ft)         *    2.35  * Cum Volume (acre-ft)    *    1.70  *    6.77  *    1.26  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    3.16  *    5.12  *    2.42  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1603.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1603.49  * Reach Len. (ft)        *  455.00  *  446.24  *  411.00  *
* Crit W.S. (ft)          * 1602.89  * Flow Area (sq ft)      *          *  175.28  *          *
* E.G. Slope (ft/ft)      *0.006081  * Area (sq ft)           *          *  175.28  *          *
* Q Total (cfs)           *  430.00  * Flow (cfs)              *          *  430.00  *          *
* Top Width (ft)          *  137.27  * Top Width (ft)          *          *  137.27  *          *
* Vel Total (ft/s)        *    2.45  * Avg. Vel. (ft/s)        *          *    2.45  *          *
* Max Chl Dpth (ft)       *    2.50  * Hydr. Depth (ft)        *          *    1.28  *          *
* Conv. Total (cfs)       *  5514.3  * Conv. (cfs)             *          *  5514.3  *          *
* Length Wtd. (ft)        *  446.24  * Wetted Per. (ft)        *          *  139.49  *          *
* Min Ch El (ft)          * 1600.99  * Shear (lb/sq ft)        *          *    0.48  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.17  *          *
* Frctn Loss (ft)         *    2.41  * Cum Volume (acre-ft)    *    0.84  *    7.67  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *    5.12  *          *
*****************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9652.01   * 9967.73   *    91.00 *    69.60 *   154.96 *    21.16 *
0.45 *     1.31 *
* 2         * Chan      * 9967.73   * 10105.00  *   297.99 *   150.28 *   137.68 *    69.30 *
1.09 *     1.98 *
* 3         * ROB       * 10105.00  * 10378.19  *    41.01 *    35.49 *    96.74 *     9.54 *
0.37 *     1.16 *
*****************************************************************************************
******************

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9967.73   * 10105.00  *   430.00 *   175.28 *   139.49 *   100.00 *
1.28 *     2.45 *
*****************************************************************************************
******************
```

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 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: T4N-R3W-S17
REACH: Reach-1 RS: 1.744

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data num= 104

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9316.94 1604.49 9329.78  1604.4 9347.67 1604.36 9351.25 1604.33 9352.16 1604.34
 9353.54 1604.32 9356.67  1604.3 9362.91 1604.21 9381.13    1604 9383.53 1603.97
 9398.62 1603.79 9447.15  1603.2 9477.61 1602.88 9532.09 1602.22 9542.67 1602.13
  9554.3    1602 9561.91 1601.93 9582.12 1601.72 9605.81 1601.46 9612.02 1601.39
 9627.66  1601.2 9669.85 1600.89 9671.22  1600.9 9674.36 1600.94 9677.02  1600.9
 9717.53    1601 9743.651600.857 9797.69 1600.56  9807.1 1600.49 9807.96 1600.48
 9807.98 1600.48 9809.47  1600.5 9815.35 1600.47  9819.1 1600.46    98351600.378
 9890.51 1600.09 9893.52 1600.09 9897.75  1600.1 9899.38 1600.07 9904.69 1600.07
 9927.37 1600.04 9932.74    1600 9944.08 1600.02 9946.89 1600.02 9947.89 1600.01
 9948.94 1600.02 9975.32  1600.2 9977.42 1600.26 9980.07 1600.28 9992.36 1600.34
 9993.02  1600.1 9993.44    1600 9997.64 1598.27 9998.21 1598.08 9998.39    1598
 9998.43 1597.99 9999.32  1597.6 9999.73 1597.7710000.46    159810002.44 1599.04
10004.62    160010005.22  1600.310005.37 1600.43 10008.8 1600.4110024.13 1600.26
 10025.7 1600.2710026.89  1600.310035.47 1600.1710038.23 1600.1810039.01 1600.17
 10039.1 1600.1710044.29  1600.310046.07 1600.2510046.57 1600.2810058.74 1600.26
   100711600.40510094.441600.68210107.74 1600.8410107.93  1600.910121.37 1600.75
10135.08 1600.7610211.62 1601.2410220.68 1601.58 10255.6  1601.610291.05 1601.84
10298.25 1601.92 10304.8    160210318.03 1602.1710335.36  1602.410371.87 1602.82
10407.83 1603.5710443.29 1603.8710448.01 1603.9510448.64    160410450.42 1603.99
10450.54 1603.9910468.18 1604.4310484.74  1604.810527.93  1605.910530.57 1605.95
 10532.8 1606.0210535.04 1605.9910540.17 1606.0310544.93 1606.04
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9316.94    .033 9743.65    .05510094.44    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9835   10071              540  617.87     575             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1601.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.054  *   0.055  *   0.044  *
* W.S. Elev (ft)         * 1600.98  * Reach Len. (ft)         *  540.00  *  617.87  *  575.00  *
* Crit W.S. (ft)         * 1600.58  * Flow Area (sq ft)       *   36.73  *  200.47  *   21.68  *
* E.G. Slope (ft/ft)     *0.005836  * Area (sq ft)            *   36.73  *  200.47  *   21.68  *
* Q Total (cfs)          *  430.00  * Flow (cfs)              *   36.77  *  369.86  *   23.37  *
* Top Width (ft)         *  496.25  * Top Width (ft)          *  161.92  *  236.00  *   98.34  *
* Vel Total (ft/s)       *    1.66  * Avg. Vel. (ft/s)         *    1.00  *    1.84  *    1.08  *
```

```
* Max Chl Dpth (ft)      *    3.37  * Hydr. Depth (ft)        *    0.23  *    0.85  *    0.22  *
* Conv. Total (cfs)      *  5628.9  * Conv. (cfs)             *   481.3  *  4841.6  *   306.0  *
* Length Wtd. (ft)       *  608.06  * Wetted Per. (ft)        *  161.92  *  237.18  *   98.35  *
* Min Ch El (ft)         * 1597.60  * Shear (lb/sq ft)        *    0.08  *    0.31  *    0.08  *
* Alpha                  *    1.12  * Stream Power (lb/ft s)  *    0.08  *    0.57  *    0.09  *
* Frctn Loss (ft)        *    3.31  * Cum Volume (acre-ft)    *    1.14  *    4.98  *    0.99  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    1.51  *    3.21  *    1.49  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)         * 1601.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *          *    0.055  *          *
* W.S. Elev (ft)         * 1601.11  * Reach Len. (ft)        *  540.00  *   617.87  *  575.00  *
* Crit W.S. (ft)         * 1600.60  * Flow Area (sq ft)      *          *   232.68  *          *
* E.G. Slope (ft/ft)     *0.004839  * Area (sq ft)           *          *   232.68  *          *
* Q Total (cfs)          *  430.00  * Flow (cfs)              *          *   430.00  *          *
* Top Width (ft)         *  236.00  * Top Width (ft)          *          *   236.00  *          *
* Vel Total (ft/s)       *    1.85  * Avg. Vel. (ft/s)        *          *    1.85  *          *
* Max Chl Dpth (ft)      *    3.51  * Hydr. Depth (ft)        *          *    0.99  *          *
* Conv. Total (cfs)      *  6181.3  * Conv. (cfs)             *          *  6181.3  *          *
* Length Wtd. (ft)       *  617.87  * Wetted Per. (ft)        *          *  238.62  *          *
* Min Ch El (ft)         * 1597.60  * Shear (lb/sq ft)        *          *    0.29  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.54  *          *
* Frctn Loss (ft)        *    3.37  * Cum Volume (acre-ft)    *    0.84  *    5.58  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *          *    3.21  *          *
*****************************************************************************************************

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9575.97   * 9835.00   *    36.77 *    36.73 *   161.92 *     8.55 *
0.23 *     1.00 *
* 2        * Chan      * 9835.00   * 10071.00  *   369.86 *   200.47 *   237.18 *    86.01 *
0.85 *     1.84 *
* 3        * ROB       * 10071.00  * 10307.96  *    23.37 *    21.68 *    98.35 *     5.44 *
0.22 *     1.08 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9835.00   * 10071.00  *   430.00 *   232.68 *   238.62 *   100.00 *
0.99 *     1.85 *
*****************************************************************************************************
******************
```

```
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: 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: T4N-R3W-S17
REACH: Reach-1            RS: 1.627

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9603.95 1599.25 9615.86  1599.2 9624.97 1598.98 9675.55 1598.58 9689.73 1598.57
  9699.2 1598.46 9710.18  1598.3 9741.03 1598.04 9804.94 1597.36 9806.26  1597.3
 9828.43 1597.26 9845.86 1597.29 9856.341597.268 9874.51 1597.23 9896.79  1597.1
 9968.24 1596.42 9981.51 1596.34 9984.27 1596.33 9991.87 1596.46 9993.79  1596.4
 9994.99 1596.12 9995.45    1596 9997.41 1595.48 9999.16 1595.2110004.18    1596
10004.39    159610004.56 1596.0310007.07 1596.4810022.35 1596.6310031.54  1596.7
10038.56 1596.9510053.02 1597.0110073.111597.207 10082.6  1597.310145.46 1597.41
10148.69  1597.410149.22 1597.4310151.69 1597.4410210.59 1597.7210250.43 1598.01
10267.41 1598.1410269.82 1598.1510272.31 1598.17 10272.6  1598.210304.02 1598.26
10331.36 1598.3910351.84 1598.4410367.36 1598.6310399.03    159910448.53 1598.97
10489.17 1599.2610532.19 1599.3410596.09 1599.8310610.35    160010611.33 1600.01
10633.12 1600.2810652.88 1600.6410673.22 1600.9610682.28  1601.110684.12 1601.13
10742.73    160210775.49 1602.54 10795.6  1602.910809.38 1603.0710818.05 1603.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9603.95    .033 9856.34    .05510073.11    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9856.3410073.11                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*************************************************************************************
* E.G. Elev (ft)         * 1597.72  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)         * 1597.68  * Reach Len. (ft)         *  405.88  *  405.88  *  405.88  *
* Crit W.S. (ft)         * 1597.26  * Flow Area (sq ft)       *   25.04  *  196.29  *   31.59  *
* E.G. Slope (ft/ft)     *0.005078  * Area (sq ft)            *   25.04  *  196.29  *   31.59  *
* Q Total (cfs)          *  430.00  * Flow (cfs)              *   36.71  *  353.43  *   39.86  *
* Top Width (ft)         *  425.96  * Top Width (ft)          *   81.05  *  216.77  *  128.13  *
* Vel Total (ft/s)       *    1.70  * Avg. Vel. (ft/s)        *    1.47  *    1.80  *    1.26  *
* Max Chl Dpth (ft)      *    2.47  * Hydr. Depth (ft)        *    0.31  *    0.91  *    0.25  *
* Conv. Total (cfs)      *  6034.5  * Conv. (cfs)             *   515.2  *  4959.9  *   559.4  *
* Length Wtd. (ft)       *  405.88  * Wetted Per. (ft)        *   81.06  *  217.02  *  128.14  *
* Min Ch El (ft)         * 1595.21  * Shear (lb/sq ft)        *    0.10  *    0.29  *    0.08  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    0.14  *    0.52  *    0.10  *
* Frctn Loss (ft)        *    1.59  * Cum Volume (acre-ft)    *    0.76  *    2.16  *    0.64  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *          *          *          *
*************************************************************************************

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 OUTPUT  Profile #2
*************************************************************************************
* E.G. Elev (ft)         * 1597.80  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1597.73  * Reach Len. (ft)         *  405.88  *  405.88  *  405.88  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  208.31  *          *
* E.G. Slope (ft/ft)     *0.006203  * Area (sq ft)            *          *  208.31  *          *
* Q Total (cfs)          *  430.00  * Flow (cfs)              *          *  430.00  *          *
* Top Width (ft)         *  216.77  * Top Width (ft)          *          *  216.77  *          *
```

```
* Vel Total (ft/s)        *    2.06  * Avg. Vel. (ft/s)        *          *    2.06  *          *
* Max Chl Dpth (ft)       *    2.52  * Hydr. Depth (ft)        *          *    0.96  *          *
* Conv. Total (cfs)       *  5459.5  * Conv. (cfs)             *          *  5459.5  *          *
* Length Wtd. (ft)        *  405.88  * Wetted Per. (ft)        *          *  218.01  *          *
* Min Ch El (ft)          * 1595.21  * Shear (lb/sq ft)        *          *    0.37  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.76  *          *
* Frctn Loss (ft)         *    1.45  * Cum Volume (acre-ft)   *    0.84  *    2.46  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *          *          *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9730.15   * 9856.34   *    36.71 *    25.04 *    81.06 *     8.54 *
0.31 *     1.47 *
* 2         * Chan      * 9856.34   * 10073.11  *   353.43 *   196.29 *   217.02 *    82.19 *
0.91 *     1.80 *
* 3         * ROB       * 10073.11  * 10445.58  *    39.86 *    31.59 *   128.14 *     9.27 *
0.25 *     1.26 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9856.34   * 10073.11  *   430.00 *   208.31 *   218.01 *   100.00 *
0.96 *     2.06 *
*****************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-2            RS: 1.550

INPUT
Description:
Station Elevation Data    num=      90
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9051.36  1598.1 9076.22 1598.16  9077.1 1598.16 9077.35  1598.2 9077.61 1598.16
 9078.08 1598.15 9080.83 1598.13 9095.21    1598 9169.46  1597.4  9174.3 1597.35
  9179.8  1597.3 9183.07 1597.28 9218.92 1597.25 9295.42  1596.7 9360.41 1596.26
 9386.92  1596.1 9403.12    1596 9426.98 1595.83 9455.74 1595.62 9460.69 1595.59
 9461.26 1595.58 9467.66  1595.6 9474.68 1595.53 9499.06 1595.53 9504.42 1595.51
 9505.88 1595.22 9509.21  1594.7  9513.3 1595.45 9514.72 1595.64 9524.55 1595.72
  9526.1 1595.73  9551.5  1595.8  9561.6 1595.85 9584.02 1595.87 9628.79 1595.89
 9640.01  1595.9 9652.64 1595.92 9667.03 1595.95 9668.58 1595.93  9684.7    1596
  9685.2    1596 9708.88 1596.07 9722.25 1596.06 9733.35    1596 9744.43 1596.03
 9755.33 1596.04  9755.7 1596.03 9757.34    1596 9767.78    1596 9853.46 1595.46
 9878.98 1595.32 9894.631595.184 9899.68 1595.14 9924.13  1595.3 9938.71 1595.17
 9963.32 1595.05 9977.95 1595.07 9983.57  1595.1 9996.06 1594.87 9997.68 1594.54
 9999.28 1594.0810001.84 1594.7110002.43  1594.910003.03 1594.9210010.94 1594.77
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10029.14 1594.7110029.25 1594.7110061.52  1594.410063.48 1594.4110063.55 1594.41
10065.64 1594.4210066.58 1594.43 10094.3    159510103.361595.16410115.32 1595.38
10119.09 1595.4310119.68 1595.4210120.92 1595.4110127.29  1594.910210.93  1595.5
10217.26 1595.5410219.99 1595.5610224.78  1595.6 10249.6  1595.810277.68    1596
10321.06 1596.3910336.54 1596.5210343.82 1596.5510344.11  1596.610350.12 1596.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9051.36    .033 9878.98    .05510115.32    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9878.9810115.32               527  500.36     441             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1596.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1596.08  * Reach Len. (ft)        *  527.00  *  500.36  *  441.00  *
* Crit W.S. (ft)          * 1595.60  * Flow Area (sq ft)      *  137.55  *  267.60  *  104.95  *
* E.G. Slope (ft/ft)      *0.003469  * Area (sq ft)           *  137.55  *  267.60  *  104.95  *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *  156.70  *  462.26  *  201.04  *
* Top Width (ft)          *  895.58  * Top Width (ft)         *  488.32  *  236.34  *  170.91  *
* Vel Total (ft/s)        *    1.61  * Avg. Vel. (ft/s)       *    1.14  *    1.73  *    1.92  *
* Max Chl Dpth (ft)       *    2.00  * Hydr. Depth (ft)       *    0.28  *    1.13  *    0.61  *
* Conv. Total (cfs)       * 13923.1  * Conv. (cfs)            *  2660.7  *  7848.8  *  3413.5  *
* Length Wtd. (ft)        *  502.41  * Wetted Per. (ft)       *  488.48  *  236.56  *  170.94  *
* Min Ch El (ft)          * 1594.08  * Shear (lb/sq ft)       *    0.06  *    0.24  *    0.13  *
* Alpha                   *    1.10  * Stream Power (lb/ft s) *    0.07  *    0.42  *    0.25  *
* Frctn Loss (ft)         *    2.56  * Cum Volume (acre-ft)   *   30.91  *   51.14  *   19.42  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   26.89  *   30.11  *   25.04  *
*****************************************************************************************

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 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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1596.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.033  *   0.055  *          *
* W.S. Elev (ft)          * 1596.30  * Reach Len. (ft)        *  527.00  *  500.36  *  441.00  *
* Crit W.S. (ft)          * 1595.65  * Flow Area (sq ft)      *  179.36  *  319.15  *          *
* E.G. Slope (ft/ft)      *0.002823  * Area (sq ft)           *  179.36  *  319.15  *          *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *  262.07  *  557.93  *          *
* Top Width (ft)          *  611.17  * Top Width (ft)         *  374.83  *  236.34  *          *
* Vel Total (ft/s)        *    1.64  * Avg. Vel. (ft/s)       *    1.46  *    1.75  *          *
* Max Chl Dpth (ft)       *    2.22  * Hydr. Depth (ft)       *    0.48  *    1.35  *          *
* Conv. Total (cfs)       * 15433.0  * Conv. (cfs)            *  4932.4  * 10500.6  *          *
* Length Wtd. (ft)        *  504.62  * Wetted Per. (ft)       *  375.77  *  237.48  *          *
* Min Ch El (ft)          * 1594.08  * Shear (lb/sq ft)       *    0.08  *    0.24  *          *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.12  *    0.41  *          *
* Frctn Loss (ft)         *    2.33  * Cum Volume (acre-ft)   *   11.75  *   64.56  *    0.55  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    3.30  *   30.11  *    0.06  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9051.36   * 9465.17   *    20.24 *    19.00 *    74.51 *     2.47 *
0.25 *     1.07 *
```

```
* 2          * LOB       * 9465.17   * 9878.98   *   136.46 *   118.55 *   413.96 *    16.64 *
0.29 *     1.15 *
* 3          * Chan      * 9878.98   * 10115.32  *   462.25 *   267.60 *   236.56 *    56.37 *
1.13 *     1.73 *
* 4          * ROB       * 10115.32  * 10232.72  *   191.79 *    93.83 *   117.42 *    23.39 *
0.80 *     2.04 *
* 5          * ROB       * 10232.72  * 10350.12  *     9.26 *    11.12 *    53.51 *     1.13 *
0.21 *     0.83 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9465.17   * 9878.98   *   262.07 *   179.36 *   375.77 *    31.96 *
0.48 *     1.46 *
* 2          * Chan      * 9878.98   * 10115.32  *   557.93 *   319.15 *   237.48 *    68.04 *
1.35 *     1.75 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S17
REACH: Reach-2            RS: 1.455

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 820cfs.  This cross-section is where wash T4N-R3W-S07
             joins T4N-R3W-S17
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8552.77  1596.6 8558.83 1596.58 8593.52  1597.1 8594.01  1597.1 8610.05  1597.5
 8628.58 1597.36 8648.43 1597.13  8702.3 1597.01  8724.2 1596.95 8745.07  1596.8
 8757.27 1596.73 8774.68 1596.49 8803.97 1596.06 8808.22    1596 8810.37    1596
 8813.83 1595.97  8826.4 1595.87 8839.52 1595.77 8844.54  1595.7 8849.01 1595.71
    8853 1595.68 8856.16 1595.67 8856.54 1595.67 8865.33  1595.6 8937.37 1595.36
 8950.96 1595.31 8962.29 1595.26 9040.14 1594.95 9045.87    1595 9049.62 1594.96
 9061.85    1595 9132.94 1595.15 9141.02 1595.17 9141.33  1595.2 9141.88 1595.17
 9213.07 1595.16 9214.09 1595.15 9227.19    1595 9284.47 1595.08 9357.01 1595.07
 9383.62  1594.9 9447.62 1594.31 9465.54  1594.1 9470.08    1594 9527.94 1593.16
 9534.23 1593.07 9537.91    1593 9567.55 1592.92 9633.47 1592.71  9676.6 1592.65
 9768.09 1592.55 9814.38  1592.5 9817.52  1592.8    9889 1592.79 9904.81 1592.71
 9927.43 1592.83 9944.02 1592.8910004.96  1593.110007.03 1593.1210007.79 1592.98
10010.22 1592.3210012.21 1593.0110012.53  1593.110013.76 1593.1310122.15 1593.06
10122.27  1593.110122.32 1593.0610122.61 1593.0610175.511593.25310213.29 1593.39
10223.02 1594.0410240.05  1593.210248.55 1593.1410252.62 1593.1410269.73 1593.17
10301.76  1593.710305.09  1593.8 10308.3  1593.910312.61    159410314.94 1594.05
10315.53 1594.0610315.74  1594.110330.39  1594.1 10387.4 1594.4110433.22 1594.92
10461.92 1595.17 10475.7  1595.310482.75 1595.3410493.48 1595.4210505.09 1595.52
10550.83 1595.8610562.04    159610601.79 1596.5210605.59 1596.5810612.44 1596.65
10628.41 1596.8410647.64    1597   10748 1597.6610782.65    159810782.93    1598

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
**********************************************
 8552.77    .033 9527.94    .05510175.51    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9817.5210175.51              392  473.07     497            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1593.56  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.055  *   0.055  *   0.033  *
* W.S. Elev (ft)         * 1593.50  * Reach Len. (ft)        *  392.00  *  473.07  *  497.00  *
* Crit W.S. (ft)         * 1593.25  * Flow Area (sq ft)      *  234.55  *  187.65  *   21.14  *
* E.G. Slope (ft/ft)     *0.008197  * Area (sq ft)           *  234.55  *  187.65  *   21.14  *
* Q Total (cfs)          *  820.00  * Flow (cfs)             *  489.49  *  298.25  *   32.26  *
* Top Width (ft)         *  766.00  * Top Width (ft)         *  312.95  *  357.99  *   95.06  *
* Vel Total (ft/s)       *    1.85  * Avg. Vel. (ft/s)       *    2.09  *    1.59  *    1.53  *
* Max Chl Dpth (ft)      *    1.18  * Hydr. Depth (ft)       *    0.75  *    0.52  *    0.22  *
* Conv. Total (cfs)      *  9056.8  * Conv. (cfs)            *  5406.4  *  3294.2  *   356.3  *
* Length Wtd. (ft)       *  449.42  * Wetted Per. (ft)       *  312.97  *  358.24  *   95.08  *
* Min Ch El (ft)         * 1592.32  * Shear (lb/sq ft)       *    0.38  *    0.27  *    0.11  *
* Alpha                  *    1.06  * Stream Power (lb/ft s) *    0.80  *    0.43  *    0.17  *
* Frctn Loss (ft)        *    2.41  * Cum Volume (acre-ft)   *   28.66  *   48.52  *   18.78  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *   22.05  *   26.70  *   23.70  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1594.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)         * 1593.92  * Reach Len. (ft)        *  392.00  *  473.07  *  497.00  *
* Crit W.S. (ft)         * 1593.53  * Flow Area (sq ft)      *          *  337.10  *          *
* E.G. Slope (ft/ft)     *0.008850  * Area (sq ft)           *          *  337.10  *          *
* Q Total (cfs)          *  820.00  * Flow (cfs)             *          *  820.00  *          *
* Top Width (ft)         *  357.99  * Top Width (ft)         *          *  357.99  *          *
* Vel Total (ft/s)       *    2.43  * Avg. Vel. (ft/s)       *          *    2.43  *          *
* Max Chl Dpth (ft)      *    1.60  * Hydr. Depth (ft)       *          *    0.94  *          *
* Conv. Total (cfs)      *  8716.6  * Conv. (cfs)            *          *  8716.6  *          *
* Length Wtd. (ft)       *  473.07  * Wetted Per. (ft)       *          *  360.02  *          *
* Min Ch El (ft)         * 1592.32  * Shear (lb/sq ft)       *          *    0.52  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    1.26  *          *
* Frctn Loss (ft)        *    2.67  * Cum Volume (acre-ft)   *   10.66  *   60.79  *    0.55  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    1.03  *   26.70  *    0.06  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9185.15   * 9817.52   *   489.49 *   234.55 *   312.97 *    59.69 *
0.75 *     2.09 *
* 2        * Chan      * 9817.52   * 10175.51  *   298.25 *   187.65 *   358.24 *    36.37 *
0.52 *     1.59 *
* 3        * ROB       * 10175.51  * 10479.22  *    32.26 *    21.14 *    95.08 *     3.93 *
0.22 *     1.53 *
*****************************************************************************************
******************
```

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9817.52	10175.51	820.00	337.10	360.02	100.00	0.94	2.43

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.

CROSS SECTION

RIVER: T4N-R3W-S17
REACH: Reach-2 RS: 1.366

INPUT
Description:
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9349.23	1593.5	9379.18	1593.34	9421.8	1593.05	9467.07	1592.62	9512.63	1592.35
9530.29	1592.3	9603.34	1592.24	9604.65	1592.23	9649.07	1592	9652.88	1592
9698.29	1591.79	9699.26	1591.78	9700.99	1591.78	9758.09	1591.74	9759.68	1591.7
9762.47	1591.73	9802.95	1591.29	9852.23	1590.612	9880.69	1590.22	9901.77	1590.08
9914.73	1590	9914.99	1590	9947.36	1589.79	9959.74	1589.72	9975.17	1589.65
9982.13	1589.7	9988.14	1589.5	9990.3	1589.47	9995.89	1588.72	9996.08	1588.68
10001.27	1589.5	10003.46	1589.84	10003.57	1589.84	10011.25	1589.75	10012.63	1589.74
10013.22	1589.7	10020.44	1589.76	10020.63	1589.77	10052.99	1589.64	10054.78	1589.62
10057.65	1588.9	10059.95	1588.32	10060.56	1588.68	10062.82	1589.65	10084.79	1589.84
10085.03	1589.8	10085.15	1589.82	10088.77	1588.51	10091.46	1589.14	10093.27	1589.72
10096.32	1589.9	10099.25	1589.93	10101.8	1589.53	10106.03	1589.19	10107.76	1589.37
10111.53	1589.8	10113.02	1589.86	10113.75	1589.86	10117.79	1590.06	10117.94	1590.07
10118.22	1590.1	10120.31	1590.12	10123.58	1590.2	10124.25	1590.21	10125.27	1590.21
10130.87	1590.1	10132.28	1590.16	10180.01	1590.52	10181.03	1590.53	10182.38	1590.54
10192.88	1590.56	10249.53	1590.7	10304.31	1591.06	10311.21	1591.34	10343.94	1591.72
10347.2	1591.72	10349.88	1591.7	10352.34	1591.74	10366.37	1591.81	10401.34	1591.97
10407.56	159	10409.08	1592.01	10464.19	1592.25	10540.88	1592.66	10558.49	1592.79
10580.75	159	10598.39	1593.24	10614.48	1593.42	10668.33	1594	10668.6	1594
10673.03	1594.03	10689.55	1594.16	10754.04	1594.76	10802.21	1595.39	10855.05	1596
10861.46	1596.08	10869.57	1596.16	10891.11	1596.14	10898.11	1596.14	10914.66	1596.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9349.23	.033	9852.23	.055	10192.88	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9880.69	10123.58	483	513.97	495	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1591.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.049	0.055	0.046
W.S. Elev (ft)	1591.09	Reach Len. (ft)	483.00	513.97	495.00
Crit W.S. (ft)		Flow Area (sq ft)	27.16	329.72	87.34
E.G. Slope (ft/ft)	0.003792	Area (sq ft)	27.16	329.72	87.34
Q Total (cfs)	820.00	Flow (cfs)	32.83	670.47	116.70

* Top Width (ft)	* 487.06	* Top Width (ft)	* 62.83	* 242.89	* 181.34	*
* Vel Total (ft/s)	* 1.85	* Avg. Vel. (ft/s)	* 1.21	* 2.03	* 1.34	*
* Max Chl Dpth (ft)	* 2.76	* Hydr. Depth (ft)	* 0.43	* 1.36	* 0.48	*
* Conv. Total (cfs)	* 13316.5	* Conv. (cfs)	* 533.1	* 10888.2	* 1895.2	*
* Length Wtd. (ft)	* 509.48	* Wetted Per. (ft)	* 62.83	* 243.99	* 181.35	*
* Min Ch El (ft)	* 1588.32	* Shear (lb/sq ft)	* 0.10	* 0.32	* 0.11	*
* Alpha	* 1.08	* Stream Power (lb/ft s)	* 0.12	* 0.65	* 0.15	*
* Frctn Loss (ft)	* 3.30	* Cum Volume (acre-ft)	* 27.48	* 45.71	* 18.16	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 20.36	* 23.43	* 22.12	*

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.

CROSS SECTION OUTPUT Profile #2

* E.G. Elev (ft)	* 1591.33	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.08	* Wt. n-Val.	*	* 0.055	*	*
* W.S. Elev (ft)	* 1591.25	* Reach Len. (ft)	* 483.00	* 513.97	* 495.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 370.07	*	*
* E.G. Slope (ft/ft)	*0.003904	* Area (sq ft)	*	* 370.07	*	*
* Q Total (cfs)	* 820.00	* Flow (cfs)	*	* 820.00	*	*
* Top Width (ft)	* 242.89	* Top Width (ft)	*	* 242.89	*	*
* Vel Total (ft/s)	* 2.22	* Avg. Vel. (ft/s)	*	* 2.22	*	*
* Max Chl Dpth (ft)	* 2.93	* Hydr. Depth (ft)	*	* 1.52	*	*
* Conv. Total (cfs)	* 13124.0	* Conv. (cfs)	*	* 13124.0	*	*
* Length Wtd. (ft)	* 513.97	* Wetted Per. (ft)	*	* 246.08	*	*
* Min Ch El (ft)	* 1588.32	* Shear (lb/sq ft)	*	* 0.37	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.81	*	*
* Frctn Loss (ft)	* 3.22	* Cum Volume (acre-ft)	* 10.66	* 56.95	* 0.55	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 1.03	* 23.43	* 0.06	*

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.

Profile #1

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s) *
* 1	* LOB	* 9614.96	* 9880.69	* 32.83	* 27.16	* 62.83	* 4.00	* 0.43	* 1.21 *
* 2	* Chan	* 9880.69	* 10123.58	* 670.47	* 329.72	* 243.99	* 81.76	* 1.36	* 2.03 *
* 3	* ROB	* 10123.58	* 10519.12	* 116.70	* 87.34	* 181.35	* 14.23	* 0.48	* 1.34 *

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.

Profile #2

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s) *
* 1	* Chan	* 9880.69	* 10123.58	* 820.00	* 370.07	* 246.08	* 100.00	* 1.52	* 2.22 *

```
*****************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-2            RS: 1.268

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9606.85  1589.2 9615.87 1589.09 9626.38 1589.04 9707.06 1588.39 9764.52  1588.2
 9785.18  1588.1 9803.14 1588.03 9827.16 1587.98 9840.26 1587.94 9859.96  1587.7
 9862.25  1587.7 9877.94 1587.55 9884.07 1587.48 9918.271587.536  9951.8 1587.59
 9952.13  1587.6 9952.49 1587.57 9959.72 1587.44 9972.48 1586.98 9990.01  1586.7
 9992.83 1586.74 9998.98 1586.7510013.49 1586.7610032.47 1586.7510046.35  1586.8
10073.04 1586.6510098.38 1586.5210159.46 1586.6810166.48 1587.0710258.961587.267
10274.67  1587.310276.43 1587.3510278.62 1587.3810328.92    158810356.39 1588.32
10369.82  1588.510378.48 1588.5610386.01 1588.6310394.03 1588.6910420.05 1588.93
10447.94    158910479.28 1589.2710564.28 1589.8110564.39 1589.8110574.83  1589.9
10589.05 1589.9510598.21    159010603.17    159010616.42  1590.110638.62  1590.2
10654.76 1590.31 10687.9 1590.4810711.69 1590.61 10760.9 1590.8310797.79  1591.2
10805.33 1591.3310818.62 1591.4910844.02 1591.7810852.89 1591.8910863.56    1592
10875.58 1592.0910893.97 1592.3510921.54 1592.6610923.08 1592.6811008.16  1593.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9606.85    .033  9951.8    .05510166.48    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9951.810166.48              473  506.74     519              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1587.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1587.70  * Reach Len. (ft)        *  473.00  *  506.74  *  519.00  *
* Crit W.S. (ft)          * 1587.49  * Flow Area (sq ft)      *   13.41  *  203.05  *   61.16  *
* E.G. Slope (ft/ft)      *0.013505  * Area (sq ft)           *   13.41  *  203.05  *   61.16  *
* Q Total (cfs)           *  820.00  * Flow (cfs)              *   19.80  *  614.23  *  185.97  *
* Top Width (ft)          *  442.21  * Top Width (ft)          *   89.49  *  214.68  *  138.05  *
* Vel Total (ft/s)        *    2.95  * Avg. Vel. (ft/s)        *    1.48  *    3.02  *    3.04  *
* Max Chl Dpth (ft)       *    1.18  * Hydr. Depth (ft)        *    0.15  *    0.95  *    0.44  *
* Conv. Total (cfs)       *  7056.0  * Conv. (cfs)             *   170.4  *  5285.4  *  1600.3  *
* Length Wtd. (ft)        *  501.00  * Wetted Per. (ft)        *   89.49  *  214.71  *  138.05  *
* Min Ch El (ft)          * 1586.52  * Shear (lb/sq ft)        *    0.13  *    0.80  *    0.37  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    0.19  *    2.41  *    1.14  *
* Frctn Loss (ft)         *    3.16  * Cum Volume (acre-ft)    *   27.25  *   42.57  *   17.32  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   19.51  *   20.73  *   20.31  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1588.09  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *          *   0.055  *          *
* W.S. Elev (ft)          * 1587.93  * Reach Len. (ft)        *  473.00  *  506.74  *  519.00  *
* Crit W.S. (ft)          * 1587.51  * Flow Area (sq ft)      *          *  252.69  *          *
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```
* E.G. Slope (ft/ft)      *0.011698  * Area (sq ft)           *          *  252.69  *          *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *          *  820.00  *          *
* Top Width (ft)          *  214.68  * Top Width (ft)         *          *  214.68  *          *
* Vel Total (ft/s)        *    3.25  * Avg. Vel. (ft/s)       *          *    3.25  *          *
* Max Chl Dpth (ft)       *    1.41  * Hydr. Depth (ft)       *          *    1.18  *          *
* Conv. Total (cfs)       *  7581.5  * Conv. (cfs)            *          *  7581.5  *          *
* Length Wtd. (ft)        *  503.48  * Wetted Per. (ft)       *          *  215.91  *          *
* Min Ch El (ft)          * 1586.52  * Shear (lb/sq ft)       *          *    0.85  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    2.77  *          *
* Frctn Loss (ft)         *    2.97  * Cum Volume (acre-ft)   *   10.66   *   53.27  *    0.55  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *    1.03   *   20.73  *    0.06  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9779.32   * 9951.80   *    19.80 *    13.41 *    89.49 *     2.41 *
0.15 *     1.48 *
* 2         * Chan      * 9951.80   * 10166.48  *   614.23 *   203.05 *   214.71 *    74.91 *
0.95 *     3.02 *
* 3         * ROB       * 10166.48  * 10587.32  *   185.97 *    61.16 *   138.05 *    22.68 *
0.44 *     3.04 *
*****************************************************************************************************
******************

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 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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9951.80   * 10166.48  *   820.00 *   252.69 *   215.91 *   100.00 *
1.18 *     3.25 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-2            RS: 1.172

INPUT
Description:
Station Elevation Data    num=     102
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9264.52  1586.8 9274.22 1586.99 9283.21 1587.07 9313.28 1586.97 9343.41 1586.72
 9343.46  1586.7 9376.68 1587.08 9377.49 1587.08 9378.63 1587.07  9416.2  1586.5
 9463.18    1586 9478.15 1585.83 9489.62 1585.73 9500.15 1585.76 9591.45  1585.6
 9606.73 1585.52 9614.76 1585.46 9625.72 1585.41 9646.59  1585.2 9703.07 1584.53
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  9707.9 1584.41 9710.83 1584.36 9711.86 1584.27 9712.62  1584.2 9713.87 1584.13
  9714.9    1584 9715.39 1583.95 9715.94  1583.9 9717.68  1583.7 9719.21 1583.89
 9720.57    1584 9721.53 1584.08 9722.74 1584.19 9729.98  1584.1 9737.12  1584.1
 9756.25    1584  9763.7 1583.92 9773.36 1583.84 9783.88  1583.8 9799.26  1583.7
  9807.3 1583.64 9807.33 1583.64 9821.87 1583.61  9843.4 1583.81 9853.66  1583.8
 9859.72 1583.81 9906.36 1583.72 9929.96 1583.72 9953.05 1583.82 9958.67  1583.7
 9961.73 1583.26 9967.16 1583.02 9971.98    1583 9974.71    1583 9975.67 1583.02
 9977.74 1583.01 9980.52  1582.8  9985.2 1582.26 9987.49    1582 9987.86 1581.93
 9988.47 1581.8310001.64 1581.6910003.38 1581.6610003.63  1581.7   10006    1582
10008.04  1582.310013.38  1583.110015.76 1583.0510017.07  1582.810020.16 1583.06
10022.46 1583.0310047.18 1583.3510054.54 1583.5510091.331583.91310121.15 1584.21
10124.05 1584.2410124.25 1584.2410181.46  1584.710226.79 1584.9810286.26 1585.61
10290.27 1585.6610298.15 1585.6710345.61  1585.710423.09 1585.9710433.57 1585.97
10436.45    1586   10442    158610450.97 1586.0610460.53 1586.0910523.07  1586.2
10541.65 1586.3210550.28 1586.3410572.79  1586.4 10603.2 1586.5610607.33  1586.6
10615.16 1586.6610737.84 1587.76 10738.1 1587.7610738.45  1587.8 10789.9    1588
10813.34 1588.11 10813.7 1588.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9264.52    .033  9843.4    .05510091.33    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.0510091.33              502   535.5     492             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1584.65  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.042  *   0.055  *   0.033  *
* W.S. Elev (ft)          * 1584.59  * Reach Len. (ft)         *  502.00  *  535.50  *  492.00  *
* Crit W.S. (ft)          * 1584.09  * Flow Area (sq ft)       *  189.85  *  209.42  *   24.78  *
* E.G. Slope (ft/ft)      *0.003645  * Area (sq ft)            *  189.85  *  209.42  *   24.78  *
* Q Total (cfs)           *  820.00  * Flow (cfs)              *  338.38  *  449.96  *   31.66  *
* Top Width (ft)          *  470.50  * Top Width (ft)          *  255.33  *  138.28  *   76.89  *
* Vel Total (ft/s)        *    1.93  * Avg. Vel. (ft/s)        *    1.78  *    2.15  *    1.28  *
* Max Chl Dpth (ft)       *    2.93  * Hydr. Depth (ft)        *    0.74  *    1.51  *    0.32  *
* Conv. Total (cfs)       * 13581.2  * Conv. (cfs)             *  5604.3  *  7452.5  *   524.4  *
* Length Wtd. (ft)        *  521.36  * Wetted Per. (ft)        *  255.39  *  138.53  *   76.89  *
* Min Ch El (ft)          * 1581.66  * Shear (lb/sq ft)        *    0.17  *    0.34  *    0.07  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.30  *    0.74  *    0.09  *
* Frctn Loss (ft)         *    2.24  * Cum Volume (acre-ft)    *   26.15  *   40.17  *   16.80  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   17.64  *   18.68  *   19.03  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1585.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.055  *   0.055  *          *
* W.S. Elev (ft)          * 1585.01  * Reach Len. (ft)         *  502.00  *  535.50  *  492.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   85.28  *  266.98  *          *
* E.G. Slope (ft/ft)      *0.003543  * Area (sq ft)            *   85.28  *  266.98  *          *
* Q Total (cfs)           *  820.00  * Flow (cfs)              *  158.58  *  661.42  *          *
* Top Width (ft)          *  205.61  * Top Width (ft)          *   67.33  *  138.28  *          *
* Vel Total (ft/s)        *    2.33  * Avg. Vel. (ft/s)        *    1.86  *    2.48  *          *
* Max Chl Dpth (ft)       *    3.35  * Hydr. Depth (ft)        *    1.27  *    1.93  *          *
* Conv. Total (cfs)       * 13775.9  * Conv. (cfs)             *  2664.1  * 11111.8  *          *
* Length Wtd. (ft)        *  532.26  * Wetted Per. (ft)        *   68.58  *  139.63  *          *
* Min Ch El (ft)          * 1581.66  * Shear (lb/sq ft)        *    0.28  *    0.42  *          *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.51  *    1.05  *          *
* Frctn Loss (ft)         *    2.39  * Cum Volume (acre-ft)    *   10.20  *   50.25  *    0.55  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.67  *   18.68  *    0.06  *
*****************************************************************************************

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.

  Profile #1
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9608.79   * 9953.05   *   338.38 *   189.85 *   255.39 *    41.27 *
0.74 *     1.78 *
* 2         * Chan      * 9953.05   * 10091.33  *   449.96 *   209.42 *   138.53 *    54.87 *
1.51 *     2.15 *
* 3         * ROB       * 10091.33  * 10452.52  *    31.66 *    24.78 *    76.89 *     3.86 *
0.32 *     1.28 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9608.79   * 9953.05   *   158.58 *    85.28 *    68.58 *    19.34 *
1.27 *     1.86 *
* 2         * Chan      * 9953.05   * 10091.33  *   661.42 *   266.98 *   139.63 *    80.66 *
1.93 *     2.48 *
*****************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-2            RS: 1.071

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9483.13  1583.2 9493.31 1583.14 9597.95 1582.74 9624.35  1582.6 9627.08 1582.83
 9669.67  1582.6 9683.87 1582.48 9752.79    1582 9758.71 1581.96  9766.4  1581.9
 9790.84 1581.66 9805.79 1581.52 9811.52 1581.48 9816.38 1581.44 9819.98  1581.4
 9820.871581.385 9821.72 1581.37 9895.85 1581.14 9919.85 1581.02 9925.33 1581.06
 9957.52  1581.1 9997.21 1581.1710031.91 1581.2210041.31  1581.310064.68 1581.54
10067.53  1581.610068.56 1581.5210076.97  1581.210081.87 1581.4210083.821581.538
10087.31 1581.7510105.79  1581.810117.84 1581.9710136.36    1582 10159.3 1582.04
10163.72  1582.1 10168.1 1582.0610181.04 1582.0810181.53 1582.0810188.52  1582.1
10195.84  1582.210262.35 1582.6110344.33  1582.410357.73 1582.4510468.61 1583.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9483.13    .033 9821.72    .05510041.31    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9821.7210041.31              470  514.91     503              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1582.41  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *   0.033  *   0.055  *   0.033  *
* W.S. Elev (ft)         * 1582.35  * Reach Len. (ft)         *  470.00  *  514.91  *  503.00  *
* Crit W.S. (ft)         * 1581.88  * Flow Area (sq ft)       *   53.31  *  257.48  *   83.56  *
* E.G. Slope (ft/ft)     *0.005163  * Area (sq ft)            *   53.31  *  257.48  *   83.56  *
```

Q Total (cfs)	820.00	Flow (cfs)	101.15	555.75	163.10	
Top Width (ft)	516.55	Top Width (ft)	118.67	219.59	178.29	
Vel Total (ft/s)	2.08	Avg. Vel. (ft/s)	1.90	2.16	1.95	
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.45	1.17	0.47	
Conv. Total (cfs)	11412.5	Conv. (cfs)	1407.7	7734.8	2269.9	
Length Wtd. (ft)	509.18	Wetted Per. (ft)	118.68	219.59	178.32	
Min Ch El (ft)	1581.02	Shear (lb/sq ft)	0.14	0.38	0.15	
Alpha	1.01	Stream Power (lb/ft s)	0.27	0.82	0.29	
Frctn Loss (ft)	3.23	Cum Volume (acre-ft)	24.75	37.30	16.19	
C & E Loss (ft)	0.00	Cum SA (acres)	15.49	16.48	17.58	

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 OUTPUT Profile #2

E.G. Elev (ft)	1582.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.055	
W.S. Elev (ft)	1582.61	Reach Len. (ft)	470.00	514.91	503.00
Crit W.S. (ft)	1581.93	Flow Area (sq ft)		314.46	
E.G. Slope (ft/ft)	0.005861	Area (sq ft)		314.46	
Q Total (cfs)	820.00	Flow (cfs)		820.00	
Top Width (ft)	219.59	Top Width (ft)		219.59	
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)		2.61	
Max Chl Dpth (ft)	1.59	Hydr. Depth (ft)		1.43	
Conv. Total (cfs)	10711.3	Conv. (cfs)		10711.3	
Length Wtd. (ft)	514.91	Wetted Per. (ft)		222.13	
Min Ch El (ft)	1581.02	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		1.35	
Frctn Loss (ft)	3.35	Cum Volume (acre-ft)	9.71	46.68	0.55
C & E Loss (ft)	0.00	Cum SA (acres)	0.28	16.48	0.06

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9652.43	9821.72	101.15	53.31	118.68	12.34	0.45	1.90
2 Chan	9821.72	10041.31	555.75	257.48	219.59	67.77	1.17	2.16
3 ROB	10041.31	10254.96	163.10	83.56	178.32	19.89	0.47	1.95

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9821.72	10041.31	820.00	314.46	222.13	100.00	1.43	2.61

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: T4N-R3W-S17
REACH: Reach-2 RS: 0.973

INPUT
Description:
Station Elevation Data num= 99

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9397.07  1581.3  9432.2 1580.89  9435.6 1580.81 9466.21 1580.72  9475.6 1580.74
  9496.9  1580.8 9509.12 1580.01 9509.19 1580.01  9509.2    1580 9509.21 1580.01
 9509.23    1580 9526.14 1580.71    9527 1580.74  9527.5 1580.76 9527.72 1580.77
 9528.14  1580.8 9528.23 1580.81 9533.76 1580.61 9535.74 1580.65  9588.6 1580.45
 9590.97  1580.4 9665.79  1580.1 9669.09 1580.09 9681.63 1580.08 9697.59    1580
 9698.07    1580 9729.86 1579.66 9762.83 1579.32 9799.12 1579.05 9889.86  1578.5
 9897.421578.471 9916.15  1578.4 9921.91 1578.39 9926.56 1578.34 9935.87 1578.26
 9953.22  1578.1 9956.76 1578.08 9956.84 1578.08 9956.97  1578.1    9957 1578.08
 9957.82    1578 9959.21 1577.79 9962.58 1577.33 9964.15  1577.8 9964.67 1577.93
 9965.15 1577.96 9965.27 1577.98 9969.86 1577.95  9970.4  1577.9 9971.04 1577.85
 9971.85 1577.62 9973.88 1577.12 9986.31 1576.46 9989.82 1576.39 9991.83 1576.66
 9998.94 1577.6710002.21 1577.6710004.69  1577.710006.72 1577.6710015.82 1576.97
10016.92 1576.9110017.75 1576.8310023.03  1577.810023.57  1577.910023.96    1578
10024.85 1578.2110025.33 1578.3110026.14  1578.510026.22 1578.4710026.94 1578.43
10027.61 1578.3810031.17  1578.110031.91    157810031.92    157810043.46 1576.99
10048.52 1576.4210052.02  1577.310055.43 1577.6710056.74 1577.6710058.12 1577.77
10060.63 1577.8210061.52  1577.810062.15 1577.8310063.41 1577.8610068.96    1578
 10080.6 1578.3210081.17  1578.310084.37 1578.6410101.84 1578.4910107.51 1578.43
10113.85 1578.4510168.11  1579.110189.051579.30610202.67 1579.4410264.36 1579.44
10266.87 1579.4210269.61 1579.4210381.68  1579.210445.18 1579.61
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9397.07    .033 9889.86    .05510084.37    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9889.8610084.37               495  508.78     496             .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1579.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033	0.055	0.033
W.S. Elev (ft)	1579.07	Reach Len. (ft)	495.00	508.78	496.00
Crit W.S. (ft)	1578.65	Flow Area (sq ft)	26.64	248.60	32.19
E.G. Slope (ft/ft)	0.007960	Area (sq ft)	26.64	248.60	32.19
Q Total (cfs)	820.00	Flow (cfs)	46.44	703.73	69.83
Top Width (ft)	368.81	Top Width (ft)	93.20	194.51	81.10
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)	1.74	2.83	2.17
Max Chl Dpth (ft)	2.68	Hydr. Depth (ft)	0.29	1.28	0.40
Conv. Total (cfs)	9191.2	Conv. (cfs)	520.5	7888.0	782.7
Length Wtd. (ft)	506.09	Wetted Per. (ft)	93.20	195.32	81.11
Min Ch El (ft)	1576.39	Shear (lb/sq ft)	0.14	0.63	0.20
Alpha	1.05	Stream Power (lb/ft s)	0.25	1.79	0.43
Frctn Loss (ft)	2.49	Cum Volume (acre-ft)	24.32	34.31	15.52
C & E Loss (ft)	0.00	Cum SA (acres)	14.34	14.03	16.09

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1579.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.055	
W.S. Elev (ft)	1579.24	Reach Len. (ft)	495.00	508.78	496.00
Crit W.S. (ft)		Flow Area (sq ft)		281.01	
E.G. Slope (ft/ft)	0.007248	Area (sq ft)		281.01	

```
* Q Total (cfs)          *  820.00  * Flow (cfs)              *          *  820.00  *          *
* Top Width (ft)         *  194.51  * Top Width (ft)          *          *  194.51  *          *
* Vel Total (ft/s)       *    2.92  * Avg. Vel. (ft/s)        *          *    2.92  *          *
* Max Chl Dpth (ft)      *    2.84  * Hydr. Depth (ft)        *          *    1.44  *          *
* Conv. Total (cfs)      *  9631.7  * Conv. (cfs)             *          *  9631.7  *          *
* Length Wtd. (ft)       *  508.78  * Wetted Per. (ft)        *          *  196.65  *          *
* Min Ch El (ft)         * 1576.39  * Shear (lb/sq ft)        *          *    0.65  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    1.89  *          *
* Frctn Loss (ft)        *    2.12  * Cum Volume (acre-ft)    *    9.71  *   43.16  *    0.55  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    0.28  *   14.03  *    0.06  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9643.47   * 9889.86   *    46.44 *    26.64 *    93.20 *     5.66 *
0.29 *     1.74 *
* 2         * Chan      * 9889.86   * 10084.37  *   703.73 *   248.60 *   195.32 *    85.82 *
1.28 *     2.83 *
* 3         * ROB       * 10084.37  * 10264.78  *    69.83 *    32.19 *    81.11 *     8.52 *
0.40 *     2.17 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9889.86   * 10084.37  *   820.00 *   281.01 *   196.65 *   100.00 *
1.44 *     2.92 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S17
REACH: Reach-2            RS: 0.877

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,230cfs.
Interpolated point added at
             (10046.42,1575.006) to set bank station
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9301.93  1578.6 9324.67 1578.46 9333.23 1578.26 9397.56 1578.22 9475.79 1578.12
 9477.34  1578.1 9477.67 1578.11 9496.68    1578 9535.36 1577.77 9594.89 1577.49
```

```
  9611.5  1577.6 9659.32 1577.63  9717.6 1577.04  9794.9 1576.42 9818.48 1576.27
 9833.62  1576.1 9847.34    1576  9848.4 1575.99 9848.44 1575.99 9874.33 1575.55
 9897.43    1575 9901.99 1574.99 9902.95 1574.97 9906.04 1574.76 9906.45 1574.76
 9907.58 1574.76 9909.79  1574.8 9912.78 1574.76 9915.18 1574.64 9920.31 1574.36
 9923.81 1574.52 9929.24  1574.8 9932.79 1574.76 9951.95 1574.79  9960.2 1574.78
 9964.02 1574.77 9970.86  1574.8 9971.79 1574.77 9978.19 1574.77 9983.33  1574.5
 9988.46 1574.15 9990.07 1574.03 9991.05 1573.97 9993.41 1573.84 9996.35  1573.7
 9998.96 1573.5910000.11 1573.4610002.06 1573.7310003.61    157410004.96 1574.25
10008.14 1574.7610012.79 1574.7610015.28  1574.810038.62 1574.9110042.32 1574.92
10046.421575.00610059.91 1575.2910074.76 1575.6110095.61    157610098.25 1575.99
10104.84    157610106.29    157610123.731576.11610158.72 1576.3510184.08  1576.5
10200.56 1576.5410221.16  1576.610226.58 1576.62 10259.3  1576.710370.13 1576.73
10450.27 1577.1310466.62 1577.17 10537.1  1577.310575.57  1577.310623.57 1577.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9301.93    .031  9848.4    .04210095.61    .031

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9901.9910046.42               525  521.65     470              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1576.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.040  *   0.042  *   0.039  *
* W.S. Elev (ft)          * 1576.54  * Reach Len. (ft)         *  525.00  *  521.65  *  470.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   74.86  *  274.87  *   79.09  *
* E.G. Slope (ft/ft)      *0.003756  * Area (sq ft)            *   74.86  *  274.87  *   79.09  *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *  149.09  *  914.52  *  146.39  *
* Top Width (ft)          *  422.39  * Top Width (ft)          *  122.52  *  144.43  *  155.44  *
* Vel Total (ft/s)        *    2.82  * Avg. Vel. (ft/s)        *    1.99  *    3.33  *    1.85  *
* Max Chl Dpth (ft)       *    3.08  * Hydr. Depth (ft)        *    0.61  *    1.90  *    0.51  *
* Conv. Total (cfs)       * 19742.9  * Conv. (cfs)             *  2432.7  * 14921.7  *  2388.5  *
* Length Wtd. (ft)        *  508.24  * Wetted Per. (ft)        *  122.54  *  144.61  *  155.45  *
* Min Ch El (ft)          * 1573.46  * Shear (lb/sq ft)        *    0.14  *    0.45  *    0.12  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.29  *    1.48  *    0.22  *
* Frctn Loss (ft)         *    2.64  * Cum Volume (acre-ft)    *   23.74  *   31.25  *   14.89  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   13.12  *   12.05  *   14.74  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1577.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)          * 1577.06  * Reach Len. (ft)         *  525.00  *  521.65  *  470.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  348.97  *          *
* E.G. Slope (ft/ft)      *0.003081  * Area (sq ft)            *          *  348.97  *          *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *          * 1210.00  *          *
* Top Width (ft)          *  144.43  * Top Width (ft)          *          *  144.43  *          *
* Vel Total (ft/s)        *    3.47  * Avg. Vel. (ft/s)        *          *    3.47  *          *
* Max Chl Dpth (ft)       *    3.60  * Hydr. Depth (ft)        *          *    2.42  *          *
* Conv. Total (cfs)       * 21800.2  * Conv. (cfs)             *          * 21800.2  *          *
* Length Wtd. (ft)        *  521.65  * Wetted Per. (ft)        *          *  148.73  *          *
* Min Ch El (ft)          * 1573.46  * Shear (lb/sq ft)        *          *    0.45  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.56  *          *
* Frctn Loss (ft)         *    2.33  * Cum Volume (acre-ft)    *    9.71  *   39.48  *    0.55  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.28  *   12.05  *    0.06  *
*****************************************************************************************

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.

  Profile #1
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9601.96   * 9901.99   *   149.09 *    74.86 *   122.54 *    12.32 *
0.61 *     1.99 *
* 2         * Chan      * 9901.99   * 10046.42  *   914.52 *   274.87 *   144.61 *    75.58 *
1.90 *     3.33 *
* 3         * ROB       * 10046.42  * 10335.00  *   146.39 *    79.09 *   155.45 *    12.10 *
0.51 *     1.85 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9901.99   * 10046.42  *  1210.00 *   348.97 *   148.73 *   100.00 *
2.42 *     3.47 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S17
REACH: Reach-2            RS: 0.778

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9533.79  1574.6 9576.27 1574.63 9623.79 1574.33 9650.59 1574.15 9655.43 1574.11
 9660.74  1574.1  9682.8 1574.07 9722.54    1574 9722.72    1574 9768.27  1573.9
 9850.03 1573.42 9876.491573.255 9888.66 1573.18 9895.64 1573.15 9923.49  1572.9
 9926.82  1572.9 9960.47 1573.06 9964.19 1573.12 9965.87 1572.75  9967.5  1572.7
 9972.11 1572.12 9972.34    1572 9974.78 1571.51 9975.51 1571.26 9977.41  1571.1
 9983.71 1571.68 9984.52  1571.6 9984.96 1571.66 9986.93  1571.3 9989.74  1571.9
  9990.1    1572 9990.62 1572.17 9991.35 1572.36  9992.3  1572.2 9993.24    1572
 9997.07 1571.29 9997.45 1571.23 9998.08 1571.1610001.84  1571.810002.46 1571.92
10002.83    157210003.37 1572.0910006.09 1572.68   10030  1573.1   10039 1573.22
10042.91 1573.2810045.41  1573.310053.51 1573.5110067.97 1573.4110074.47 1573.35
10113.19 1573.0610148.99  1572.710162.87 1572.6710177.08 1572.8910190.22 1572.86
10231.13 1573.2410236.751573.28810249.96  1573.410261.78 1573.5310282.63 1573.71
10314.53    157410318.09 1574.0410370.01  1574.610474.93 1575.4910486.96 1575.51
10523.58 1575.46 10541.1 1575.54 10544.5  1575.510593.44 1575.4610684.43 1575.26
 10688.2 1575.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9533.79    .031 9850.03    .04210249.96    .031

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9895.64   10030              503  523.77     507              .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1574.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.038	0.042	0.042
W.S. Elev (ft)	1573.89	Reach Len. (ft)	503.00	523.77	507.00
Crit W.S. (ft)	1573.67	Flow Area (sq ft)	46.72	171.08	190.18
E.G. Slope (ft/ft)	0.007660	Area (sq ft)	46.72	171.08	190.18
Q Total (cfs)	1210.00	Flow (cfs)	92.29	620.30	497.41
Top Width (ft)	532.56	Top Width (ft)	125.73	134.36	272.47
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)	1.98	3.63	2.62
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)	0.37	1.27	0.70
Conv. Total (cfs)	13825.3	Conv. (cfs)	1054.5	7087.4	5683.3
Length Wtd. (ft)	515.11	Wetted Per. (ft)	125.73	135.02	272.49
Min Ch El (ft)	1571.10	Shear (lb/sq ft)	0.18	0.61	0.33
Alpha	1.12	Stream Power (lb/ft s)	0.35	2.20	0.87
Frctn Loss (ft)	2.84	Cum Volume (acre-ft)	23.01	28.58	13.44
C & E Loss (ft)	0.01	Cum SA (acres)	11.62	10.38	12.43

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1574.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.042	
W.S. Elev (ft)	1574.58	Reach Len. (ft)	503.00	523.77	507.00
Crit W.S. (ft)		Flow Area (sq ft)		264.09	
E.G. Slope (ft/ft)	0.007054	Area (sq ft)		264.09	
Q Total (cfs)	1210.00	Flow (cfs)		1210.00	
Top Width (ft)	134.36	Top Width (ft)		134.36	
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		4.58	
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)		1.97	
Conv. Total (cfs)	14406.6	Conv. (cfs)		14406.6	
Length Wtd. (ft)	523.62	Wetted Per. (ft)		137.93	
Min Ch El (ft)	1571.10	Shear (lb/sq ft)		0.84	
Alpha	1.00	Stream Power (lb/ft s)		3.86	
Frctn Loss (ft)	2.83	Cum Volume (acre-ft)	9.71	35.81	0.55
C & E Loss (ft)	0.03	Cum SA (acres)	0.28	10.38	0.06

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9714.72	9895.64	92.29	46.72	125.73	7.63	0.37	1.98
2	Chan	9895.64	10030.00	620.30	171.08	135.02	51.26	1.27	3.63
3	ROB	10030.00	10359.10	497.41	190.18	272.49	41.11	0.70	2.62

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)

```
* 1          * Chan       * 9895.64    * 10030.00  *  1210.00 *   264.09 *   137.93 *   100.00 *
1.97 *      4.58 *
*****************************************************************************************
******************
```

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: T4N-R3W-S17
REACH: Reach-2 RS: 0.679

INPUT
Description:
Station Elevation Data num= 74

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9661.55  1571.6 9706.79 1571.61 9718.54 1571.59 9730.33 1571.56  9739.7 1571.53
  9745.8  1571.5 9748.97 1571.49 9749.14  1571.5 9784.74 1571.06 9856.05 1570.27
 9858.94  1570.3 9868.52 1570.17 9887.48 1570.02 9929.831569.651 9947.11  1569.5
 9948.48  1569.5 9948.96 1569.49 9951.47 1569.49 9969.55  1569.6 9989.42 1569.63
 9989.98 1569.54 9993.25 1569.32 9999.04 1568.89   10000  1569.210003.28 1569.74
10003.37 1569.76   10012 1569.1710014.53 1569.0210015.09  1569.110015.15 1569.06
 10017.5 1569.3310024.71    157010025.16 1570.0310025.27    157010028.42 1570.01
10031.68    157010041.95    157010043.37 1569.9810049.56 1569.9710049.93 1569.97
10051.12 1569.9810059.86    157010077.97    157010113.93  1570.210114.43 1570.16
10116.63    157010123.04 1569.5510123.51 1569.5210124.49 1569.5710125.19  1569.6
10135.31 1569.8610135.34 1569.8510149.08 1569.9610151.66 1569.9910153.13    1570
10159.04    157010183.17 1570.2110201.641570.34910210.82  1570.410215.51 1570.47
10218.09  1570.510228.28 1570.63 10265.4 1570.88 10330.3  1571.410335.43 1571.41
10354.52 1571.4310423.79 1571.9210434.01    157210447.54  1572.110473.09 1572.28
10473.35  1572.310500.21 1572.4710551.93 1572.7510573.96  1572.8
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9661.55    .031 9868.52    .04210201.64    .031
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9887.4810024.71              464  497.24     522            .1        .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)          * 1571.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.035  *   0.042  *   0.041  *
* W.S. Elev (ft)          * 1571.09  * Reach Len. (ft)         *  464.00  *  497.24  *  522.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   59.28  *  203.14  *  218.69  *
* E.G. Slope (ft/ft)      *0.004146  * Area (sq ft)            *   59.28  *  203.14  *  218.69  *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *  118.25  *  600.42  *  491.33  *
* Top Width (ft)          *  508.43  * Top Width (ft)          *  104.82  *  137.23  *  266.38  *
* Vel Total (ft/s)        *    2.51  * Avg. Vel. (ft/s)        *    1.99  *    2.96  *    2.25  *
* Max Chl Dpth (ft)       *    2.20  * Hydr. Depth (ft)        *    0.57  *    1.48  *    0.82  *
* Conv. Total (cfs)       * 18792.9  * Conv. (cfs)             *  1836.6  *  9325.2  *  7631.0  *
* Length Wtd. (ft)        *  499.29  * Wetted Per. (ft)        *  104.83  *  137.45  *  266.42  *
* Min Ch El (ft)          * 1568.89  * Shear (lb/sq ft)        *    0.15  *    0.38  *    0.21  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    0.29  *    1.13  *    0.48  *
* Frctn Loss (ft)         *    2.80  * Cum Volume (acre-ft)    *   22.40  *   26.33  *   11.06  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   10.29  *    8.75  *    9.30  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)          * 1572.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *          *   0.042  *   0.042  *
* W.S. Elev (ft)          * 1571.83  * Reach Len. (ft)         *  464.00  *  497.24  *  522.00  *
* Crit W.S. (ft)          * 1570.93  * Flow Area (sq ft)       *          *  305.09  *    7.73  *
```

```
* E.G. Slope (ft/ft)      *0.004264  * Area (sq ft)            *          *  305.09  *    7.73  *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *          * 1189.03  *   20.97  *
* Top Width (ft)          *  141.47  * Top Width (ft)          *          *  137.23  *    4.24  *
* Vel Total (ft/s)        *    3.87  * Avg. Vel. (ft/s)        *          *    3.90  *    2.71  *
* Max Chl Dpth (ft)       *    2.94  * Hydr. Depth (ft)        *          *    2.22  *    1.82  *
* Conv. Total (cfs)       * 18529.0  * Conv. (cfs)             *          * 18207.9  *   321.1  *
* Length Wtd. (ft)        *  497.45  * Wetted Per. (ft)        *          *  139.26  *    6.07  *
* Min Ch El (ft)          * 1568.89  * Shear (lb/sq ft)        *          *    0.58  *    0.34  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *          *    2.27  *    0.92  *
* Frctn Loss (ft)         *    2.98  * Cum Volume (acre-ft)    *    9.71  *   32.38  *    0.51  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.28  *    8.75  *    0.03  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9774.52   * 9887.48   *   118.25 *    59.28 *   104.83 *     9.77 *
0.57 *     1.99 *
* 2         * Chan      * 9887.48   * 10024.71  *   600.42 *   203.14 *   137.45 *    49.62 *
1.48 *     2.96 *
* 3         * ROB       * 10024.71  * 10299.33  *   491.33 *   218.69 *   266.42 *    40.61 *
0.82 *     2.25 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9887.48   * 10024.71  *  1189.03 *   305.09 *   139.26 *    98.27 *
2.22 *     3.90 *
* 2         * ROB       * 10024.71  * 10299.33  *    20.97 *     7.73 *     6.07 *     1.73 *
1.82 *     2.71 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-2            RS: 0.585

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9111.75  1572.3 9139.75    1572 9208.61 1571.15 9219.98 1571.01 9226.78    1571
  9323.3 1570.19    9358 1569.92 9381.13 1569.78 9423.31  1569.7 9425.09 1569.72
 9494.83 1569.55 9508.36 1569.55 9548.25  1569.4 9549.75 1569.43 9598.11 1569.13
  9624.7    1569 9653.73 1568.78 9745.53  1568.3 9764.64 1568.12 9783.91    1568
```

```
  9835.4 1567.65 9842.52  1567.6  9875.2  1567.4 9885.82 1567.36 9888.531567.361
 9940.73 1567.39 9952.37  1567.5 9985.67 1567.05 9990.98    1567 9993.94  1566.8
 9996.39 1566.7810018.25 1566.7710024.07  1566.810037.11  1566.910042.59 1567.01
10059.38 1567.1810064.84 1567.2110065.55 1567.2110072.06  1567.210095.78  1567.2
10106.84 1567.3510109.36 1567.3610113.48 1566.7910116.44  1566.610122.75 1566.89
 10127.5 1567.2910141.58 1567.3410152.53 1567.4510154.83 1567.4610163.75  1567.5
10208.19 1567.7610211.23 1567.7810254.61    1568 10304.8  1568.310362.83 1568.52
10379.11 1568.6510480.38 1568.8810536.24 1568.7310551.47  1568.710558.92 1568.66
10571.96 1568.6610606.67  1568.5 10614.4 1568.3910619.97  1568.310629.83 1568.51
10630.38 1568.5210637.36 1568.5410710.57 1568.73   10730  1568.710846.64 1568.98
10859.98 1568.9510950.36  1568.310951.15  1568.310953.48 1568.3110955.35 1568.31
10985.95 1568.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9111.75    .031 9842.52    .04210163.75    .031

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.3710109.36               570  543.27     514              .1       .3
Right Levee     Station=10480.38      Elevation= 1568.88
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1568.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.040	0.042	0.038
W.S. Elev (ft)	1568.23	Reach Len. (ft)	570.00	543.27	514.00
Crit W.S. (ft)	1568.01	Flow Area (sq ft)	118.40	180.43	102.13
E.G. Slope (ft/ft)	0.008015	Area (sq ft)	118.40	180.43	102.13
Q Total (cfs)	1210.00	Flow (cfs)	305.14	627.00	277.86
Top Width (ft)	540.58	Top Width (ft)	199.59	156.99	184.00
Vel Total (ft/s)	3.02	Avg. Vel. (ft/s)	2.58	3.48	2.72
Max Chl Dpth (ft)	1.63	Hydr. Depth (ft)	0.59	1.15	0.56
Conv. Total (cfs)	13515.8	Conv. (cfs)	3408.4	7003.7	3103.7
Length Wtd. (ft)	547.79	Wetted Per. (ft)	199.59	157.00	184.08
Min Ch El (ft)	1566.77	Shear (lb/sq ft)	0.30	0.58	0.28
Alpha	1.06	Stream Power (lb/ft s)	0.76	2.00	0.76
Frctn Loss (ft)	2.76	Cum Volume (acre-ft)	21.45	24.14	9.14
C & E Loss (ft)	0.02	Cum SA (acres)	8.67	7.07	6.60

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1569.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.042	
W.S. Elev (ft)	1568.74	Reach Len. (ft)	570.00	543.27	514.00
Crit W.S. (ft)	1568.32	Flow Area (sq ft)		260.23	
E.G. Slope (ft/ft)	0.009002	Area (sq ft)		260.23	
Q Total (cfs)	1210.00	Flow (cfs)		1210.00	
Top Width (ft)	156.99	Top Width (ft)		156.99	
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)		4.65	
Max Chl Dpth (ft)	1.97	Hydr. Depth (ft)		1.66	
Conv. Total (cfs)	12752.9	Conv. (cfs)		12752.9	
Length Wtd. (ft)	544.40	Wetted Per. (ft)		159.62	
Min Ch El (ft)	1566.77	Shear (lb/sq ft)		0.92	
Alpha	1.00	Stream Power (lb/ft s)		4.26	
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)	9.71	29.16	0.46
C & E Loss (ft)	0.05	Cum SA (acres)	0.28	7.07	0.01

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

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9532.06   * 9952.37   *   305.14 *   118.40 *   199.59 *    25.22 *
0.59 *     2.58 *
* 2        * Chan      * 9952.37   * 10109.36  *   627.00 *   180.43 *   157.00 *    51.82 *
1.15 *     3.48 *
* 3        * ROB       * 10109.36  * 10480.38  *   277.86 *   102.13 *   184.08 *    22.96 *
0.56 *     2.72 *
*****************************************************************************************
******************

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

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9952.37   * 10109.36  *  1210.00 *   260.23 *   159.62 *   100.00 *
1.66 *     4.65 *
*****************************************************************************************
******************

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

CROSS SECTION


RIVER: T4N-R3W-S17
REACH: Reach-2            RS: 0.482

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8993.64  1568.8 9000.09 1568.87 9011.64 1568.98 9022.84 1568.88 9057.97  1568.6
  9079.5 1568.45 9121.96 1568.19  9148.6 1567.97 9148.88    1568 9163.31 1567.84
 9186.64 1567.73 9211.41 1567.56 9267.48 1566.96 9279.64    1567 9309.22 1566.92
 9358.07 1566.96 9421.02 1566.88 9431.58 1567.03 9448.56    1567 9455.57 1567.01
 9459.04 1566.98 9460.48 1566.98 9562.17 1566.34 9564.04  1566.3 9573.39 1566.23
 9596.16 1566.05 9601.22    1566 9624.45 1565.82  9656.7  1565.5 9666.06 1565.47
  9673.2 1565.42 9689.16 1565.25 9795.291564.343 9804.98 1564.26 9817.67  1564.2
 9923.88  1564.4 9926.91 1564.41  9931.8 1564.36  9963.8    1564 9983.33  1563.8
 9991.56 1563.6610008.99 1563.9410012.11    156410013.53 1564.0210021.42  1564.1
10030.54 1564.2410034.18 1564.2210037.65 1564.2110042.85 1564.1910043.79  1564.2
10044.21 1564.1710044.29 1564.1710072.69 1564.4310092.65 1564.6510101.14  1564.7
```

```
10103.51 1564.7310128.811564.94410226.71 1565.7710226.93 1565.7710233.82 1565.85
   10258 1566.1210308.98 1566.4510316.92 1566.45

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8993.64     .031 9795.29     .04210072.69     .031

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9926.9110072.69              497  529.98     514              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1565.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.039  *   0.042  *   0.031  *
* W.S. Elev (ft)          * 1565.52  * Reach Len. (ft)         *  497.00  *  529.98  *  514.00  *
* Crit W.S. (ft)          * 1565.00  * Flow Area (sq ft)       *  241.79  *  208.26  *   65.60  *
* E.G. Slope (ft/ft)      *0.003453  * Area (sq ft)            *  241.79  *  208.26  *   65.60  *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *  540.22  *  549.18  *  120.61  *
* Top Width (ft)          *  542.43  * Top Width (ft)           *  272.24  *  145.78  *  124.41  *
* Vel Total (ft/s)        *    2.35  * Avg. Vel. (ft/s)         *    2.23  *    2.64  *    1.84  *
* Max Chl Dpth (ft)       *    1.86  * Hydr. Depth (ft)         *    0.89  *    1.43  *    0.53  *
* Conv. Total (cfs)       * 20591.0  * Conv. (cfs)              *  9193.0  *  9345.6  *  2052.4  *
* Length Wtd. (ft)        *  516.90  * Wetted Per. (ft)         *  272.25  *  145.79  *  124.41  *
* Min Ch El (ft)          * 1563.66  * Shear (lb/sq ft)         *    0.19  *    0.31  *    0.11  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)   *    0.43  *    0.81  *    0.21  *
* Frctn Loss (ft)         *    3.13  * Cum Volume (acre-ft)     *   19.09  *   21.72  *    8.15  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *    5.58  *    5.18  *    4.78  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1566.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.042  *   0.042  *          *
* W.S. Elev (ft)          * 1566.47  * Reach Len. (ft)         *  497.00  *  529.98  *  514.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   37.46  *  347.07  *          *
* E.G. Slope (ft/ft)      *0.002607  * Area (sq ft)            *   37.46  *  347.07  *          *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *  102.53  * 1107.47  *          *
* Top Width (ft)          *  163.76  * Top Width (ft)           *   17.98  *  145.78  *          *
* Vel Total (ft/s)        *    3.15  * Avg. Vel. (ft/s)         *    2.74  *    3.19  *          *
* Max Chl Dpth (ft)       *    2.81  * Hydr. Depth (ft)         *    2.08  *    2.38  *          *
* Conv. Total (cfs)       * 23697.5  * Conv. (cfs)              *  2008.0  * 21689.6  *          *
* Length Wtd. (ft)        *  528.78  * Wetted Per. (ft)         *   20.08  *  147.83  *          *
* Min Ch El (ft)          * 1563.66  * Shear (lb/sq ft)         *    0.30  *    0.38  *          *
* Alpha                   *    1.01  * Stream Power (lb/ft s)   *    0.83  *    1.22  *          *
* Frctn Loss (ft)         *    3.08  * Cum Volume (acre-ft)     *    9.46  *   25.37  *    0.46  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)           *    0.16  *    5.18  *    0.01  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9460.28   * 9926.91   *   540.22 *   241.79 *   272.25 *    44.65 *
0.89 *     2.23 *
* 2        * Chan      * 9926.91   * 10072.69  *   549.18 *   208.26 *   145.79 *    45.39 *
1.43 *     2.64 *
```

```
* 3          * ROB       * 10072.69  * 10194.80  *   120.60 *    65.58 *   122.12 *     9.97 *
0.54 *     1.84 *
* 4          * ROB       * 10194.80  * 10316.92  *     0.00 *     0.02 *     2.29 *     0.00 *
0.01 *     0.13 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9460.28   * 9926.91   *   102.53 *    37.46 *    20.08 *     8.47 *
2.08 *     2.74 *
* 2          * Chan      * 9926.91   * 10072.69  *  1107.47 *   347.07 *   147.83 *    91.53 *
2.38 *     3.19 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-2            RS: 0.382

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,600cfs.
Interpolated point added at
             (9941.43,1560.734) to set bank station
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9109.71  1565.8 9128.15  1565.8 9286.49 1565.06 9314.83  1564.6 9361.08 1564.35
 9397.21 1564.24 9403.29 1564.21  9412.4 1564.16 9412.71  1564.1 9424.84 1564.11
 9459.77    1564 9459.98    1564 9477.94  1563.9 9490.27  1563.9 9497.89 1563.88
 9498.89 1563.86 9555.49 1563.44 9585.03  1563.3 9594.97 1563.15 9619.24 1563.06
 9656.62 1563.05 9659.37 1563.01 9663.82  1563.1 9739.27 1563.41 9748.96 1563.26
  9784.6  1562.5 9796.95 1562.34 9829.81    1562 9832.65    1562 9843.01 1561.86
 9846.92 1561.74 9907.06 1561.07 9911.361561.032 9926.31  1560.9 9941.431560.734
  9984.4 1560.2610002.27 1560.25   10010 1560.5410022.52 1560.1910029.32  1560.1
10036.32 1560.6310036.78 1560.6610037.14  1560.710038.96 1560.7210108.33  1561.3
 10124.4 1561.48 10125.91561.49910147.04 1561.7610197.27 1562.3910296.11  1563.1
10321.39 1563.3610326.44 1563.2710334.46 1563.0710344.15 1563.48 10347.2  1563.5
 10370.8 1563.3110412.74 1563.7410424.53 1563.88   10425 1563.8910425.25  1563.9
10425.28 1563.89 10425.6 1563.8910426.97 1563.8810427.25 1563.8910461.81  1563.7
10480.36 1563.5410482.43 1563.5210484.15 1563.5210492.37 1563.5510499.97  1563.6
10517.59  1563.610537.19 1563.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9109.71    .031 9907.06    .04210108.33    .031

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.4310038.96              499  516.44     493             .1       .3

CROSS SECTION OUTPUT  Profile #1
```

E.G. Elev (ft)	1562.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.037	0.042	0.040
W.S. Elev (ft)	1562.13	Reach Len. (ft)	499.00	516.44	493.00
Crit W.S. (ft)	1561.95	Flow Area (sq ft)	89.71	168.57	106.22
E.G. Slope (ft/ft)	0.010639	Area (sq ft)	89.71	168.57	106.22
Q Total (cfs)	1600.00	Flow (cfs)	329.90	885.69	384.41
Top Width (ft)	358.82	Top Width (ft)	123.93	97.53	137.37
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	3.68	5.25	3.62
Max Chl Dpth (ft)	2.03	Hydr. Depth (ft)	0.72	1.73	0.77
Conv. Total (cfs)	15512.1	Conv. (cfs)	3198.4	8586.8	3726.9
Length Wtd. (ft)	509.11	Wetted Per. (ft)	123.93	97.57	137.37
Min Ch El (ft)	1560.10	Shear (lb/sq ft)	0.48	1.15	0.51
Alpha	1.10	Stream Power (lb/ft s)	1.77	6.03	1.86
Frctn Loss (ft)	3.27	Cum Volume (acre-ft)	17.20	19.43	7.13
C & E Loss (ft)	0.04	Cum SA (acres)	3.32	3.70	3.23

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1563.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.		0.042	
W.S. Elev (ft)	1562.67	Reach Len. (ft)	499.00	516.44	493.00
Crit W.S. (ft)	1562.42	Flow Area (sq ft)		221.08	
E.G. Slope (ft/ft)	0.014809	Area (sq ft)		221.08	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	97.53	Top Width (ft)		97.53	
Vel Total (ft/s)	7.24	Avg. Vel. (ft/s)		7.24	
Max Chl Dpth (ft)	2.57	Hydr. Depth (ft)		2.27	
Conv. Total (cfs)	13147.7	Conv. (cfs)		13147.7	
Length Wtd. (ft)	516.44	Wetted Per. (ft)		101.44	
Min Ch El (ft)	1560.10	Shear (lb/sq ft)		2.01	
Alpha	1.00	Stream Power (lb/ft s)		14.58	
Frctn Loss (ft)	3.59	Cum Volume (acre-ft)	9.25	21.91	0.46
C & E Loss (ft)	0.16	Cum SA (acres)	0.06	3.70	0.01

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.
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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9525.57	9941.43	329.90	89.71	123.93	20.62	0.72	3.68
2	Chan	9941.43	10038.96	885.69	168.57	97.57	55.36	1.73	5.25
3	ROB	10038.96	10288.08	384.41	106.22	137.37	24.03	0.77	3.62

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9941.43   * 10038.96  *  1600.00 *   221.08 *   101.44 *   100.00 *
2.27 *     7.24 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S17
REACH: Reach-2            RS: 0.284

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data    num=     133
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9176.64  1562.6  9182.5  1562.5 9201.29 1562.27 9247.06 1562.14 9261.38 1562.12
 9295.19  1562.1 9308.33  1562.1 9314.18 1562.09 9324.43  1562.1 9328.57 1562.09
 9335.18  1562.1 9343.07 1562.06 9355.99    1562 9375.37 1561.92 9400.22  1561.9
 9409.09 1561.86 9410.02 1561.85 9411.08 1561.85 9432.15  1561.6 9459.01 1561.27
 9464.96 1561.24 9507.94 1560.79  9555.2 1560.38 9570.96  1560.2 9573.29 1560.24
 9586.08 1560.16 9604.99 1560.05 9612.62    1560 9616.75    1560 9618.35 1559.96
 9653.04 1559.94 9655.59 1559.92 9658.92 1559.88 9659.55  1559.9 9660.53 1559.86
 9662.31 1559.83 9683.88 1559.51 9692.29 1559.43 9749.38    1559 9758.49 1559.02
 9761.98 1559.03 9770.89 1559.07 9792.27 1559.13 9796.16  1559.1 9835.96 1558.81
 9849.24 1558.56 9857.88  1558.3  9866.8 1558.01 9867.23    1558 9867.27    1558
 9875.62  1557.8    9895 1557.38 9895.85 1557.38 9897.43  1557.4 9905.38 1557.19
 9906.031557.171 9913.13 1556.96  9914.2 1556.94 9915.75  1556.9    9918  1556.9
 9919.22 1556.88 9950.18 1557.04  9955.3 1557.08 9967.68 1557.12 9969.82  1556.2
 9970.59    1556 9970.96 1555.78 9971.48 1555.58  9973.3 1555.98 9973.34    1556
 9974.32  1556.2  9976.8 1556.85 9983.53 1556.81 9984.77 1556.78 9985.16  1556.8
 9985.65 1556.76 9994.17 1556.47  9994.7 1556.25 9995.18    1556 9996.64  1555.4
 9998.45  1554.710000.42 1555.2510001.69 1555.5310003.37    155610006.42  1556.7
10006.58 1556.7810015.16 1556.8810045.09 1557.2210047.28 1557.2410048.99  1557.3
 10050.4 1557.2910086.09  1557.910087.33 1557.9210094.27 1557.9810094.73    1558
10094.89 1557.9910095.17 1557.9910098.02    155810102.51 1558.02 10106.7  1558.1
10116.52 1558.1910118.681558.22110148.36 1558.6510181.96 1559.0110201.77 1559.33
10214.75  1559.510239.02 1560.0710244.79  1560.210247.83 1560.04 10251.2 1559.92
10252.22    156010252.82 1559.9910253.22    156010258.81  1560.210261.48 1560.34
10286.12  1560.410310.11 1560.5310319.12 1560.5510319.16 1560.5510372.05 1561.04
10391.08  1561.210393.58 1561.3610394.95 1561.3610448.31 1561.4110486.79 1561.39
10506.12  1561.410515.28 1561.2610535.71 1561.79   10537 1561.8610538.41 1561.85
10540.47  1561.810548.87 1561.7510558.87 1561.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9176.64    .031 9875.62    .04210087.33    .031

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9905.38 10050.4               511  515.32     494             .1       .3
Left Levee      Station= 9792.27      Elevation= 1559.13

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1559.15  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.19	Wt. n-Val.	0.039	0.042	0.037	
W.S. Elev (ft)	1558.95	Reach Len. (ft)	511.00	515.32	494.00	
Crit W.S. (ft)	1558.33	Flow Area (sq ft)	69.22	309.45	97.45	
E.G. Slope (ft/ft)	0.004303	Area (sq ft)	69.22	309.45	97.45	
Q Total (cfs)	1600.00	Flow (cfs)	176.14	1184.29	239.58	
Top Width (ft)	360.25	Top Width (ft)	89.01	145.02	126.22	
Vel Total (ft/s)	3.36	Avg. Vel. (ft/s)	2.54	3.83	2.46	
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)	0.78	2.13	0.77	
Conv. Total (cfs)	24391.3	Conv. (cfs)	2685.2	18053.9	3652.2	
Length Wtd. (ft)	511.25	Wetted Per. (ft)	89.03	146.12	126.23	
Min Ch El (ft)	1554.70	Shear (lb/sq ft)	0.21	0.57	0.21	
Alpha	1.10	Stream Power (lb/ft s)	0.53	2.18	0.51	
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	16.29	16.59	5.98	
C & E Loss (ft)	0.01	Cum SA (acres)	2.10	2.27	1.74	

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 OUTPUT Profile #2

			Left OB	Channel	Right OB
E.G. Elev (ft)	1559.72	Element			
Vel Head (ft)	0.27	Wt. n-Val.	0.042	0.042	
W.S. Elev (ft)	1559.44	Reach Len. (ft)	511.00	515.32	494.00
Crit W.S. (ft)	1558.38	Flow Area (sq ft)	0.09	380.31	
E.G. Slope (ft/ft)	0.004028	Area (sq ft)	0.09	380.31	
Q Total (cfs)	1600.00	Flow (cfs)	0.02	1599.98	
Top Width (ft)	145.06	Top Width (ft)	0.04	145.02	
Vel Total (ft/s)	4.21	Avg. Vel. (ft/s)	0.26	4.21	
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)	2.25	2.62	
Conv. Total (cfs)	25211.6	Conv. (cfs)	0.4	25211.2	
Length Wtd. (ft)	515.32	Wetted Per. (ft)	2.29	148.28	
Min Ch El (ft)	1554.70	Shear (lb/sq ft)	0.01	0.64	
Alpha	1.00	Stream Power (lb/ft s)	0.00	2.71	
Frctn Loss (ft)	2.62	Cum Volume (acre-ft)	9.25	18.35	0.46
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	2.27	0.01

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9792.27	9905.38	176.14	69.22	89.03	11.01	0.78	2.54
2	Chan	9905.38	10050.40	1184.29	309.45	146.12	74.02	2.13	3.83
3	ROB	10050.40	10304.63	239.58	97.45	126.23	14.97	0.77	2.46

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.

Profile #2

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9792.27   * 9905.38   *     0.02 *     0.09 *     2.29 *     0.00 *
2.25 *     0.26 *
* 2         * Chan      * 9905.38   * 10050.40  *  1599.98 *   380.31 *   148.28 *   100.00 *
2.62 *     4.21 *
*****************************************************************************************
******************

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: T4N-R3W-S17
REACH: Reach-2            RS: 0.186

INPUT
Description:
Station Elevation Data    num=     119
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9256.25  1559.5 9283.34 1559.32 9340.26 1559.11 9342.81 1559.09 9361.55  1559.2
 9391.85 1559.28 9393.94 1559.29 9396.32 1559.28 9398.72 1559.24 9419.87  1558.9
 9437.11 1558.97 9443.98 1558.98 9451.28 1558.96 9474.14 1558.86 9475.75  1558.8
 9500.18 1558.35 9524.48 1558.27 9539.13 1558.14 9561.62    1558 9566.36    1558
 9584.19 1557.65 9587.94  1557.6 9596.42 1557.59 9596.81 1557.59 9598.71 1557.57
 9613.28 1557.45  9623.5  1557.5 9647.53 1557.63 9649.52 1557.58 9677.22  1556.6
 9684.47 1556.55 9690.38  1556.5  9711.2 1556.47 9727.26 1556.46 9748.05  1556.3
 9760.99 1556.18 9771.79  1556.1 9778.34 1556.01 9779.58    1556  9793.2 1555.85
 9793.75 1555.84 9795.64  1555.8 9798.46 1555.81 9809.22 1555.74 9841.01 1555.42
 9841.26 1555.42  9841.4  1555.4 9841.59 1555.42 9881.651554.996 9891.71 1554.89
 9913.66 1554.64 9921.37 1554.54 9928.78  1554.4 9947.82  1554.2 9956.37 1554.18
 9993.94 1554.1310023.13 1554.0710028.84  1554.110047.63 1554.1110053.08  1554.1
10053.23 1554.1110070.91 1554.4110074.88 1554.4910077.49  1554.510099.33 1554.61
10112.521554.86810140.19 1555.41 10167.2    155610173.01  1556.110258.98  1557.2
 10267.9 1557.3210313.88 1557.6810339.68 1557.7910345.55 1557.8210352.64  1557.9
10360.36 1557.8810380.25  1557.910380.26  1557.910400.64    1558 10402.2    1558
10407.75 1558.0410407.84 1558.0410408.05    155810416.86    155710416.94    1557
10417.22 1556.9810417.59 1557.0210423.28 1557.3910424.99 1557.4910425.55  1557.5
 10429.4 1557.7310429.59 1557.7510429.71 1557.7610429.83 1557.7510429.87  1557.8
10432.33 1557.5910432.95 1557.4610433.37 1557.3710436.49  1556.4 10438.1  1556.7
10441.72 1557.0210447.48 1557.0710448.02 1557.0710448.29 1557.0810455.41  1557.3
10470.15 1557.3410478.32 1557.2810485.98 1557.8510488.23    155810489.79  1558.1
10490.35 1558.1510491.56 1558.1810494.32 1558.2210494.66 1558.2210495.12  1558.2
10495.87 1558.2210497.23  1558.2 10499.7 1558.1610503.63 1558.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9256.25    .033 9891.71    .05810112.52    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9921.3710074.88               177  176.78     176              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1556.27  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.16  * Wt. n-Val.              *   0.042  *   0.058  *   0.048  *
* W.S. Elev (ft)         * 1556.10  * Reach Len. (ft)         *  177.00  *  176.78  *  176.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  113.42  *  293.77  *   93.68  *
* E.G. Slope (ft/ft)     *0.007616  * Area (sq ft)            *  113.42  *  293.77  *   93.68  *
* Q Total (cfs)          * 1600.00  * Flow (cfs)              *  316.68  * 1012.40  *  270.92  *
```

Top Width (ft)	401.77	Top Width (ft)	149.93	153.51	98.33
Vel Total (ft/s)	3.19	Avg. Vel. (ft/s)	2.79	3.45	2.89
Max Chl Dpth (ft)	2.03	Hydr. Depth (ft)	0.76	1.91	0.95
Conv. Total (cfs)	18333.4	Conv. (cfs)	3628.6	11600.5	3104.3
Length Wtd. (ft)	176.70	Wetted Per. (ft)	149.94	153.52	98.35
Min Ch El (ft)	1554.07	Shear (lb/sq ft)	0.36	0.91	0.45
Alpha	1.03	Stream Power (lb/ft s)	1.00	3.14	1.31
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	15.22	13.03	4.90
C & E Loss (ft)	0.02	Cum SA (acres)	0.70	0.50	0.47

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 OUTPUT Profile #2

E.G. Elev (ft)	1557.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.058	
W.S. Elev (ft)	1556.85	Reach Len. (ft)	177.00	176.78	176.00
Crit W.S. (ft)		Flow Area (sq ft)		408.62	
E.G. Slope (ft/ft)	0.006591	Area (sq ft)		408.62	
Q Total (cfs)	1600.00	Flow (cfs)		1600.00	
Top Width (ft)	153.51	Top Width (ft)		153.51	
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)		3.92	
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)		2.66	
Conv. Total (cfs)	19708.5	Conv. (cfs)		19708.5	
Length Wtd. (ft)	176.79	Wetted Per. (ft)		158.19	
Min Ch El (ft)	1554.07	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		4.16	
Frctn Loss (ft)	1.18	Cum Volume (acre-ft)	9.25	13.68	0.46
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	0.50	0.01

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9588.81	9921.37	316.68	113.42	149.94	19.79	0.76	2.79
2	Chan	9921.37	10074.88	1012.40	293.77	153.52	63.28	1.91	3.45
3	ROB	10074.88	10289.25	270.92	93.68	98.35	16.93	0.95	2.89

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9921.37	10074.88	1600.00	408.62	158.19	100.00	2.66	3.92

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: T4N-R3W-S17
REACH: Reach-2 RS: 0.153

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9544.63	1557.3	9552.46	1557.18	9553.98	1557.15	9556.54	1557.15	9579.35	1557.15
9585.4	1557.2	9588.28	1557.15	9602.46	1557.03	9619.93	1556.89	9621.96	1556.88
9624.22	1556.8	9624.92	1556.84	9635.73	1556.74	9678.18	1556.41	9695.67	1556.33
9699.48	1556.3	9700.6	1556.3	9703.79	1556.27	9728.59	1556.07	9729.03	1556.06
9734.02	1556	9758.11	1555.78	9760.8	1555.75	9768.63	1555.66	9790.89	1555.19
9808.64	1555	9814.17	1554.85	9824.25	1554.8	9839.6	1554.55	9871.29	1554.06
9874.71	1554	9875.35	1554	9875.71	1554	9877.2	1553.97	9879.2	1553.96
9881.03	1553.9	9883.06	1553.93	9886.43	1553.9	9921.92	1553.39	9926.8	1553.34
9926.8	1553.3	9937.5	1553.16	9947.04	1552.99	9963.09	1552.72	9975.11	1552.87
9988.21	1552.8	9999.62	1552.64	10011.55	1552.41	10017.84	1552.28	10024.21	1552.29
10033.5	1552.41	10043.28	1552.44	10051.86	1552.53	10068.05	1552.76	10077.72	1553.11
10092.33	1553.61	10106.83	1553.81	10113.83	1553.93	10118.2	1554	10138.63	1554.34
10139.7	1554.41	10147.18	1554.49	10152.07	1554.58	10176.84	1555	10210.27	1555.56
10236.99	1556	10241.08	1556.05	10275.41	1556.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9544.63	.033	9886.43	.058	10113.83	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.11	10068.05	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1555.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.051	0.058	0.048
W.S. Elev (ft)	1555.41	Reach Len. (ft)	807.84	807.84	807.84
Crit W.S. (ft)		Flow Area (sq ft)	274.33	265.75	154.18
E.G. Slope (ft/ft)	0.002659	Area (sq ft)	274.33	265.75	154.18
Q Total (cfs)	1600.00	Flow (cfs)	585.29	707.18	307.52
Top Width (ft)	420.91	Top Width (ft)	194.67	92.94	133.30
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	2.13	2.66	1.99
Max Chl Dpth (ft)	3.13	Hydr. Depth (ft)	1.41	2.86	1.16
Conv. Total (cfs)	31031.3	Conv. (cfs)	11351.5	13715.5	5964.3
Length Wtd. (ft)	807.84	Wetted Per. (ft)	194.73	92.95	133.33
Min Ch El (ft)	1552.28	Shear (lb/sq ft)	0.23	0.47	0.19
Alpha	1.05	Stream Power (lb/ft s)	0.50	1.26	0.38
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	14.43	11.89	4.40
C & E Loss (ft)	0.02	Cum SA (acres)			

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1555.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.058	0.058	0.058
W.S. Elev (ft)	1555.62	Reach Len. (ft)	807.84	807.84	807.84
Crit W.S. (ft)		Flow Area (sq ft)	78.23	284.86	10.13
E.G. Slope (ft/ft)	0.006739	Area (sq ft)	78.23	284.86	10.13
Q Total (cfs)	1600.00	Flow (cfs)	306.94	1264.00	29.06
Top Width (ft)	124.64	Top Width (ft)	28.07	92.94	3.63
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)	3.92	4.44	2.87
Max Chl Dpth (ft)	3.34	Hydr. Depth (ft)	2.79	3.07	2.79
Conv. Total (cfs)	19491.0	Conv. (cfs)	3739.1	15397.9	354.0
Length Wtd. (ft)	807.84	Wetted Per. (ft)	30.70	92.95	6.36
Min Ch El (ft)	1552.28	Shear (lb/sq ft)	1.07	1.29	0.67
Alpha	1.02	Stream Power (lb/ft s)	4.21	5.72	1.92
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	9.09	12.28	0.44
C & E Loss (ft)	0.08	Cum SA (acres)			

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9759.87	9975.11	585.29	274.33	194.73	36.58	1.41	2.13
2	Chan	9975.11	10068.05	707.18	265.75	92.95	44.20	2.86	2.66
3	ROB	10068.05	10171.73	301.12	146.83	103.71	18.82	1.42	2.05
4	ROB	10171.73	10275.41	6.40	7.35	29.62	0.40	0.25	0.87

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9759.87	9975.11	306.94	78.23	30.70	19.18	2.79	3.92
2	Chan	9975.11	10068.05	1264.00	284.86	92.95	79.00	3.07	4.44
3	ROB	10068.05	10171.73	29.06	10.13	6.36	1.82	2.79	2.87

CROSS SECTION

RIVER: T4N-R3W-S18E
REACH: Reach-1 RS: 4.247

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Flow rate
starting at this cross-section is 280cfs
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9777.96	1698.4	9784.57	1698.31	9807.32	1698	9807.5	1698	9820.2	1697.8
9821.05	1697.8	9844.65	1697.63	9881.31	1697.47	9910.67	1696.94	9926.57	1696.62
9938.96	1696.4	9942.11	1696.41	9967.38	1696.12	9968.37	1696.12	9969.21	1696.1
9969.76	1696.1	9978.71	1696.12	10002.1	1696.15	10007.42	1696.23	10019.53	1696.21
10021.71	1696.2	10022.55	1696.22	10024.14	1696.24	10024.87	1696.26	10030.65	1696.37
10065.11	1696.5	10088.55	1696.18	10100.9	1696.34	10101.02	1696.39	10106.46	1696.39
10140.76	1696.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9777.96	.033	9942.11	.058	10030.65	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.11	10030.65	601	599.33	486	.1	.3

CROSS SECTION OUTPUT Profile #1

*		*		*		*		*	
E.G. Elev (ft)	1696.65	Element		Left OB		Channel		Right OB	
Vel Head (ft)	0.09	Wt. n-Val.		0.033		0.058		0.033	
W.S. Elev (ft)	1696.57	Reach Len. (ft)		601.00		599.33		486.00	
Crit W.S. (ft)	1696.54	Flow Area (sq ft)		1.27		32.25		16.99	
E.G. Slope (ft/ft)	0.032871	Area (sq ft)		1.27		32.25		16.99	
Q Total (cfs)	120.00	Flow (cfs)		2.26		76.39		41.35	

Top Width (ft)	205.37	Top Width (ft)	12.44	88.54	104.39	
Vel Total (ft/s)	2.38	Avg. Vel. (ft/s)	1.78	2.37	2.43	
Max Chl Dpth (ft)	0.46	Hydr. Depth (ft)	0.10	0.36	0.16	
Conv. Total (cfs)	661.9	Conv. (cfs)	12.5	421.3	228.1	
Length Wtd. (ft)	565.23	Wetted Per. (ft)	12.44	88.54	104.40	
Min Ch El (ft)	1696.10	Shear (lb/sq ft)	0.21	0.75	0.33	
Alpha	1.00	Stream Power (lb/ft s)	0.37	1.77	0.81	
Frctn Loss (ft)	3.93	Cum Volume (acre-ft)	15.42	27.88	14.11	
C & E Loss (ft)	0.02	Cum SA (acres)	46.40	42.26	42.25	

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1696.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.058	
W.S. Elev (ft)	1696.89	Reach Len. (ft)	601.00	599.33	486.00
Crit W.S. (ft)		Flow Area (sq ft)		60.96	
E.G. Slope (ft/ft)	0.009855	Area (sq ft)		60.96	
Q Total (cfs)	120.00	Flow (cfs)		120.00	
Top Width (ft)	88.54	Top Width (ft)		88.54	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	0.79	Hydr. Depth (ft)		0.69	
Conv. Total (cfs)	1208.8	Conv. (cfs)		1208.8	
Length Wtd. (ft)	599.33	Wetted Per. (ft)		89.54	
Min Ch El (ft)	1696.10	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		0.82	
Frctn Loss (ft)	4.18	Cum Volume (acre-ft)	2.21	38.10	1.93
C & E Loss (ft)	0.00	Cum SA (acres)	4.02	42.43	4.26

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9860.04	9942.11	2.26	1.27	12.44	1.89	0.10	1.78
2	Chan	9942.11	10030.65	76.39	32.25	88.54	63.66	0.36	2.37
3	ROB	10030.65	10085.71	20.79	8.71	55.06	17.32	0.16	2.39
4	ROB	10085.71	10140.76	20.56	8.28	49.34	17.13	0.17	2.48

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.
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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9942.11	10030.65	120.00	60.96	89.54	100.00	0.69	1.97

****
****

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: T4N-R3W-S18E
REACH: Reach-1 RS: 4.135

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9854.88	1693.7	9872.26	1693.67	9892.69	1693.62	9919.13	1693.26	9933.56	1693.05
9946.15	1692.8	9967.43	1692.29	9974.55	1692.14	9980.38	1692.01	9980.94	1691.98
9982.97	1692	9986.54	1692.01	9989.58	1692.02	10000.14	1692.05	10006.35	1692.07
10023.52	1692.21	10024.92	1692.17	10029.12	1692.21	10030.68	1692.19	10070.87	1692.19
10081.17	1692.11	10081.98	1692.12	10106.8	1692.26	10109.04	1692.27	10111.02	1692.28
10112.21	1692.31	10131.37	1692.81	10148.56	1692.93	10149.17	1692.93	10160.54	1693.11
10160.79	1693.11	10160.81	1693.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9854.88	.033	9967.43	.033	10112.21	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9974.55	10070.87	403	401.56	320	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1692.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	1692.66	Reach Len. (ft)	403.00	401.56	320.00
Crit W.S. (ft)	1692.43	Flow Area (sq ft)	6.08	51.30	22.07
E.G. Slope (ft/ft)	0.002931	Area (sq ft)	6.08	51.30	22.07
Q Total (cfs)	120.00	Flow (cfs)	6.84	82.17	30.99
Top Width (ft)	173.94	Top Width (ft)	22.66	96.32	54.96
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	1.13	1.60	1.40
Max Chl Dpth (ft)	0.68	Hydr. Depth (ft)	0.27	0.53	0.40
Conv. Total (cfs)	2216.4	Conv. (cfs)	126.4	1517.6	572.4
Length Wtd. (ft)	373.59	Wetted Per. (ft)	22.67	96.32	54.96
Min Ch El (ft)	1691.98	Shear (lb/sq ft)	0.05	0.10	0.07
Alpha	1.02	Stream Power (lb/ft s)	0.06	0.16	0.10
Frctn Loss (ft)	2.82	Cum Volume (acre-ft)	15.37	27.31	13.89
C & E Loss (ft)	0.01	Cum SA (acres)	46.16	40.98	41.36

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1692.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	1692.70	Reach Len. (ft)	403.00	401.56	320.00
Crit W.S. (ft)	1692.49	Flow Area (sq ft)		54.46	
E.G. Slope (ft/ft)	0.005197	Area (sq ft)		54.46	
Q Total (cfs)	120.00	Flow (cfs)		120.00	
Top Width (ft)	96.32	Top Width (ft)		96.32	
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)		2.20	
Max Chl Dpth (ft)	0.72	Hydr. Depth (ft)		0.57	
Conv. Total (cfs)	1664.6	Conv. (cfs)		1664.6	
Length Wtd. (ft)	401.56	Wetted Per. (ft)		97.38	
Min Ch El (ft)	1691.98	Shear (lb/sq ft)		0.18	

```
* Alpha                    *    1.00  * Stream Power (lb/ft s) *          *    0.40  *          *
* Frctn Loss (ft)          *    2.55  * Cum Volume (acre-ft)   *    2.21  *   37.31  *    1.93  *
* C & E Loss (ft)          *    0.01  * Cum SA (acres)         *    4.02  *   41.16  *    4.26  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9914.72   * 9974.55   *     6.84 *     6.08 *    22.67 *     5.70 *
0.27 *     1.13 *
* 2         * Chan      * 9974.55   * 10070.87  *    82.17 *    51.30 *    96.32 *    68.47 *
0.53 *     1.60 *
* 3         * ROB       * 10070.87  * 10115.84  *    30.15 *    20.75 *    44.97 *    25.12 *
0.46 *     1.45 *
* 4         * ROB       * 10115.84  * 10160.81  *     0.84 *     1.33 *     9.99 *     0.70 *
0.13 *     0.63 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9974.55   * 10070.87  *   120.00 *    54.46 *    97.38 *   100.00 *
0.57 *     2.20 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 4.059

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9891.33  1691.1 9899.95 1690.88 9935.04 1690.04 9936.75 1690.02 9937.64    1690
 9951.05  1689.8 9959.33 1689.61 9967.05 1689.49 9982.54 1689.3610013.61 1689.44
10019.88  1689.410024.16 1689.4410058.56 1689.6710069.39 1689.6710107.41  1689.4
10138.93  1689.710144.07 1689.8710146.09 1689.9110150.53 1689.9710150.87 1690.05
10154.56    169010156.62 1690.0410163.41 1690.0910183.59 1690.1310187.96 1690.15
10190.84  1690.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9891.33    .033 9959.33    .05810058.56    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.3310058.56              539   511.4     478             .1        .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1689.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033	0.058	0.033
W.S. Elev (ft)	1689.75	Reach Len. (ft)	539.00	511.40	478.00
Crit W.S. (ft)	1689.75	Flow Area (sq ft)	0.45	28.01	15.68
E.G. Slope (ft/ft)	0.048195	Area (sq ft)	0.45	28.01	15.68
Q Total (cfs)	120.00	Flow (cfs)	0.77	67.78	51.45
Top Width (ft)	187.48	Top Width (ft)	6.26	99.23	81.99
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)	1.71	2.42	3.28
Max Chl Dpth (ft)	0.39	Hydr. Depth (ft)	0.07	0.28	0.19
Conv. Total (cfs)	546.6	Conv. (cfs)	3.5	308.7	234.4
Length Wtd. (ft)	487.91	Wetted Per. (ft)	6.26	99.23	82.00
Min Ch El (ft)	1689.36	Shear (lb/sq ft)	0.22	0.85	0.58
Alpha	1.07	Stream Power (lb/ft s)	0.37	2.06	1.89
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	15.34	26.94	13.76
C & E Loss (ft)	0.04	Cum SA (acres)	46.03	40.08	40.85

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 OUTPUT Profile #2

E.G. Elev (ft)	1690.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.058	
W.S. Elev (ft)	1690.16	Reach Len. (ft)	539.00	511.40	478.00
Crit W.S. (ft)	1689.83	Flow Area (sq ft)		68.05	
E.G. Slope (ft/ft)	0.007942	Area (sq ft)		68.05	
Q Total (cfs)	120.00	Flow (cfs)		120.00	
Top Width (ft)	99.23	Top Width (ft)		99.23	
Vel Total (ft/s)	1.76	Avg. Vel. (ft/s)		1.76	
Max Chl Dpth (ft)	0.80	Hydr. Depth (ft)		0.69	
Conv. Total (cfs)	1346.5	Conv. (cfs)		1346.5	
Length Wtd. (ft)	496.27	Wetted Per. (ft)		100.27	
Min Ch El (ft)	1689.36	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)		0.59	
Frctn Loss (ft)	3.56	Cum Volume (acre-ft)	2.21	36.74	1.93
C & E Loss (ft)	0.00	Cum SA (acres)	4.02	40.26	4.26

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9925.33	9959.33	0.77	0.45	6.26	0.64	0.07	1.71
2	Chan	9959.33	10058.56	67.78	28.01	99.23	56.48	0.28	2.42
3	ROB	10058.56	10124.70	47.49	13.91	66.14	39.57	0.21	3.41
4	ROB	10124.70	10190.84	3.97	1.77	15.86	3.30	0.11	2.24

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9959.33   * 10058.56  *   120.00 *    68.05 *   100.27 *   100.00 *
0.69 *     1.76 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.962

INPUT
Description:
Station Elevation Data    num=     103
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9917.95 1687.04 9923.28 1687.03 9924.95 1687.03 9948.21  1686.9 9955.08 1686.93
 9966.01 1687.01 9981.24 1686.53 9994.01 1686.04 10015.3  1686.5 10024.4 1686.47
   10031 1686.5910043.25 1686.5410074.89 1686.5810088.37  1686.610111.47 1686.52
10128.63 1686.4910138.82 1686.4410157.25 1686.4610169.69  1686.410173.06 1686.46
10173.18 1686.4610173.28 1686.4510173.35 1686.45 10173.8  1686.510177.14 1685.96
10177.44 1685.9410180.29 1685.7310185.43 1685.6210185.78  1685.610189.46 1685.78
10191.01 1685.9110192.59 1686.2310193.81 1686.5110198.33  1686.310205.94    1686
10207.15 1685.9610207.45 1685.9210216.35  1685.910217.59  1685.910222.06 1685.91
10227.99 1685.8910230.35 1685.8810238.92 1685.8710242.99  1685.810244.39 1685.77
10247.26 1685.8310254.73 1685.8810255.67 1685.8610273.36  1685.8 10282.1 1685.86
10291.74 1685.9310295.82 1685.9510303.26    168610304.73    168610306.11    1686
10306.87    168610310.84 1686.0210321.06 1686.0610335.28    168610368.58 1686.28
10378.21 1686.3910413.17 1686.1810434.42 1686.1310448.48  1686.110474.02 1686.07
10476.39 1686.0710480.09 1686.0610480.13 1686.0610484.06  1686.1 10487.5 1686.07
10500.06 1686.2310522.84 1686.3110538.88 1686.3610542.33  1686.410542.93 1686.34
10548.47 1686.2910570.67    168610573.87 1685.9810593.52  1685.710617.22 1685.95
10624.87    168610626.06 1686.0110637.11 1686.1210642.52  1686.210649.53 1686.25
10659.91 1686.2110664.36  1686.210667.01 1686.1810671.16  1686.2 10688.8 1686.25
10688.97 1686.1410689.57    168610690.78 1685.5710692.42    168510694.59 1684.32
10696.41 1684.7410702.52    168610703.08 1686.1910703.55  1686.310713.41 1686.43
10740.49 1686.6610779.03 1686.8210796.56 1687.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9917.95    .033 9981.24    .058 10015.3    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
      9981.24 10015.3              473  476.38     465              .1        .3
Right Levee     Station=10088.37      Elevation=  1686.6
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1686.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.033	0.058	0.033
W.S. Elev (ft)	1686.61	Reach Len. (ft)	473.00	476.38	465.00
Crit W.S. (ft)	1686.61	Flow Area (sq ft)	0.10	11.35	312.23
E.G. Slope (ft/ft)	0.000214	Area (sq ft)	0.10	11.35	312.23
Q Total (cfs)	120.00	Flow (cfs)	0.01	2.05	117.95
Top Width (ft)	755.75	Top Width (ft)	2.51	34.06	719.18
Vel Total (ft/s)	0.37	Avg. Vel. (ft/s)	0.08	0.18	0.38
Max Chl Dpth (ft)	2.29	Hydr. Depth (ft)	0.04	0.33	0.43
Conv. Total (cfs)	8195.7	Conv. (cfs)	0.5	139.8	8055.4
Length Wtd. (ft)	465.60	Wetted Per. (ft)	2.51	34.07	719.89
Min Ch El (ft)	1686.04	Shear (lb/sq ft)	0.00	0.00	0.01
Alpha	1.02	Stream Power (lb/ft s)	0.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	15.33	26.71	11.96
C & E Loss (ft)	0.00	Cum SA (acres)	45.97	39.30	36.46

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 OUTPUT Profile #2

E.G. Elev (ft)	1686.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.058	0.033
W.S. Elev (ft)	1686.61	Reach Len. (ft)	473.00	476.38	465.00
Crit W.S. (ft)	1686.61	Flow Area (sq ft)		11.35	68.86
E.G. Slope (ft/ft)	0.006509	Area (sq ft)		11.35	68.86
Q Total (cfs)	120.00	Flow (cfs)		11.26	108.74
Top Width (ft)	273.49	Top Width (ft)		34.06	239.43
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)		0.99	1.58
Max Chl Dpth (ft)	1.01	Hydr. Depth (ft)		0.33	0.29
Conv. Total (cfs)	1487.3	Conv. (cfs)		139.6	1347.7
Length Wtd. (ft)	471.22	Wetted Per. (ft)		34.15	240.31
Min Ch El (ft)	1686.04	Shear (lb/sq ft)		0.14	0.12
Alpha	1.05	Stream Power (lb/ft s)		0.13	0.18
Frctn Loss (ft)	2.54	Cum Volume (acre-ft)	2.21	36.28	1.55
C & E Loss (ft)	0.00	Cum SA (acres)	4.02	39.48	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 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.

Profile #1

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9949.60   * 9981.24   *     0.01 *     0.10 *     2.51 *     0.01 *
0.04 *     0.08 *
* 2         * Chan      * 9981.24   * 10015.30  *     2.05 *    11.35 *    34.07 *     1.71 *
0.33 *     0.18 *
* 3         * ROB       * 10015.30  * 10088.37  *     0.36 *     4.00 *    73.07 *     0.30 *
0.05 *     0.09 *
* 4         * ROB       * 10088.37  * 10442.46  *    60.22 *   162.26 *   354.25 *    50.19 *
0.46 *     0.37 *
* 5         * ROB       * 10442.46  * 10796.56  *    57.36 *   145.97 *   292.57 *    47.80 *
0.50 *     0.39 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9981.24   * 10015.30  *    11.26 *    11.35 *    34.15 *     9.39 *
0.33 *     0.99 *
* 2         * ROB       * 10015.30  * 10088.37  *     1.79 *     4.00 *    73.07 *     1.49 *
0.05 *     0.45 *
* 3         * ROB       * 10088.37  * 10442.46  *   106.95 *    64.87 *   167.24 *    89.13 *
0.39 *     1.65 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.872

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9649.64  1683.7 9659.44  1683.5  9664.8 1683.43 9675.38  1683.1 9678.63  1683.1
```

```
 9682.14 1683.22 9689.45 1683.54 9695.03  1683.4 9708.76  1683.4 9718.33 1683.33
 9736.99 1683.12 9753.17 1683.02 9756.19 1683.02 9768.95  1682.9 9782.65 1682.74
 9785.29 1682.71 9787.02 1682.72 9808.45 1682.76 9829.06  1682.9  9834.5 1682.84
 9874.32 1682.51 9877.42 1682.41 9906.25 1682.39 9906.69  1682.4 9907.93 1682.38
 9950.66 1682.04 9956.28    1682 9990.98 1681.74 9992.03  1681.7 9993.62 1681.72
10017.03 1681.5710026.95 1681.5210031.81 1681.6110042.37  1681.810052.84    1682
10056.02 1682.0610068.62 1682.2610096.63 1682.3610098.73  1682.410108.82  1682.3
10118.54 1682.2810134.57 1682.1310146.81    168210160.69  1681.9   10168 1681.83
10180.11 1681.7110207.45 1681.5710211.08 1681.5910212.41  1681.610213.53  1681.6
10216.83 1681.6210247.99 1681.6410270.04 1681.7410291.68  1681.910292.89 1681.92
10293.05  1681.910294.21  1681.910294.91 1681.8910301.47  1681.8 10311.3 1681.68
10347.14 1681.2310354.68 1681.2110382.08 1681.5910386.09  1681.510404.53 1681.28
10405.04 1681.2810407.22 1681.28 10426.1 1681.5810432.66  1681.710444.96    1682
10455.51 1682.2510462.78 1682.4110466.51 1682.4910468.82  1682.510474.12 1682.62
10488.89 1682.7410500.95 1682.4510517.14 1682.4510521.26  1682.510548.73 1682.77
   10549 1682.7710549.27 1682.7710549.55 1682.7710552.85  1682.810553.44 1682.81
10597.23 1683.27

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9649.64    .033 9950.66    .05310056.02    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.6610056.02              429   451.6     429              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1681.98  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *          *   0.053  *   0.033  *
* W.S. Elev (ft)          * 1681.96  * Reach Len. (ft)        *  429.00  *  451.60  *  429.00  *
* Crit W.S. (ft)          * 1681.74  * Flow Area (sq ft)      *          *   20.56  *  104.01  *
* E.G. Slope (ft/ft)      *0.002168  * Area (sq ft)           *          *   20.56  *  104.01  *
* Q Total (cfs)           *  120.00  * Flow (cfs)             *          *   10.11  *  109.89  *
* Top Width (ft)          *  379.71  * Top Width (ft)         *          *   88.94  *  290.77  *
* Vel Total (ft/s)        *    0.96  * Avg. Vel. (ft/s)       *          *    0.49  *    1.06  *
* Max Chl Dpth (ft)       *    0.75  * Hydr. Depth (ft)       *          *    0.23  *    0.36  *
* Conv. Total (cfs)       *  2576.9  * Conv. (cfs)            *          *   217.2  *  2359.8  *
* Length Wtd. (ft)        *  443.90  * Wetted Per. (ft)       *          *   88.94  *  290.79  *
* Min Ch El (ft)          * 1681.52  * Shear (lb/sq ft)       *          *    0.03  *    0.05  *
* Alpha                   *    1.12  * Stream Power (lb/ft s) *          *    0.02  *    0.05  *
* Frctn Loss (ft)         *    2.96  * Cum Volume (acre-ft)   *   15.33  *   26.54  *    9.74  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *   45.96  *   38.63  *   31.07  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1682.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)          * 1682.51  * Reach Len. (ft)        *  429.00  *  451.60  *  429.00  *
* Crit W.S. (ft)          * 1682.11  * Flow Area (sq ft)      *          *   78.05  *          *
* E.G. Slope (ft/ft)      *0.004540  * Area (sq ft)           *          *   78.05  *          *
* Q Total (cfs)           *  120.00  * Flow (cfs)             *          *  120.00  *          *
* Top Width (ft)          *  105.36  * Top Width (ft)         *          *  105.36  *          *
* Vel Total (ft/s)        *    1.54  * Avg. Vel. (ft/s)       *          *    1.54  *          *
* Max Chl Dpth (ft)       *    0.99  * Hydr. Depth (ft)       *          *    0.74  *          *
* Conv. Total (cfs)       *  1781.0  * Conv. (cfs)            *          *  1781.0  *          *
* Length Wtd. (ft)        *  451.60  * Wetted Per. (ft)       *          *  106.29  *          *
* Min Ch El (ft)          * 1681.52  * Shear (lb/sq ft)       *          *    0.21  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.32  *          *
* Frctn Loss (ft)         *    3.43  * Cum Volume (acre-ft)   *    2.21  *   35.79  *    1.19  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    4.02  *   38.71  *    1.67  *
*****************************************************************************************

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.
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.

```
  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9950.66   * 10056.02  *    10.11 *    20.56 *    88.94 *     8.43 *
0.23 *     0.49 *
* 2         * ROB       * 10056.02  * 10326.63  *    33.47 *    43.37 *   174.13 *    27.89 *
0.25 *     0.77 *
* 3         * ROB       * 10326.63  * 10597.23  *    76.41 *    60.64 *   116.67 *    63.68 *
0.52 *     1.26 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9950.66   * 10056.02  *   120.00 *    78.05 *   106.29 *   100.00 *
0.74 *     1.54 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.787

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs; Cross
             section was surveyed, and some discrepancies are apparent between
             the 4-ft contour mapping and the survey. The floodplain is mapped
             at the left and right water surface stations, therefore survey
             takes precedence over the topographic mapping.
Interpolated point
             added at (9916.24, 1678.596) to set n-value station
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8883.47 1680.96 8957.61 1680.64  9031.6 1680.27 9105.56 1679.36 9213.73 1678.89
 9287.51 1678.37 9361.83 1677.88 9435.73 1678.03 9464.97  1678.2 9509.53 1678.31
 9583.49 1678.81  9657.5 1679.27 9731.63 1679.62 9769.25 1679.69 9805.68 1679.39
 9879.51 1678.77 9887.91 1678.73 9916.241678.596 9953.71 1678.42 9987.95 1678.19
10027.61 1678.1610101.54 1678.5910175.58 1678.9410184.461679.02510249.81 1679.65
10306.31 1680.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8883.47    .033 9887.91    .05310184.46    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.2410101.54              385  396.77     491              .1       .3
Left Levee      Station= 9769.25      Elevation= 1679.69
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1679.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.048	0.053	0.053
W.S. Elev (ft)	1678.93	Reach Len. (ft)	385.00	396.77	491.00
Crit W.S. (ft)	1678.77	Flow Area (sq ft)	10.43	107.61	12.01
E.G. Slope (ft/ft)	0.014576	Area (sq ft)	10.43	107.61	12.01
Q Total (cfs)	280.00	Flow (cfs)	14.07	253.53	12.40
Top Width (ft)	311.99	Top Width (ft)	55.41	185.30	71.28
Vel Total (ft/s)	2.15	Avg. Vel. (ft/s)	1.35	2.36	1.03
Max Chl Dpth (ft)	1.05	Hydr. Depth (ft)	0.19	0.58	0.17
Conv. Total (cfs)	2319.2	Conv. (cfs)	116.6	2100.0	102.7
Length Wtd. (ft)	397.13	Wetted Per. (ft)	55.41	185.30	71.28
Min Ch El (ft)	1678.16	Shear (lb/sq ft)	0.17	0.53	0.15
Alpha	1.11	Stream Power (lb/ft s)	0.23	1.25	0.16
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	15.28	25.87	9.16
C & E Loss (ft)	0.01	Cum SA (acres)	45.69	37.21	29.28

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

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1679.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.053	
W.S. Elev (ft)	1679.04	Reach Len. (ft)	385.00	396.77	491.00
Crit W.S. (ft)	1678.76	Flow Area (sq ft)		128.35	
E.G. Slope (ft/ft)	0.009942	Area (sq ft)		128.35	
Q Total (cfs)	280.00	Flow (cfs)		280.00	
Top Width (ft)	185.30	Top Width (ft)		185.30	
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)		2.18	
Max Chl Dpth (ft)	0.88	Hydr. Depth (ft)		0.69	
Conv. Total (cfs)	2808.1	Conv. (cfs)		2808.1	
Length Wtd. (ft)	398.15	Wetted Per. (ft)		186.19	
Min Ch El (ft)	1678.16	Shear (lb/sq ft)		0.43	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	3.19	Cum Volume (acre-ft)	2.21	34.72	1.19
C & E Loss (ft)	0.00	Cum SA (acres)	4.02	37.21	1.67

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9769.25	9916.24	14.07	10.43	55.41	5.03	0.19	1.35
2	Chan	9916.24	10101.54	253.53	107.61	185.30	90.55	0.58	2.36
3	ROB	10101.54	10203.92	12.40	12.01	71.28	4.43	0.17	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.

```
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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9916.24   * 10101.54  *   280.00 *   128.35 *   186.19 *   100.00 *
0.69 *     2.18 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.706

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent
             between the 4-ft contour mapping and the survey. The floodplain is
             mapped at the left and right water surface stations, therefore
             survey takes precedence over the topographic
             mapping.
Interpolated point added at (9914.44,1675.347) to set
             n-value station
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9233.08 1677.14 9296.11 1676.98 9359.08 1676.61 9422.21 1676.22 9485.26  1675.4
 9548.09 1675.27 9611.29 1675.48 9674.26 1675.45 9737.15  1675.5 9800.14 1675.76
 9863.13 1675.46 9926.35 1675.35 9977.271674.806 9984.42 1674.73 9986.32 1674.44
 9990.18 1674.37 9993.08 1675.1310014.771675.347 10049.1 1675.6810112.29 1675.67
10161.29 1675.7810174.92 1675.8110238.19 1676.4810300.83 1677.3310364.25 1677.87
10427.31 1678.02

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************************
 9233.08    .033 9548.09    .053 9800.14    .03310161.29    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9926.3510014.77              687  696.73     628             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1675.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.041  *   0.033  *   0.033  *
* W.S. Elev (ft)         * 1675.72  * Reach Len. (ft)         *  687.00  *  696.73  *  628.00  *
* Crit W.S. (ft)         * 1675.62  * Flow Area (sq ft)       *  115.03  *   60.13  *   10.69  *
* E.G. Slope (ft/ft)     *0.005151  * Area (sq ft)            *  115.03  *   60.13  *   10.69  *
* Q Total (cfs)          *  280.00  * Flow (cfs)              *  122.98  *  150.15  *    6.87  *
* Top Width (ft)         *  657.44  * Top Width (ft)          *  448.49  *   88.42  *  120.53  *
* Vel Total (ft/s)       *    1.51  * Avg. Vel. (ft/s)        *    1.07  *    2.50  *    0.64  *
* Max Chl Dpth (ft)      *    1.35  * Hydr. Depth (ft)        *    0.26  *    0.68  *    0.09  *
* Conv. Total (cfs)      *  3901.3  * Conv. (cfs)             *  1713.6  *  2092.1  *    95.7  *
* Length Wtd. (ft)       *  692.34  * Wetted Per. (ft)        *  448.49  *   88.54  *  120.53  *
* Min Ch El (ft)         * 1674.37  * Shear (lb/sq ft)        *    0.08  *    0.22  *    0.03  *
* Alpha                  *    1.70  * Stream Power (lb/ft s)  *    0.09  *    0.55  *    0.02  *
```

```
* Frctn Loss (ft)        *    4.21  * Cum Volume (acre-ft)   *   14.73  *   25.11  *    9.04  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   43.46  *   35.96  *   28.20  *
*********************************************************************************************
```

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.

CROSS SECTION OUTPUT Profile #2

```
*********************************************************************************************
* E.G. Elev (ft)         * 1675.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.033  *   0.033  *   0.033  *
* W.S. Elev (ft)         * 1675.80  * Reach Len. (ft)         *  687.00  *  696.73  *  628.00  *
* Crit W.S. (ft)         * 1675.70  * Flow Area (sq ft)       *   37.07  *   67.15  *    9.87  *
* E.G. Slope (ft/ft)     *0.006606  * Area (sq ft)            *   37.07  *   67.15  *    9.87  *
* Q Total (cfs)          *  280.00  * Flow (cfs)              *   59.94  *  204.37  *   15.69  *
* Top Width (ft)         *  248.96  * Top Width (ft)          *  126.21  *   88.42  *   34.33  *
* Vel Total (ft/s)       *    2.45  * Avg. Vel. (ft/s)        *    1.62  *    3.04  *    1.59  *
* Max Chl Dpth (ft)      *    1.43  * Hydr. Depth (ft)        *    0.29  *    0.76  *    0.29  *
* Conv. Total (cfs)      *  3445.1  * Conv. (cfs)             *   737.5  *  2514.5  *   193.1  *
* Length Wtd. (ft)       *  693.76  * Wetted Per. (ft)        *  126.25  *   88.54  *   34.45  *
* Min Ch El (ft)         * 1674.37  * Shear (lb/sq ft)        *    0.12  *    0.31  *    0.12  *
* Alpha                  *    1.24  * Stream Power (lb/ft s)   *    0.20  *    0.95  *    0.19  *
* Frctn Loss (ft)        *    4.22  * Cum Volume (acre-ft)    *    2.04  *   33.83  *    1.13  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    3.46  *   35.96  *    1.48  *
*********************************************************************************************
```

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.

Profile #1

```
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9233.08   * 9579.72   *    56.10 *    40.89 *   119.19 *    20.04 *
0.34 *     1.37 *
* 2        * LOB       * 9579.72   * 9926.35   *    66.88 *    74.13 *   329.30 *    23.89 *
0.23 *     0.90 *
* 3        * Chan      * 9926.35   * 10014.77  *   150.15 *    60.13 *    88.54 *    53.63 *
0.68 *     2.50 *
* 4        * ROB       * 10014.77  * 10221.04  *     6.87 *    10.69 *   120.53 *     2.45 *
0.09 *     0.64 *
*********************************************************************************************
******************
```

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.

Profile #2

```
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9579.72   * 9926.35   *    59.94 *    37.07 *   126.25 *    21.41 *
0.29 *     1.62 *
* 2        * Chan      * 9926.35   * 10014.77  *   204.37 *    67.15 *    88.54 *    72.99 *
0.76 *     3.04 *
* 3        * ROB       * 10014.77  * 10221.04  *    15.69 *     9.87 *    34.45 *     5.61 *
0.29 *     1.59 *
*********************************************************************************************
******************
```

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: T4N-R3W-S18E
REACH: Reach-1 RS: 3.578

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.
Levee
added-Ridge not overtopped per BFE calcs.
Interpolated point
added at (10141.7,1671.215) to set bank station.

Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500.28	1672.62	9553.23	1672.78	9606.36	1672.8	9659.23	1672.28	9712.38	1672.11
9764.94	1671.73	9818.02	1671.21	9871.27	1671.11	9924.32	1670.91	9977.07	1671.02
10055.39	1670.95	10108.28	1670.9	10141.7	1671.215	10161.35	1671.41	10214.05	1671.87
10216.04	1671.88	10267.23	1672.21	10306.49	1671.95	10308.04	1671.57	10309.28	1671.56
10310.88	1672.34	10320.67	1672.38	10373.48	1672.68	10426.45	1672.79	10479.44	1672.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500.28	.033	9871.27	.053	10141.7	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9871.27	10141.7	553	616.79	579	.1	.3

Right Levee Station=10267.23 Elevation= 1672.21

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1671.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.053	0.033
W.S. Elev (ft)	1671.53	Reach Len. (ft)	553.00	616.79	579.00
Crit W.S. (ft)	1671.30	Flow Area (sq ft)	24.54	146.62	5.16
E.G. Slope (ft/ft)	0.007285	Area (sq ft)	24.54	146.62	5.16
Q Total (cfs)	280.00	Flow (cfs)	41.04	233.28	5.68
Top Width (ft)	389.58	Top Width (ft)	85.45	270.43	33.71
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	1.67	1.59	1.10
Max Chl Dpth (ft)	0.63	Hydr. Depth (ft)	0.29	0.54	0.15
Conv. Total (cfs)	3280.5	Conv. (cfs)	480.9	2733.1	66.5
Length Wtd. (ft)	608.61	Wetted Per. (ft)	85.45	270.43	33.71
Min Ch El (ft)	1670.90	Shear (lb/sq ft)	0.13	0.25	0.07
Alpha	1.01	Stream Power (lb/ft s)	0.22	0.39	0.08
Frctn Loss (ft)	3.75	Cum Volume (acre-ft)	13.63	23.46	8.92
C & E Loss (ft)	0.00	Cum SA (acres)	39.25	33.09	27.09

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 OUTPUT Profile #2

E.G. Elev (ft)	1671.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.053	
W.S. Elev (ft)	1671.64	Reach Len. (ft)	553.00	616.79	579.00
Crit W.S. (ft)	1671.30	Flow Area (sq ft)		177.19	
E.G. Slope (ft/ft)	0.005609	Area (sq ft)		177.19	
Q Total (cfs)	280.00	Flow (cfs)		280.00	
Top Width (ft)	270.43	Top Width (ft)		270.43	
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)		1.58	
Max Chl Dpth (ft)	0.74	Hydr. Depth (ft)		0.66	
Conv. Total (cfs)	3738.6	Conv. (cfs)		3738.6	
Length Wtd. (ft)	616.79	Wetted Per. (ft)		271.38	

```
* Min Ch El (ft)          * 1670.90  * Shear (lb/sq ft)        *          *    0.23  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.36  *          *
* Frctn Loss (ft)         *    3.83  * Cum Volume (acre-ft)   *    1.75  *   31.87  *    1.06  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    2.47  *   33.09  *    1.23  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9685.78   * 9871.27   *    41.04 *    24.54 *    85.45 *    14.66 *
0.29 *     1.67 *
* 2         * Chan      * 9871.27   * 10141.70  *   233.28 *   146.62 *   270.43 *    83.31 *
0.54 *     1.59 *
* 3         * ROB       * 10141.70  * 10267.23  *     5.68 *     5.16 *    33.71 *     2.03 *
0.15 *     1.10 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9871.27   * 10141.70  *   280.00 *   177.19 *   271.38 *   100.00 *
0.66 *     1.58 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.461

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent
             between the 4-ft contour mapping and the survey. The floodplain is
             mapped at the left and right water surface stations, therefore
             survey takes precedence over the topographic mapping.
Levee
             added-Ridge not overtopped per BFE calcs.
Interpolated point
             added at (9916.08, 1667.284) to set bank station.
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9624.19 1668.99 9663.92  1669.4 9704.01 1669.47 9744.08  1669.3 9783.86 1668.52
```

```
  9824.2 1668.21 9863.83 1667.89 9904.06 1667.38 9916.081667.284  9944.1 1667.06
 9983.81 1666.8110023.95 1666.8710063.81 1667.0710104.11 1667.2710144.02 1667.59
10183.81 1668.0610224.23 1668.1510264.26 1668.8410303.75 1668.9210328.57 1668.55
10330.82  1667.710333.71  1667.710335.92 1668.6510345.44 1668.7410385.42 1668.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9624.19    .033 9916.08    .05310104.11    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.0810104.11               594  621.56     643            .1       .3
Right Levee     Station=10303.75      Elevation= 1668.92

CROSS SECTION OUTPUT  Profile #1
*************************************************************************************************
* E.G. Elev (ft)          * 1667.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.033  *   0.053  *   0.033  *
* W.S. Elev (ft)          * 1667.77  * Reach Len. (ft)        *  594.00  *  621.56  *  643.00  *
* Crit W.S. (ft)          * 1667.43  * Flow Area (sq ft)      *   11.33  *  143.59  *   15.02  *
* E.G. Slope (ft/ft)      *0.005270  * Area (sq ft)           *   11.33  *  143.59  *   15.02  *
* Q Total (cfs)           *  280.00  * Flow (cfs)             *   15.24  *  244.16  *   20.60  *
* Top Width (ft)          *  286.20  * Top Width (ft)         *   42.90  *  188.03  *   55.27  *
* Vel Total (ft/s)        *    1.65  * Avg. Vel. (ft/s)       *    1.35  *    1.70  *    1.37  *
* Max Chl Dpth (ft)       *    0.96  * Hydr. Depth (ft)       *    0.26  *    0.76  *    0.27  *
* Conv. Total (cfs)       *  3857.0  * Conv. (cfs)            *   209.9  *  3363.3  *   283.8  *
* Length Wtd. (ft)        *  622.62  * Wetted Per. (ft)       *   42.90  *  188.03  *   55.28  *
* Min Ch El (ft)          * 1666.81  * Shear (lb/sq ft)       *    0.09  *    0.25  *    0.09  *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.12  *    0.43  *    0.12  *
* Frctn Loss (ft)         *    4.03  * Cum Volume (acre-ft)   *   13.40  *   21.40  *    8.79  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   38.43  *   29.84  *   26.50  *
*************************************************************************************************

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 OUTPUT  Profile #2
*************************************************************************************************
* E.G. Elev (ft)          * 1667.83  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)          * 1667.77  * Reach Len. (ft)        *  594.00  *  621.56  *  643.00  *
* Crit W.S. (ft)          * 1667.42  * Flow Area (sq ft)      *          *  143.93  *          *
* E.G. Slope (ft/ft)      *0.006924  * Area (sq ft)           *          *  143.93  *          *
* Q Total (cfs)           *  280.00  * Flow (cfs)             *          *  280.00  *          *
* Top Width (ft)          *  188.03  * Top Width (ft)         *          *  188.03  *          *
* Vel Total (ft/s)        *    1.95  * Avg. Vel. (ft/s)       *          *    1.95  *          *
* Max Chl Dpth (ft)       *    0.96  * Hydr. Depth (ft)       *          *    0.77  *          *
* Conv. Total (cfs)       *  3364.9  * Conv. (cfs)            *          *  3364.9  *          *
* Length Wtd. (ft)        *  621.56  * Wetted Per. (ft)       *          *  189.03  *          *
* Min Ch El (ft)          * 1666.81  * Shear (lb/sq ft)       *          *    0.33  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.64  *          *
* Frctn Loss (ft)         *    3.84  * Cum Volume (acre-ft)   *    1.75  *   29.60  *    1.06  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    2.47  *   29.84  *    1.23  *
*************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9770.14   * 9916.08   *    15.24 *    11.33 *    42.90 *     5.44 *
0.26 *     1.35 *
* 2          * Chan      * 9916.08   * 10104.11  *   244.16 *   143.59 *   188.03 *    87.20 *
0.76 *     1.70 *
* 3          * ROB       * 10104.11  * 10303.75  *    20.60 *    15.02 *    55.28 *     7.36 *
0.27 *     1.37 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9916.08   * 10104.11  *   280.00 *   143.93 *   189.03 *   100.00 *
0.77 *     1.95 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.344

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent
             between the 4-ft contour mapping and the survey. The floodplain is
             mapped at the left and right water surface stations, therefore
             survey takes precedence over the topographic mapping.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9594.82 1664.62  9640.9 1664.34  9690.9 1664.37 9739.09 1663.97 9787.08 1663.61
 9833.581663.289 9834.89 1663.28 9883.07 1663.16 9930.83 1663.07 9979.18 1663.05
10027.15 1663.2810074.91 1663.33 10122.9 1663.85 10170.8 1664.2310218.89 1664.21
10267.15 1664.3310314.75 1664.6810363.02 1664.7510410.96 1665.0510458.96  1665.5
10506.76 1666.0110555.14  1666.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9594.82    .033 9833.58    .05310027.15    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9833.5810027.15              399  420.87     426              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1663.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.033  *   0.053  *   0.033  *
* W.S. Elev (ft)         * 1663.73  * Reach Len. (ft)         *  399.00  *  420.87  *  426.00  *
* Crit W.S. (ft)         * 1663.52  * Flow Area (sq ft)       *   14.19  *  114.59  *   27.93  *
* E.G. Slope (ft/ft)     *0.008155  * Area (sq ft)            *   14.19  *  114.59  *   27.93  *
* Q Total (cfs)          *  280.00  * Flow (cfs)              *   21.38  *  204.52  *   54.10  *
* Top Width (ft)         *  341.40  * Top Width (ft)          *   62.89  *  193.57  *   84.95  *
* Vel Total (ft/s)       *    1.79  * Avg. Vel. (ft/s)        *    1.51  *    1.78  *    1.94  *
```

Max Chl Dpth (ft)	0.68	Hydr. Depth (ft)	0.23	0.59	0.33	
Conv. Total (cfs)	3100.7	Conv. (cfs)	236.7	2264.9	599.1	
Length Wtd. (ft)	418.89	Wetted Per. (ft)	62.89	193.57	84.95	
Min Ch El (ft)	1663.05	Shear (lb/sq ft)	0.11	0.30	0.17	
Alpha	1.01	Stream Power (lb/ft s)	0.17	0.54	0.32	
Frctn Loss (ft)	2.31	Cum Volume (acre-ft)	13.22	19.56	8.47	
C & E Loss (ft)	0.00	Cum SA (acres)	37.71	27.12	25.47	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1664.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.053	
W.S. Elev (ft)	1663.95	Reach Len. (ft)	399.00	420.87	426.00
Crit W.S. (ft)	1663.54	Flow Area (sq ft)		155.80	
E.G. Slope (ft/ft)	0.005539	Area (sq ft)		155.80	
Q Total (cfs)	280.00	Flow (cfs)		280.00	
Top Width (ft)	193.57	Top Width (ft)		193.57	
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)		1.80	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.80	
Conv. Total (cfs)	3762.2	Conv. (cfs)		3762.2	
Length Wtd. (ft)	420.87	Wetted Per. (ft)		194.89	
Min Ch El (ft)	1663.05	Shear (lb/sq ft)		0.28	
Alpha	1.00	Stream Power (lb/ft s)		0.50	
Frctn Loss (ft)	2.00	Cum Volume (acre-ft)	1.75	27.46	1.06
C & E Loss (ft)	0.00	Cum SA (acres)	2.47	27.12	1.23

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.
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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9714.20	9833.58	21.38	14.19	62.89	7.64	0.23	1.51
2	Chan	9833.58	10027.15	204.52	114.59	193.57	73.04	0.59	1.78
3	ROB	10027.15	10291.14	54.10	27.93	84.95	19.32	0.33	1.94

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9833.58	10027.15	280.00	155.80	194.89	100.00	0.80	1.80

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.

CROSS SECTION

RIVER: T4N-R3W-S18E
REACH: Reach-1 RS: 3.264

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 450cfs; Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9271.92	1663.85	9345.71	1663.18	9419.46	1662.73	9493.72	1662.21	9567.57	1662.31
9641.91	1661.59	9715.88	1661.72	9789.82	1661.77	9863.95	1660.88	9937.76	1660.62
10011.65	1660.46	10085.92	1660.71	10092.13	1660.74	10159.59	1661.07	10233.78	1661.03
10308	1661.15	10381.78	1661.37	10455.62	1661.91	10529.83	1662.15	10603.8	1662.73
10673.64	1663.46	10677.04	1662.71	10678.28	1662.61	10679.68	1663.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9271.92	.033	9863.95	.053	10159.59	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9937.76	10085.92	551	584.25	570	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1661.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.049	0.053	0.040
W.S. Elev (ft)	1661.44	Reach Len. (ft)	551.00	584.25	570.00
Crit W.S. (ft)		Flow Area (sq ft)	63.36	129.24	107.48
E.G. Slope (ft/ft)	0.004461	Area (sq ft)	63.36	129.24	107.48
Q Total (cfs)	450.00	Flow (cfs)	89.93	220.94	139.13
Top Width (ft)	573.07	Top Width (ft)	120.02	148.16	304.89
Vel Total (ft/s)	1.50	Avg. Vel. (ft/s)	1.42	1.71	1.29
Max Chl Dpth (ft)	0.97	Hydr. Depth (ft)	0.53	0.87	0.35
Conv. Total (cfs)	6737.4	Conv. (cfs)	1346.5	3307.9	2083.0
Length Wtd. (ft)	572.72	Wetted Per. (ft)	120.02	148.16	304.89
Min Ch El (ft)	1660.46	Shear (lb/sq ft)	0.15	0.24	0.10
Alpha	1.05	Stream Power (lb/ft s)	0.21	0.42	0.13
Frctn Loss (ft)	3.68	Cum Volume (acre-ft)	12.87	18.38	7.81
C & E Loss (ft)	0.00	Cum SA (acres)	36.88	25.47	23.56

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1662.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.053	
W.S. Elev (ft)	1661.92	Reach Len. (ft)	551.00	584.25	570.00
Crit W.S. (ft)	1661.22	Flow Area (sq ft)		200.97	
E.G. Slope (ft/ft)	0.004344	Area (sq ft)		200.97	
Q Total (cfs)	450.00	Flow (cfs)		450.00	
Top Width (ft)	148.16	Top Width (ft)		148.16	
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)		2.24	
Max Chl Dpth (ft)	1.46	Hydr. Depth (ft)		1.36	
Conv. Total (cfs)	6827.2	Conv. (cfs)		6827.2	

```
* Length Wtd. (ft)        *  582.85  * Wetted Per. (ft)        *          *  150.67  *          *
* Min Ch El (ft)          * 1660.46  * Shear (lb/sq ft)        *          *    0.36  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.81  *          *
* Frctn Loss (ft)         *    3.52  * Cum Volume (acre-ft)    *    1.75  *   25.74  *    1.06  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    2.47  *   25.47  *    1.23  *
*********************************************************************************************

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.
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.

  Profile #1
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9604.84   * 9937.76   *    89.93 *    63.36 *   120.02 *    19.99 *
0.53 *     1.42 *
* 2         * Chan      * 9937.76   * 10085.92  *   220.94 *   129.24 *   148.16 *    49.10 *
0.87 *     1.71 *
* 3         * ROB       * 10085.92  * 10382.80  *   139.06 *   107.25 *   296.88 *    30.90 *
0.36 *     1.30 *
* 4         * ROB       * 10382.80  * 10679.68  *     0.06 *     0.23 *     8.01 *     0.01 *
0.03 *     0.28 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9937.76   * 10085.92  *   450.00 *   200.97 *   150.67 *   100.00 *
1.36 *     2.24 *
*********************************************************************************************
******************

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.
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: T4N-R3W-S18E
REACH: Reach-1            RS: 3.153

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent
             between the 4-ft contour mapping and the survey. The floodplain is
             mapped at the left and right water surface stations, therefore
             survey takes precedence over the topographic mapping.
Station Elevation Data    num=      20
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9568.39 1659.59 9624.46 1659.16 9680.15 1658.75  9736.2 1658.18 9792.43 1657.84
 9848.12 1657.59 9904.51 1657.36 9960.19 1657.1210016.34 1657.2810072.03 1657.22
 10128.5 1657.2210184.06 1657.2810240.41 1657.2110296.39 1657.2510352.13 1657.33
10408.46 1657.6610464.13 1658.0610520.43 1658.4710576.29 1659.0210632.43  1659.8
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9568.39    .033 9904.51    .05310352.13    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9904.5110016.34              469  498.02     453            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1657.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.033  *   0.053  *   0.052  *
* W.S. Elev (ft)          * 1657.74  * Reach Len. (ft)         *  469.00  *  498.02  *  453.00  *
* Crit W.S. (ft)          * 1657.55  * Flow Area (sq ft)       *   17.72  *   58.49  *  180.83  *
* E.G. Slope (ft/ft)      *0.010061  * Area (sq ft)            *   17.72  *   58.49  *  180.83  *
* Q Total (cfs)           *  450.00  * Flow (cfs)              *   26.98  *  106.77  *  316.25  *
* Top Width (ft)          *  605.95  * Top Width (ft)          *   90.46  *  111.83  *  403.66  *
* Vel Total (ft/s)        *    1.75  * Avg. Vel. (ft/s)        *    1.52  *    1.83  *    1.75  *
* Max Chl Dpth (ft)       *    0.62  * Hydr. Depth (ft)        *    0.20  *    0.52  *    0.45  *
* Conv. Total (cfs)       *  4486.3  * Conv. (cfs)             *   269.0  *  1064.4  *  3152.9  *
* Length Wtd. (ft)        *  474.74  * Wetted Per. (ft)        *   90.46  *  111.83  *  403.66  *
* Min Ch El (ft)          * 1657.12  * Shear (lb/sq ft)        *    0.12  *    0.33  *    0.28  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.19  *    0.60  *    0.49  *
* Frctn Loss (ft)         *    2.82  * Cum Volume (acre-ft)    *   12.36  *   17.12  *    5.92  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   35.54  *   23.73  *   18.92  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1658.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *          *   0.053  *   0.053  *
* W.S. Elev (ft)          * 1658.35  * Reach Len. (ft)         *  469.00  *  498.02  *  453.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  126.43  *   32.39  *
* E.G. Slope (ft/ft)      *0.008934  * Area (sq ft)            *          *  126.43  *   32.39  *
* Q Total (cfs)           *  450.00  * Flow (cfs)              *          *  361.46  *   88.54  *
* Top Width (ft)          *  141.64  * Top Width (ft)          *          *  111.83  *   29.81  *
* Vel Total (ft/s)        *    2.83  * Avg. Vel. (ft/s)        *          *    2.86  *    2.73  *
* Max Chl Dpth (ft)       *    1.23  * Hydr. Depth (ft)        *          *    1.13  *    1.09  *
* Conv. Total (cfs)       *  4760.9  * Conv. (cfs)             *          *  3824.2  *   936.7  *
* Length Wtd. (ft)        *  493.59  * Wetted Per. (ft)        *          *  112.82  *   30.91  *
* Min Ch El (ft)          * 1657.12  * Shear (lb/sq ft)        *          *    0.63  *    0.58  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.79  *    1.60  *
* Frctn Loss (ft)         *    3.36  * Cum Volume (acre-ft)    *    1.75  *   23.54  *    0.85  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    2.47  *   23.73  *    1.03  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *    (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9736.45   * 9904.51   *    26.98 *    17.72 *    90.46 *     6.00 *
0.20 *     1.52 *
* 2        * Chan      * 9904.51   * 10016.34  *   106.77 *    58.49 *   111.83 *    23.73 *
0.52 *     1.83 *
* 3        * ROB       * 10016.34  * 10324.38  *   273.70 *   154.38 *   308.05 *    60.82 *
0.50 *     1.77 *
* 4        * ROB       * 10324.38  * 10632.43  *    42.55 *    26.45 *    95.61 *     9.46 *
0.28 *     1.61 *
*****************************************************************************************
******************
```

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9904.51	10016.34	361.46	126.43	112.82	80.32	1.13	2.86
2	ROB	10016.34	10324.38	88.54	32.39	30.91	19.68	1.09	2.73

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: T4N-R3W-S18E
REACH: Reach-1 RS: 3.059

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550.14	1656.56	9599.95	1656.39	9650.04	1656.4	9700.01	1656.12	9749.82	1655.81
9799.73	1655.66	9850.08	1655.28	9890.38	1654.81	9900.21	1655	9907.09	1654.73
9923.79	1654.48	9940.37	1654.24	9949.82	1654.21	9957.01	1654.11	9973.92	1653.91
9990.63	1653.98	10000.07	1653.89	10007.25	1653.96	10023.74	1653.99	10040.06	1653.95
10050.02	1654.21	10057.36	1654	10073.89	1653.88	10090.39	1653.79	10100.05	1653.88
10107.31	1653.95	10123.3	1654.06	10140.09	1654.44	10150.07	1654.27	10157.34	1654.14
10173.65	1654.13	10190.44	1654.15	10200.06	1654.28	10207.21	1654.26	10250.27	1654.52
10300.14	1654.89	10350.04	1654.91	10400.2	1655.33	10450.17	1655.78	10500.04	1656.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550.14	.033	9923.79	.053	10140.09	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.79	10140.09	475	519.2	536	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1654.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.053	0.033
W.S. Elev (ft)	1654.93	Reach Len. (ft)	475.00	519.20	536.00
Crit W.S. (ft)	1654.50	Flow Area (sq ft)	6.72	193.62	83.67
E.G. Slope (ft/ft)	0.003921	Area (sq ft)	6.72	193.62	83.67
Q Total (cfs)	450.00	Flow (cfs)	7.21	315.72	127.07
Top Width (ft)	465.39	Top Width (ft)	37.40	216.30	211.69
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	1.07	1.63	1.52
Max Chl Dpth (ft)	1.13	Hydr. Depth (ft)	0.18	0.90	0.40
Conv. Total (cfs)	7186.1	Conv. (cfs)	115.1	5041.8	2029.2
Length Wtd. (ft)	519.37	Wetted Per. (ft)	37.41	216.32	211.69
Min Ch El (ft)	1653.79	Shear (lb/sq ft)	0.04	0.22	0.10
Alpha	1.01	Stream Power (lb/ft s)	0.05	0.36	0.15
Frctn Loss (ft)	3.12	Cum Volume (acre-ft)	12.22	15.68	4.55
C & E Loss (ft)	0.00	Cum SA (acres)	34.86	21.85	15.72

```
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)        * 1655.11  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.07  * Wt. n-Val.              *          *   0.053  *         *
* W.S. Elev (ft)        * 1655.04  * Reach Len. (ft)         *  475.00  *  519.20  *  536.00  *
* Crit W.S. (ft)        * 1654.54  * Flow Area (sq ft)       *          *  218.71  *          *
* E.G. Slope (ft/ft)    *0.005346  * Area (sq ft)            *          *  218.71  *          *
* Q Total (cfs)         *  450.00  * Flow (cfs)               *          *  450.00  *          *
* Top Width (ft)        *  216.30  * Top Width (ft)           *          *  216.30  *          *
* Vel Total (ft/s)      *    2.06  * Avg. Vel. (ft/s)         *          *    2.06  *          *
* Max Chl Dpth (ft)     *    1.25  * Hydr. Depth (ft)         *          *    1.01  *          *
* Conv. Total (cfs)     *  6154.7  * Conv. (cfs)              *          *  6154.7  *          *
* Length Wtd. (ft)      *  519.20  * Wetted Per. (ft)         *          *  217.48  *          *
* Min Ch El (ft)        * 1653.79  * Shear (lb/sq ft)         *          *    0.34  *          *
* Alpha                 *    1.00  * Stream Power (lb/ft s)   *          *    0.69  *          *
* Frctn Loss (ft)       *    3.02  * Cum Volume (acre-ft)     *    1.75  *   21.57  *    0.68  *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)           *    2.47  *   21.85  *    0.88  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9736.97   * 9923.79   *     7.21 *     6.72 *    37.41 *     1.60 *
0.18 *     1.07 *
* 2        * Chan      * 9923.79   * 10140.09  *   315.72 *   193.62 *   216.32 *    70.16 *
0.90 *     1.63 *
* 3        * ROB       * 10140.09  * 10320.06  *   126.96 *    83.05 *   179.98 *    28.21 *
0.46 *     1.53 *
* 4        * ROB       * 10320.06  * 10500.04  *     0.12 *     0.63 *    31.71 *     0.03 *
0.02 *     0.19 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9923.79   * 10140.09  *   450.00 *   218.71 *   217.48 *   100.00 *
1.01 *     2.06 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1 RS: 2.961

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9611.21	1652.01	9651.08	1651.94	9691.15	1651.91	9731.1	1651.77	9771.1	1651.6
9811.34	1651.67	9816.01	1651.629	9851.13	1651.32	9891.21	1651.31	9931.04	1651.13
9971.02	1650.89	10011.34	1650.88	10051.9	1651.09	10053.81	1651.27	10060.2	1649.46
10063.21	1649.81	10064.71	1651.01	10094.01	1651.41	10133.68	1651.42	10173.42	1651.6
10205.59	1651.72	10213.56	1651.75	10253.78	1652.03	10293.57	1652.56	10333.93	1652.66
10373.56	1653.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9611.21	.033	9811.34	.053	10173.42	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9891.21	10094.01	530	534.17	518	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1651.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.053	0.051
W.S. Elev (ft)	1651.77	Reach Len. (ft)	530.00	534.17	518.00
Crit W.S. (ft)		Flow Area (sq ft)	37.43	154.08	27.82
E.G. Slope (ft/ft)	0.010344	Area (sq ft)	37.43	154.08	27.82
Q Total (cfs)	450.00	Flow (cfs)	50.66	364.94	34.40
Top Width (ft)	483.95	Top Width (ft)	159.25	202.80	121.90
Vel Total (ft/s)	2.05	Avg. Vel. (ft/s)	1.35	2.37	1.24
Max Chl Dpth (ft)	2.31	Hydr. Depth (ft)	0.24	0.76	0.23
Conv. Total (cfs)	4424.6	Conv. (cfs)	498.1	3588.3	338.3
Length Wtd. (ft)	530.66	Wetted Per. (ft)	159.25	203.51	121.90
Min Ch El (ft)	1649.46	Shear (lb/sq ft)	0.15	0.49	0.15
Alpha	1.16	Stream Power (lb/ft s)	0.21	1.16	0.18
Frctn Loss (ft)	3.30	Cum Volume (acre-ft)	11.98	13.61	3.86
C & E Loss (ft)	0.01	Cum SA (acres)	33.78	19.35	13.67

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1652.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.053	
W.S. Elev (ft)	1652.01	Reach Len. (ft)	530.00	534.17	518.00
Crit W.S. (ft)		Flow Area (sq ft)		202.62	
E.G. Slope (ft/ft)	0.006365	Area (sq ft)		202.62	
Q Total (cfs)	450.00	Flow (cfs)		450.00	
Top Width (ft)	202.80	Top Width (ft)		202.80	
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)		2.22	
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)		1.00	
Conv. Total (cfs)	5640.3	Conv. (cfs)		5640.3	
Length Wtd. (ft)	532.65	Wetted Per. (ft)		204.80	
Min Ch El (ft)	1649.46	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		0.87	
Frctn Loss (ft)	3.15	Cum Volume (acre-ft)	1.75	19.06	0.68
C & E Loss (ft)	0.00	Cum SA (acres)	2.47	19.35	0.88

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9611.21	9751.21	0.42	0.79	19.25	0.09	0.04	0.54
2	LOB	9751.21	9891.21	50.24	36.64	140.00	11.16	0.26	1.37
3	Chan	9891.21	10094.01	364.94	154.08	203.51	81.10	0.76	2.37
4	ROB	10094.01	10233.79	34.40	27.82	121.90	7.64	0.23	1.24

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.
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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9891.21	10094.01	450.00	202.62	204.80	100.00	1.00	2.22

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: T4N-R3W-S18E
REACH: Reach-1 RS: 2.860

INPUT
Description: Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9555.61	1648.55	9597.54	1648.54	9639.92	1648.22	9681.9	1648.12	9723.33	1648
9765.8	1648.05	9807.73	1648.03	9849.62	1647.96	9880.33	1647.894	9891.37	1647.87
9933.65	1647.44	9975.57	1647.54	10017.68	1647.94	10059.98	1647.79	10101.85	1647.94
10143.93	1648.17	10154.27	1648.25	10185.94	1648.53	10227.9	1648.87	10269.54	1649.16
10311.73	1650.06	10354.3	1649.86						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9555.61	.033	9765.8	.05	10101.85	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9891.37	10017.68	541	565.04	569	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1648.54	Element	Left OB	Channel	Right OB

* Vel Head (ft)	* 0.03	* Wt. n-Val.	* 0.042	* 0.053	* 0.047	*
* W.S. Elev (ft)	* 1648.50	* Reach Len. (ft)	* 541.00	* 565.04	* 569.00	*
* Crit W.S. (ft)	* 1648.22	* Flow Area (sq ft)	* 123.58	* 110.63	* 79.24	*
* E.G. Slope (ft/ft)	*0.004145	* Area (sq ft)	* 123.58	* 110.63	* 79.24	*
* Q Total (cfs)	* 450.00	* Flow (cfs)	* 161.09	* 182.79	* 106.12	*
* Top Width (ft)	* 580.68	* Top Width (ft)	* 289.11	* 126.31	* 165.26	*
* Vel Total (ft/s)	* 1.44	* Avg. Vel. (ft/s)	* 1.30	* 1.65	* 1.34	*
* Max Chl Dpth (ft)	* 1.06	* Hydr. Depth (ft)	* 0.43	* 0.88	* 0.48	*
* Conv. Total (cfs)	* 6989.3	* Conv. (cfs)	* 2502.0	* 2839.1	* 1648.2	*
* Length Wtd. (ft)	* 554.60	* Wetted Per. (ft)	* 289.11	* 126.31	* 165.27	*
* Min Ch El (ft)	* 1647.44	* Shear (lb/sq ft)	* 0.11	* 0.23	* 0.12	*
* Alpha	* 1.04	* Stream Power (lb/ft s)	* 0.14	* 0.37	* 0.17	*
* Frctn Loss (ft)	* 3.29	* Cum Volume (acre-ft)	* 11.00	* 11.99	* 3.22	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 31.06	* 17.34	* 11.96	*

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 OUTPUT Profile #2

* E.G. Elev (ft)	* 1648.93	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.08	* Wt. n-Val.	*	* 0.053	* 0.053	*
* W.S. Elev (ft)	* 1648.85	* Reach Len. (ft)	* 541.00	* 565.04	* 569.00	*
* Crit W.S. (ft)	* 1648.30	* Flow Area (sq ft)	*	* 154.51	* 41.74	*
* E.G. Slope (ft/ft)	*0.005496	* Area (sq ft)	*	* 154.51	* 41.74	*
* Q Total (cfs)	* 450.00	* Flow (cfs)	*	* 365.41	* 84.59	*
* Top Width (ft)	* 168.61	* Top Width (ft)	*	* 126.31	* 42.30	*
* Vel Total (ft/s)	* 2.29	* Avg. Vel. (ft/s)	*	* 2.37	* 2.03	*
* Max Chl Dpth (ft)	* 1.41	* Hydr. Depth (ft)	*	* 1.22	* 0.99	*
* Conv. Total (cfs)	* 6070.0	* Conv. (cfs)	*	* 4929.0	* 1141.0	*
* Length Wtd. (ft)	* 565.38	* Wetted Per. (ft)	*	* 127.30	* 43.36	*
* Min Ch El (ft)	* 1647.44	* Shear (lb/sq ft)	*	* 0.42	* 0.33	*
* Alpha	* 1.01	* Stream Power (lb/ft s)	*	* 0.98	* 0.67	*
* Frctn Loss (ft)	* 3.08	* Cum Volume (acre-ft)	* 1.75	* 16.87	* 0.43	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 2.47	* 17.34	* 0.63	*

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.

Profile #1

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)	*
* 1	* LOB	* 9555.61	* 9723.49	* 49.98	* 37.89	* 121.23	* 11.11	* 0.31	* 1.32	*
* 2	* LOB	* 9723.49	* 9891.37	* 111.11	* 85.69	* 167.88	* 24.69	* 0.51	* 1.30	*
* 3	* Chan	* 9891.37	* 10017.68	* 182.79	* 110.63	* 126.31	* 40.62	* 0.88	* 1.65	*
* 4	* ROB	* 10017.68	* 10185.99	* 106.12	* 79.24	* 165.27	* 23.58	* 0.48	* 1.34	*

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.

Profile #2

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)	*
* 1	* Chan	* 9891.37	* 10017.68	* 365.41	* 154.51	* 127.30	* 81.20	* 1.22	* 2.37	*

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* 2          * ROB       * 10017.68  * 10185.99  *    84.59 *    41.74 *    43.36 *    18.80 *
0.99 *     2.03 *
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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: T4N-R3W-S18E
REACH: Reach-1 RS: 2.752

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs; Cross section was surveyed, and some discrepancies are apparent between the 4-ft contour mapping and the survey. The floodplain is mapped at the left and right water surface stations, therefore survey takes precedence over the topographic mapping.
The 10,000 station placed on the western-most thalweg.

Flow rate starting at this cross-section is increased to 540cfs
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9278.2	1645.4	9337.94	1645.59	9398.08	1645.11	9458	1644.9	9517.47	1644.67
9517.5	1644.7	9538.05	1644.71	9557.91	1644.66	9577.98	1644.72	9597.52	1644.56
9617.88	1644.6	9637.68	1644.61	9658.19	1644.69	9678.14	1644.71	9698.07	1644.83
9717.43	1644.85	9737.77	1644.86	9758.01	1644.74	9777.97	1644.76	9798.26	1644.83
9818	1644.83	9860.1	1644.83	9880.2	1644.78	9900.43	1644.7	9920.22	1644.76
9940.48	1644.72	9960.33	1644.83	9980.47	1644.65	10000.3	1644.52	10020.3	1644.64
10040.15	1644.96	10060.43	1644.86	10080.22	1644.99	10100.43	1644.82	10120.31	1644.99
10140.63	1644.83	10200.54	1644.91	10260.26	1644.95	10320.41	1645.02	10380.38	1645.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9278.2	.033	9458	.05	10200.54	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9860.1	10120.31	343	510.6	491	.1	.3

Left Levee Station= 9337.94 Elevation= 1645.59

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1645.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.052	0.053	0.041
W.S. Elev (ft)	1645.20	Reach Len. (ft)	343.00	510.60	491.00
Crit W.S. (ft)	1645.03	Flow Area (sq ft)	196.75	110.29	57.33
E.G. Slope (ft/ft)	0.008504	Area (sq ft)	196.75	110.29	57.33
Q Total (cfs)	540.00	Flow (cfs)	299.33	160.90	79.77
Top Width (ft)	953.81	Top Width (ft)	473.80	260.21	219.80
Vel Total (ft/s)	1.48	Avg. Vel. (ft/s)	1.52	1.46	1.39
Max Chl Dpth (ft)	0.68	Hydr. Depth (ft)	0.42	0.42	0.26
Conv. Total (cfs)	5855.7	Conv. (cfs)	3245.9	1744.7	865.1
Length Wtd. (ft)	418.43	Wetted Per. (ft)	473.81	260.22	219.80
Min Ch El (ft)	1644.52	Shear (lb/sq ft)	0.22	0.23	0.14
Alpha	1.00	Stream Power (lb/ft s)	0.34	0.33	0.19
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	9.02	10.55	2.33
C & E Loss (ft)	0.00	Cum SA (acres)	26.32	14.83	9.45

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 OUTPUT Profile #2

E.G. Elev (ft)	1645.85	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.07	Wt. n-Val.		0.053		
W.S. Elev (ft)	1645.79	Reach Len. (ft)	343.00	510.60	491.00	
Crit W.S. (ft)	1645.29	Flow Area (sq ft)		262.15		
E.G. Slope (ft/ft)	0.005393	Area (sq ft)		262.15		
Q Total (cfs)	540.00	Flow (cfs)		540.00		
Top Width (ft)	260.21	Top Width (ft)		260.21		
Vel Total (ft/s)	2.06	Avg. Vel. (ft/s)		2.06		
Max Chl Dpth (ft)	1.27	Hydr. Depth (ft)		1.01		
Conv. Total (cfs)	7353.2	Conv. (cfs)		7353.2		
Length Wtd. (ft)	490.46	Wetted Per. (ft)		261.97		
Min Ch El (ft)	1644.52	Shear (lb/sq ft)		0.34		
Alpha	1.00	Stream Power (lb/ft s)		0.69		
Frctn Loss (ft)	3.01	Cum Volume (acre-ft)	1.75	14.17	0.16	
C & E Loss (ft)	0.00	Cum SA (acres)	2.47	14.83	0.35	

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9337.94	9599.02	123.61	80.27	212.73	22.89	0.38	1.54
2 LOB	9599.02	9860.10	175.72	116.48	261.08	32.54	0.45	1.51
3 Chan	9860.10	10120.31	160.90	110.29	260.22	29.80	0.42	1.46
4 ROB	10120.31	10250.34	55.50	39.79	130.04	10.28	0.31	1.39
5 ROB	10250.34	10380.38	24.27	17.54	89.77	4.49	0.20	1.38

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9860.10	10120.31	540.00	262.15	261.97	100.00	1.01	2.06

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: T4N-R3W-S18E
REACH: Reach-1 RS: 2.656

INPUT
Description: The 10,000 station placed on the western-most thalweg.
Station Elevation Data num= 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9130.43	1643.8	9138.91	1643.91	9139.21	1643.91	9143.95	1643.7	9198.8	1643.79
9199.13	1643.8	9213.87	1643.65	9257.38	1643.51	9273.68	1643.39	9283.91	1643.37
9300.88	1643.4	9332.57	1643.18	9346.22	1643.08	9360.07	1642.9	9367.66	1642.9
9378.77	1642.75	9405.57	1642.561	9421.31	1642.45	9458.46	1642.53	9458.83	1642.52
9459.15	1642.5	9459.17	1642.51	9459.34	1642.51	9481.41	1642.2	9483.58	1642.19
9515.8	1642.19	9520.61	1642.21	9521.79	1642.21	9522.69	1642.2	9523.51	1642.21
9524.42	1642.21	9525.65	1642.2	9531.55	1642.16	9536.33	1642.1	9550.3	1642.03
9557.97	1642	9562.35	1641.98	9569.92	1642	9577.67	1641.97	9592.39	1641.99
9598.15	1641.99	9615.2	1642.02	9618.91	1642.03	9657.7	1642.12	9677.55	1642.08
9693.03	1642	9703.54	1642.01	9712.58	1642	9724.92	1641.99	9727.81	1642
9734.32	1642	9735.91	1642.01	9744.72	1642.03	9745.32	1642.02	9760.53	1642
9774.65	1641.95	9786.07	1641.93	9789.91	1641.92	9791.95	1641.91	9792.3	1641.9
9822.54	1642	9825.04	1642.01	9829.59	1642.02	9831.24	1642.01	9856.17	1642
9871.03	1642.11	9903.01	1642.01	9906.39	1642.01	9910.7	1642	9912.64	1642
9917.44	1642.03	9920.06	1642.07	9932.67	1642.18	9936.53	1642.2	9939.9	1642.2
9947.99	1642.22	9957.91	1642.23	9966.89	1642.18	9983.89	1642.09	9998.56	1641.99
10003.04	1641.97	10005.22	1641.94	10006.85	1641.96	10012.04	1642	10020.79	1642
10028.99	1642.02	10041.69	1642.08	10052.02	1642.12	10052.69	1642.11	0053.15	1642.13
10053.26	1642.12	10053.96	1642.12	10070.31	1642	10074.86	1641.97	10103.08	1641.76
10123.13	1641.77	10142.55	1641.83	10153.4	1641.81	0157.46	1641.82	10169.39	1641.88
10202.53	1641.94	10204.87	1641.94	10215.51	1642	10232.25	1642.11	0241.43	1642.14
10254.96	1642.18	10256.87	1642.19	10281.59	1642.31	0295.89	1642.38	10300.65	1642.41
10304.46	1642.43	10305.14	1642.42	10322.26	1642.4	10354.9	1642.28	10387.15	1642.22
10395.44	1642.21	10399.2	1642.21	10404.81	1642.21	0438.36	1642.32	10451.09	1642.38
10457.67	1642.38	10501.44	1642.36	10520.11	1642.31	0549.94	1642.39	10571.39	1642.44
10598.22	1642.61	10616.04	1642.78	10651.99	1643	10693.23	1643.57	0694.89	1643.58
10695.97	1643.61	0699.07	1643.61	0730.23	1644	10740.18	1644.13	10743.45	1644.16
10744.17	1644.17	10766.68	1644.41	0802.09	1644.61	0849.62	1644.96	10852.45	1644.99
10856.79	1644.98	10875.95	1644.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9130.43	.035	9524.42	.05	10232.25	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.89	10215.51	586	494.36	468	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1642.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.052	0.053	0.037
W.S. Elev (ft)	1642.51	Reach Len. (ft)	586.00	494.36	468.00
Crit W.S. (ft)	1642.28	Flow Area (sq ft)	231.18	134.77	74.54
E.G. Slope (ft/ft)	0.005068	Area (sq ft)	231.18	134.77	74.54
Q Total (cfs)	540.00	Flow (cfs)	276.35	187.48	76.17
Top Width (ft)	1157.16	Top Width (ft)	559.07	231.62	366.47
Vel Total (ft/s)	1.23	Avg. Vel. (ft/s)	1.20	1.39	1.02
Max Chl Dpth (ft)	0.75	Hydr. Depth (ft)	0.41	0.58	0.20
Conv. Total (cfs)	7585.0	Conv. (cfs)	3881.7	2633.3	1070.0
Length Wtd. (ft)	523.22	Wetted Per. (ft)	559.07	231.62	366.48
Min Ch El (ft)	1641.76	Shear (lb/sq ft)	0.13	0.18	0.06
Alpha	1.03	Stream Power (lb/ft s)	0.16	0.26	0.07
Frctn Loss (ft)	3.19	Cum Volume (acre-ft)	7.33	9.12	1.59
C & E Loss (ft)	0.00	Cum SA (acres)	22.25	11.95	6.14

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1642.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.053	0.053	
W.S. Elev (ft)	1642.77	Reach Len. (ft)	586.00	494.36	468.00
Crit W.S. (ft)		Flow Area (sq ft)	73.57	195.42	
E.G. Slope (ft/ft)	0.007063	Area (sq ft)	73.57	195.42	
Q Total (cfs)	540.00	Flow (cfs)	129.80	410.20	
Top Width (ft)	344.51	Top Width (ft)	112.89	231.62	
Vel Total (ft/s)	2.01	Avg. Vel. (ft/s)	1.76	2.10	
Max Chl Dpth (ft)	1.01	Hydr. Depth (ft)	0.65	0.84	
Conv. Total (cfs)	6425.4	Conv. (cfs)	1544.5	4880.9	
Length Wtd. (ft)	504.84	Wetted Per. (ft)	113.55	232.39	
Min Ch El (ft)	1641.76	Shear (lb/sq ft)	0.29	0.37	
Alpha	1.02	Stream Power (lb/ft s)	0.50	0.78	
Frctn Loss (ft)	3.28	Cum Volume (acre-ft)	1.46	11.49	0.16
C & E Loss (ft)	0.00	Cum SA (acres)	2.02	11.95	0.35

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9130.43	9557.16	32.81	31.50	132.34	6.08	0.24	1.04
2 LOB	9557.16	9983.89	243.54	199.68	426.73	45.10	0.47	1.22
3 Chan	9983.89	10215.51	187.48	134.77	231.62	34.72	0.58	1.39
4 ROB	10215.51	10545.73	74.63	71.69	330.22	13.82	0.22	1.04
5 ROB	10545.73	10875.95	1.55	2.85	36.25	0.29	0.08	0.54

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9557.16	9983.89	129.80	73.57	113.55	24.04	0.65	1.76
2 Chan	9983.89	10215.51	410.20	195.42	232.39	75.96	0.84	2.10

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: T4N-R3W-S18E
REACH: Reach-1 RS: 2.562

INPUT
Description: Divided flow okay, dry island not significant
The 10,000 station

placed on the western-most thalweg.

Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9263.91	1640.7	9308.27	1640.4	9322.25	1640.27	9331.32	1640.18	9337.78	1640.1
9351.23	1640.05	9360.23	1640	9364.83	1639.97	9384.64	1639.89	9402.79	1639.7
9418.75	1639.63	9428.99	1639.67	9461.65	1639.63	9475.68	1639.62	9496.57	1639.4
9500.64	1639.36	9525.24	1639.31	9551.69	1639.215	9567.04	1639.16	9577.52	1639.08
9586.01	1639	9629.7	1638.92	9657.9	1638.81	9664.62	1638.79	9699.55	1639.12
9706.38	1639.2	9746.31	1638.91	9752.13	1638.86	9753.64	1638.86	9788.33	1638.71
9793.77	1638.7	9799.6	1638.72	9804.1	1638.72	9834.26	1638.61	9843.73	1638.54
9858.86	1638.6	9882.02	1638.58	9901.49	1638.46	9916.77	1638.46	9932.13	1638.47
9938.56	1638.5	9952.26	1638.47	9963.09	1638.51	9988.66	1638.46	10006.6	1638.58
10012.98	1638.7	10024.78	1638.75	10032.39	1638.75	10033.5	1638.74	10038.93	1638.75
10074.07	1638.6	10080.62	1638.79	10097.09	1639.04	10128.8	1639.55	10130.45	1639.55
10181.39	1639.56	10182.55	1639.6	10182.99	1639.56	10231.9	1639.48	10272.85	1639.39
10282.97	1639.39	10297.17	1639.2	10327.69	1638.72	10344.2	1638.79	10381.18	1639.19
10409.35	1639.3	10431.11	1639.3	10470.7	1639.6	10479.94	1639.63	10488.02	1639.7
10490.53	1639.72	10493.57	1639.7	10526.86	1639.94	10527.17	1639.94	10529.3	1639.97
10531.83	1640	10568.07	1640.48	10577.99	1640.59	10607.06	1640.7	10628.13	1640.79
10653.52	1641.1	10673.37	1641.43	10705.3	1641.82	10721.33	1642	10724.66	1642.04
10725.87	1642.1	10735	1642.23	10773.92	1642.82	10818.34	1642.95	10825.43	1642.96
10825.98	1643	10844.87	1642.9	10896.95	1642.79				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9263.91	.035	9586.01	.053	10097.09	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9799.6	10080.62	513	495.52	479	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1639.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.052	0.053	0.037
W.S. Elev (ft)	1639.29	Reach Len. (ft)	513.00	495.52	479.00
Crit W.S. (ft)	1639.05	Flow Area (sq ft)	84.34	198.20	39.33
E.G. Slope (ft/ft)	0.007463	Area (sq ft)	84.34	198.20	39.33
Q Total (cfs)	540.00	Flow (cfs)	102.19	380.34	57.47
Top Width (ft)	696.46	Top Width (ft)	268.08	281.02	147.36
Vel Total (ft/s)	1.68	Avg. Vel. (ft/s)	1.21	1.92	1.46
Max Chl Dpth (ft)	0.83	Hydr. Depth (ft)	0.31	0.71	0.27
Conv. Total (cfs)	6250.9	Conv. (cfs)	1182.9	4402.7	665.3
Length Wtd. (ft)	497.29	Wetted Per. (ft)	268.08	281.03	147.37
Min Ch El (ft)	1638.46	Shear (lb/sq ft)	0.15	0.33	0.12
Alpha	1.10	Stream Power (lb/ft s)	0.18	0.63	0.18
Frctn Loss (ft)	3.04	Cum Volume (acre-ft)	5.21	7.23	0.98
C & E Loss (ft)	0.00	Cum SA (acres)	16.69	9.04	3.38

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1639.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.053	0.047
W.S. Elev (ft)	1639.49	Reach Len. (ft)	513.00	495.52	479.00
Crit W.S. (ft)		Flow Area (sq ft)		254.87	14.54
E.G. Slope (ft/ft)	0.006009	Area (sq ft)		254.87	14.54
Q Total (cfs)	540.00	Flow (cfs)		518.01	21.99
Top Width (ft)	313.25	Top Width (ft)		281.02	32.23
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)		2.03	1.51
Max Chl Dpth (ft)	1.03	Hydr. Depth (ft)		0.91	0.45
Conv. Total (cfs)	6966.4	Conv. (cfs)		6682.7	283.7
Length Wtd. (ft)	495.18	Wetted Per. (ft)		281.80	32.43
Min Ch El (ft)	1638.46	Shear (lb/sq ft)		0.34	0.17
Alpha	1.01	Stream Power (lb/ft s)		0.69	0.25
Frctn Loss (ft)	3.17	Cum Volume (acre-ft)	0.97	8.93	0.08

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    1.26  *    9.04  *    0.18  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9531.76   * 9799.60   *   102.19 *    84.34 *   267.85 *    18.92 *
0.31 *     1.21 *
* 2         * Chan      * 9799.60   * 10080.62  *   380.34 *   198.20 *   281.03 *    70.43 *
0.71 *     1.92 *
* 3         * ROB       * 10080.62  * 10488.79  *    57.47 *    39.33 *   147.37 *    10.64 *
0.27 *     1.46 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9799.60   * 10080.62  *   518.01 *   254.87 *   281.80 *    95.93 *
0.91 *     2.03 *
* 2         * ROB       * 10080.62  * 10488.79  *    21.99 *    14.54 *    32.43 *     4.07 *
0.45 *     1.51 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-1            RS: 2.468

INPUT
Description: The 10,000 station placed on the western-most thalweg.
Station Elevation Data    num=     202
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9076.89  1636.9 9109.64  1637.3 9168.17 1637.16 9181.74  1637.1  9265.1  1637.2
 9298.76 1637.17 9327.62 1637.22 9342.43 1637.24 9346.09  1637.1 9349.83  1637.1
 9378.08 1637.03 9393.53 1636.94 9415.74 1636.87 9488.341636.661 9488.74 1636.66
 9526.19  1636.5 9535.01 1636.52 9535.38 1636.52 9536.17 1636.51 9536.29 1636.51
 9536.94  1636.5  9537.9  1636.5 9539.28 1636.49 9541.17 1636.47 9549.91 1636.36
 9565.46  1636.2 9580.83    1636 9581.26 1636.01 9584.27 1635.97 9585.93  1635.9
    9587 1635.95 9591.03 1635.93 9592.91 1635.93 9595.38  1635.9 9604.78 1635.97
 9610.05 1635.99 9610.59    1636 9616.53    1636 9622.43 1635.98 9628.18 1635.97
 9629.47 1635.97 9632.76 1635.95 9647.08  1635.8 9679.61 1635.69 9694.68 1635.89
 9715.68 1635.91 9717.16  1635.9 9717.85 1635.91 9718.79 1635.91 9736.92 1635.87
 9752.16  1635.9 9792.36 1635.81 9806.48 1635.51 9817.62 1635.46 9823.47 1635.46
 9831.98  1635.3 9860.83 1635.45 9882.96 1635.34 9884.03 1635.34 9887.16  1635.3
 9887.88 1635.21 9891.88 1635.34 9895.27 1635.26 9900.07  1635.3 9906.44  1635.3
  9909.3 1635.28 9912.73 1635.24 9914.19 1635.22  9916.9 1635.23 9917.01  1635.2
 9918.67 1635.24 9920.75 1635.24 9921.04  1635.3 9922.68 1635.26 9923.06 1635.27
  9926.4 1635.29 9926.93  1635.3 9928.48 1635.32  9930.1 1635.33 9930.61 1635.34
 9932.14 1635.35 9932.71  1635.3 9934.16 1635.36 9934.79 1635.36 9937.57 1635.38
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  9938.2  1635.4 9938.86 1635.38 9940.13 1635.39 9940.83  1635.4 9942.82  1635.4
    9944 1635.42 9944.76 1635.42 9946.88 1635.43  9948.3 1635.44 9949.39  1635.4
 9950.93 1635.46 9952.88 1635.47 9955.04 1635.49 9955.92 1635.49 9958.29  1635.5
 9959.04  1635.5 9959.71 1635.52 9967.78 1635.52 9968.04 1635.53 9968.28  1635.5
 9969.04 1635.55  9969.5 1635.55 9975.06  1635.5  9977.7 1635.48 9984.16  1635.5
 9986.46 1635.45 9988.53 1635.45 9995.48 1635.49 9997.45 1635.51 9998.71  1635.6
 9999.83  1635.610000.81 1635.6110001.49 1635.5910015.21 1635.6210015.49  1635.6
10015.73 1635.6110016.43 1635.6110016.61  1635.610016.78 1635.61 10020.9 1635.64
 10030.1 1635.6510032.52 1635.6510043.36  1635.610048.35 1635.6210052.71  1635.6
10057.09  1635.610060.74 1635.5810063.67  1635.610084.97 1635.4510086.53 1635.43
10087.62 1635.4110088.671635.43510091.34  1635.510094.22  1635.310098.14  1635.7
 10106.9    163610113.49 1636.0210122.33 1636.2410152.36    163610160.06    1636
10163.21 1635.9810167.65 1635.9610170.47 1635.9610178.65    163610186.61    1636
10196.82 1636.0210208.46 1636.0310218.59    163610222.02    163610226.71 1635.99
10230.46 1635.9710232.31 1635.9710234.44    163610238.42    163610250.17 1636.09
 10251.6 1636.12 10255.6 1636.1310267.24  1636.210284.33  1636.310320.97 1636.45
10336.27 1636.5210369.78  1636.710394.54    163710411.27 1637.1810425.81  1637.1
10456.11 1637.2810471.71  1637.410501.82  1637.8 10517.1 1637.9810519.32 1638.01
10520.26 1637.9910524.43 1637.9910533.86    163810547.29 1637.9310552.52 1637.93
10557.42 1637.9510562.89    163810563.01    163810565.94 1637.9910568.59 1638.06
10571.91  1638.110603.56 1638.6810614.81  1638.710626.02 1638.8810663.43 1639.12
10689.02 1639.3710752.38    164010758.27    164010775.21  1640.1 10795.1 1640.31
10800.99 1640.3610803.36 1640.3910808.59  1640.410848.59  1640.410854.71 1640.48
 10864.1 1640.4610872.22 1640.45

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
 9076.89    .035 9632.76    .053 10106.9    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9792.36 10106.9               510  497.68     472             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1636.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.049  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1636.25  * Reach Len. (ft)        *  510.00  *  497.68  *  472.00  *
* Crit W.S. (ft)          * 1635.95  * Flow Area (sq ft)      *   83.12  *  244.29  *   32.98  *
* E.G. Slope (ft/ft)      *0.005100  * Area (sq ft)           *   83.12  *  244.29  *   32.98  *
* Q Total (cfs)           *  540.00  * Flow (cfs)             *   93.23  *  413.19  *   33.58  *
* Top Width (ft)          *  716.01  * Top Width (ft)         *  232.06  *  314.54  *  169.41  *
* Vel Total (ft/s)        *    1.50  * Avg. Vel. (ft/s)       *    1.12  *    1.69  *    1.02  *
* Max Chl Dpth (ft)       *    1.05  * Hydr. Depth (ft)       *    0.36  *    0.78  *    0.19  *
* Conv. Total (cfs)       *  7561.8  * Conv. (cfs)            *  1305.5  *  5786.0  *   470.3  *
* Length Wtd. (ft)        *  500.43  * Wetted Per. (ft)       *  232.07  *  314.62  *  169.41  *
* Min Ch El (ft)          * 1635.20  * Shear (lb/sq ft)       *    0.11  *    0.25  *    0.06  *
* Alpha                   *    1.10  * Stream Power (lb/ft s) *    0.13  *    0.42  *    0.06  *
* Frctn Loss (ft)         *    2.68  * Cum Volume (acre-ft)   *    4.22  *    4.71  *    0.58  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   13.74  *    5.65  *    1.64  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1636.38  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)          * 1636.31  * Reach Len. (ft)        *  510.00  *  497.68  *  472.00  *
* Crit W.S. (ft)          * 1635.92  * Flow Area (sq ft)      *          *  262.99  *          *
* E.G. Slope (ft/ft)      *0.006835  * Area (sq ft)           *          *  262.99  *          *
* Q Total (cfs)           *  540.00  * Flow (cfs)             *          *  540.00  *          *
* Top Width (ft)          *  314.54  * Top Width (ft)         *          *  314.54  *          *
* Vel Total (ft/s)        *    2.05  * Avg. Vel. (ft/s)       *          *    2.05  *          *
* Max Chl Dpth (ft)       *    1.11  * Hydr. Depth (ft)       *          *    0.84  *          *
* Conv. Total (cfs)       *  6531.5  * Conv. (cfs)            *          *  6531.5  *          *
* Length Wtd. (ft)        *  498.91  * Wetted Per. (ft)       *          *  315.43  *          *
* Min Ch El (ft)          * 1635.20  * Shear (lb/sq ft)       *          *    0.36  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.73  *          *
* Frctn Loss (ft)         *    2.46  * Cum Volume (acre-ft)   *    0.97  *    5.98  *          *
```

```
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    1.26  *    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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9434.63   * 9792.36   *    93.23 *    83.12 *   232.07 *    17.26 *
0.36 *     1.12 *
* 2         * Chan      * 9792.36   * 10106.90  *   413.19 *   244.29 *   314.62 *    76.52 *
0.78 *     1.69 *
* 3         * ROB       * 10106.90  * 10489.56  *    33.58 *    32.98 *   169.41 *     6.22 *
0.19 *     1.02 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9792.36   * 10106.90  *   540.00 *   262.99 *   315.43 *   100.00 *
0.84 *     2.05 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18E
REACH: Reach-1            RS: 2.374

INPUT
Description: The 10,000 station placed on the western-most
             thalweg.
Interpolated point added at (10122.81,1633.145) to set
             bank station.
Station Elevation Data    num=     148
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8802.94  1634.7 8820.18 1634.84 8845.56 1634.64 8860.75 1634.61 8865.76 1634.55
 8910.71  1634.3 8931.15 1634.28 8936.63 1634.28 8937.88  1634.3 8977.79 1634.31
 8979.68 1634.29 8986.74 1634.25 9011.13  1634.1 9029.56    1634 9037.56 1633.95
 9043.71 1633.95 9044.62 1633.94 9045.17  1633.9 9147.59  1633.4 9149.07  1633.4
 9180.74 1633.74 9204.79 1633.87 9206.18  1633.9  9207.8 1633.87 9221.58 1633.76
 9260.93 1633.39 9265.04 1633.36 9267.36  1633.3    9295  1633.3 9299.62 1633.25
 9299.82  1633.3 9328.12 1633.34    9359  1633.4 9370.15 1633.43 9382.87 1633.49
 9391.03 1633.58  9399.2 1633.44 9425.39  1633.3 9426.15 1633.34 9426.43 1633.34
 9433.751633.305 9459.45 1633.18 9476.32 1633.33 9494.68  1632.8 9495.08 1632.77
    9496 1632.77 9505.99 1633.01 9513.94 1632.93 9539.48  1633.1 9569.56 1633.05
 9583.51 1632.96 9598.46 1633.17 9611.09 1633.39 9622.69  1633.5 9638.88 1633.36
 9644.36 1633.42 9653.93 1633.23 9661.69  1633.2 9681.08  1633.4 9709.76 1633.41
 9728.64 1633.42 9759.58 1633.32 9769.68 1633.31 9799.95  1633.3 9832.49 1633.09
 9843.04 1633.08  9858.2 1633.13  9859.7 1633.14 9860.97  1633.1 9862.04 1633.15
 9862.94 1633.16 9863.71 1633.16  9864.4 1633.17 9865.01  1633.2 9874.54 1633.16
 9883.86 1633.23 9884.32  1633.2 9884.83 1633.17 9885.15  1633.1 9885.49 1633.11
 9885.85 1633.09 9889.99  1633.1 9890.91 1633.13 9891.89  1633.1 9893.05 1633.12
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  9894.4  1633.1 9896.26 1633.09 9898.51 1633.07 9901.19  1633.1 9905.04 1633.09
 9908.06 1633.13  9912.2 1633.12 9920.99 1633.07 9940.31  1632.9 9942.79 1632.82
 9946.21 1632.74 9966.94 1632.66 9971.26 1632.6510008.81  1632.610028.01 1632.79
10039.54 1632.7610047.21 1632.8610083.681632.70610096.81 1632.6510105.37  1632.6
10111.02 1632.7110122.811633.14510139.48 1633.76 10149.7 1633.7310153.59 1633.76
 10181.5  1633.6 10203.6 1633.6710228.79 1633.9410238.48    163410251.25 1634.15
10299.25  1634.610301.19 1634.5810301.93 1634.5810346.53 1635.1510369.45 1635.01
10393.94  1634.910436.68 1635.0510438.36 1635.0610439.98 1635.0610483.96 1635.44
10484.29  1635.410489.78 1635.4610529.27 1635.4910542.34 1635.4510579.38 1635.39
10588.01  1635.510624.45 1635.7910629.64 1635.8410648.56    163610671.56  1636.2
10673.12  1636.210673.93 1636.2210674.12 1636.2210680.35 1636.2610723.01 1636.57
10735.47  1636.710770.16    163710804.28 1637.2510815.46 1637.2610837.98 1637.33
10860.07  1637.510861.84 1637.5310867.12 1637.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8802.94    .035 9391.03    .05310139.48    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9908.0610122.81              507  518.21     508            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1633.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.050  *   0.053  *   0.053  *
* W.S. Elev (ft)          * 1633.58  * Reach Len. (ft)         *  507.00  *  518.21  *  508.00  *
* Crit W.S. (ft)          * 1633.30  * Flow Area (sq ft)       *  213.59  *  173.36  *    2.51  *
* E.G. Slope (ft/ft)      *0.005647  * Area (sq ft)            *  213.59  *  173.36  *    2.51  *
* Q Total (cfs)           *  540.00  * Flow (cfs)              *  221.47  *  316.64  *    1.89  *
* Top Width (ft)          *  946.06  * Top Width (ft)          *  719.66  *  214.75  *   11.65  *
* Vel Total (ft/s)        *    1.39  * Avg. Vel. (ft/s)        *    1.04  *    1.83  *    0.76  *
* Max Chl Dpth (ft)       *    0.97  * Hydr. Depth (ft)        *    0.30  *    0.81  *    0.21  *
* Conv. Total (cfs)       *  7186.1  * Conv. (cfs)             *  2947.3  *  4213.7  *    25.2  *
* Length Wtd. (ft)        *  513.15  * Wetted Per. (ft)        *  719.71  *  214.76  *   11.66  *
* Min Ch El (ft)          * 1632.60  * Shear (lb/sq ft)        *    0.10  *    0.28  *    0.08  *
* Alpha                   *    1.25  * Stream Power (lb/ft s)  *    0.11  *    0.52  *    0.06  *
* Frctn Loss (ft)         *    3.04  * Cum Volume (acre-ft)    *    2.49  *    2.33  *    0.39  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    8.17  *    2.63  *    0.66  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1633.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.053  *   0.053  *          *
* W.S. Elev (ft)          * 1633.87  * Reach Len. (ft)         *  507.00  *  518.21  *  508.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   78.48  *  237.22  *          *
* E.G. Slope (ft/ft)      *0.003713  * Area (sq ft)            *   78.48  *  237.22  *          *
* Q Total (cfs)           *  540.00  * Flow (cfs)              *  107.92  *  432.08  *          *
* Top Width (ft)          *  322.86  * Top Width (ft)          *  108.11  *  214.75  *          *
* Vel Total (ft/s)        *    1.71  * Avg. Vel. (ft/s)        *    1.38  *    1.82  *          *
* Max Chl Dpth (ft)       *    1.27  * Hydr. Depth (ft)        *    0.73  *    1.10  *          *
* Conv. Total (cfs)       *  8861.5  * Conv. (cfs)             *  1770.9  *  7090.6  *          *
* Length Wtd. (ft)        *  517.19  * Wetted Per. (ft)        *  108.70  *  215.49  *          *
* Min Ch El (ft)          * 1632.60  * Shear (lb/sq ft)        *    0.17  *    0.26  *          *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.23  *    0.46  *          *
* Frctn Loss (ft)         *    3.00  * Cum Volume (acre-ft)    *    0.51  *    3.13  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.63  *    2.63  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 8802.94   * 9355.50   *    30.51 *    29.99 *   167.86 *     5.65 *
0.18 *     1.02 *
* 2         * LOB       * 9355.50   * 9908.06   *   190.96 *   183.60 *   551.85 *    35.36 *
0.33 *     1.04 *
* 3         * Chan      * 9908.06   * 10122.81  *   316.64 *   173.36 *   214.76 *    58.64 *
0.81 *     1.83 *
* 4         * ROB       * 10122.81  * 10494.96  *     1.89 *     2.51 *    11.66 *     0.35 *
0.21 *     0.76 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9355.50   * 9908.06   *   107.92 *    78.48 *   108.70 *    19.98 *
0.73 *     1.38 *
* 2         * Chan      * 9908.06   * 10122.81  *   432.08 *   237.22 *   215.49 *    80.02 *
1.10 *     1.82 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18E
REACH: Reach-1            RS: 2.276

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 650cfs
This cross-section is the downstream end of
             Reach-1.  The ridge at STA 9672.19 in the cross-section divides
             the flow creating two seperate water surfaces.  A flow
             distribution calculated the flow that continues on each side of
             the ridge.  The flow on the right side of the ridge is 520cfs and
             the flow on the left side of the ridge is 130cfs.
The 10,000
             station placed on the western-most thalweg.
Station Elevation Data    num=     169
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8823.03    1632 8828.93 1632.02 8834.56 1632.02 8840.56 1632.02 8847.47 1632.05
 8853.28    1632 8857.46    1632 8859.28 1631.98 8863.59 1631.94 8883.41 1631.76
 8914.27  1631.9 8926.53 1631.82 8949.94  1631.8 8984.44 1631.78 8995.36 1631.62
 9019.67  1631.4 9053.36 1631.08 9103.91 1630.96 9181.52 1630.46 9200.24 1630.43
 9227.78  1630.5 9238.34 1630.46 9263.08 1630.42 9297.02 1630.29 9316.81 1630.44
 9325.29  1630.5 9329.29 1630.54 9352.05 1630.51 9353.41 1630.49 9372.59 1630.35
 9380.51  1630.3 9406.93 1630.14 9414.21 1630.19 9418.83 1630.18 9424.42 1630.19
 9439.89  1630.2 9440.16 1630.14  9440.7 1630.01 9440.93    1630 9442.59 1629.73
 9443.99  1629.4 9445.72 1629.82 9447.07 1630.02 9447.12 1630.02 9447.36 1630.02
  9447.4    1630 9457.56 1630.09 9481.06 1630.25 9490.26 1630.28 9499.38 1630.31
 9515.37  1630.2 9520.19 1630.22 9548.44 1630.01 9549.54 1630.01 9550.72 1630.01
 9552.68    1630  9557.5 1630.01 9586.29 1630.21 9611.09  1630.3 9620.96 1630.29
 9635.44  1630.2 9637.66 1630.19 9640.25 1630.18 9660.74 1630.16 9696.49 1630.27
 9704.77  1630.3 9720.61 1630.23 9721.47 1630.22 9722.26 1630.23 9746.11 1630.53
 9748.13  1630.5 9749.18 1630.54 9809.49 1630.21 9815.99 1630.21 9822.37  1630.2
```

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  9829.2  1630.2 9837.02 1630.17 9865.02 1630.16 9865.97 1630.16 9866.98 1630.16
 9867.75  1630.2 9868.54 1630.17 9869.38 1630.18 9870.88 1630.19 9872.53 1630.21
 9874.41  1630.2 9875.78  1630.2 9876.16 1630.19 9878.72 1630.17 9880.51 1630.13
 9881.62  1630.1 9882.35 1630.09 9890.51 1630.05  9895.6 1630.01  9896.4 1630.01
 9898.75    1630 9900.11 1629.99 9900.71 1629.99 9902.09 1629.99 9903.16 1629.98
 9917.37    1630 9921.06 1629.95 9931.93 1629.94 9934.72 1629.94 9935.78 1629.94
 9938.33  1629.9 9965.46 1629.78 9966.96 1629.77 9967.34 1629.77 9967.43 1629.77
 9967.55  1629.8  9968.9 1629.75 9969.14 1629.75 9969.44 1629.75 9969.92 1629.74
 9970.68  1629.7 9972.07 1629.7210007.55 1629.4110009.06  1629.410020.98 1629.61
10023.24  1629.6 10032.9 1629.5910053.02 1629.4410058.87 1629.55 10059.3 1629.55
10061.12  1629.6 10096.5  1629.810097.73 1629.8110099.36 1629.8210101.11 1629.82
10108.27  1629.810111.52 1629.8110114.93 1629.8110132.18 1629.8310132.31 1629.84
10146.85    163010150.51 1629.9610154.24 1629.9610155.78 1629.9610156.81 1629.96
10160.54    163010163.31 1630.0410178.31 1630.2510189.35  1630.410196.34 1630.48
10200.38  1630.510202.14 1630.5510202.55 1630.5510204.11 1630.5610218.35 1630.66
10259.79  1630.910280.24 1631.13 10318.5 1631.7510334.88 1631.8610357.18 1631.92
10368.49    163210370.19    163210372.25 1632.01 10372.5 1631.9910373.98 1632.02
10382.89  1632.210408.19 1632.6410429.11 1632.9510485.51 1633.2210486.61 1633.22
10486.93  1633.210487.21 1633.2210504.92 1633.1510536.23 1632.94

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*****************************************************************************
 8823.03    .035 9372.59    .053 9499.38    .035 9872.53    .05310099.36    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9872.5310099.36                 0       0       0              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1630.57  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.039   *   0.053   *   0.035  *
* W.S. Elev (ft)         * 1630.53  * Reach Len. (ft)         *           *           *          *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  169.58   *  175.89   *   49.83  *
* E.G. Slope (ft/ft)     *0.006170  * Area (sq ft)            *  169.58   *  175.89   *   49.83  *
* Q Total (cfs)          *  650.00  * Flow (cfs)              *  219.94   *  326.91   *  103.15  *
* Top Width (ft)         * 1013.26  * Top Width (ft)          *  684.53   *  226.83   *  101.90  *
* Vel Total (ft/s)       *    1.64  * Avg. Vel. (ft/s)        *    1.30   *    1.86   *    2.07  *
* Max Chl Dpth (ft)      *    1.13  * Hydr. Depth (ft)        *    0.25   *    0.78   *    0.49  *
* Conv. Total (cfs)      *  8275.2  * Conv. (cfs)             *  2800.1   *  4161.9   *  1313.2  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *  684.69   *  226.84   *  101.91  *
* Min Ch El (ft)         * 1629.40  * Shear (lb/sq ft)        *    0.10   *    0.30   *    0.19  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)  *    0.12   *    0.56   *    0.39  *
* Frctn Loss (ft)        *    0.48  * Cum Volume (acre-ft)    *    0.26   *    0.25   *    0.08  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *           *           *          *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: A flow split was encountered.  The program first calculated the momentum of both
channels
         below the junction.  An energy balance was performed across the junction from the stream
with
         the highest momentum downstream to the section upstream.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1630.91  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *           *   0.053   *          *
* W.S. Elev (ft)         * 1630.79  * Reach Len. (ft)         *           *           *          *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *           *  236.08   *          *
* E.G. Slope (ft/ft)     *0.009227  * Area (sq ft)            *           *  236.08   *          *
* Q Total (cfs)          *  650.00  * Flow (cfs)              *           *  650.00   *          *
* Top Width (ft)         *  226.83  * Top Width (ft)          *           *  226.83   *          *
* Vel Total (ft/s)       *    2.75  * Avg. Vel. (ft/s)        *           *    2.75   *          *
* Max Chl Dpth (ft)      *    1.39  * Hydr. Depth (ft)        *           *    1.04   *          *
* Conv. Total (cfs)      *  6766.6  * Conv. (cfs)             *           *  6766.6   *          *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *           *  228.40   *          *
* Min Ch El (ft)         * 1629.40  * Shear (lb/sq ft)        *           *    0.60   *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *           *    1.64   *          *
* Frctn Loss (ft)        *    0.49  * Cum Volume (acre-ft)    *    0.05   *    0.31   *          *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *           *           *          *
```

```
*****************************************************************************************

Warning: A flow split was encountered.  The program first calculated the momentum of both
channels
         below the junction.  An energy balance was performed across the junction from the stream
with
         the highest momentum downstream to the section upstream.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
*           *           *           *           *          *          *          *          *
*          *
*****************************************************************************************
******************

Warning: Divided flow computed for this cross-section.
Warning: A flow split was encountered.  The program first calculated the momentum of both
channels
         below the junction.  An energy balance was performed across the junction from the stream
with
         the highest momentum downstream to the section upstream.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
*           *           *           *           *          *          *          *          *
*          *
*****************************************************************************************
******************

Warning: A flow split was encountered.  The program first calculated the momentum of both
channels
         below the junction.  An energy balance was performed across the junction from the stream
with
         the highest momentum downstream to the section upstream.

CROSS SECTION


RIVER: T4N-R3W-S18E
REACH: Reach-2            RS: 2.260

INPUT
Description: Flow rate starting at this cross-section and downstream is 70 cfs,
             the West portion of this cross-section is truncated at STA
             9610.20, which is the location of the black tick mark on the
             workmaps.  The stationing is based off of the western thalweg
             (REACH-3) as the 10,000 station.
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8823.03  1631.6 8845.78 1631.44 8861.79 1631.26 8872.32 1631.33 8879.97  1631.3
 8896.95  1631.3  8916.2 1631.27  8936.6 1631.24 8938.17 1631.23 8942.77 1631.25
 8978.42  1631.4 8999.42 1631.47 9003.38 1631.44 9046.64 1631.04 9074.39 1630.64
 9113.55  1630.5 9182.41 1630.07 9196.26    1630 9196.51    1630 9206.41 1629.93
 9232.47  1629.9 9248.72 1629.95 9256.64 1629.93 9264.89 1629.92 9265.02 1629.92
    9282  1629.9  9303.8 1629.84 9314.28 1629.82 9327.05 1629.78 9333.66  1629.8
 9334.66  1629.8  9335.5 1629.78 9344.08  1629.8 9380.72 1629.86  9381.1 1629.86
 9381.58  1629.9 9381.84 1629.86 9382.02 1629.86 9383.03 1629.85 9384.29 1629.85
 9432.79  1629.7 9449.76 1629.62 9456.54 1629.62 9463.47 1629.63 9466.41 1629.63
 9469.29  1629.4 9470.76 1629.21 9471.91 1629.38 9472.79  1629.5 9473.75 1629.64
 9491.52  1629.7 9501.44 1629.56 9514.28 1629.52 9536.37 1629.83 9569.82 1629.99
```

```
 9573.64    1630 9574.98 1629.92 9576.98 1629.89 9582.07  1629.9  9584.5 1629.95
  9610.2    1630

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8823.03    .035 9384.29    .053 9536.37    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9432.79 9491.52              344   448.8     386             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1630.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.01  * Wt. n-Val.              *   0.040  *   0.053  *   0.048  *
* W.S. Elev (ft)          * 1630.07  * Reach Len. (ft)        *  344.00  *  448.80  *  386.00  *
* Crit W.S. (ft)          * 1629.87  * Flow Area (sq ft)      *   52.89  *   26.39  *   30.20  *
* E.G. Slope (ft/ft)      *0.001921  * Area (sq ft)           *   52.89  *   26.39  *   30.20  *
* Q Total (cfs)           *   70.00  * Flow (cfs)             *   31.54  *   19.02  *   19.44  *
* Top Width (ft)          *  428.47  * Top Width (ft)         *  251.06  *   58.73  *  118.68  *
* Vel Total (ft/s)        *    0.64  * Avg. Vel. (ft/s)       *    0.60  *    0.72  *    0.64  *
* Max Chl Dpth (ft)       *    0.86  * Hydr. Depth (ft)       *    0.21  *    0.45  *    0.25  *
* Conv. Total (cfs)       *  1596.9  * Conv. (cfs)            *   719.5  *   433.8  *   443.6  *
* Length Wtd. (ft)        *  409.85  * Wetted Per. (ft)       *  251.07  *   58.78  *  118.76  *
* Min Ch El (ft)          * 1629.21  * Shear (lb/sq ft)       *    0.03  *    0.05  *    0.03  *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.02  *    0.04  *    0.02  *
* Frctn Loss (ft)         *    2.21  * Cum Volume (acre-ft)   *    1.58  *    2.46  *    1.66  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    1.16  *    2.63  *    3.42  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1629.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.00  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)          * 1629.24  * Reach Len. (ft)        *  344.00  *  448.80  *  386.00  *
* Crit W.S. (ft)          * 1629.24  * Flow Area (sq ft)      *          *    0.01  *          *
* E.G. Slope (ft/ft)      *0.000106  * Area (sq ft)           *          *    0.01  *          *
* Q Total (cfs)           *    0.00  * Flow (cfs)             *          *    0.00  *          *
* Top Width (ft)          *    0.41  * Top Width (ft)         *          *    0.41  *          *
* Vel Total (ft/s)        *    0.02  * Avg. Vel. (ft/s)       *          *    0.02  *          *
* Max Chl Dpth (ft)       *    0.03  * Hydr. Depth (ft)       *          *    0.01  *          *
* Conv. Total (cfs)       *     0.0  * Conv. (cfs)            *          *     0.0  *          *
* Length Wtd. (ft)        *  448.80  * Wetted Per. (ft)       *          *    0.42  *          *
* Min Ch El (ft)          * 1629.21  * Shear (lb/sq ft)       *          *          *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *          *          *
* Frctn Loss (ft)         *    0.00  * Cum Volume (acre-ft)   *    0.47  *    2.31  *    0.68  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    0.06  *    1.39  *    1.77  *
*****************************************************************************************

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.

  Profile #1
```

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9127.91   * 9432.79   *    31.54 *    52.89 *   251.07 *    45.06 *
0.21 *     0.60 *
* 2        * Chan      * 9432.79   * 9491.52   *    19.02 *    26.39 *    58.78 *    27.17 *
0.45 *     0.72 *
* 3        * ROB       * 9491.52   * 9550.86   *    16.29 *    23.12 *    59.34 *    23.27 *
0.39 *     0.70 *
* 4        * ROB       * 9550.86   * 9610.20   *     3.16 *     7.08 *    59.42 *     4.51 *
0.12 *     0.45 *
*****************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9432.79   * 9491.52   *     0.00 *     0.01 *     0.42 *   100.00 *
0.01 *     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 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: T4N-R3W-S18E
REACH: Reach-2            RS: 2.175

INPUT
Description: The West portion of this cross-section is truncated at STA
             9602.45, which is the location of the black tick mark on the
             workmaps.  The stationing is based off of the western thalweg
             (REACH-3) as the 10,000 station.
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8882.06  1629.4 8892.18 1629.23 8909.53 1629.14 8938.58 1629.22 8954.42  1629.1
 8966.77  1629.1 8976.58 1628.98 8990.52 1628.89 8996.51 1628.83 9008.42 1628.75
 9029.43  1628.8 9108.74 1628.07  9116.4 1628.03 9116.67 1628.03 9117.87    1628
 9118.23    1628  9119.2 1627.99 9122.46 1627.96 9124.35 1627.94 9128.44 1627.92
  9132.6    1628 9144.58 1627.94 9211.02 1627.92 9223.17  1627.9 9232.09 1627.92
 9261.12    1628 9268.54 1627.98 9272.91 1627.98 9278.41 1627.98 9281.56 1627.98
 9282.98    1628 9302.91 1627.98 9305.83 1627.98 9310.37 1627.94 9312.51 1627.93
```

```
 9323.02  1627.8 9329.26 1627.69 9356.75 1627.52 9380.08 1627.41 9403.16 1627.59
 9410.99  1627.6 9424.31 1627.67 9472.46 1627.66 9494.41 1627.71 9500.72 1627.67
 9505.96  1627.7 9508.13 1627.69 9527.08  1627.8 9581.12 1627.88 9583.11 1627.88
 9584.41  1627.9 9585.06 1627.88  9585.1 1627.89 9585.65 1627.88 9586.12 1627.88
 9599.45  1627.9 9600.55 1627.95 9602.45 1627.97

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8882.06    .035 9312.51    .053 9584.41    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9329.26 9424.31               490  495.69     503              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1627.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.053  *   0.053  *   0.053  *
* W.S. Elev (ft)          * 1627.79  * Reach Len. (ft)         *  490.00  *  495.69  *  503.00  *
* Crit W.S. (ft)          * 1627.79  * Flow Area (sq ft)       *    0.27  *   22.75  *   10.35  *
* E.G. Slope (ft/ft)      *0.050804  * Area (sq ft)            *    0.27  *   22.75  *   10.35  *
* Q Total (cfs)           *   70.00  * Flow (cfs)              *    0.23  *   55.41  *   14.36  *
* Top Width (ft)          *  201.27  * Top Width (ft)          *    5.55  *   95.05  *  100.67  *
* Vel Total (ft/s)        *    2.10  * Avg. Vel. (ft/s)        *    0.85  *    2.44  *    1.39  *
* Max Chl Dpth (ft)       *    0.38  * Hydr. Depth (ft)        *    0.05  *    0.24  *    0.10  *
* Conv. Total (cfs)       *   310.6  * Conv. (cfs)             *     1.0  *   245.8  *    63.7  *
* Length Wtd. (ft)        *  498.19  * Wetted Per. (ft)        *    5.55  *   95.05  *  100.67  *
* Min Ch El (ft)          * 1627.41  * Shear (lb/sq ft)        *    0.16  *    0.76  *    0.33  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.13  *    1.85  *    0.45  *
* Frctn Loss (ft)         *    2.29  * Cum Volume (acre-ft)    *    1.37  *    2.21  *    1.48  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    0.15  *    1.84  *    2.44  *
*****************************************************************************************

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 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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1627.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.00  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)          * 1627.44  * Reach Len. (ft)         *  490.00  *  495.69  *  503.00  *
* Crit W.S. (ft)          * 1627.44  * Flow Area (sq ft)       *          *    0.11  *          *
* E.G. Slope (ft/ft)      *0.000000  * Area (sq ft)            *          *    0.11  *          *
* Q Total (cfs)           *    0.00  * Flow (cfs)              *          *    0.00  *          *
* Top Width (ft)          *    8.68  * Top Width (ft)          *          *    8.68  *          *
* Vel Total (ft/s)        *    0.00  * Avg. Vel. (ft/s)        *          *    0.00  *          *
* Max Chl Dpth (ft)       *    0.03  * Hydr. Depth (ft)        *          *    0.01  *          *
* Conv. Total (cfs)       *     0.2  * Conv. (cfs)             *          *     0.2  *          *
* Length Wtd. (ft)        *  497.36  * Wetted Per. (ft)        *          *    8.68  *          *
* Min Ch El (ft)          * 1627.41  * 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)    *    0.47  *    2.30  *    0.68  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.06  *    1.35  *    1.77  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9105.66   * 9329.26   *     0.23 *     0.27 *     5.55 *     0.33 *
0.05 *     0.85 *
* 2        * Chan      * 9329.26   * 9424.31   *    55.41 *    22.75 *    95.05 *    79.16 *
0.24 *     2.44 *
* 3        * ROB       * 9424.31   * 9513.38   *    14.11 *     9.96 *    89.07 *    20.16 *
0.11 *     1.42 *
* 4        * ROB       * 9513.38   * 9602.45   *     0.25 *     0.39 *    11.60 *     0.36 *
0.03 *     0.64 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9329.26   * 9424.31   *     0.00 *     0.11 *     8.68 *   100.00 *
0.01 *     0.00 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
```

REACH: Reach-2 RS: 2.081

INPUT
Description: Interpolated point added at (9160.59,1624.606) to set bank station
The West portion of this cross-section is truncated at STA 9716.24, which is the location of the black tick mark on the workmaps. The stationing is based off of the western thalweg (REACH-3) as the 10,000 station.

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8932.65	1625.1	8953.59	1625.14	9002.47	1625.08	9026.37	1625.07	9042.7	1625.06
9059.03	1625	9070.04	1624.91	9083.39	1624.9	9100.53	1624.83	9124.72	1624.9
9146.85	1624.72	9160.59	1624.606	9184.16	1624.41	9193.18	1624.38	9198.13	1624.37
9205.86	1624.4	9223.17	1624.46	9268.74	1624.56	9356.17	1624.39	9366.14	1624.4
9375.11	1624.37	9375.88	1624.37	9388.49	1624.6	9411.92	1624.6	9447.62	1624.56
9453.44	1624.56	9458.54	1624.57	9489.56	1624.4	9528.34	1624.23	9568.02	1624.52
9574.87	1624.6	9577.68	1624.62	9578.41	1624.6	9579.11	1624.62	9579.76	1624.62
9587.17	1624.64	9591.33	1624.67	9638.09	1624.7	9653.71	1624.7	9695.15	1624.63
9699.29	1624.59	9702.14	1624.57	9709.12	1624.6	9713.44	1625	9716.24	1625.12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8932.65	.035	9146.85	.053	9591.33	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9160.59	9388.49	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1624.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.052	0.053	0.051
W.S. Elev (ft)	1624.77	Reach Len. (ft)	718.24	718.24	718.24
Crit W.S. (ft)	1624.56	Flow Area (sq ft)	1.69	69.86	72.06
E.G. Slope (ft/ft)	0.001588	Area (sq ft)	1.69	69.86	72.06
Q Total (cfs)	70.00	Flow (cfs)	0.42	35.49	34.10
Top Width (ft)	570.70	Top Width (ft)	20.30	227.90	322.50
Vel Total (ft/s)	0.49	Avg. Vel. (ft/s)	0.25	0.51	0.47
Max Chl Dpth (ft)	0.54	Hydr. Depth (ft)	0.08	0.31	0.22
Conv. Total (cfs)	1756.5	Conv. (cfs)	10.4	890.4	855.6
Length Wtd. (ft)	718.24	Wetted Per. (ft)	20.30	227.90	322.51
Min Ch El (ft)	1624.37	Shear (lb/sq ft)	0.01	0.03	0.02
Alpha	1.01	Stream Power (lb/ft s)	0.00	0.02	0.01
Frctn Loss (ft)	4.42	Cum Volume (acre-ft)	1.36	1.68	1.01
C & E Loss (ft)	0.01	Cum SA (acres)			

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 OUTPUT Profile #2

E.G. Elev (ft)	1624.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.053	0.053	0.052
W.S. Elev (ft)	1624.70	Reach Len. (ft)	718.24	718.24	718.24
Crit W.S. (ft)	1624.25	Flow Area (sq ft)	0.53	53.14	48.43
E.G. Slope (ft/ft)	0.000000	Area (sq ft)	0.53	53.14	48.43
Q Total (cfs)	0.00	Flow (cfs)	0.00	0.00	0.00
Top Width (ft)	545.32	Top Width (ft)	11.33	227.90	306.09
Vel Total (ft/s)	0.00	Avg. Vel. (ft/s)	0.00	0.00	0.00
Max Chl Dpth (ft)	0.47	Hydr. Depth (ft)	0.05	0.23	0.16
Conv. Total (cfs)	1043.8	Conv. (cfs)	1.9	564.4	477.5
Length Wtd. (ft)	718.24	Wetted Per. (ft)	11.33	227.90	306.10
Min Ch El (ft)	1624.37	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)	3.92	Cum Volume (acre-ft)	0.47	2.00	0.40
C & E Loss (ft)	0.01	Cum SA (acres)			

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.

Profile #1

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity	*
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)	*
* 1	* LOB	* 9046.62	* 9160.59	* 0.42	* 1.69	* 20.30	* 0.59	* 0.08	* 0.25	*
* 2	* Chan	* 9160.59	* 9388.49	* 35.49	* 69.86	* 227.90	* 50.69	* 0.31	* 0.51	*
* 3	* ROB	* 9388.49	* 9552.37	* 25.93	* 50.93	* 163.88	* 37.04	* 0.31	* 0.51	*
* 4	* ROB	* 9552.37	* 9716.24	* 8.17	* 21.14	* 158.64	* 11.67	* 0.13	* 0.39	*

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.

Profile #2

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity	*
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)	*
* 1	* LOB	* 9046.62	* 9160.59	* 0.00	* 0.53	* 11.33	* 0.19	* 0.05	* 0.00	*
* 2	* Chan	* 9160.59	* 9388.49	* 0.00	* 53.14	* 227.90	* 54.07	* 0.23	* 0.00	*
* 3	* ROB	* 9388.49	* 9552.37	* 0.00	* 38.90	* 163.88	* 39.52	* 0.24	* 0.00	*
* 4	* ROB	* 9552.37	* 9716.24	* 0.00	* 9.53	* 142.22	* 6.22	* 0.07	* 0.00	*

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.

CROSS SECTION

RIVER: T4N-R3W-S18E
REACH: Reach-3 RS: 2.260

INPUT
Description: The East portion of this cross-section is truncated at STA 9610.20, which is the location of the black tick mark on the workmaps. The stationing is based off of the western thalweg (REACH-3) as the 10,000 station.
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9610.2	1630	9620.38	1630	9622.99	1630	9627.05	1629.97	9653.21	1629.98
9655.56	1630	9656.08	1629.97	9669.48	1629.95	9703.09	1629.75	9740.3	1629.78
9745.37	1629.8	9752.33	1629.79	9753.15	1629.79	9754.44	1629.78	9756.26	1629.78
9758.98	1629.8	9778.09	1629.76	9837.12	1629.71	9840	1629.73	9884.04	1629.57
9884.21	1629.6	9884.24	1629.57	9895.37	1629.46	9935.51	1629.02	9961.47	1629.24
9967.62	1629.3	9972.66	1629.45	9972.9	1629.45	9972.94	1629.44	9972.99	1629.44
9973.05	1629.4	9973.15	1629.44	9973.27	1629.44	9973.46	1629.44	9973.89	1629.44
10005.08	1629	10019.11	1628.92	10036.39	1628.84	10050.39	1628.88	10072.7	1629.06
10102.27	1629.21	10115.56	1629.24	10142.27	1629.48	10151.96	1629.56	10165.39	1629.62
10172.86	1629.71	10182.18	1629.79	10212.09	1629.96	10215.72	1629.93	10220.97	1629.98

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10221.82    1630 10235.8 1630.17 10242.8 1630.25 10245.6 1630.2810247.03 1630.29
10248.09  1630.310253.07 1630.3710280.18 1630.7910312.55 1631.0910332.95 1631.26
10344.92  1631.410386.05 1631.8110397.32 1631.9410403.27    163210403.71    1632
10435.38  1632.310435.38 1632.3410440.51 1632.39

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
  9610.2    .035 9967.62    .05310115.56    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.8910115.56              400   448.8     503            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1630.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.036  *   0.053  *   0.035  *
* W.S. Elev (ft)          * 1630.05  * Reach Len. (ft)         *  400.00  *  448.80  *  503.00  *
* Crit W.S. (ft)          * 1629.73  * Flow Area (sq ft)       *  140.64  *  140.59  *   41.92  *
* E.G. Slope (ft/ft)      *0.005267  * Area (sq ft)            *  140.64  *  140.59  *   41.92  *
* Q Total (cfs)           *  580.00  * Flow (cfs)              *  227.73  *  284.58  *   67.69  *
* Top Width (ft)          *  615.84  * Top Width (ft)          *  363.69  *  141.67  *  110.49  *
* Vel Total (ft/s)        *    1.79  * Avg. Vel. (ft/s)        *    1.62  *    2.02  *    1.61  *
* Max Chl Dpth (ft)       *    1.21  * Hydr. Depth (ft)        *    0.39  *    0.99  *    0.38  *
* Conv. Total (cfs)       *  7991.9  * Conv. (cfs)             *  3137.9  *  3921.2  *   932.8  *
* Length Wtd. (ft)        *  454.19  * Wetted Per. (ft)        *  363.79  *  141.67  *  110.49  *
* Min Ch El (ft)          * 1628.84  * Shear (lb/sq ft)        *    0.13  *    0.33  *    0.12  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.21  *    0.66  *    0.20  *
* Frctn Loss (ft)         *    2.65  * Cum Volume (acre-ft)    *    3.48  *    5.90  *    2.96  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    4.79  *    2.95  *    3.53  *
*****************************************************************************************

Warning: The cross-section end points had to be extended vertically for the computed water
surface.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1630.41  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.036  *   0.053  *          *
* W.S. Elev (ft)          * 1630.33  * Reach Len. (ft)         *  400.00  *  448.80  *  503.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  103.51  *  179.36  *          *
* E.G. Slope (ft/ft)      *0.004019  * Area (sq ft)            *  103.51  *  179.36  *          *
* Q Total (cfs)           *  650.00  * Flow (cfs)              *  278.81  *  371.19  *          *
* Top Width (ft)          *  241.56  * Top Width (ft)          *   99.89  *  141.67  *          *
* Vel Total (ft/s)        *    2.30  * Avg. Vel. (ft/s)        *    2.69  *    2.07  *          *
* Max Chl Dpth (ft)       *    1.49  * Hydr. Depth (ft)        *    1.04  *    1.27  *          *
* Conv. Total (cfs)       * 10252.5  * Conv. (cfs)             *  4397.6  *  5854.8  *          *
* Length Wtd. (ft)        *  446.46  * Wetted Per. (ft)        *  100.65  *  142.76  *          *
* Min Ch El (ft)          * 1628.84  * Shear (lb/sq ft)        *    0.26  *    0.32  *          *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.70  *    0.65  *          *
* Frctn Loss (ft)         *    2.39  * Cum Volume (acre-ft)    *    0.94  *    7.84  *    0.78  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.46  *    2.95  *    0.58  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9610.20   * 9792.05   *    33.25 *    35.96 *   181.90 *     5.73 *
0.20 *     0.92 *
* 2         * LOB       * 9792.05   * 9973.89   *   194.48 *   104.68 *   181.89 *    33.53 *
0.58 *     1.86 *
```

```
* 3          * Chan      * 9973.89   * 10115.56  *   284.58 *   140.59 *   141.67 *    49.07 *
0.99 *     2.02 *
* 4          * ROB       * 10115.56  * 10278.04  *    67.69 *    41.92 *   110.49 *    11.67 *
0.38 *     1.61 *
*****************************************************************************************
******************

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

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9792.05   * 9973.89   *   278.81 *   103.51 *   100.65 *    42.89 *
1.04 *     2.69 *
* 2          * Chan      * 9973.89   * 10115.56  *   371.19 *   179.36 *   142.76 *    57.11 *
1.27 *     2.07 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-3            RS: 2.175

INPUT
Description: Flow rate starting at this cross-section and downstream is 520cfs,
             the levee is added since the ridge is not overtopped.
             Interpolated point added at (9920.26,1626.763) to set bank
             station
The East portion of this cross-section is truncated at
             STA 9602.45, which is the location of the black tick mark on the
             workmaps.  The stationing is based off of the western thalweg
             (REACH-3) as the 10,000 station.
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9602.45 1627.97 9608.25 1627.92 9608.61 1627.94 9610.28  1627.9 9611.87 1627.92
  9612.5 1627.92 9612.83 1627.92 9612.87 1627.91 9614.78  1627.6 9616.18 1627.25
 9621.81  1627.7 9630.45 1627.78 9637.16  1627.8  9646.9 1627.93 9648.28 1627.93
 9650.54 1627.93 9651.21 1627.93 9653.17  1627.9 9654.31 1627.94 9662.94 1627.83
 9667.68 1627.66 9671.48 1627.65 9675.82  1627.6 9722.79 1627.18 9733.14 1627.18
 9751.44 1627.36 9762.56 1627.37 9769.53  1627.3  9801.9 1627.25 9811.77 1627.24
 9813.07 1627.22 9814.88  1627.2 9821.16  1627.2 9839.37 1627.07 9853.01 1627.01
 9865.83 1627.04 9878.07 1627.06 9885.04  1627.1 9889.57 1627.06 9894.06 1627.05
 9908.25 1627.02 9910.31 1626.92 9920.261626.763 9943.16  1626.4 9945.62 1626.39
 9947.83 1626.34 9951.93  1626.3  9952.9  1626.3 9955.81  1626.3 9986.98  1626.2
 10003.4 1626.4710019.34 1626.7410031.12 1626.7410057.48  1626.410077.78 1626.11
10079.69 1626.08 10081.4 1626.0810097.87 1626.1510104.15  1626.210107.28 1626.23
10136.23 1626.5510148.49 1626.7210177.86 1626.9610191.51  1627.110228.79 1627.58
10238.45 1627.6810250.42 1627.7910274.67    162810287.49  1628.210317.69  1628.5
10341.66  1628.710353.54 1628.8510377.21 1629.0710390.93  1629.110426.01 1629.46
10430.68 1629.4810436.73 1629.4510473.47 1629.3710490.01  1629.410529.69 1629.23
10537.09 1629.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9602.45    .035 9908.25    .05310191.51    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
      9920.2610019.34              490  495.69     503              .1        .3
Left Levee      Station= 9654.31      Elevation= 1627.94

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1627.45  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.038  *   0.053  *   0.053  *
* W.S. Elev (ft)          * 1627.39  * Reach Len. (ft)         *  490.00  *  495.69  *  503.00  *
* Crit W.S. (ft)          * 1627.00  * Flow Area (sq ft)       *   48.34  *   96.89  *  151.24  *
* E.G. Slope (ft/ft)      *0.006499  * Area (sq ft)            *   48.34  *   96.89  *  151.24  *
* Q Total (cfs)           *  580.00  * Flow (cfs)              *   58.71  *  215.74  *  305.55  *
* Top Width (ft)          *  514.11  * Top Width (ft)          *  220.59  *   99.08  *  194.44  *
* Vel Total (ft/s)        *    1.96  * Avg. Vel. (ft/s)        *    1.21  *    2.23  *    2.02  *
* Max Chl Dpth (ft)       *    1.31  * Hydr. Depth (ft)        *    0.22  *    0.98  *    0.78  *
* Conv. Total (cfs)       *  7194.5  * Conv. (cfs)             *   728.3  *  2676.1  *  3790.2  *
* Length Wtd. (ft)        *  497.11  * Wetted Per. (ft)        *  220.59  *   99.09  *  194.45  *
* Min Ch El (ft)          * 1626.20  * Shear (lb/sq ft)        *    0.09  *    0.40  *    0.32  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)  *    0.11  *    0.88  *    0.64  *
* Frctn Loss (ft)         *    2.76  * Cum Volume (acre-ft)    *    2.61  *    4.67  *    1.84  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    2.11  *    1.71  *    1.77  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1628.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *   0.053  *   0.053  *
* W.S. Elev (ft)          * 1627.88  * Reach Len. (ft)         *  490.00  *  495.69  *  503.00  *
* Crit W.S. (ft)          * 1627.29  * Flow Area (sq ft)       *          *  146.16  *   67.70  *
* E.G. Slope (ft/ft)      *0.007459  * Area (sq ft)            *          *  146.16  *   67.70  *
* Q Total (cfs)           *  650.00  * Flow (cfs)              *          *  455.19  *  194.81  *
* Top Width (ft)          *  149.67  * Top Width (ft)          *          *   99.08  *   50.59  *
* Vel Total (ft/s)        *    3.04  * Avg. Vel. (ft/s)        *          *    3.11  *    2.88  *
* Max Chl Dpth (ft)       *    1.68  * Hydr. Depth (ft)        *          *    1.48  *    1.34  *
* Conv. Total (cfs)       *  7526.0  * Conv. (cfs)             *          *  5270.4  *  2255.5  *
* Length Wtd. (ft)        *  496.79  * Wetted Per. (ft)        *          *  100.21  *   52.26  *
* Min Ch El (ft)          * 1626.20  * Shear (lb/sq ft)        *          *    0.68  *    0.60  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.12  *    1.74  *
* Frctn Loss (ft)         *    3.01  * Cum Volume (acre-ft)    *    0.47  *    6.17  *    0.39  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *          *    1.71  *    0.29  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *            * (ft)      * (ft)      *    (cfs) *  (sq ft) *    (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9654.31   * 9787.29   *     6.30 *     9.05 *    87.61 *     1.09 *
0.10 *     0.70 *
* 2        * LOB       * 9787.29   * 9920.26   *    52.41 *    39.29 *   132.98 *     9.04 *
0.30 *     1.33 *
* 3        * Chan      * 9920.26   * 10019.34  *   215.74 *    96.89 *    99.09 *    37.20 *
0.98 *     2.23 *
* 4        * ROB       * 10019.34  * 10278.21  *   305.55 *   151.24 *   194.45 *    52.68 *
0.78 *     2.02 *
*****************************************************************************************
******************
```

```
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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9920.26   * 10019.34  *   455.19 *   146.16 *   100.21 *    70.03 *
1.48 *     3.11 *
* 2         * ROB       * 10019.34  * 10278.21  *   194.81 *    67.70 *    52.26 *    29.97 *
1.34 *     2.88 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-3            RS: 2.081

INPUT
Description: The East portion of this cross-section is truncated at STA
             9716.24, which is the location of the black tick mark on the
             workmaps.  The stationing is based off of the western thalweg
             (REACH-3) as the 10,000 station.
Station Elevation Data     num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9716.24 1625.12 9737.47 1624.73 9755.68 1624.41 9756.21  1624.4 9757.68 1624.21
 9761.19 1623.83 9763.84 1624.14 9766.59 1624.41 9773.77  1624.5 9778.18 1624.49
 9784.77 1624.54 9793.59  1624.6 9794.59 1624.59 9794.98  1624.6 9795.46  1624.6
 9796.44 1624.61 9798.47  1624.6 9799.04 1624.55 9800.76 1624.52 9822.29 1624.08
 9823.56 1624.06 9824.02  1624.1 9830.12    1624 9833.95 1623.95  9858.6 1623.95
 9862.06 1623.92 9862.211623.919 9864.64  1623.9 9870.94 1623.93 9875.18 1623.93
  9896.9  1623.8 9923.03  1623.7 9943.03 1623.64 9979.22 1623.43 9991.64 1623.34
10009.11  1623.310044.93 1623.4910068.31 1623.7110068.35 1623.7110087.04 1623.83
10096.41 1623.8910098.48  1623.910099.72  1623.910105.88    1624 10112.7 1624.05
10115.25 1624.0610117.37  1624.110126.72 1624.1610133.69 1624.1710140.32 1624.21
10192.43  1624.510201.31 1624.5710267.81 1625.1410281.09 1625.2410285.51 1625.29
 10291.9  1625.410339.78    162610341.27 1626.02 10341.5 1626.0310341.56    1626
10341.62 1626.03   10344 1626.0310346.28    1626 10368.3 1626.02

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9716.24    .035 9800.76    .05310192.43    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9896.910098.48                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1624.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.051  *   0.053  *   0.053  *
* W.S. Elev (ft)         * 1624.65  * Reach Len. (ft)         *  718.24  *  718.24  *  718.24  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   71.97  *  216.56  *   39.84  *
* E.G. Slope (ft/ft)     *0.004782  * Area (sq ft)            *   71.97  *  216.56  *   39.84  *
* Q Total (cfs)          *  580.00  * Flow (cfs)              *   97.68  *  440.42  *   41.90  *
* Top Width (ft)         *  467.93  * Top Width (ft)          *  154.65  *  201.58  *  111.70  *
```

Vel Total (ft/s)	1.77	Avg. Vel. (ft/s)	1.36	2.03	1.05	
Max Chl Dpth (ft)	1.35	Hydr. Depth (ft)	0.47	1.07	0.36	
Conv. Total (cfs)	8387.1	Conv. (cfs)	1412.5	6368.7	605.9	
Length Wtd. (ft)	718.24	Wetted Per. (ft)	154.73	201.58	111.70	
Min Ch El (ft)	1623.30	Shear (lb/sq ft)	0.14	0.32	0.11	
Alpha	1.13	Stream Power (lb/ft s)	0.19	0.65	0.11	
Frctn Loss (ft)	4.35	Cum Volume (acre-ft)	1.93	2.89	0.74	
C & E Loss (ft)	0.00	Cum SA (acres)				

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 OUTPUT Profile #2

			Left OB	Channel	Right OB
E.G. Elev (ft)	1625.00	Element			
Vel Head (ft)	0.09	Wt. n-Val.		0.053	
W.S. Elev (ft)	1624.91	Reach Len. (ft)	718.24	718.24	718.24
Crit W.S. (ft)		Flow Area (sq ft)		270.57	
E.G. Slope (ft/ft)	0.005029	Area (sq ft)		270.57	
Q Total (cfs)	650.00	Flow (cfs)		650.00	
Top Width (ft)	201.58	Top Width (ft)		201.58	
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)		2.40	
Max Chl Dpth (ft)	1.61	Hydr. Depth (ft)		1.34	
Conv. Total (cfs)	9166.1	Conv. (cfs)		9166.1	
Length Wtd. (ft)	718.24	Wetted Per. (ft)		203.71	
Min Ch El (ft)	1623.30	Shear (lb/sq ft)		0.42	
Alpha	1.00	Stream Power (lb/ft s)		1.00	
Frctn Loss (ft)	4.24	Cum Volume (acre-ft)	0.47	3.79	
C & E Loss (ft)	0.00	Cum SA (acres)			

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9716.24	9806.57	11.39	12.28	64.39	1.96	0.19	0.93
2	LOB	9806.57	9896.90	86.29	59.69	90.34	14.88	0.66	1.45
3	Chan	9896.90	10098.48	440.42	216.56	201.58	75.93	1.07	2.03
4	ROB	10098.48	10233.39	41.90	39.84	111.70	7.22	0.36	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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9896.90	10098.48	650.00	270.57	203.71	100.00	1.34	2.40

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: T4N-R3W-S18E
REACH: Reach-4 RS: 1.945

INPUT
Description: Flow rate at this cross-section and downstream is 650cfs, this cross-section contains the full flow from both sides of the split just upstream from this cross-section.
Interpolated point added at (9983.81,1619.547) to set bank station

Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9266.57	1622.1	9269.64	1622.06	9277.19	1622.04	9281.21	1622.02	9284.31	1622
9293.86	1621.9	9328.21	1621.72	9340.86	1621.65	9369.35	1621.47	9449.62	1620.9
9498.75	1620.61	9506.79	1620.56	9539.43	1620.27	9548.4	1620.3	9558.98	1620.26
9569.88	1620.19	9578.02	1620.14	9592.06	1620.11	9595.46	1620.1	9609.9	1620.03
9617.25	1620	9628.25	1620	9635.79	1619.99	9640.57	1619.95	9653.08	1619.93
9656.71	1619.94	9659.43	1619.9	9720.35	1619.77	9725.94	1619.74	9745.45	1619.63
9746.18	1619.63	9747.27	1619.6	9748.53	1619.62	9750.39	1619.61	9785.69	1619.59
9796.13	1619.58	9813.47	1619.6	9840.15	1619.51	9856.62	1619.515	9876.14	1619.52
9880.42	1619.51	9882.83	1619.49	9948.77	1619.4	9979.03	1619.38	9981.83	1619.39
9983.67	1619.37	10000.56	1619.37	10030.91	1619.54	10057.13	1619.7	10114.3	1619.97
10117.38	1620	10120.93	1620.02	10129.75	1620.06	10131.51	1620.07	10135.36	1620.1
10140.11	1620.23	10143.69	1620.34	10155.37	1620.51	10161.33	1620.54	10164.5	1620.6
10247.69	1620.44	10253.33	1620.44	10264.2	1620.71	10271.04	1620.75	10334.57	1621.32
10376.73	1621.37	10388.32	1621.47	10397.87	1621.61	10402.77	1621.63	10420.95	1621.91
10426.84	1621.95	10433.34	1621.99	10435.52	1622	10453.86	1622.13	10456.16	1622.16
10462.41	1622.22	10525.37	1623.05	10526.5	1623.11	10608.75	1623.25	10611.92	1623.21
10650.14	1623.02	10653.48	1623						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9266.57	.035	9628.25	.053	10131.5	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9876.14	10030.9	440	418.06	385	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1620.35	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.06	Wt. n-Val.	0.052	0.053	0.053	
W.S. Elev (ft)	1620.30	Reach Len. (ft)	440.00	418.06	385.00	
Crit W.S. (ft)	1620.03	Flow Area (sq ft)	162.68	133.95	50.04	
E.G. Slope (ft/ft)	0.007679	Area (sq ft)	162.68	133.95	50.04	
Q Total (cfs)	650.00	Flow (cfs)	276.27	298.87	74.87	
Top Width (ft)	602.88	Top Width (ft)	336.79	154.76	111.33	
Vel Total (ft/s)	1.87	Avg. Vel. (ft/s)	1.70	2.23	1.50	
Max Chl Dpth (ft)	0.93	Hydr. Depth (ft)	0.48	0.87	0.45	
Conv. Total (cfs)	7417.8	Conv. (cfs)	3152.7	3410.7	854.4	
Length Wtd. (ft)	421.96	Wetted Per. (ft)	336.79	154.76	111.34	
Min Ch El (ft)	1619.37	Shear (lb/sq ft)	0.23	0.41	0.22	
Alpha	1.07	Stream Power (lb/ft s)	0.39	0.93	0.32	
Frctn Loss (ft)	2.30	Cum Volume (acre-ft)	41.85	59.64	16.49	
C & E Loss (ft)	0.00	Cum SA (acres)	52.00	33.40	33.16	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1620.76	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.11	Wt. n-Val.	0.053	0.053		
W.S. Elev (ft)	1620.66	Reach Len. (ft)	440.00	418.06	385.00	
Crit W.S. (ft)	1620.13	Flow Area (sq ft)	56.45	189.64		
E.G. Slope (ft/ft)	0.007023	Area (sq ft)	56.45	189.64		

```
* Q Total (cfs)          *  650.00  * Flow (cfs)              *  142.20  *  507.80  *          *
* Top Width (ft)         *  204.50  * Top Width (ft)          *   49.74  *  154.76  *          *
* Vel Total (ft/s)       *    2.64  * Avg. Vel. (ft/s)        *    2.52  *    2.68  *          *
* Max Chl Dpth (ft)      *    1.29  * Hydr. Depth (ft)        *    1.13  *    1.23  *          *
* Conv. Total (cfs)      *  7756.3  * Conv. (cfs)             *  1696.9  *  6059.4  *          *
* Length Wtd. (ft)       *  420.46  * Wetted Per. (ft)        *   50.84  *  155.87  *          *
* Min Ch El (ft)         * 1619.37  * Shear (lb/sq ft)        *    0.49  *    0.53  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *    1.23  *    1.43  *          *
* Frctn Loss (ft)        *    2.28  * Cum Volume (acre-ft)   *    6.19  *   78.28  *    0.18  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    1.29  *   33.40  *    0.00  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9266.57   * 9571.36   *     0.51 *     1.22 *    32.01 *     0.08 *
0.04 *     0.42 *
* 2         * LOB       * 9571.36   * 9876.14   *   275.76 *   161.46 *   304.79 *    42.42 *
0.53 *     1.71 *
* 3         * Chan      * 9876.14   * 10030.90  *   298.87 *   133.95 *   154.76 *    45.98 *
0.87 *     2.23 *
* 4         * ROB       * 10030.90  * 10342.19  *    74.87 *    50.04 *   111.34 *    11.52 *
0.45 *     1.50 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9571.36   * 9876.14   *   142.20 *    56.45 *    50.84 *    21.88 *
1.13 *     2.52 *
* 2         * Chan      * 9876.14   * 10030.90  *   507.80 *   189.64 *   155.87 *    78.12 *
1.23 *     2.68 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 1.866

INPUT
Description:
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9381.62     1619 9402.17 1618.87 9436.17 1618.69 9448.67 1618.43 9451.88 1618.52
 9455.16   1618.5 9460.83 1618.51 9463.42 1618.49 9469.17  1618.5 9480.96 1618.55
 9502.83   1618.3 9524.47 1618.29 9543.68 1618.31 9549.21 1618.37 9564.33 1618.39
 9572.16   1618.2 9575.45  1618.2    9578 1618.16 9578.74 1618.15 9579.33 1618.15
 9585.62   1618.2 9592.46 1618.26 9595.33 1618.26  9608.8 1618.11 9617.58    1618
 9618.58     1618 9623.79 1617.92 9625.47 1617.91 9632.62 1617.91 9634.29  1617.9
```

```
 9635.33  1617.9 9640.92 1617.89 9642.61 1617.87 9648.54 1617.78 9659.75  1617.6
 9663.83 1617.57 9668.97 1617.52 9674.18 1617.48  9682.2 1617.51 9688.62  1617.5
 9702.17  1617.4 9711.04 1617.37 9761.211617.302 9770.43 1617.29 9780.75 1617.25
 9797.93  1617.2 9802.92 1617.13 9811.84 1617.03 9836.58 1617.27 9838.95 1617.25
 9841.38  1617.2 9845.14 1617.09 9975.83 1616.65 9980.61 1616.64 9988.71 1616.63
10014.96  1617.110020.76 1617.1910045.83 1617.35 10056.5 1617.3810061.82 1617.45
10120.43  1617.6   10142 1617.8110154.39 1617.84 10160.5 1617.8610167.71 1617.89
10176.16  1617.910185.92 1617.9810188.76    161810191.951618.02610199.79 1618.09
10203.33 1618.1110208.71  1618.110216.22 1618.1510232.14 1618.2310246.49 1618.34
10255.01 1618.4110272.75  1618.510279.13 1618.5310281.05 1618.5310310.88 1618.84
10373.45 1619.4310375.83  1619.510378.68 1619.4910426.37    162010453.63 1620.29
10493.29 1620.7610549.67  1621.110562.25  1621.210578.16  1621.310591.62 1621.29
10612.96 1621.2810647.79  1621.510661.12 1621.47 10670.5 1621.4410692.33 1621.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9381.62    .035 9648.54    .053   10142    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9845.1410020.76              450  491.89     393              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1618.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.053  *   0.053  *   0.052  *
* W.S. Elev (ft)         * 1618.00  * Reach Len. (ft)         *  450.00  *  491.89  *  393.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  134.88  *  200.46  *   68.35  *
* E.G. Slope (ft/ft)     *0.004072  * Area (sq ft)            *  134.88  *  200.46  *   68.35  *
* Q Total (cfs)          *  650.00  * Flow (cfs)              *  182.27  *  391.70  *   76.03  *
* Top Width (ft)         *  571.75  * Top Width (ft)          *  227.78  *  175.62  *  168.34  *
* Vel Total (ft/s)       *    1.61  * Avg. Vel. (ft/s)        *    1.35  *    1.95  *    1.11  *
* Max Chl Dpth (ft)      *    1.37  * Hydr. Depth (ft)        *    0.59  *    1.14  *    0.41  *
* Conv. Total (cfs)      * 10185.9  * Conv. (cfs)             *  2856.3  *  6138.2  *  1191.4  *
* Length Wtd. (ft)       *  465.24  * Wetted Per. (ft)        *  227.79  *  175.63  *  168.35  *
* Min Ch El (ft)         * 1616.63  * Shear (lb/sq ft)        *    0.15  *    0.29  *    0.10  *
* Alpha                  *    1.14  * Stream Power (lb/ft s)  *    0.20  *    0.57  *    0.11  *
* Frctn Loss (ft)        *    2.81  * Cum Volume (acre-ft)    *   40.35  *   58.04  *   15.96  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   49.15  *   31.82  *   31.93  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1618.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *          *   0.053  *          *
* W.S. Elev (ft)         * 1618.39  * Reach Len. (ft)         *  450.00  *  491.89  *  393.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  268.59  *          *
* E.G. Slope (ft/ft)     *0.004309  * Area (sq ft)            *          *  268.59  *          *
* Q Total (cfs)          *  650.00  * Flow (cfs)              *          *  650.00  *          *
* Top Width (ft)         *  175.62  * Top Width (ft)          *          *  175.62  *          *
* Vel Total (ft/s)       *    2.42  * Avg. Vel. (ft/s)        *          *    2.42  *          *
* Max Chl Dpth (ft)      *    1.76  * Hydr. Depth (ft)        *          *    1.53  *          *
* Conv. Total (cfs)      *  9901.8  * Conv. (cfs)             *          *  9901.8  *          *
* Length Wtd. (ft)       *  491.89  * Wetted Per. (ft)        *          *  178.13  *          *
* Min Ch El (ft)         * 1616.63  * Shear (lb/sq ft)        *          *    0.41  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.98  *          *
* Frctn Loss (ft)        *    2.19  * Cum Volume (acre-ft)    *    5.91  *   76.08  *    0.18  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    1.04  *   31.82  *    0.00  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9613.38    * 9845.14    *   182.27 *   134.88 *   227.79 *    28.04 *
0.59 *     1.35 *
* 2          * Chan      * 9845.14    * 10020.76   *   391.70 *   200.46 *   175.63 *    60.26 *
1.14 *     1.95 *
* 3          * ROB       * 10020.76   * 10356.54   *    76.03 *    68.35 *   168.35 *    11.70 *
0.41 *     1.11 *
*****************************************************************************************
******************
```

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta   * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9845.14    * 10020.76   *   650.00 *   268.59 *   178.13 *   100.00 *
1.53 *     2.42 *
*****************************************************************************************
******************
```

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: T4N-R3W-S18E
REACH: Reach-4 RS: 1.773

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 810cfs.

Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9086.87	1615.8	9101.86	1615.81	9106.17	1615.81	9124.53	1615.79	9126.54	1615.79
9128.25	1615.8	9132.95	1615.76	9142.24	1615.7	9188.77	1615.42	9198.16	1615.37
9204	1615.3	9250.71	1615.3	9253.12	1615.27	9291.21	1615.26	9315.83	1615.23
9336.08	1615.2	9382.73	1615.26	9463.42	1615.34	9471.92	1615.35	9487.29	1615.32
9587.5	1615.1	9628.04	1615.17	9637.71	1615.18	9644.27	1615.19	9680.9	1615.22
9685.6	1615.2	9690.69	1615.09	9698.21	1615.04	9708.57	1614.95	9715.58	1614.92
9716.88	1614.9	9717.4	1614.91	9719.2	1614.91	9720.23	1614.9	9721.08	1614.9
9722.5	1614.89	9767.92	1614.71	9850.85	1614.335	9882.83	1614.19	9905.58	1614.08
9918.25	1614.1	9922.08	1614.04	9946.04	1614	9948.25	1614	9948.35	1613.99
9948.44	1614	9988.48	1613.92	10002.46	1613.86	10013.23	1613.85	10017.92	1613.89
10037.91	1614.05	10039.75	1614.07	10078.17	1614.37	10085.82	1614.5	10089.98	1614.49
10156.6	1615.06	10157.58	1615.06	10157.94	1615.07	10161.8	1615.11	10206.25	1615.5
10218.71	1615.69	10242.92	1616	10267.58	1616.26	10280.58	1616.38	10303.45	1616.7
10331.77	1616.99	10354.16	1617.23	10365.12	1617.35	10368.95	1617.36	10373.67	1617.4
10383.79	1617.37	10395.25	1617.38	10400.04	1617.43	10413.21	1617.5	10417.7	1617.46
10424.15	1617.45	10426.28	1617.47	10429.02	1617.46	10436.53	1617.5	10446.29	1617.5
10455.08	1617.55								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9086.87	.035	9722.5	.053	10157.58	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9918.25	10037.91	467	518.93	479	.1	.3

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)          * 1615.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.053  *   0.053  *   0.053  *
```

```
* W.S. Elev (ft)          * 1615.14  * Reach Len. (ft)         *  467.00  *  518.93  *  479.00  *
* Crit W.S. (ft)          * 1614.81  * Flow Area (sq ft)       *  135.60  *  140.99  *   69.45  *
* E.G. Slope (ft/ft)      *0.008889  * Area (sq ft)            *  135.60  *  140.99  *   69.45  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *  267.15  *  415.74  *  127.11  *
* Top Width (ft)          *  512.42  * Top Width (ft)          *  266.01  *  119.66  *  126.76  *
* Vel Total (ft/s)        *    2.34  * Avg. Vel. (ft/s)        *    1.97  *    2.95  *    1.83  *
* Max Chl Dpth (ft)       *    1.29  * Hydr. Depth (ft)        *    0.51  *    1.18  *    0.55  *
* Conv. Total (cfs)       *  8591.4  * Conv. (cfs)             *  2833.6  *  4409.7  *  1348.2  *
* Length Wtd. (ft)        *  491.15  * Wetted Per. (ft)        *  266.01  *  119.66  *  126.76  *
* Min Ch El (ft)          * 1613.85  * Shear (lb/sq ft)        *    0.28  *    0.65  *    0.30  *
* Alpha                   *    1.14  * Stream Power (lb/ft s)  *    0.56  *    1.93  *    0.56  *
* Frctn Loss (ft)         *    2.64  * Cum Volume (acre-ft)    *   38.95  *   56.11  *   15.34  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   46.60  *   30.15  *   30.60  *
*****************************************************************************************************
```

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.

CROSS SECTION OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1616.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *          *    0.053  *          *
* W.S. Elev (ft)          * 1616.13  * Reach Len. (ft)         *  467.00  *  518.93  *  479.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  260.13  *          *
* E.G. Slope (ft/ft)      *0.004582  * Area (sq ft)            *          *  260.13  *          *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *          *  810.00  *          *
* Top Width (ft)          *  119.66  * Top Width (ft)          *          *  119.66  *          *
* Vel Total (ft/s)        *    3.11  * Avg. Vel. (ft/s)        *          *    3.11  *          *
* Max Chl Dpth (ft)       *    2.28  * Hydr. Depth (ft)        *          *    2.17  *          *
* Conv. Total (cfs)       * 11965.8  * Conv. (cfs)             *          * 11965.8  *          *
* Length Wtd. (ft)        *  518.93  * Wetted Per. (ft)        *          *  123.77  *          *
* Min Ch El (ft)          * 1613.85  * Shear (lb/sq ft)        *          *    0.60  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.87  *          *
* Frctn Loss (ft)         *    2.61  * Cum Volume (acre-ft)    *    5.91  *   73.09  *    0.18  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    1.04  *   30.15  *    0.00  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9502.56   * 9918.25   *   267.15 *   135.60 *   266.01 *    32.98 *
0.51 *     1.97 *
* 2        * Chan      * 9918.25   * 10037.91  *   415.74 *   140.99 *   119.66 *    51.33 *
1.18 *     2.95 *
* 3        * ROB       * 10037.91  * 10246.50  *   127.11 *    69.45 *   126.76 *    15.69 *
0.55 *     1.83 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9918.25   * 10037.91  *   810.00 *   260.13 *   123.77 *   100.00 *
2.17 *     3.11 *
*****************************************************************************************
******************
```

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: T4N-R3W-S18E
REACH: Reach-4 RS: 1.674

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9355.31	1612.7	9400.25	1612.73	9415.49	1612.66	9432.72	1612.6	9436.49	1612.65
9440.56	1612.6	9441.19	1612.65	9441.9	1612.64	9442.25	1612.64	9463.81	1612.56
9465.88	1612.6	9475.04	1612.48	9478.94	1612.47	9553.17	1612.22	9558.98	1612.27
9566.09	1612.3	9566.6	1612.34	9567.19	1612.33	9568.25	1612.34	9574.32	1612.25
9585.3	1612.2	9594.69	1612.17	9641.85	1612.13	9650.08	1612.18	9652.68	1612.18
9656.27	1612.2	9658.81	1612.18	9662.4	1612.18	9671.91	1612.14	9723.84	1612.28
9737.05	1612.2	9761.55	1612.2	9765.56	1612.18	9772.6	1612.12	9776.07	1612.09
9810.06	1612	9810.43	1612.01	9811.44	1612	9812.22	1612	9827.9	1611.96
9831.54	1611.9	9848.72	1611.92	9856.98	1611.9	9857.88	1611.9	9857.9	1611.9
9858.86	1611.9	9859.24	1611.87	9859.68	1611.87	9874.03	1611.91	9878.25	1611.92
9882.53	1611.9	9950.31	1611.48	9953.31	1611.47	9955.25	1611.47	9958.21	1611.45
9959.36	1611.4	9962.11	1611.4	9963.12	1611.4	9964.74	1611.39	9971.85	1611.37
10004.17	1611.3	10023.12	1611.34	10032.02	1611.37	10032.66	1611.37	10060.02	1611.56
10153.52	1611.5	10153.93	1611.54	10158.69	1611.45	10166.35	1611.62	10178.8	1611.72
10188.53	1611.9	10201.31	1611.94	10208.93	1612	10214.54	1612.04	10220.32	1612.09
10236.57	1612.2	10253.19	1612.4	10259.72	1612.46	10266.13	1612.51	10272.5	1612.56
10290.37	1612.8	10303.97	1612.91	10304.15	1612.91	10304.18	1612.91	10304.46	1612.91
10365.29	1612.6	10398.45	1612.52	10404.83	1612.52	10416.42	1612.47	10424.18	1612.46
10516.82	1612.5	10519.42	1612.51	10523.85	1612.49	10526.12	1612.47	10532.31	1612.3
10540.31	1612.4	10541.81	1612.36	10549.3	1612.42	10571.73	1612.37	10577.82	1612.42
10592.58	1612.6	10599.36	1612.71	10608.34	1612.78	10612.54	1612.85	10615.96	1612.87
10617.92	1612.9	10707.54	1613.42	10710.85	1613.45	10718.16	1613.49	10726.18	1613.57
10733.35	1613.6	10755	1613.59	10755.45	1613.6	10769.58	1613.72	10770.68	1613.73
10780.65	1613.8	10785.59	1613.87	10790.87	1613.92	10796.25	1613.97	10800.05	1614
10857.55	1614.5	10857.87	1614.52	10858	1614.52	10858.14	1614.52	10858.21	1614.52
10858.52	1614.5	10877.9	1614.67	10887.32	1614.8	10893.41	1614.88	10897.83	1614.91
10900.79	1614.9	10917.22	1614.69						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9355.31	.033	9878.25	.05	10188.53	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.3	110060.02	450	498.76	506	.1	.3

Right Levee Station=10303.97 Elevation= 1612.91

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1612.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.038	0.050	0.047
W.S. Elev (ft)	1612.54	Reach Len. (ft)	450.00	498.76	506.00
Crit W.S. (ft)	1612.17	Flow Area (sq ft)	209.93	126.71	154.55
E.G. Slope (ft/ft)	0.003591	Area (sq ft)	209.93	126.71	154.55
Q Total (cfs)	810.00	Flow (cfs)	302.29	248.40	259.31
Top Width (ft)	799.12	Top Width (ft)	479.71	109.71	209.70
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.44	1.96	1.68
Max Chl Dpth (ft)	1.24	Hydr. Depth (ft)	0.44	1.15	0.74
Conv. Total (cfs)	13517.3	Conv. (cfs)	5044.7	4145.3	4327.3
Length Wtd. (ft)	487.10	Wetted Per. (ft)	479.72	109.71	209.71

```
* Min Ch El (ft)          * 1611.30  * Shear (lb/sq ft)        *    0.10  *    0.26  *    0.17  *
* Alpha                   *    1.05  * Stream Power (lb/ft s) *    0.14  *    0.51  *    0.28  *
* Frctn Loss (ft)         *    2.89  * Cum Volume (acre-ft)   *   37.10  *   54.51  *   14.11  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *   42.60  *   28.79  *   28.75  *
*****************************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1613.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *    0.050  *          *
* W.S. Elev (ft)          * 1613.47  * Reach Len. (ft)        *  450.00  *   498.76  *  506.00  *
* Crit W.S. (ft)          * 1612.56  * Flow Area (sq ft)      *          *   229.34  *          *
* E.G. Slope (ft/ft)      *0.005537  * Area (sq ft)           *          *   229.34  *          *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *          *   810.00  *          *
* Top Width (ft)          *  109.71  * Top Width (ft)          *          *   109.71  *          *
* Vel Total (ft/s)        *    3.53  * Avg. Vel. (ft/s)        *          *     3.53  *          *
* Max Chl Dpth (ft)       *    2.17  * Hydr. Depth (ft)        *          *     2.09  *          *
* Conv. Total (cfs)       * 10885.6  * Conv. (cfs)             *          *  10885.6  *          *
* Length Wtd. (ft)        *  498.76  * Wetted Per. (ft)        *          *   113.62  *          *
* Min Ch El (ft)          * 1611.30  * Shear (lb/sq ft)        *          *     0.70  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *     2.46  *          *
* Frctn Loss (ft)         *    3.21  * Cum Volume (acre-ft)   *    5.91  *    70.18  *    0.18  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    1.04  *    28.79  *    0.00  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9355.31   * 9652.81   *    54.55 *    49.34 *   182.22 *     6.73 *
0.27 *     1.11 *
* 2        * LOB       * 9652.81   * 9950.31   *   247.74 *   160.59 *   297.50 *    30.59 *
0.54 *     1.54 *
* 3        * Chan      * 9950.31   * 10060.02  *   248.40 *   126.71 *   109.71 *    30.67 *
1.15 *     1.96 *
* 4        * ROB       * 10060.02  * 10303.97  *   259.31 *   154.55 *   209.71 *    32.01 *
0.74 *     1.68 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*          *          * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9950.31   * 10060.02  *   810.00 *   229.34 *   113.62 *   100.00 *
2.09 *     3.53 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 1.580

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9272.57  1610.8 9275.95 1610.78 9350.09 1610.89 9365.56 1610.72  9368.4  1610.7
 9370.19  1610.7  9372.5 1610.66 9378.57  1610.6  9381.9 1610.57 9385.29 1610.53
 9388.97  1610.5 9406.67 1610.18 9416.59 1610.04 9417.96 1610.01 9419.29.   1610
 9436.89  1609.9 9461.77 1609.74 9471.86 1609.67  9473.6 1609.65 9475.03  1609.6
 9477.21 1609.64 9477.89 1609.64  9484.7 1609.62 9492.69 1609.23 9495.61  1609.1
 9496.82 1609.14 9504.58 1609.67 9511.09 1609.72 9525.88 1609.64  9563.9  1609.7
 9593.54 1609.86  9654.4  1609.7 9703.67 1609.56  9710.9 1609.55 9744.86  1609.6
 9809.65 1609.55 9817.27 1609.44 9822.94 1609.41 9846.79 1609.31 9897.991608.902
 9935.93  1608.6 9941.48 1608.31 9955.91 1608.3610062.08  1608.710114.35 1608.94
10168.451609.11610194.44  1609.210227.88 1609.2910240.93 1609.3610252.99 1609.52
 10265.1 1609.6110270.51  1609.710276.18 1609.7110397.26 1610.9110399.54 1610.93
10402.79    161110403.39 1610.9610404.19 1610.9710404.43 1610.97 10404.7 1610.98
10405.49    161110407.93 1611.0110435.77 1611.2510452.15 1611.3810486.42 1611.66
10509.61  1611.9 10531.6    1612 10542.2 1612.08 10558.3 1612.2110570.49  1612.3
10572.76 1612.3510576.44 1612.3710589.06 1612.4210615.17 1612.4810646.85  1612.6
10687.13 1612.7910733.44 1613.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9272.57    .033 9897.99     .0510168.45    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.9310062.08              442   493.8     511            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1609.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.042  *   0.050  *   0.046  *
* W.S. Elev (ft)          * 1609.56  * Reach Len. (ft)         *  442.00  *  493.80  *  511.00  *
* Crit W.S. (ft)          * 1609.40  * Flow Area (sq ft)       *   64.25  *  133.21  *   93.13  *
* E.G. Slope (ft/ft)      *0.011579  * Area (sq ft)            *   64.25  *  133.21  *   93.13  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *  155.14  *  441.69  *  213.16  *
* Top Width (ft)          *  493.41  * Top Width (ft)          *  170.93  *  126.15  *  196.33  *
* Vel Total (ft/s)        *    2.79  * Avg. Vel. (ft/s)        *    2.41  *    3.32  *    2.29  *
* Max Chl Dpth (ft)       *    1.25  * Hydr. Depth (ft)        *    0.38  *    1.06  *    0.47  *
* Conv. Total (cfs)       *  7527.5  * Conv. (cfs)             *  1441.8  *  4104.8  *  1981.0  *
* Length Wtd. (ft)        *  485.80  * Wetted Per. (ft)        *  170.96  *  126.16  *  196.33  *
* Min Ch El (ft)          * 1608.31  * Shear (lb/sq ft)        *    0.27  *    0.76  *    0.34  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    0.66  *    2.53  *    0.78  *
* Frctn Loss (ft)         *    2.63  * Cum Volume (acre-ft)    *   35.68  *   53.03  *   12.67  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   39.24  *   27.43  *   26.39  *
*****************************************************************************************

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.
```

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 OUTPUT Profile #2

E.G. Elev (ft)	1610.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.050	
W.S. Elev (ft)	1610.25	Reach Len. (ft)	442.00	493.80	511.00
Crit W.S. (ft)		Flow Area (sq ft)		219.87	
E.G. Slope (ft/ft)	0.007575	Area (sq ft)		219.87	
Q Total (cfs)	810.00	Flow (cfs)		810.00	
Top Width (ft)	126.15	Top Width (ft)		126.15	
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)		3.68	
Max Chl Dpth (ft)	1.94	Hydr. Depth (ft)		1.74	
Conv. Total (cfs)	9306.6	Conv. (cfs)		9306.6	
Length Wtd. (ft)	493.80	Wetted Per. (ft)		129.35	
Min Ch El (ft)	1608.31	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		2.96	
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	5.91	67.61	0.18
C & E Loss (ft)	0.03	Cum SA (acres)	1.04	27.43	0.00

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9272.57	9604.25	7.92	4.10	17.08	0.98	0.24	1.93
2	LOB	9604.25	9935.93	147.22	60.15	153.88	18.18	0.39	2.45
3	Chan	9935.93	10062.08	441.69	133.21	126.16	54.53	1.06	3.32
4	ROB	10062.08	10397.76	213.16	93.13	196.33	26.32	0.47	2.29

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9935.93	10062.08	810.00	219.87	129.35	100.00	1.74	3.68

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: T4N-R3W-S18E
REACH: Reach-4 RS: 1.486

INPUT

Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9222.26	1608.1	9223.42	1608.13	9231.95	1608	9232.15	1608	9233.02	1607.99
9245.29	1607.8	9255.67	1607.73	9265.06	1607.66	9273.36	1607.62	9290.33	1607.57
9342.3	1607.6	9355.68	1607.54	9356.05	1607.54	9361.13	1607.28	9363.1	1607.2
9364.97	1607.31	9368.78	1607.54	9378.05	1607.5	9390.05	1607.55	9415.75	1607.3
9420.92	1607.41	9514.85	1606.99	9534.32	1606.88	9557.5	1606.8	9642.15	1606.8
9650.22	1606.75	9662.65	1606.72	9691.03	1606.57	9791.43	1606.43	9819.13	1606.37
9846.12	1606.25	9853.47	1606.21	9880.11	1606.09	9882.55	1606.1	9885.69	1606.04
9887.84	1606.029	9922.37	1605.84	9923.61	1605.83	9924.3	1605.8	9925.02	1605.83
9925.21	1605.83	9963.06	1605.59	9975.44	1605.56	9977.6	1605.6	9980.28	1605.56
10021.38	1605.55	10050.26	1605.71	10052.76	1605.72	10055.7	1605.71	10082.53	1605.92
10093.35	1606	10097.49	1606.06	10101.03	1606.12	10102.98	1606.11	10105.73	1606.16
10118.08	1606.22	10142.17	1606.35	10152.11	1606.41	10157.78	1606.45	10165.24	1606.5
10175.58	1606.56	10193.03	1606.64	10194.66	1606.65	10211.24	1606.8	10227.65	1606.9
10312.95	1607.78	10326.76	1607.79	10329.73	1607.8	10333.04	1607.8	10335.25	1607.81
10344.32	1607.86	10349	1607.88	10351.99	1607.9	10359.3	1607.93	10367.24	1607.97
10382.21	1608.07	10382.63	1608.11	10382.92	1608.08	10383.9	1608.07	10384.49	1608.07
10384.54	1608.11	10387.88	1608.03	10398.69	1608.12	10406.65	1608.21	10442.59	1608.37
10509.31	1608.8	10514.51	1608.87	10517.42	1608.89	10526.03	1608.91	10535.49	1608.9
10539.94	1608.99	10551.83		10691.24	1609.27				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9222.26	.033	9846.12	.05	10142.17	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9880.1	10097.49	534	573.73	607	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1607.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.037	0.050	0.042
W.S. Elev (ft)	1606.99	Reach Len. (ft)	534.00	573.73	607.00
Crit W.S. (ft)		Flow Area (sq ft)	148.38	272.53	66.84
E.G. Slope (ft/ft)	0.003130	Area (sq ft)	148.38	272.53	66.84
Q Total (cfs)	810.00	Flow (cfs)	195.13	526.80	88.08
Top Width (ft)	722.58	Top Width (ft)	366.00	217.38	139.20
Vel Total (ft/s)	1.66	Avg. Vel. (ft/s)	1.32	1.93	1.32
Max Chl Dpth (ft)	1.44	Hydr. Depth (ft)	0.41	1.25	0.48
Conv. Total (cfs)	14478.6	Conv. (cfs)	3487.9	9416.4	1574.3
Length Wtd. (ft)	569.60	Wetted Per. (ft)	366.00	217.39	139.20
Min Ch El (ft)	1605.55	Shear (lb/sq ft)	0.08	0.24	0.09
Alpha	1.10	Stream Power (lb/ft s)	0.10	0.47	0.12
Frctn Loss (ft)	3.50	Cum Volume (acre-ft)	34.61	50.73	11.73
C & E Loss (ft)	0.01	Cum SA (acres)	36.52	25.49	24.42

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1607.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.050	
W.S. Elev (ft)	1607.10	Reach Len. (ft)	534.00	573.73	607.00
Crit W.S. (ft)		Flow Area (sq ft)		296.36	
E.G. Slope (ft/ft)	0.005666	Area (sq ft)		296.36	
Q Total (cfs)	810.00	Flow (cfs)		810.00	
Top Width (ft)	217.38	Top Width (ft)		217.38	
Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)		2.73	
Max Chl Dpth (ft)	1.55	Hydr. Depth (ft)		1.36	
Conv. Total (cfs)	10760.6	Conv. (cfs)		10760.6	
Length Wtd. (ft)	573.73	Wetted Per. (ft)		219.44	
Min Ch El (ft)	1605.55	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		1.31	

```
* Frctn Loss (ft)        *    3.08  * Cum Volume (acre-ft)   *    5.91  *   64.68  *    0.18  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    1.04  *   25.49  *    0.00  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9222.26   * 9551.19   *     1.80 *     3.54 *    37.07 *     0.22 *
0.10 *     0.51 *
* 2         * LOB       * 9551.19   * 9880.11   *   193.33 *   144.84 *   328.93 *    23.87 *
0.44 *     1.33 *
* 3         * Chan      * 9880.11   * 10097.49  *   526.80 *   272.53 *   217.39 *    65.04 *
1.25 *     1.93 *
* 4         * ROB       * 10097.49  * 10394.37  *    88.08 *    66.84 *   139.20 *    10.87 *
0.48 *     1.32 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9880.11   * 10097.49  *   810.00 *   296.36 *   219.44 *   100.00 *
1.36 *     2.73 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 1.378

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9342.82  1605.3 9353.21 1605.14 9354.64 1605.14 9475.11 1604.09 9478.31 1604.09
 9482.27  1604.1 9484.98 1604.07 9512.24  1604.2 9523.58 1604.23 9530.96 1604.14
 9537.27    1604 9546.13 1603.94 9557.23 1603.85 9582.71  1603.6 9593.65 1603.61
 9606.32  1603.6 9693.08 1603.26 9699.56 1603.24 9706.61 1603.29 9749.86 1603.64
 9776.85  1603.6 9781.19 1603.47 9787.87 1603.41 9810.34 1603.11 9899.83 1602.72
 9923.87  1602.7 9981.49 1602.41 9992.09 1602.3310009.31  1602.410037.79  1602.5
 10101.9  1602.710115.54 1602.7910127.83 1602.82 10129.3 1602.8310134.24 1602.83
10139.36  1602.810157.44 1603.0610157.83 1603.0710158.03 1603.0810161.89 1603.09
10166.19  1603.1   10177 1603.1510288.46 1603.5610297.92 1603.5910301.35  1603.6
10314.07  1603.710327.92 1603.7110347.33 1603.8810388.58 1603.8710428.19 1603.92
10429.77  1603.910436.67 1603.96 10441.8 1603.9610444.78 1603.9410446.25 1603.94
10447.36  1603.910448.41 1603.9410451.04 1603.9410455.39 1603.9610461.48 1603.96
10468.57  1603.910470.16 1603.9310471.16 1603.9410506.26 1603.9710580.21 1603.94
10587.77  1603.910599.33  1603.910616.35 1603.8610649.62 1603.97 10654.5 1603.98
10657.47    160410658.61 1603.9910668.49 1603.9910681.24 1603.9910688.45 1603.96
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```
10694.63  1603.910699.22 1604.0210707.66 1604.0610727.33 1604.2210763.87 1604.53
10812.77  1604.810828.11 1604.81 10829.7 1604.83

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9342.82    .033 9899.83     .05 10101.9    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9899.83 10101.9              516   508.1     493            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1603.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *   0.033  *   0.050  *   0.033  *
* W.S. Elev (ft)          * 1603.37  * Reach Len. (ft)         *  516.00  *  508.10  *  493.00  *
* Crit W.S. (ft)          * 1603.26  * Flow Area (sq ft)       *   45.89  *  165.27  *   40.73  *
* E.G. Slope (ft/ft)      *0.017171  * Area (sq ft)            *   45.89  *  165.27  *   40.73  *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *  138.24  *  562.85  *  108.92  *
* Top Width (ft)          *  493.69  * Top Width (ft)          *  158.11  *  202.07  *  133.50  *
* Vel Total (ft/s)        *    3.22  * Avg. Vel. (ft/s)        *    3.01  *    3.41  *    2.67  *
* Max Chl Dpth (ft)       *    1.03  * Hydr. Depth (ft)        *    0.29  *    0.82  *    0.31  *
* Conv. Total (cfs)       *  6181.4  * Conv. (cfs)             *  1054.9  *  4295.3  *   831.2  *
* Length Wtd. (ft)        *  507.46  * Wetted Per. (ft)        *  158.12  *  202.07  *  133.50  *
* Min Ch El (ft)          * 1602.33  * Shear (lb/sq ft)        *    0.31  *    0.88  *    0.33  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.94  *    2.99  *    0.87  *
* Frctn Loss (ft)         *    2.81  * Cum Volume (acre-ft)    *   33.41  *   47.84  *   10.98  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *   33.31  *   22.73  *   22.52  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1604.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)          * 1604.02  * Reach Len. (ft)         *  516.00  *  508.10  *  493.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  297.33  *          *
* E.G. Slope (ft/ft)      *0.005108  * Area (sq ft)            *          *  297.33  *          *
* Q Total (cfs)           *  810.00  * Flow (cfs)              *          *  810.00  *          *
* Top Width (ft)          *  202.07  * Top Width (ft)          *          *  202.07  *          *
* Vel Total (ft/s)        *    2.72  * Avg. Vel. (ft/s)        *          *    2.72  *          *
* Max Chl Dpth (ft)       *    1.69  * Hydr. Depth (ft)        *          *    1.47  *          *
* Conv. Total (cfs)       * 11333.5  * Conv. (cfs)             *          * 11333.5  *          *
* Length Wtd. (ft)        *  508.10  * Wetted Per. (ft)        *          *  204.69  *          *
* Min Ch El (ft)          * 1602.33  * Shear (lb/sq ft)        *          *    0.46  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.26  *          *
* Frctn Loss (ft)         *    2.77  * Cum Volume (acre-ft)    *    5.91  *   60.77  *    0.18  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    1.04  *   22.73  *    0.00  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9621.33   * 9899.83   *   138.24 *    45.89 *   158.12 *    17.07 *
0.29 *     3.01 *
* 2        * Chan      * 9899.83   * 10101.90  *   562.85 *   165.27 *   202.07 *    69.49 *
0.82 *     3.41 *
* 3        * ROB       * 10101.90  * 10465.80  *   108.92 *    40.73 *   133.50 *    13.45 *
0.31 *     2.67 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9899.83   * 10101.90  *   810.00 *   297.33 *   204.69 *   100.00 *
1.47 *     2.72 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 1.282

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 930cfs.
Station Elevation Data    num=      87
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9391.15  1600.7 9446.54 1600.83 9457.05 1600.83 9503.88 1600.84 9510.73 1600.78
 9538.07  1600.6 9607.83 1600.25 9637.56 1600.13  9648.9 1600.08 9664.46 1600.05
 9695.98    1600 9730.08 1599.94 9736.87 1599.96 9758.74 1599.86 9794.58 1599.85
 9812.89  1599.7 9820.25 1599.66 9875.71 1599.47  9893.91599.401 9907.45 1599.35
 9955.11 1599.22  9980.4  1599.2  9996.2 1599.2810004.86 1599.2210008.02 1599.14
10011.63 1598.9910017.71  1599.410019.58 1599.5310025.84 1599.4910060.91 1599.44
10067.76 1599.51 10068.7  1599.510107.15 1599.7110109.67 1599.7610113.591599.824
10124.45    160010127.19 1600.0410142.73  1600.310146.23 1600.2810158.15 1600.36
10172.02 1600.4610187.97 1600.2810213.97  1600.510217.98 1600.5610220.53 1600.57
10222.77  1600.610237.66 1600.8310275.36  1600.210280.65    160010286.47 1599.89
10293.53  1599.810299.02 1599.7610305.92  1599.810306.78  1599.810311.58 1599.76
10315.34 1599.7410317.33  1599.710320.48  1599.710328.87 1599.7810344.39 1599.88
10378.69 1600.0910413.72  1600.310439.02 1600.4910458.63 1600.6310525.72 1601.03
10547.84 1600.9710615.74  1600.710637.83 1600.6210666.94 1600.8710738.97 1601.45
10739.25 1601.3410782.26  1601.7 10833.9 1601.9710837.13    160210846.11 1601.99
10853.27    160210861.55    160210871.91 1602.0310886.82 1602.0910947.84 1602.08
10952.57 1602.0910954.43  1602.110955.19 1602.0910957.35 1602.0910958.64  1602.1
10961.84 1602.08 10989.7 1602.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9391.15    .033 9794.58     .0510113.59    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9875.7110019.58              436  473.92     491            .1        .3
Right Levee     Station=10237.66      Elevation= 1600.83

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1600.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.040  *   0.050  *   0.047  *
* W.S. Elev (ft)         * 1600.63  * Reach Len. (ft)         *  436.00  *  473.92  *  491.00  *
* Crit W.S. (ft)         * 1600.14  * Flow Area (sq ft)       *  213.92  *  193.92  *  137.60  *
* E.G. Slope (ft/ft)     *0.002923  * Area (sq ft)            *  213.92  *  193.92  *  137.60  *
```

Q Total (cfs)	930.00	Flow (cfs)	336.35	380.15	213.50	
Top Width (ft)	691.39	Top Width (ft)	342.33	143.87	205.19	
Vel Total (ft/s)	1.71	Avg. Vel. (ft/s)	1.57	1.96	1.55	
Max Chl Dpth (ft)	1.64	Hydr. Depth (ft)	0.62	1.35	0.67	
Conv. Total (cfs)	17200.8	Conv. (cfs)	6221.0	7031.0	3948.8	
Length Wtd. (ft)	465.64	Wetted Per. (ft)	342.33	143.89	205.20	
Min Ch El (ft)	1598.99	Shear (lb/sq ft)	0.11	0.25	0.12	
Alpha	1.04	Stream Power (lb/ft s)	0.18	0.48	0.19	
Frctn Loss (ft)	2.82	Cum Volume (acre-ft)	31.88	45.75	9.97	
C & E Loss (ft)	0.02	Cum SA (acres)	30.34	20.71	20.60	

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1601.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.050	
W.S. Elev (ft)	1601.18	Reach Len. (ft)	436.00	473.92	491.00
Crit W.S. (ft)	1600.38	Flow Area (sq ft)		273.05	
E.G. Slope (ft/ft)	0.005766	Area (sq ft)		273.05	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	143.87	Top Width (ft)		143.87	
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)		3.41	
Max Chl Dpth (ft)	2.19	Hydr. Depth (ft)		1.90	
Conv. Total (cfs)	12247.6	Conv. (cfs)		12247.6	
Length Wtd. (ft)	473.92	Wetted Per. (ft)		147.26	
Min Ch El (ft)	1598.99	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		2.27	
Frctn Loss (ft)	2.85	Cum Volume (acre-ft)	5.91	57.44	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	1.04	20.71	0.00

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9391.15	9633.43	23.71	25.51	100.05	2.55	0.25	0.93
2	LOB	9633.43	9875.71	312.64	188.41	242.28	33.62	0.78	1.66
3	Chan	9875.71	10019.58	380.15	193.92	143.89	40.88	1.35	1.96
4	ROB	10019.58	10237.66	213.50	137.60	205.20	22.96	0.67	1.55

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.
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.

Profile #2

* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)
* 1 Chan	* 9875.71	* 10019.58	* 930.00	* 273.05	* 147.26	* 100.00	* 1.90	* 3.41

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: T4N-R3W-S18E
REACH: Reach-4 RS: 1.192

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9522.58	1598	9524.67	1598.01	9530.66	1598	9537.04	1597.96	9552.09	1597.91
9565	1597.9	9573.09	1597.88	9585.27	1597.87	9625.53	1597.78	9651.04	1597.86
9664.86	1597.9	9682.03	1597.76	9708.55	1597.47	9715.53	1597.49	9721.84	1597.5
9770.78	1597.4	9784.75	1597.36	9788.98	1597.4	9804.51	1597.57	9835.73	1597.92
9836.53	1597.9	9837.08	1597.57	9841.08	1597.37	9865.97	1597	9866.03	1596.99
9868.49	1597	9868.49	1596.96	9872.25	1596.96	9879.4	1596.92	9924.36	1596.87
9927.25	1596.6	9940.43	1596.3	9966.22	1596.49	9988.27	1596.53	9988.41	1596.52
9989.28	1596.5	9990.02	1596.5	10002.79	1596.66	10027.41	1596.54	10030.59	1596.54
10073.11	1596.8	10079.68	1596.9	10096.08	1597.11	10109.44	1597.25	10144.93	1597.68
10166.03	1597.7	10195.94	1597.5	10202.66	1597.46	10224.79	1597.55	10231.18	1597.56
10248.58	1597.6	10308.18	1597.8	10308.37	1597.81	10321.36	1597.74	10325.91	1597.73
10333.72	1597.7	10366.18	1597.84	10395.14	1597.77	10401.24	1597.7	10411.32	1597.68
10421.27	1597.6	10441.47	1597.77	10443.58	1597.84	10447.87	1597.9	10455.22	1598
10456.12	1598	10459.12	1598.04	10460.9	1598.04				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9522.58	.033	9865.97	.05	10096.08	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.36	10079.68	489	512.82	524	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1597.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.045	0.050	0.041
W.S. Elev (ft)	1597.60	Reach Len. (ft)	489.00	512.82	524.00
Crit W.S. (ft)	1597.56	Flow Area (sq ft)	66.97	160.43	24.93
E.G. Slope (ft/ft)	0.019327	Area (sq ft)	66.97	160.43	24.93
Q Total (cfs)	930.00	Flow (cfs)	192.82	677.18	60.00
Top Width (ft)	481.04	Top Width (ft)	198.17	155.32	127.56
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)	2.88	4.22	2.41
Max Chl Dpth (ft)	1.30	Hydr. Depth (ft)	0.34	1.03	0.20
Conv. Total (cfs)	6689.7	Conv. (cfs)	1387.0	4871.1	431.6
Length Wtd. (ft)	501.53	Wetted Per. (ft)	198.23	155.34	127.56
Min Ch El (ft)	1596.30	Shear (lb/sq ft)	0.41	1.25	0.24
Alpha	1.11	Stream Power (lb/ft s)	1.17	5.26	0.57
Frctn Loss (ft)	3.69	Cum Volume (acre-ft)	30.47	43.82	9.06
C & E Loss (ft)	0.05	Cum SA (acres)	27.64	19.08	18.73

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1598.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.050	
W.S. Elev (ft)	1598.33	Reach Len. (ft)	489.00	512.82	524.00
Crit W.S. (ft)	1597.60	Flow Area (sq ft)		274.11	
E.G. Slope (ft/ft)	0.006265	Area (sq ft)		274.11	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	155.32	Top Width (ft)		155.32	
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)		3.39	
Max Chl Dpth (ft)	2.03	Hydr. Depth (ft)		1.76	
Conv. Total (cfs)	11749.7	Conv. (cfs)		11749.7	
Length Wtd. (ft)	510.22	Wetted Per. (ft)		158.24	
Min Ch El (ft)	1596.30	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)		2.30	
Frctn Loss (ft)	3.42	Cum Volume (acre-ft)	5.91	54.47	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	1.04	19.08	0.00

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9522.58	9723.47	3.26	2.48	26.96	0.35	0.09	1.31
2	LOB	9723.47	9924.36	189.56	64.49	171.26	20.38	0.38	2.94
3	Chan	9924.36	10079.68	677.18	160.43	155.34	72.82	1.03	4.22
4	ROB	10079.68	10270.29	60.00	24.93	127.15	6.45	0.20	2.41

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.
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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9924.36	10079.68	930.00	274.11	158.24	100.00	1.76	3.39

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: T4N-R3W-S18E

REACH: Reach-4 RS: 1.095

INPUT
Description:
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9230.81	1595.3	9261.69	1595.23	9265.12	1595.23	9285.36	1594.85	9325.07	1594.36
9359.46	1594.5	9377.68	1594.25	9389.29	1594.01	9389.84	1594	9390.31	1593.99
9397.13	1593.9	9402.99	1593.8	9409.02	1593.74	9421.75	1593.64	9426.99	1593.59
9437.44	1593.4	9441.19	1593.42	9445.21	1593.39	9449.36	1593.38	9453.77	1593.38
9458.71	1593.4	9463.96	1593.4	9509.67	1593.52	9516.35	1593.52	9516.4	1593.5
9516.95	1593.51	9558.84	1593.15	9570.51	1593.07	9581.71	1593.02	9625.74	1592.8
9652.83	1593.28	9670.74	1593.53	9692.28	1593.41	9712.31	1593.02	9768.32	1593.3
9828.01	1593.8	9836.23	1593.84	9836.89	1593.84	9844.26	1593.89	9862.27	1594
9864.74	1594.02	9886.16	1594.01	9889.02	1594.02	9889.24	1594.018	9891.25	1594
9891.44	1594	9902.21	1593.73	9920.02	1593.33	9920.55	1593.33	9924.82	1593.32
9952.26	1593.4	9956.9	1593.36	9959.37	1593.32	9964.47	1593.25	9975.69	1593.27
9995.16	1593.5	10003.96	1593.37	10010.37	1593.27	10014	1593.23	10017.42	1592.95
10018.6	1592.9	10020.15	1592.78	10024.87	1592.35	10029.97	1592.06	10030.6	1592.03
10032.13	1592	10035.88	1592.34	10038.84	1592.65	10043.47	1593.26	10056.8	1593.27
10110.94	1593.51	10118.31	1593.41	10119.06	1593.41	10155.51	1593.75	10163.66	1593.85
10173.4	1593.94	10180.85	1594	10191.47	1594.1	10199.6	1594.18	10236.06	1594.16
10244.18	1594.21	10258.57	1594.37	10268.47	1594.42	10352.37	1594.54	10356.9	1594.55
10407.95	1594.61	10434.17	1594.58	10448.53	1594.61	10468.89	1594.64	10476.15	1594.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9230.81	.033	9902.21	.051	10155.51	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9995.16	10110.94	535	509.67	490	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1594.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.035	0.050	0.048
W.S. Elev (ft)	1594.04	Reach Len. (ft)	535.00	509.67	490.00
Crit W.S. (ft)	1593.69	Flow Area (sq ft)	379.24	102.27	25.47
E.G. Slope (ft/ft)	0.003842	Area (sq ft)	379.24	102.27	25.47
Q Total (cfs)	930.00	Flow (cfs)	729.43	173.31	27.27
Top Width (ft)	797.21	Top Width (ft)	607.30	115.78	74.12
Vel Total (ft/s)	1.83	Avg. Vel. (ft/s)	1.92	1.69	1.07
Max Chl Dpth (ft)	2.04	Hydr. Depth (ft)	0.62	0.88	0.34
Conv. Total (cfs)	15004.1	Conv. (cfs)	11768.2	2796.1	439.9
Length Wtd. (ft)	525.98	Wetted Per. (ft)	607.34	115.90	74.13
Min Ch El (ft)	1592.00	Shear (lb/sq ft)	0.15	0.21	0.08
Alpha	1.03	Stream Power (lb/ft s)	0.29	0.36	0.09
Frctn Loss (ft)	2.52	Cum Volume (acre-ft)	27.97	42.27	8.76
C & E Loss (ft)	0.00	Cum SA (acres)	23.12	17.48	17.52

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 OUTPUT Profile #2

E.G. Elev (ft)	1595.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.050	0.050	
W.S. Elev (ft)	1594.90	Reach Len. (ft)	535.00	509.67	490.00
Crit W.S. (ft)		Flow Area (sq ft)	61.43	201.39	
E.G. Slope (ft/ft)	0.007176	Area (sq ft)	61.43	201.39	
Q Total (cfs)	930.00	Flow (cfs)	203.05	726.95	
Top Width (ft)	155.09	Top Width (ft)	39.31	115.78	
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)	3.31	3.61	
Max Chl Dpth (ft)	2.90	Hydr. Depth (ft)	1.56	1.74	
Conv. Total (cfs)	10978.3	Conv. (cfs)	2396.9	8581.4	
Length Wtd. (ft)	516.10	Wetted Per. (ft)	40.84	117.30	
Min Ch El (ft)	1592.00	Shear (lb/sq ft)	0.67	0.77	
Alpha	1.00	Stream Power (lb/ft s)	2.23	2.78	

```
* Frctn Loss (ft)        *    2.71  * Cum Volume (acre-ft)   *    5.56  *   51.67  *    0.18  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)        *    0.82  *   17.48  *    0.00  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9230.81   * 9612.98   *   316.08 *   149.26 *   225.14 *    33.99 *
0.66 *     2.12 *
* 2         * LOB       * 9612.98   * 9995.16   *   413.34 *   229.98 *   382.20 *    44.45 *
0.60 *     1.80 *
* 3         * Chan      * 9995.16   * 10110.94  *   173.31 *   102.27 *   115.90 *    18.64 *
0.88 *     1.69 *
* 4         * ROB       * 10110.94  * 10293.54  *    27.27 *    25.47 *    74.13 *     2.93 *
0.34 *     1.07 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9612.98   * 9995.16   *   203.05 *    61.43 *    40.84 *    21.83 *
1.56 *     3.31 *
* 2         * Chan      * 9995.16   * 10110.94  *   726.95 *   201.39 *   117.30 *    78.17 *
1.74 *     3.61 *
*****************************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 0.998

INPUT
Description: Interpolated point added at (10064.24,1590.711) to set bank station
Station Elevation Data    num=     104
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9625.39    1592 9626.85    1592 9636.32 1591.95 9639.17 1591.94 9641.47 1591.92
 9649.73  1591.8  9669.4 1591.67 9711.05 1591.29 9715.06 1591.21 9715.79 1591.19
 9720.62  1591.2 9766.72 1590.81 9807.761590.879 9808.17 1590.88 9810.92 1590.87
 9811.57 1590.86 9813.74  1590.8 9829.21 1590.57 9860.74 1590.17 9861.17 1590.16
 9861.33 1590.16 9864.93  1590.1 9869.16 1590.19 9872.17 1590.22 9879.85 1590.36
 9880.89 1590.21 9882.17    1590  9885.6 1589.57 9886.59 1589.42 9887.47 1589.56
 9889.43    1590 9890.16  1590.2 9890.35 1590.19 9894.38 1590.24 9896.71 1590.22
 9903.29 1590.19 9908.45  1590.2 9908.72 1590.18 9909.07 1590.18 9909.08 1590.17
 9909.35 1590.15 9910.46    1590 9913.09 1589.57 9916.08 1589.14 9917.28 1589.43
    9918 1589.64 9919.54    1590 9920.12 1590.17 9920.39 1590.23 9927.82 1590.29
 9943.63 1590.38 9959.09  1590.7 9961.43 1590.66 9992.82 1590.03 9994.39 1590.01
 9994.58    1590 9996.63    1590 9996.94 1589.94 9996.97 1589.94 9997.07 1589.93
10004.84 1589.0410008.08  1589.510010.32 1589.6710011.86 1589.7810013.46 1589.91
10018.26 1589.8610021.35  1589.910023.18 1589.8810025.21 1589.9110028.24 1589.98
10029.06    159010042.02  1590.310047.99 1590.4610064.241590.711 10095.9  1591.2
```

```
10125.17 1591.5610136.121591.51210163.61 1591.3910172.11  1591.410181.19 1591.48
10184.13 1591.5210213.83 1591.9510216.58 1592.0310220.95    1592 10230.9 1591.99
10248.04 1591.96 10252.7 1591.9810260.96 1591.9810262.44    159210270.97 1591.97
10283.62 1591.96 10304.2 1591.9610315.49 1591.9310341.69  1591.910349.69 1591.86
10369.63 1591.8610383.48 1591.8410387.67 1591.8610390.88  1591.910401.59 1591.92
10416.38 1591.8810434.88 1591.81 10448.3 1591.6410456.11  1591.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9625.39    .033 9720.62     .05 10095.9    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.0910064.24               443  628.76     493             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1591.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.050  *   0.050  *   0.048  *
* W.S. Elev (ft)          * 1591.48  * Reach Len. (ft)        *  443.00  *  628.76  *  493.00  *
* Crit W.S. (ft)          * 1591.03  * Flow Area (sq ft)      *  230.67  *  138.86  *   21.72  *
* E.G. Slope (ft/ft)      *0.006135  * Area (sq ft)           *  230.67  *  138.86  *   21.72  *
* Q Total (cfs)           *  930.00  * Flow (cfs)             *  512.19  *  388.75  *   29.06  *
* Top Width (ft)          *  465.90  * Top Width (ft)         *  268.78  *  105.15  *   91.97  *
* Vel Total (ft/s)        *    2.38  * Avg. Vel. (ft/s)       *    2.22  *    2.80  *    1.34  *
* Max Chl Dpth (ft)       *    2.44  * Hydr. Depth (ft)       *    0.86  *    1.32  *    0.24  *
* Conv. Total (cfs)       * 11873.5  * Conv. (cfs)            *  6539.2  *  4963.3  *   371.0  *
* Length Wtd. (ft)        *  542.98  * Wetted Per. (ft)       *  269.16  *  105.27  *   91.98  *
* Min Ch El (ft)          * 1589.04  * Shear (lb/sq ft)       *    0.33  *    0.51  *    0.09  *
* Alpha                   *    1.07  * Stream Power (lb/ft s) *    0.73  *    1.41  *    0.12  *
* Frctn Loss (ft)         *    2.51  * Cum Volume (acre-ft)   *   24.22  *   40.86  *    8.49  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *   17.74  *   16.19  *   16.58  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1592.37  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.050  *   0.050  *          *
* W.S. Elev (ft)          * 1592.23  * Reach Len. (ft)        *  443.00  *  628.76  *  493.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *   93.97  *  218.04  *          *
* E.G. Slope (ft/ft)      *0.004013  * Area (sq ft)           *   93.97  *  218.04  *          *
* Q Total (cfs)           *  930.00  * Flow (cfs)             *  269.34  *  660.66  *          *
* Top Width (ft)          *  152.55  * Top Width (ft)         *   47.40  *  105.15  *          *
* Vel Total (ft/s)        *    2.98  * Avg. Vel. (ft/s)       *    2.87  *    3.03  *          *
* Max Chl Dpth (ft)       *    3.19  * Hydr. Depth (ft)       *    1.98  *    2.07  *          *
* Conv. Total (cfs)       * 14680.4  * Conv. (cfs)            *  4251.7  * 10428.7  *          *
* Length Wtd. (ft)        *  603.62  * Wetted Per. (ft)       *   50.02  *  106.79  *          *
* Min Ch El (ft)          * 1589.04  * Shear (lb/sq ft)       *    0.47  *    0.51  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *    1.35  *    1.55  *          *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)   *    4.61  *   49.21  *    0.18  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    0.29  *   16.19  *    0.00  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9625.39   * 9792.24   *    60.57 *    42.85 *   101.93 *     6.51 *
0.42 *     1.41 *
```

```
* 2          * LOB       * 9792.24   * 9959.09   *   451.62 *   187.82 *   167.23 *    48.56 *
1.13 *     2.40 *
* 3          * Chan      * 9959.09   * 10064.24  *   388.75 *   138.86 *   105.27 *    41.80 *
1.32 *     2.80 *
* 4          * ROB       * 10064.24  * 10260.18  *    29.06 *    21.72 *    91.98 *     3.12 *
0.24 *     1.34 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9792.24   * 9959.09   *   269.34 *    93.97 *    50.02 *    28.96 *
1.98 *     2.87 *
* 2          * Chan      * 9959.09   * 10064.24  *   660.66 *   218.04 *   106.79 *    71.04 *
2.07 *     3.03 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 0.879

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,060cfs.
Station Elevation Data    num=      68
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9407.45  1592.5 9416.98 1592.47 9427.56 1592.45 9437.29 1592.41 9448.23 1592.33
 9465.62  1592.2 9486.52    1592  9487.5 1591.99 9489.88 1591.97 9517.52 1591.77
 9547.58  1591.4 9592.29 1590.81 9621.61  1590.5 9636.88 1590.36 9673.67    1590
 9674.77    1590 9679.24 1589.96 9695.65 1589.75 9734.25  1589.4 9746.86 1589.35
 9771.72    1589 9783.95 1588.84 9790.54 1588.71 9827.62 1588.14 9843.34  1588.1
 9859.16  1588.2 9871.88 1588.08 9873.93 1588.04 9877.83    1588 9880.29 1587.99
 9890.85  1587.9 9910.25 1587.69  9925.6 1587.62 9950.52 1587.56 9964.11 1587.61
 9982.74  1587.710006.35 1587.5410020.43 1587.5710029.96 1587.6310044.06 1587.79
10055.98    158810063.47    158810078.92 1588.1510120.09 1588.4410123.68 1588.42
10164.46  1588.110181.67 1588.0610193.46 1588.1310206.34 1588.1110220.24 1588.12
10234.66  1588.210242.83  1588.310250.92 1588.3510272.17 1588.2810278.77 1588.32
10295.87  1588.610327.46 1589.1410344.06 1589.0910389.49 1588.8910406.86 1588.81
10424.99  1588.810456.27 1588.7210481.56 1588.63 10502.4 1588.6710505.33  1588.7
10528.77  1588.910554.71 1589.2710561.01 1589.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9407.45    .033 9859.16     .0510078.92    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9859.1610078.92              521  402.69     444            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1589.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.033  *   0.050  *   0.033  *
```

```
* W.S. Elev (ft)          * 1589.00  * Reach Len. (ft)          *  521.00  *  402.69  *  444.00  *
* Crit W.S. (ft)          * 1588.57  * Flow Area (sq ft)        *   50.74  *  272.36  *  203.17  *
* E.G. Slope (ft/ft)      *0.003701  * Area (sq ft)             *   50.74  *  272.36  *  203.17  *
* Q Total (cfs)           * 1060.00  * Flow (cfs)               *   96.92  *  568.13  *  394.96  *
* Top Width (ft)          *  717.25  * Top Width (ft)           *   87.16  *  219.76  *  410.33  *
* Vel Total (ft/s)        *    2.01  * Avg. Vel. (ft/s)         *    1.91  *    2.09  *    1.94  *
* Max Chl Dpth (ft)       *    1.46  * Hydr. Depth (ft)         *    0.58  *    1.24  *    0.50  *
* Conv. Total (cfs)       * 17423.6  * Conv. (cfs)              *  1593.1  *  9338.5  *  6492.1  *
* Length Wtd. (ft)        *  424.26  * Wetted Per. (ft)         *   87.17  *  219.77  *  410.34  *
* Min Ch El (ft)          * 1587.54  * Shear (lb/sq ft)         *    0.13  *    0.29  *    0.11  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *    0.26  *    0.60  *    0.22  *
* Frctn Loss (ft)         *    2.31  * Cum Volume (acre-ft)     *   22.79  *   37.90  *    7.22  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   15.93  *   13.85  *   13.74  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1589.50  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *           *    0.050  *          *
* W.S. Elev (ft)          * 1589.36  * Reach Len. (ft)         *  521.00   *  402.69  *  444.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *           *  351.09  *          *
* E.G. Slope (ft/ft)      *0.005606  * Area (sq ft)             *           *  351.09  *          *
* Q Total (cfs)           * 1060.00  * Flow (cfs)               *           * 1060.00  *          *
* Top Width (ft)          *  219.76  * Top Width (ft)           *           *  219.76  *          *
* Vel Total (ft/s)        *    3.02  * Avg. Vel. (ft/s)         *           *    3.02  *          *
* Max Chl Dpth (ft)       *    1.81  * Hydr. Depth (ft)         *           *    1.60  *          *
* Conv. Total (cfs)       * 14157.6  * Conv. (cfs)              *           * 14157.6  *          *
* Length Wtd. (ft)        *  402.69  * Wetted Per. (ft)         *           *  222.13  *          *
* Min Ch El (ft)          * 1587.54  * Shear (lb/sq ft)         *           *    0.55  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *           *    1.67  *          *
* Frctn Loss (ft)         *    2.47  * Cum Volume (acre-ft)     *    4.13   *   45.11  *    0.18  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    0.04   *   13.85  *    0.00  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9633.31   * 9859.16   *    96.92 *    50.74 *    87.17 *     9.14 *
0.58 *     1.91 *
* 2        * Chan      * 9859.16   * 10078.92  *   568.13 *   272.36 *   219.77 *    53.60 *
1.24 *     2.09 *
* 3        * ROB       * 10078.92  * 10319.96  *   360.16 *   167.30 *   240.15 *    33.98 *
0.70 *     2.15 *
* 4        * ROB       * 10319.96  * 10561.01  *    34.80 *    35.87 *   170.19 *     3.28 *
0.21 *     0.97 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
```

```
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9859.16   * 10078.92  *  1060.00 *   351.09 *   222.13 *   100.00 *
1.60 *     3.02 *
*************************************************************************************************
******************
```

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: T4N-R3W-S18E
REACH: Reach-4 RS: 0.803

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9263.86	1589.5	9283.38	1589.6	9318.81	1589.68	9367.81	1589.5	9378.81	1589.52
9405.67	1589.7	9418.65	1589.75	9481.07	1589.55	9502.96	1589.76	9520.76	1589.72
9574.22	1589.4	9582.37	1589.38	9619.84	1588.78	9686.22	1588.31	9722.92	1588
9730.03	1587.9	9734.97	1587.79	9779.16	1586.7	9816.3	1586.44	9832.72	1586.11
9837.86	1586.1	9844.07	1586	9846.29	1585.98	9865.28	1585.79	9888.37	1585.66
9924.8	1585.4	9942.1	1585.29	9956.89	1585.09	9984.81	1584.93	9998.39	1585.16
10010.88	1585.3	10018.97	1585.37	10027.3	1585.42	10052.35	1585.45	10109.97	1585.69
10114.81	1585.7	10115.76	1585.72	10122.72	1585.84	10133.12	1586	10136.71	1586.07
10153.22	1586.4	10163.69	1586.45	10187.91	1586.42	10211.75	1586.64	10214.38	1586.63
10221	1586.6	10276.61	1586.47	10313.25	1586.58	10320.6	1586.54	10327.81	1586.6
10377.76	1586.5	10422.86	1586.67	10427.23	1586.67	10438.11	1586.65	10467.22	1586.61
10484.37	1586.7	10546.58	1586.77	10578.04	1586.77				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9263.86	.033	9888.37	.05	10109.97	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9888.37	10109.97	504	494.42	482	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1586.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.033	0.050	0.033
W.S. Elev (ft)	1586.59	Reach Len. (ft)	504.00	494.42	482.00
Crit W.S. (ft)	1586.23	Flow Area (sq ft)	47.13	270.31	41.08
E.G. Slope (ft/ft)	0.008829	Area (sq ft)	47.13	270.31	41.08
Q Total (cfs)	1060.00	Flow (cfs)	126.56	861.71	71.73
Top Width (ft)	578.54	Top Width (ft)	93.22	221.60	263.71
Vel Total (ft/s)	2.96	Avg. Vel. (ft/s)	2.69	3.19	1.75
Max Chl Dpth (ft)	1.66	Hydr. Depth (ft)	0.51	1.22	0.16
Conv. Total (cfs)	11281.2	Conv. (cfs)	1346.9	9171.0	763.4
Length Wtd. (ft)	493.96	Wetted Per. (ft)	93.23	221.61	263.72
Min Ch El (ft)	1584.93	Shear (lb/sq ft)	0.28	0.67	0.09
Alpha	1.07	Stream Power (lb/ft s)	0.75	2.14	0.15
Frctn Loss (ft)	2.79	Cum Volume (acre-ft)	22.20	35.39	5.97
C & E Loss (ft)	0.02	Cum SA (acres)	14.85	11.81	10.30

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1587.03	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.16	Wt. n-Val.		0.050		
W.S. Elev (ft)	1586.87	Reach Len. (ft)	504.00	494.42	482.00	
Crit W.S. (ft)		Flow Area (sq ft)		333.10		
E.G. Slope (ft/ft)	0.006755	Area (sq ft)		333.10		
Q Total (cfs)	1060.00	Flow (cfs)		1060.00		
Top Width (ft)	221.60	Top Width (ft)		221.60		
Vel Total (ft/s)	3.18	Avg. Vel. (ft/s)		3.18		
Max Chl Dpth (ft)	1.94	Hydr. Depth (ft)		1.50		
Conv. Total (cfs)	12896.8	Conv. (cfs)		12896.8		
Length Wtd. (ft)	494.42	Wetted Per. (ft)		224.00		
Min Ch El (ft)	1584.93	Shear (lb/sq ft)		0.63		
Alpha	1.00	Stream Power (lb/ft s)		2.00		
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)	4.13	41.94	0.18	
C & E Loss (ft)	0.01	Cum SA (acres)	0.04	11.81	0.00	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9576.12	9888.37	126.56	47.13	93.23	11.94	0.51	2.69
2	Chan	9888.37	10109.97	861.71	270.31	221.61	81.29	1.22	3.19
3	ROB	10109.97	10344.00	69.55	38.22	206.62	6.56	0.18	1.82
4	ROB	10344.00	10578.04	2.18	2.86	57.10	0.21	0.05	0.76

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.*

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9888.37	10109.97	1060.00	333.10	224.00	100.00	1.50	3.18

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: T4N-R3W-S18E
REACH: Reach-4 RS: 0.709

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9562.82	1586.2	9571.8	1586.17	9583.84	1586.05	9598.88	1586.06	9607.35	1586.04

```
 9628.24  1586.1 9641.29 1586.06 9655.61 1586.06  9678.1 1586.18  9679.2 1586.16
 9687.23    1586 9688.04    1586 9702.08 1585.71    9789 1584.05 9794.06    1584
  9794.2    1584 9795.72 1583.99 9820.41 1583.64 9875.06 1582.89 9883.91 1582.77
 9888.41  1582.7 9890.831582.691 9969.52 1582.16 9972.71 1582.12 9979.23    1582
 9979.79  1582.1 9989.76 1582.06 9998.36 1582.0710003.52 1582.0210012.83 1582.07
10025.34  1582.110035.37 1582.1310044.76 1582.2510052.05 1582.2910057.13 1582.34
10077.56  1582.410096.21 1582.5910102.43 1582.6910113.12 1582.7810134.29 1582.99
10146.44  1583.210156.191583.343 10169.7 1583.5410184.75 1583.47 10200.9 1583.29
10216.49 1583.4510228.21  1583.410237.09 1583.46 10263.4 1583.5510314.76 1583.86
10343.74 1583.8810350.85  1583.910362.61 1583.8410389.25 1583.7710395.97 1583.78
 10419.6  1583.810422.85 1583.7810448.26 1583.7610463.83  1583.910474.22 1583.99
10475.58    158410483.43 1584.0710493.01  1584.110499.66 1584.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9562.82    .033 9875.06     .0510134.29    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9890.8310096.21               487  496.18     519             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1583.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.039  *   0.050  *   0.040  *
* W.S. Elev (ft)          * 1583.85  * Reach Len. (ft)         *  487.00  *  496.18  *  519.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       *   50.19  *  318.83  *  110.90  *
* E.G. Slope (ft/ft)      *0.003927  * Area (sq ft)            *   50.19  *  318.83  *  110.90  *
* Q Total (cfs)           * 1060.00  * Flow (cfs)              *   90.54  *  796.05  *  173.41  *
* Top Width (ft)          *  604.06  * Top Width (ft)           *   85.09  *  205.38  *  313.58  *
* Vel Total (ft/s)        *    2.21  * Avg. Vel. (ft/s)         *    1.80  *    2.50  *    1.56  *
* Max Chl Dpth (ft)       *    1.85  * Hydr. Depth (ft)         *    0.59  *    1.55  *    0.35  *
* Conv. Total (cfs)       * 16914.5  * Conv. (cfs)              *  1444.8  * 12702.6  *  2767.1  *
* Length Wtd. (ft)        *  498.49  * Wetted Per. (ft)         *   85.10  *  205.39  *  313.59  *
* Min Ch El (ft)          * 1582.00  * Shear (lb/sq ft)         *    0.14  *    0.38  *    0.09  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)   *    0.26  *    0.95  *    0.14  *
* Frctn Loss (ft)         *    3.15  * Cum Volume (acre-ft)     *   21.64  *   32.04  *    5.13  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   13.82  *    9.38  *    7.11  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1584.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)          * 1584.02  * Reach Len. (ft)         *  487.00  *  496.18  *  519.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       *          *  353.12  *          *
* E.G. Slope (ft/ft)      *0.005042  * Area (sq ft)            *          *  353.12  *          *
* Q Total (cfs)           * 1060.00  * Flow (cfs)              *          * 1060.00  *          *
* Top Width (ft)          *  205.38  * Top Width (ft)           *          *  205.38  *          *
* Vel Total (ft/s)        *    3.00  * Avg. Vel. (ft/s)         *          *    3.00  *          *
* Max Chl Dpth (ft)       *    2.02  * Hydr. Depth (ft)         *          *    1.72  *          *
* Conv. Total (cfs)       * 14927.8  * Conv. (cfs)              *          * 14927.8  *          *
* Length Wtd. (ft)        *  496.18  * Wetted Per. (ft)         *          *  208.14  *          *
* Min Ch El (ft)          * 1582.00  * Shear (lb/sq ft)         *          *    0.53  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    1.60  *          *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)     *    4.13  *   38.05  *    0.18  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.04  *    9.38  *    0.00  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
```

```
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9726.83   * 9890.83   *    90.54 *    50.19 *    85.10 *     8.54 *
0.59 *     1.80 *
* 2         * Chan      * 9890.83   * 10096.21  *   796.05 *   318.83 *   205.39 *    75.10 *
1.55 *     2.50 *
* 3         * ROB       * 10096.21  * 10297.94  *   170.87 *   104.62 *   201.74 *    16.12 *
0.52 *     1.63 *
* 4         * ROB       * 10297.94  * 10499.66  *     2.55 *     6.28 *   111.86 *     0.24 *
0.06 *     0.41 *
*****************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9890.83   * 10096.21  *  1060.00 *   353.12 *   208.14 *   100.00 *
1.72 *     3.00 *
*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 0.615

INPUT
Description: Interpolated point added at (9931.17,1579.428) to set bank station
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9311.64  1583.2 9321.05 1583.22 9336.97 1583.09 9385.36 1582.84 9433.54 1582.76
 9472.47  1582.3  9521.7 1582.15 9541.44 1581.98 9547.95    1582 9548.27    1582
 9562.81  1581.9 9580.39 1581.98 9626.04 1581.95 9635.48 1581.89 9659.46 1581.93
 9726.72  1581.9  9743.1 1581.87 9830.04 1581.05 9843.37 1580.92 9851.77 1580.78
 9897.51    1580 9931.171579.428 9941.63 1579.25 9950.07  1579.1 9967.59 1579.05
10038.28 1579.1110056.83  1579.110079.22 1579.4210084.75 1579.4910092.92  1579.6
10106.59 1579.8110119.17    158010126.67 1580.1210175.27 1580.8510229.17 1580.68
10292.03 1580.5610365.44  1580.610397.69 1580.6910439.37 1580.6310441.16 1580.62
10483.81 1580.6710495.84  1580.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9311.64    .033 9897.51     .0510119.17    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.1710079.22              512  520.46     494              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1580.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.23  * Wt. n-Val.              *   0.047  *   0.050  *   0.047  *
* W.S. Elev (ft)         * 1580.54  * Reach Len. (ft)         *  512.00  *  520.46  *  494.00  *
* Crit W.S. (ft)         * 1580.27  * Flow Area (sq ft)       *   36.55  *  208.67  *   43.23  *
```

E.G. Slope (ft/ft)	0.011791	Area (sq ft)	36.55	208.67	43.23	
Q Total (cfs)	1060.00	Flow (cfs)	97.17	846.50	116.33	
Top Width (ft)	289.16	Top Width (ft)	65.50	148.05	75.61	
Vel Total (ft/s)	3.67	Avg. Vel. (ft/s)	2.66	4.06	2.69	
Max Chl Dpth (ft)	1.49	Hydr. Depth (ft)	0.56	1.41	0.57	
Conv. Total (cfs)	9762.0	Conv. (cfs)	894.9	7795.7	1071.4	
Length Wtd. (ft)	514.81	Wetted Per. (ft)	65.51	148.06	75.62	
Min Ch El (ft)	1579.05	Shear (lb/sq ft)	0.41	1.04	0.42	
Alpha	1.08	Stream Power (lb/ft s)	1.09	4.21	1.13	
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	21.16	29.04	4.21	
C & E Loss (ft)	0.04	Cum SA (acres)	12.97	7.37	4.79	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1581.27	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.21	Wt. n-Val.		0.050		
W.S. Elev (ft)	1581.06	Reach Len. (ft)	512.00	520.46	494.00	
Crit W.S. (ft)		Flow Area (sq ft)		285.17		
E.G. Slope (ft/ft)	0.006721	Area (sq ft)		285.17		
Q Total (cfs)	1060.00	Flow (cfs)		1060.00		
Top Width (ft)	148.05	Top Width (ft)		148.05		
Vel Total (ft/s)	3.72	Avg. Vel. (ft/s)		3.72		
Max Chl Dpth (ft)	2.01	Hydr. Depth (ft)		1.93		
Conv. Total (cfs)	12930.1	Conv. (cfs)		12930.1		
Length Wtd. (ft)	520.35	Wetted Per. (ft)		151.33		
Min Ch El (ft)	1579.05	Shear (lb/sq ft)		0.79		
Alpha	1.00	Stream Power (lb/ft s)		2.94		
Frctn Loss (ft)	2.61	Cum Volume (acre-ft)	4.13	34.41	0.18	
C & E Loss (ft)	0.01	Cum SA (acres)	0.04	7.37	0.00	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9621.40	9931.17	97.17	36.55	65.51	9.17	0.56	2.66
2	Chan	9931.17	10079.22	846.50	208.67	148.06	79.86	1.41	4.06
3	ROB	10079.22	10287.53	116.33	43.23	75.62	10.97	0.57	2.69

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.
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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9931.17	10079.22	1060.00	285.17	151.33	100.00	1.93	3.72

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*****************************************************************************************
******************

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: T4N-R3W-S18E
REACH: Reach-4            RS: 0.517

INPUT
Description:
Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9525.03  1580.1 9535.95 1580.07 9549.43 1580.07 9566.12 1580.22    9568 1580.21
 9570.68  1580.2 9594.19    1580 9611.46 1579.88 9637.23 1579.68 9676.89  1579.2
  9736.6 1578.47 9787.54    1578 9790.26 1577.98 9858.18  1577.1 9889.11 1576.66
 9917.31 1576.39 9925.571576.333 9973.64    1576  9988.4 1575.8710008.61  1575.7
10034.46    157610050.37 1576.2210084.61 1576.6110112.63 1576.9310116.09    1577
10116.97 1576.9910123.95 1577.09 10130.4 1577.1910148.68  1577.510182.69    1578
10193.67 1578.14 10212.4 1578.4210230.89 1578.4110300.31  1578.510303.84 1578.55
10345.47 1578.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9525.03    .033 9925.57     .0510084.61    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9925.5710050.37              514  500.64     469            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1577.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.              *   0.033  *   0.050  *   0.041  *
* W.S. Elev (ft)         * 1577.91  * Reach Len. (ft)         *  514.00  *  500.64  *  469.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  108.57  *  237.36  *  113.85  *
* E.G. Slope (ft/ft)     *0.003002  * Area (sq ft)            *  108.57  *  237.36  *  113.85  *
* Q Total (cfs)          * 1060.00  * Flow (cfs)              *  237.96  *  593.22  *  228.82  *
* Top Width (ft)         *  380.40  * Top Width (ft)           *  129.64  *  124.80  *  125.96  *
* Vel Total (ft/s)       *    2.31  * Avg. Vel. (ft/s)         *    2.19  *    2.50  *    2.01  *
* Max Chl Dpth (ft)      *    2.21  * Hydr. Depth (ft)         *    0.84  *    1.90  *    0.90  *
* Conv. Total (cfs)      * 19347.9  * Conv. (cfs)              *  4343.4  * 10828.0  *  4176.6  *
* Length Wtd. (ft)       *  497.94  * Wetted Per. (ft)         *  129.65  *  124.81  *  125.97  *
* Min Ch El (ft)         * 1575.70  * Shear (lb/sq ft)         *    0.16  *    0.36  *    0.17  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)   *    0.34  *    0.89  *    0.34  *
* Frctn Loss (ft)        *    2.76  * Cum Volume (acre-ft)     *   20.30  *   26.37  *    3.32  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *   11.83  *    5.74  *    3.65  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1578.65  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.17  * Wt. n-Val.              *   0.033  *   0.050  *          *
* W.S. Elev (ft)         * 1578.48  * Reach Len. (ft)         *  514.00  *  500.64  *  469.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *    8.09  *  308.28  *          *
* E.G. Slope (ft/ft)     *0.003892  * Area (sq ft)            *    8.09  *  308.28  *          *
* Q Total (cfs)          * 1060.00  * Flow (cfs)              *   28.00  * 1032.00  *          *
* Top Width (ft)         *  128.60  * Top Width (ft)           *    3.80  *  124.80  *          *
* Vel Total (ft/s)       *    3.35  * Avg. Vel. (ft/s)         *    3.46  *    3.35  *          *
* Max Chl Dpth (ft)      *    2.77  * Hydr. Depth (ft)         *    2.13  *    2.47  *          *
* Conv. Total (cfs)      * 16990.7  * Conv. (cfs)              *   448.8  * 16541.8  *          *
* Length Wtd. (ft)       *  500.81  * Wetted Per. (ft)         *    5.92  *  127.06  *          *
```

```
* Min Ch El (ft)          * 1575.70  * Shear (lb/sq ft)        *    0.33  *    0.59  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    1.15  *    1.97  *          *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)    *    4.09  *   30.87  *    0.18  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.02  *    5.74  *    0.00  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9725.30   * 9925.57   *   237.96 *   108.57 *   129.65 *    22.45 *
0.84 *     2.19 *
* 2        * Chan      * 9925.57   * 10050.37  *   593.22 *   237.36 *   124.81 *    55.96 *
1.90 *     2.50 *
* 3        * ROB       * 10050.37  * 10197.92  *   228.82 *   113.85 *   125.97 *    21.59 *
0.90 *     2.01 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9725.30   * 9925.57   *    28.00 *    8.09 *    5.92 *     2.64 *
2.13 *     3.46 *
* 2        * Chan      * 9925.57   * 10050.37  *  1032.00 *  308.28 *  127.06 *    97.36 *
2.47 *     3.35 *
*****************************************************************************************************
******************
```

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: T4N-R3W-S18E
REACH: Reach-4 RS: 0.422

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 1,200cfs.
Station Elevation Data num= 48

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************
 9386.93  1576.1 9388.94 1576.04 9400.68    1576 9404.82 1575.98 9431.61 1575.92
  9437.6  1575.9 9448.46 1575.84 9453.55 1575.81 9457.93 1575.79 9461.85 1575.76
 9488.21  1575.6 9520.97 1575.29 9574.61 1575.18 9589.37 1575.16 9603.32 1575.06
 9637.47  1574.9 9644.78 1574.92 9706.81 1574.71  9735.1 1575.22 9750.44 1575.24
 9775.95    1575 9823.28 1574.58 9857.46 1574.34 9864.87 1574.28 9899.971574.023
 9903.13    1574 9907.14    1574 9925.21 1573.85 9943.73 1573.72 9951.25 1573.67
 9951.91  1573.7 9954.34 1573.64 9959.96 1573.66 10078.6 1573.97 10079.8  1573.9
10082.98 1573.97 10086.7    157410111.391574.28110162.27 1574.8610201.53 1575.31
10242.87  1575.810258.79    157610262.31 1576.0110279.87 1576.1810305.86 1576.41
10332.91  1576.710401.22 1576.6810456.15  1576.7
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9386.93    .033 9864.87     .0510111.39    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9903.13 10078.6              511  504.22     500            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1575.22  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.18  * Wt. n-Val.              *   0.041  *   0.050  *   0.043  *
* W.S. Elev (ft)         * 1575.04  * Reach Len. (ft)         *  511.00  *  504.22  *  500.00  *
* Crit W.S. (ft)         * 1574.83  * Flow Area (sq ft)       *   90.62  *  214.34  *   55.88  *
* E.G. Slope (ft/ft)     *0.012013  * Area (sq ft)            *   90.62  *  214.34  *   55.88  *
* Q Total (cfs)          * 1190.00  * Flow (cfs)              *  231.15  *  797.82  *  161.03  *
* Top Width (ft)         *  521.95  * Top Width (ft)           *  247.45  *  175.47  *   99.03  *
* Vel Total (ft/s)       *    3.30  * Avg. Vel. (ft/s)         *    2.55  *    3.72  *    2.88  *
* Max Chl Dpth (ft)      *    1.40  * Hydr. Depth (ft)         *    0.37  *    1.22  *    0.56  *
* Conv. Total (cfs)      * 10857.1  * Conv. (cfs)             *  2108.9  *  7279.0  *  1469.2  *
* Length Wtd. (ft)       *  505.09  * Wetted Per. (ft)         *  247.46  *  175.47  *   99.03  *
* Min Ch El (ft)         * 1573.64  * Shear (lb/sq ft)         *    0.27  *    0.92  *    0.42  *
* Alpha                  *    1.07  * Stream Power (lb/ft s)   *    0.70  *    3.41  *    1.22  *
* Frctn Loss (ft)        *    2.55  * Cum Volume (acre-ft)     *   19.13  *   23.78  *    2.41  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *    9.60  *    4.02  *    2.44  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1575.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.24  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)         * 1575.54  * Reach Len. (ft)         *  511.00  *  504.22  *  500.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  301.91  *          *
* E.G. Slope (ft/ft)     *0.008734  * Area (sq ft)            *          *  301.91  *          *
* Q Total (cfs)          * 1190.00  * Flow (cfs)              *          * 1190.00  *          *
* Top Width (ft)         *  175.47  * Top Width (ft)           *          *  175.47  *          *
* Vel Total (ft/s)       *    3.94  * Avg. Vel. (ft/s)         *          *    3.94  *          *
* Max Chl Dpth (ft)      *    1.90  * Hydr. Depth (ft)         *          *    1.72  *          *
* Conv. Total (cfs)      * 12733.3  * Conv. (cfs)             *          * 12733.3  *          *
* Length Wtd. (ft)       *  504.22  * Wetted Per. (ft)         *          *  178.57  *          *
* Min Ch El (ft)         * 1573.64  * Shear (lb/sq ft)         *          *    0.92  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    3.63  *          *
* Frctn Loss (ft)        *    2.35  * Cum Volume (acre-ft)     *    4.04  *   27.36  *    0.18  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *          *    4.02  *    0.00  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9386.93   * 9645.03   *     2.72 *     2.92 *    36.58 *     0.23 *
0.08 *     0.93 *
* 2        * LOB       * 9645.03   * 9903.13   *   228.43 *    87.70 *   210.88 *    19.20 *
0.42 *     2.60 *
* 3        * Chan      * 9903.13   * 10078.60  *   797.82 *   214.34 *   175.47 *    67.04 *
1.22 *     3.72 *
* 4        * ROB       * 10078.60  * 10267.38  *   161.03 *    55.88 *    99.03 *    13.53 *
0.56 *     2.88 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9903.13   * 10078.60  *  1190.00 *   301.91 *   178.57 *   100.00 *
1.72 *     3.94 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18E
REACH: Reach-4            RS: 0.326

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9380.46 1572.61 9401.93 1572.52 9444.08 1572.34 9447.16 1572.35 9450.03  1572.3
 9497.58  1572.5 9525.06 1572.39 9576.83 1572.19 9579.47 1572.17 9580.15  1572.2
 9581.25 1572.16 9582.73 1572.16 9607.51 1572.06 9620.58 1572.06 9634.03    1572
 9642.61 1572.03 9647.59 1572.02 9658.28 1572.02 9683.36 1572.09 9693.44  1572.1
 9700.98 1572.12 9701.84 1572.12 9705.78 1572.13 9715.26 1572.15 9743.62  1572.3
 9771.43 1572.31 9799.86 1572.21 9805.62 1572.19  9816.6 1572.16 9825.07    1572
 9826.67    1572 9830.22 1571.86  9847.1 1571.33 9864.33 1571.41 9871.29  1571.4
 9883.24 1571.21  9898.5 1570.91  9917.8 1570.75 9933.56 1570.75 9942.09  1570.7
 9962.64 1570.98 9979.34 1570.67 9983.41 1570.67 9994.55 1570.6210024.03  1570.5
10037.97 1570.6910059.93 1570.9610123.42 1571.8410125.81 1571.8810128.48  1571.9
10132.39 1571.9710133.04 1571.9610138.85    157210145.68 1572.0710170.94  1572.2
10172.03 1572.2210172.56 1572.2310172.85 1572.2310172.88 1572.2310173.93  1572.2
10177.19  1572.310212.41 1572.9110226.68 1573.1510264.84 1573.67 10272.6  1573.7
10273.15 1573.7410274.89 1573.75 10278.9 1573.7810288.88 1573.8510304.44  1573.9
10309.71 1573.9910310.01    157410325.71  1574.210329.76 1574.2410331.05  1574.3
10332.08 1574.2710336.68  1574.310353.23 1574.3610388.77 1574.3110395.64  1574.3
10420.13 1574.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9380.46    .033 9871.29     .0510059.93    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9898.510059.93              484  518.89     505             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1572.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.037  *   0.050  *   0.033  *
* W.S. Elev (ft)          * 1572.56  * Reach Len. (ft)         *  484.00  *  518.89  *  505.00  *
* Crit W.S. (ft)          * 1571.82  * Flow Area (sq ft)       *  219.14  *  295.06  *  101.37  *
* E.G. Slope (ft/ft)      *0.002770  * Area (sq ft)            *  219.14  *  295.06  *  101.37  *
* Q Total (cfs)           * 1190.00  * Flow (cfs)              *  298.74  *  689.94  *  201.31  *
```

```
* Top Width (ft)          *  799.25  * Top Width (ft)          *  505.66  *  161.43  *  132.16  *
* Vel Total (ft/s)        *    1.93  * Avg. Vel. (ft/s)        *    1.36  *    2.34  *    1.99  *
* Max Chl Dpth (ft)       *    2.06  * Hydr. Depth (ft)        *    0.43  *    1.83  *    0.77  *
* Conv. Total (cfs)       * 22608.6  * Conv. (cfs)            *  5675.8  * 13108.1  *  3824.7  *
* Length Wtd. (ft)        *  510.37  * Wetted Per. (ft)        *  505.68  *  161.44  *  132.17  *
* Min Ch El (ft)          * 1570.50  * Shear (lb/sq ft)        *    0.07  *    0.32  *    0.13  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)  *    0.10  *    0.74  *    0.26  *
* Frctn Loss (ft)         *    3.01  * Cum Volume (acre-ft)    *   17.31  *   20.83  *    1.51  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    5.19  *    2.07  *    1.11  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1573.39  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.             *          *    0.050  *          *
* W.S. Elev (ft)          * 1573.26  * Reach Len. (ft)        *  484.00  *  518.89  *  505.00  *
* Crit W.S. (ft)          * 1571.91  * Flow Area (sq ft)      *          *  408.59  *          *
* E.G. Slope (ft/ft)      *0.002892  * Area (sq ft)           *          *  408.59  *          *
* Q Total (cfs)           * 1190.00  * Flow (cfs)             *          * 1190.00  *          *
* Top Width (ft)          *  161.43  * Top Width (ft)          *          *  161.43  *          *
* Vel Total (ft/s)        *    2.91  * Avg. Vel. (ft/s)        *          *    2.91  *          *
* Max Chl Dpth (ft)       *    2.76  * Hydr. Depth (ft)        *          *    2.53  *          *
* Conv. Total (cfs)       * 22127.5  * Conv. (cfs)            *          * 22127.5  *          *
* Length Wtd. (ft)        *  518.88  * Wetted Per. (ft)        *          *  166.09  *          *
* Min Ch El (ft)          * 1570.50  * Shear (lb/sq ft)        *          *    0.44  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.29  *          *
* Frctn Loss (ft)         *    3.55  * Cum Volume (acre-ft)    *    4.04  *   23.25  *    0.18  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *          *    2.07  *    0.00  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9380.46   * 9639.48   *    54.66 *    61.37 *   246.64 *     4.59 *
0.25 *     0.89 *
* 2        * LOB       * 9639.48   * 9898.50   *   244.09 *   157.78 *   259.04 *    20.51 *
0.61 *     1.55 *
* 3        * Chan      * 9898.50   * 10059.93  *   689.94 *   295.06 *   161.44 *    57.98 *
1.83 *     2.34 *
* 4        * ROB       * 10059.93  * 10240.03  *   201.31 *   101.37 *   132.17 *    16.92 *
0.77 *     1.99 *
*****************************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * Chan       * 9898.50    * 10059.93   *  1190.00 *    408.59 *    166.09 *    100.00 *
2.53 *      2.91 *
*****************************************************************************************************
******************
```

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.
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: T4N-R3W-S18E
REACH: Reach-4 RS: 0.228

INPUT
Description: Interpolated point added at (9893.93,1568.52) to set bank station
Station Elevation Data num= 61

```
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*******************************************************************************
 9400.87  1569.7 9407.59 1569.63 9432.19 1569.44 9434.03 1569.43 9438.18  1569.4
 9470.61  1569.2 9486.21  1569.2 9500.85 1569.25 9517.79 1569.19 9534.26 1569.25
 9558.63  1569.3  9575.3 1569.39 9592.41 1569.26 9595.74 1569.24 9603.96 1569.18
 9616.58  1569.1 9621.58  1569.1 9657.65 1569.05 9681.95  1569.2 9698.06 1569.34
 9725.21  1569.3 9763.09 1569.22 9809.08 1568.91  9810.9 1568.89 9811.28  1568.9
 9842.91  1569.1 9849.95 1569.06 9877.56 1568.84 9893.93 1568.52 9912.33 1568.16
 9916.88 1568.09 9934.36  1568.1 9999.13 1568.0710028.89 1568.1910049.73 1568.24
 10079.3  1568.510083.02  1568.510111.86 1568.8910124.54 1569.07 10142.5 1569.41
10167.95 1569.9210172.07    1570 10172.9 1570.0210175.32 1570.0510213.76 1570.69
10269.38 1571.2310305.77  1571.510321.07 1571.6910326.83 1571.7110375.86 1571.76
10376.92 1571.7710377.96  1571.810378.57 1571.7810381.34 1571.7910385.81  1571.8
10392.35 1571.8210413.66  1571.910433.42 1571.8310443.69 1571.8610455.68 1571.87
10459.99 1571.88
```

Manning's n Values num= 3

```
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9400.87    .033 9842.91    .05310124.54    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9893.93 10079.3                 0       0       0             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1569.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.039  *   0.053  *   0.052  *
* W.S. Elev (ft)          * 1569.34  * Reach Len. (ft)         * 1968.30  * 1968.30  * 1968.30  *
* Crit W.S. (ft)          * 1569.34  * Flow Area (sq ft)       *   83.12  *  214.75  *   28.10  *
* E.G. Slope (ft/ft)      *0.020135  * Area (sq ft)            *   83.12  *  214.75  *   28.10  *
* Q Total (cfs)           * 1190.00  * Flow (cfs)              *  172.03  *  942.38  *   75.60  *
* Top Width (ft)          *  672.43  * Top Width (ft)           *  427.67  *  185.37  *   59.40  *
* Vel Total (ft/s)        *    3.65  * Avg. Vel. (ft/s)         *    2.07  *    4.39  *    2.69  *
* Max Chl Dpth (ft)       *    1.27  * Hydr. Depth (ft)         *    0.19  *    1.16  *    0.47  *
* Conv. Total (cfs)       *  8386.2  * Conv. (cfs)              *  1212.3  *  6641.2  *   532.8  *
* Length Wtd. (ft)        * 1968.30  * Wetted Per. (ft)         *  427.68  *  185.38  *   59.40  *
* Min Ch El (ft)          * 1568.07  * Shear (lb/sq ft)         *    0.24  *    1.46  *    0.59  *
* Alpha                   *    1.23  * Stream Power (lb/ft s)   *    0.51  *    6.39  *    1.60  *
* Frctn Loss (ft)         *    4.11  * Cum Volume (acre-ft)     *   15.63  *   17.79  *    0.76  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *          *          *          *
*****************************************************************************************************
```

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 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 OUTPUT Profile #2

E.G. Elev (ft)	1569.81	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.47	Wt. n-Val.		0.053	0.053	
W.S. Elev (ft)	1569.34	Reach Len. (ft)	1968.30	1968.30	1968.30	
Crit W.S. (ft)	1569.26	Flow Area (sq ft)		215.36	0.50	
E.G. Slope (ft/ft)	0.031927	Area (sq ft)		215.36	0.50	
Q Total (cfs)	1190.00	Flow (cfs)		1188.77	1.23	
Top Width (ft)	185.96	Top Width (ft)		185.37	0.59	
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)		5.52	2.47	
Max Chl Dpth (ft)	1.27	Hydr. Depth (ft)		1.16	0.84	
Conv. Total (cfs)	6659.9	Conv. (cfs)		6653.1	6.9	
Length Wtd. (ft)	1968.30	Wetted Per. (ft)		186.20	1.43	
Min Ch El (ft)	1568.07	Shear (lb/sq ft)		2.31	0.69	
Alpha	1.00	Stream Power (lb/ft s)		12.73	1.71	
Frctn Loss (ft)	6.48	Cum Volume (acre-ft)	4.04	19.53	0.17	
C & E Loss (ft)	0.11	Cum SA (acres)				

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9400.87	9647.40	37.47	23.01	182.69	3.15	0.13	1.63
2 LOB	9647.40	9893.93	134.56	60.11	244.98	11.31	0.25	2.24
3 Chan	9893.93	10079.30	942.37	214.75	185.38	79.19	1.16	4.39
4 ROB	10079.30	10269.64	75.60	28.10	59.40	6.35	0.47	2.69

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 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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9893.93	10079.30	1188.77	215.36	186.20	99.90	1.16	5.52
2 ROB	10079.30	10269.64	1.23	0.50	1.43	0.10	0.84	2.47

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: T4N-R3W-S18W
REACH: Reach-1 RS: 2.537

INPUT
Description: Flow rate starting at this cross-section and downstream is 250cfs
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9592.94	1637.4	9613.86	1637.45	9636.84	1637.54	9660.65	1637.74	9662.38	1637.75
9666.66	1637.8	9670.98	1637.84	9674.04	1637.84	9685.1	1637.97	9689.87	1637.95
9716.19	1637.8	9760.95	1637.34	9774.91	1637.18	9797.04	1637.22	9813.38	1637.18
9827.56	1637	9835.64	1636.97	9882.01	1636.68	9887.88	1636.62	9889.17	1636.6
9902.35	1636.5	9923.23	1636.25	9936.1	1636.16	9948.44	1636.08	9953.09	1636.05
9960.46	1636	9962.24	1635.99	9971.06	1635.93	9976.75	1635.88	9987.33	1635.8
10019.27	1635.8	10037.71	1635.78	10063.58	1635.8	10086.33	1635.83	10089.7	1635.83
10089.87	1635.8	10094.29	1635.85	10100.15	1635.87	10118.41	1635.94	10133.4	1636
10133.83	1636	10140.42	1636.02	10141.2	1636.03	10146.45	1636.06	10150.03	1636.08
10167.71	1636.2	10191.33	1636.31	10223.78	1636.55	10245.42	1636.71	10267.21	1636.9
10282.4	1637.1	10289.78	1637.13	10291.71	1637.15	10296.5	1637.2	10315.22	1637.41
10345.72	1637.8	10358.19	1637.94	10363.41	1638	10393.08	1638.34	10401.45	1638.44
10407.71	1638.5	10408.07	1638.52	10414.27	1638.53	10457.57	1638.72	10466.15	1638.84
10479.41	1639.3	10505.42	1639.23	10542.77	1639.08	10547.74	1639.18		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9592.94	.033	9923.23	.05	10167.71	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.06	10118.41	427	483.786	549	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1636.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.050	0.052	0.047
W.S. Elev (ft)	1636.51	Reach Len. (ft)	427.00	483.79	549.00
Crit W.S. (ft)	1636.26	Flow Area (sq ft)	22.88	101.02	31.41
E.G. Slope (ft/ft)	0.006483	Area (sq ft)	22.88	101.02	31.41
Q Total (cfs)	250.00	Flow (cfs)	28.47	180.70	40.82
Top Width (ft)	317.20	Top Width (ft)	69.85	147.35	100.00
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	1.24	1.79	1.30
Max Chl Dpth (ft)	0.73	Hydr. Depth (ft)	0.33	0.69	0.31
Conv. Total (cfs)	3104.9	Conv. (cfs)	353.6	2244.3	507.0
Length Wtd. (ft)	483.27	Wetted Per. (ft)	69.86	147.35	100.00
Min Ch El (ft)	1635.78	Shear (lb/sq ft)	0.13	0.28	0.13
Alpha	1.07	Stream Power (lb/ft s)	0.16	0.50	0.17
Frctn Loss (ft)	2.94	Cum Volume (acre-ft)	32.74	34.15	17.75
C & E Loss (ft)	0.00	Cum SA (acres)	60.97	43.93	49.03

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 OUTPUT Profile #2

E.G. Elev (ft)	1636.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.052	
W.S. Elev (ft)	1636.68	Reach Len. (ft)	427.00	483.79	549.00
Crit W.S. (ft)	1636.27	Flow Area (sq ft)		126.79	
E.G. Slope (ft/ft)	0.005896	Area (sq ft)		126.79	
Q Total (cfs)	250.00	Flow (cfs)		250.00	
Top Width (ft)	147.35	Top Width (ft)		147.35	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)		0.86	
Conv. Total (cfs)	3255.7	Conv. (cfs)		3255.7	

```
* Length Wtd. (ft)        *  483.79  * Wetted Per. (ft)        *          *  148.85  *          *
* Min Ch El (ft)          * 1635.78  * Shear (lb/sq ft)        *          *    0.31  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.62  *          *
* Frctn Loss (ft)         *    2.97  * Cum Volume (acre-ft)   *    6.63  *   52.29  *    3.35  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    6.50  *   43.93  *    3.92  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9782.00   * 9971.06   *    28.47 *    22.88 *    69.86 *    11.39 *
0.33 *     1.24 *
* 2         * Chan      * 9971.06   * 10118.41  *   180.70 *   101.02 *   147.35 *    72.28 *
0.69 *     1.79 *
* 3         * ROB       * 10118.41  * 10333.08  *    40.82 *    31.41 *   100.00 *    16.33 *
0.31 *     1.30 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9971.06   * 10118.41  *   250.00 *   126.79 *   148.85 *   100.00 *
0.86 *     1.97 *
*****************************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 2.445

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9398.88  1635.3 9413.66 1635.28 9416.24 1635.27 9456.45 1635.34 9467.84 1635.46
 9470.26  1635.5 9472.63 1635.51 9474.52 1635.53 9500.63 1635.56 9500.96 1635.57
 9501.13  1635.6 9501.98 1635.56 9504.14 1635.56 9507.61 1635.55 9546.65 1635.46
 9574.09  1634.9 9586.02 1634.84 9615.64 1634.77 9637.32  1634.8 9650.38 1634.74
 9661.69  1634.6 9690.08 1634.45 9728.19 1634.33 9732.67 1634.32 9740.92 1634.28
  9764.6  1634.2 9786.99 1634.01 9795.51    1634 9797.53 1634.03  9799.2 1634.01
 9801.36 1633.99 9802.79 1633.96 9810.95 1633.89 9815.03 1633.84 9845.94  1633.5
 9893.11 1633.78 9894.27 1633.78 9895.83 1633.77 9919.68 1633.15 9926.861633.138
  9949.2  1633.1 9990.39 1633.0710000.82 1633.0610033.13 1632.9310049.16 1632.87
10050.74  1632.9   10089 1632.8210098.86 1632.7910106.69 1632.8210151.51 1633.07
10180.23  1633.310200.32 1633.4510214.58 1633.4210255.41 1633.5610304.19 1633.76
 10310.6 1633.8110310.83  1633.810312.71 1633.8110314.75 1633.81 10318.3  1633.8
10354.45 1633.8410359.97 1633.8410360.04 1633.8510362.41  1633.810397.88 1633.73
10409.99 1633.7110420.65 1633.7410447.12 1633.9310451.19    163410455.54 1633.99
10462.05 1634.0310508.93 1634.2910528.09  1634.4 10545.1 1634.4210563.64 1634.67
10596.45 1634.8610623.58 1634.7210637.68  1634.610639.69 1634.6410640.62 1634.63
```

```
10641.19 1634.64 10665.6 1634.9610670.59    1635

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9398.88    .033 9926.86    .05210151.51    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.3910151.51              496 493.864     495            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1633.62  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.048  *   0.052  *   0.033  *
* W.S. Elev (ft)          * 1633.58  * Reach Len. (ft)         *  496.00  *  493.86  *  495.00  *
* Crit W.S. (ft)          * 1633.31  * Flow Area (sq ft)       *   38.43  *  106.32  *   21.47  *
* E.G. Slope (ft/ft)      *0.005709  * Area (sq ft)            *   38.43  *  106.32  *   21.47  *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *   51.31  *  173.99  *   24.70  *
* Top Width (ft)          *  378.98  * Top Width (ft)          *  108.60  *  161.12  *  109.26  *
* Vel Total (ft/s)        *    1.50  * Avg. Vel. (ft/s)        *    1.34  *    1.64  *    1.15  *
* Max Chl Dpth (ft)       *    0.79  * Hydr. Depth (ft)        *    0.35  *    0.66  *    0.20  *
* Conv. Total (cfs)       *  3308.6  * Conv. (cfs)             *   679.1  *  2302.7  *   326.8  *
* Length Wtd. (ft)        *  494.34  * Wetted Per. (ft)        *  108.61  *  161.12  *  109.26  *
* Min Ch El (ft)          * 1632.79  * Shear (lb/sq ft)        *    0.13  *    0.24  *    0.07  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.17  *    0.38  *    0.08  *
* Frctn Loss (ft)         *    3.24  * Cum Volume (acre-ft)    *   32.44  *   33.00  *   17.41  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   60.10  *   42.22  *   47.72  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1633.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *   0.052  *          *
* W.S. Elev (ft)          * 1633.72  * Reach Len. (ft)         *  496.00  *  493.86  *  495.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  128.17  *          *
* E.G. Slope (ft/ft)      *0.006390  * Area (sq ft)            *          *  128.17  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *          *  250.00  *          *
* Top Width (ft)          *  161.12  * Top Width (ft)          *          *  161.12  *          *
* Vel Total (ft/s)        *    1.95  * Avg. Vel. (ft/s)        *          *    1.95  *          *
* Max Chl Dpth (ft)       *    0.93  * Hydr. Depth (ft)        *          *    0.80  *          *
* Conv. Total (cfs)       *  3127.6  * Conv. (cfs)             *          *  3127.6  *          *
* Length Wtd. (ft)        *  493.86  * Wetted Per. (ft)        *          *  162.42  *          *
* Min Ch El (ft)          * 1632.79  * Shear (lb/sq ft)        *          *    0.31  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.61  *          *
* Frctn Loss (ft)         *    3.27  * Cum Volume (acre-ft)    *    6.63  *   50.87  *    3.35  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    6.50  *   42.22  *    3.92  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9694.64   * 9990.39   *    51.31 *    38.43 *   108.61 *    20.53 *
0.35 *     1.34 *
* 2        * Chan      * 9990.39   * 10151.51  *   173.99 *   106.32 *   161.12 *    69.60 *
0.66 *     1.64 *
* 3        * ROB       * 10151.51  * 10411.05  *    24.70 *    21.47 *   109.26 *     9.88 *
0.20 *     1.15 *
*****************************************************************************************
******************
```

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.

Profile #2

* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)
* 1 Chan	* 9990.39	* 10151.51	* 250.00	* 128.17	* 162.42	* 100.00	* 0.80	* 1.95

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: T4N-R3W-S18W
REACH: Reach-1 RS: 2.351

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9376.57	1632.7	9402.42	1632.87	9405	1632.94	9444.02	1632.66	9455.11	1632.61
9464.5	1632.4	9466.9	1632.37	9471.55	1632.33	9477.2	1632.27	9501.79	1632.04
9503.23	1632	9509.8	1632	9531.69	1631.88	9540.24	1631.83	9544.39	1631.8
9549.41	1631.8	9567.98	1631.74	9597.54	1631.72	9600.38	1631.8	9607.42	1631.8
9609.59	1631.77	9631.49	1631.72	9636.83	1631.6	9656.86	1631.37	9707.18	1630.7
9711.66	1630.67	9728.58	1630.57	9758.04	1630.39	9798.62	1630.21	9799.97	1630.2
9800.32	1630.21	9801.14	1630.2	9850.51	1630.03	9850.92	1630.03	9852.12	1630
9854.62	1630.03	9857.24	1630.03	9865.51	1630.01	9876.33	1630.026	9891.75	1630.05
9902.08	1630.1	9909.5	1630.02	9911.83	1630	9931.16	1629.8	9957.16	1629.56
9958.49	1629.6	9958.75	1629.6	9976.52	1629.57	9988.97	1629.58	10010.98	1629.64
10034.64	1629.7	10057.72	1629.83	10078.93	1629.94	10092.28	1630	10093.07	1630
10102.31	1630.05	10106.35	1630.07	10107.92	1630.07	10112.02	1630.08	10122.43	1630.1
10139.75	1630.13	10145.72	1630.15	10151	1630.16	10151.82	1630.15	10154.58	1630.2
10165.3	1630.3	10196.71	1630.67	10220.92	1630.67	10243.95	1630.87	10284.19	1631.5
10293.27	1631.6	10337.98	1631.66	10338.46	1631.66	10382.96	1631.41	10383.49	1631.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9376.57	.033	9876.33	.05	10093.07	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9902.08	10093.07	482	481.125	474	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1630.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.037	0.052	0.033
W.S. Elev (ft)	1630.33	Reach Len. (ft)	482.00	481.13	474.00
Crit W.S. (ft)	1630.15	Flow Area (sq ft)	28.11	111.40	15.34
E.G. Slope (ft/ft)	0.007588	Area (sq ft)	28.11	111.40	15.34
Q Total (cfs)	250.00	Flow (cfs)	35.55	193.56	20.89
Top Width (ft)	397.25	Top Width (ft)	131.22	190.99	75.04
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	1.26	1.74	1.36
Max Chl Dpth (ft)	0.77	Hydr. Depth (ft)	0.21	0.58	0.20
Conv. Total (cfs)	2870.0	Conv. (cfs)	408.1	2222.1	239.8
Length Wtd. (ft)	479.77	Wetted Per. (ft)	131.22	190.99	75.04
Min Ch El (ft)	1629.56	Shear (lb/sq ft)	0.10	0.28	0.10
Alpha	1.04	Stream Power (lb/ft s)	0.13	0.48	0.13
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	32.06	31.77	17.21
C & E Loss (ft)	0.00	Cum SA (acres)	58.73	40.22	46.67

```
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1630.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *          *   0.052  *          *
* W.S. Elev (ft)         * 1630.45  * Reach Len. (ft)        *  482.00  *  481.13  *  474.00  *
* Crit W.S. (ft)         * 1630.12  * Flow Area (sq ft)      *          *  134.17  *          *
* E.G. Slope (ft/ft)     *0.006847  * Area (sq ft)           *          *  134.17  *          *
* Q Total (cfs)          *  250.00  * Flow (cfs)             *          *  250.00  *          *
* Top Width (ft)         *  190.99  * Top Width (ft)         *          *  190.99  *          *
* Vel Total (ft/s)       *    1.86  * Avg. Vel. (ft/s)        *          *    1.86  *          *
* Max Chl Dpth (ft)      *    0.89  * Hydr. Depth (ft)        *          *    0.70  *          *
* Conv. Total (cfs)      *  3021.4  * Conv. (cfs)             *          *  3021.4  *          *
* Length Wtd. (ft)       *  480.38  * Wetted Per. (ft)        *          *  191.80  *          *
* Min Ch El (ft)         * 1629.56  * Shear (lb/sq ft)        *          *    0.30  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.56  *          *
* Frctn Loss (ft)        *    3.23  * Cum Volume (acre-ft)    *    6.63  *   49.38  *    3.35  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    6.50  *   40.22  *    3.92  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9639.33   * 9902.08   *    35.55 *    28.11 *   131.22 *    14.22 *
0.21 *     1.26 *
* 2        * Chan      * 9902.08   * 10093.07  *   193.56 *   111.40 *   190.99 *    77.42 *
0.58 *     1.74 *
* 3        * ROB       * 10093.07  * 10238.28  *    20.89 *    15.34 *    75.04 *     8.36 *
0.20 *     1.36 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9902.08   * 10093.07  *   250.00 *   134.17 *   191.80 *   100.00 *
0.70 *     1.86 *
*****************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 2.260

INPUT
Description:
Station Elevation Data    num=      59
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
```

```
*****************************************************************************
 9479.67  1629.6 9495.81 1629.61 9498.38  1629.6 9543.31 1629.62 9583.29 1629.34
 9599.86  1629.3 9606.98  1629.3 9614.32  1629.2 9626.76 1629.13 9637.95 1629.02
 9638.77    1629 9654.03 1628.75 9685.43 1628.25 9729.44  1628.1 9732.19  1628.1
 9739.59    1628 9761.78 1627.71  9773.9  1627.6 9801.32 1627.41 9824.67  1627.3
 9854.45 1627.01 9870.46 1626.89 9907.431626.719 9909.44 1626.71  9918.1 1626.66
 9933.15  1626.7 9959.94  1626.7 9970.46 1626.48 9973.64 1626.42 9978.09 1626.35
 9983.56  1626.3  9998.3 1626.1810002.34 1626.1410006.95 1626.1210007.05  1626.1
10011.59  1626.110020.13 1626.1510025.42 1626.1910031.19 1626.2510036.31 1626.33
10049.48 1626.5810073.44 1626.4110092.93 1626.5510138.31 1626.6810143.93  1626.7
10144.45 1626.7310146.49 1626.7710150.55 1626.78 10213.2    1627 10248.2  1627.5
10271.27 1627.7910304.47 1627.9610311.27    162810311.99    162810330.69  1628.1
10376.71 1628.4110431.94 1628.6310480.26 1628.52 10483.6 1628.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9479.67    .033 9907.43    .05210146.49    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.9410049.48              545 461.922     399             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1627.11  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.045  *   0.052  *   0.049  *
* W.S. Elev (ft)          * 1627.07  * Reach Len. (ft)         *  545.00  *  461.92  *  399.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   31.84  *   68.79  *   61.67  *
* E.G. Slope (ft/ft)      *0.006107  * Area (sq ft)            *   31.84  *   68.79  *   61.67  *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *   37.72  *  128.84  *   83.43  *
* Top Width (ft)          *  369.95  * Top Width (ft)          *  111.73  *   89.54  *  168.68  *
* Vel Total (ft/s)        *    1.54  * Avg. Vel. (ft/s)        *    1.18  *    1.87  *    1.35  *
* Max Chl Dpth (ft)       *    0.97  * Hydr. Depth (ft)        *    0.28  *    0.77  *    0.37  *
* Conv. Total (cfs)       *  3199.1  * Conv. (cfs)             *   482.7  *  1648.7  *  1067.7  *
* Length Wtd. (ft)        *  458.87  * Wetted Per. (ft)        *  111.73  *   89.55  *  168.68  *
* Min Ch El (ft)          * 1626.10  * Shear (lb/sq ft)        *    0.11  *    0.29  *    0.14  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)  *    0.13  *    0.55  *    0.19  *
* Frctn Loss (ft)         *    2.69  * Cum Volume (acre-ft)    *   31.73  *   30.77  *   16.79  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   57.39  *   38.68  *   45.34  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1627.27  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.052  *   0.052  *   0.052  *
* W.S. Elev (ft)          * 1627.21  * Reach Len. (ft)         *  545.00  *  461.92  *  399.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   13.57  *   80.94  *   29.55  *
* E.G. Slope (ft/ft)      *0.006598  * Area (sq ft)            *   13.57  *   80.94  *   29.55  *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *   19.77  *  175.65  *   54.58  *
* Top Width (ft)          *  157.29  * Top Width (ft)          *   26.79  *   89.54  *   40.96  *
* Vel Total (ft/s)        *    2.02  * Avg. Vel. (ft/s)        *    1.46  *    2.17  *    1.85  *
* Max Chl Dpth (ft)       *    1.11  * Hydr. Depth (ft)        *    0.51  *    0.90  *    0.72  *
* Conv. Total (cfs)       *  3077.6  * Conv. (cfs)             *   243.4  *  2162.3  *   671.9  *
* Length Wtd. (ft)        *  458.34  * Wetted Per. (ft)        *   27.30  *   89.55  *   41.64  *
* Min Ch El (ft)          * 1626.10  * Shear (lb/sq ft)        *    0.20  *    0.37  *    0.29  *
* Alpha                   *    1.04  * Stream Power (lb/ft s)  *    0.30  *    0.81  *    0.54  *
* Frctn Loss (ft)         *    2.69  * Cum Volume (acre-ft)    *    6.55  *   48.20  *    3.19  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    6.35  *   38.68  *    3.69  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9719.81   * 9959.94   *    37.72 *    31.84 *   111.73 *    15.09 *
0.28 *     1.18 *
* 2         * Chan      * 9959.94   * 10049.48  *   128.84 *    68.79 *    89.55 *    51.54 *
0.77 *     1.87 *
* 3         * ROB       * 10049.48  * 10266.54  *    83.43 *    61.67 *   168.68 *    33.37 *
0.37 *     1.35 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9719.81   * 9959.94   *    19.77 *    13.57 *    27.30 *     7.91 *
0.51 *     1.46 *
* 2         * Chan      * 9959.94   * 10049.48  *   175.65 *    80.94 *    89.55 *    70.26 *
0.90 *     2.17 *
* 3         * ROB       * 10049.48  * 10266.54  *    54.58 *    29.55 *    41.64 *    21.83 *
0.72 *     1.85 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18W
REACH: Reach-1            RS: 2.173

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9504.4  1625.1 9542.57 1625.26 9557.46 1625.28 9569.91  1625.3 9606.91 1625.59
 9625.47  1625.6 9629.91 1625.58 9642.97 1625.51 9668.37 1625.38 9697.13  1625.3
 9736.07 1625.06 9744.69    1625 9763.84 1624.87 9770.07 1624.82 9773.96  1624.8
 9795.06 1624.72 9805.48 1624.62 9814.78  1624.5 9834.52 1624.46 9859.48  1624.3
 9859.54 1624.27 9859.65 1624.27 9873.451624.189 9883.59 1624.13 9900.53 1624.01
 9900.74    1624 9901.32    1624 9919.03 1623.87 9933.03 1623.77 9938.04 1623.73
 9973.46  1623.5 9995.39 1623.5910083.59 1623.7710104.73 1623.9210111.121623.964
10144.55  1624.210169.59 1624.45 10214.1 1624.8110236.98 1625.0510257.78 1625.17
 10339.5  1625.810350.24 1625.9210354.82 1625.9610358.69 1625.99 10371.9 1626.11
10443.42    162710457.69 1627.1410467.03 1627.2610525.06 1627.2510560.77 1627.27

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9504.4    .033 9873.45    .05210144.55    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.0310083.59              484 489.965     483              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1624.42  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.051  *   0.052  *   0.051  *
* W.S. Elev (ft)         * 1624.38  * Reach Len. (ft)         *  484.00  *  489.97  *  483.00  *
* Crit W.S. (ft)         * 1624.08  * Flow Area (sq ft)       *   26.05  *  110.21  *   25.65  *
* E.G. Slope (ft/ft)     *0.005647  * Area (sq ft)            *   26.05  *  110.21  *   25.65  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   28.93  *  192.22  *   28.84  *
```

```
* Top Width (ft)          *  315.43  * Top Width (ft)          *   85.93  *  150.56  *   78.93  *
* Vel Total (ft/s)        *    1.54  * Avg. Vel. (ft/s)        *    1.11  *    1.74  *    1.12  *
* Max Chl Dpth (ft)       *    0.88  * Hydr. Depth (ft)        *    0.30  *    0.73  *    0.32  *
* Conv. Total (cfs)       *  3326.9  * Conv. (cfs)            *   385.1  *  2558.1  *   383.8  *
* Length Wtd. (ft)        *  488.25  * Wetted Per. (ft)        *   85.94  *  150.56  *   78.94  *
* Min Ch El (ft)          * 1623.50  * Shear (lb/sq ft)        *    0.11  *    0.26  *    0.11  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)  *    0.12  *    0.45  *    0.13  *
* Frctn Loss (ft)         *    2.35  * Cum Volume (acre-ft)    *   31.37  *   29.82  *   16.39  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   56.15  *   37.40  *   44.21  *
*****************************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1624.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.052  *          *
* W.S. Elev (ft)          * 1624.53  * Reach Len. (ft)         *  484.00  *  489.97  *  483.00  *
* Crit W.S. (ft)          * 1624.09  * Flow Area (sq ft)       *          *  132.36  *          *
* E.G. Slope (ft/ft)      *0.005257  * Area (sq ft)            *          *  132.36  *          *
* Q Total (cfs)           *  250.00  * Flow (cfs)              *          *  250.00  *          *
* Top Width (ft)          *  150.56  * Top Width (ft)          *          *  150.56  *          *
* Vel Total (ft/s)        *    1.89  * Avg. Vel. (ft/s)        *          *    1.89  *          *
* Max Chl Dpth (ft)       *    1.03  * Hydr. Depth (ft)        *          *    0.88  *          *
* Conv. Total (cfs)       *  3447.9  * Conv. (cfs)             *          *  3447.9  *          *
* Length Wtd. (ft)        *  489.97  * Wetted Per. (ft)        *          *  152.07  *          *
* Min Ch El (ft)          * 1623.50  * Shear (lb/sq ft)        *          *    0.29  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.54  *          *
* Frctn Loss (ft)         *    2.32  * Cum Volume (acre-ft)    *    6.47  *   47.07  *    3.05  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    6.18  *   37.40  *    3.51  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9718.72   * 9933.03   *    28.93 *    26.05 *    85.94 *    11.57 *
0.30 *     1.11 *
* 2        * Chan      * 9933.03   * 10083.59  *   192.22 *   110.21 *   150.56 *    76.89 *
0.73 *     1.74 *
* 3        * ROB       * 10083.59  * 10322.18  *    28.84 *    25.65 *    78.94 *    11.54 *
0.32 *     1.12 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9933.03   * 10083.59  *   250.00 *   132.36 *   152.07 *   100.00 *
0.88 *     1.89 *
*****************************************************************************************************
******************
```

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: T4N-R3W-S18W
REACH: Reach-1 RS: 2.080

INPUT
Description: Interpolated point added at (10140.08, 1621.602) to set bank station.
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9516.66	1623.3	9517.13	1623.29	9520.89	1623.28	9535.93	1623.23	9555.49	1623.24
9564.86	1623.3	9572.16	1623.26	9587.87	1623.24	9610.5	1623.15	9613.95	1623.12
9682.84	1622.8	9691.37	1622.7	9713.28	1622.48	9724.75	1622.36	9731.69	1622.3
9734.44	1622.29	9735.33	1622.29	9738.25	1622.27	9758.59	1622.2	9762.59	1622.2
9766.02	1622.11	9776.28	1622.08	9783.97	1622.04	9787.49	1622	9789.1	1622
9823.01	1621.78	9840.63	1621.66	9842.32	1621.65	9842.68	1621.6	9864.23	1621.66
9876.54	1621.67	9881.21	1621.658	9896.48	1621.62	9908.91	1621.58	9923.82	1621.5
9938.18	1621.61	9940.76	1621.6	9955.8	1621.63	9970.4	1621.63	9982.01	1621.6
9997.19	1621.5	10011.1	1621.42	10023.14	1621.36	10078.23	1621.09	10087.16	1621.05
10087.52	1621.1	10093.91	1621.11	10140.08	1621.602	10177.37	1622	10190.54	1622.13
10229.27	1622.5	10260.1	1622.68	10296.35	1623.02	10334	1623.23	10368.19	1623.64
10380.92	1623.7	10387.59	1623.81	10405.06	1623.97	10408.65	1624	10451.43	1624.32
10473	1624.5	10496.29	1624.7	10538.46	1625.04	10598.72	1625.38		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9516.66	.033	9840.63	.052	10177.37	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9982.01	10140.08	490	493.934	479	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1622.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.049	0.052	0.052
W.S. Elev (ft)	1622.04	Reach Len. (ft)	490.00	493.93	479.00
Crit W.S. (ft)	1621.75	Flow Area (sq ft)	71.20	114.61	8.97
E.G. Slope (ft/ft)	0.004149	Area (sq ft)	71.20	114.61	8.97
Q Total (cfs)	250.00	Flow (cfs)	73.44	170.25	6.31
Top Width (ft)	397.34	Top Width (ft)	197.99	158.07	41.28
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)	1.03	1.49	0.70
Max Chl Dpth (ft)	0.99	Hydr. Depth (ft)	0.36	0.73	0.22
Conv. Total (cfs)	3881.1	Conv. (cfs)	1140.1	2643.0	97.9
Length Wtd. (ft)	491.68	Wetted Per. (ft)	197.99	158.08	41.29
Min Ch El (ft)	1621.05	Shear (lb/sq ft)	0.09	0.19	0.06
Alpha	1.11	Stream Power (lb/ft s)	0.10	0.28	0.04
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	30.83	28.56	16.19
C & E Loss (ft)	0.00	Cum SA (acres)	54.57	35.67	43.54

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 OUTPUT Profile #2

E.G. Elev (ft)	1622.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.052	
W.S. Elev (ft)	1622.22	Reach Len. (ft)	490.00	493.93	479.00
Crit W.S. (ft)		Flow Area (sq ft)		143.44	
E.G. Slope (ft/ft)	0.004280	Area (sq ft)		143.44	
Q Total (cfs)	250.00	Flow (cfs)		250.00	
Top Width (ft)	158.07	Top Width (ft)		158.07	
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)		1.74	
Max Chl Dpth (ft)	1.17	Hydr. Depth (ft)		0.91	
Conv. Total (cfs)	3821.5	Conv. (cfs)		3821.5	
Length Wtd. (ft)	493.64	Wetted Per. (ft)		159.32	
Min Ch El (ft)	1621.05	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.42	
Frctn Loss (ft)	2.76	Cum Volume (acre-ft)	6.47	45.51	3.05

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    6.18  *   35.67  *    3.51  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9749.34   * 9982.01   *    73.44 *    71.20 *   197.99 *    29.38 *
0.36 *     1.03 *
* 2         * Chan      * 9982.01   * 10140.08  *   170.25 *   114.61 *   158.08 *    68.10 *
0.73 *     1.49 *
* 3         * ROB       * 10140.08  * 10369.40  *     6.31 *     8.97 *    41.29 *     2.52 *
0.22 *     0.70 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9982.01   * 10140.08  *   250.00 *   143.44 *   159.32 *   100.00 *
0.91 *     1.74 *
*****************************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.987

INPUT
Description: Interpolated point added at (10103.1, 1618.7) to set bank station.
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9299.33  1620.5  9307.6 1620.63 9313.37 1620.64 9333.67 1620.66 9335.01 1620.68
 9337.75  1620.7 9370.75 1620.56 9393.63 1620.55 9402.32 1620.52 9424.22 1620.43
 9428.61  1620.4 9432.81 1620.41 9449.69 1620.52 9459.38 1620.59 9463.01 1620.57
 9474.97  1620.6 9484.99 1620.46 9496.42 1620.52 9507.45 1620.52 9509.88  1620.5
 9514.79 1620.47 9517.93 1620.46 9520.98 1620.42 9522.51 1620.42 9527.25  1620.4
 9545.09  1620.3 9591.37 1620.29 9596.23 1620.27 9601.88  1620.3 9602.43 1620.28
 9603.23 1620.28 9609.57 1620.22 9611.97 1620.22 9618.22  1620.2  9632.5 1620.18
 9647.86 1620.18 9659.21  1620.1 9661.82  1620.1  9665.8 1620.09 9668.13 1620.08
  9673.7 1620.07 9675.67  1620.1 9682.18 1620.05 9683.43 1620.06 9704.69 1620.01
 9707.13    1620  9709.1    1620 9717.67 1619.96 9728.24 1619.92 9731.79  1619.9
 9736.35  1619.9 9747.51 1619.88 9757.29 1619.86 9774.52 1619.74 9778.46  1619.7
 9793.55 1619.59 9811.23 1619.43  9849.5 1619.19 9850.78 1619.18 9921.49  1619.1
 9927.36 1619.02 9935.92 1618.84  9936.8 1618.84 9942.881618.814 9953.21 1618.77
  9980.1  1618.710052.54 1618.6110081.13 1618.56 10081.91618.565 10103.1  1618.7
10126.62 1618.8510169.95  1619.310228.55  1619.710261.36 1619.61 10275.5 1619.66
10294.02 1619.7110350.38 1619.9110371.58    162010384.65 1620.0510394.53 1620.09
10403.07 1620.1410423.65 1620.1610434.28  1620.210440.52  1620.210442.45 1620.19
10453.81 1620.19

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9299.33    .033  9936.8    .05210126.62    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9980.1 10103.1              326 310.929     291            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1619.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.045  *   0.052  *   0.044  *
* W.S. Elev (ft)         * 1619.30  * Reach Len. (ft)         *  326.00  *  310.93  *  291.00  *
* Crit W.S. (ft)         * 1619.07  * Flow Area (sq ft)       *   40.48  *   81.68  *   21.99  *
* E.G. Slope (ft/ft)     *0.007761  * Area (sq ft)            *   40.48  *   81.68  *   21.99  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   59.20  *  156.51  *   34.29  *
* Top Width (ft)         *  337.56  * Top Width (ft)          *  147.88  *  123.00  *   66.69  *
* Vel Total (ft/s)       *    1.73  * Avg. Vel. (ft/s)        *    1.46  *    1.92  *    1.56  *
* Max Chl Dpth (ft)      *    0.74  * Hydr. Depth (ft)        *    0.27  *    0.66  *    0.33  *
* Conv. Total (cfs)      *  2837.9  * Conv. (cfs)             *   672.0  *  1776.7  *   389.2  *
* Length Wtd. (ft)       *  310.09  * Wetted Per. (ft)        *  147.88  *  123.00  *   66.69  *
* Min Ch El (ft)         * 1618.56  * Shear (lb/sq ft)        *    0.13  *    0.32  *    0.16  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    0.19  *    0.62  *    0.25  *
* Frctn Loss (ft)        *    1.82  * Cum Volume (acre-ft)    *   30.20  *   27.45  *   16.02  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   52.63  *   34.07  *   42.95  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1619.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *   0.052  *   0.052  *          *
* W.S. Elev (ft)         * 1619.44  * Reach Len. (ft)         *  326.00  *  310.93  *  291.00  *
* Crit W.S. (ft)         * 1619.09  * Flow Area (sq ft)       *   18.98  *   99.22  *          *
* E.G. Slope (ft/ft)     *0.007587  * Area (sq ft)            *   18.98  *   99.22  *          *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   36.85  *  213.15  *          *
* Top Width (ft)         *  149.89  * Top Width (ft)          *   26.89  *  123.00  *          *
* Vel Total (ft/s)       *    2.12  * Avg. Vel. (ft/s)        *    1.94  *    2.15  *          *
* Max Chl Dpth (ft)      *    0.88  * Hydr. Depth (ft)        *    0.71  *    0.81  *          *
* Conv. Total (cfs)      *  2870.1  * Conv. (cfs)             *   423.0  *  2447.1  *          *
* Length Wtd. (ft)       *  312.04  * Wetted Per. (ft)        *   27.56  *  123.74  *          *
* Min Ch El (ft)         * 1618.56  * Shear (lb/sq ft)        *    0.33  *    0.38  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    0.63  *    0.82  *          *
* Frctn Loss (ft)        *    1.61  * Cum Volume (acre-ft)    *    6.36  *   44.14  *    3.05  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    6.03  *   34.07  *    3.51  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9639.72   * 9980.10   *    59.20 *    40.48 *   147.88 *    23.68 *
0.27 *     1.46 *
* 2        * Chan      * 9980.10   * 10103.10  *   156.51 *    81.68 *   123.00 *    62.61 *
0.66 *     1.92 *
* 3        * ROB       * 10103.10  * 10278.46  *    34.29 *    21.99 *    66.69 *    13.72 *
0.33 *     1.56 *
*****************************************************************************************
******************

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.

  Profile #2
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9639.72   * 9980.10   *    36.85 *    18.98 *    27.56 *    14.74 *
0.71 *     1.94 *
* 2         * Chan      * 9980.10   * 10103.10  *   213.15 *    99.22 *   123.74 *    85.26 *
0.81 *     2.15 *
*****************************************************************************************
******************
```

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: T4N-R3W-S18W
REACH: Reach-1 RS: 1.928

INPUT
Description:
Station Elevation Data num= 55

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9568.04  1618.4 9572.22 1618.39 9583.01 1618.47 9590.04 1618.55 9622.79  1618.5
 9626.47 1618.54 9627.89 1618.53 9629.17 1618.53  9630.4 1618.52 9631.63  1618.5
  9634.3 1618.49 9635.92 1618.48 9651.03 1618.34  9661.2  1618.3 9688.38 1618.05
  9692.6 1618.01  9695.3    1618 9715.91 1617.84 9724.42  1617.8 9725.63 1617.77
 9726.52 1617.77 9757.99  1617.6 9789.42 1617.68  9794.1  1617.7 9795.84  1617.7
 9810.66 1617.67 9813.84  1617.6 9838.07 1617.45  9860.1 1617.29 9895.55 1617.08
 9902.09 1617.09 9907.35  1617.2 9911.19 1617.13 9937.181616.98810006.15 1616.61
10012.69 1616.5810012.91 1616.58 10014.6  1616.610036.38 1616.7110054.15 1616.88
10064.36 1616.9310098.981616.961 10120.5 1616.9810133.31  1617.110153.31 1617.18
 10249.7 1617.9610255.45    161810278.54  1618.210282.61  1618.3 10284.6 1618.23
10295.52 1618.2510312.43 1618.2710326.06 1618.16 10346.1  1618.210351.89 1617.18
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9568.04    .033 9937.18    .052 10120.5    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.1810064.36              437 467.714     500             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1617.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.033  *   0.052  *   0.045  *
* W.S. Elev (ft)         * 1617.50  * Reach Len. (ft)         *  437.00  *  467.71  *  500.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   31.16  *   92.53  *   49.52  *
* E.G. Slope (ft/ft)     *0.004590  * Area (sq ft)            *   31.16  *   92.53  *   49.52  *
* Q Total (cfs)          *  250.00  * Flow (cfs)              *   41.87  *  144.91  *   63.22  *
* Top Width (ft)         *  361.79  * Top Width (ft)          *  106.58  *  127.18  *  128.02  *
* Vel Total (ft/s)       *    1.44  * Avg. Vel. (ft/s)        *    1.34  *    1.57  *    1.28  *
* Max Chl Dpth (ft)      *    0.92  * Hydr. Depth (ft)        *    0.29  *    0.73  *    0.39  *
* Conv. Total (cfs)      *  3690.1  * Conv. (cfs)             *   618.0  *  2139.0  *   933.2  *
* Length Wtd. (ft)       *  477.97  * Wetted Per. (ft)        *  106.59  *  127.18  *  128.03  *
* Min Ch El (ft)         * 1616.58  * Shear (lb/sq ft)        *    0.08  *    0.21  *    0.11  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.11  *    0.33  *    0.14  *
* Frctn Loss (ft)        *    2.67  * Cum Volume (acre-ft)    *   29.93  *   26.83  *   15.79  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   51.67  *   33.18  *   42.30  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
```

E.G. Elev (ft)	1617.90	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.05	Wt. n-Val.		0.052		
W.S. Elev (ft)	1617.85	Reach Len. (ft)	437.00	467.71	500.00	
Crit W.S. (ft)		Flow Area (sq ft)		137.17		
E.G. Slope (ft/ft)	0.003747	Area (sq ft)		137.17		
Q Total (cfs)	250.00	Flow (cfs)		250.00		
Top Width (ft)	127.18	Top Width (ft)		127.18		
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)		1.82		
Max Chl Dpth (ft)	1.27	Hydr. Depth (ft)		1.08		
Conv. Total (cfs)	4084.2	Conv. (cfs)		4084.2		
Length Wtd. (ft)	470.69	Wetted Per. (ft)		128.96		
Min Ch El (ft)	1616.58	Shear (lb/sq ft)		0.25		
Alpha	1.00	Stream Power (lb/ft s)		0.45		
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	6.29	43.29	3.05	
C & E Loss (ft)	0.00	Cum SA (acres)	5.93	33.18	3.51	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9752.61	9937.18	41.87	31.16	106.59	16.75	0.29	1.34
2	Chan	9937.18	10064.36	144.91	92.53	127.18	57.96	0.73	1.57
3	ROB	10064.36	10208.13	63.22	49.52	128.03	25.29	0.39	1.28

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9937.18	10064.36	250.00	137.17	128.96	100.00	1.08	1.82

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.

CROSS SECTION

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 1.838

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9461.2	1616.2	9474.82	1616.31	9483.31	1616.18	9494.61	1616.18	9505.95	1616.1
9522.53	1616.06	9534.67	1616	9541.42	1615.96	9562.42	1615.86	9580.29	1615.8

```
 9583.86 1615.78 9587.36 1615.77 9590.72 1615.77  9596.5 1615.76  9615.3  1615.7
 9636.69 1615.58 9643.57 1615.53 9771.56    1615 9777.19 1614.82 9788.14  1614.8
 9888.06 1614.58  9917.5 1614.37 9935.88 1614.16 9940.89 1614.18 9946.611614.257
 9949.85  1614.310012.62  1614.510030.35 1614.6710049.69 1614.5710056.67 1614.54
 10061.3  1614.510066.35 1614.5110128.91 1614.4510145.91 1614.3910174.57  1614.3
10207.52 1614.3410215.31  1614.310225.95 1614.3710303.53 1614.5310314.43  1614.6
10315.391614.59310318.64 1614.5710329.93 1614.69 10360.9 1615.0310447.27    1616
10449.27    161610462.77 1616.1510466.98  1616.210502.21  1616.610584.45 1617.63
10591.18 1617.7110611.88 1617.9910612.51    161810620.05  1618.110626.94 1618.23
10628.75 1618.26 10631.9 1618.27 10649.6 1618.3410662.45  1618.410680.05 1618.36
10716.21 1618.4810729.26 1618.51 10753.9 1618.5210770.32  1618.510792.55 1618.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9461.2    .033 9888.06    .05210314.43    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9888.0610030.35               402 461.159     474              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1614.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.033  *   0.052  *   0.051  *
* W.S. Elev (ft)          * 1614.84  * Reach Len. (ft)        *  402.00  *  461.16  *  474.00  *
* Crit W.S. (ft)          * 1614.65  * Flow Area (sq ft)      *   15.26  *   62.11  *  117.38  *
* E.G. Slope (ft/ft)      *0.006918  * Area (sq ft)           *   15.26  *   62.11  *  117.38  *
* Q Total (cfs)           *  250.00  * Flow (cfs)             *   15.19  *   84.94  *  149.88  *
* Top Width (ft)          *  566.97  * Top Width (ft)         *  111.48  *  142.29  *  313.20  *
* Vel Total (ft/s)        *    1.28  * Avg. Vel. (ft/s)       *    0.99  *    1.37  *    1.28  *
* Max Chl Dpth (ft)       *    0.68  * Hydr. Depth (ft)       *    0.14  *    0.44  *    0.37  *
* Conv. Total (cfs)       *  3005.8  * Conv. (cfs)            *   182.6  *  1021.2  *  1802.0  *
* Length Wtd. (ft)        *  452.73  * Wetted Per. (ft)       *  111.48  *  142.29  *  313.20  *
* Min Ch El (ft)          * 1614.16  * Shear (lb/sq ft)       *    0.06  *    0.19  *    0.16  *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.06  *    0.26  *    0.21  *
* Frctn Loss (ft)         *    2.44  * Cum Volume (acre-ft)   *   29.70  *   26.00  *   14.83  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   50.58  *   31.73  *   39.77  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1615.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *          *   0.052  *   0.052  *
* W.S. Elev (ft)          * 1615.05  * Reach Len. (ft)        *  402.00  *  461.16  *  474.00  *
* Crit W.S. (ft)          * 1614.82  * Flow Area (sq ft)      *          *   92.35  *   25.10  *
* E.G. Slope (ft/ft)      *0.010676  * Area (sq ft)           *          *   92.35  *   25.10  *
* Q Total (cfs)           *  250.00  * Flow (cfs)             *          *  203.94  *   46.06  *
* Top Width (ft)          *  192.95  * Top Width (ft)         *          *  142.29  *   50.66  *
* Vel Total (ft/s)        *    2.13  * Avg. Vel. (ft/s)       *          *    2.21  *    1.84  *
* Max Chl Dpth (ft)       *    0.89  * Hydr. Depth (ft)       *          *    0.65  *    0.50  *
* Conv. Total (cfs)       *  2419.5  * Conv. (cfs)            *          *  1973.8  *   445.8  *
* Length Wtd. (ft)        *  454.22  * Wetted Per. (ft)       *          *  142.77  *   51.22  *
* Min Ch El (ft)          * 1614.16  * Shear (lb/sq ft)       *          *    0.43  *    0.33  *
* Alpha                   *    1.01  * Stream Power (lb/ft s) *          *    0.95  *    0.60  *
* Frctn Loss (ft)         *    2.41  * Cum Volume (acre-ft)   *    6.29  *   42.06  *    2.91  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    5.93  *   31.73  *    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.
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.

  Profile #1
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9674.63   * 9888.06   *    15.19 *    15.26 *   111.48 *     6.07 *
0.14 *     0.99 *
* 2         * Chan      * 9888.06   * 10030.35  *    84.94 *    62.11 *   142.29 *    33.98 *
0.44 *     1.37 *
* 3         * ROB       * 10030.35  * 10411.45  *   149.88 *   117.38 *   313.20 *    59.95 *
0.37 *     1.28 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9888.06   * 10030.35  *   203.94 *    92.35 *   142.77 *    81.58 *
0.65 *     2.21 *
* 2         * ROB       * 10030.35  * 10411.45  *    46.06 *    25.10 *    51.22 *    18.42 *
0.50 *     1.84 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.750

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 350cfs
Station Elevation Data    num=      86
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************
 9311.59  1614.9 9320.49 1614.98 9332.54 1614.91 9337.52 1614.89 9462.54 1614.26
 9462.75  1614.3 9462.79 1614.26 9488.52 1614.06 9496.66    1614 9504.56  1613.9
 9516.03 1613.86 9542.22 1613.66 9563.44  1613.5 9597.52 1613.31 9623.84  1613.2
 9639.65 1613.04 9642.46 1613.04 9646.65 1613.03 9647.39 1613.03 9655.67    1613
 9655.99 1612.97 9656.38 1612.97  9656.5 1612.96 9656.55    1613 9658.96 1612.96
 9661.99 1612.96 9663.96 1612.94 9668.66  1612.9 9710.79  1612.7  9724.3 1612.64
 9736.59 1612.57 9752.44 1612.45 9818.65 1612.08 9827.09    1612 9832.39    1612
 9839.67 1611.97 9839.79 1611.97 9839.941611.969 9853.28  1611.9 9858.17 1611.94
 9864.53 1611.95  9867.8 1611.93 9872.71 1611.93 9897.26 1611.89 9905.49 1611.89
 9912.13 1611.83  9919.4 1611.81 9926.54  1611.8 9929.29 1611.78 9936.75 1611.75
 9944.27 1611.79  9962.1 1611.71 9976.09  1611.7 9983.96 1611.63 9986.92 1611.64
10049.83  1611.710055.41 1611.6910077.93  1611.710081.43 1611.6610100.55 1611.74
10111.92 1611.4810116.06 1611.3710128.01  1611.610129.27 1611.6810189.54 1611.98
10191.28    161210209.15 1612.1810246.571612.63810251.61  1612.710270.46 1612.89
10356.45 1613.6210379.18 1613.7510409.66 1613.8910417.77  1613.9 10422.5    1614
 10427.8 1614.0210431.95 1614.0310444.57 1614.09 10457.4  1614.1 10485.3 1614.28
10532.66 1614.48   10539  1614.510543.02 1614.5110545.76  1614.510546.15 1614.52
10553.91  1614.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
```

9311.59 .033 9818.65 .05210191.28 .033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9976.09	10129.27	489	454.82	413	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1612.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.051	0.052	0.049
W.S. Elev (ft)	1612.40	Reach Len. (ft)	489.00	454.82	413.00
Crit W.S. (ft)		Flow Area (sq ft)	92.79	114.12	42.27
E.G. Slope (ft/ft)	0.004588	Area (sq ft)	92.79	114.12	42.27
Q Total (cfs)	350.00	Flow (cfs)	114.57	181.52	53.91
Top Width (ft)	464.93	Top Width (ft)	214.15	153.18	97.60
Vel Total (ft/s)	1.40	Avg. Vel. (ft/s)	1.23	1.59	1.28
Max Chl Dpth (ft)	1.03	Hydr. Depth (ft)	0.43	0.74	0.43
Conv. Total (cfs)	5167.0	Conv. (cfs)	1691.3	2679.8	795.9
Length Wtd. (ft)	453.02	Wetted Per. (ft)	214.15	153.19	97.60
Min Ch El (ft)	1611.37	Shear (lb/sq ft)	0.12	0.21	0.12
Alpha	1.05	Stream Power (lb/ft s)	0.15	0.34	0.16
Frctn Loss (ft)	2.62	Cum Volume (acre-ft)	29.20	25.06	13.96
C & E Loss (ft)	0.00	Cum SA (acres)	49.08	30.17	37.53

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 OUTPUT Profile #2

E.G. Elev (ft)	1612.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.052	0.052	
W.S. Elev (ft)	1612.67	Reach Len. (ft)	489.00	454.82	413.00
Crit W.S. (ft)		Flow Area (sq ft)	50.00	155.70	
E.G. Slope (ft/ft)	0.003624	Area (sq ft)	50.00	155.70	
Q Total (cfs)	350.00	Flow (cfs)	80.40	269.60	
Top Width (ft)	207.63	Top Width (ft)	54.45	153.18	
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)	1.61	1.73	
Max Chl Dpth (ft)	1.30	Hydr. Depth (ft)	0.92	1.02	
Conv. Total (cfs)	5814.3	Conv. (cfs)	1335.7	4478.6	
Length Wtd. (ft)	458.75	Wetted Per. (ft)	55.31	154.18	
Min Ch El (ft)	1611.37	Shear (lb/sq ft)	0.20	0.23	
Alpha	1.00	Stream Power (lb/ft s)	0.33	0.40	
Frctn Loss (ft)	2.84	Cum Volume (acre-ft)	6.06	40.75	2.77
C & E Loss (ft)	0.00	Cum SA (acres)	5.68	30.17	2.94

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9643.84	9976.09	114.57	92.79	214.15	32.73	0.43	1.23
2	Chan	9976.09	10129.27	181.52	114.12	153.19	51.86	0.74	1.59
3	ROB	10129.27	10341.59	53.91	42.27	97.60	15.40	0.43	1.28

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.

Profile #2

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9643.84   * 9976.09   *    80.40 *    50.00 *    55.31 *    22.97 *
0.92 *     1.61 *
* 2         * Chan      * 9976.09   * 10129.27  *   269.60 *   155.70 *   154.18 *    77.03 *
1.02 *     1.73 *
*****************************************************************************************
******************
```

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.

CROSS SECTION

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 1.664

INPUT
Description: Interpolated point added at (9813.09, 1609.338) to set bank station.
Station Elevation Data num= 96

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9183.57  1612.2 9197.88 1612.33 9220.05 1612.19 9227.23 1612.15 9234.79  1612.2
 9263.28 1612.13 9277.13 1612.04 9281.45 1612.01 9281.66 1612.01 9283.96    1612
 9289.45 1611.98 9300.24 1611.97 9341.56 1611.95 9342.58 1611.92 9348.57  1611.9
 9350.05 1611.91 9354.25  1611.9 9367.87 1611.88 9384.13  1611.8 9397.66  1611.7
 9403.22 1611.69 9505.32 1611.48 9505.75 1611.47 9617.15    1611 9660.46 1610.56
 9716.69 1610.01 9722.38    1610 9726.81 1610.01 9733.41 1609.95 9735.06 1609.93
 9762.84 1609.76 9778.981609.615 9783.94 1609.57 9813.091609.338 9842.89  1609.1
 9866.39 1609.14 9975.06 1609.13 9986.66 1609.1410006.46  1609.210033.41  1609.2
10045.38  1609.310054.76 1609.3310069.17 1609.3110087.41 1609.32 10096.4  1609.3
10120.37 1609.3410124.22 1609.3410124.89 1609.3510125.22  1609.3 10127.5 1609.35
10139.79 1609.3710182.19 1609.4510206.28 1609.5910209.341609.61410232.76  1609.8
10264.49    161010279.01 1610.1310357.63 1610.7810366.08 1610.7610411.53  1610.4
10435.23  1610.210440.82 1610.1810441.37 1610.1610443.84  1610.210446.26 1610.17
10479.23 1610.2810480.96 1610.2810486.71 1610.3210487.06  1610.310490.64 1610.34
10492.12 1610.1210494.25 1609.8510495.46 1609.9110498.58  1610.310503.74 1610.34
10504.65 1610.3410563.57  1610.610584.71 1610.72 10589.8  1610.710603.67 1610.84
10622.69 1610.9610651.07 1611.0710739.45 1611.4710757.07  1611.5 10764.5 1611.55
 10807.8 1611.6110841.14 1611.6410944.73 1611.49 10953.9  1611.5 10956.4 1611.49
11017.89 1611.1911034.87 1611.1111118.45 1611.5711157.54  1611.811178.95 1611.76
11236.48  1611.9
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9183.57    .033 9778.98    .05210209.34    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9813.0910054.76              473 511.379     586             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)        * 1609.81  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.04  * Wt. n-Val.           *   0.051  *   0.052  *   0.052  *
* W.S. Elev (ft)        * 1609.77  * Reach Len. (ft)      *  473.00  *  511.38  *  586.00  *
* Crit W.S. (ft)        * 1609.55  * Flow Area (sq ft)    *   11.50  *  146.10  *   61.40  *
* E.G. Slope (ft/ft)    *0.007483  * Area (sq ft)         *   11.50  *  146.10  *   61.40  *
* Q Total (cfs)         *  350.00  * Flow (cfs)            *   12.10  *  258.21  *   79.68  *
* Top Width (ft)        *  468.13  * Top Width (ft)        *   52.08  *  241.67  *  174.37  *
* Vel Total (ft/s)      *    1.60  * Avg. Vel. (ft/s)      *    1.05  *    1.77  *    1.30  *
* Max Chl Dpth (ft)     *    0.67  * Hydr. Depth (ft)      *    0.22  *    0.60  *    0.35  *
* Conv. Total (cfs)     *  4045.9  * Conv. (cfs)           *   139.9  *  2984.9  *   921.1  *
```

```
* Length Wtd. (ft)        *  526.46  * Wetted Per. (ft)        *   52.09  *  241.67  *  174.38  *
* Min Ch El (ft)          * 1609.10  * Shear (lb/sq ft)        *    0.10  *    0.28  *    0.16  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    0.11  *    0.50  *    0.21  *
* Frctn Loss (ft)         *    2.96  * Cum Volume (acre-ft)    *   28.62  *   23.70  *   13.47  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   47.58  *   28.11  *   36.24  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1609.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *          *   0.052  *          *
* W.S. Elev (ft)          * 1609.78  * Reach Len. (ft)         *  473.00  *  511.38  *  586.00  *
* Crit W.S. (ft)          * 1609.57  * Flow Area (sq ft)       *          *  149.17  *          *
* E.G. Slope (ft/ft)      *0.012893  * Area (sq ft)            *          *  149.17  *          *
* Q Total (cfs)           *  350.00  * Flow (cfs)              *          *  350.00  *          *
* Top Width (ft)          *  241.67  * Top Width (ft)          *          *  241.67  *          *
* Vel Total (ft/s)        *    2.35  * Avg. Vel. (ft/s)         *          *    2.35  *          *
* Max Chl Dpth (ft)       *    0.68  * Hydr. Depth (ft)         *          *    0.62  *          *
* Conv. Total (cfs)       *  3082.4  * Conv. (cfs)              *          *  3082.4  *          *
* Length Wtd. (ft)        *  511.38  * Wetted Per. (ft)         *          *  242.57  *          *
* Min Ch El (ft)          * 1609.10  * Shear (lb/sq ft)         *          *    0.49  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    1.16  *          *
* Frctn Loss (ft)         *    2.76  * Cum Volume (acre-ft)     *    5.78  *   39.16  *    2.77  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *    5.38  *   28.11  *    2.94  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9498.33   * 9813.09   *    12.10 *    11.50 *    52.09 *     3.46 *
0.22 *     1.05 *
* 2         * Chan      * 9813.09   * 10054.76  *   258.21 *   146.10 *   241.67 *    73.78 *
0.60 *     1.77 *
* 3         * ROB       * 10054.76  * 10645.62  *    79.68 *    61.40 *   174.38 *    22.77 *
0.35 *     1.30 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9813.09   * 10054.76  *   350.00 *   149.17 *   242.57 *   100.00 *
0.62 *     2.35 *
*****************************************************************************************************
******************

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.

CROSS SECTION
```

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 1.567

INPUT
Description: Interpolated point added at (10113.05, 1606.396) to set bank station.
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9095.8	1610.1	9103.52	1610.16	9126.54	1610.1	9131.26	1610.04	9134.85	1610.02
9135.18	1610	9137.33	1610	9142.86	1609.98	9190.15	1609.79	9193.19	1609.78
9196.86	1609.8	9202.06	1609.74	9206.25	1609.76	9212.29	1609.74	9215.76	1609.72
9220.02	1609.7	9239.42	1609.58	9247.84	1609.53	9257.93	1609.48	9273.27	1609.33
9297.54	1609.24	9323.13	1609.08	9335.46	1609.11	9340.33	1609.08	9406.94	1608.8
9428.47	1608.81	9435.42	1608.82	9448.39	1608.81	9484.71	1608.59	9549.79	1608.08
9550.26	1608.08	9552.09	1608.06	9555.25	1608.02	9558.93	1608	9578.5	1607.95
9625	1607.44	9651.64	1607.27	9691.86	1607.03	9715.01	1606.8	9724.3	1606.8
9741.14	1606.68	9796.11	1606.51	9818.94	1606.42	9823.93	1606.4	9837.64	1606.4
9847.88	1606.35	9856.89	1606.29	9925.05	1606.19	9932.72	1606.12	9947.96	1606.1
9951.55	1606.13	9954.33	1606.15	9972.04	1606.02	9988.98	1606.14	10039.06	1606.1
10045.82	1606.11	10055.21	1606.13	10063.85	1606.17	10064.09	1606.2	10066	1606.17
10113.05	1606.39	10130.54	1606.48	10136.26	1606.51	10137.75	1606.51	10194.47	1606.5
10211.06	1606.51	10214.88	1606.51	10224.6	1606.52	10234.37	1606.49	10258.32	1606.5
10262.18	1606.46	10375.99	1606.92	10433.27	1607.46	10477.79	1607.91	10492.88	1608
10513.21	1608.19	10523.67	1608.28	10528.18	1608.31	10529.67	1608.31	0531.94	1608.32
10537.54	1608.32	10547.71	1608.29	10590.74	1608.17	10612.84	1608.21	0649.89	1608.03
10650.93	1608.03	10653.09	1608.04	10667.23	1608.08	10681.52	1608.11	0733.08	1608.21
10742.82	1608.21	10745.71	1608.26	10767.38	1608.37	10837.08	1609	10899.59	1609.58
10948.51	1609.96	10954.1	1610	10958.48	1610	10961.37	1610.11	0967.38	1610.11
10990.48	1610.22	11039.19	1610.41	11054.21	1610.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9095.8	.033	9818.94	.05	10113.05	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9818.94	10113.05	478	479.899	481	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1606.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.033	0.052	0.033
W.S. Elev (ft)	1606.82	Reach Len. (ft)	478.00	479.90	481.00
Crit W.S. (ft)	1606.58	Flow Area (sq ft)	21.87	180.84	64.12
E.G. Slope (ft/ft)	0.004384	Area (sq ft)	21.87	180.84	64.12
Q Total (cfs)	350.00	Flow (cfs)	22.80	247.42	79.77
Top Width (ft)	637.75	Top Width (ft)	105.80	294.11	237.85
Vel Total (ft/s)	1.31	Avg. Vel. (ft/s)	1.04	1.37	1.24
Max Chl Dpth (ft)	0.80	Hydr. Depth (ft)	0.21	0.61	0.27
Conv. Total (cfs)	5285.9	Conv. (cfs)	344.4	3736.7	1204.8
Length Wtd. (ft)	479.94	Wetted Per. (ft)	105.80	294.11	237.85
Min Ch El (ft)	1606.02	Shear (lb/sq ft)	0.06	0.17	0.07
Alpha	1.02	Stream Power (lb/ft s)	0.06	0.23	0.09
Frctn Loss (ft)	2.45	Cum Volume (acre-ft)	28.44	21.79	12.62
C & E Loss (ft)	0.00	Cum SA (acres)	46.73	24.96	33.47

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 OUTPUT Profile #2

E.G. Elev (ft)	1607.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.		0.052	
W.S. Elev (ft)	1607.06	Reach Len. (ft)	478.00	479.90	481.00
Crit W.S. (ft)		Flow Area (sq ft)		251.21	
E.G. Slope (ft/ft)	0.002951	Area (sq ft)		251.21	
Q Total (cfs)	350.00	Flow (cfs)		350.00	

```
* Top Width (ft)          *  294.11  * Top Width (ft)          *          *  294.11  *          *
* Vel Total (ft/s)        *    1.39  * Avg. Vel. (ft/s)        *          *    1.39  *          *
* Max Chl Dpth (ft)       *    1.04  * Hydr. Depth (ft)        *          *    0.85  *          *
* Conv. Total (cfs)       *  6443.3  * Conv. (cfs)             *          *  6443.3  *          *
* Length Wtd. (ft)        *  479.90  * Wetted Per. (ft)        *          *  295.41  *          *
* Min Ch El (ft)          * 1606.02  * Shear (lb/sq ft)        *          *    0.16  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.22  *          *
* Frctn Loss (ft)         *    2.59  * Cum Volume (acre-ft)    *    5.78  *   36.81  *    2.77  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    5.38  *   24.96  *    2.94  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9457.37   * 9818.94   *    22.80 *    21.87 *   105.80 *     6.52 *
0.21 *     1.04 *
* 2         * Chan      * 9818.94   * 10113.05  *   247.42 *   180.84 *   294.11 *    70.69 *
0.61 *     1.37 *
* 3         * ROB       * 10113.05  * 10583.63  *    79.77 *    64.12 *   237.85 *    22.79 *
0.27 *     1.24 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9818.94   * 10113.05  *   350.00 *   251.21 *   295.41 *   100.00 *
0.85 *     1.39 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18W
REACH: Reach-1            RS: 1.477

INPUT
Description: Interpolated point added at (9950.07, 1603.691) to set bank
             station.
Station Elevation Data    num=     111
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9051.76  1606.1 9056.68 1606.11 9061.09  1606.1 9064.54 1606.08 9068.76 1606.08
 9070.48  1606.1 9079.45 1606.05 9090.29 1606.03  9091.9 1606.03 9103.59    1606
 9124.79 1605.94 9141.94  1605.9 9161.15 1605.85 9173.35 1605.83 9180.09  1605.8
 9194.06 1605.72 9197.11 1605.72 9204.56 1605.67  9242.6  1605.4 9263.53 1605.37
 9306.42 1605.19 9307.57 1605.25 9332.35 1605.12 9404.56  1604.8 9496.83 1605.71
 9506.45 1605.82 9507.32 1605.82 9509.13  1605.8 9512.17 1605.83 9516.35 1605.84
 9527.54 1605.86 9531.75 1605.86 9582.87  1605.9  9586.1 1605.96 9586.95 1605.96
```

```
 9593.59 1605.84 9594.27  1605.8 9607.07 1605.61 9618.54 1605.43 9624.21 1605.33
 9635.81 1605.09  9661.4  1604.8 9716.04 1604.52 9736.71 1604.36 9784.18 1604.14
 9791.52  1604.1 9798.12  1604.1 9802.99 1604.06 9806.63 1604.05 9812.63 1604.06
 9814.54 1604.06 9837.66  1604.1 9856.39 1604.07 9858.34 1604.07    9874 1604.07
 9883.38 1604.06 9886.25 1604.07 9892.24    1604 9900.96 1604.02 9906.31    1604
 9911.13 1603.98 9920.34 1603.93 9950.071603.691 9973.87  1603.510007.83 1603.52
10036.71  1603.610057.19 1603.6910107.51  1603.910110.01 1603.8910111.07 1603.89
   10119 1603.9210140.74 1603.9910142.85    160410144.99    160410163.01 1604.04
10179.34 1604.0710201.83  1604.110203.411604.11110230.16  1604.310250.08 1604.26
10304.56 1604.1410316.14 1604.1110332.19  1604.110345.06 1604.1110356.31 1604.13
 10406.4 1604.2310416.91 1604.2610424.08  1604.310428.55  1604.3 10431.3 1604.32
10431.81 1604.3210447.75 1604.3910478.67  1604.610528.38 1604.8210566.14 1605.01
10581.31 1605.0910593.24 1605.1110620.57  1604.710632.65  1604.810658.44    1605
10727.52 1605.4310761.65 1605.6610763.03  1605.7 10795.3    160610796.72 1606.01
10830.01 1606.3610845.15  1606.5 10891.2 1606.9810899.78 1607.1610955.59 1607.16
10959.17 1607.15

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9051.76    .033 9858.34    .05210203.41    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.0710057.19               494 501.458     481             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1604.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.044  *   0.052  *   0.046  *
* W.S. Elev (ft)          * 1604.36  * Reach Len. (ft)        *  494.00  *  501.46  *  481.00  *
* Crit W.S. (ft)          * 1604.20  * Flow Area (sq ft)      *   61.91  *   84.44  *   99.07  *
* E.G. Slope (ft/ft)      *0.006026  * Area (sq ft)           *   61.91  *   84.44  *   99.07  *
* Q Total (cfs)           *  350.00  * Flow (cfs)             *   75.19  *  159.83  *  114.98  *
* Top Width (ft)          *  702.69  * Top Width (ft)         *  212.62  *  107.12  *  382.95  *
* Vel Total (ft/s)        *    1.43  * Avg. Vel. (ft/s)       *    1.21  *    1.89  *    1.16  *
* Max Chl Dpth (ft)       *    0.86  * Hydr. Depth (ft)       *    0.29  *    0.79  *    0.26  *
* Conv. Total (cfs)       *  4508.9  * Conv. (cfs)            *   968.7  *  2059.0  *  1481.2  *
* Length Wtd. (ft)        *  495.61  * Wetted Per. (ft)       *  212.63  *  107.12  *  382.95  *
* Min Ch El (ft)          * 1603.50  * Shear (lb/sq ft)       *    0.11  *    0.30  *    0.10  *
* Alpha                   *    1.18  * Stream Power (lb/ft s) *    0.13  *    0.56  *    0.11  *
* Frctn Loss (ft)         *    2.75  * Cum Volume (acre-ft)   *   27.98  *   20.32  *   11.72  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   44.98  *   22.75  *   30.04  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1604.49  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.052  *   0.052  *   0.052  *
* W.S. Elev (ft)          * 1604.38  * Reach Len. (ft)        *  494.00  *  501.46  *  481.00  *
* Crit W.S. (ft)          * 1604.16  * Flow Area (sq ft)      *   17.01  *   87.23  *   29.57  *
* E.G. Slope (ft/ft)      *0.012797  * Area (sq ft)           *   17.01  *   87.23  *   29.57  *
* Q Total (cfs)           *  350.00  * Flow (cfs)             *   37.50  *  245.87  *   66.63  *
* Top Width (ft)          *  187.17  * Top Width (ft)         *   29.73  *  107.12  *   50.32  *
* Vel Total (ft/s)        *    2.62  * Avg. Vel. (ft/s)       *    2.21  *    2.82  *    2.25  *
* Max Chl Dpth (ft)       *    0.88  * Hydr. Depth (ft)       *    0.57  *    0.81  *    0.59  *
* Conv. Total (cfs)       *  3093.9  * Conv. (cfs)            *   331.5  *  2173.5  *   589.0  *
* Length Wtd. (ft)        *  497.71  * Wetted Per. (ft)       *   30.18  *  107.12  *   50.80  *
* Min Ch El (ft)          * 1603.50  * Shear (lb/sq ft)       *    0.45  *    0.65  *    0.46  *
* Alpha                   *    1.03  * Stream Power (lb/ft s) *    0.99  *    1.83  *    1.05  *
* Frctn Loss (ft)         *    2.59  * Cum Volume (acre-ft)   *    5.68  *   34.94  *    2.61  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *    5.21  *   22.75  *    2.66  *
*****************************************************************************************

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.
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.
```

```
  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9500.92   * 9950.07   *    75.19 *    61.91 *   212.63 *    21.48 *
0.29 *     1.21 *
* 2         * Chan      * 9950.07   * 10057.19  *   159.83 *    84.44 *   107.12 *    45.67 *
0.79 *     1.89 *
* 3         * ROB       * 10057.19  * 10508.18  *   114.98 *    99.07 *   382.95 *    32.85 *
0.26 *     1.16 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9500.92   * 9950.07   *    37.50 *    17.01 *    30.18 *    10.71 *
0.57 *     2.21 *
* 2         * Chan      * 9950.07   * 10057.19  *   245.87 *    87.23 *   107.12 *    70.25 *
0.81 *     2.82 *
* 3         * ROB       * 10057.19  * 10508.18  *    66.63 *    29.57 *    50.80 *    19.04 *
0.59 *     2.25 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.382

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs.
Interpolated
             point added at (10039.14, 1600.729) to set bank station.
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9073.88  1602.9 9074.45 1602.95  9131.6 1602.61 9172.35  1602.4 9204.13 1602.01
 9205.15    1602 9206.74 1601.98 9219.39 1601.86 9258.45 1601.48 9267.87 1601.39
 9276.93  1601.3 9279.76 1601.29 9281.85 1601.27 9287.91 1601.23 9343.88  1601.2
 9370.06 1601.22 9393.24 1601.33 9415.94 1601.45 9416.15  1601.4  9433.3 1601.51
 9475.62  1601.7 9512.46 1601.84 9519.51 1601.88 9520.05  1601.9 9528.56 1601.96
 9538.02 1602.04 9558.73 1602.23  9596.6  1602.6 9623.29 1602.84 9626.08 1602.86
 9637.05 1602.64 9661.48 1602.53 9673.37  1602.5 9679.64 1602.44 9716.51 1602.25
 9729.62 1602.18 9803.54 1601.51  9814.9 1601.41 9861.681601.133 9887.55 1600.98
 9914.29 1600.76 9932.81  1600.7 9939.86 1600.63 9982.07 1600.74 9985.07 1600.64
 9992.58  1600.4 9994.29  1600.4 9995.14 1600.3610005.49 1600.3610009.55  1600.4
10018.58 1600.4210039.141600.72910072.53 1601.2310079.03 1601.27 10124.81601.494
10175.07 1601.7410212.45  1601.7   10277 1601.5710278.94 1601.5810315.59  1601.6
10375.91 1601.6810413.47  1601.910421.58    160210454.18 1602.2410467.46 1602.34
10472.68 1602.3710478.86  1602.4 10488.3 1602.4410559.81 1602.6110620.92 1602.93
 10642.7 1603.0910642.75    160310653.35 1603.1410674.98 1603.4710685.07 1603.63
10708.09 1603.9410712.72    160410728.78 1604.25 10743.6 1604.4410789.99 1604.34
10839.43 1604.6110930.88  1604.6
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9073.88    .033  9814.9    .052 10124.8    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.2910039.14              484 450.962     441          .1        .3
Left Levee       Station= 9626.08      Elevation= 1602.86

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1601.65  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.052  *   0.052  *   0.052  *
* W.S. Elev (ft)          * 1601.59  * Reach Len. (ft)         *  484.00  *  450.96  *  441.00  *
* Crit W.S. (ft)          * 1601.21  * Flow Area (sq ft)       *   50.13  *  123.99  *   33.68  *
* E.G. Slope (ft/ft)      *0.005133  * Area (sq ft)            *   50.13  *  123.99  *   33.68  *
* Q Total (cfs)           *  350.00  * Flow (cfs)              *   62.24  *  252.66  *   35.10  *
* Top Width (ft)          *  387.63  * Top Width (ft)          *  119.89  *  124.85  *  142.89  *
* Vel Total (ft/s)        *    1.68  * Avg. Vel. (ft/s)        *    1.24  *    2.04  *    1.04  *
* Max Chl Dpth (ft)       *    1.23  * Hydr. Depth (ft)        *    0.42  *    0.99  *    0.24  *
* Conv. Total (cfs)       *  4885.0  * Conv. (cfs)             *   868.7  *  3526.4  *   489.9  *
* Length Wtd. (ft)        *  470.14  * Wetted Per. (ft)        *  119.90  *  124.86  *  142.90  *
* Min Ch El (ft)          * 1600.36  * Shear (lb/sq ft)        *    0.13  *    0.32  *    0.08  *
* Alpha                   *    1.19  * Stream Power (lb/ft s)  *    0.17  *    0.65  *    0.08  *
* Frctn Loss (ft)         *    2.40  * Cum Volume (acre-ft)    *   27.34  *   19.12  *   10.99  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   43.09  *   21.42  *   27.14  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1601.88  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.052  *   0.052  *   0.052  *
* W.S. Elev (ft)          * 1601.84  * Reach Len. (ft)         *  484.00  *  450.96  *  441.00  *
* Crit W.S. (ft)          * 1601.20  * Flow Area (sq ft)       *   35.35  *  154.73  *   20.71  *
* E.G. Slope (ft/ft)      *0.002808  * Area (sq ft)            *   35.35  *  154.73  *   20.71  *
* Q Total (cfs)           *  350.00  * Flow (cfs)              *   50.16  *  270.32  *   29.52  *
* Top Width (ft)          *  184.92  * Top Width (ft)          *   38.17  *  124.85  *   21.90  *
* Vel Total (ft/s)        *    1.66  * Avg. Vel. (ft/s)        *    1.42  *    1.75  *    1.43  *
* Max Chl Dpth (ft)       *    1.48  * Hydr. Depth (ft)        *    0.93  *    1.24  *    0.95  *
* Conv. Total (cfs)       *  6604.6  * Conv. (cfs)             *   946.6  *  5100.9  *   557.1  *
* Length Wtd. (ft)        *  452.60  * Wetted Per. (ft)        *   38.96  *  124.86  *   22.68  *
* Min Ch El (ft)          * 1600.36  * Shear (lb/sq ft)        *    0.16  *    0.22  *    0.16  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.23  *    0.38  *    0.23  *
* Frctn Loss (ft)         *    1.88  * Cum Volume (acre-ft)    *    5.39  *   33.55  *    2.33  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    4.83  *   21.42  *    2.26  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9626.08   * 9914.29   *    62.24 *    50.13 *   119.90 *    17.78 *
0.42 *     1.24 *
* 2        * Chan      * 9914.29   * 10039.14  *   252.66 *   123.99 *   124.86 *    72.19 *
0.99 *     2.04 *
```

```
* 3          * ROB       * 10039.14  * 10485.01  *    35.10 *    33.68 *   142.90 *    10.03 *
0.24 *     1.04 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9626.08   * 9914.29   *    50.16 *    35.35 *    38.96 *    14.33 *
0.93 *     1.42 *
* 2         * Chan      * 9914.29   * 10039.14  *   270.32 *   154.73 *   124.86 *    77.23 *
1.24 *     1.75 *
* 3         * ROB       * 10039.14  * 10485.01  *    29.52 *    20.71 *    22.68 *     8.43 *
0.95 *     1.43 *
*****************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.296

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 480cfs
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9043.98  1600.3 9052.39  1600.3 9111.25 1600.26 9114.92 1600.25 9115.41 1600.26
  9119.9  1600.2 9141.03    1600 9165.23 1599.74 9185.01 1599.54 9192.18 1599.47
 9196.32  1599.4 9199.56 1599.42 9204.96 1599.41  9209.8 1599.39 9248.56 1599.58
 9280.08  1599.5 9294.48 1599.43 9328.35 1599.25  9391.2 1599.01 9449.76 1598.62
 9508.86  1598.3 9582.25 1598.66 9584.66 1598.66 9585.47 1598.67 9591.52 1598.66
 9693.68  1598.7 9794.48 1598.96 9795.95 1598.97  9798.1 1598.98 9826.03 1598.98
 9883.791599.078 9897.07  1599.1 9906.61 1599.03 9912.83 1599.05 9999.58 1598.87
10021.06 1598.9310023.19  1598.910077.87 1599.0110088.21 1598.9710097.44 1598.93
10098.26 1598.9310135.12  1599.210153.32 1599.37 10161.7 1599.4410171.13 1599.47
10181.15 1599.4710187.071599.43510260.84    159910261.12 1598.9610269.47 1598.99
10369.47 1599.4610382.47  1599.510390.78 1599.5510406.14 1599.6310442.58 1599.84
 10473.6    160010482.01    160010483.13 1600.0610491.89 1600.0810568.42 1600.31
10574.94  1600.310584.06 1600.3510586.81 1600.36 10587.6 1600.3510588.46 1600.36
10626.55  1600.510682.62 1600.6910701.62 1600.8610743.51 1601.2510771.46  1601.5
10772.12 1601.4810777.83 1601.52 10835.7    160210881.12 1602.4210921.78  1602.8
   10959 1603.2811003.37 1602.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9043.98    .033 9897.07    .05210135.12    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9897.0710135.12              460 529.224     525             .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1599.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.052	0.033
W.S. Elev (ft)	1599.20	Reach Len. (ft)	460.00	529.22	525.00
Crit W.S. (ft)	1599.04	Flow Area (sq ft)	237.67	53.27	10.04
E.G. Slope (ft/ft)	0.005067	Area (sq ft)	237.67	53.27	10.04
Q Total (cfs)	480.00	Flow (cfs)	432.45	39.94	7.61
Top Width (ft)	881.06	Top Width (ft)	555.68	238.05	87.33
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	1.82	0.75	0.76
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)	0.43	0.22	0.11
Conv. Total (cfs)	6743.2	Conv. (cfs)	6075.2	561.1	106.9
Length Wtd. (ft)	480.76	Wetted Per. (ft)	555.68	238.05	87.33
Min Ch El (ft)	1598.87	Shear (lb/sq ft)	0.14	0.07	0.04
Alpha	1.19	Stream Power (lb/ft s)	0.25	0.05	0.03
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	25.74	18.21	10.77
C & E Loss (ft)	0.00	Cum SA (acres)	39.34	19.54	25.97

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1600.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.052	
W.S. Elev (ft)	1599.93	Reach Len. (ft)	460.00	529.22	525.00
Crit W.S. (ft)		Flow Area (sq ft)		227.45	
E.G. Slope (ft/ft)	0.005847	Area (sq ft)		227.45	
Q Total (cfs)	480.00	Flow (cfs)		480.00	
Top Width (ft)	238.05	Top Width (ft)		238.05	
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)		2.11	
Max Chl Dpth (ft)	1.06	Hydr. Depth (ft)		0.96	
Conv. Total (cfs)	6277.5	Conv. (cfs)		6277.5	
Length Wtd. (ft)	529.22	Wetted Per. (ft)		239.62	
Min Ch El (ft)	1598.87	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		0.73	
Frctn Loss (ft)	3.27	Cum Volume (acre-ft)	5.19	31.57	2.23
C & E Loss (ft)	0.01	Cum SA (acres)	4.62	19.54	2.15

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9043.98	9470.53	59.22	40.51	129.13	12.34	0.31	1.46
2	LOB	9470.53	9897.07	373.23	197.16	426.55	77.76	0.46	1.89
3	Chan	9897.07	10135.12	39.94	53.27	238.05	8.32	0.22	0.75
4	ROB	10135.12	10569.25	7.61	10.04	87.33	1.59	0.11	0.76

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.

Profile #2

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9897.07   * 10135.12  *   480.00 *   227.45 *   239.62 *   100.00 *
0.96 *     2.11 *
*****************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.196

INPUT
Description:
Station Elevation Data    num=     101
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8915.73  1598.3 8925.68 1598.26 8944.17 1598.22 8986.07 1598.15 8998.53 1598.11
 9013.94    1598 9021.76 1598.05 9022.03 1598.05 9030.46 1597.96    9040  1597.9
 9087.96  1597.5 9101.28 1597.46 9208.77 1596.56 9218.37 1596.49  9231.3  1596.4
 9256.06 1596.22 9282.25 1596.02 9288.53    1596 9291.75 1595.98  9300.1  1595.9
 9305.23 1595.93  9315.9 1595.92 9329.44 1595.93 9349.41 1595.96 9373.32    1596
 9377.43 1595.99  9394.3    1596  9406.8    1596 9417.88 1595.94 9419.09 1595.96
 9424.11 1595.96 9442.19 1596.01 9454.95 1596.05 9500.84 1596.21 9532.64 1596.18
 9549.79  1596.2  9571.4 1596.14 9611.27 1596.06 9622.49 1596.04 9636.77 1596.03
 9642.14    1596 9659.84    1596 9681.11 1595.97    9695 1595.93 9710.27 1595.93
 9714.46 1595.93 9723.03  1595.9 9728.38 1595.91 9735.67 1595.91  9739.2  1595.9
 9743.62 1595.91 9762.98 1595.87 9777.76 1595.89 9815.37 1595.95 9838.88    1596
 9852.85 1595.97 9885.39 1595.99 9890.84    1596 9902.13    1596 9928.15 1596.05
 9948.98 1596.03 9991.54 1596.0310000.48 1596.0210013.09  1596.110046.13 1596.24
10081.73 1596.3810089.86 1596.41 10096.2 1596.4510100.73  1596.510107.96 1596.52
10114.211596.57210124.96 1596.6610206.86 1596.7510270.57  1596.910289.66  1596.9
10305.85 1596.9510371.58 1597.2310433.33 1597.3610440.16  1597.410452.83 1597.55
10492.68    159810495.83 1598.0310631.49 1599.4910659.54  1599.810661.79 1599.79
10662.76 1599.7910671.16 1599.7610709.55 1599.9810711.83    160010732.95 1600.14
10744.16 1600.2210748.58 1600.2610758.14 1600.3710765.73  1600.410817.78 1600.63
10865.92  1600.8 10874.2 1600.8110877.27  1600.810893.84    160110900.69 1600.94
10912.69 1600.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8915.73    .033 9549.79    .05210046.13    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9636.7710013.09              393 483.288     557             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1596.46  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.035  *   0.052  *   0.046  *
* W.S. Elev (ft)         * 1596.42  * Reach Len. (ft)         *  393.00  *  483.29  *  557.00  *
* Crit W.S. (ft)         * 1596.25  * Flow Area (sq ft)       *  141.31  *  168.62  *   12.59  *
* E.G. Slope (ft/ft)     *0.006674  * Area (sq ft)            *  141.31  *  168.62  *   12.59  *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *  238.52  *  230.49  *   10.99  *
* Top Width (ft)         *  863.80  * Top Width (ft)          *  408.71  *  376.32  *   78.77  *
* Vel Total (ft/s)       *    1.49  * Avg. Vel. (ft/s)        *    1.69  *    1.37  *    0.87  *
* Max Chl Dpth (ft)      *    0.55  * Hydr. Depth (ft)        *    0.35  *    0.45  *    0.16  *
* Conv. Total (cfs)      *  5875.7  * Conv. (cfs)             *  2919.7  *  2821.5  *   134.5  *
* Length Wtd. (ft)       *  444.31  * Wetted Per. (ft)        *  408.72  *  376.32  *   78.77  *
* Min Ch El (ft)         * 1595.87  * Shear (lb/sq ft)        *    0.14  *    0.19  *    0.07  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)  *    0.24  *    0.26  *    0.06  *
* Frctn Loss (ft)        *    2.47  * Cum Volume (acre-ft)    *   23.74  *   16.86  *   10.63  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   34.25  *   15.81  *   24.97  *
*****************************************************************************************
```

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 OUTPUT Profile #2

E.G. Elev (ft)	1596.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.052	
W.S. Elev (ft)	1596.68	Reach Len. (ft)	393.00	483.29	557.00
Crit W.S. (ft)	1596.34	Flow Area (sq ft)		263.90	
E.G. Slope (ft/ft)	0.006531	Area (sq ft)		263.90	
Q Total (cfs)	480.00	Flow (cfs)		480.00	
Top Width (ft)	376.32	Top Width (ft)		376.32	
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)		1.82	
Max Chl Dpth (ft)	0.81	Hydr. Depth (ft)		0.70	
Conv. Total (cfs)	5939.3	Conv. (cfs)		5939.3	
Length Wtd. (ft)	456.92	Wetted Per. (ft)		377.54	
Min Ch El (ft)	1595.87	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)	2.16	Cum Volume (acre-ft)	5.19	28.59	2.23
C & E Loss (ft)	0.00	Cum SA (acres)	4.62	15.81	2.15

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	8915.73	9276.25	9.56	8.47	48.20	1.99	0.18	1.13
2	LOB	9276.25	9636.77	228.95	132.84	360.52	47.70	0.37	1.72
3	Chan	9636.77	10013.09	230.49	168.62	376.32	48.02	0.45	1.37
4	ROB	10013.09	10462.89	10.99	12.59	78.77	2.29	0.16	0.87

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9636.77	10013.09	480.00	263.90	377.54	100.00	0.70	1.82

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.

CROSS SECTION

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 1.104

INPUT
Description:
Station Elevation Data num= 106

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9032.57  1596.1  9033.4 1596.07 9040.57 1596.08 9044.48 1596.08 9045.05  1596.1
  9045.5 1596.08 9046.19 1596.07 9046.51 1596.06 9047.44 1596.06 9049.28  1596.1
 9056.14 1596.04 9066.87    1596 9075.62 1595.98 9102.29  1595.9 9114.65  1595.9
 9119.92 1595.85 9122.24 1595.84 9123.09 1595.84 9138.48  1595.7 9235.76  1594.9
 9279.98 1594.56 9311.98 1594.43 9377.05 1594.05 9385.98    1594 9396.67  1593.9
 9432.06 1593.69 9442.85 1593.67 9538.06 1593.45 9540.79 1593.45 9552.04  1593.5
 9641.28 1593.65 9661.91 1593.59 9733.861593.554 9741.28 1593.55 9775.19  1593.5
 9779.95 1593.47 9794.23 1593.48 9817.05 1593.48  9900.6 1593.56 9939.96  1593.8
 9949.45 1593.7710001.61 1593.3810003.99 1593.3610046.53 1593.5710064.511593.595
10067.98  1593.610114.88 1593.74 10135.3 1593.7610152.43 1593.7710167.54 1593.77
10168.74  1593.810184.89 1593.7710199.99 1593.77 10228.9 1593.7610243.05 1593.77
10243.35  1593.810272.61 1593.6910321.72 1593.6310338.01 1593.6710345.99 1593.68
10349.55  1593.710352.75 1593.6810403.33 1593.6710425.61  1593.510426.06  1593.5
10426.22 1593.5110426.55  1593.5 10427.1 1593.5210428.01 1593.5310451.22 1593.88
10458.87    159410466.44  1594.110467.47 1594.1610468.03 1594.1610468.05 1594.17
10468.17  1594.110468.53 1594.0810468.85 1594.0110468.92    159410469.06 1593.97
10473.56  1593.210477.96 1593.7810479.45    159410481.12 1594.2110510.03  1594.2
 10545.6 1594.1610551.35 1594.2110586.77 1594.72   10609 1594.98 10628.3  1595.3
10628.42 1595.2610629.07 1595.26 10645.6 1595.2210680.52 1595.1610695.96  1595.2
10720.57 1595.4310728.11 1595.6910728.59 1595.6910741.36  1595.610790.51 1595.38
10816.93 1595.6310859.47    159610867.88 1596.0810871.74  1596.110879.01 1596.12
10911.03  1596.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9032.57    .033 9741.28    .05210067.98    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.4510067.98               421 490.446     486              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1593.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.039  *   0.052  *   0.033  *
* W.S. Elev (ft)         * 1593.96  * Reach Len. (ft)         *  421.00  *  490.45  *  486.00  *
* Crit W.S. (ft)         * 1593.81  * Flow Area (sq ft)       *  212.73  *   51.03  *  103.95  *
* E.G. Slope (ft/ft)     *0.004686  * Area (sq ft)            *  212.73  *   51.03  *  103.95  *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *  291.94  *   56.92  *  131.14  *
* Top Width (ft)         * 1076.81  * Top Width (ft)          *  559.59  *  118.53  *  398.69  *
* Vel Total (ft/s)       *    1.31  * Avg. Vel. (ft/s)        *    1.37  *    1.12  *    1.26  *
* Max Chl Dpth (ft)      *    0.76  * Hydr. Depth (ft)        *    0.38  *    0.43  *    0.26  *
* Conv. Total (cfs)      *  7011.8  * Conv. (cfs)             *  4264.7  *   831.5  *  1915.6  *
* Length Wtd. (ft)       *  459.68  * Wetted Per. (ft)        *  559.60  *  118.53  *  398.81  *
* Min Ch El (ft)         * 1593.36  * Shear (lb/sq ft)        *    0.11  *    0.13  *    0.08  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    0.15  *    0.14  *    0.10  *
* Frctn Loss (ft)        *    2.64  * Cum Volume (acre-ft)    *   22.14  *   15.64  *    9.89  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   29.88  *   13.06  *   21.92  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1594.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.052  *   0.052  *          *
* W.S. Elev (ft)         * 1594.53  * Reach Len. (ft)         *  421.00  *  490.45  *  486.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  168.40  *  117.81  *          *
* E.G. Slope (ft/ft)     *0.003581  * Area (sq ft)            *  168.40  *  117.81  *          *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *  280.40  *  199.60  *          *
* Top Width (ft)         *  292.79  * Top Width (ft)          *  174.26  *  118.53  *          *
* Vel Total (ft/s)       *    1.68  * Avg. Vel. (ft/s)        *    1.67  *    1.69  *          *
* Max Chl Dpth (ft)      *    1.17  * Hydr. Depth (ft)        *    0.97  *    0.99  *          *
* Conv. Total (cfs)      *  8020.7  * Conv. (cfs)             *  4685.3  *  3335.3  *          *
* Length Wtd. (ft)       *  466.37  * Wetted Per. (ft)        *  175.29  *  119.46  *          *
* Min Ch El (ft)         * 1593.36  * Shear (lb/sq ft)        *    0.21  *    0.22  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    0.36  *    0.37  *          *
```

```
* Frctn Loss (ft)        *    2.73  * Cum Volume (acre-ft)   *    4.43  *   26.47  *    2.23  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)        *    3.83  *   13.06  *    2.15  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9032.57   * 9491.01   *    32.13 *    26.08 *   101.15 *     6.69 *
0.26 *     1.23 *
* 2         * LOB       * 9491.01   * 9949.45   *   259.81 *   186.65 *   458.44 *    54.13 *
0.41 *     1.39 *
* 3         * Chan      * 9949.45   * 10067.98  *    56.92 *    51.03 *   118.53 *    11.86 *
0.43 *     1.12 *
* 4         * ROB       * 10067.98  * 10489.51  *   131.14 *   103.95 *   398.81 *    27.32 *
0.26 *     1.26 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9491.01   * 9949.45   *   280.40 *   168.40 *   175.29 *    58.42 *
0.97 *     1.67 *
* 2         * Chan      * 9949.45   * 10067.98  *   199.60 *   117.81 *   119.46 *    41.58 *
0.99 *     1.69 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S18W
REACH: Reach-1            RS: 1.012

INPUT
Description:
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9106.71  1594.4 9108.05 1594.44 9109.14 1594.38 9115.34 1594.33  9124.3 1594.23
  9138.1  1594.1 9142.59    1594 9153.12 1593.87 9160.99 1593.76 9165.31 1593.69
  9166.9  1593.7 9197.86 1593.86 9203.47 1593.82 9208.18 1593.82 9210.86  1593.8
 9214.26 1593.83 9217.85 1593.82 9257.35 1593.58 9278.07 1593.43 9286.77  1593.4
 9289.03 1593.38 9302.52  1593.2 9354.01 1592.64 9369.58 1592.63 9450.08  1592.1
 9456.43 1592.07 9461.03 1592.05 9467.45    1592 9477.64  1591.9 9555.02 1591.17
 9625.56 1591.28 9665.16 1591.29 9674.39 1591.11 9729.56    1591 9747.29 1590.94
 9811.691590.877 9849.87 1590.84 9890.59 1590.86 9896.87 1591.09  9968.5  1590.8
10001.61 1590.7410031.56 1590.9410034.53 1590.9510074.54 1591.1110114.49  1591.1
10159.52 1591.0610166.98 1590.77 10171.81590.75610190.42  1590.710210.03  1590.7
```

```
10229.44  1590.610237.55 1590.4310239.62 1590.1710242.27    159010242.53 1589.97
10242.71  1589.910243.37    1590 10243.4    159010243.43 1590.0110245.58 1590.22
10250.71  1590.710276.39 1590.5910283.46 1590.5410293.58 1590.4910294.79 1590.48
10311.49  1590.7 10317.1 1590.7410320.86 1590.9410356.88 1591.37 10407.5 1591.98
10409.52    159210444.32  1592.310482.12 1592.0910497.62    159210501.36    1592
10514.01 1591.9210533.08 1591.8510567.44 1591.9610589.96    159210590.14    1592
10613.01 1592.1210625.43 1592.1910663.77 1592.2710663.91 1592.2610676.55  1592.3
 10689.7 1592.2910752.89 1592.2610764.63 1592.2610769.12 1592.2410773.89  1592.4
10774.23 1592.4210783.87 1592.4610841.43 1592.4610844.72 1592.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9106.71    .033 9729.56    .05210074.54    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9896.8710074.54               471 485.919     477             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1591.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.048  *   0.052  *   0.033  *
* W.S. Elev (ft)         * 1591.29  * Reach Len. (ft)        *  471.00  *  485.92  *  477.00  *
* Crit W.S. (ft)         * 1591.14  * Flow Area (sq ft)      *   84.17  *   65.91  *  127.29  *
* E.G. Slope (ft/ft)     *0.007215  * Area (sq ft)           *   84.17  *   65.91  *  127.29  *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *  106.33  *   82.59  *  291.08  *
* Top Width (ft)         *  785.85  * Top Width (ft)          *  332.98  *  177.67  *  275.20  *
* Vel Total (ft/s)       *    1.73  * Avg. Vel. (ft/s)        *    1.26  *    1.25  *    2.29  *
* Max Chl Dpth (ft)      *    1.38  * Hydr. Depth (ft)        *    0.25  *    0.37  *    0.46  *
* Conv. Total (cfs)      *  5651.1  * Conv. (cfs)             *  1251.8  *   972.4  *  3426.9  *
* Length Wtd. (ft)       *  477.92  * Wetted Per. (ft)        *  332.98  *  177.67  *  275.30  *
* Min Ch El (ft)         * 1590.74  * Shear (lb/sq ft)        *    0.11  *    0.17  *    0.21  *
* Alpha                  *    1.27  * Stream Power (lb/ft s)  *    0.14  *    0.21  *    0.48  *
* Frctn Loss (ft)        *    2.66  * Cum Volume (acre-ft)    *   20.71  *   14.98  *    8.60  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   25.57  *   11.39  *   18.16  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1591.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.052  *   0.052  *   0.033  *
* W.S. Elev (ft)         * 1591.72  * Reach Len. (ft)        *  471.00  *  485.92  *  477.00  *
* Crit W.S. (ft)         * 1591.45  * Flow Area (sq ft)      *   18.72  *  143.21  *   16.29  *
* E.G. Slope (ft/ft)     *0.011245  * Area (sq ft)           *   18.72  *  143.21  *   16.29  *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *   48.88  *  375.84  *   55.28  *
* Top Width (ft)         *  226.77  * Top Width (ft)          *   22.54  *  177.67  *   26.56  *
* Vel Total (ft/s)       *    2.69  * Avg. Vel. (ft/s)        *    2.61  *    2.62  *    3.39  *
* Max Chl Dpth (ft)      *    0.98  * Hydr. Depth (ft)        *    0.83  *    0.81  *    0.61  *
* Conv. Total (cfs)      *  4526.5  * Conv. (cfs)             *   461.0  *  3544.2  *   521.3  *
* Length Wtd. (ft)       *  483.09  * Wetted Per. (ft)        *   23.41  *  177.67  *   27.18  *
* Min Ch El (ft)         * 1590.74  * Shear (lb/sq ft)        *    0.56  *    0.57  *    0.42  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    1.47  *    1.49  *    1.43  *
* Frctn Loss (ft)        *    2.72  * Cum Volume (acre-ft)    *    3.53  *   25.00  *    2.14  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    2.88  *   11.39  *    2.00  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9501.79   * 9896.87   *   106.33 *    84.17 *   332.98 *    22.15 *
0.25 *     1.26 *
* 2         * Chan      * 9896.87   * 10074.54  *    82.59 *    65.91 *   177.67 *    17.21 *
0.37 *     1.25 *
* 3         * ROB       * 10074.54  * 10459.63  *   291.08 *   127.29 *   275.30 *    60.64 *
0.46 *     2.29 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9501.79   * 9896.87   *    48.88 *    18.72 *    23.41 *    10.18 *
0.83 *     2.61 *
* 2         * Chan      * 9896.87   * 10074.54  *   375.84 *   143.21 *   177.67 *    78.30 *
0.81 *     2.62 *
* 3         * ROB       * 10074.54  * 10459.63  *    55.28 *    16.29 *    27.18 *    11.52 *
0.61 *     3.39 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18W
REACH: Reach-1            RS: 0.920

INPUT
Description:
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9298.38  1591.4  9326.5 1591.57  9327.8 1591.09  9360.2 1590.69 9379.57  1590.7
 9441.89 1590.37 9495.59 1590.07 9502.85    1590 9510.09  1589.9 9538.29 1589.69
 9554.89 1589.78 9576.44 1589.86  9619.9 1589.36 9631.47  1589.2 9660.54 1588.82
 9665.32  1588.8 9673.49 1588.66 9724.79  1588.1 9737.351587.997 9739.42 1587.98
 9740.84 1587.98 9741.68 1587.99 9742.22 1587.99 9782.04  1587.8 9791.67 1587.76
 9811.05  1587.9 9818.89    1588 9843.29 1588.35 9849.46  1588.4 9851.05 1588.46
  9852.9 1588.46 9855.38 1588.45 9867.99 1588.34 9901.11    1588 9902.78 1587.99
 9915.84 1587.86 9935.25 1587.92 9942.31 1587.92 9989.71  1587.9 9998.61 1587.86
10002.59 1587.8710004.62 1587.8710008.03 1587.8810059.99    158810060.23    1588
10065.36 1588.0110066.29 1588.0110066.83    158810067.08    158810068.09 1587.96
10075.84 1587.6310076.15  1587.710079.371587.86710081.93    158810082.01 1588.01
10082.51 1588.0310094.82 1588.2710098.82  1588.310099.13 1588.2310100.31 1588.12
10101.27    158810103.45 1587.7510106.41  1587.410107.79 1587.4810113.62 1587.75
10125.41 1587.9710127.14    158810129.76  1588.110149.59 1588.4310199.41 1588.42
 10205.6 1588.4210217.17  1588.510316.29  1588.810321.06 1588.7710321.22 1588.77
10321.58 1588.7810351.53 1589.1610361.68  1589.310361.79 1589.29 10406.3 1589.45
10432.97 1589.6210445.23 1589.6710466.37  1589.710520.49 1589.81 10521.7 1589.84
10524.19 1589.8310525.36 1589.8310546.07  1589.910550.61 1589.9210569.73 1589.98
 10578.3 1589.9810585.68    159010602.17 1590.1210605.81 1590.1210609.89 1590.11
 10616.1  1590.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
```

```
 9298.38    .033 9737.35    .04510065.36    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9902.7810065.36               545 502.127     422             .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1588.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.043  *   0.045  *   0.033  *
* W.S. Elev (ft)          * 1588.63  * Reach Len. (ft)         *  545.00  *  502.13  *  422.00  *
* Crit W.S. (ft)          * 1588.31  * Flow Area (sq ft)       *  114.71  *  115.84  *   69.49  *
* E.G. Slope (ft/ft)      *0.004436  * Area (sq ft)            *  114.71  *  115.84  *   69.49  *
* Q Total (cfs)           *  480.00  * Flow (cfs)              *  172.04  *  203.21  *  104.75  *
* Top Width (ft)          *  584.08  * Top Width (ft)          *  226.58  *  162.58  *  194.92  *
* Vel Total (ft/s)        *    1.60  * Avg. Vel. (ft/s)        *    1.50  *    1.75  *    1.51  *
* Max Chl Dpth (ft)       *    1.23  * Hydr. Depth (ft)        *    0.51  *    0.71  *    0.36  *
* Conv. Total (cfs)       *  7207.2  * Conv. (cfs)             *  2583.2  *  3051.2  *  1572.8  *
* Length Wtd. (ft)        *  492.72  * Wetted Per. (ft)        *  226.60  *  162.58  *  195.02  *
* Min Ch El (ft)          * 1587.86  * Shear (lb/sq ft)        *    0.14  *    0.20  *    0.10  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.21  *    0.35  *    0.15  *
* Frctn Loss (ft)         *    1.92  * Cum Volume (acre-ft)    *   19.63  *   13.97  *    7.52  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   22.54  *    9.50  *   15.59  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1589.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.045  *   0.045  *   0.033  *
* W.S. Elev (ft)          * 1589.04  * Reach Len. (ft)         *  545.00  *  502.13  *  422.00  *
* Crit W.S. (ft)          * 1588.54  * Flow Area (sq ft)       *   59.88  *  182.40  *    2.69  *
* E.G. Slope (ft/ft)      *0.003368  * Area (sq ft)            *   59.88  *  182.40  *    2.69  *
* Q Total (cfs)           *  480.00  * Flow (cfs)              *   96.88  *  377.41  *    5.72  *
* Top Width (ft)          *  241.43  * Top Width (ft)          *   76.27  *  162.58  *    2.58  *
* Vel Total (ft/s)        *    1.96  * Avg. Vel. (ft/s)        *    1.62  *    2.07  *    2.13  *
* Max Chl Dpth (ft)       *    1.18  * Hydr. Depth (ft)        *    0.79  *    1.12  *    1.04  *
* Conv. Total (cfs)       *  8270.7  * Conv. (cfs)             *  1669.3  *  6503.0  *    98.5  *
* Length Wtd. (ft)        *  503.58  * Wetted Per. (ft)        *   77.21  *  162.58  *    3.65  *
* Min Ch El (ft)          * 1587.86  * Shear (lb/sq ft)        *    0.16  *    0.24  *    0.15  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    0.26  *    0.49  *    0.33  *
* Frctn Loss (ft)         *    2.10  * Cum Volume (acre-ft)    *    3.10  *   23.18  *    2.03  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    2.34  *    9.50  *    1.85  *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9600.58   * 9902.78   *   172.04 *   114.71 *   226.60 *    35.84 *
0.51 *     1.50 *
* 2        * Chan      * 9902.78   * 10065.36  *   203.21 *   115.84 *   162.58 *    42.34 *
0.71 *     1.75 *
* 3        * ROB       * 10065.36  * 10340.73  *   104.75 *    69.49 *   195.02 *    21.82 *
0.36 *     1.51 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9600.58   * 9902.78   *    96.88 *    59.88 *    77.21 *    20.18 *
0.79 *     1.62 *
* 2         * Chan      * 9902.78   * 10065.36  *   377.41 *   182.40 *   162.58 *    78.63 *
1.12 *     2.07 *
* 3         * ROB       * 10065.36  * 10340.73  *     5.72 *     2.69 *     3.65 *     1.19 *
1.04 *     2.13 *
*****************************************************************************************************
******************

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: T4N-R3W-S18W
REACH: Reach-1            RS: 0.824

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs.
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9553.45  1587.1  9565.5 1587.05 9638.47 1586.69 9662.18 1586.57 9663.96 1586.56
 9735.76  1586.5 9755.57 1586.44 9790.34  1586.6 9791.74  1586.6 9792.08 1586.59
 9792.72  1586.6  9815.8 1586.48 9839.01 1586.36 9841.95 1586.34 9876.55 1586.29
 9903.45  1586.2  9905.5 1586.25 9905.92 1586.25 9908.38 1586.24 9908.79 1586.24
 9909.84  1586.2 9959.54 1586.05 9960.62 1586.05 9961.81 1586.05 9962.05 1586.05
 9971.32  1586.2 9975.09 1586.17 9976.32 1586.17 9979.73 1586.15 9982.25  1586.1
 9983.99  1586.2 9988.71 1586.14 9989.36 1586.09 9991.13 1586.12 9992.85  1586.1
 9994.84  1586.1 9995.07 1586.07 9995.09 1586.07 9995.16 1586.04 9995.31    1586
 9997.18  1585.7 10000.4 1585.0210003.16 1585.5210005.29 1585.9510005.31 1585.95
10008.34    158610008.39    158610008.42    158610011.63 1586.0710011.97 1586.03
10012.11    158610013.37 1585.8410018.38 1585.2610019.66 1585.6110021.07 1585.92
10027.45    158610034.54    158610036.39    158610068.21 1585.8810069.44 1585.87
10078.63  1585.810082.79 1585.8310120.67 1585.9410128.16 1585.9410149.21 1585.88
10157.71  1585.910184.56 1585.7810208.86    158610209.04    158610209.11    1586
10221.34  1586.110228.55 1586.0810230.93  1586.110292.83 1586.4810320.31  1586.7
10322.54  1586.710339.42 1586.6610375.68 1587.04 10389.6  1586.710440.49 1586.82
10465.92  1586.910495.21 1587.0110518.66  1587.210535.23 1587.22 10562.1 1587.54
10575.64  1587.710581.37 1587.7110583.86 1587.7310586.77 1587.7710589.21 1587.77
10604.57  1587.910624.55    158810631.76 1588.03 10642.3 1588.08   10646 1588.13
10669.71  1588.310717.55 1588.3910718.19 1588.3910718.63 1588.3910718.75  1588.4
10719.14  1588.410719.58  1588.410720.45 1588.3910720.73 1588.3910721.05 1588.39
10746.98  1588.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9553.45    .033 9841.95    .04510292.83    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.7110120.67              497 489.325     477            .1        .3
Right Levee     Station=10375.68      Elevation= 1587.04

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1586.74  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.042  *   0.045  *   0.045  *
* W.S. Elev (ft)         * 1586.71  * Reach Len. (ft)         *  497.00  *  489.33  *  477.00  *
* Crit W.S. (ft)         * 1586.39  * Flow Area (sq ft)       *  112.51  *  109.94  *  116.48  *
* E.G. Slope (ft/ft)     *0.003459  * Area (sq ft)            *  112.51  *  109.94  *  116.48  *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *  124.60  *  188.72  *  166.68  *
* Top Width (ft)         *  709.08  * Top Width (ft)          *  353.83  *  131.96  *  223.29  *
* Vel Total (ft/s)       *    1.42  * Avg. Vel. (ft/s)        *    1.11  *    1.72  *    1.43  *
* Max Chl Dpth (ft)      *    1.69  * Hydr. Depth (ft)        *    0.32  *    0.83  *    0.52  *
* Conv. Total (cfs)      *  8161.8  * Conv. (cfs)             *  2118.7  *  3209.0  *  2834.2  *
```

```
* Length Wtd. (ft)        *  486.58  * Wetted Per. (ft)        *  353.84  *  132.29  *  223.30  *
* Min Ch El (ft)          * 1585.02  * Shear (lb/sq ft)        *    0.07  *    0.18  *    0.11  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    0.08  *    0.31  *    0.16  *
* Frctn Loss (ft)         *    2.44  * Cum Volume (acre-ft)    *   18.21  *   12.67  *    6.62  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   18.91  *    7.80  *   13.56  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1587.00  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.045   *   0.045   *   0.045   *
* W.S. Elev (ft)          * 1586.91  * Reach Len. (ft)         *  497.00   *  489.33   *  477.00   *
* Crit W.S. (ft)          * 1586.49  * Flow Area (sq ft)       *   37.27   *  136.34   *   29.59   *
* E.G. Slope (ft/ft)      *0.005314  * Area (sq ft)            *   37.27   *  136.34   *   29.59   *
* Q Total (cfs)           *  480.00  * Flow (cfs)              *   75.87   *  334.87   *   69.26   *
* Top Width (ft)          *  208.93  * Top Width (ft)          *   47.12   *  131.96   *   29.85   *
* Vel Total (ft/s)        *    2.36  * Avg. Vel. (ft/s)        *    2.04   *    2.46   *    2.34   *
* Max Chl Dpth (ft)       *    1.89  * Hydr. Depth (ft)        *    0.79   *    1.03   *    0.99   *
* Conv. Total (cfs)       *  6584.4  * Conv. (cfs)             *  1040.8   *  4593.6   *   950.1   *
* Length Wtd. (ft)        *  489.09  * Wetted Per. (ft)        *   47.93   *  132.29   *   30.87   *
* Min Ch El (ft)          * 1585.02  * Shear (lb/sq ft)        *    0.26   *    0.34   *    0.32   *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.53   *    0.84   *    0.74   *
* Frctn Loss (ft)         *    2.01  * Cum Volume (acre-ft)    *    2.49   *   21.35   *    1.88   *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    1.57   *    7.80   *    1.69   *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9553.45   * 9771.08   *    18.83 *    23.19 *   136.20 *     3.92 *
0.17 *     0.81 *
* 2        * LOB       * 9771.08   * 9988.71   *   105.76 *    89.32 *   217.64 *    22.03 *
0.41 *     1.18 *
* 3        * Chan      * 9988.71   * 10120.67  *   188.72 *   109.94 *   132.29 *    39.32 *
0.83 *     1.72 *
* 4        * ROB       * 10120.67  * 10375.68  *   166.68 *   116.48 *   223.30 *    34.72 *
0.52 *     1.43 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9771.08   * 9988.71   *    75.87 *    37.27 *    47.93 *    15.81 *
0.79 *     2.04 *
* 2          * Chan      * 9988.71   * 10120.67  *   334.87 *   136.34 *   132.29 *    69.76 *
1.03 *     2.46 *
* 3          * ROB       * 10120.67  * 10375.68  *    69.26 *    29.59 *    30.87 *    14.43 *
0.99 *     2.34 *
*****************************************************************************************
******************

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

CROSS SECTION


RIVER: T4N-R3W-S18W
REACH: Reach-1            RS: 0.732

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 650cfs
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9710.08  1584.6 9728.58 1584.67 9736.24 1584.71 9750.46 1584.49 9771.32 1584.29
 9779.12  1584.2 9779.25 1584.25 9791.17 1584.24 9823.78 1584.27 9845.84  1584.3
 9871.97 1584.21 9872.14  1584.2 9880.88 1584.17 9881.281584.168 9891.18 1584.12
 9904.99    1584 9906.51    1584 9916.91 1583.93 9922.22 1583.88 9925.05 1583.84
 9960.26  1583.6 9981.49 1583.4710004.87 1583.4310026.17 1583.26   10031 1583.24
10035.04  1583.210056.17 1583.0410078.59 1583.0310137.62 1583.5210156.84 1583.53
10176.59  1583.610179.741583.594 10181.5 1583.5910206.59 1583.6610229.79 1583.72
 10269.5 1583.5310274.25  1583.510275.79 1583.5110277.04 1583.5210279.74 1583.55
10302.92 1583.8810303.75  1583.910318.18    158410334.88 1584.1410352.86 1584.28
10365.64  1584.310392.38  1584.310416.42 1584.6510423.68 1584.69   10433  1584.5
10456.61 1584.5910456.62 1584.5910459.36  1584.610468.67  1584.7 10514.7 1584.88
10544.28 1584.9110561.59 1584.8110562.03  1584.8 10562.5  1584.810606.54 1585.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9710.08    .033 9925.05    .04510229.79    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.4910137.62              517 510.224     459             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1584.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.043  *   0.045  *   0.039  *
* W.S. Elev (ft)         * 1584.21  * Reach Len. (ft)         *  517.00  *  510.22  *  459.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   39.66  *  148.87  *  103.43  *
* E.G. Slope (ft/ft)     *0.006855  * Area (sq ft)            *   39.66  *  148.87  *  103.43  *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *   66.98  *  394.30  *  208.72  *
* Top Width (ft)         *  472.01  * Top Width (ft)          *  110.06  *  156.13  *  205.82  *
* Vel Total (ft/s)       *    2.29  * Avg. Vel. (ft/s)        *    1.69  *    2.65  *    2.02  *
* Max Chl Dpth (ft)      *    1.18  * Hydr. Depth (ft)        *    0.36  *    0.95  *    0.50  *
* Conv. Total (cfs)      *  8092.1  * Conv. (cfs)             *   808.9  *  4762.3  *  2520.9  *
* Length Wtd. (ft)       *  485.27  * Wetted Per. (ft)        *  110.07  *  156.13  *  205.82  *
* Min Ch El (ft)         * 1583.03  * Shear (lb/sq ft)        *    0.15  *    0.41  *    0.22  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)  *    0.26  *    1.08  *    0.43  *
* Frctn Loss (ft)        *    2.33  * Cum Volume (acre-ft)    *   17.34  *   11.21  *    5.41  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   16.27  *    6.18  *   11.21  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1584.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.045	
W.S. Elev (ft)	1584.87	Reach Len. (ft)	517.00	510.22	459.00
Crit W.S. (ft)		Flow Area (sq ft)		252.25	
E.G. Slope (ft/ft)	0.003493	Area (sq ft)		252.25	
Q Total (cfs)	670.00	Flow (cfs)		670.00	
Top Width (ft)	156.13	Top Width (ft)		156.13	
Vel Total (ft/s)	2.66	Avg. Vel. (ft/s)		2.66	
Max Chl Dpth (ft)	1.84	Hydr. Depth (ft)		1.62	
Conv. Total (cfs)	11335.8	Conv. (cfs)		11335.8	
Length Wtd. (ft)	496.29	Wetted Per. (ft)		158.88	
Min Ch El (ft)	1583.03	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		0.92	
Frctn Loss (ft)	2.47	Cum Volume (acre-ft)	2.28	19.17	1.72
C & E Loss (ft)	0.01	Cum SA (acres)	1.30	6.18	1.52

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.
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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9710.08	9845.79	0.00	0.00	0.60	0.00	0.00	0.08
2 LOB	9845.79	9981.49	66.98	39.66	109.47	10.00	0.36	1.69
3 Chan	9981.49	10137.62	394.30	148.87	156.13	58.85	0.95	2.65
4 ROB	10137.62	10372.08	208.72	103.43	205.82	31.15	0.50	2.02

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9981.49	10137.62	670.00	252.25	158.88	100.00	1.62	2.66

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.
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: T4N-R3W-S18W
REACH: Reach-1 RS: 0.635

```
INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9677.35  1582.2 9687.44 1582.19 9730.32 1582.18 9740.09  1582.2 9749.45 1582.21
 9791.02  1582.2 9801.92 1582.11 9814.32    1582 9833.55 1581.81 9843.36 1581.73
 9846.76  1581.7 9857.25 1581.49 9880.61 1581.37 9884.12 1581.36 9884.93 1581.35
 9907.771581.227 9912.88  1581.2  9928.2 1581.18 9936.58 1581.01 9971.85 1580.89
 9999.68 1580.9810033.17    158110056.46 1580.9610094.15 1580.9410097.01 1580.96
10125.42 1580.8210141.441580.80110141.97  1580.810159.18 1580.9610182.79  1581.2
10223.54 1581.5210225.69 1581.5210234.65  1581.410263.57 1581.1810299.27 1581.46
10350.69 1581.8210358.22 1581.9710360.06    158210374.25 1582.2810389.04 1582.54
10408.75 1582.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9677.35    .033  9928.2    .04510182.79    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.58 9999.68              212 221.385     184             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1581.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.035  *   0.045  *   0.042  *
* W.S. Elev (ft)          * 1581.91  * Reach Len. (ft)         *  212.00  *  221.39  *  184.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   54.87  *   60.90  *  255.76  *
* E.G. Slope (ft/ft)      *0.003544  * Area (sq ft)            *   54.87  *   60.90  *  255.76  *
* Q Total (cfs)           *  670.00  * Flow (cfs)              *   88.37  *  116.93  *  464.71  *
* Top Width (ft)          *  531.56  * Top Width (ft)          *  113.00  *   63.10  *  355.46  *
* Vel Total (ft/s)        *    1.80  * Avg. Vel. (ft/s)        *    1.61  *    1.92  *    1.82  *
* Max Chl Dpth (ft)       *    1.11  * Hydr. Depth (ft)        *    0.49  *    0.97  *    0.72  *
* Conv. Total (cfs)       * 11254.3  * Conv. (cfs)             *  1484.3  *  1964.1  *  7805.9  *
* Length Wtd. (ft)        *  205.66  * Wetted Per. (ft)        *  113.01  *   63.10  *  355.47  *
* Min Ch El (ft)          * 1580.89  * Shear (lb/sq ft)        *    0.11  *    0.21  *    0.16  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.17  *    0.41  *    0.29  *
* Frctn Loss (ft)         *    0.92  * Cum Volume (acre-ft)    *   16.78  *    9.98  *    3.52  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   14.94  *    4.90  *    8.25  *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1582.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *   0.045  *   0.045  *
* W.S. Elev (ft)          * 1582.32  * Reach Len. (ft)         *  212.00  *  221.39  *  184.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *   86.68  *  104.98  *
* E.G. Slope (ft/ft)      *0.007664  * Area (sq ft)            *          *   86.68  *  104.98  *
* Q Total (cfs)           *  670.00  * Flow (cfs)              *          *  305.41  *  364.59  *
* Top Width (ft)          *  141.45  * Top Width (ft)          *          *   63.10  *   78.35  *
* Vel Total (ft/s)        *    3.50  * Avg. Vel. (ft/s)        *          *    3.52  *    3.47  *
* Max Chl Dpth (ft)       *    1.43  * Hydr. Depth (ft)        *          *    1.37  *    1.34  *
* Conv. Total (cfs)       *  7653.2  * Conv. (cfs)             *          *  3488.6  *  4164.6  *
* Length Wtd. (ft)        *  211.21  * Wetted Per. (ft)        *          *   64.41  *   79.72  *
* Min Ch El (ft)          * 1580.89  * Shear (lb/sq ft)        *          *    0.64  *    0.63  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.27  *    2.19  *
* Frctn Loss (ft)         *    1.08  * Cum Volume (acre-ft)    *    2.28  *   17.18  *    1.16  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    1.30  *    4.90  *    1.11  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9806.97   * 9936.58   *    88.37 *    54.87 *   113.01 *    13.19 *
0.49 *     1.61 *
* 2         * Chan      * 9936.58   * 9999.68   *   116.93 *    60.90 *    63.10 *    17.45 *
0.97 *     1.92 *
* 3         * ROB       * 9999.68   * 10204.21  *   361.13 *   189.02 *   204.54 *    53.90 *
0.92 *     1.91 *
* 4         * ROB       * 10204.21  * 10408.75  *   103.58 *    66.74 *   150.93 *    15.46 *
0.44 *     1.55 *
*****************************************************************************************
******************

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9936.58   * 9999.68   *   305.41 *    86.68 *    64.41 *    45.58 *
1.37 *     3.52 *
* 2         * ROB       * 9999.68   * 10204.21  *   364.59 *   104.98 *    79.72 *    54.42 *
1.34 *     3.47 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S18W
REACH: Reach-1            RS: 0.593

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Interpolated point
             added at (9941.97, 1580.179) to set bank station.
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9672.12    1581 9713.54 1581.39 9715.14 1581.39 9740.33  1581.5 9811.54 1580.71
 9857.61 1580.44 9858.38  1580.4 9859.53 1580.43 9908.52 1580.29  9909.6 1580.29
 9910.79  1580.3 9912.72 1580.29 9917.62 1580.29 9919.72  1580.3 9921.58  1580.3
 9924.13 1580.29 9941.971580.179  9970.7    1580 10049.4 1579.9710072.26    1580
10077.88 1579.97   10084 1579.9110098.82 1579.9410101.61 1579.9510104.82    1580
   10111 1579.9910141.82 1580.1410162.77  1580.210247.22 1581.2110247.51 1581.21
10265.86 1580.8710278.42  1580.610279.28 1580.5510403.24 1580.1910414.59  1580.2
10433.25 1580.4310441.44 1580.4110444.29 1580.4310450.88  1580.410471.61 1580.19
10552.15 1580.1910570.38 1580.31 10585.8  1580.510606.69 1580.3110612.76  1580.3
10641.74 1580.1710704.48  1580.210712.61 1580.1710715.49 1580.1710715.74  1580.2
10716.06 1580.1710716.78 1580.1710751.62 1580.4610752.62 1580.4710818.08    1581
10844.64  1580.810870.46 1581.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9672.12    .033 9919.72    .04510162.77    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.9710162.77              304 289.303     262            .1        .3
Right Levee     Station=10247.22      Elevation= 1581.21

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1581.02  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.             *   0.036  *   0.045  *   0.033  *
```

W.S. Elev (ft)	1580.94	Reach Len. (ft)	304.00	289.30	262.00	
Crit W.S. (ft)	1580.65	Flow Area (sq ft)	71.65	203.30	23.04	
E.G. Slope (ft/ft)	0.005873	Area (sq ft)	71.65	203.30	23.04	
Q Total (cfs)	670.00	Flow (cfs)	142.04	486.89	41.07	
Top Width (ft)	434.26	Top Width (ft)	151.38	220.80	62.08	
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	1.98	2.39	1.78	
Max Chl Dpth (ft)	1.03	Hydr. Depth (ft)	0.47	0.92	0.37	
Conv. Total (cfs)	8742.6	Conv. (cfs)	1853.5	6353.2	535.9	
Length Wtd. (ft)	284.58	Wetted Per. (ft)	151.38	220.80	62.08	
Min Ch El (ft)	1579.91	Shear (lb/sq ft)	0.17	0.34	0.14	
Alpha	1.03	Stream Power (lb/ft s)	0.34	0.81	0.24	
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)	16.48	9.31	2.93	
C & E Loss (ft)	0.01	Cum SA (acres)	14.30	4.18	7.37	

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 OUTPUT Profile #2

E.G. Elev (ft)	1581.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.045	
W.S. Elev (ft)	1581.31	Reach Len. (ft)	304.00	289.30	262.00
Crit W.S. (ft)	1580.68	Flow Area (sq ft)		285.29	
E.G. Slope (ft/ft)	0.003643	Area (sq ft)		285.29	
Q Total (cfs)	670.00	Flow (cfs)		670.00	
Top Width (ft)	220.80	Top Width (ft)		220.80	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)		1.29	
Conv. Total (cfs)	11099.9	Conv. (cfs)		11099.9	
Length Wtd. (ft)	283.29	Wetted Per. (ft)		223.05	
Min Ch El (ft)	1579.91	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.68	
Frctn Loss (ft)	1.50	Cum Volume (acre-ft)	2.28	16.24	0.94
C & E Loss (ft)	0.01	Cum SA (acres)	1.30	4.18	0.95

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

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9672.12	9807.05	1.01	1.50	16.46	0.15	0.09	0.67
2	LOB	9807.05	9941.97	141.04	70.15	134.93	21.05	0.52	2.01
3	Chan	9941.97	10162.77	486.89	203.30	220.80	72.67	0.92	2.39
4	ROB	10162.77	10247.22	41.07	23.04	62.08	6.13	0.37	1.78

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9941.97	10162.77	670.00	285.29	223.05	100.00	1.29	2.35

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

CROSS SECTION

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 0.538

INPUT
Description: Interpolated point added at (10070.71, 1578.734) to set bank station.
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9524.84	1579.5	9558.13	1579.63	9563.37	1579.65	9611.04	1579.6	9650.14	1579.55
9694.9	1579.7	9727.6	1579.63	9808.19	1579.25	9812.47	1579.27	9829	1578.92
9845.55	1578.7	9881.15	1578.46	9881.85	1578.46	9951.46	1578.6	9970.09	1578.59
9990.61	1578.7	10021.11	1578.16	10027.3	1578.02	10032.31	1578.16	10070.71	1578.734
10079.81	1578.87	10103.5	1578.91	10111.87	1578.98	10133.21	1578.88	10179.79	1578.96
10203.23	1578.91	10231.82	1578.91	10250.09	1578.76	10252.49	1578.74	10254.56	1578.73
10308.85	1578.58	10376.24	1578.51	10379.65	1578.31	10432.93	1578.67	10484.7	1578.9
10490.16	1578.93	10501.28	1578.91	10529.15	1579.14	10581.96	1579.42	10614.14	1579.59
10615.71	1579.6	10619	1579.61	10625.28	1579.62	10666.6	1579.81	10700.98	1579.52
10707.93	1579.55	10715.46	1579.61	10719.32	1579.56	10724.57	1579.76	10733.12	1579.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9524.84	.033	9829	.045	10079.81	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9990.61	10070.71	473	492.206	494	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1579.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.045	0.045	0.033
W.S. Elev (ft)	1579.16	Reach Len. (ft)	473.00	492.21	494.00
Crit W.S. (ft)	1578.98	Flow Area (sq ft)	92.53	61.30	181.14
E.G. Slope (ft/ft)	0.006811	Area (sq ft)	92.53	61.30	181.14
Q Total (cfs)	670.00	Flow (cfs)	170.95	139.74	359.32
Top Width (ft)	714.28	Top Width (ft)	172.75	80.10	461.43
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)	1.85	2.28	1.98
Max Chl Dpth (ft)	1.14	Hydr. Depth (ft)	0.54	0.77	0.39
Conv. Total (cfs)	8118.6	Conv. (cfs)	2071.4	1693.2	4353.9
Length Wtd. (ft)	484.48	Wetted Per. (ft)	172.76	80.11	461.44
Min Ch El (ft)	1578.02	Shear (lb/sq ft)	0.23	0.33	0.17
Alpha	1.02	Stream Power (lb/ft s)	0.42	0.74	0.33
Frctn Loss (ft)	2.22	Cum Volume (acre-ft)	15.90	8.43	2.32
C & E Loss (ft)	0.01	Cum SA (acres)	13.17	3.18	5.80

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1579.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.045	0.034
W.S. Elev (ft)	1579.70	Reach Len. (ft)	473.00	492.21	494.00
Crit W.S. (ft)		Flow Area (sq ft)		104.71	86.37
E.G. Slope (ft/ft)	0.008365	Area (sq ft)		104.71	86.37
Q Total (cfs)	670.00	Flow (cfs)		374.94	295.06
Top Width (ft)	189.18	Top Width (ft)		80.10	109.08
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)		3.58	3.42
Max Chl Dpth (ft)	1.68	Hydr. Depth (ft)		1.31	0.79
Conv. Total (cfs)	7325.4	Conv. (cfs)		4099.4	3226.0
Length Wtd. (ft)	487.49	Wetted Per. (ft)		81.11	109.82
Min Ch El (ft)	1578.02	Shear (lb/sq ft)		0.67	0.41
Alpha	1.00	Stream Power (lb/ft s)		2.41	1.40
Frctn Loss (ft)	2.19	Cum Volume (acre-ft)	2.28	14.94	0.68
C & E Loss (ft)	0.03	Cum SA (acres)	1.30	3.18	0.62

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9757.73	9990.61	170.94	92.53	172.76	25.51	0.54	1.85
2 Chan	9990.61	10070.71	139.74	61.30	80.11	20.86	0.77	2.28
3 ROB	10070.71	10401.92	276.24	135.82	331.21	41.23	0.41	2.03
4 ROB	10401.92	10733.12	83.08	45.32	130.23	12.40	0.35	1.83

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9990.61	10070.71	374.94	104.71	81.11	55.96	1.31	3.58
2 ROB	10070.71	10401.92	295.06	86.37	109.82	44.04	0.79	3.42

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.

CROSS SECTION

RIVER: T4N-R3W-S18W
REACH: Reach-1 RS: 0.445

INPUT
Description:
Station Elevation Data num= 61

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9421.5    1577 9432.21 1576.96 9445.16 1576.97 9539.43 1576.43 9559.74  1576.3
 9590.29 1576.28 9647.49 1576.95 9718.14 1577.07 9720.39 1576.89 9751.43  1576.4
 9764.93 1576.33 9789.86 1576.25 9791.56 1576.25 9841.42 1576.33 9873.99  1576.3
 9893.97 1576.41 9930.17 1576.34  9944.5 1576.32 9955.86 1576.28 9965.62  1576.2
 9976.15 1576.18 9989.49 1576.12 9996.95 1576.1210009.68 1576.0710010.91  1576.1
 10019.3 1576.0210020.99    157610034.17 1575.9710068.08 1575.7810086.66  1575.9
10094.96    157610146.57 1576.4110155.19 1576.4810155.57 1576.4810155.89  1576.5
10156.19 1576.4810156.71 1576.4810156.72 1576.4810157.95 1576.4910184.27  1576.6
10226.13  1576.810270.21 1576.7110275.48 1576.7310284.87 1576.7710343.94  1576.9
10345.49 1576.9410354.95 1577.0210412.92 1577.3210459.81 1577.3610480.08  1577.8
10484.52 1577.9210487.97    157810490.88 1578.0710491.82 1578.09   10492  1578.1
10492.53  1578.110493.22  1578.110493.82  1578.110494.74 1578.1110542.79  1578.4
10555.55 1578.47
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9421.5    .033 9893.97    .04510146.57    .033
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
10019.310094.96 433 507.373 438 .1 .3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1576.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.037	0.045	0.040
W.S. Elev (ft)	1576.95	Reach Len. (ft)	433.00	507.37	438.00
Crit W.S. (ft)	1576.65	Flow Area (sq ft)	262.74	79.55	83.30
E.G. Slope (ft/ft)	0.003298	Area (sq ft)	262.74	79.55	83.30
Q Total (cfs)	670.00	Flow (cfs)	411.36	155.99	102.65
Top Width (ft)	825.20	Top Width (ft)	498.03	75.66	251.51
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)	1.57	1.96	1.23
Max Chl Dpth (ft)	1.17	Hydr. Depth (ft)	0.53	1.05	0.33
Conv. Total (cfs)	11665.9	Conv. (cfs)	7162.4	2716.1	1787.4
Length Wtd. (ft)	456.75	Wetted Per. (ft)	498.04	75.66	251.52
Min Ch El (ft)	1575.78	Shear (lb/sq ft)	0.11	0.22	0.07
Alpha	1.06	Stream Power (lb/ft s)	0.17	0.42	0.08
Frctn Loss (ft)	2.17	Cum Volume (acre-ft)	13.97	7.64	0.82
C & E Loss (ft)	0.00	Cum SA (acres)	9.53	2.30	1.75

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1577.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.045	0.045	
W.S. Elev (ft)	1577.59	Reach Len. (ft)	433.00	507.37	438.00
Crit W.S. (ft)		Flow Area (sq ft)	168.70	128.22	
E.G. Slope (ft/ft)	0.002790	Area (sq ft)	168.70	128.22	
Q Total (cfs)	670.00	Flow (cfs)	356.48	313.52	
Top Width (ft)	200.99	Top Width (ft)	125.33	75.66	
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	2.11	2.45	
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)	1.35	1.69	
Conv. Total (cfs)	12684.2	Conv. (cfs)	6748.8	5935.4	
Length Wtd. (ft)	487.59	Wetted Per. (ft)	126.51	77.25	

```
* Min Ch El (ft)          * 1575.78  * Shear (lb/sq ft)        *    0.23  *    0.29  *          *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.49  *    0.71  *          *
* Frctn Loss (ft)         *    2.05  * Cum Volume (acre-ft)   *    1.36  *   13.62  *    0.19  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    0.62  *    2.30  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9421.50   * 9720.40   *    99.92 *    74.48 *   199.14 *    14.91 *
0.37 *     1.34 *
* 2         * LOB       * 9720.40   * 10019.30  *   311.43 *   188.26 *   298.91 *    46.48 *
0.63 *     1.65 *
* 3         * Chan      * 10019.30  * 10094.96  *   155.99 *    79.55 *    75.66 *    23.28 *
1.05 *     1.96 *
* 4         * ROB       * 10094.96  * 10325.25  *   102.12 *    81.97 *   230.30 *    15.24 *
0.36 *     1.25 *
* 5         * ROB       * 10325.25  * 10555.55  *     0.54 *     1.33 *    21.22 *     0.08 *
0.06 *     0.40 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9720.40   * 10019.30  *   356.48 *   168.70 *   126.51 *    53.21 *
1.35 *     2.11 *
* 2         * Chan      * 10019.30  * 10094.96  *   313.52 *   128.22 *    77.25 *    46.79 *
1.69 *     2.45 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S18W
REACH: Reach-1            RS: 0.349

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9244.87 1575.03 9280.04 1575.03 9309.56 1574.94 9331.75 1574.89  9370.1  1574.6
  9399.9 1574.64 9446.15 1574.52 9477.84 1574.44  9495.6 1574.45 9503.49  1574.5
 9510.48 1574.48 9569.31 1574.42 9612.21 1574.41 9652.57 1574.41 9679.98  1574.4
 9682.79 1574.44 9691.45 1574.43 9696.33 1574.43 9701.51 1574.41 9707.94  1574.4
```

```
 9732.23 1574.37 9742.68 1574.33 9752.23 1574.32 9821.58 1574.22 9844.42  1574.1
 9921.31 1574.19 9940.23 1574.27 9949.65 1574.04 9951.83    1574 9955.49    1574
 9969.06 1573.6710014.26 1573.8610031.68    157410039.85 1574.0110066.55  1574.2
10142.63  1575.310144.78 1575.3210145.48 1575.3310149.52 1575.3310214.07  1575.1
10217.94 1575.1110227.98 1575.13   10260 1575.0610297.22  1575.810305.49  1575.9
10314.44 1575.9410321.61 1575.9410403.88 1575.5110406.15  1575.510464.04  1575.8
10494.62 1575.9110511.17 1575.9410524.12 1575.9610533.58    157610534.92    1576
 10540.5 1576.0110543.66 1576.0410547.03 1576.0610555.01 1576.0310561.78    1576
10619.13 1576.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9244.87    .033 9752.23    .04510066.55    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.2310066.55              286  342.89     298             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1574.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *   0.039  *   0.045  *   0.033  *
* W.S. Elev (ft)         * 1574.75  * Reach Len. (ft)         *  286.00  *  342.89  *  298.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  217.27  *  104.80  *   10.56  *
* E.G. Slope (ft/ft)     *0.007455  * Area (sq ft)            *  217.27  *  104.80  *   10.56  *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *  388.81  *  263.77  *   17.41  *
* Top Width (ft)         *  754.84  * Top Width (ft)          *  590.31  *  126.32  *   38.22  *
* Vel Total (ft/s)       *    2.01  * Avg. Vel. (ft/s)        *    1.79  *    2.52  *    1.65  *
* Max Chl Dpth (ft)      *    1.08  * Hydr. Depth (ft)        *    0.37  *    0.83  *    0.28  *
* Conv. Total (cfs)      *  7760.0  * Conv. (cfs)             *  4503.3  *  3055.0  *   201.7  *
* Length Wtd. (ft)       *  306.95  * Wetted Per. (ft)        *  590.31  *  126.33  *   38.22  *
* Min Ch El (ft)         * 1573.67  * Shear (lb/sq ft)        *    0.17  *    0.39  *    0.13  *
* Alpha                  *    1.09  * Stream Power (lb/ft s)  *    0.31  *    0.97  *    0.21  *
* Frctn Loss (ft)        *    1.58  * Cum Volume (acre-ft)    *   11.59  *    6.57  *    0.35  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    4.12  *    1.12  *    0.30  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1575.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.20  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)         * 1575.41  * Reach Len. (ft)         *  286.00  *  342.89  *  298.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  188.00  *          *
* E.G. Slope (ft/ft)     *0.007027  * Area (sq ft)            *          *  188.00  *          *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *          *  670.00  *          *
* Top Width (ft)         *  126.32  * Top Width (ft)          *          *  126.32  *          *
* Vel Total (ft/s)       *    3.56  * Avg. Vel. (ft/s)        *          *    3.56  *          *
* Max Chl Dpth (ft)      *    1.74  * Hydr. Depth (ft)        *          *    1.49  *          *
* Conv. Total (cfs)      *  7992.9  * Conv. (cfs)             *          *  7992.9  *          *
* Length Wtd. (ft)       *  342.89  * Wetted Per. (ft)        *          *  128.68  *          *
* Min Ch El (ft)         * 1573.67  * Shear (lb/sq ft)        *          *    0.64  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    2.28  *          *
* Frctn Loss (ft)        *    1.32  * Cum Volume (acre-ft)    *    0.53  *   11.78  *    0.19  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *          *    1.12  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9244.87   * 9592.55   *    83.89 *    57.19 *   242.63 *    12.52 *
0.24 *     1.47 *
* 2          * LOB       * 9592.55   * 9940.23   *   304.93 *   160.08 *   347.68 *    45.51 *
0.46 *     1.90 *
* 3          * Chan      * 9940.23   * 10066.55  *   263.77 *   104.80 *   126.33 *    39.37 *
0.83 *     2.52 *
* 4          * ROB       * 10066.55  * 10342.84  *    17.41 *    10.56 *    38.22 *     2.60 *
0.28 *     1.65 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9940.23   * 10066.55  *   670.00 *   188.00 *   128.68 *   100.00 *
1.49 *     3.56 *
*****************************************************************************************************
******************

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.
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: T4N-R3W-S18W
REACH: Reach-1            RS: 0.284

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9147.83  1573.2 9183.37 1573.11 9263.77    1573 9271.94 1572.99 9272.49 1572.99
  9275.7    1573 9357.06 1573.41 9360.69 1573.41 9372.45 1573.26 9413.96 1572.54
 9431.33  1572.4 9433.58 1572.45 9473.66 1572.68 9482.32 1572.68 9590.36  1572.4
 9591.54  1572.4 9595.11 1572.42 9600.61 1572.44 9684.53    1573 9715.57 1572.83
 9766.54  1572.7  9810.8 1572.82  9847.6 1572.89 9860.22 1572.79 9878.83 1572.63
 9908.63  1572.3 9929.47 1572.28 9968.96  1572.610011.01  1572.110014.08 1572.14
10037.13  1572.610051.93 1572.8510055.68 1572.9710105.66 1573.3310156.54 1572.98
10169.58  1572.910180.15 1573.0110235.13 1573.2710304.65 1573.15 10304.7 1573.15
10304.77  1573.210383.43 1573.6410457.21 1573.6910468.63 1573.6710469.01 1573.67
10473.96  1573.710540.55 1573.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9147.83    .033  9847.6    .04510051.93    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9878.8310037.13                 0       0       0             .1       .3
Right Levee     Station=10105.66      Elevation= 1573.33

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1573.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.033  *   0.045  *   0.042  *
* W.S. Elev (ft)         * 1573.19  * Reach Len. (ft)         * 1499.52  * 1499.52  * 1499.52  *
* Crit W.S. (ft)         * 1572.93  * Flow Area (sq ft)       *  265.93  *  127.38  *   11.26  *
* E.G. Slope (ft/ft)     *0.003777  * Area (sq ft)            *  265.93  *  127.38  *   11.26  *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *  434.92  *  223.62  *   11.45  *
* Top Width (ft)         *  870.85  * Top Width (ft)          *  663.55  *  158.30  *   49.01  *
```

Vel Total (ft/s)	1.66	Avg. Vel. (ft/s)	1.64	1.76	1.02	
Max Chl Dpth (ft)	1.09	Hydr. Depth (ft)	0.40	0.80	0.23	
Conv. Total (cfs)	10901.8	Conv. (cfs)	7076.8	3638.7	186.3	
Length Wtd. (ft)	1499.52	Wetted Per. (ft)	663.56	158.31	49.01	
Min Ch El (ft)	1572.10	Shear (lb/sq ft)	0.09	0.19	0.05	
Alpha	1.01	Stream Power (lb/ft s)	0.15	0.33	0.06	
Frctn Loss (ft)	3.05	Cum Volume (acre-ft)	10.00	5.65	0.27	
C & E Loss (ft)	0.00	Cum SA (acres)				

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 OUTPUT Profile #2

E.G. Elev (ft)	1574.26	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.09	Wt. n-Val.		0.045		
W.S. Elev (ft)	1574.17	Reach Len. (ft)	1499.52	1499.52	1499.52	
Crit W.S. (ft)	1573.20	Flow Area (sq ft)		282.78		
E.G. Slope (ft/ft)	0.002438	Area (sq ft)		282.78		
Q Total (cfs)	670.00	Flow (cfs)		670.00		
Top Width (ft)	158.30	Top Width (ft)		158.30		
Vel Total (ft/s)	2.37	Avg. Vel. (ft/s)		2.37		
Max Chl Dpth (ft)	2.07	Hydr. Depth (ft)		1.79		
Conv. Total (cfs)	13569.3	Conv. (cfs)		13569.3		
Length Wtd. (ft)	1499.52	Wetted Per. (ft)		161.42		
Min Ch El (ft)	1572.10	Shear (lb/sq ft)		0.27		
Alpha	1.00	Stream Power (lb/ft s)		0.63		
Frctn Loss (ft)	3.18	Cum Volume (acre-ft)	0.53	9.93	0.19	
C & E Loss (ft)	0.00	Cum SA (acres)				

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9147.83	9513.33	122.03	90.76	298.06	18.21	0.30	1.34
2	LOB	9513.33	9878.83	312.89	175.17	365.50	46.70	0.48	1.79
3	Chan	9878.83	10037.13	223.63	127.38	158.31	33.38	0.80	1.76
4	ROB	10037.13	10105.66	11.45	11.26	49.01	1.71	0.23	1.02

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.

Profile #2

```
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9878.83   * 10037.13  *   670.00 *   282.78 *   161.42 *   100.00 *
1.79 *     2.37 *
*****************************************************************************************
******************
```

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.

****

SUMMARY OF MANNING'S N VALUES

River:T4N-R3W-S07

Reach	River Sta.	n1	n2	n3
Reach-1	1.993	.033	.055	.033
Reach-1	1.893	.033	.055	.033
Reach-1	1.807	.033	.055	.033
Reach-1	1.710	.033	.055	.033
Reach-1	1.617	.033	.055	.033
Reach-1	1.524	.033	.055	.033
Reach-1	1.431	.033	.055	.033
Reach-1	1.336	.033	.055	.033
Reach-1	1.241	.033	.055	.033
Reach-1	1.137	.033	.055	.033
Reach-1	1.051	.033	.055	.033
Reach-1	0.948	.033	.055	.033
Reach-1	0.859	.033	.055	.033
Reach-1	0.767	.033	.055	.033
Reach-1	0.684	.033	.055	.033
Reach-1	0.581	.033	.055	.033
Reach-1	0.477	.033	.055	.033
Reach-1	0.399	.033	.055	.033
Reach-1	0.317	.033	.055	.033
Reach-1	0.180	.033	.055	.033

River:T4N-R3W-S16

Reach	River Sta.	n1	n2	n3
Reach-1a	1.648	.035	.053	.035
Reach-1a	1.644	.035	.053	.035
Reach-1	1.640	.035	.053	.035
Reach-1	1.556	.035	.06	.035
Reach-2	1.184	.033	.06	.035
Reach-2	1.089	.035	.053	.035
Reach-2	0.995	.035	.053	.035
Reach-2	0.899	.035	.053	.035
Reach-2	0.831	.035	.06	.033
Reach-3	0.707	.035	.06	.033
Reach-3	0.602	.035	.06	.033
Reach-3	0.506	.035	.06	.033
Reach-3	0.409	.035	.06	.033
Reach-3	0.297	.033	.06	.035
Reach-3	0.221	.033	.06	.035
Reach-3	0.102	.033	.06	.035
Reach-3	0.000	.033	.06	.035

River:T4N-R3W-S17

Reach	River Sta.	n1	n2	n3

*Reach-1	2.757	.033*	.055*	.033*
*Reach-1	2.673	.033*	.055*	.033*
*Reach-1	2.584	.033*	.055*	.033*
*Reach-1	2.473	.033*	.055*	.033*
*Reach-1	2.391	.033*	.055*	.033*
*Reach-1	2.298	.033*	.055*	.033*
*Reach-1	2.215	.033*	.055*	.033*
*Reach-1	2.124	.033*	.055*	.033*
*Reach-1	2.029	.033*	.055*	.033*
*Reach-1	1.923	.033*	.055*	.033*
*Reach-1	1.828	.033*	.055*	.033*
*Reach-1	1.744	.033*	.055*	.033*
*Reach-1	1.627	.033*	.055*	.033*
*Reach-2	1.550	.033*	.055*	.033*
*Reach-2	1.455	.033*	.055*	.033*
*Reach-2	1.366	.033*	.055*	.033*
*Reach-2	1.268	.033*	.055*	.033*
*Reach-2	1.172	.033*	.055*	.033*
*Reach-2	1.071	.033*	.055*	.033*
*Reach-2	0.973	.033*	.055*	.033*
*Reach-2	0.877	.031*	.042*	.031*
*Reach-2	0.778	.031*	.042*	.031*
*Reach-2	0.679	.031*	.042*	.031*
*Reach-2	0.585	.031*	.042*	.031*
*Reach-2	0.482	.031*	.042*	.031*
*Reach-2	0.382	.031*	.042*	.031*
*Reach-2	0.284	.031*	.042*	.031*
*Reach-2	0.186	.033*	.058*	.033*
*Reach-2	0.153	.033*	.058*	.033*

River:T4N-R3W-S18E

Reach	River Sta.	n1	n2	n3	n4	n5
*Reach-1	4.247	.033*	.058*	.033*	*	*
*Reach-1	4.135	.033*	.033*	.033*	*	*
*Reach-1	4.059	.033*	.058*	.033*	*	*
*Reach-1	3.962	.033*	.058*	.033*	*	*
*Reach-1	3.872	.033*	.053*	.033*	*	*
*Reach-1	3.787	.033*	.053*	.033*	*	*
*Reach-1	3.706	.033*	.053*	.033*	.033*	*
*Reach-1	3.578	.033*	.053*	.033*	*	*
*Reach-1	3.461	.033*	.053*	.033*	*	*
*Reach-1	3.344	.033*	.053*	.033*	*	*
*Reach-1	3.264	.033*	.053*	.033*	*	*
*Reach-1	3.153	.033*	.053*	.033*	*	*
*Reach-1	3.059	.033*	.053*	.033*	*	*
*Reach-1	2.961	.033*	.053*	.033*	*	*
*Reach-1	2.860	.033*	.053*	.033*	*	*
*Reach-1	2.752	.033*	.053*	.033*	*	*
*Reach-1	2.656	.035*	.053*	.035*	*	*
*Reach-1	2.562	.035*	.053*	.035*	*	*
*Reach-1	2.468	.035*	.053*	.035*	*	*
*Reach-1	2.374	.035*	.053*	.035*	*	*
*Reach-1	2.276	.035*	.053*	.035*	.053*	.035*
*Reach-2	2.260	.035*	.053*	.035*	*	*
*Reach-2	2.175	.035*	.053*	.035*	*	*
*Reach-2	2.081	.035*	.053*	.035*	*	*
*Reach-3	2.260	.035*	.053*	.035*	*	*
*Reach-3	2.175	.035*	.053*	.035*	*	*
*Reach-3	2.081	.035*	.053*	.035*	*	*
*Reach-4	1.945	.035*	.053*	.035*	*	*
*Reach-4	1.866	.035*	.053*	.035*	*	*
*Reach-4	1.773	.035*	.053*	.035*	*	*
*Reach-4	1.674	.033*	.05*	.033*	*	*
*Reach-4	1.580	.033*	.05*	.033*	*	*
*Reach-4	1.486	.033*	.05*	.033*	*	*
*Reach-4	1.378	.033*	.05*	.033*	*	*
*Reach-4	1.282	.033*	.05*	.033*	*	*

*Reach-4	*	1.192	*	.033*	.05*	.033*	*	*
*Reach-4	*	1.095	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.998	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.879	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.803	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.709	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.615	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.517	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.422	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.326	*	.033*	.05*	.033*	*	*
*Reach-4	*	0.228	*	.033*	.053*	.033*	*	*

River:T4N-R3W-S18W

* Reach	*	River Sta.	*	n1	*	n2	*	n3	*
*Reach-1	*	2.537	*	.033*		.052*		.033*	
*Reach-1	*	2.445	*	.033*		.052*		.033*	
*Reach-1	*	2.351	*	.033*		.052*		.033*	
*Reach-1	*	2.260	*	.033*		.052*		.033*	
*Reach-1	*	2.173	*	.033*		.052*		.033*	
*Reach-1	*	2.080	*	.033*		.052*		.033*	
*Reach-1	*	1.987	*	.033*		.052*		.033*	
*Reach-1	*	1.928	*	.033*		.052*		.033*	
*Reach-1	*	1.838	*	.033*		.052*		.033*	
*Reach-1	*	1.750	*	.033*		.052*		.033*	
*Reach-1	*	1.664	*	.033*		.052*		.033*	
*Reach-1	*	1.567	*	.033*		.052*		.033*	
*Reach-1	*	1.477	*	.033*		.052*		.033*	
*Reach-1	*	1.382	*	.033*		.052*		.033*	
*Reach-1	*	1.296	*	.033*		.052*		.033*	
*Reach-1	*	1.196	*	.033*		.052*		.033*	
*Reach-1	*	1.104	*	.033*		.052*		.033*	
*Reach-1	*	1.012	*	.033*		.052*		.033*	
*Reach-1	*	0.920	*	.033*		.045*		.033*	
*Reach-1	*	0.824	*	.033*		.045*		.033*	
*Reach-1	*	0.732	*	.033*		.045*		.033*	
*Reach-1	*	0.635	*	.033*		.045*		.033*	
*Reach-1	*	0.593	*	.033*		.045*		.033*	
*Reach-1	*	0.538	*	.033*		.045*		.033*	
*Reach-1	*	0.445	*	.033*		.045*		.033*	
*Reach-1	*	0.349	*	.033*		.045*		.033*	
*Reach-1	*	0.284	*	.033*		.045*		.033*	

SUMMARY OF REACH LENGTHS

River: T4N-R3W-S07

* Reach	*	River Sta.	*	Left	*	Channel	*	Right	*
*Reach-1	*	1.993	*	500*		528.39*		543*	
*Reach-1	*	1.893	*	434*		457.73*		436*	
*Reach-1	*	1.807	*	472*		509.43*		528*	
*Reach-1	*	1.710	*	488*		494.68*		480*	
*Reach-1	*	1.617	*	488*		487.79*		478*	
*Reach-1	*	1.524	*	493*		491.44*		492*	
*Reach-1	*	1.431	*	510*		501.09*		492*	
*Reach-1	*	1.336	*	502*		502.14*		463*	
*Reach-1	*	1.241	*	501*		551.91*		465*	
*Reach-1	*	1.137	*	460*		453.4*		429*	
*Reach-1	*	1.051	*	491*		541.85*		552*	
*Reach-1	*	0.948	*	457*		469.76*		471*	
*Reach-1	*	0.859	*	482*		485.56*		481*	
*Reach-1	*	0.767	*	464*		437.11*		426*	
*Reach-1	*	0.684	*	555*		548.15*		529*	
*Reach-1	*	0.581	*	530*		544.25*		510*	
*Reach-1	*	0.477	*	426*		413.05*		405*	

*Reach-1	*	0.399	*	404*	432.97*	441*
*Reach-1	*	0.317	*	723*	727.16*	627*
*Reach-1	*	0.180	*	0*	0*	0*

River: T4N-R3W-S16

* Reach	*	River Sta.	*	Left	* Channel *	Right *
*Reach-1a	*	1.648	*	20*	20*	20*
*Reach-1a	*	1.644	*	0*	0*	0*
*Reach-1	*	1.640	*	430*	441.26*	443*
*Reach-1	*	1.556	*	0*	0*	0*
*Reach-2	*	1.184	*	497*	501.18*	500*
*Reach-2	*	1.089	*	502*	501.28*	501*
*Reach-2	*	0.995	*	504*	504.09*	504*
*Reach-2	*	0.899	*	352*	358.05*	351*
*Reach-2	*	0.831	*	0*	0*	0*
*Reach-3	*	0.707	*	554*	554.39*	554*
*Reach-3	*	0.602	*	512*	510.98*	511*
*Reach-3	*	0.506	*	511*	511.92*	512*
*Reach-3	*	0.409	*	580*	588.42*	580*
*Reach-3	*	0.297	*	396*	402.37*	394*
*Reach-3	*	0.221	*	620*	629.2*	625*
*Reach-3	*	0.102	*	542*	537.24*	531*
*Reach-3	*	0.000	*	0*	0*	0*

River: T4N-R3W-S17

* Reach	*	River Sta.	*	Left	* Channel *	Right *
*Reach-1	*	2.757	*	433*	439.95*	441*
*Reach-1	*	2.673	*	468*	474.47*	474*
*Reach-1	*	2.584	*	587*	584.74*	553*
*Reach-1	*	2.473	*	397*	432.26*	442*
*Reach-1	*	2.391	*	475*	490.07*	499*
*Reach-1	*	2.298	*	447*	437.2*	415*
*Reach-1	*	2.215	*	466*	480.01*	457*
*Reach-1	*	2.124	*	547*	505.23*	406*
*Reach-1	*	2.029	*	474*	558.16*	490*
*Reach-1	*	1.923	*	447*	499.57*	515*
*Reach-1	*	1.828	*	455*	446.24*	411*
*Reach-1	*	1.744	*	540*	617.87*	575*
*Reach-1	*	1.627	*	0*	0*	0*
*Reach-2	*	1.550	*	527*	500.36*	441*
*Reach-2	*	1.455	*	392*	473.07*	497*
*Reach-2	*	1.366	*	483*	513.97*	495*
*Reach-2	*	1.268	*	473*	506.74*	519*
*Reach-2	*	1.172	*	502*	535.5*	492*
*Reach-2	*	1.071	*	470*	514.91*	503*
*Reach-2	*	0.973	*	495*	508.78*	496*
*Reach-2	*	0.877	*	525*	521.65*	470*
*Reach-2	*	0.778	*	503*	523.77*	507*
*Reach-2	*	0.679	*	464*	497.24*	522*
*Reach-2	*	0.585	*	570*	543.27*	514*
*Reach-2	*	0.482	*	497*	529.98*	514*
*Reach-2	*	0.382	*	499*	516.44*	493*
*Reach-2	*	0.284	*	511*	515.32*	494*
*Reach-2	*	0.186	*	177*	176.78*	176*
*Reach-2	*	0.153	*	0*	0*	0*

River: T4N-R3W-S18E

* Reach	*	River Sta.	*	Left	* Channel *	Right *
*Reach-1	*	4.247	*	601*	599.33*	486*
*Reach-1	*	4.135	*	403*	401.56*	320*
*Reach-1	*	4.059	*	539*	511.4*	478*
*Reach-1	*	3.962	*	473*	476.38*	465*

*Reach-1	*	3.872	*	429*	451.6*	429*
*Reach-1	*	3.787	*	385*	396.77*	491*
*Reach-1	*	3.706	*	687*	696.73*	628*
*Reach-1	*	3.578	*	553*	616.79*	579*
*Reach-1	*	3.461	*	594*	621.56*	643*
*Reach-1	*	3.344	*	399*	420.87*	426*
*Reach-1	*	3.264	*	551*	584.25*	570*
*Reach-1	*	3.153	*	469*	498.02*	453*
*Reach-1	*	3.059	*	475*	519.2*	536*
*Reach-1	*	2.961	*	530*	534.17*	518*
*Reach-1	*	2.860	*	541*	565.04*	569*
*Reach-1	*	2.752	*	343*	510.6*	491*
*Reach-1	*	2.656	*	586*	494.36*	468*
*Reach-1	*	2.562	*	513*	495.52*	479*
*Reach-1	*	2.468	*	510*	497.68*	472*
*Reach-1	*	2.374	*	507*	518.21*	508*
*Reach-1	*	2.276	*	0*	0*	0*
*Reach-2	*	2.260	*	344*	448.8*	386*
*Reach-2	*	2.175	*	490*	495.69*	503*
*Reach-2	*	2.081	*	0*	0*	0*
*Reach-3	*	2.260	*	400*	448.8*	503*
*Reach-3	*	2.175	*	490*	495.69*	503*
*Reach-3	*	2.081	*	0*	0*	0*
*Reach-4	*	1.945	*	440*	418.06*	385*
*Reach-4	*	1.866	*	450*	491.89*	393*
*Reach-4	*	1.773	*	467*	518.93*	479*
*Reach-4	*	1.674	*	450*	498.76*	506*
*Reach-4	*	1.580	*	442*	493.8*	511*
*Reach-4	*	1.486	*	534*	573.73*	607*
*Reach-4	*	1.378	*	516*	508.1*	493*
*Reach-4	*	1.282	*	436*	473.92*	491*
*Reach-4	*	1.192	*	489*	512.82*	524*
*Reach-4	*	1.095	*	535*	509.67*	490*
*Reach-4	*	0.998	*	443*	628.76*	493*
*Reach-4	*	0.879	*	521*	402.69*	444*
*Reach-4	*	0.803	*	504*	494.42*	482*
*Reach-4	*	0.709	*	487*	496.18*	519*
*Reach-4	*	0.615	*	512*	520.46*	494*
*Reach-4	*	0.517	*	514*	500.64*	469*
*Reach-4	*	0.422	*	511*	504.22*	500*
*Reach-4	*	0.326	*	484*	518.89*	505*
*Reach-4	*	0.228	*	0*	0*	0*

River: T4N-R3W-S18W

* Reach	*	River Sta.	*	Left *	Channel *	Right *
*Reach-1	*	2.537	*	427*	483.786*	549*
*Reach-1	*	2.445	*	496*	493.864*	495*
*Reach-1	*	2.351	*	482*	481.125*	474*
*Reach-1	*	2.260	*	545*	461.922*	399*
*Reach-1	*	2.173	*	484*	489.965*	483*
*Reach-1	*	2.080	*	490*	493.934*	479*
*Reach-1	*	1.987	*	326*	310.929*	291*
*Reach-1	*	1.928	*	437*	467.714*	500*
*Reach-1	*	1.838	*	402*	461.159*	474*
*Reach-1	*	1.750	*	489*	454.822*	413*
*Reach-1	*	1.664	*	473*	511.379*	586*
*Reach-1	*	1.567	*	478*	479.899*	481*
*Reach-1	*	1.477	*	494*	501.458*	481*
*Reach-1	*	1.382	*	484*	450.962*	441*
*Reach-1	*	1.296	*	460*	529.224*	525*
*Reach-1	*	1.196	*	393*	483.288*	557*
*Reach-1	*	1.104	*	421*	490.446*	486*
*Reach-1	*	1.012	*	471*	485.919*	477*
*Reach-1	*	0.920	*	545*	502.127*	422*
*Reach-1	*	0.824	*	497*	489.325*	477*
*Reach-1	*	0.732	*	517*	510.224*	459*
*Reach-1	*	0.635	*	212*	221.385*	184*
*Reach-1	*	0.593	*	304*	289.303*	262*

*Reach-1	*	0.538	*	473*	492.206*	494*
*Reach-1	*	0.445	*	433*	507.373*	438*
*Reach-1	*	0.349	*	286*	342.89*	298*
*Reach-1	*	0.284	*	0*	0*	0*

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: T4N-R3W-S07

Reach	River Sta.	Contr.	Expan.
*Reach-1	1.993	.1	.3
*Reach-1	1.893	.1	.3
*Reach-1	1.807	.1	.3
*Reach-1	1.710	.1	.3
*Reach-1	1.617	.1	.3
*Reach-1	1.524	.1	.3
*Reach-1	1.431	.1	.3
*Reach-1	1.336	.1	.3
*Reach-1	1.241	.1	.3
*Reach-1	1.137	.1	.3
*Reach-1	1.051	.1	.3
*Reach-1	0.948	.1	.3
*Reach-1	0.859	.1	.3
*Reach-1	0.767	.1	.3
*Reach-1	0.684	.1	.3
*Reach-1	0.581	.1	.3
*Reach-1	0.477	.1	.3
*Reach-1	0.399	.1	.3
*Reach-1	0.317	.1	.3
*Reach-1	0.180	.1	.3

River: T4N-R3W-S16

Reach	River Sta.	Contr.	Expan.
*Reach-1a	1.648	.1	.3
*Reach-1a	1.644	.1	.3
*Reach-1	1.640	.1	.3
*Reach-1	1.556	.1	.3
*Reach-2	1.184	.1	.3
*Reach-2	1.089	.1	.3
*Reach-2	0.995	.1	.3
*Reach-2	0.899	.1	.3
*Reach-2	0.831	.1	.3
*Reach-3	0.707	.1	.3
*Reach-3	0.602	.1	.3
*Reach-3	0.506	.1	.3
*Reach-3	0.409	.1	.3
*Reach-3	0.297	.1	.3
*Reach-3	0.221	.1	.3
*Reach-3	0.102	.1	.3
*Reach-3	0.000	.1	.3

River: T4N-R3W-S17

Reach	River Sta.	Contr.	Expan.
*Reach-1	2.757	.1	.3
*Reach-1	2.673	.1	.3
*Reach-1	2.584	.1	.3
*Reach-1	2.473	.1	.3
*Reach-1	2.391	.1	.3
*Reach-1	2.298	.1	.3
*Reach-1	2.215	.1	.3
*Reach-1	2.124	.1	.3

*Reach-1	*	2.029	*	.1*	.3*
*Reach-1	*	1.923	*	.1*	.3*
*Reach-1	*	1.828	*	.1*	.3*
*Reach-1	*	1.744	*	.1*	.3*
*Reach-1	*	1.627	*	.1*	.3*
*Reach-2	*	1.550	*	.1*	.3*
*Reach-2	*	1.455	*	.1*	.3*
*Reach-2	*	1.366	*	.1*	.3*
*Reach-2	*	1.268	*	.1*	.3*
*Reach-2	*	1.172	*	.1*	.3*
*Reach-2	*	1.071	*	.1*	.3*
*Reach-2	*	0.973	*	.1*	.3*
*Reach-2	*	0.877	*	.1*	.3*
*Reach-2	*	0.778	*	.1*	.3*
*Reach-2	*	0.679	*	.1*	.3*
*Reach-2	*	0.585	*	.1*	.3*
*Reach-2	*	0.482	*	.1*	.3*
*Reach-2	*	0.382	*	.1*	.3*
*Reach-2	*	0.284	*	.1*	.3*
*Reach-2	*	0.186	*	.1*	.3*
*Reach-2	*	0.153	*	.1*	.3*

River: T4N-R3W-S18E

* Reach	*	River Sta.	*	Contr.	*	Expan.	*
*Reach-1	*	4.247	*	.1*		.3*	
*Reach-1	*	4.135	*	.1*		.3*	
*Reach-1	*	4.059	*	.1*		.3*	
*Reach-1	*	3.962	*	.1*		.3*	
*Reach-1	*	3.872	*	.1*		.3*	
*Reach-1	*	3.787	*	.1*		.3*	
*Reach-1	*	3.706	*	.1*		.3*	
*Reach-1	*	3.578	*	.1*		.3*	
*Reach-1	*	3.461	*	.1*		.3*	
*Reach-1	*	3.344	*	.1*		.3*	
*Reach-1	*	3.264	*	.1*		.3*	
*Reach-1	*	3.153	*	.1*		.3*	
*Reach-1	*	3.059	*	.1*		.3*	
*Reach-1	*	2.961	*	.1*		.3*	
*Reach-1	*	2.860	*	.1*		.3*	
*Reach-1	*	2.752	*	.1*		.3*	
*Reach-1	*	2.656	*	.1*		.3*	
*Reach-1	*	2.562	*	.1*		.3*	
*Reach-1	*	2.468	*	.1*		.3*	
*Reach-1	*	2.374	*	.1*		.3*	
*Reach-1	*	2.276	*	.1*		.3*	
*Reach-2	*	2.260	*	.1*		.3*	
*Reach-2	*	2.175	*	.1*		.3*	
*Reach-2	*	2.081	*	.1*		.3*	
*Reach-3	*	2.260	*	.1*		.3*	
*Reach-3	*	2.175	*	.1*		.3*	
*Reach-3	*	2.081	*	.1*		.3*	
*Reach-4	*	1.945	*	.1*		.3*	
*Reach-4	*	1.866	*	.1*		.3*	
*Reach-4	*	1.773	*	.1*		.3*	
*Reach-4	*	1.674	*	.1*		.3*	
*Reach-4	*	1.580	*	.1*		.3*	
*Reach-4	*	1.486	*	.1*		.3*	
*Reach-4	*	1.378	*	.1*		.3*	
*Reach-4	*	1.282	*	.1*		.3*	
*Reach-4	*	1.192	*	.1*		.3*	
*Reach-4	*	1.095	*	.1*		.3*	
*Reach-4	*	0.998	*	.1*		.3*	
*Reach-4	*	0.879	*	.1*		.3*	
*Reach-4	*	0.803	*	.1*		.3*	
*Reach-4	*	0.709	*	.1*		.3*	
*Reach-4	*	0.615	*	.1*		.3*	
*Reach-4	*	0.517	*	.1*		.3*	
*Reach-4	*	0.422	*	.1*		.3*	

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*Reach-4          *    0.326   *        .1*        .3*
*Reach-4          *    0.228   *        .1*        .3*
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River: T4N-R3W-S18W

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*     Reach       *   River Sta.   * Contr.  * Expan.  *
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*Reach-1          *    2.537   *        .1*        .3*
*Reach-1          *    2.445   *        .1*        .3*
*Reach-1          *    2.351   *        .1*        .3*
*Reach-1          *    2.260   *        .1*        .3*
*Reach-1          *    2.173   *        .1*        .3*
*Reach-1          *    2.080   *        .1*        .3*
*Reach-1          *    1.987   *        .1*        .3*
*Reach-1          *    1.928   *        .1*        .3*
*Reach-1          *    1.838   *        .1*        .3*
*Reach-1          *    1.750   *        .1*        .3*
*Reach-1          *    1.664   *        .1*        .3*
*Reach-1          *    1.567   *        .1*        .3*
*Reach-1          *    1.477   *        .1*        .3*
*Reach-1          *    1.382   *        .1*        .3*
*Reach-1          *    1.296   *        .1*        .3*
*Reach-1          *    1.196   *        .1*        .3*
*Reach-1          *    1.104   *        .1*        .3*
*Reach-1          *    1.012   *        .1*        .3*
*Reach-1          *    0.920   *        .1*        .3*
*Reach-1          *    0.824   *        .1*        .3*
*Reach-1          *    0.732   *        .1*        .3*
*Reach-1          *    0.635   *        .1*        .3*
*Reach-1          *    0.593   *        .1*        .3*
*Reach-1          *    0.538   *        .1*        .3*
*Reach-1          *    0.445   *        .1*        .3*
*Reach-1          *    0.349   *        .1*        .3*
*Reach-1          *    0.284   *        .1*        .3*
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HEC-RAS Plan: FP

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH 3-WEST	REACH-1	6.912	1	380.00	1741.87	1744.70		1744.90	0.005995	3.70	115.70	146.46	0.49
WASH 3-WEST	REACH-1	6.912	2	380.00	1741.87	1744.86		1745.06	0.005247	3.62	104.91	54.19	0.46
WASH 3-WEST	REACH-1	6.811	1	380.00	1739.40	1741.39	1741.19	1741.50	0.006894	2.84	150.71	257.00	0.49
WASH 3-WEST	REACH-1	6.811	2	380.00	1739.40	1742.09		1742.29	0.005205	3.39	107.05	65.22	0.45
WASH 3-WEST	REACH-1	6.685	1	380.00	1734.93	1737.37		1737.47	0.006190	2.61	155.41	289.20	0.46
WASH 3-WEST	REACH-1	6.685	2	380.00	1734.93	1737.72		1737.94	0.008801	3.75	101.25	73.81	0.56
WASH 3-WEST	REACH-1	6.578	1	380.00	1733.02	1734.13	1733.96	1734.19	0.005886	2.18	201.16	388.78	0.43
WASH 3-WEST	REACH-1	6.578	2	380.00	1733.02	1734.75	1734.07	1734.85	0.003794	2.53	150.43	108.38	0.37
WASH 3-WEST	REACH-1	6.476	1	670.00	1727.48	1730.88	1730.54	1731.01	0.005811	2.82	236.48	278.31	0.45
WASH 3-WEST	REACH-1	6.476	2	670.00	1727.48	1731.59	1730.91	1731.84	0.006796	4.05	165.40	86.44	0.52
WASH 3-WEST	REACH-1	6.387	1	670.00	1725.30	1728.14	1727.85	1728.25	0.006405	2.56	259.96	357.40	0.46
WASH 3-WEST	REACH-1	6.387	2	670.00	1725.30	1728.70		1728.87	0.005800	3.27	204.94	134.55	0.47
WASH 3-WEST	REACH-1	6.318	1	670.00	1724.97	1725.95	1725.88	1726.05	0.005880	2.23	279.09	396.97	0.43
WASH 3-WEST	REACH-1	6.318	2	670.00	1724.97	1726.46	1725.96	1726.62	0.006676	3.23	207.32	155.77	0.49
WASH 3-WEST	REACH-1	6.209	1	670.00	1718.93	1722.04	1721.62	1722.16	0.008006	3.21	255.78	356.60	0.52
WASH 3-WEST	REACH-1	6.209	2	670.00	1718.93	1722.75		1722.96	0.005955	3.71	180.40	95.56	0.48
WASH 3-WEST	REACH-1	6.111	1	670.00	1716.01	1719.01	1718.69	1719.09	0.004846	2.56	318.24	515.39	0.41
WASH 3-WEST	REACH-1	6.111	2	670.00	1716.01	1719.35	1718.82	1719.56	0.007457	3.70	181.02	119.12	0.53
WASH 3-WEST	REACH-1	6.005	1	670.00	1711.46	1715.51	1715.37	1715.64	0.008697	3.57	261.98	475.35	0.55
WASH 3-WEST	REACH-1	6.005	2	670.00	1711.46	1716.48		1716.64	0.003847	3.40	213.70	110.88	0.40
WASH 3-WEST	REACH-1	5.905	1	980.00	1709.20	1712.41	1711.91	1712.55	0.005052	3.47	336.66	351.16	0.46
WASH 3-WEST	REACH-1	5.905	2	980.00	1709.20	1713.13		1713.58	0.008263	5.38	182.09	72.07	0.60
WASH 3-WEST	REACH-1	5.801	1	980.00	1707.95	1709.62	1709.25	1709.70	0.004795	2.40	422.97	494.15	0.41
WASH 3-WEST	REACH-1	5.801	2	980.00	1707.95	1710.30		1710.44	0.003972	3.00	328.90	184.96	0.40
WASH 3-WEST	REACH-1	5.687	1	980.00	1704.14	1705.89	1705.61	1706.01	0.008289	2.90	351.97	511.49	0.52
WASH 3-WEST	REACH-1	5.687	2	980.00	1704.14	1706.07	1705.82	1706.35	0.014252	4.24	231.19	204.72	0.70
WASH 3-WEST	REACH-1	5.589	1	980.00	1698.68	1702.29		1702.47	0.005981	4.00	311.72	369.47	0.50
WASH 3-WEST	REACH-1	5.589	2	980.00	1698.68	1702.74		1702.92	0.003786	3.61	291.76	135.05	0.41
WASH 3-WEST	REACH-1	5.528	1	980.00	1697.61	1700.79	1700.37	1700.89	0.004206	3.12	411.77	510.82	0.41
WASH 3-WEST	REACH-1	5.528	2	980.00	1697.61	1701.67	1700.48	1701.84	0.003135	3.46	293.64	116.83	0.37
WASH 3-WEST	REACH-1	5.410	1	980.00	1695.68	1697.81	1697.51	1697.89	0.005722	2.53	433.88	605.23	0.45
WASH 3-WEST	REACH-1	5.410	2	980.00	1695.68	1697.96	1697.72	1698.24	0.013716	4.28	229.08	199.70	0.70
WASH 3-WEST	REACH-1	5.323	1	1220.00	1694.24	1695.06	1694.62	1695.21	0.005837	1.72	428.89	493.06	0.40
WASH 3-WEST	REACH-1	5.323	2	1220.00	1694.24	1695.27	1694.62	1695.39	0.003778	1.71	471.97	374.34	0.34
WASH 3-WEST	REACH-1	5.210	1	1220.00	1687.74	1691.99	1691.55	1692.14	0.005458	3.38	393.90	374.80	0.46
WASH 3-WEST	REACH-1	5.210	2	1220.00	1687.74	1692.79		1693.04	0.004479	3.94	306.57	126.14	0.44
WASH 3-WEST	REACH-1	5.147	1	1220.00	1685.37	1690.11	1689.79	1690.25	0.006498	3.49	434.23	626.92	0.49
WASH 3-WEST	REACH-1	5.147	2	1220.00	1685.37	1690.82	1690.16	1691.17	0.007486	4.81	257.67	121.13	0.56
WASH 3-WEST	REACH-1	5.022	1	1220.00	1682.90	1686.00		1686.14	0.006128	3.45	433.27	511.26	0.52
WASH 3-WEST	REACH-1	5.022	2	1220.00	1682.90	1686.75		1687.03	0.005308	4.24	287.72	137.54	0.52
WASH 3-WEST	REACH-1	4.928	1	1220.00	1680.52	1683.43	1682.95	1683.58	0.004965	3.50	407.74	383.25	0.49
WASH 3-WEST	REACH-1	4.928	2	1220.00	1680.52	1684.31		1684.61	0.004539	4.42	278.72	111.99	0.49
WASH 3-WEST	REACH-1	4.837	1	1430.00	1677.63	1680.92	1680.46	1681.05	0.005742	3.47	524.43	649.51	0.51
WASH 3-WEST	REACH-1	4.837	2	1430.00	1677.63	1681.56	1680.92	1681.91	0.006854	4.77	299.66	143.58	0.58
WASH 3-WEST	REACH-1	4.709	1	1430.00	1672.31	1676.37	1676.12	1676.59	0.007948	4.16	416.44	490.44	0.60
WASH 3-WEST	REACH-1	4.709	2	1430.00	1672.31	1676.82	1676.24	1677.16	0.007207	4.67	306.36	158.30	0.59
WASH 3-WEST	REACH-1	4.624	1	1430.00	1668.37	1673.46	1673.07	1673.59	0.005646	3.15	512.23	538.35	0.49
WASH 3-WEST	REACH-1	4.624	2	1430.00	1668.37	1674.15	1673.43	1674.40	0.005155	3.97	359.95	184.24	0.50
WASH 3-WEST	REACH-1	4.519	1	1430.00	1666.60	1670.27	1669.92	1670.42	0.006196	3.39	480.72	515.94	0.52
WASH 3-WEST	REACH-1	4.519	2	1430.00	1666.60	1670.99	1670.32	1671.29	0.006047	4.42	323.57	160.51	0.55
WASH 3-WEST	REACH-1	4.421	1	1450.00	1664.85	1666.85	1666.70	1667.07	0.007860	4.63	436.53	614.77	0.62
WASH 3-WEST	REACH-1	4.421	2	1450.00	1664.85	1667.37	1666.88	1667.63	0.008365	5.62	270.01	129.62	0.66
WASH 3-WEST	REACH-1	4.310	1	1450.00	1658.89	1663.49		1663.62	0.004943	4.07	534.04	441.29	0.43
WASH 3-WEST	REACH-1	4.310	2	1450.00	1658.89	1664.31		1664.52	0.004224	4.47	405.32	163.92	0.42
WASH 3-WEST	REACH-1	4.196	1	1450.00	1657.00	1659.44	1659.16	1659.63	0.009702	3.63	415.57	437.62	0.54
WASH 3-WEST	REACH-1	4.196	2	1450.00	1657.00	1659.96	1659.53	1660.37	0.013262	5.21	285.43	154.67	0.66
WASH 3-WEST	REACH-1	4.077	1	1450.00	1652.00	1655.35	1654.92	1655.50	0.004718	3.51	499.97	491.47	0.46
WASH 3-WEST	REACH-1	4.077	2	1450.00	1652.00	1655.80	1654.94	1656.02	0.004138	3.81	380.50	178.73	0.46
WASH 3-WEST	REACH-1	3.959	1	1450.00	1649.40	1651.30	1651.22	1651.60	0.008757	5.03	372.76	416.47	0.70
WASH 3-WEST	REACH-1	3.959	2	1450.00	1649.40	1651.50	1651.32	1652.02	0.010845	6.00	256.20	162.26	0.79
WASH 3-WEST	REACH-1	3.840	1	1490.00	1645.14	1647.72	1647.23	1647.86	0.004544	3.31	632.06	557.56	0.46
WASH 3-WEST	REACH-1	3.840	2	1490.00	1645.14	1648.39	1647.39	1648.58	0.003297	3.52	422.78	188.31	0.41
WASH 3-WEST	REACH-1	3.727	1	1490.00	1642.53	1644.09	1643.73	1644.23	0.009166	3.39	507.25	626.79	0.52

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH 3-WEST	REACH-1	3.727	2	1490.00	1642.53	1644.91		1645.29	0.011474	5.19	305.59	159.94	0.63
WASH 3-WEST	REACH-1	3.590	1	1490.00	1638.20	1640.07	1639.45	1640.16	0.003893	2.58	663.71	680.90	0.35
WASH 3-WEST	REACH-1	3.590	2	1490.00	1638.20	1640.41	1639.40	1640.55	0.004176	3.00	497.17	251.70	0.38
WASH 3-WEST	REACH-1	3.441	1	1490.00	1631.82	1635.21	1634.98	1635.48	0.011208	4.86	387.23	374.51	0.61
WASH 3-WEST	REACH-1	3.441	2	1490.00	1631.82	1635.50	1635.06	1635.82	0.009745	4.98	340.09	195.80	0.59
WASH 3-WEST	REACH-1	3.298	1	1490.00	1625.67	1630.87	1630.44	1630.97	0.003773	3.03	631.71	629.80	0.36
WASH 3-WEST	REACH-1	3.298	2	1490.00	1625.67	1631.61		1631.77	0.003421	3.46	470.28	203.67	0.36
WASH 3-WEST	REACH-1	3.152	1	1490.00	1623.24	1626.67	1626.49	1626.90	0.009194	4.67	416.25	483.46	0.66
WASH 3-WEST	REACH-1	3.152	2	1490.00	1623.24	1627.04	1626.87	1627.50	0.011497	6.02	282.71	191.88	0.77
WASH 3-WEST	REACH-1	3.054	1	1520.00	1619.90	1623.80	1623.29	1623.94	0.003965	3.36	551.43	620.77	0.45
WASH 3-WEST	REACH-1	3.054	2	1520.00	1619.90	1624.10		1624.39	0.003835	3.64	417.91	197.34	0.44
WASH 3-WEST	REACH-1	2.942	1	1520.00	1619.21	1620.82	1620.58	1620.98	0.007447	3.56	485.82	621.11	0.58
WASH 3-WEST	REACH-1	2.942	2	1520.00	1619.21	1621.43	1620.82	1621.59	0.005788	4.11	369.71	207.96	0.54
WASH 3-WEST	REACH-1	2.816	1	1520.00	1614.02	1616.82	1616.60	1616.98	0.005306	3.63	516.84	700.05	0.59
WASH 3-WEST	REACH-1	2.816	2	1520.00	1614.02	1617.17	1616.84	1617.53	0.006747	4.83	315.00	208.02	0.69
WASH 3-WEST	REACH-1	2.703	1	1520.00	1611.80	1613.54		1613.68	0.006128	3.16	529.51	480.29	0.44
WASH 3-WEST	REACH-1	2.703	2	1520.00	1611.80	1614.06		1614.23	0.004439	3.23	470.20	221.59	0.39
WASH 3-WEST	REACH-1	2.615	1	1520.00	1608.77	1610.56	1610.08	1610.70	0.007025	3.27	514.53	478.55	0.47
WASH 3-WEST	REACH-1	2.615	2	1520.00	1608.77	1611.26	1610.48	1611.55	0.007789	4.38	347.40	157.30	0.52
WASH 3-WEST	REACH-1	2.530	1	1520.00	1605.79	1607.52	1607.04	1607.67	0.006753	3.36	504.31	439.70	0.47
WASH 3-WEST	REACH-1	2.530	2	1520.00	1605.79	1608.10		1608.35	0.006498	3.97	382.47	174.94	0.47
WASH 3-WEST	REACH-1	2.447	1	1540.00	1601.73	1604.67	1604.22	1604.80	0.006390	3.10	559.93	534.20	0.45
WASH 3-WEST	REACH-1	2.447	2	1540.00	1601.73	1605.09		1605.33	0.007298	3.87	398.04	207.82	0.49
WASH 3-WEST	REACH-1	2.366	1	1540.00	1597.23	1602.00	1601.43	1602.19	0.006049	3.78	452.26	339.52	0.46
WASH 3-WEST	REACH-1	2.366	2	1540.00	1597.23	1602.72		1602.94	0.004382	3.88	407.91	148.79	0.41
WASH 3-WEST	REACH-1	2.240	1	1540.00	1594.16	1597.40		1597.72	0.007797	4.99	348.12	283.15	0.67
WASH 3-WEST	REACH-1	2.240	2	1540.00	1594.16	1597.67	1597.44	1598.37	0.012243	6.74	228.64	113.77	0.84
WASH 3-WEST	REACH-1	2.151	1	1540.00	1590.35	1593.67	1593.48	1594.04	0.007848	5.31	341.34	311.39	0.68
WASH 3-WEST	REACH-1	2.151	2	1540.00	1590.35	1594.32		1594.73	0.005111	5.11	301.53	117.86	0.56
WASH 3-WEST	REACH-1	2.061	1	1590.00	1586.42	1589.87	1589.86	1590.28	0.008016	5.94	324.42	244.83	0.71
WASH 3-WEST	REACH-1	2.061	2	1590.00	1586.42	1590.52	1590.12	1591.40	0.009630	7.63	212.96	76.51	0.80
WASH 3-WEST	REACH-1	1.979	1	1590.00	1582.40	1586.74	1586.51	1587.16	0.006849	5.79	335.81	258.63	0.66
WASH 3-WEST	REACH-1	1.979	2	1590.00	1582.40	1587.49		1588.11	0.006043	6.37	254.16	81.02	0.63
WASH 3-WEST	REACH-1	1.894	1	1590.00	1578.80	1583.49	1583.12	1584.02	0.007296	6.85	282.57	155.82	0.68
WASH 3-WEST	REACH-1	1.894	2	1590.00	1578.80	1583.67	1583.36	1584.60	0.010503	8.53	200.34	75.71	0.83
WASH 3-WEST	REACH-1	1.816	1	1590.00	1573.80	1579.99	1579.99	1580.89	0.007866	8.23	236.44	130.38	0.75
WASH 3-WEST	REACH-1	1.816	2	1590.00	1573.80	1579.99	1579.99	1580.89	0.007866	8.23	236.44	130.38	0.75
WASH 3-WEST	REACH-1	1.721	1	1590.00	1570.22	1576.68		1577.21	0.004245	6.19	301.03	144.14	0.55
WASH 3-WEST	REACH-1	1.721	2	1590.00	1570.22	1577.87		1578.07	0.002251	5.21	318.95	70.05	0.42
WASH 3-WEST	REACH-1	1.625	1	1970.00	1566.11	1574.04	1574.04	1574.93	0.004699	9.01	327.68	192.57	0.62
WASH 3-WEST	REACH-1	1.625	2	1970.00	1566.11	1574.04		1575.88	0.007805	11.62	196.15	41.17	0.80
WASH 3-WEST	REACH-1	1.545	1	1970.00	1563.07	1570.22	1570.22	1571.86	0.011175	10.61	202.66	67.02	0.88
WASH 3-WEST	REACH-1	1.545	2	1970.00	1563.07	1571.16		1572.49	0.007460	9.35	214.35	40.62	0.71
WASH 3-WEST	REACH-1	1.460	1	1970.00	1561.30	1569.29		1569.67	0.002578	5.79	432.19	160.84	0.44
WASH 3-WEST	REACH-1	1.460	2	1970.00	1561.30	1570.11		1570.72	0.003035	6.41	314.83	58.63	0.45
WASH 3-WEST	REACH-1	1.406	1	1970.00	1560.13	1566.90		1568.08	0.006671	10.09	252.59	95.40	0.74
WASH 3-WEST	REACH-1	1.406	2	1970.00	1560.13	1567.62		1569.04	0.006038	10.37	217.75	40.94	0.71
WASH 3-WEST	REACH-1	1.343	1	3750.00	1557.06	1565.10		1566.00	0.005629	8.39	573.43	271.15	0.66
WASH 3-WEST	REACH-1	1.343	2	3750.00	1557.06	1565.49		1566.83	0.006793	9.40	406.10	77.54	0.71
WASH 3-WEST	REACH-1	1.289	1	3750.00	1556.27	1564.07		1564.63	0.004045	7.11	669.98	251.47	0.56
WASH 3-WEST	REACH-1	1.289	2	3750.00	1556.27	1565.06		1565.57	0.002424	6.20	665.09	145.00	0.45
WASH 3-WEST	REACH-1	1.196	1	3750.00	1553.47	1561.57		1562.23	0.006100	7.53	609.25	257.41	0.61
WASH 3-WEST	REACH-1	1.196	2	3750.00	1553.47	1561.63	1561.58	1563.20	0.012030	10.68	382.03	109.00	0.85
WASH 3-WEST	REACH-1	1.168	1	4250.00	1552.48	1561.04	1559.74	1561.62	0.002866	5.67	814.42	307.54	0.43
WASH 3-WEST	REACH-1	1.168	2	4250.00	1552.48	1561.93	1559.63	1562.34	0.001760	4.93	843.74	152.00	0.35
WASH 3-WEST	REACH-1	1.112	1	4250.00	1551.44	1559.50		1560.34	0.007597	8.01	622.40	267.81	0.68
WASH 3-WEST	REACH-1	1.112	2	4250.00	1551.44	1559.86		1561.24	0.009590	9.50	452.46	100.00	0.78
WASH 3-WEST	REACH-1	1.049	1	4250.00	1549.60	1558.40		1558.80	0.002766	6.17	914.08	343.49	0.43
WASH 3-WEST	REACH-1	1.049	2	4250.00	1549.60	1559.30		1559.74	0.001951	5.66	803.22	155.00	0.37
WASH 3-WEST	REACH-1	0.946	1	4250.00	1548.45	1555.77		1556.56	0.006935	7.86	634.23	262.19	0.66
WASH 3-WEST	REACH-1	0.946	2	4250.00	1548.45	1556.60		1557.84	0.007600	9.00	477.13	93.00	0.69
WASH 3-WEST	REACH-1	0.86	1	4250.00	1547.03	1553.62		1554.09	0.003967	6.04	816.14	333.64	0.50
WASH 3-WEST	REACH-1	0.86	2	4250.00	1547.03	1554.62		1555.30	0.003878	6.64	648.31	139.00	0.50

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH 3-WEST	REACH-1	0.781	1	4250.00	1545.22	1551.84		1552.31	0.004848	6.29	811.44	361.32	0.54
WASH 3-WEST	REACH-1	0.781	2	4250.00	1545.22	1552.75		1553.56	0.004830	7.16	590.89	125.00	0.58
WASH 3-WEST	REACH-1	0.701	1	4250.00	1543.22	1550.05		1550.48	0.004001	6.40	880.44	408.32	0.51
WASH 3-WEST	REACH-1	0.701	2	4250.00	1543.22	1551.04		1551.77	0.003743	7.00	625.08	126.00	0.51
WASH 3-WEST	REACH-1	0.618	1	4250.00	1541.71	1547.94		1548.46	0.005415	6.78	795.50	393.75	0.58
WASH 3-WEST	REACH-1	0.618	2	4250.00	1541.71	1548.73		1549.69	0.006096	8.06	543.50	123.00	0.63
WASH 3-WEST	REACH-1	0.544	1	4250.00	1540.43	1546.64		1548.97	0.002840	5.31	971.68	382.94	0.43
WASH 3-WEST	REACH-1	0.544	2	4250.00	1540.43	1547.64		1548.13	0.002537	5.70	762.17	154.00	0.42
WASH 3-WEST	REACH-1	0.463	1	4250.00	1539.29	1546.36		1546.50	0.000602	3.27	1572.82	490.92	0.24
WASH 3-WEST	REACH-1	0.463	2	4250.00	1539.29	1547.10		1547.48	0.001681	5.11	860.71	152.00	0.35
WASH 3-WEST	REACH-1	0.403	1	4250.00	1538.31	1546.08		1546.21	0.000689	3.21	1480.85	357.86	0.22
WASH 3-WEST	REACH-1	0.403	2	4250.00	1538.31	1546.61		1546.91	0.001121	4.31	970.24	147.00	0.29
WASH 3-WEST	REACH-1	0.356	1	4250.00	1536.98	1546.05		1546.10	0.000206	2.27	2581.10	625.77	0.15
WASH 3-WEST	REACH-1	0.356	2	4250.00	1536.98	1546.50		1546.69	0.000511	3.72	1220.97	165.00	0.24
WASH 3-WEST	REACH-1	0.277	1	4250.00	1536.61	1546.01		1546.03	0.000118	0.92	4091.85	790.77	0.06
WASH 3-WEST	REACH-1	0.277	2	4250.00	1536.61	1546.35		1546.42	0.000645	2.21	2013.30	236.00	0.13
WASH 3-WEST	REACH-1	0.207	1	4250.00	1535.19	1545.98		1545.99	0.000082	0.82	5605.52	1102.40	0.05
WASH 3-WEST	REACH-1	0.207	2	4250.00	1535.19	1546.28		1546.30	0.000155	1.16	3668.64	425.00	0.07
WASH 3-WEST	REACH-1	0.129	1	4250.00	1533.69	1545.95	1538.57	1545.96	0.000068	0.78	5449.39	1507.03	0.04
WASH 3-WEST	REACH-1	0.129	2	4250.00	1533.69	1546.18	1538.73	1546.21	0.000297	1.64	2760.54	584.00	0.09
WASH 3-WEST	REACH-1	0.047	1	4250.00	1537.32	1545.86	1539.34	1545.90	0.000297	1.46	2939.94	1890.87	0.09
WASH 3-WEST	REACH-1	0.047	2	4250.00	1537.32	1546.01	1539.48	1546.05	0.000406	1.73	2557.10	305.00	0.10
WASH 3-WEST	REACH-1	0	1	4250.00	1533.74	1545.10	1539.98	1545.71	0.001029	6.42	709.49	72.54	0.35
WASH 3-WEST	REACH-1	0	2	4250.00	1533.74	1545.10	1540.15	1545.61	0.001439	6.78	627.14	61.00	0.37
T4N-R3W-S09	REACH-1	2.651	1	710.00	1645.73	1647.21	1646.92	1647.30	0.005852	2.70	309.95	504.60	0.45
T4N-R3W-S09	REACH-1	2.651	2	710.00	1645.73	1647.44		1647.57	0.005196	2.87	247.75	185.92	0.44
T4N-R3W-S09	REACH-1	2.552	1	710.00	1642.50	1643.62	1643.42	1643.71	0.008208	2.57	306.81	536.75	0.51
T4N-R3W-S09	REACH-1	2.552	2	710.00	1642.50	1643.79	1643.48	1643.95	0.009693	3.17	223.63	230.98	0.57
T4N-R3W-S09	REACH-1	2.454	1	710.00	1639.12	1640.74	1640.24	1640.81	0.003864	2.31	330.62	378.05	0.37
T4N-R3W-S09	REACH-1	2.454	2	710.00	1639.12	1640.87	1640.23	1640.96	0.003790	2.44	291.05	219.54	0.37
T4N-R3W-S09	REACH-1	2.362	1	710.00	1636.30	1637.83	1637.60	1638.01	0.009319	3.69	221.26	290.27	0.58
T4N-R3W-S09	REACH-1	2.362	2	710.00	1636.30	1637.91	1637.58	1638.14	0.009605	3.94	188.78	154.68	0.60
T4N-R3W-S09	REACH-1	2.267	1	710.00	1633.64	1634.63	1634.36	1634.68	0.004928	1.90	383.82	675.05	0.39
T4N-R3W-S09	REACH-1	2.267	2	710.00	1633.64	1635.15		1635.23	0.003756	2.35	302.11	239.39	0.37
T4N-R3W-S09	REACH-1	2.169	1	710.00	1630.43	1631.63	1631.46	1631.71	0.007010	2.54	331.31	890.43	0.48
T4N-R3W-S09	REACH-1	2.169	2	710.00	1630.43	1631.91		1632.13	0.010886	3.79	187.47	161.18	0.62
T4N-R3W-S09	REACH-1	2.065	1	710.00	1627.07	1628.44	1627.95	1628.52	0.004955	2.24	363.36	827.14	0.38
T4N-R3W-S09	REACH-1	2.065	2	710.00	1627.07	1628.61		1628.68	0.004013	2.20	322.04	252.88	0.34
T4N-R3W-S09	REACH-1	1.971	1	740.00	1623.70	1625.12	1624.85	1625.24	0.008821	3.04	261.04	308.53	0.50
T4N-R3W-S09	REACH-1	1.971	2	740.00	1623.70	1625.42	1624.97	1625.63	0.009869	3.76	202.02	145.19	0.55
T4N-R3W-S09	REACH-1	1.876	1	740.00	1620.52	1621.72	1621.39	1621.80	0.005587	2.15	342.59	474.18	0.39
T4N-R3W-S09	REACH-1	1.876	2	740.00	1620.52	1622.10	1621.47	1622.20	0.004919	2.50	295.90	223.09	0.38
T4N-R3W-S09	REACH-1	1.781	1	740.00	1617.42	1618.67	1618.35	1618.76	0.006375	2.36	307.77	414.21	0.42
T4N-R3W-S09	REACH-1	1.781	2	740.00	1617.42	1618.94	1618.45	1619.09	0.008030	3.10	239.03	188.83	0.46
T4N-R3W-S09	REACH-1	1.686	1	740.00	1613.61	1615.39	1615.22	1615.50	0.006816	2.85	293.10	507.81	0.53
T4N-R3W-S09	REACH-1	1.686	2	740.00	1613.61	1615.55	1615.16	1615.68	0.005924	2.95	250.75	237.78	0.51
T4N-R3W-S09	REACH-1	1.594	1	740.00	1610.58	1611.59	1611.40	1611.74	0.008687	3.34	252.45	367.13	0.60
T4N-R3W-S09	REACH-1	1.594	2	740.00	1610.58	1611.75	1611.51	1611.99	0.009954	3.95	191.82	160.09	0.66
T4N-R3W-S09	REACH-1	1.488	1	780.00	1607.20	1608.46	1608.14	1608.54	0.004167	2.52	360.16	535.29	0.43
T4N-R3W-S09	REACH-1	1.488	2	780.00	1607.20	1608.91		1609.04	0.003331	2.83	272.79	184.20	0.40
T4N-R3W-S09	REACH-1	1.394	1	780.00	1604.50	1605.70	1605.46	1605.82	0.007103	3.14	261.04	435.91	0.55
T4N-R3W-S09	REACH-1	1.394	2	780.00	1604.50	1606.24		1606.54	0.008219	4.40	177.41	113.58	0.62
T4N-R3W-S09	REACH-1	1.302	1	780.00	1601.66	1602.76	1602.46	1602.87	0.005270	2.30	314.30	424.72	0.46
T4N-R3W-S09	REACH-1	1.302	2	780.00	1601.66	1603.28	1602.77	1603.43	0.005019	3.12	249.66	191.04	0.48
T4N-R3W-S09	REACH-1	1.201	1	780.00	1596.98	1600.09		1600.17	0.005042	2.18	353.14	450.92	0.37
T4N-R3W-S09	REACH-1	1.201	2	780.00	1596.98	1600.49		1600.61	0.005550	2.80	278.70	192.26	0.41
T4N-R3W-S09	REACH-1	1.104	1	780.00	1595.85	1597.08	1596.76	1597.17	0.006840	2.73	352.27	543.00	0.44
T4N-R3W-S09	REACH-1	1.104	2	780.00	1595.85	1597.34	1596.75	1597.48	0.008744	3.07	254.18	178.00	0.45
T4N-R3W-S09	REACH-1	1.013	1	780.00	1593.22	1594.51	1594.12	1594.57	0.004353	2.13	426.31	688.73	0.35
T4N-R3W-S09	REACH-1	1.013	2	780.00	1593.22	1594.86		1594.96	0.004206	2.48	314.06	212.19	0.36
T4N-R3W-S09	REACH-1	0.920	1	820.00	1590.86	1592.18	1591.84	1592.24	0.005165	2.00	429.68	707.03	0.37
T4N-R3W-S09	REACH-1	0.920	2	820.00	1590.86	1592.76	1592.03	1592.86	0.004307	2.53	324.46	217.61	0.36

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta.	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S09	REACH-1	0.819	1	820.00	1587.99	1588.78	1588.60	1588.89	0.008404	1.95	325.07	647.90	0.44
T4N-R3W-S09	REACH-1	0.819	2	820.00	1587.99	1589.76		1589.99	0.007220	3.39	217.19	134.40	0.47
T4N-R3W-S09	REACH-1	0.676	1	820.00	1583.60	1585.05	1584.63	1585.15	0.006191	2.62	339.01	408.74	0.42
T4N-R3W-S09	REACH-1	0.676	2	820.00	1583.60	1585.08	1584.61	1585.23	0.008200	3.05	268.43	220.30	0.49
T4N-R3W-S09	REACH-1	0.616	1	820.00	1579.95	1582.02	1582.37	1583.02	0.004944	2.73	332.75	318.68	0.39
T4N-R3W-S09	REACH-1	0.616	2	820.00	1579.95	1583.27	1582.36	1583.39	0.004064	2.82	290.40	156.38	0.37
T4N-R3W-S09	REACH-1	0.501	1	820.00	1575.80	1579.71		1579.82	0.005728	2.83	335.28	277.23	0.36
T4N-R3W-S09	REACH-1	0.501	2	820.00	1575.80	1580.12		1580.30	0.006552	3.39	241.96	106.27	0.40
T4N-R3W-S09	REACH-1	0.398	1	850.00	1571.99	1576.70		1575.89	0.009796	3.55	240.74	185.08	0.47
T4N-R3W-S09	REACH-1	0.398	2	850.00	1571.99	1575.86		1576.06	0.009516	3.65	233.07	121.90	0.46
T4N-R3W-S09	REACH-1	0.299	1	850.00	1568.60	1571.59	1570.81	1571.72	0.006487	2.97	289.92	168.61	0.39
T4N-R3W-S09	REACH-1	0.299	2	850.00	1568.60	1571.65	1570.78	1571.80	0.005897	3.10	273.98	145.27	0.40
T4N-R3W-S09	REACH-1	0.204	1	850.00	1564.34	1567.44	1566.99	1567.84	0.010857	3.81	246.82	199.31	0.50
T4N-R3W-S09	REACH-1	0.204	2	850.00	1564.34	1568.25		1568.46	0.006528	3.67	231.54	88.47	0.40
T4N-R3W-S09	REACH-1	0.104	1	850.00	1558.45	1563.70	1562.85	1563.89	0.004948	3.87	254.32	140.10	0.37
T4N-R3W-S09	REACH-1	0.104	2	850.00	1558.45	1564.23	1562.79	1564.61	0.007982	5.15	173.94	47.85	0.46
T4N-R3W-S09	REACH-1	0.032	1	850.00	1554.72	1561.03	1559.73	1561.53	0.008214	7.00	167.90	54.71	0.52
T4N-R3W-S09	REACH-1	0.032	2	850.00	1554.72	1561.04	1559.72	1561.58	0.008202	7.00	153.53	37.93	0.52
T4N-R3W-S08W	REACH-1	3.254	1	880.00	1682.09	1683.53	1683.27	1683.66	0.005333	2.90	338.57	429.55	0.46
T4N-R3W-S08W	REACH-1	3.254	2	880.00	1682.09	1684.35	1683.52	1684.53	0.004465	3.44	255.93	133.06	0.44
T4N-R3W-S08W	REACH-1	3.156	1	880.00	1677.27	1679.89	1679.60	1680.04	0.008187	3.51	265.59	332.93	0.56
T4N-R3W-S08W	REACH-1	3.156	2	880.00	1677.27	1680.46	1680.09	1680.92	0.012111	5.44	161.76	88.03	0.71
T4N-R3W-S08W	REACH-1	3.055	1	880.00	1675.01	1676.46	1676.08	1676.55	0.005453	2.70	379.27	495.57	0.43
T4N-R3W-S08W	REACH-1	3.055	2	880.00	1675.01	1676.72	1676.05	1676.88	0.005023	2.93	300.36	198.50	0.42
T4N-R3W-S08W	REACH-1	2.960	1	880.00	1672.20	1673.53	1673.22	1673.62	0.006542	2.86	367.61	529.91	0.46
T4N-R3W-S08W	REACH-1	2.960	2	880.00	1672.20	1673.95	1673.34	1674.11	0.006116	3.21	274.26	183.12	0.46
T4N-R3W-S08W	REACH-1	2.865	1	880.00	1668.87	1670.41		1670.51	0.005834	2.79	354.67	452.63	0.44
T4N-R3W-S08W	REACH-1	2.865	2	880.00	1668.87	1671.15		1671.33	0.004962	3.43	256.61	131.00	0.43
T4N-R3W-S08W	REACH-1	2.769	1	880.00	1665.70	1667.32	1666.91	1667.43	0.005845	2.96	345.02	398.79	0.45
T4N-R3W-S08W	REACH-1	2.769	2	880.00	1665.70	1668.03		1668.31	0.007183	4.25	207.02	100.10	0.52
T4N-R3W-S08W	REACH-1	2.671	1	880.00	1661.78	1664.04	1663.59	1664.17	0.006860	3.33	305.77	347.76	0.49
T4N-R3W-S08W	REACH-1	2.671	2	880.00	1661.78	1664.37	1663.75	1664.60	0.007195	3.88	232.31	135.27	0.51
T4N-R3W-S08W	REACH-1	2.573	1	880.00	1658.60	1660.93	1660.55	1661.04	0.005533	2.85	340.09	452.67	0.43
T4N-R3W-S08W	REACH-1	2.573	2	880.00	1658.60	1661.41	1660.62	1661.58	0.004871	3.25	271.01	146.62	0.42
T4N-R3W-S08W	REACH-1	2.476	1	880.00	1656.18	1657.85	1657.53	1657.96	0.006714	2.77	354.95	530.51	0.46
T4N-R3W-S08W	REACH-1	2.476	2	880.00	1656.18	1658.32	1657.74	1658.52	0.007422	3.66	241.41	153.77	0.51
T4N-R3W-S08W	REACH-1	2.375	1	910.00	1652.90	1654.41		1654.54	0.005255	3.26	328.41	445.27	0.53
T4N-R3W-S08W	REACH-1	2.375	2	910.00	1652.90	1655.19		1655.43	0.004637	3.87	235.03	120.70	0.49
T4N-R3W-S08W	REACH-1	2.277	1	910.00	1649.59	1650.99	1650.83	1651.17	0.007277	3.53	288.34	387.91	0.57
T4N-R3W-S08W	REACH-1	2.277	2	910.00	1649.59	1651.42	1651.18	1651.88	0.011302	5.40	168.40	109.93	0.75
T4N-R3W-S08W	REACH-1	2.181	1	910.00	1646.95	1648.48		1648.55	0.003806	2.62	375.81	366.51	0.40
T4N-R3W-S08W	REACH-1	2.181	2	910.00	1646.95	1648.95		1649.08	0.003100	2.69	315.39	174.67	0.38
T4N-R3W-S08W	REACH-1	2.082	1	910.00	1643.97	1645.43	1645.26	1645.63	0.009075	4.08	268.54	382.60	0.62
T4N-R3W-S08W	REACH-1	2.082	2	910.00	1643.97	1645.69	1645.40	1646.14	0.012827	5.39	168.68	104.63	0.75
T4N-R3W-S08W	REACH-1	1.987	1	910.00	1638.70	1642.39		1642.54	0.004317	3.28	317.32	345.29	0.45
T4N-R3W-S08W	REACH-1	1.987	2	910.00	1638.70	1642.60		1642.78	0.003942	3.38	271.14	143.86	0.43
T4N-R3W-S08W	REACH-1	1.891	1	910.00	1637.76	1639.44	1639.22	1639.62	0.008294	3.82	276.69	325.64	0.59
T4N-R3W-S08W	REACH-1	1.891	2	910.00	1637.76	1639.87		1640.14	0.007171	4.23	214.89	125.05	0.57
T4N-R3W-S08W	REACH-1	1.803	1	950.00	1635.34	1636.70	1636.34	1636.77	0.004603	2.29	451.85	584.58	0.38
T4N-R3W-S08W	REACH-1	1.803	2	950.00	1635.34	1637.07		1637.20	0.005437	2.99	317.78	216.58	0.43
T4N-R3W-S08W	REACH-1	1.698	1	950.00	1632.35	1634.01	1633.70	1634.18	0.004702	3.51	269.78	350.67	0.56
T4N-R3W-S08W	REACH-1	1.698	2	950.00	1632.35	1634.15	1633.73	1634.37	0.004821	3.78	251.07	186.24	0.57
T4N-R3W-S08W	REACH-1	1.604	1	950.00	1629.20	1631.21	1630.85	1631.41	0.006840	3.83	275.87	277.65	0.55
T4N-R3W-S08W	REACH-1	1.604	2	950.00	1629.20	1631.56	1630.89	1631.80	0.005587	3.93	241.89	130.42	0.51
T4N-R3W-S08W	REACH-1	1.506	1	950.00	1626.02	1628.18	1627.88	1628.30	0.005297	3.10	367.37	489.16	0.48
T4N-R3W-S08W	REACH-1	1.506	2	950.00	1626.02	1628.39		1628.62	0.006719	3.83	248.12	161.45	0.54
T4N-R3W-S08W	REACH-1	1.408	1	950.00	1623.23	1625.01	1624.67	1625.13	0.007212	2.93	354.19	426.55	0.49
T4N-R3W-S08W	REACH-1	1.408	2	950.00	1623.23	1625.38		1625.50	0.005341	2.99	317.20	212.24	0.43
T4N-R3W-S08W	REACH-1	1.315	1	950.00	1620.33	1621.96		1622.08	0.005471	3.09	351.22	344.36	0.44
T4N-R3W-S08W	REACH-1	1.315	2	950.00	1620.33	1622.44		1622.67	0.006255	3.89	244.30	122.40	0.49
T4N-R3W-S08W	REACH-1	1.218	1	990.00	1617.62	1619.17	1618.71	1619.29	0.005477	2.98	375.63	409.52	0.44
T4N-R3W-S08W	REACH-1	1.218	2	990.00	1617.62	1619.51		1619.69	0.005437	3.38	293.15	165.10	0.45
T4N-R3W-S08W	REACH-1	1.123	1	990.00	1614.92	1616.49		1616.59	0.005245	2.80	415.91	609.71	0.42

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
T4N-R3W-S08W	REACH-1	1.123	2	990.00	1614.92	1616.74		1616.90	0.005686	3.23	306.73	191.99	0.45
T4N-R3W-S08W	REACH-1	1.029	1	990.00	1611.94	1613.53	1613.16	1613.66	0.008653	3.06	359.15	425.44	0.47
T4N-R3W-S08W	REACH-1	1.029	2	990.00	1611.84	1613.81		1613.98	0.006088	3.31	299.23	190.14	0.46
T4N-R3W-S08W	REACH-1	0.934	1	990.00	1608.84	1610.56	1610.12	1610.66	0.005313	2.77	401.19	447.97	0.42
T4N-R3W-S08W	REACH-1	0.934	2	990.00	1608.84	1610.79	1610.16	1610.95	0.005960	3.24	305.36	196.62	0.46
T4N-R3W-S08W	REACH-1	0.833	1	990.00	1605.07	1607.21		1607.35	0.007432	3.40	337.44	485.41	0.55
T4N-R3W-S08W	REACH-1	0.833	2	990.00	1605.07	1607.55		1607.76	0.006016	3.61	267.94	181.70	0.52
T4N-R3W-S08W	REACH-1	0.726	1	990.00	1601.77	1603.94	1603.59	1604.06	0.005034	2.88	363.97	485.79	0.46
T4N-R3W-S08W	REACH-1	0.726	2	990.00	1601.77	1604.33	1603.72	1604.53	0.005521	3.59	275.62	169.75	0.50
T4N-R3W-S08W	REACH-1	0.626	1	1030.00	1599.69	1601.03		1601.16	0.006529	2.94	371.69	384.62	0.47
T4N-R3W-S08W	REACH-1	0.626	2	1030.00	1599.69	1601.26	1600.88	1601.43	0.006306	3.21	320.41	218.41	0.47
T4N-R3W-S08W	REACH-1	0.523	1	1030.00	1595.45	1596.69	1596.46	1596.92	0.009774	3.81	275.34	290.59	0.63
T4N-R3W-S08W	REACH-1	0.523	2	1030.00	1595.45	1597.19	1596.73	1597.50	0.008300	4.42	232.99	142.19	0.61
T4N-R3W-S08W	REACH-1	0.417	1	1030.00	1589.43	1592.23	1591.91	1592.44	0.006647	4.12	291.16	287.65	0.55
T4N-R3W-S08W	REACH-1	0.417	2	1030.00	1589.43	1592.58		1592.95	0.007807	4.97	209.50	105.27	0.61
T4N-R3W-S08W	REACH-1	0.330	1	1030.00	1586.50	1588.72	1588.43	1589.04	0.008528	4.65	235.68	191.18	0.63
T4N-R3W-S08W	REACH-1	0.330	2	1030.00	1586.50	1588.91	1588.38	1589.27	0.008204	4.81	213.93	113.70	0.62
T4N-R3W-S08W	REACH-1	0.243	1	1030.00	1580.80	1584.89	1584.48	1585.30	0.007848	5.42	207.17	132.11	0.63
T4N-R3W-S08W	REACH-1	0.243	2	1030.00	1580.80	1585.22	1584.46	1585.70	0.007403	5.56	185.30	70.15	0.60
T4N-R3W-S08W	REACH-1	0.156	1	1030.00	1574.92	1580.24	1580.02	1580.98	0.011331	7.18	151.79	76.17	0.77
T4N-R3W-S08W	REACH-1	0.156	2	1030.00	1574.92	1580.79	1580.11	1581.57	0.010937	7.35	140.08	43.76	0.72
T4N-R3W-S08W	REACH-1	0.057	1	1030.00	1571.40	1575.66	1575.11	1576.18	0.007501	6.00	189.65	85.56	0.63
T4N-R3W-S08W	REACH-1	0.057	2	1030.00	1571.40	1576.17	1575.28	1576.80	0.007501	6.38	161.46	49.27	0.62

HEC-RAS Plan: FP

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
WASH 3-WEST	REACH-1	6.912	1	2.83	0.79	146.46	115.70	3.28	1744.70	1744.70	
WASH 3-WEST	REACH-1	6.912	2	2.99	1.94	54.19	104.91	3.62	1744.86	1744.70	0.16
WASH 3-WEST	REACH-1	6.811	1	1.99	0.59	257.00	150.71	2.52	1741.39	1741.39	
WASH 3-WEST	REACH-1	6.811	2	2.69	1.64	65.22	107.05	3.65	1742.09	1741.39	0.70
WASH 3-WEST	REACH-1	6.685	1	2.44	0.54	289.20	155.41	2.45	1737.37	1737.37	
WASH 3-WEST	REACH-1	6.685	2	2.79	1.37	73.81	101.26	3.75	1737.72	1737.37	0.35
WASH 3-WEST	REACH-1	6.578	1	1.37	0.52	388.78	201.16	1.89	1734.13	1734.13	
WASH 3-WEST	REACH-1	6.578	2	1.73	1.41	106.38	150.43	2.53	1734.75	1734.13	0.62
WASH 3-WEST	REACH-1	6.476	1	3.40	0.86	278.31	236.48	2.81	1730.88	1730.88	
WASH 3-WEST	REACH-1	6.476	2	4.11	1.91	86.44	165.40	4.05	1731.59	1730.88	0.70
WASH 3-WEST	REACH-1	6.387	1	2.84	0.73	357.40	259.96	2.58	1728.14	1728.14	
WASH 3-WEST	REACH-1	6.387	2	3.40	1.52	134.55	204.94	3.27	1728.70	1728.14	0.56
WASH 3-WEST	REACH-1	6.318	1	1.25	0.70	396.97	279.09	2.40	1725.95	1725.95	
WASH 3-WEST	REACH-1	6.318	2	1.49	1.33	155.77	207.32	3.23	1726.46	1725.95	0.51
WASH 3-WEST	REACH-1	6.209	1	3.11	0.72	356.60	255.78	2.62	1722.04	1722.04	
WASH 3-WEST	REACH-1	6.209	2	3.82	1.89	95.56	180.40	3.71	1722.75	1722.04	0.71
WASH 3-WEST	REACH-1	6.111	1	3.00	0.62	515.39	318.24	2.11	1719.01	1719.01	
WASH 3-WEST	REACH-1	6.111	2	3.33	1.52	119.12	181.02	3.70	1719.35	1719.01	0.33
WASH 3-WEST	REACH-1	6.005	1	4.05	0.55	475.35	261.98	2.56	1715.51	1715.51	
WASH 3-WEST	REACH-1	6.005	2	5.02	1.93	110.88	213.70	3.14	1716.48	1715.51	0.97
WASH 3-WEST	REACH-1	5.905	1	3.21	0.98	351.18	336.66	2.91	1712.41	1712.41	
WASH 3-WEST	REACH-1	5.905	2	3.93	2.53	72.07	182.09	5.38	1713.13	1712.41	0.72
WASH 3-WEST	REACH-1	5.801	1	1.67	0.85	494.15	422.07	2.32	1709.62	1709.62	
WASH 3-WEST	REACH-1	5.801	2	2.35	1.77	184.98	328.90	3.00	1710.30	1709.62	0.69
WASH 3-WEST	REACH-1	5.687	1	1.75	0.89	511.49	351.97	2.78	1706.89	1705.89	
WASH 3-WEST	REACH-1	5.687	2	1.93	1.13	204.72	231.19	4.24	1706.07	1705.89	0.18
WASH 3-WEST	REACH-1	5.589	1	3.61	0.84	369.47	311.72	3.14	1702.29	1702.29	
WASH 3-WEST	REACH-1	5.589	2	4.08	2.16	135.05	291.76	3.36	1702.74	1702.29	0.46
WASH 3-WEST	REACH-1	5.528	1	3.18	0.81	510.82	411.77	2.38	1700.79	1700.79	
WASH 3-WEST	REACH-1	5.528	2	4.08	2.51	116.83	293.64	3.34	1701.67	1700.79	0.88
WASH 3-WEST	REACH-1	5.410	1	1.41	0.72	605.23	433.88	2.26	1697.81	1697.81	
WASH 3-WEST	REACH-1	5.410	2	1.28	1.15	199.70	229.08	4.28	1697.96	1697.81	0.15
WASH 3-WEST	REACH-1	5.323	1	2.55	0.87	493.06	428.89	2.84	1695.06	1695.06	
WASH 3-WEST	REACH-1	5.323	2	2.76	1.28	374.34	471.87	2.58	1695.27	1695.06	0.21
WASH 3-WEST	REACH-1	5.210	1	4.25	1.05	374.90	393.90	3.10	1691.99	1691.99	
WASH 3-WEST	REACH-1	5.210	2	5.05	2.43	126.14	306.57	3.98	1692.79	1691.99	0.81
WASH 3-WEST	REACH-1	5.147	1	4.74	0.69	628.92	434.23	2.81	1690.11	1690.11	
WASH 3-WEST	REACH-1	5.147	2	5.45	2.13	121.13	257.67	4.73	1690.82	1690.11	0.71
WASH 3-WEST	REACH-1	5.022	1	3.10	0.85	511.26	433.27	2.82	1686.00	1686.00	
WASH 3-WEST	REACH-1	5.022	2	3.85	2.09	137.54	287.72	4.24	1686.76	1686.00	0.75
WASH 3-WEST	REACH-1	4.928	1	2.91	1.06	383.25	407.74	2.99	1683.43	1683.43	
WASH 3-WEST	REACH-1	4.928	2	3.79	2.49	111.99	278.72	4.38	1684.31	1683.43	0.88
WASH 3-WEST	REACH-1	4.837	1	3.29	0.81	649.51	524.43	2.73	1680.92	1680.92	
WASH 3-WEST	REACH-1	4.837	2	3.93	2.09	143.58	299.66	4.77	1681.56	1680.92	0.64
WASH 3-WEST	REACH-1	4.709	1	4.06	0.85	490.44	416.44	3.43	1676.37	1676.37	
WASH 3-WEST	REACH-1	4.709	2	4.51	1.94	158.30	306.35	4.67	1676.82	1676.37	0.45
WASH 3-WEST	REACH-1	4.624	1	5.09	0.95	538.35	512.23	2.79	1673.46	1673.46	
WASH 3-WEST	REACH-1	4.624	2	5.78	1.95	184.24	359.95	3.97	1674.15	1673.46	0.69
WASH 3-WEST	REACH-1	4.519	1	3.67	0.93	515.94	480.72	2.97	1670.27	1670.27	
WASH 3-WEST	REACH-1	4.519	2	4.39	2.02	160.51	323.57	4.42	1670.99	1670.27	0.71
WASH 3-WEST	REACH-1	4.421	1	2.00	0.71	614.77	438.53	3.32	1666.85	1666.85	
WASH 3-WEST	REACH-1	4.421	2	2.52	2.08	129.62	270.01	5.37	1667.37	1666.85	0.52
WASH 3-WEST	REACH-1	4.310	1	4.60	1.21	441.29	534.04	2.72	1663.49	1663.49	
WASH 3-WEST	REACH-1	4.310	2	5.42	2.47	163.92	405.32	3.58	1664.31	1663.49	0.82
WASH 3-WEST	REACH-1	4.196	1	2.44	0.95	437.62	415.57	3.49	1659.44	1659.44	
WASH 3-WEST	REACH-1	4.196	2	2.96	1.85	154.67	285.43	5.08	1659.96	1659.44	0.53
WASH 3-WEST	REACH-1	4.077	1	3.35	1.02	491.47	499.97	2.90	1655.35	1655.35	

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
WASH 3-WEST	REACH-1	4.077	2	3.80	2.13	178.73	380.50	3.81	1655.80	1655.35	0.45
WASH 3-WEST	REACH-1	3.959	1	1.90	0.90	416.47	372.76	3.89	1651.30	1651.30	
WASH 3-WEST	REACH-1	3.959	2	2.10	1.58	162.26	256.20	5.66	1651.50	1651.30	0.20
WASH 3-WEST	REACH-1	3.840	1	2.58	0.95	557.56	532.06	2.80	1647.72	1647.72	
WASH 3-WEST	REACH-1	3.840	2	3.25	2.25	188.31	422.78	3.52	1648.39	1647.72	0.67
WASH 3-WEST	REACH-1	3.727	1	2.12	0.81	626.79	507.25	2.94	1644.09	1644.09	
WASH 3-WEST	REACH-1	3.727	2	2.38	1.91	159.94	305.59	4.88	1644.91	1644.09	0.82
WASH 3-WEST	REACH-1	3.590	1	1.87	0.97	680.90	663.71	2.24	1640.07	1640.07	
WASH 3-WEST	REACH-1	3.590	2	2.21	1.98	251.70	497.17	3.00	1640.41	1640.07	0.34
WASH 3-WEST	REACH-1	3.441	1	3.39	1.03	374.51	387.23	3.85	1635.21	1635.21	
WASH 3-WEST	REACH-1	3.441	2	3.68	1.74	195.80	340.09	4.38	1635.50	1635.21	0.29
WASH 3-WEST	REACH-1	3.298	1	5.20	1.00	629.80	631.71	2.36	1630.87	1630.87	
WASH 3-WEST	REACH-1	3.298	2	5.94	2.31	203.67	470.28	3.17	1631.61	1630.87	0.73
WASH 3-WEST	REACH-1	3.152	1	3.43	0.86	483.46	416.25	3.58	1626.67	1626.67	
WASH 3-WEST	REACH-1	3.152	2	3.80	1.47	191.88	282.71	5.27	1627.04	1626.67	0.37
WASH 3-WEST	REACH-1	3.054	1	3.90	0.89	620.77	551.43	2.76	1623.80	1623.80	
WASH 3-WEST	REACH-1	3.054	2	4.29	2.12	197.34	417.91	3.64	1624.19	1623.80	0.39
WASH 3-WEST	REACH-1	2.942	1	2.06	0.78	621.11	485.82	3.13	1620.82	1620.82	
WASH 3-WEST	REACH-1	2.942	2	2.22	1.78	207.96	369.71	4.11	1621.43	1620.82	0.61
WASH 3-WEST	REACH-1	2.816	1	2.80	0.74	700.05	518.84	2.93	1616.82	1616.82	
WASH 3-WEST	REACH-1	2.816	2	3.15	1.51	208.02	315.00	4.83	1617.17	1616.82	0.35
WASH 3-WEST	REACH-1	2.703	1	1.74	1.10	480.29	529.51	2.87	1613.54	1613.54	
WASH 3-WEST	REACH-1	2.703	2	2.26	2.12	221.59	470.20	3.23	1614.06	1613.54	0.52
WASH 3-WEST	REACH-1	2.615	1	1.79	1.08	478.55	514.53	2.95	1610.56	1610.56	
WASH 3-WEST	REACH-1	2.615	2	2.49	2.21	157.30	347.40	4.38	1611.26	1610.56	0.70
WASH 3-WEST	REACH-1	2.530	1	1.73	1.15	439.70	504.31	3.01	1607.52	1607.52	
WASH 3-WEST	REACH-1	2.530	2	2.31	2.19	174.94	382.47	3.97	1608.10	1607.52	0.58
WASH 3-WEST	REACH-1	2.447	1	2.94	1.05	534.20	559.93	2.75	1604.67	1604.67	
WASH 3-WEST	REACH-1	2.447	2	3.36	1.92	207.82	398.04	3.87	1605.09	1604.67	0.42
WASH 3-WEST	REACH-1	2.366	1	4.77	1.33	339.52	452.26	3.41	1602.00	1602.00	
WASH 3-WEST	REACH-1	2.366	2	5.49	2.74	148.79	407.91	3.78	1602.72	1602.00	0.72
WASH 3-WEST	REACH-1	2.240	1	3.22	1.23	283.15	348.12	4.42	1597.40	1597.40	
WASH 3-WEST	REACH-1	2.240	2	3.49	2.01	113.77	228.64	6.74	1597.67	1597.40	0.27
WASH 3-WEST	REACH-1	2.151	1	3.32	1.10	311.39	341.34	4.51	1593.67	1593.67	
WASH 3-WEST	REACH-1	2.151	2	3.97	2.56	117.86	301.53	5.11	1594.32	1593.67	0.65
WASH 3-WEST	REACH-1	2.061	1	3.44	1.33	244.63	324.42	4.90	1589.87	1589.87	
WASH 3-WEST	REACH-1	2.061	2	4.10	2.78	76.51	212.96	7.47	1590.52	1589.87	0.66
WASH 3-WEST	REACH-1	1.979	1	4.34	1.30	258.63	335.81	4.73	1586.74	1586.74	
WASH 3-WEST	REACH-1	1.979	2	5.09	3.14	81.02	254.16	6.26	1587.49	1586.74	0.76
WASH 3-WEST	REACH-1	1.894	1	4.69	1.81	155.82	282.57	5.63	1583.49	1583.49	
WASH 3-WEST	REACH-1	1.894	2	4.87	2.77	75.71	209.34	7.60	1583.67	1583.49	0.18
WASH 3-WEST	REACH-1	1.816	1	6.19	1.81	130.38	236.44	6.72	1579.99	1579.99	
WASH 3-WEST	REACH-1	1.816	2	6.19	1.81	130.38	236.44	6.72	1579.99	1579.99	0.00
WASH 3-WEST	REACH-1	1.721	1	6.46	2.09	144.14	301.03	5.28	1576.68	1576.68	
WASH 3-WEST	REACH-1	1.721	2	7.45	4.55	70.05	318.95	4.99	1577.67	1576.68	0.99
WASH 3-WEST	REACH-1	1.625	1	7.93	1.70	192.57	327.88	6.01	1574.04	1574.04	
WASH 3-WEST	REACH-1	1.625	2	7.93	4.76	41.17	196.15	10.04	1574.04	1574.04	0.00
WASH 3-WEST	REACH-1	1.545	1	7.15	3.00	67.62	202.66	9.72	1570.22	1570.22	
WASH 3-WEST	REACH-1	1.545	2	8.09	5.26	40.62	214.35	9.19	1571.16	1570.22	0.93
WASH 3-WEST	REACH-1	1.480	1	7.99	2.69	160.84	432.19	4.56	1569.29	1569.29	
WASH 3-WEST	REACH-1	1.480	2	8.81	5.37	58.63	314.83	6.26	1570.11	1569.29	0.82
WASH 3-WEST	REACH-1	1.406	1	6.77	2.65	95.40	252.59	7.80	1566.90	1566.90	
WASH 3-WEST	REACH-1	1.406	2	7.49	5.32	40.94	217.75	9.05	1567.62	1566.90	0.72
WASH 3-WEST	REACH-1	1.343	1	8.02	2.11	271.15	573.43	6.54	1565.10	1565.10	
WASH 3-WEST	REACH-1	1.343	2	8.41	5.24	77.54	406.10	9.23	1565.49	1565.10	0.39
WASH 3-WEST	REACH-1	1.289	1	7.80	2.66	251.47	669.98	5.60	1564.07	1564.07	
WASH 3-WEST	REACH-1	1.289	2	8.79	4.59	145.00	665.09	5.64	1565.06	1564.07	0.99

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Width Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
WASH 3-WEST	REACH-1	1.196	1	8.10	2.37	257.41	609.25	6.16	1561.57	1561.57	
WASH 3-WEST	REACH-1	1.196	2	8.16	3.50	109.00	382.03	8.82	1561.63	1561.57	0.07
WASH 3-WEST	REACH-1	1.168	1	8.56	2.83	288.20	864.47	5.22	1561.04	1561.04	
WASH 3-WEST	REACH-1	1.168	2	9.45	5.55	152.00	843.74	5.04	1561.93	1561.04	0.89
WASH 3-WEST	REACH-1	1.112	1	8.06	2.32	267.81	622.40	6.83	1559.50	1559.50	
WASH 3-WEST	REACH-1	1.112	2	8.42	4.52	100.00	452.48	9.39	1559.86	1559.50	0.36
WASH 3-WEST	REACH-1	1.049	1	8.80	2.66	343.49	914.08	4.65	1558.40	1558.40	
WASH 3-WEST	REACH-1	1.049	2	9.70	5.18	155.00	803.22	5.29	1559.30	1558.40	0.90
WASH 3-WEST	REACH-1	0.948	1	7.32	2.42	262.18	634.23	6.70	1555.77	1555.77	
WASH 3-WEST	REACH-1	0.948	2	8.15	5.13	93.00	477.13	8.91	1556.60	1555.77	0.83
WASH 3-WEST	REACH-1	0.86	1	6.59	2.45	333.64	818.14	5.19	1553.62	1553.62	
WASH 3-WEST	REACH-1	0.86	2	7.59	4.66	139.00	648.31	6.56	1554.62	1553.62	1.00
WASH 3-WEST	REACH-1	0.781	1	6.62	2.25	361.32	811.44	5.24	1551.84	1551.84	
WASH 3-WEST	REACH-1	0.781	2	7.53	4.73	125.00	590.89	7.19	1552.75	1551.84	0.90
WASH 3-WEST	REACH-1	0.701	1	6.83	2.16	408.32	880.44	4.83	1550.05	1550.05	
WASH 3-WEST	REACH-1	0.701	2	7.82	4.96	126.00	625.08	6.80	1551.04	1550.05	0.99
WASH 3-WEST	REACH-1	0.618	1	6.23	2.02	393.75	795.50	5.34	1547.94	1547.94	
WASH 3-WEST	REACH-1	0.618	2	7.02	4.42	123.00	543.50	7.82	1548.73	1547.94	0.79
WASH 3-WEST	REACH-1	0.544	1	6.21	2.54	382.94	971.68	4.37	1546.64	1546.64	
WASH 3-WEST	REACH-1	0.544	2	7.21	4.95	154.00	762.17	5.58	1547.64	1546.64	1.00
WASH 3-WEST	REACH-1	0.483	1	7.09	3.20	490.92	1572.82	2.70	1546.38	1546.38	
WASH 3-WEST	REACH-1	0.483	2	7.81	5.66	152.00	860.71	4.94	1547.10	1546.38	0.72
WASH 3-WEST	REACH-1	0.403	1	7.77	4.14	357.86	1480.85	2.87	1546.08	1546.08	
WASH 3-WEST	REACH-1	0.403	2	8.30	6.60	147.00	970.24	4.38	1546.61	1546.08	0.53
WASH 3-WEST	REACH-1	0.356	1	9.07	4.12	625.77	2581.10	1.65	1546.05	1546.05	
WASH 3-WEST	REACH-1	0.356	2	9.52	7.40	165.00	1220.97	3.48	1546.50	1546.05	0.45
WASH 3-WEST	REACH-1	0.277	1	9.40	5.17	790.77	4091.85	1.04	1546.01	1546.01	
WASH 3-WEST	REACH-1	0.277	2	9.74	8.53	236.00	2013.30	2.11	1546.35	1546.01	0.34
WASH 3-WEST	REACH-1	0.207	1	10.79	5.08	1102.40	5605.52	0.76	1545.98	1546.98	
WASH 3-WEST	REACH-1	0.207	2	11.09	9.10	425.00	3866.64	1.10	1546.28	1545.98	0.30
WASH 3-WEST	REACH-1	0.129	1	12.26	5.89	925.01	9183.24	0.78	1545.95	1545.95	
WASH 3-WEST	REACH-1	0.129	2	12.48	9.39	294.00	6001.15	1.54	1546.18	1545.95	0.23
WASH 3-WEST	REACH-1	0.047	1	8.56	8.19	358.84	11490.79	1.45	1545.86	1545.86	
WASH 3-WEST	REACH-1	0.047	2	8.71	8.38	305.00	2557.10	1.66	1546.01	1545.86	0.15
WASH 3-WEST	REACH-1	0	1	11.40	9.78	72.54	709.49	5.99	1545.10	1545.10	
WASH 3-WEST	REACH-1	0	2	11.36	10.28	61.00	627.14	6.78	1545.10	1545.10	0.00
T4N-R3W-S09	REACH-1	2.651	1	1.48	0.61	504.60	309.95	2.29	1647.21	1647.21	
T4N-R3W-S09	REACH-1	2.651	2	1.71	1.33	185.92	247.75	2.87	1647.44	1647.21	0.23
T4N-R3W-S09	REACH-1	2.552	1	1.12	0.57	536.75	306.81	2.31	1643.62	1643.62	
T4N-R3W-S09	REACH-1	2.552	2	1.29	0.97	230.88	223.83	3.17	1643.79	1643.62	0.17
T4N-R3W-S09	REACH-1	2.454	1	1.62	0.87	378.05	330.62	2.15	1640.74	1640.74	
T4N-R3W-S09	REACH-1	2.454	2	1.75	1.33	219.54	291.05	2.44	1640.87	1640.74	0.13
T4N-R3W-S09	REACH-1	2.362	1	1.53	0.76	290.27	221.26	3.21	1637.83	1637.83	
T4N-R3W-S09	REACH-1	2.362	2	1.61	1.22	154.68	188.78	3.76	1637.91	1637.83	0.08
T4N-R3W-S09	REACH-1	2.267	1	1.03	0.57	675.05	383.82	1.85	1634.63	1634.63	
T4N-R3W-S09	REACH-1	2.267	2	1.51	1.26	239.39	302.11	2.35	1635.15	1634.63	0.52
T4N-R3W-S09	REACH-1	2.169	1	1.20	0.48	690.43	331.31	2.14	1631.63	1631.63	
T4N-R3W-S09	REACH-1	2.169	2	1.48	1.16	161.18	187.47	3.79	1631.91	1631.63	0.28
T4N-R3W-S09	REACH-1	2.065	1	1.37	0.44	827.14	363.36	1.95	1628.44	1628.44	
T4N-R3W-S09	REACH-1	2.065	2	1.54	1.27	252.89	322.04	2.20	1628.61	1628.44	0.16
T4N-R3W-S09	REACH-1	1.971	1	1.42	0.85	308.53	261.04	2.83	1625.12	1625.12	
T4N-R3W-S09	REACH-1	1.971	2	1.72	1.39	145.19	202.02	3.66	1625.42	1625.12	0.30
T4N-R3W-S09	REACH-1	1.876	1	1.20	0.72	474.18	342.59	2.16	1621.72	1621.72	
T4N-R3W-S09	REACH-1	1.876	2	1.58	1.33	223.09	295.80	2.50	1622.10	1621.72	0.37
T4N-R3W-S09	REACH-1	1.781	1	1.25	0.74	414.21	307.77	2.40	1618.67	1618.67	
T4N-R3W-S09	REACH-1	1.781	2	1.52	1.27	188.83	239.03	3.10	1618.94	1618.67	0.27

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
T4N-R3W-S09	REACH-1	1.686	1	1.78	0.58	507.81	293.10	2.52	1615.39	1615.39	
T4N-R3W-S09	REACH-1	1.686	2	1.94	1.05	237.78	250.75	2.95	1615.55	1615.39	0.16
T4N-R3W-S09	REACH-1	1.594	1	1.10	0.65	387.13	252.45	2.93	1611.59	1611.59	
T4N-R3W-S09	REACH-1	1.594	2	1.17	1.07	180.09	191.82	3.85	1611.75	1611.59	0.16
T4N-R3W-S09	REACH-1	1.488	1	1.26	0.60	635.29	380.16	2.05	1608.46	1608.46	
T4N-R3W-S09	REACH-1	1.488	2	1.71	1.48	184.20	272.79	2.86	1608.91	1608.46	0.45
T4N-R3W-S09	REACH-1	1.394	1	1.21	0.64	435.91	281.04	2.78	1605.70	1605.70	
T4N-R3W-S09	REACH-1	1.394	2	1.74	1.56	113.58	177.41	4.40	1606.24	1605.70	0.54
T4N-R3W-S09	REACH-1	1.302	1	2.06	0.74	424.72	314.30	2.48	1602.76	1602.76	
T4N-R3W-S09	REACH-1	1.302	2	1.62	1.31	191.04	249.66	3.12	1603.28	1602.76	0.52
T4N-R3W-S09	REACH-1	1.201	1	3.11	0.78	450.92	353.14	2.21	1600.09	1600.09	
T4N-R3W-S09	REACH-1	1.201	2	3.51	1.45	192.26	278.70	2.80	1600.49	1600.09	0.40
T4N-R3W-S09	REACH-1	1.104	1	1.43	0.65	543.00	352.27	2.21	1597.08	1597.08	
T4N-R3W-S09	REACH-1	1.104	2	1.69	1.43	178.00	254.18	3.07	1597.34	1597.08	0.26
T4N-R3W-S09	REACH-1	1.013	1	1.29	0.62	688.73	426.31	1.83	1594.51	1594.51	
T4N-R3W-S09	REACH-1	1.013	2	1.64	1.48	212.19	314.06	2.48	1594.86	1594.51	0.35
T4N-R3W-S09	REACH-1	0.920	1	1.98	0.61	707.03	429.68	1.91	1592.18	1592.18	
T4N-R3W-S09	REACH-1	0.920	2	1.90	1.49	217.61	324.46	2.53	1592.76	1592.18	0.58
T4N-R3W-S09	REACH-1	0.819	1	0.89	0.59	547.90	325.07	2.52	1588.78	1588.78	
T4N-R3W-S09	REACH-1	0.819	2	1.80	1.62	134.40	217.19	3.78	1589.76	1588.78	0.98
T4N-R3W-S09	REACH-1	0.678	1	1.45	0.83	406.74	339.01	2.42	1585.05	1585.05	
T4N-R3W-S09	REACH-1	0.678	2	1.48	1.22	220.30	268.43	3.05	1585.08	1585.05	0.03
T4N-R3W-S09	REACH-1	0.616	1	2.97	1.04	318.66	332.75	2.48	1582.92	1582.92	
T4N-R3W-S09	REACH-1	0.616	2	3.32	1.86	156.35	290.40	2.82	1583.27	1582.92	0.35
T4N-R3W-S09	REACH-1	0.501	1	3.91	1.21	277.23	335.28	2.45	1579.71	1579.71	
T4N-R3W-S09	REACH-1	0.501	2	4.32	2.28	106.27	241.96	3.39	1580.12	1579.71	0.41
T4N-R3W-S09	REACH-1	0.398	1	3.71	1.35	185.08	249.74	3.40	1575.70	1575.70	
T4N-R3W-S09	REACH-1	0.398	2	3.87	1.91	121.90	233.07	3.65	1575.86	1575.70	0.16
T4N-R3W-S09	REACH-1	0.299	1	2.99	1.54	188.61	289.92	2.93	1571.59	1571.59	
T4N-R3W-S09	REACH-1	0.299	2	3.05	1.89	145.27	273.98	3.10	1571.65	1571.59	0.06
T4N-R3W-S09	REACH-1	0.204	1	3.10	1.24	199.31	246.82	3.44	1567.44	1567.44	
T4N-R3W-S09	REACH-1	0.204	2	3.91	2.62	88.47	231.54	3.67	1568.25	1567.44	0.81
T4N-R3W-S09	REACH-1	0.104	1	5.25	1.82	140.10	254.32	3.34	1563.70	1563.70	
T4N-R3W-S09	REACH-1	0.104	2	5.78	3.64	47.85	173.94	4.89	1564.23	1563.70	0.53
T4N-R3W-S09	REACH-1	0.032	1	6.31	3.07	54.71	167.90	5.06	1561.03	1561.03	
T4N-R3W-S09	REACH-1	0.032	2	6.32	4.05	37.93	153.53	5.54	1561.04	1561.03	0.01
T4N-R3W-S08W	REACH-1	3.254	1	1.46	0.79	429.55	338.57	2.60	1683.55	1683.55	
T4N-R3W-S08W	REACH-1	3.254	2	2.28	1.92	133.06	255.93	3.44	1684.35	1683.55	0.80
T4N-R3W-S08W	REACH-1	3.156	1	2.59	0.80	332.93	265.59	3.31	1679.86	1679.86	
T4N-R3W-S08W	REACH-1	3.156	2	3.19	1.84	88.03	161.76	5.44	1680.46	1679.86	0.60
T4N-R3W-S08W	REACH-1	3.055	1	1.45	0.77	495.57	379.27	2.32	1676.46	1676.46	
T4N-R3W-S08W	REACH-1	3.055	2	1.71	1.51	198.50	300.36	2.93	1676.72	1676.46	0.27
T4N-R3W-S08W	REACH-1	2.960	1	1.33	0.69	529.91	387.81	2.30	1673.53	1673.53	
T4N-R3W-S08W	REACH-1	2.960	2	1.75	1.50	183.12	274.26	3.21	1673.95	1673.53	0.42
T4N-R3W-S08W	REACH-1	2.865	1	1.70	0.77	462.63	354.67	2.48	1670.41	1670.41	
T4N-R3W-S08W	REACH-1	2.865	2	2.28	1.96	131.00	256.61	3.43	1671.15	1670.41	0.74
T4N-R3W-S08W	REACH-1	2.769	1	1.62	0.87	398.79	345.02	2.55	1667.32	1667.32	
T4N-R3W-S08W	REACH-1	2.769	2	2.33	2.07	100.10	207.02	4.25	1668.03	1667.32	0.71
T4N-R3W-S08W	REACH-1	2.671	1	2.26	0.68	347.76	305.77	2.88	1664.04	1664.04	
T4N-R3W-S08W	REACH-1	2.671	2	2.59	1.72	135.27	232.31	3.79	1664.37	1664.04	0.33
T4N-R3W-S08W	REACH-1	2.573	1	2.33	0.75	452.67	340.09	2.59	1660.93	1660.93	
T4N-R3W-S08W	REACH-1	2.573	2	2.81	1.82	148.62	271.01	3.25	1661.41	1660.93	0.48
T4N-R3W-S08W	REACH-1	2.476	1	1.67	0.67	530.51	354.95	2.48	1657.85	1657.85	
T4N-R3W-S08W	REACH-1	2.476	2	2.14	1.57	153.77	241.41	3.65	1658.32	1657.85	0.46
T4N-R3W-S08W	REACH-1	2.375	1	1.51	0.74	445.27	328.41	2.77	1654.41	1654.41	
T4N-R3W-S08W	REACH-1	2.375	2	2.29	1.96	120.70	235.03	3.87	1655.19	1654.41	0.79
T4N-R3W-S08W	REACH-1	2.277	1	1.40	0.74	387.91	288.34	3.16	1650.99	1650.99	

HEC-RAS Plan: FP (Continued)

River	Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
				(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
T4N-R3W-S08W	REACH-1	2.277	2	1.83	1.53	109.93	168.40	5.40	1651.42	1650.99	0.43
T4N-R3W-S08W	REACH-1	2.181	1	1.51	1.03	366.51	375.81	2.42	1648.46	1648.46	
T4N-R3W-S08W	REACH-1	2.181	2	2.00	1.81	174.87	315.39	2.89	1648.95	1648.46	0.49
T4N-R3W-S08W	REACH-1	2.082	1	1.45	0.74	362.60	266.54	3.41	1645.43	1645.43	
T4N-R3W-S08W	REACH-1	2.082	2	1.72	1.61	104.63	168.68	5.39	1645.69	1645.43	0.26
T4N-R3W-S08W	REACH-1	1.987	1	3.69	0.92	345.29	317.32	2.87	1642.39	1642.39	
T4N-R3W-S08W	REACH-1	1.987	2	3.90	1.88	143.88	271.14	3.36	1642.60	1642.39	0.21
T4N-R3W-S08W	REACH-1	1.891	1	1.68	0.85	325.64	276.99	3.29	1639.44	1639.44	
T4N-R3W-S08W	REACH-1	1.891	2	2.11	1.72	125.05	214.89	4.23	1639.87	1639.44	0.43
T4N-R3W-S08W	REACH-1	1.803	1	1.36	0.77	584.58	451.85	2.10	1636.70	1636.70	
T4N-R3W-S08W	REACH-1	1.803	2	1.73	1.47	216.56	317.78	2.99	1637.07	1636.70	0.36
T4N-R3W-S08W	REACH-1	1.698	1	1.66	0.85	350.67	299.78	3.17	1634.01	1634.01	
T4N-R3W-S08W	REACH-1	1.698	2	1.80	1.35	186.24	251.07	3.78	1634.15	1634.01	0.14
T4N-R3W-S08W	REACH-1	1.604	1	2.01	0.99	277.65	275.87	3.44	1631.21	1631.21	
T4N-R3W-S08W	REACH-1	1.604	2	2.36	1.85	130.42	241.89	3.93	1631.56	1631.21	0.36
T4N-R3W-S08W	REACH-1	1.506	1	2.16	0.75	489.16	367.37	2.59	1628.18	1628.18	
T4N-R3W-S08W	REACH-1	1.506	2	2.37	1.54	161.45	248.12	3.83	1628.39	1628.18	0.22
T4N-R3W-S08W	REACH-1	1.408	1	1.78	0.83	426.55	354.19	2.66	1625.01	1625.01	
T4N-R3W-S08W	REACH-1	1.408	2	2.13	1.49	212.24	317.20	2.99	1625.36	1625.01	0.35
T4N-R3W-S08W	REACH-1	1.315	1	2.06	1.02	344.36	351.22	2.70	1621.96	1621.96	
T4N-R3W-S08W	REACH-1	1.315	2	2.11	2.00	122.40	244.30	3.89	1622.44	1621.96	0.47
T4N-R3W-S08W	REACH-1	1.218	1	1.55	0.92	409.52	375.63	2.64	1619.17	1619.17	
T4N-R3W-S08W	REACH-1	1.218	2	1.89	1.78	165.10	293.15	3.38	1619.51	1619.17	0.34
T4N-R3W-S08W	REACH-1	1.123	1	1.57	0.68	609.71	415.91	2.38	1616.49	1616.49	
T4N-R3W-S08W	REACH-1	1.123	2	1.82	1.60	191.99	306.73	3.23	1616.74	1616.49	0.25
T4N-R3W-S08W	REACH-1	1.029	1	1.59	0.84	425.44	359.15	2.76	1613.53	1613.53	
T4N-R3W-S08W	REACH-1	1.029	2	1.87	1.57	190.14	299.23	3.31	1613.81	1613.53	0.28
T4N-R3W-S08W	REACH-1	0.934	1	1.71	0.90	447.97	401.19	2.47	1610.56	1610.56	
T4N-R3W-S08W	REACH-1	0.934	2	1.95	1.55	196.62	305.36	3.24	1610.79	1610.56	0.24
T4N-R3W-S08W	REACH-1	0.833	1	2.14	0.70	485.41	337.44	2.93	1607.21	1607.21	
T4N-R3W-S08W	REACH-1	0.833	2	2.48	1.47	181.70	267.94	3.69	1607.55	1607.21	0.34
T4N-R3W-S08W	REACH-1	0.726	1	2.17	0.75	485.79	363.97	2.72	1603.94	1603.94	
T4N-R3W-S08W	REACH-1	0.726	2	2.56	1.62	169.75	275.82	3.59	1604.33	1603.94	0.39
T4N-R3W-S08W	REACH-1	0.626	1	1.34	0.97	384.62	371.69	2.77	1601.03	1601.03	
T4N-R3W-S08W	REACH-1	0.626	2	1.57	1.47	218.41	320.41	3.21	1601.26	1601.03	0.23
T4N-R3W-S08W	REACH-1	0.523	1	1.24	0.95	290.59	275.34	3.74	1596.69	1596.69	
T4N-R3W-S08W	REACH-1	0.523	2	1.74	1.64	142.19	232.99	4.42	1597.19	1596.69	0.50
T4N-R3W-S08W	REACH-1	0.417	1	2.80	1.01	287.65	291.16	3.54	1592.23	1592.23	
T4N-R3W-S08W	REACH-1	0.417	2	3.15	1.99	105.27	209.50	4.92	1592.58	1592.23	0.35
T4N-R3W-S08W	REACH-1	0.330	1	2.22	1.23	191.18	235.68	4.37	1588.72	1588.72	
T4N-R3W-S08W	REACH-1	0.330	2	2.40	1.88	113.70	213.93	4.81	1588.91	1588.72	0.18
T4N-R3W-S08W	REACH-1	0.243	1	4.08	1.67	132.11	207.17	4.97	1584.89	1584.89	
T4N-R3W-S08W	REACH-1	0.243	2	4.42	2.64	70.15	185.30	5.56	1585.22	1584.89	0.33
T4N-R3W-S08W	REACH-1	0.156	1	5.32	1.99	76.17	151.79	6.79	1580.24	1580.24	
T4N-R3W-S08W	REACH-1	0.156	2	5.81	3.20	43.76	140.08	7.35	1580.73	1580.24	0.49
T4N-R3W-S08W	REACH-1	0.057	1	4.26	2.22	85.56	189.65	5.43	1576.66	1576.66	
T4N-R3W-S08W	REACH-1	0.057	2	4.77	3.28	49.27	161.46	6.38	1576.17	1576.66	0.50

CHECK-RAS Report for Washes:
Wash 3-West
T4N-R3W-S08W
T4N-R3W-S09

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.p02
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.nt
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:42:01 PM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
T4N-R3W-S08W,REACH-1						
3.254		0.033	-----	-----	0.1	0.3
		0.044	-----	-----		
3.156		0.033	0.044	0.033	0.1	0.3
3.055		0.035	-----	-----	0.1	0.3
		0.047	-----	-----		
2.96		0.035	0.047	0.047	0.1	0.3
		-----	-----	0.035		
2.865		0.035	0.047	0.047	0.1	0.3
		-----	-----	0.035		
2.769		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
2.671		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
2.573		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
2.476		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
2.375		0.033	0.04	0.04	0.1	0.3
2.277		0.033	0.04	0.04	0.1	0.3
2.181		0.033	-----	-----	0.1	0.3
		0.042	-----	-----		
2.082		0.033	-----	-----	0.1	0.3
		0.042	-----	-----		
1.987		0.033	0.042	0.033	0.1	0.3
1.891		0.033	-----	-----	0.1	0.3
		0.042	-----	-----		
1.803		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
1.698		0.033	-----	-----	0.1	0.3
		0.033	-----	-----		
1.604		0.033	-----	-----	0.1	0.3
		0.042	-----	-----		
1.506		0.033	-----	-----	0.1	0.3
		0.042	-----	-----		
1.408		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
1.315		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
1.218		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
1.123		0.033	0.047	0.047	0.1	0.3
		-----	-----	0.033		
1.029		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		
.934		0.033	-----	-----	0.1	0.3
		0.047	-----	-----		

.833	0.03	0.042	0.042	0.1	0.3
.726	0.03	0.042	0.03	0.1	0.3
.626	0.033	-----	-----	0.1	0.3
	0.047	-----	-----		
.523	0.03	0.042	0.042	0.1	0.3
.417	0.03	-----	-----	0.1	0.3
	0.042	-----	-----		
.33	0.03	0.042	0.03	0.1	0.3
.243	0.03	-----	-----	0.1	0.3
	0.042	-----	-----		
.156	0.03	0.042	0.03	0.1	0.3
T4N-R3W-S09,REACH-1					
.057	0.03	-----	-----	0.1	0.3
	0.042	-----	-----		
2.651	0.035	-----	-----	0.1	0.3
	0.045	-----	-----		
2.552	0.035	-----	-----	0.1	0.3
	0.045	-----	-----		
2.454	0.035	0.045	0.035	0.1	0.3
2.362	0.035	-----	-----	0.1	0.3
	0.045	-----	-----		
2.267	0.035	0.045	0.045	0.1	0.3
	-----	-----	0.035		
2.169	0.035	0.045	0.035	0.1	0.3
2.065	0.033	0.05	0.033	0.1	0.3
1.971	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
1.876	0.033	0.05	0.033	0.1	0.3
1.781	0.033	0.05	0.033	0.1	0.3
1.686	0.033	0.04	0.04	0.1	0.3
	-----	-----	0.033		
1.594	0.033	-----	-----	0.1	0.3
	0.04	-----	-----		
1.488	0.033	0.04	0.04	0.1	0.3
	-----	-----	0.033		
1.394	0.033	-----	-----	0.1	0.3
	0.04	-----	-----		
1.302	0.035	-----	-----	0.1	0.3
	0.04	-----	-----		
1.201	0.035	0.05	0.033	0.1	0.3
1.104	0.035	0.05	0.05	0.1	0.3
1.013	0.035	-----	-----	0.1	0.3
	0.05	-----	-----		
.92	0.035	0.05	0.05	0.1	0.3
	-----	-----	0.033		
.819	0.035	-----	-----	0.1	0.3
	0.05	-----	-----		
.678	0.035	0.05	0.05	0.1	0.3
	-----	-----	0.033		
.616	0.035	-----	-----	0.1	0.3
	0.05	-----	-----		
.501	0.033	0.06	0.06	0.1	0.3
.398	0.033	0.06	0.06	0.1	0.3
	-----	-----	0.033		
.299	0.033	0.06	0.033	0.1	0.3
.204	0.033	0.06	0.06	0.1	0.3
.104	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
WASH 3-WEST,REACH-1					
.032	0.033	-----	-----	0.1	0.3
	0.06	-----	-----		
6.912	0.033	0.045	0.033	0.1	0.3
6.811	0.033	0.045	0.033	0.1	0.3
6.685	0.033	0.045	0.033	0.1	0.3
6.578	0.033	0.045	0.045	0.1	0.3
	-----	-----	0.033		
6.476	0.033	0.045	0.033	0.1	0.3

6.387	0.033	0.045	0.033	0.1	0.3
6.318	0.033	0.045	0.033	0.1	0.3
6.209	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
6.111	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
6.005	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
5.905	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
5.801	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
5.687	0.033	0.045	0.033	0.1	0.3
5.589	0.033	0.045	0.045	0.1	0.3
	-----	-----	0.033		
5.528	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
5.41	0.033	0.033	0.045	0.1	0.3
	-----	0.045	0.033		
5.323	0.033	0.045	0.045	0.1	0.3
	-----	-----	0.033		
5.21	0.033	0.045	0.033	0.1	0.3
5.147	0.033	-----	-----	0.1	0.3
	0.045	-----	-----		
5.022	0.037	-----	-----	0.1	0.3
	0.041	-----	-----		
4.928	0.037	0.041	0.041	0.1	0.3
	-----	-----	0.037		
4.837	0.037	0.041	0.037	0.1	0.3
4.709	0.037	0.041	0.041	0.1	0.3
	-----	-----	0.037		
4.624	0.037	0.041	0.041	0.1	0.3
	-----	-----	0.037		
4.519	0.037	-----	-----	0.1	0.3
	0.041	-----	-----		
4.421	0.037	-----	-----	0.1	0.3
	0.041	-----	-----		
4.31	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
4.196	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
4.077	0.037	-----	-----	0.1	0.3
	0.041	-----	-----		
3.959	0.037	0.038	0.038	0.1	0.3
	-----	-----	0.037		
3.84	0.037	-----	-----	0.1	0.3
	0.041	-----	-----		
3.727	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
3.59	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
3.441	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
3.298	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
3.152	0.033	-----	-----	0.1	0.3
	0.04	-----	-----		
3.054	0.033	-----	-----	0.1	0.3
	0.04	-----	-----		
2.942	0.033	-----	-----	0.1	0.3
	0.04	-----	-----		
2.816	0.033	-----	-----	0.1	0.3
	0.033	-----	-----		
2.703	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
2.615	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		

2.53	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
2.447	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
2.366	0.033	-----	-----	0.1	0.3
	0.05	-----	-----		
2.24	0.033	0.038	0.033	0.1	0.3
2.151	0.033	0.038	0.033	0.1	0.3
2.061	0.033	0.033	0.038	0.1	0.3
	-----	0.038	0.033		
1.979	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.894	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.816	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.721	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.625	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.545	0.033	0.038	0.033	0.1	0.3
1.48	0.033	0.038	0.033	0.1	0.3
1.406	0.033	-----	-----	0.1	0.3
	0.038	-----	-----		
1.343	0.033	0.038	0.033	0.1	0.3
1.289	0.033	0.038	0.033	0.1	0.3
1.196	0.033	0.042	0.033	0.1	0.3
1.168	0.033	0.042	0.033	0.1	0.3
1.112	0.033	0.042	0.033	0.1	0.3
1.049	0.033	0.042	0.033	0.1	0.3
.948	0.033	0.042	0.033	0.1	0.3
.86	0.033	0.042	0.033	0.1	0.3
.781	0.033	0.042	0.033	0.1	0.3
.701	0.033	0.042	0.033	0.1	0.3
.618	0.033	0.042	0.033	0.1	0.3
.544	0.033	0.042	0.033	0.1	0.3
.483	0.033	0.042	0.033	0.1	0.3
.403	0.033	0.042	0.033	0.1	0.3
.356	0.035	0.035	0.035	0.1	0.3
.277	0.035	-----	-----	0.1	0.3
	0.072	-----	-----		
.207	0.035	-----	-----	0.1	0.3
	0.072	-----	-----		
.129	0.035	-----	-----	0.1	0.3
	0.072	-----	-----		
.047	0.035	-----	-----	0.1	0.3
	0.072	-----	-----		
0	0.035	0.035	0.035	0.1	0.3

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.03	0.072
Right Overbank n Value:	0.03	0.06
Channel n Value:	0.033	0.06
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

RS: 3.156
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

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RS:       3.156
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       3.156
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.044
         The overbank n values should be reevaluated.

RS:       2.375
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2.375
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.04 are less than or equal to the channel n value of 0.04
         The overbank n values should be reevaluated.

RS:       2.277
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2.277
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.04 are less than or equal to the channel n value of 0.04
         The overbank n values should be reevaluated.

RS:       1.987
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.987
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.987
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       1.698
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.123
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.833
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.833
NT RC 05 The left overbank n value of 0.03 and the right overbank n value
         of 0.042 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       0.726
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NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.726
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.726
NT RC 05 The left overbank n value of 0.03 and the right overbank n value
         of 0.03 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.523
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.523
NT RC 05 The left overbank n value of 0.03 and the right overbank n value
         of 0.042 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.33
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.33
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.33
NT RC 05 The left overbank n value of 0.03 and the right overbank n value
         of 0.03 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.156
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.156
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.156
NT RC 05 The left overbank n value of 0.03 and the right overbank n value
         of 0.03 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      2.454
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      2.169
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      2.065
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
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         The n value should be reevaluated.

RS:      2.065
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      2.065
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      1.876
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.876
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.876
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      1.781
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.781
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.781
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      1.686
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.488
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.201
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.201
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      1.104
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.05 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.
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RS:       0.501
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.501
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.06 are less than or equal to the channel n value of 0.06
         The overbank n values should be reevaluated.

RS:       0.398
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.299
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.299
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.299
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.06
         The overbank n values should be reevaluated.

RS:       0.204
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.204
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.06 are less than or equal to the channel n value of 0.06
         The overbank n values should be reevaluated.

RS:       6.912
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       6.912
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       6.912
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:       6.811
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       6.811
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       6.811
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
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         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      6.685
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.685
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.685
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      6.578
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.476
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.476
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.476
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      6.387
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.387
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.387
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:      6.318
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.318
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      6.318
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.
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RS:       5.687
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.687
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.687
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:       5.589
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.41
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.323
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.21
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.21
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       5.21
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.045
         The overbank n values should be reevaluated.

RS:       4.837
NT RC 05 The left overbank n value of 0.037 and the right overbank n value
         of 0.037 are less than or equal to the channel n value of 0.041
         The overbank n values should be reevaluated.

RS:       2.816
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2.24
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2.24
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       2.24
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NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
         The overbank n values should be reevaluated.

RS:      2.151
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      2.151
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      2.151
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
         The overbank n values should be reevaluated.

RS:      2.061
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.545
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.545
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.545
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
         The overbank n values should be reevaluated.

RS:      1.48
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.48
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.48
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
         The overbank n values should be reevaluated.

RS:      1.343
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.343
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.343
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
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         The overbank n values should be reevaluated.

RS:      1.289
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.289
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.289
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.038
         The overbank n values should be reevaluated.

RS:      1.196
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.196
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.196
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      1.168
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.168
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.168
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      1.112
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.112
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.112
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      1.049
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.
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RS:       1.049
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       1.049
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       0.948
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.948
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.948
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       0.86
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.86
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.86
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       0.781
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.781
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.781
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:       0.701
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.701
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.701
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
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         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.618
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.618
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.618
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.544
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.544
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.544
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.483
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.483
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.483
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.403
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.403
NT RC 01 Right overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      0.403
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.033 are less than or equal to the channel n value of 0.042
         The overbank n values should be reevaluated.

RS:      0.356
NT RC 05 The left overbank n value of 0.035 and the right overbank n value
         of 0.035 are less than or equal to the channel n value of 0.035
         The overbank n values should be reevaluated.
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TRANSITION LOSS COEFFICIENT CHECK

ROUGHNESS COEFFICIENT AT STRUCTURES

---END---

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.p02
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.xs
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:42:33 PM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
T4N-R3W-S08W,REACH-1						
3.254	483	518.274	495	429.55	880	
3.156	568	533.15	492	332.93	880	
3.055	527	497.15	464	495.57	880	
2.96	517	506.44	484	529.91	880	D,B
2.865	490	506.86	549	462.63	880	
2.769	504	516.76	517	398.79	880	
2.671	505	514.67	502	347.76	880	
2.573	498	511.83	501	452.67	880	D,B
2.476	499	535.54	543	530.51	880	D,B
2.375	486	518.49	495	445.27	910	B
2.277	509	506.1	501	387.91	910	D,B
2.181	513	520.95	508	366.51	910	D,B
2.082	531	503.25	477	362.6	910	D,B
1.987	481	503.55	510	345.29	910	
1.891	484	468	452	325.64	910	
1.803	655	552.38	377	584.58	950	
1.698	450	495.58	522	350.67	950	
1.604	493	519.86	509	277.65	950	
1.506	502	518.67	533	489.16	950	
1.408	469	490.22	514	426.55	950	
1.315	488	510.63	523	344.36	950	
1.218	475	502.5	526	409.52	990	
1.123	509	496.42	486	609.71	990	
1.029	538	502.12	469	425.44	990	
.934	516	534.27	517	447.97	990	
.833	508	564.81	507	485.41	990	
.726	423	524.94	491	485.79	990	D
.626	556	543.51	457	384.62	1030	D,B
.523	554	563.26	558	290.59	1030	B
.417	456	459.78	407	287.65	1030	
.33	452	455.86	440	191.18	1030	
.243	414	459.52	479	132.11	1030	
.156	521	524.92	461	76.17	1030	
.057	0	0	0	85.56	1030	
T4N-R3W-S09,REACH-1						
2.651	525	522.45	520	506.31	710	D
2.552	647	517.95	452	536.68	710	
2.454	495	488.2	481	378.1	710	
2.362	499	500.01	500	289.99	710	
2.267	494	517.67	517	675.13	710	
2.169	550	548.32	523	690.35	710	
2.065	444	496.36	579	829.39	710	D
1.971	489	503.99	482	308.42	740	
1.876	483	501.91	539	474.65	740	
1.781	547	496.44	453	413.93	740	

1.686	565	490.56	450	508.42	740	
1.594	502	558.56	570	386.45	740	D
1.488	541	495.23	444	638.39	780	D
1.394	487	483.54	482	433.56	780	D,B
1.302	521	534.72	485	426.27	780	D,B
1.201	493	511.87	522	452.93	780	D,B
1.104	438	478.95	515	544.9	780	D
1.013	460	491.21	515	688.73	780	D
.92	483	538.08	584	707.03	820	D
.819	285	744.4	527	547.9	820	
.678	737	326.34	446	406.74	820	
.616	642	607.64	522	318.66	820	
.501	552	539.54	478	277.23	820	
.398	506	527.92	507	185.08	850	
.299	495	496.42	470	189.07	850	D
.204	474	531.77	547	199.31	850	
.104	355	379.25	363	140.1	850	
.032	0	0	0	54.71	850	
WASH 3-WEST,REACH-1						
6.912	500	536.18	527	146.46	380	
6.811	586	666.45	577	257	380	
6.685	574	552.85	514	289.2	380	
6.578	549	555.83	482	388.78	380	
6.476	425	470.32	480	278.31	670	
6.387	334	363.05	374	357.4	670	
6.318	558	579.9	558	396.97	670	
6.209	494	512.79	482	356.6	670	
6.111	519	563.28	529	515.39	670	
6.005	477	524.74	485	475.35	670	
5.905	606	549.67	524	351.16	980	
5.801	614	600.96	546	494.15	980	
5.687	495	522.64	483	511.49	980	
5.589	316	318.33	300	369.47	980	
5.528	626	625.97	583	510.82	980	
5.41	450	459.32	466	605.23	980	
5.323	472	596.28	542	493.06	1220	D
5.21	299	331.1	320	374.9	1220	
5.147	643	661.7	646	626.92	1220	
5.022	454	494.13	433	511.26	1220	
4.928	457	480.24	466	383.25	1220	
4.837	648	676.29	650	649.51	1430	
4.709	412	450.63	450	490.44	1430	
4.624	509	554.74	532	538.35	1430	
4.519	451	490.71	516	515.94	1430	D
4.421	498	586.93	582	614.77	1450	D
4.31	611	599.78	564	441.29	1450	D,B
4.196	618	631.85	629	437.62	1450	D,B
4.077	567	627.22	611	491.47	1450	B
3.959	600	618.09	564	416.47	1450	B
3.84	658	597.61	515	557.56	1490	D
3.727	731	722.38	692	626.79	1490	
3.59	697	783.51	711	680.9	1490	D
3.441	715	754.58	732	374.51	1490	
3.298	678	774.09	705	629.8	1490	
3.152	509	514.16	493	483.46	1490	
3.054	450	594.89	533	620.77	1520	
2.942	673	664.74	553	621.11	1520	
2.816	638	599.24	504	700.05	1520	
2.703	448	460.71	433	480.29	1520	
2.615	397	450.44	510	478.55	1520	
2.53	429	438.56	439	439.7	1520	
2.447	422	428.52	382	534.2	1540	
2.366	642	662.46	617	339.52	1540	
2.24	434	471.47	489	283.15	1540	
2.151	467	477.22	469	311.39	1540	D
2.061	408	428.26	417	244.63	1590	D
1.979	398	450.11	447	258.63	1590	D

1.894	425	413.55	392	155.82	1590	
1.816	460	498.13	464	130.38	1590	C
1.721	455	508.12	497	144.14	1590	D
1.625	418	423.53	430	192.57	1970	C
1.545	345	343.1	341	67.62	1970	C
1.48	380	389.42	386	160.84	1970	
1.406	335	335.21	321	95.4	1970	
1.343	276	263.27	276	271.15	3750	
1.289	491.506	492.301	475.917	251.47	3750	
1.196	150.213	146.404	151.914	257.41	3750	
1.168	266.86	296.403	270	288.2	4250	
1.112	331.609	335.12	291.129	267.81	4250	
1.049	531.466	532.281	515.565	343.49	4250	
.948	462.142	464.365	450.244	262.18	4250	
.86	419.393	418.74	364.022	333.64	4250	
.781	426.411	420.403	395.114	361.32	4250	
.701	424.627	439.349	428.831	408.32	4250	
.618	310.115	391.99	413.854	393.75	4250	
.544	230.902	320.516	325.895	382.94	4250	
.483	334.018	421.216	448.599	490.92	4250	
.403	271.255	246.43	233.107	357.86	4250	
.356	439.033	416.326	370.915	625.77	4250	
.277	416.958	368.34	341.759	790.77	4250	
.207	455.73	413.811	355.159	1102.4	4250	
.129	455.653	435.323	524.317	925.01	4250	D,E
.047	255.445	249.085	259.833	358.84	4250	E
0	0	0	0	72.54	4250	

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

RS: 0.678
XS DT 01 Both right and left overbank distances are
longer than the channel distance.

SPACING CHECK

INEFFECTIVE FLOW CHECK

RS: 6.578
XS IF 01 Left Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 6.476
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 5.528
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 4.196

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XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      4.077
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      4.077
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.959
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.84
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.615
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.454
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.362
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.971
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.876
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.686
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.594
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.104
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      0.104
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
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         for levees are met.

RS:      0.032
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.156
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      3.055
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.671
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.671
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      2.573
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.604
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      1.604
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:      0.156
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.


DISCHARGE CHECK
---------------


LOCATION CHECK
--------------

RS:      1.625
XS LC 01 Lenchl Up/TopwdthAct Dn = 6.26
         MaxChlDpth Up/MaxChlDpth Dn = 1.11
         TopwdthAct Up/TopwdthAct Dn = 2.85
         This cross section is located too far upstream from the
         critical depth cross section.


BOUNDARY CONDITION CHECK
------------------------

XS BC 02 The name of the stream is T4N-R3W-S08W,REACH-1
```

```
        Normal S = 0.0075 is specified as the downstream boundary
        for profile 1

XS BC 02 The name of the stream is T4N-R3W-S09,REACH-1
        Normal S = 0.0082 is specified as the downstream boundary
        for profile 1

XS BC 02 The name of the stream is WASH 3-WEST,REACH-1
        Known WS = 1545.1 is specified as the downstream boundary
        for profile 1

XS BC 03 Maximum number of iterations is 0
        It should not be less than 20.


LATERAL WEIRS CHECK
-----------------------

---END---
```

CHECK-RAS Program: Floodway Check
Encroachment Method, Starting WSEL, Floodway Width, and Surcharge Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.p02
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.f01
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.fw
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:42:45 PM

SECNO	Method	Surcharge	EncStaL	EncStaR	LStaEff	RStaEff	Structure
T4N-R3W-S08W,REACH-1							
3.254					9762.71	10192.26	
3.254	19	0.8	9967.94	10101	9967.94	10101	
3.156					9868.87	10201.8	
3.156	19	0.6	9947.81	10035.84	9947.81	10035.84	
3.055					9728.56	10224.13	
3.055	19	0.27	9853.28	10051.78	9853.28	10051.78	
2.96					9829.22	10422.43	
2.96	19	0.42	9911.42	10094.54	9911.42	10094.54	
2.865					9861.35	10323.98	
2.865	19	0.74	9941.16	10072.16	9941.16	10072.16	
2.769					9882.97	10281.75	
2.769	19	0.71	9948.18	10048.28	9948.18	10048.28	
2.671					9787.11	10134.87	
2.671	19	0.33	9951.37	10086.64	9951.37	10086.64	
2.573					9786.77	10335.12	
2.573	1	0.48	9971.1	10119.72	9971.1	10119.72	
2.476					9561.56	10152.3	
2.476	19	0.46	9859.36	10013.13	9859.36	10013.13	
2.375					9698.52	10143.79	
2.375	19	0.79	9952.21	10072.91	9952.21	10072.91	
2.277					9757.98	10217.04	
2.277	19	0.43	9944.49	10054.42	9944.49	10054.42	
2.181					9745.15	10192.29	
2.181	19	0.49	9914.53	10089.2	9914.53	10089.2	
2.082					9683.13	10128.81	
2.082	19	0.26	9879.67	10029.13	9879.67	9984.3	
1.987					9773.85	10119.13	
1.987	19	0.21	9925.71	10069.59	9925.71	10069.59	
1.891					9827.65	10153.29	
1.891	19	0.43	9916.28	10041.33	9916.28	10041.33	
1.803					9754.9	10339.48	
1.803	19	0.36	9976.12	10192.68	9976.12	10192.68	
1.698					9843.93	10194.6	
1.698	19	0.14	9936.03	10122.27	9936.03	10122.27	
1.604					9857.81	10135.46	
1.604	19	0.36	9939.91	10070.33	9939.91	10070.33	
1.506					9741.12	10230.28	
1.506	19	0.22	9973.77	10135.22	9973.77	10135.22	
1.408					9795.18	10221.73	
1.408	19	0.35	9959.67	10171.91	9959.67	10171.91	
1.315					9861.97	10206.33	
1.315	19	0.47	9976.97	10099.37	9976.97	10099.37	
1.218					9784.15	10193.67	
1.218	19	0.34	9932.87	10097.97	9932.87	10097.97	
1.123					9628.92	10238.64	
1.123	19	0.25	9876.73	10068.72	9876.73	10068.72	

1.029					9725.69	10151.13
1.029	19	0.28	9880.69	10070.83	9880.69	10070.83
0.934					9733.69	10181.66
0.934	19	0.24	9884.89	10081.51	9884.89	10081.51
0.833					9733.86	10219.27
0.833	19	0.34	9919.51	10101.21	9919.51	10101.21
0.726					9639.62	10176.48
0.726	1	0.39	9849.5	10019.25	9849.5	10019.25
0.626					9710.4	10154.63
0.626	19	0.23	9835.51	10053.92	9835.51	10053.92
0.523					9864.61	10155.2
0.523	19	0.5	9942.58	10084.77	9942.58	10084.77
0.417					9847.96	10135.61
0.417	19	0.35	9939.54	10044.81	9939.54	10044.81
0.33					9884.89	10076.07
0.33	19	0.18	9930.99	10044.69	9930.99	10044.69
0.243					9945.88	10077.99
0.243	19	0.33	9967.28	10037.43	9967.28	10037.43
0.156					9954.2	10030.37
0.156	19	0.49	9966.72	10010.48	9966.72	10010.48
0.057					9954.93	10040.49
0.057	19	0.5	9986.21	10035.48	9986.21	10035.48
T4N-R3W-S09,REACH-1						
2.651					9631.61	10226.82
2.651	19	0.23	9967.68	10153.6	9967.68	10153.6
2.552					9641.57	10178.25
2.552	19	0.17	9844.24	10075.22	9844.24	10075.22
2.454					9804.56	10182.65
2.454	19	0.13	9903.15	10122.69	9903.15	10122.69
2.362					9837.72	10127.71
2.362	19	0.08	9919.04	10073.72	9919.04	10073.72
2.267					9475.28	10150.42
2.267	19	0.52	9883.47	10122.86	9883.47	10122.86
2.169					9537.06	10227.41
2.169	19	0.29	9902.25	10063.43	9902.25	10063.43
2.065					9225.07	10210.06
2.065	1	0.16	9940	10192.89	9940	10192.89
1.971					9819.41	10127.83
1.971	19	0.31	9906.79	10051.98	9906.79	10051.98
1.876					9820.8	10295.45
1.876	19	0.37	9972.72	10195.81	9972.72	10195.81
1.781					9752.48	10166.41
1.781	19	0.28	9855.14	10043.97	9855.14	10043.97
1.686					9616.24	10124.66
1.686	19	0.15	9830.48	10068.26	9830.48	10068.26
1.594					9808.53	10224.96
1.594	19	0.17	9870.72	10050.81	9870.72	10050.81
1.488					9643.79	10349.63
1.488	19	0.43	9947.26	10131.46	9947.26	10131.46
1.394					9564.74	10233.95
1.394	19	0.58	9958.18	10125.36	9958.18	10125.36
1.302					9587.64	10160.12
1.302	19	0.48	9883.57	10075.96	9884.92	10075.96
1.201					9831.76	10362.75
1.201	19	0.2	9893.57	10137.46	9893.57	10137.46
1.104					9765.68	10367.83
1.104	19	0.19	9885.74	10107.43	9885.74	10107.43
1.013					9577.99	10307.77
1.013	19	0.35	9928.88	10141.07	9928.88	10141.07
0.92					9586.78	10424.44
0.92	1	0.58	9827.2	10044.81	9827.2	10044.81
0.819					9543.83	10091.73
0.819	19	0.98	9894.45	10028.85	9894.45	10028.85
0.678					9755.08	10161.82
0.678	19	0.03	9829.99	10050.29	9829.99	10050.29
0.616					9806.19	10124.85
0.616	1	0.35	9934.4	10090.78	9934.4	10090.78

0.501					9895.1	10172.33
0.501	19	0.41	9947.19	10053.46	9947.19	10053.46
0.398					9872.72	10057.8
0.398	19	0.16	9887.36	10009.26	9887.36	10009.26
0.299					9899.84	10146.11
0.299	19	0.06	9921.08	10066.35	9921.08	10066.35
0.204					9891.61	10090.91
0.204	19	0.81	9942.73	10031.2	9942.73	10031.2
0.104					9965.97	10106.07
0.104	19	0.53	9986.55	10034.4	9986.55	10034.4
0.032					9976.39	10031.1
0.032	19	0.01	9982.32	10020.25	9982.32	10020.25
WASH 3-WEST,REACH-1						
6.912					9893.4	10039.86
6.912	19	0.16	9955.26	10009.45	9955.26	10009.45
6.811					9874.73	10131.73
6.811	19	0.7	9960.95	10026.17	9960.95	10026.17
6.685					9816.85	10106.05
6.685	19	0.35	9934.82	10008.63	9934.82	10008.63
6.578					9872.57	10261.36
6.578	19	0.62	9957.61	10063.99	9957.61	10063.99
6.476					9794.65	10072.97
6.476	19	0.7	9953.78	10040.22	9953.78	10040.22
6.387					9817.88	10175.28
6.387	19	0.56	9936.19	10070.74	9936.19	10070.74
6.318					9803.38	10200.36
6.318	1	0.51	9907	10062.77	9907	10062.77
6.209					9890.11	10246.71
6.209	19	0.71	9938.49	10034.05	9938.49	10034.05
6.111					9632.02	10147.42
6.111	19	0.33	9945.58	10064.7	9945.58	10064.7
6.005					9595.33	10070.68
6.005	19	0.97	9948.19	10059.07	9948.19	10059.07
5.905					9769.5	10120.66
5.905	1	0.72	9973	10045.07	9973	10045.07
5.801					9625.78	10119.92
5.801	19	0.69	9857.87	10042.83	9857.87	10042.83
5.687					9725.52	10237.01
5.687	19	0.18	9872.02	10076.74	9872.02	10076.74
5.589					9868	10237.47
5.589	19	0.46	9975.59	10110.64	9975.59	10110.64
5.528					9731.08	10241.9
5.528	1	0.88	9941.7	10058.53	9941.7	10058.53
5.41					9773.07	10378.3
5.41	19	0.15	9840.22	10039.92	9840.22	10039.92
5.323					9768.7	10286.99
5.323	19	0.21	9894.89	10286.99	9894.89	10286.99
5.21					9712.32	10087.22
5.21	1	0.81	9931.4	10057.54	9931.4	10057.54
5.147					9763.4	10390.31
5.147	19	0.71	9975.93	10097.06	9975.93	10097.06
5.022					9811.48	10322.74
5.022	19	0.75	9941.25	10078.79	9941.25	10078.79
4.928					9788.79	10172.04
4.928	19	0.88	9920.94	10032.93	9920.94	10032.93
4.837					9522.82	10172.32
4.837	19	0.64	9948.12	10091.7	9948.12	10091.7
4.709					9721.21	10211.65
4.709	19	0.45	9849.04	10007.34	9849.04	10007.34
4.624					9678.74	10217.08
4.624	19	0.69	9820.16	10004.4	9820.16	10004.4
4.519					9613.31	10192.86
4.519	19	0.71	9977.42	10137.93	9977.42	10137.93
4.421					9548.32	10168.46
4.421	1	0.52	9923.4	10053.02	9923.4	10053.02
4.31					9713.6	10166.62
4.31	19	0.82	9881.98	10045.9	9881.98	10045.9

4.196					9679.35	10212.11
4.196	19	0.53	9937.56	10092.23	9937.56	10092.23
4.077					9855.08	10346.55
4.077	19	0.45	9935.69	10114.42	9935.69	10114.42
3.959					9921.88	10338.35
3.959	19	0.2	9947.97	10110.23	9947.97	10110.23
3.84					9732.85	10311.3
3.84	19	0.67	9955.42	10143.73	9955.42	10143.73
3.727					9719.47	10346.26
3.727	19	0.82	9915.46	10075.4	9915.46	10075.4
3.59					9771.93	10462.11
3.59	19	0.34	9946.01	10197.71	9946.01	10197.71
3.441					9824.2	10198.71
3.441	19	0.29	9909.57	10105.37	9909.57	10105.37
3.298					9629.71	10259.51
3.298	19	0.73	9863.73	10067.4	9863.73	10067.4
3.152					9716.71	10200.17
3.152	19	0.37	9875.59	10067.47	9875.59	10067.47
3.054					9738.03	10358.79
3.054	19	0.39	9897.86	10095.2	9897.86	10095.2
2.942					9693.15	10314.26
2.942	19	0.61	9874.63	10082.59	9874.63	10082.59
2.816					9758.08	10458.13
2.816	1	0.35	9878.6	10086.62	9878.6	10086.62
2.703					9828.64	10308.93
2.703	19	0.52	9892.88	10114.47	9892.88	10114.47
2.615					9730.11	10208.66
2.615	19	0.7	9962.03	10119.33	9962.03	10119.33
2.53					9766.56	10206.26
2.53	19	0.58	9899.74	10074.68	9899.74	10074.68
2.447					9735.84	10270.04
2.447	19	0.42	9912.31	10120.13	9912.31	10120.13
2.366					9842.02	10181.54
2.366	19	0.72	9943.79	10092.58	9943.79	10092.58
2.24					9916.57	10199.72
2.24	1	0.27	9984.9	10098.67	9984.9	10098.67
2.151					9905.86	10266.31
2.151	1	0.65	9958.1	10075.96	9958.1	10075.96
2.061					9868.35	10116.39
2.061	19	0.66	9961.67	10038.18	9961.67	10038.18
1.979					9824.55	10116.28
1.979	19	0.76	9966.79	10047.81	9966.79	10047.81
1.894					9926.34	10082.16
1.894	19	0.18	9965.78	10041.49	9965.78	10041.49
1.816					9970.43	10100.81
1.816	19	0	9242.23	10173.83	9970.43	10100.81
1.721					9967.03	10113.58
1.721	19	0.99	9986.38	10056.43	9986.38	10056.43
1.625					9931.25	10123.82
1.625	19	0	9984.24	10025.41	9984.24	10025.41
1.545					9965.29	10032.91
1.545	19	0.93	9982.24	10022.86	9982.24	10022.86
1.48					9899.85	10060.69
1.48	19	0.82	9963.65	10022.28	9963.65	10022.28
1.406					9939.48	10034.87
1.406	19	0.72	9972.04	10012.98	9972.04	10012.98
1.343					9819.34	10090.49
1.343	19	0.39	9941.99	10019.53	9941.99	10019.53
1.289					9875.73	10127.2
1.289	1	0.99	9929	10074	9929	10074
1.196					9927.77	10185.17
1.196	1	0.07	9975	10084	9975	10084
1.168					9938.86	10227.06
1.168	1	0.89	9937	10089	9937	10089
1.112					9806.51	10074.32
1.112	1	0.36	9947	10047	9947	10047
1.049					9812.88	10156.38

1.049	1	0.9	9914	10069	9914	10069
0.948					9874.9	10137.08
0.948	1	0.83	9952	10045	9952	10045
0.86					9845.42	10179.06
0.86	1	1	9910	10049	9910	10049
0.781					9814.04	10175.36
0.781	1	0.9	9944	10069	9944.	10069
0.701					9778.31	10186.63
0.701	1	0.99	9946	10072	9946	10072
0.618					9729.62	10123.37
0.618	1	0.79	9937	10060	9937	10060
0.544					9833.83	10216.77
0.544	1	1	9901	10055	9901	10055
0.483					9778.28	10269.2
0.483	1	0.72	9930	10082	9930	10082
0.403					9701.28	10059.14
0.403	1	0.53	9893	10040	9893	10040
0.356					9569.14	10194.92
0.356	1	0.45	9880	10045	9880	10045
0.277					9547.08	10337.85
0.277	1	0.34	9883	10119	9883	10119
0.207					9357.32	10459.72
0.207	1	0.3	9784	10209	9784	10209
0.129					9080.98	10570
0.129	1	0.23	9714	10298	9714	10298
0.047					9826.16	10185
0.047	1	0.15	9850	10155	9850	10155
0					9959.46	10032.01
0	1	0	9966	10027	9966	10027

ENCROACHMENT METHOD CHECK

FLOODWAY WIDTH CHECK

RS: 3.156
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 3.055
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.96
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.865
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.573
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.476
FW FW 03 The right channel bank station may not be at the proper location.

RS: 2.277
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 2.082
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.987
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.891
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.891
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.803
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.698
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.604
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.408
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.029
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.934
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.934
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.833
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.726
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.626
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.626
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.523
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.33
FW FW 03 The Left channel bank station may not be at the proper location.

```
RS:        0.33
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.243
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.156
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.651
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.454
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.362
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.362
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.267
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.781
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        1.594
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.394
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        1.302
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.104
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.92
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.819
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.678
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.616
FW FW 03   The right channel bank station may not be at the proper
```

location.

RS: 0.501
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.501
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.299
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.204
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.104
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.104
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.032
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.032
FW FW 03 The right channel bank station may not be at the proper location.

RS: 6.685
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 6.578
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 6.476
FW FW 03 The right channel bank station may not be at the proper location.

RS: 6.387
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 6.387
FW FW 03 The right channel bank station may not be at the proper location.

RS: 6.318
FW FW 03 The right channel bank station may not be at the proper location.

RS: 6.111
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 5.687
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 5.589

```
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       5.323
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       5.21
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       5.21
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       5.147
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       4.709
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       4.519
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       4.519
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       4.421
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       4.31
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       3.959
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       3.84
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       3.84
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       3.727
FW FW 03  The right channel bank station may not be at the proper
          location.

RS:       3.59
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       3.441
FW FW 03  The Left channel bank station may not be at the proper
          location.

RS:       3.298
FW FW 03  The Left channel bank station may not be at the proper
          location.
```

```
RS:        3.152
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        3.054
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.942
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.816
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.816
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.703
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.615
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.53
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.24
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        2.151
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        2.061
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.979
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.979
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        1.894
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.816
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        1.816
FW FW 04   The left station effective of 9970.43 for 1% annual chance floodplain
           is less than the left channel bank station 9979.46
           The 1% annual chance floodplain is outside the channel.
           However, the left encroachment station (9242.23) is outside of 1% annual
           chance floodplain.
           The left encroachment station should be adjusted.
```

RS: 1.816
FW FW 04 The right station effective of 10100.81 for 1% annual chance floodplain is greater than the right channel bank station (10021.57).
The 1% annual chance floodplain is outside the channel.
However, the right encroachment station (10173.83) is outside of 1% annual chance floodplain.
The right encroachment station should be adjusted.

RS: 1.721
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.545
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.48
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.343
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.289
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.289
FW FW 03 The right channel bank station may not be at the proper location.

RS: 1.168
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.168
FW FW 04 The left station effective of 9938.86 for 1% annual chance floodplain is less than the left channel bank station 9958.99
The 1% annual chance floodplain is outside the channel.
However, the left encroachment station (9937) is outside of 1% annual chance floodplain.
The left encroachment station should be adjusted.

RS: 1.112
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 1.112
FW FW 03 The right channel bank station may not be at the proper location.

RS: 0.948
FW FW 01 Right encroachment station 10045 is less than right channel bank station 10045.26 and greater than the left channel bank station 9961.34
Right encroachment station is within the channel.
The encroachment station or channel bank station should be adjusted.

RS: 0.948
FW FW 03 The Left channel bank station may not be at the proper location.

RS: 0.86
FW FW 03 The Left channel bank station may not be at the proper location.

```
RS:        0.86
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.781
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.618
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.544
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.483
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.403
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.356
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.277
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.047
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.047
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0
FW FW 01   Right encroachment station 10027 is less than right channel bank
           station 10027.22 and greater than the left channel bank station 9966.09
           Right encroachment station is within the channel.
           The encroachment station or channel bank station should be adjusted.

RS:        0
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0
FW FW 03   The right channel bank station may not be at the proper
           location.


SURCHARGE CHECK
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DISCHARGE CHECK
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STARTING WATER-SURFACE ELEVATION CHECK
--------------------------------------

---END---
```

HEC-RAS Report for Washes:
Wash 3-West
T4N-R3W-S08W
T4N-R3W-S09

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: WITT_PH2_WASH 3-WEST+ TRIBS_S09_S08W
Project File : WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.prj
Run Date and Time: 4/3/2007 10:24:06 AM

Project in English units

Project Description:
WITTMANN PHASE 2 ZONE AE FLOODPLAIN DELINEATION STUDY, Contract FCD2004C066

Prepared by David Evans and Associates Inc.
Initial modeling
in January 2006, updated in May 2006, Floodway on Wash T4N-R3W-S09 Revised April 2007
Modeled by Frank Brown, P.E., CFM and Nathan Logan, E.I.T.

HEC-RAS Version 3.1.3 is utilized for floodplain and floodway delineation. Floodway is based upon equal conveyance reduction (RAS Method 4), and refined with set floodway locations (RAS Method 1).

Filename :
WITT_PH2_WASH_3-WEST_TRIBS_S09_S08W.PRJ

Vertical datum:
NAVD1988

Topography and aerial photography provided by FCDMC, origin is the Wittmann ADMS/ADMSU (FCD 2002C029), flight dates are 04/18/02, 04/19/02 and 04/23/02 at 1:7200 ratio and 04/23/02 at 1:14400 ratio.

DTM data provided by
Wittmann ADMSU consultant from contract FCD 2002C029.

Manning's 'n' values
were determined by field reconnaissance; see the Technical Data Notebook for more detailed information.

Flow rates are from the Hydrology Computations
Appendix of the Technical Data Notebook; please refer to the Flow Rate Exhibit and the computations for the interpolated and intermediate values.

The
cross-sections RM 6.912 to RM 4.709 on Wash 3-West were surveyed by DEA; see the survey report in the Technical Data Notebook for more detailed information.

River Mile 1.343 on Wash 3-West is the downstream limit of the Wittmann Phase 2 Zone AE Floodplain Delineation Study Contract FCD 2004C066 and the upstream limit of the Wittmann Area Drainage Master Study Update Contract FCD 2002C029.

Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain are accounted for and some house(s) are projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses are projected to the nearest cross-section.

****

PLAN DATA

Plan Title: FLOODPLAIN
Plan File : p:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.p02

Geometry Title: WASH 3-WEST
Geometry File : p:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.g01

Flow Title : FLOODPLAIN
Flow File : p:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.f01

Plan Summary Information:

Number of:	Cross Sections =	137	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

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 =	True	
Left Offset =	0	
Right Offset =	0	

River = WASH 3-WEST Reach = REACH-1

RS	Profile	Method	Value1	Value2
6.912	2	1	9955.2610009.45	
6.811	2	1	9960.9510026.17	
6.685	2	1	9934.8210008.63	
6.578	2	1	9957.6110063.99	
6.476	2	1	9953.7810040.22	
6.387	2	1	9936.1910070.74	
6.318	2	1	990710062.77	
6.209	2	1	9938.4910034.05	
6.111	2	1	9945.58 10064.7	
6.005	2	1	9948.1910059.07	
5.905	2	1	997310045.07	
5.801	2	1	9857.8710042.83	
5.687	2	1	9872.0210076.74	
5.589	2	1	9975.5910110.64	
5.528	2	1	9941.710058.53	
5.410	2	1	9840.2210039.92	
5.323	2	1	9894.8910286.99	
5.210	2	1	9931.410057.54	
5.147	2	1	9975.9310097.06	

5.022	2	1	9941.2510078.79	
4.928	2	1	9920.9410032.93	
4.837	2	1	9948.12 10091.7	
4.709	2	1	9849.0410007.34	
4.624	2	1	9820.16 10004.4	
4.519	2	1	9977.4210137.93	
4.421	2	1	9923.410053.02	
4.310	2	1	9881.98 10045.9	
4.196	2	1	9937.5610092.23	
4.077	2	1	9935.6910114.42	
3.959	2	1	9947.9710110.23	
3.840	2	1	9955.4210143.73	
3.727	2	1	9915.46 10075.4	
3.590	2	1	9946.0110197.71	
3.441	2	1	9909.5710105.37	
3.298	2	1	9863.73 10067.4	
3.152	2	1	9875.5910067.47	
3.054	2	1	9897.86 10095.2	
2.942	2	1	9874.6310082.59	
2.816	2	1	9878.610086.62	
2.703	2	1	9892.8810114.47	
2.615	2	1	9962.0310119.33	
2.530	2	1	9899.7410074.68	
2.447	2	1	9912.3110120.13	
2.366	2	1	9943.7910092.58	
2.240	2	1	9984.910098.67	
2.151	2	1	9958.110075.96	
2.061	2	1	9961.6710038.18	
1.979	2	1	9966.7910047.81	
1.894	2	1	9965.7810041.49	
1.816	2	1	9242.2310173.83	
1.721	2	1	9986.3810056.43	
1.625	2	1	9984.2410025.41	
1.545	2	1	9982.2410022.86	
1.480	2	1	9963.6510022.28	
1.406	2	1	9972.0410012.98	
1.343	2	1	9941.9910019.53	
1.289	2	1	9929	10074
1.196	2	1	9975	10084
1.168	2	1	9937	10089
1.112	2	1	9947	10047
1.049	2	1	9914	10069
0.948	2	1	9952	10045
0.86	2	1	9910	10049
0.781	2	1	9944	10069
0.701	2	1	9946	10072
0.618	2	1	9937	10060
0.544	2	1	9901	10055
0.483	2	1	9930	10082
0.403	2	1	9893	10040
0.356	2	1	9880	10045
0.277	2	1	9883	10119
0.207	2	1	9784	10209
0.129	2	1	9714	10298
0.047	2	1	9850	10155
0	2	1	9966	10027

River = T4N-R3W-S08W Reach = REACH-1

RS	Profile	Method	Value1	Value2
3.254	2	1	9967.94	10101
3.156	2	1	9947.8110035.84	
3.055	2	1	9853.2810051.78	
2.960	2	1	9911.4210094.54	
2.865	2	1	9941.1610072.16	
2.769	2	1	9948.1810048.28	
2.671	2	1	9951.3710086.64	
2.573	2	1	9971.110119.72	
2.476	2	1	9859.3610013.13	
2.375	2	1	9952.2110072.91	
2.277	2	1	9944.4910054.42	
2.181	2	1	9914.53 10089.2	

```
2.082   2                        1 9879.6710029.13
1.987   2                        1 9925.7110069.59
1.891   2                        1 9916.2810041.33
1.803   2                        1 9976.1210192.68
1.698   2                        1 9936.0310122.27
1.604   2                        1 9939.9110070.33
1.506   2                        1 9973.7710135.22
1.408   2                        1 9959.6710171.91
1.315   2                        1 9976.9710099.37
1.218   2                        1 9932.8710097.97
1.123   2                        1 9876.7310068.72
1.029   2                        1 9880.6910070.83
0.934   2                        1 9884.8910081.51
0.833   2                        1 9919.5110101.21
0.726   2                        1  9849.510019.25
0.626   2                        1 9835.5110053.92
0.523   2                        1 9942.5810084.77
0.417   2                        1 9939.5410044.81
0.330   2                        1 9930.9910044.69
0.243   2                        1 9967.2810037.43
0.156   2                        1 9966.7210010.48
0.057   2                        1 9986.2110035.48

River = T4N-R3W-S09       Reach = REACH-1
RS      Profile            Method  Value1  Value2
2.651   2                        1 9967.68 10153.6
2.552   2                        1 9844.2410075.22
2.454   2                        1 9903.1510122.69
2.362   2                        1 9919.0410073.72
2.267   2                        1 9883.4710122.86
2.169   2                        1 9902.2510063.43
2.065   2                        1    994010192.89
1.971   2                        1 9906.7910051.98
1.876   2                        1 9972.7210195.81
1.781   2                        1 9855.1410043.97
1.686   2                        1 9830.4810068.26
1.594   2                        1 9870.7210050.81
1.488   2                        1 9947.2610131.46
1.394   2                        1 9958.1810125.36
1.302   2                        1 9883.5710075.96
1.201   2                        1 9914.5510106.81
1.104   2                        1    9917   10095
1.013   2                        1 9928.8810141.07
0.920   2                        1  9827.210044.81
0.819   2                        1 9894.4510028.85
0.678   2                        1 9829.9910050.29
0.616   2                        1  9934.410090.78
0.501   2                        1 9947.1910053.46
0.398   2                        1 9887.3610009.26
0.299   2                        1 9921.0810066.35
0.204   2                        1 9942.73 10031.2
0.104   2                        1 9986.55 10034.4
0.032   2                        1 9982.3210020.25

*****************************************************************************

FLOW DATA

Flow Title: FLOODPLAIN
Flow File : p:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.f01

Flow Data (cfs)
*****************************************************************************
* River           Reach           RS      *              1              2 *
* T4N-R3W-S08W    REACH-1         3.254   *            880            880 *
* T4N-R3W-S08W    REACH-1         2.375   *            910            910 *
* T4N-R3W-S08W    REACH-1         1.803   *            950            950 *
* T4N-R3W-S08W    REACH-1         1.218   *            990            990 *
* T4N-R3W-S08W    REACH-1         0.626   *           1030           1030 *
```

```
* T4N-R3W-S09      REACH-1          2.651    *              710              710 *
* T4N-R3W-S09      REACH-1          1.971    *              740              740 *
* T4N-R3W-S09      REACH-1          1.488    *              780              780 *
* T4N-R3W-S09      REACH-1          0.920    *              820              820 *
* T4N-R3W-S09      REACH-1          0.398    *              850              850 *
* WASH 3-WEST      REACH-1          6.912    *              380              380 *
* WASH 3-WEST      REACH-1          6.476    *              670              670 *
* WASH 3-WEST      REACH-1          5.905    *              980              980 *
* WASH 3-WEST      REACH-1          5.323    *             1220             1220 *
* WASH 3-WEST      REACH-1          4.837    *             1430             1430 *
* WASH 3-WEST      REACH-1          4.421    *             1450             1450 *
* WASH 3-WEST      REACH-1          3.840    *             1490             1490 *
* WASH 3-WEST      REACH-1          3.054    *             1520             1520 *
* WASH 3-WEST      REACH-1          2.447    *             1540             1540 *
* WASH 3-WEST      REACH-1          2.061    *             1590             1590 *
* WASH 3-WEST      REACH-1          1.625    *             1970             1970 *
* WASH 3-WEST      REACH-1          1.343    *             3750             3750 *
* WASH 3-WEST      REACH-1          1.168    *             4250             4250 *
* WASH 3-WEST      REACH-1          1.112    *             4250             4250 *
* WASH 3-WEST      REACH-1          1.049    *             4250             4250 *
*****************************************************************************

Boundary Conditions
*****************************************************************************************************
*******
* River            Reach            Profile          *            Upstream
Downstream    *
*****************************************************************************************************
*******
* T4N-R3W-S08W     REACH-1          1                *                                Normal S =
0.0075 *
* T4N-R3W-S09      REACH-1          1                *                                Normal S =
0.0082 *
* WASH 3-WEST      REACH-1          1                *                                Known WS =
1545.1 *
*****************************************************************************************************
*******

*****************************************************************************

GEOMETRY DATA

Geometry Title: WASH 3-WEST
Geometry File : p:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITT_PH2_WASH_3_WEST_TRIBS_S09_S08W.g01

CROSS SECTION


RIVER: T4N-R3W-S08W
REACH: REACH-1            RS: 3.254

INPUT
Description: Flow rate starting at this cross-section and downstream is 880cfs.
Station Elevation Data    num=      58
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9693.29  1684.5  9706.5 1684.32 9726.64 1684.13 9742.96    1684 9748.03 1683.93
 9750.37  1683.8 9755.73 1683.67  9798.4 1682.92 9832.02 1682.68 9842.93 1682.65
 9849.44  1682.8 9874.72 1682.83    9910 1682.89 9921.15 1682.96 9931.65  1682.7
 9932.76 1682.66 9950.66 1682.95 9967.94 1682.92  9974.7 1682.68   10000  1682.1
10000.05 1682.0910039.39 1682.4410039.84 1682.4410041.25 1682.4510043.54  1682.5
10045.04 1682.4510064.96 1682.3110082.28 1682.58   10101 1682.7810118.05  1682.7
10151.02 1682.8410169.72 1683.0810196.25 1683.6310219.08 1683.9210222.44    1684
10247.28 1684.6110283.25 1685.5710296.57 1685.7610305.84 1685.7710323.27  1685.8
10337.16 1685.9310344.12    168610367.54 1686.2310369.11 1686.2410390.78  1686.3
10410.86 1686.4310411.48 1686.4410420.99 1686.4910455.18 1686.6210456.57  1686.6
10474.51 1686.5510481.29 1686.5310498.57 1686.4610537.19 1686.8310555.59    1687
10591.77 1686.9510609.91 1687.25 10638.4 1687.25

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
9693.29	.033	9849.44	.044	10101	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.94	10101	483	518.274	495	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1683.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.039	0.044	0.033
W.S. Elev (ft)	1683.55	Reach Len. (ft)	483.00	518.27	495.00
Crit W.S. (ft)	1683.27	Flow Area (sq ft)	133.37	149.56	55.65
E.G. Slope (ft/ft)	0.006333	Area (sq ft)	133.37	149.56	55.65
Q Total (cfs)	880.00	Flow (cfs)	302.16	434.46	143.38
Top Width (ft)	429.55	Top Width (ft)	205.23	133.06	91.26
Vel Total (ft/s)	2.60	Avg. Vel. (ft/s)	2.27	2.90	2.58
Max Chl Dpth (ft)	1.46	Hydr. Depth (ft)	0.65	1.12	0.61
Conv. Total (cfs)	11058.1	Conv. (cfs)	3797.0	5459.4	1801.8
Length Wtd. (ft)	503.31	Wetted Per. (ft)	205.25	133.08	91.27
Min Ch El (ft)	1682.09	Shear (lb/sq ft)	0.26	0.44	0.24
Alpha	1.04	Stream Power (lb/ft s)	0.58	1.29	0.62
Frctn Loss (ft)	3.61	Cum Volume (acre-ft)	26.86	73.17	24.88
C & E Loss (ft)	0.01	Cum SA (acres)	51.19	55.24	41.47

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 OUTPUT Profile #2

E.G. Elev (ft)	1684.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.044	
W.S. Elev (ft)	1684.35	Reach Len. (ft)	483.00	518.27	495.00
Crit W.S. (ft)	1683.52	Flow Area (sq ft)		255.93	
E.G. Slope (ft/ft)	0.004465	Area (sq ft)		255.93	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	133.06	Top Width (ft)		133.06	
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)		3.44	
Max Chl Dpth (ft)	2.26	Hydr. Depth (ft)		1.92	
Conv. Total (cfs)	13169.3	Conv. (cfs)		13169.3	
Length Wtd. (ft)	518.27	Wetted Per. (ft)		136.07	
Min Ch El (ft)	1682.09	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		1.80	
Frctn Loss (ft)	3.58	Cum Volume (acre-ft)	1.91	94.02	0.42
C & E Loss (ft)	0.03	Cum SA (acres)	1.29	55.24	0.31

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9693.29	9830.62	79.98	35.11	67.91	9.09	0.52	2.28
2	LOB	9830.62	9967.94	222.18	98.26	137.33	25.25	0.72	2.26
3	Chan	9967.94	10101.00	434.46	149.56	133.08	49.37	1.12	2.90
4	ROB	10101.00	10369.70	143.38	55.65	91.27	16.29	0.61	2.58

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9967.94	10101.00	880.00	255.93	136.07	100.00	1.92	3.44

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.
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: T4N-R3W-S08W
REACH: REACH-1 RS: 3.156

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground right of levee appears to be minor tributary flowing into floodplain
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9746.21	1680.2	9751.09	1680.23	9754.71	1680.24	9760.54	1680.18	9779.27	1680.04
9785.78	1680	9789.49	1679.98	9792.26	1679.97	9807.68	1679.93	9810.76	1679.95
9826.73	1680	9829.69	1680.01	9841.31	1680.04	9849.74	1680.02	9853.63	1680
9859.63	1680	9866.1	1679.9	9868.14	1679.88	9868.56	1679.88	9868.81	1679.86
9870.21	1679.8	9871.72	1679.71	9873.1	1679.62	9889.97	1679.69	9896.41	1679.76
9903.04	1679.7	9912.49	1679.56	9912.93	1679.55	9923.61	1679.39	9928.64	1679.23
9947.81	1679	9965.59	1678.88	9994.37	1678.42	9995.97	1678.39	9996.19	1678.35
9997.44	1678	9999.36	1677.53	10000.48	1677.27	10002.69	1677.75	10003.62	1678
10004.1	1678.2	10004.97	1678.41	10013.99	1678.56	10020.07	1678.68	10035.84	1678.9
10057.17	1678.9	10064.1	1678.85	10083.85	1678.93	10096.18	1678.86	10120.15	1678.64
10145.44	1679.1	10160.86	1679.43	10184.66	1679.66	10202.88	1679.87	10207.65	1680
10207.71	1680	10208.21	1680.02	10245.21	1680.56	10249.65	1680.57	10284.99	1680.17
10285.02	1680.2	10287.9	1680.15	10290.65	1680.14	10297.05	1680.09	10299.65	1680.1
10302.69	1680.1	10325.24	1680.41	10353.23	1680.11	10358.16	1680.06	10363.78	1680
10370.96	1679.9	10377.61	1679.85	10381.87	1679.96	10383.35	1680	10385.37	1680.06
10385.7	1680.1	10422.12	1681.07	10455.8	1681.03	10470.58	1681.04	10484.66	1681.2
10523.92	1681.26	10526.01	1681.25	10527.27	1681.27	10528.8	1681.29	10533.48	1681.3
10572.25	1681.74	10595.18	1681.95	10599.18	1681.99	10600.24	1682	10606.05	1682.1
10606.77	1682.12	10610.96	1682.16	10623.36	1682.23	10663.54	1682.77	10711.88	1682.5
10730.75	1682.52	10748.57	1682.36	10784.47	1682.34	10799.23	1682.31		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9746.21	.033	9947.81	.044	10035.84	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.81	10035.84	568	533.15	492	.1	.3

Right Levee Station=10245.21 Elevation= 1680.56

CROSS SECTION OUTPUT Profile #1

*		*		*		*		*	
* E.G. Elev (ft)	*	1680.04	* Element	*	Left OB	*	Channel	*	Right OB
* Vel Head (ft)	*	0.18	* Wt. n-Val.	*	0.033	*	0.044	*	0.033
* W.S. Elev (ft)	*	1679.86	* Reach Len. (ft)	*	568.00	*	533.15	*	492.00
* Crit W.S. (ft)	*	1679.60	* Flow Area (sq ft)	*	28.99	*	108.61	*	128.00
* E.G. Slope (ft/ft)	*	0.008187	* Area (sq ft)	*	28.99	*	108.61	*	128.00
* Q Total (cfs)	*	880.00	* Flow (cfs)	*	60.55	*	380.89	*	438.56
* Top Width (ft)	*	332.93	* Top Width (ft)	*	78.94	*	88.03	*	165.96

```
* Vel Total (ft/s)       *    3.31  * Avg. Vel. (ft/s)       *    2.09  *    3.51  *    3.43  *
* Max Chl Dpth (ft)      *    2.59  * Hydr. Depth (ft)       *    0.37  *    1.23  *    0.77  *
* Conv. Total (cfs)      *  9725.8  * Conv. (cfs)            *   669.2  *  4209.6  *  4847.0  *
* Length Wtd. (ft)       *  523.47  * Wetted Per. (ft)       *   78.96  *   88.32  *  165.97  *
* Min Ch El (ft)         * 1677.27  * Shear (lb/sq ft)       *    0.19  *    0.63  *    0.39  *
* Alpha                  *    1.05  * Stream Power (lb/ft s) *    0.39  *    2.20  *    1.35  *
* Frctn Loss (ft)        *    3.46  * Cum Volume (acre-ft)   *   25.96  *   71.63  *   23.84  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   49.61  *   53.93  *   40.01  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)         * 1680.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.46  * Wt. n-Val.              *          *    0.044  *          *
* W.S. Elev (ft)         * 1680.46  * Reach Len. (ft)         *  568.00  *  533.15  *  492.00  *
* Crit W.S. (ft)         * 1680.09  * Flow Area (sq ft)       *          *  161.76  *          *
* E.G. Slope (ft/ft)     *0.012111  * Area (sq ft)            *          *  161.76  *          *
* Q Total (cfs)          *  880.00  * Flow (cfs)              *          *  880.00  *          *
* Top Width (ft)         *   88.03  * Top Width (ft)          *          *   88.03  *          *
* Vel Total (ft/s)       *    5.44  * Avg. Vel. (ft/s)        *          *    5.44  *          *
* Max Chl Dpth (ft)      *    3.19  * Hydr. Depth (ft)        *          *    1.84  *          *
* Conv. Total (cfs)      *  7996.3  * Conv. (cfs)             *          *  7996.3  *          *
* Length Wtd. (ft)       *  533.15  * Wetted Per. (ft)        *          *   91.35  *          *
* Min Ch El (ft)         * 1677.27  * Shear (lb/sq ft)        *          *    1.34  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    7.28  *          *
* Frctn Loss (ft)        *    3.96  * Cum Volume (acre-ft)    *    1.91  *   91.53  *    0.42  *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)          *    1.29  *   53.93  *    0.31  *
*****************************************************************************************************

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 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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the
lowest, valid,
         water surface was used.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9847.01   * 9947.81   *    60.55 *    28.99 *    78.96 *     6.88 *
0.37 *     2.09 *
* 2        * Chan      * 9947.81   * 10035.84  *   380.89 *   108.61 *    88.32 *    43.28 *
1.23 *     3.51 *
* 3        * ROB       * 10035.84  * 10245.21  *   438.56 *   128.00 *   165.97 *    49.84 *
0.77 *     3.43 *
*****************************************************************************************************
******************

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.

  Profile #2
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9947.81   * 10035.84  *   880.00 *   161.76 *    91.35 *   100.00 *
1.84 *     5.44 *
*****************************************************************************************
******************

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.
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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find 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: T4N-R3W-S08W
REACH: REACH-1            RS: 3.055

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs,
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9429.13  1678.9 9430.53 1678.92 9444.86 1679.02 9464.26 1679.04 9475.09 1678.96
 9488.14  1678.9 9531.36 1678.76 9574.99 1678.56 9580.02 1678.52 9583.24 1678.52
 9588.31  1678.4 9591.17  1678.4 9618.48    1678 9622.89 1677.94 9634.98 1677.76
 9654.52  1677.4 9685.23 1676.87 9714.87 1676.54 9736.22 1676.41 9768.85 1676.07
 9779.48 1675.95 9783.46 1675.91 9796.93 1675.87 9833.73 1675.75 9853.28  1675.6
 9879.81 1675.26 9885.821675.254 9919.78 1675.22 9923.86  1675.2 9935.43 1675.19
 9967.36  1675.2 9973.04 1675.12 9992.76 1675.08 10021.6 1675.0110051.78 1675.46
10077.33  1675.9 10088.3 1675.8210109.76  1675.710116.79  1675.810125.97 1675.98
10127.32    167610128.73 1676.0310145.561676.21710151.22 1676.2810153.41 1676.28
10190.71  1676.310201.09 1676.2410201.87 1676.2310202.86 1676.2310203.36  1676.2
10203.89 1676.2410231.92 1676.5410253.43 1676.8310259.09  1676.710262.02  1676.7
10280.21 1676.52   10295 1676.3710295.97 1676.41   10301 1676.4510304.32  1676.5
10315.82 1676.7810319.49 1676.7910320.26 1676.7410331.12 1676.5610333.76  1676.5
 10334.4 1676.4910334.92 1676.5110345.47 1676.71   10353  1676.610371.47 1676.58
10394.26 1676.7310406.35 1676.87 10429.9 1676.9710447.64  1677.110465.66 1676.83
10485.86 1677.1310511.14  1677.210522.66 1677.3910522.96  1677.410531.61 1677.32
10551.44 1677.4410554.88 1677.43 10590.4 1677.1110591.73  1677.110592.01  1677.1
 10637.8 1677.9510638.66 1677.9910643.46 1678.0110644.33    167810649.75 1678.05
10684.25 1678.2110691.23 1678.2410691.83 1678.2510734.25  1679.110735.08 1679.11
10738.83 1679.1610741.24 1679.1510777.26  1679.610785.08  1679.710799.21    1680
10807.37    1680 10817.8 1680.1210834.65 1680.4910874.24  1680.310874.37 1680.34
10898.52  1680.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9429.13    .035 9768.85    .04710145.56    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9853.2810051.78              527  497.15     464            .1        .3
Right Levee     Station=10253.43      Elevation= 1676.83

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1676.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.046  *   0.047  *   0.046  *
* W.S. Elev (ft)         * 1676.46  * Reach Len. (ft)         *  527.00  *  497.15  *  464.00  *
```

Crit W.S. (ft)	1676.08	Flow Area (sq ft)	60.81	247.54	70.92	
E.G. Slope (ft/ft)	0.005453	Area (sq ft)	60.81	247.54	70.92	
Q Total (cfs)	880.00	Flow (cfs)	99.55	669.53	110.92	
Top Width (ft)	495.57	Top Width (ft)	124.72	198.50	172.35	
Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)	1.64	2.70	1.56	
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)	0.49	1.25	0.41	
Conv. Total (cfs)	11917.1	Conv. (cfs)	1348.1	9066.9	1502.1	
Length Wtd. (ft)	491.73	Wetted Per. (ft)	124.72	198.51	172.36	
Min Ch El (ft)	1675.01	Shear (lb/sq ft)	0.17	0.42	0.14	
Alpha	1.15	Stream Power (lb/ft s)	0.27	1.15	0.22	
Frctn Loss (ft)	2.93	Cum Volume (acre-ft)	25.37	69.45	22.71	
C & E Loss (ft)	0.00	Cum SA (acres)	48.29	52.18	38.10	

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 OUTPUT Profile #2

E.G. Elev (ft)	1676.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.047	
W.S. Elev (ft)	1676.72	Reach Len. (ft)	527.00	497.15	464.00
Crit W.S. (ft)	1676.05	Flow Area (sq ft)		300.36	
E.G. Slope (ft/ft)	0.005023	Area (sq ft)		300.36	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	198.50	Top Width (ft)		198.50	
Vel Total (ft/s)	2.93	Avg. Vel. (ft/s)		2.93	
Max Chl Dpth (ft)	1.71	Hydr. Depth (ft)		1.51	
Conv. Total (cfs)	12416.6	Conv. (cfs)		12416.6	
Length Wtd. (ft)	497.15	Wetted Per. (ft)		200.89	
Min Ch El (ft)	1675.01	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)		1.37	
Frctn Loss (ft)	2.75	Cum Volume (acre-ft)	1.91	88.70	0.42
C & E Loss (ft)	0.00	Cum SA (acres)	1.29	52.18	0.31

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9641.21	9853.28	99.55	60.81	124.72	11.31	0.49	1.64
2 Chan	9853.28	10051.78	669.53	247.54	198.51	76.08	1.25	2.70
3 ROB	10051.78	10253.43	110.92	70.92	172.36	12.60	0.41	1.56

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.

Profile #2

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9853.28   * 10051.78  *   880.00 *   300.36 *   200.89 *   100.00 *
1.51 *     2.93 *
*****************************************************************************************
******************
```

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: T4N-R3W-S08W
REACH: REACH-1 RS: 2.960

INPUT

Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.

Station Elevation Data num= 125

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9541.62  1674.9 9604.68 1674.77 9610.02 1674.73 9628.08  1674.7 9657.02  1674.7
 9669.17 1674.46 9700.34 1673.99 9719.01 1674.17 9748.88 1674.42 9750.24  1674.4
 9777.79 1674.47 9789.74 1674.48 9794.33 1674.45 9805.43  1674.5 9814.08 1674.14
  9817.8    1674  9819.1 1673.96 9822.08 1673.84 9829.81  1673.5 9839.42  1673.2
 9852.58 1673.16 9858.28 1673.26 9877.81  1673.3 9910.69  1672.9 9911.42 1672.83
 9922.28 1672.47 9925.79 1672.44 9928.64 1672.42 9933.581672.448 9960.54  1672.6
 9984.72 1672.53  9990.8 1672.54 9995.77 1672.4710000.56 1672.4510005.84  1672.4
10007.35 1672.4110011.92  1672.410057.23 1672.3810070.73 1672.3810079.77  1672.2
10087.99 1672.2610094.21 1672.5710094.54 1672.7110094.66  1672.710094.68  1672.7
10119.29 1672.5910121.88 1672.6210124.64 1672.6410135.19 1672.7110142.02  1672.5
10143.47 1672.4310146.55  1672.310148.47 1672.2710154.68 1672.3610162.92  1672.5
10166.12 1672.6210167.871672.65810174.51  1672.810185.32 1672.8610192.88 1672.88
10211.55  1673.110220.68 1673.0510272.56 1673.08 10290.8 1673.0810308.83    1673
10313.63 1672.99 10335.3 1673.1510356.37 1673.24   10398 1673.2710400.18  1673.3
10406.36 1673.3410448.71 1673.83 10455.5 1673.8910459.91  1673.910470.46    1674
10474.08 1674.0310498.52 1674.2110506.29 1674.3310510.33  1674.3   10512 1674.17
10513.83 1674.05 10515.2    167410516.77 1673.9310518.14  1673.9 10519.4  1673.8
10519.48 1673.8110520.82    167410521.06 1674.0410521.88  1674.210525.09  1674.2
10530.07 1674.7210533.21 1674.5710534.35 1674.4710541.43  1674.610548.62 1674.78
10554.05 1674.6610557.96 1674.6410560.63 1674.6110575.15  1674.910595.86 1674.97
10602.61 1675.0710607.07 1675.1310633.55 1675.6110642.96  1675.710670.57 1675.98
10671.26    167610671.34    167610672.15 1676.0210690.79  1676.410698.97 1676.53
10705.79 1676.6310733.85 1676.7410742.74 1676.7110760.08  1676.910797.01  1677.4
 10806.8 1677.5510808.02 1677.5810828.15    167810835.59  1678.110862.19 1678.54
10894.33 1678.31 10907.2  1678.310908.19 1678.2810917.05  1678.210923.62 1678.17
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9541.62    .035 9911.42    .04710174.51    .035
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9911.4210094.54              517  506.44     484              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
************************
10178.6910241.99    1685
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1673.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.035	0.047	0.042
W.S. Elev (ft)	1673.53	Reach Len. (ft)	517.00	506.44	484.00
Crit W.S. (ft)	1673.22	Flow Area (sq ft)	27.34	196.83	143.65
E.G. Slope (ft/ft)	0.006542	Area (sq ft)	27.34	196.83	143.65
Q Total (cfs)	880.00	Flow (cfs)	45.05	528.03	306.92
Top Width (ft)	529.91	Top Width (ft)	82.20	183.12	264.59
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	1.65	2.68	2.14
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	0.33	1.07	0.54
Conv. Total (cfs)	10880.1	Conv. (cfs)	557.0	6528.4	3794.6
Length Wtd. (ft)	498.91	Wetted Per. (ft)	82.21	183.17	265.77
Min Ch El (ft)	1672.20	Shear (lb/sq ft)	0.14	0.44	0.22
Alpha	1.06	Stream Power (lb/ft s)	0.22	1.18	0.47
Frctn Loss (ft)	3.11	Cum Volume (acre-ft)	24.84	66.91	21.57
C & E Loss (ft)	0.00	Cum SA (acres)	47.04	50.00	35.77

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1674.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.047	
W.S. Elev (ft)	1673.95	Reach Len. (ft)	517.00	506.44	484.00
Crit W.S. (ft)	1673.34	Flow Area (sq ft)		274.26	
E.G. Slope (ft/ft)	0.006116	Area (sq ft)		274.26	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	183.12	Top Width (ft)		183.12	
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)		3.21	
Max Chl Dpth (ft)	1.75	Hydr. Depth (ft)		1.50	
Conv. Total (cfs)	11252.1	Conv. (cfs)		11252.1	
Length Wtd. (ft)	506.44	Wetted Per. (ft)		185.52	
Min Ch El (ft)	1672.20	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		1.81	
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	1.91	85.42	0.42
C & E Loss (ft)	0.00	Cum SA (acres)	1.29	50.00	0.31

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9726.52	9911.42	45.05	27.34	82.21	5.12	0.33	1.65
2	Chan	9911.42	10094.54	528.03	196.83	183.17	60.00	1.07	2.68
3	ROB	10094.54	10509.08	306.92	143.65	265.77	34.88	0.54	2.14

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.

Profile #2

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9911.42    * 10094.54   *   880.00 *   274.26 *   185.52 *   100.00 *
1.50 * .    3.21 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 2.865

INPUT
Description:
Station Elevation Data    num=     126
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9389.03  1671.5 9405.56 1671.61 9408.53 1671.61 9452.36 1671.12 9466.49 1671.05
 9474.35  1671.1  9488.2 1671.09 9527.16 1671.36 9538.06 1671.25 9571.34  1671.1
 9598.02  1671.1 9615.69 1671.19 9645.62 1671.01 9654.95 1670.93 9666.03 1671.17
 9679.38  1671.3 9691.95 1671.19 9701.03  1671.3 9701.37 1671.32 9716.11 1671.14
 9722.74    1671  9725.4 1671.04 9730.59 1670.93 9741.83 1670.77 9765.89  1670.9
 9770.34  1670.9 9783.58 1670.77 9807.74 1670.48 9830.55 1670.54 9852.55 1670.61
 9854.82  1670.5 9857.62 1670.49 9859.62 1670.45 9866.23 1670.31 9872.12 1670.17
 9873.74  1670.1  9883.4    1670  9884.8    1670 9886.65 1669.96 9887.64  1669.9
 9888.08 1669.93 9888.76 1669.93 9916.75 1669.77 9919.53  1669.8 9922.82 1669.74
 9924.59 1669.74 9931.63 1669.64 9941.161669.525 9957.38 1669.33 9967.69  1669.2
 9968.02 1669.24 9968.36 1669.24 9971.59 1669.21 10006.2 1669.2510015.84    1669
10018.98 1668.9510038.59 1668.8710065.05 1669.4210069.66 1669.4610072.16  1669.5
10105.73 1669.3610108.38 1669.3110116.461669.27210118.95 1669.2610134.56 1669.03
10135.72  1669.1   10140 1669.2410142.83 1669.0810148.01 1668.71 10153.1 1669.31
10154.36  1669.510172.52 1669.6510183.77 1669.7810184.89 1669.7810214.86    1670
10215.62    167010216.51 1670.0110224.63 1670.06 10228.9    167010230.63 1670.03
10250.57 1670.2210256.65 1670.1910258.78  1670.210260.47  1670.210261.55 1670.22
10265.35 1670.25   10283 1670.3210322.82  1670.410358.56 1670.8110362.07 1670.84
10365.12 1670.8810372.66 1670.9610373.52    167110391.87  1671.210413.94 1671.47
10444.52 1671.7310456.94 1671.8410460.53  1671.910467.19    167210499.85 1672.51
 10521.9 1672.7510537.78  1672.910543.07 1672.9710576.16 1673.3810594.52 1673.74
10604.95 1673.9410605.19  1673.910605.92 1673.9310608.47 1673.8710617.25 1673.95
10622.99 1673.9810625.74    167410627.06    1674 10627.8 1674.01   10628    1674
 10629.7 1674.1210635.78 1674.54 10642.9 1674.4810661.99  1674.610667.85 1674.58
10675.04 1674.6310684.11 1674.5110716.62 1674.5310738.45  1674.710747.07 1674.69
10760.52 1674.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9389.03    .035 9941.16    .04710154.36    .035

Bank Sta: Left  Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.1610072.16              490  506.86     549             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1670.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.035  *   0.047  *   0.044  *
* W.S. Elev (ft)         * 1670.41  * Reach Len. (ft)         *  490.00  *  506.86  *  549.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   41.47  *  160.21  *  152.99  *
* E.G. Slope (ft/ft)     *0.005934  * Area (sq ft)            *   41.47  *  160.21  *  152.99  *
* Q Total (cfs)          *  880.00  * Flow (cfs)              *   87.66  *  446.21  *  346.13  *
* Top Width (ft)         *  462.63  * Top Width (ft)          *   79.81  *  131.00  *  251.82  *
* Vel Total (ft/s)       *    2.48  * Avg. Vel. (ft/s)        *    2.11  *    2.79  *    2.26  *
* Max Chl Dpth (ft)      *    1.70  * Hydr. Depth (ft)        *    0.52  *    1.22  *    0.61  *
* Conv. Total (cfs)      * 11423.3  * Conv. (cfs)             *  1137.9  *  5792.3  *  4493.2  *
* Length Wtd. (ft)       *  524.19  * Wetted Per. (ft)        *   79.82  *  131.01  *  251.90  *
* Min Ch El (ft)         * 1668.87  * Shear (lb/sq ft)        *    0.19  *    0.45  *    0.23  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    0.41  *    1.26  *    0.51  *
```

```
* Frctn Loss (ft)        *    3.09  * Cum Volume (acre-ft)   *   24.43  *   64.84  *   19.92  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *   46.07  *   48.17  *   32.90  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)         * 1671.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.18  * Wt. n-Val.              *          *   0.047  *          *
* W.S. Elev (ft)         * 1671.15  * Reach Len. (ft)         *  490.00  *  506.86  *  549.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  256.61  *          *
* E.G. Slope (ft/ft)     *0.004962  * Area (sq ft)            *          *  256.61  *          *
* Q Total (cfs)          *  880.00  * Flow (cfs)              *          *  880.00  *          *
* Top Width (ft)         *  131.00  * Top Width (ft)          *          *  131.00  *          *
* Vel Total (ft/s)       *    3.43  * Avg. Vel. (ft/s)         *          *    3.43  *          *
* Max Chl Dpth (ft)      *    2.28  * Hydr. Depth (ft)         *          *    1.96  *          *
* Conv. Total (cfs)      * 12492.7  * Conv. (cfs)              *          * 12492.7  *          *
* Length Wtd. (ft)       *  506.86  * Wetted Per. (ft)         *          *  134.29  *          *
* Min Ch El (ft)         * 1668.87  * Shear (lb/sq ft)         *          *    0.59  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    2.03  *          *
* Frctn Loss (ft)        *    3.00  * Cum Volume (acre-ft)     *    1.91  *   82.34  *    0.42  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *    1.29  *   48.17  *    0.31  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9665.10   * 9941.16   *    87.66 *    41.47 *    79.82 *     9.96 *
0.52 *     2.11 *
* 2        * Chan      * 9941.16   * 10072.16  *   446.21 *   160.21 *   131.01 *    50.71 *
1.22 *     2.79 *
* 3        * ROB       * 10072.16  * 10416.34  *   346.13 *   152.99 *   251.90 *    39.33 *
0.61 *     2.26 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9941.16   * 10072.16  *   880.00 *   256.61 *   134.29 *   100.00 *
1.96 *     3.43 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S08W
REACH: REACH-1            RS: 2.769

INPUT
Description: Interpolated point added at (9948.18, 1666.278) to set bank
```

```
            station.
Station Elevation Data     num=      132
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9226.7  1668.5 9230.67 1668.53 9274.83 1668.72 9333.45 1668.44 9335.16 1668.43
 9365.88  1668.4 9377.11 1668.41 9393.28 1668.52 9420.91 1668.74 9444.13 1668.56
 9467.32  1668.4 9474.49 1668.38 9508.88 1668.41 9544.65 1668.23 9547.88 1668.22
  9552.9  1668.2 9584.31 1668.02 9586.34 1668.03 9591.85 1668.02 9593.62 1668.05
  9594.1    1668 9594.71 1668.04 9603.55    1668 9606.38 1667.99 9608.42 1667.99
 9608.97    1668 9619.09 1667.97 9626.86 1667.89 9632.84 1667.86 9636.47 1667.85
 9637.11  1667.8 9639.54 1667.86 9643.86 1667.89 9655.47    1668 9655.84    1668
 9662.33 1668.03 9663.58 1668.04 9663.77 1668.04  9665.2    1668 9666.78    1668
 9685.85 1667.71 9688.17 1667.72 9703.21  1667.7  9722.1 1667.65 9726.36 1667.65
 9730.98 1667.64 9744.19 1667.65 9771.23  1667.6 9778.79 1667.65  9806.5 1667.72
 9830.09 1667.75 9862.81  1667.5 9869.49  1667.5 9872.66 1667.41 9879.04 1667.38
 9879.55 1667.37  9884.2  1667.3 9891.93 1667.19  9904.2 1667.13 9917.84 1666.87
 9918.42 1666.86  9929.5  1666.7 9937.57 1666.62 9941.26  1666.6 9948.181666.278
 9950.06 1666.19 9950.63 1666.17 9952.33 1666.11 9955.04    1666 9955.45 1666.01
    9956    1666  9967.3  1665.7 9976.77  1665.7 9998.71 1665.8410003.65 1665.86
10005.28 1665.8810006.53 1665.8810006.68  1665.910006.99 1665.8810007.77 1665.89
10011.05 1665.9510013.83 1665.9910014.46    166610014.58    166610021.07 1666.11
 10035.1 1666.2810039.37 1666.2510048.28  1666.3 10079.7 1666.3610096.61 1666.29
10128.65 1666.0710132.82 1666.04 10134.4    166610135.64 1666.0210137.06 1666.01
10137.54    166610138.31 1666.0210144.44    166610154.77 1666.1710163.73 1666.29
10165.32 1666.3110169.25 1666.3810174.86  1666.5 10176.5  1666.510182.18 1666.76
10184.76 1666.3310186.18  1666.110186.47 1666.1210191.15 1666.7710209.39 1666.84
10215.641666.85910222.46 1666.88 10233.8    166710237.85 1666.9910250.49 1667.08
10261.03 1666.9910263.19    166710263.84 1666.9910264.52    166710304.01 1667.73
10315.83 1667.8310338.56    166810341.45    166810345.18 1668.0210352.96 1668.08
10390.86 1668.3910396.09  1668.410418.94 1668.6310425.23 1668.68 10434.5 1668.76
10451.64 1668.9510466.94  1669.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
  9226.7    .033  9929.5    .04710191.15    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.1810048.28               504  516.76     517              .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1667.43  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.041  *   0.047  *   0.045  *
* W.S. Elev (ft)          * 1667.32  * Reach Len. (ft)        *  504.00  *  516.76  *  517.00  *
* Crit W.S. (ft)          * 1666.91  * Flow Area (sq ft)      *   27.12  *  135.56  *  182.34  *
* E.G. Slope (ft/ft)      *0.005846  * Area (sq ft)           *   27.12  *  135.56  *  182.34  *
* Q Total (cfs)           *  880.00  * Flow (cfs)              *   47.35  *  401.05  *  431.59  *
* Top Width (ft)          *  398.79  * Top Width (ft)          *   65.21  *  100.10  *  233.47  *
* Vel Total (ft/s)        *    2.55  * Avg. Vel. (ft/s)        *    1.75  *    2.96  *    2.37  *
* Max Chl Dpth (ft)       *    1.62  * Hydr. Depth (ft)        *    0.42  *    1.35  *    0.78  *
* Conv. Total (cfs)       * 11509.6  * Conv. (cfs)             *   619.3  *  5245.4  *  5644.8  *
* Length Wtd. (ft)        *  513.57  * Wetted Per. (ft)        *   65.23  *  100.12  *  233.59  *
* Min Ch El (ft)          * 1665.70  * Shear (lb/sq ft)        *    0.15  *    0.49  *    0.28  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.26  *    1.46  *    0.67  *
* Frctn Loss (ft)         *    3.25  * Cum Volume (acre-ft)    *   24.05  *   63.12  *   17.81  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   45.26  *   46.83  *   29.84  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1668.31  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.              *          *   0.047  *          *
* W.S. Elev (ft)          * 1668.03  * Reach Len. (ft)        *  504.00  *  516.76  *  517.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  207.02  *          *
* E.G. Slope (ft/ft)      *0.007183  * Area (sq ft)           *          *  207.02  *          *
* Q Total (cfs)           *  880.00  * Flow (cfs)              *          *  880.00  *          *
* Top Width (ft)          *  100.10  * Top Width (ft)          *          *  100.10  *          *
```

```
* Vel Total (ft/s)        *    4.25  * Avg. Vel. (ft/s)        *          *    4.25  *          *
* Max Chl Dpth (ft)       *    2.33  * Hydr. Depth (ft)        *          *    2.07  *          *
* Conv. Total (cfs)       * 10383.2  * Conv. (cfs)             *          * 10383.2  *          *
* Length Wtd. (ft)        *  514.87  * Wetted Per. (ft)        *          *  103.60  *          *
* Min Ch El (ft)          * 1665.70  * Shear (lb/sq ft)        *          *    0.90  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.81  *          *
* Frctn Loss (ft)         *    3.70  * Cum Volume (acre-ft)    *    1.91  *   79.64  *    0.42  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    1.29  *   46.83  *    0.31  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9587.44   * 9948.18   *    47.35 *    27.12 *    65.23 *     5.38 *
0.42 *     1.75 *
* 2         * Chan      * 9948.18   * 10048.28  *   401.05 *   135.56 *   100.12 *    45.57 *
1.35 *     2.96 *
* 3         * ROB       * 10048.28  * 10257.61  *   425.70 *   177.39 *   209.44 *    48.37 *
0.85 *     2.40 *
* 4         * ROB       * 10257.61  * 10466.94  *     5.90 *     4.95 *    24.15 *     0.67 *
0.20 *     1.19 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9948.18   * 10048.28  *   880.00 *   207.02 *   103.60 *   100.00 *
2.07 *     4.25 *
*****************************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 2.671

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground right
             of levee appears to be minor tributary flowing into floodplain and
             joins downstream of this cross-section.
Interpolated point added
             at (10086.64, 1662.979) to set bank station.
Station Elevation Data    num=     166
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9387.03  1665.2 9430.29 1665.29  9440.5 1665.36 9473.64 1665.46  9492.5    1665
  9500.2 1664.66 9509.81 1664.31 9514.63 1664.41 9526.54 1664.78 9532.92  1664.7
 9535.07 1664.64 9551.64 1664.32 9569.83 1664.29 9584.25 1664.23 9603.71  1664.1
 9605.06 1664.14 9606.64 1664.14 9606.81 1664.13 9608.12 1664.14 9609.35  1664.2
 9629.32 1664.28 9644.42 1664.35 9668.43 1664.27 9681.26 1664.27 9686.66  1664.2
 9693.81 1664.11 9696.72 1664.08 9704.43 1664.05 9705.46 1664.03 9706.64    1664
 9707.98 1664.03 9709.24 1664.02 9712.99 1664.03 9714.44 1664.03 9718.01    1664
```

```
 9720.35 1664.05 9740.81 1664.09  9741.3 1664.09 9741.67  1664.1 9741.97 1664.09
  9774.6 1664.16  9781.3  1664.1  9790.5    1664 9795.05    1664 9805.01 1663.85
 9835.56 1663.94 9842.19 1663.91 9851.73  1663.8 9873.571663.621 9889.46 1663.49
  9921.3 1662.73 9928.61 1662.64 9951.37 1662.62 9970.33  1662.7 9983.34 1662.83
 9996.28 1662.97 9996.83 1662.75 9998.96    1662 9999.58  1661.8 9999.76 1661.78
 9999.95 1661.8110000.84    166210002.55 1662.4110002.91  1662.510013.85 1662.51
10029.08 1662.48   10038 1662.57 10079.5 1662.8110086.641662.97910103.741663.383
10117.18  1663.710127.92 1663.9110128.65 1663.89 10130.7 1663.9410133.33    1664
10150.06  1664.410170.08 1664.8510193.16 1664.8510213.34  1664.910237.01  1664.9
10249.04 1664.8510254.74 1664.8510285.17 1664.6610295.87 1664.4710320.46  1664.2
 10332.4 1664.0410332.57 1664.0410335.11 1664.0110335.47    166410338.35    1664
10339.26 1663.9910340.17    166410343.81 1663.9810353.93 1663.97 10382.7  1663.9
10383.65 1663.9110383.92 1663.9110386.98 1663.8210390.33 1663.8510391.32  1663.9
 10397.7 1663.9810406.82 1663.9810415.77    166410425.62    166410428.54 1664.01
   10431    166410431.82 1664.0210462.81 1664.2910468.16 1664.3310478.15 1664.51
10501.82  1664.810509.52 1664.9110511.72 1664.9210531.35 1664.9510538.19 1665.02
 10554.5  1665.210604.27 1665.5310604.57 1665.5310604.89 1665.5410634.19 1665.78
10647.87  1665.910647.99 1665.8910648.03 1665.8910658.97 1665.9110661.21 1665.91
10666.76  1665.9 10671.9 1665.9410681.48    166610684.89    166610693.65 1666.07
10695.93  1666.110701.27 1666.1410703.37 1666.1610708.69 1666.2210712.68 1666.26
10721.23  1666.410739.08 1666.5410759.88  1666.8 10774.7 1667.1110798.62 1667.37
10812.53  1667.410817.86 1667.47 10835.2 1667.61 10861.9 1667.6810863.98 1667.67
10864.06  1667.710867.75 1667.7110879.43 1667.8210885.05 1667.8810887.17 1667.89
10893.59  1667.910899.27    166810900.26    166810904.35 1668.0310906.51 1668.05
10911.46  1668.110913.49 1668.1110923.37 1668.19 10928.6 1668.2310933.55 1668.28
   10937  1668.310940.02 1668.34 10946.1 1668.2610948.45 1668.2710949.58 1668.28
10952.74  1668.3

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9387.03    .033 9873.57    .04710117.18    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9996.2810086.64              505  514.67     502            .1        .3
Left Levee      Station=  9774.6      Elevation= 1664.16
Right Levee     Station=10170.08      Elevation= 1664.85

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1664.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.046  *   0.047  *   0.046  *
* W.S. Elev (ft)          * 1664.04  * Reach Len. (ft)         *  505.00  *  514.67  *  502.00  *
* Crit W.S. (ft)          * 1663.59  * Flow Area (sq ft)       *  151.71  *  129.72  *   24.34  *
* E.G. Slope (ft/ft)      *0.006860  * Area (sq ft)            *  151.71  *  129.72  *   24.34  *
* Q Total (cfs)           *  880.00  * Flow (cfs)              *  401.32  *  431.34  *   47.34  *
* Top Width (ft)          *  347.76  * Top Width (ft)          *  209.17  *   90.36  *   48.23  *
* Vel Total (ft/s)        *    2.88  * Avg. Vel. (ft/s)        *    2.65  *    3.33  *    1.95  *
* Max Chl Dpth (ft)       *    2.26  * Hydr. Depth (ft)        *    0.73  *    1.44  *    0.50  *
* Conv. Total (cfs)       * 10625.0  * Conv. (cfs)             *  4845.4  *  5208.0  *   571.6  *
* Length Wtd. (ft)        *  510.02  * Wetted Per. (ft)        *  209.19  *   90.65  *   48.25  *
* Min Ch El (ft)          * 1661.78  * Shear (lb/sq ft)        *    0.31  *    0.61  *    0.22  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.82  *    2.04  *    0.42  *
* Frctn Loss (ft)         *    3.13  * Cum Volume (acre-ft)    *   23.01  *   61.54  *   16.58  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   43.67  *   45.70  *   28.17  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1664.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *   0.047  *   0.047  *          *
* W.S. Elev (ft)          * 1664.37  * Reach Len. (ft)         *  505.00  *  514.67  *  502.00  *
* Crit W.S. (ft)          * 1663.75  * Flow Area (sq ft)       *   72.38  *  159.93  *          *
* E.G. Slope (ft/ft)      *0.007195  * Area (sq ft)            *   72.38  *  159.93  *          *
* Q Total (cfs)           *  880.00  * Flow (cfs)              *  260.10  *  619.90  *          *
```

```
* Top Width (ft)          *  135.27  * Top Width (ft)          *   44.91  *   90.36  *          *
* Vel Total (ft/s)        *    3.79  * Avg. Vel. (ft/s)        *    3.59  *    3.88  *          *
* Max Chl Dpth (ft)       *    2.59  * Hydr. Depth (ft)        *    1.61  *    1.77  *          *
* Conv. Total (cfs)       * 10374.4  * Conv. (cfs)             * 3066.4  * 7308.0  *          *
* Length Wtd. (ft)        *  513.24  * Wetted Per. (ft)        *   46.66  *   92.04  *          *
* Min Ch El (ft)          * 1661.78  * Shear (lb/sq ft)        *    0.70  *    0.78  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    2.50  *    3.03  *          *
* Frctn Loss (ft)         *    3.01  * Cum Volume (acre-ft)    *    1.50  *   77.46  *    0.42  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    1.03  *   45.70  *    0.31  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9774.60   * 9996.28   *   401.32 *   151.71 *   209.19 *    45.60 *
0.73 *     2.65 *
* 2        * Chan      * 9996.28   * 10086.64  *   431.34 *   129.72 *    90.65 *    49.02 *
1.44 *     3.33 *
* 3        * ROB       * 10086.64  * 10170.08  *    47.34 *    24.34 *    48.25 *     5.38 *
0.50 *     1.95 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9774.60   * 9996.28   *   260.10 *    72.38 *    46.66 *    29.56 *
1.61 *     3.59 *
* 2        * Chan      * 9996.28   * 10086.64  *   619.90 *   159.93 *    92.04 *    70.44 *
1.77 *     3.88 *
*****************************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 2.573

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as
             of aerial photography date; n-values are not adjusted to account
             for the house(s), only the houses in or near the floodplain were
             accounted for and some house(s) were projected to the nearest
             cross-section.  The area available for flood flows in between
```

houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected

Levee added-Ridge not overtopped per BFE calcs,

Station Elevation Data num= 141

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9450.44	1661.4	9451.17	1661.41	9463.61	1661.4	9473.11	1661.29	9482.91	1661.27
9490.15	1661.2	9492.3	1661.21	9501.19	1661.23	9529.72	1661.27	9539.62	1661.17
9576.64	1661	9585.27	1660.99	9603.55	1661.03	9620.88	1661.2	9624.14	1661.1
9631.09	1661.01	9640.05	1660.93	9641.93	1660.93	9647.65	1660.95	9657.08	1661
9691.22	1661	9694.08	1660.95	9695.73	1660.96	9731.37	1661.03	9733.81	1661.1
9734.89	1661.21	9744.12	1661.06	9749.94	1660.99	9751.31	1660.98	9752.74	1660.9
9754.31	1660.96	9764	1660.96	9767.35	1660.97	9780.13	1660.99	9789.8	1660.9
9830.03	1660.84	9851.41	1660.84	9882.97	1660.9	9900.91	1660.7	9904.76	1660.67
9907.84	1660.64	9929.53	1660.38	9946.86	1660.169	9960.69	1660	9964.15	1660
9971.1	1659.92	9973.59	1659.9	9974.4	1659.89	9975.99	1659.9	9985.61	1659.7
10008.87	1659.39	10014.41	1659.36	10020.88	1659.43	10037.15	1659.61	10040.87	1658.88
10042.15	1658.61	10043.18	1658.86	10046.42	1659.61	10047.01	1659.61	10051.93	1659.59
10081.61	1659.59	10089.12	1659.61	10119.72	1659.93	10128.2	1660	10137.08	1660.124
10141.81	1660.19	10147.09	1660.21	10164.91	1660.07	10179.02	1660.05	10180.69	1660.05
10186.38	1660.07	10187.36	1660.11	10188.39	1660.07	10189.9	1660.09	10198.04	1660.18
10199.99	1660.16	10217.77	1660.21	10221.19	1660.27	10227.15	1660.29	10236.37	1660.31
10237.84	1660.31	10244.76	1660.31	10247.45	1660.31	10269.62	1660.21	10269.69	1660.2
10284.15	1660.12	10297.75	1660.16	10299.84	1660.16	10305.12	1660.21	10320.06	1660.44
10329.55	1660.59	10333.67	1660.68	10338.19	1660.97	10342.35	1661.21	10344.62	1661.37
10352.47	1661.78	10355.29	1661.91	10358.69	1662	10360.06	1662	10360.54	1662.04
10364.81	1661.98	10364.92	1661.98	10368.53	1661.91	10370.04	1661.78	10378.25	1661.35
10383.23	1661.02	10384.96	1660.91	10391.72	1660.91	10410.98	1661.09	10422.06	1661.16
10423.9	1661.17	10424.94	1661.2	10431.6	1661.15	10444.07	1661.06	10448.88	1661.06
10460.27	1661.08	10483.81	1661.11	10489.63	1661.12	10501.15	1661.14	10519.05	1661.28
10524.51	1661.33	10541.83	1661.6	10544.97	1661.62	10547.67	1661.65	10561.07	1661.78
10561.24	1661.78	10561.79	1661.81	10562.08	1661.79	10563.33	1661.81	10574.31	1662
10579.95	1662.11	10581.86	1662.11	10583.52	1662.15	10584.97	1662.19	10590.82	1662.42
10603.06	1662.71	10609.02	1662.91	10614.44	1663.07	10616.06	1663.11	10661.11	1664
10662.19	1664.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9450.44	.033	9946.86	.047	10137.08	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.11	10119.72	498	511.83	501	.1	.3

Left Levee Station= 9780.13 Elevation= 1660.99

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
10190.92	10286.6	167	210335.12	10423.75	1673

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1661.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.041	0.047	0.035
W.S. Elev (ft)	1660.93	Reach Len. (ft)	498.00	511.83	501.00
Crit W.S. (ft)	1660.55	Flow Area (sq ft)	52.20	199.08	88.81
E.G. Slope (ft/ft)	0.005533	Area (sq ft)	52.20	199.08	88.81
Q Total (cfs)	880.00	Flow (cfs)	81.06	568.34	230.60
Top Width (ft)	452.67	Top Width (ft)	184.33	148.62	119.72
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.55	2.85	2.60
Max Chl Dpth (ft)	2.33	Hydr. Depth (ft)	0.28	1.34	0.74
Conv. Total (cfs)	11830.2	Conv. (cfs)	1089.7	7640.4	3100.1
Length Wtd. (ft)	507.04	Wetted Per. (ft)	184.34	148.84	121.51
Min Ch El (ft)	1658.60	Shear (lb/sq ft)	0.10	0.46	0.25
Alpha	1.08	Stream Power (lb/ft s)	0.15	1.32	0.66
Frctn Loss (ft)	3.08	Cum Volume (acre-ft)	21.83	59.60	15.93
C & E Loss (ft)	0.00	Cum SA (acres)	41.39	44.29	27.20

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 OUTPUT Profile #2

E.G. Elev (ft)	1661.58	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.16	Wt. n-Val.		0.047		
W.S. Elev (ft)	1661.41	Reach Len. (ft)	498.00	511.83	501.00	
Crit W.S. (ft)	1660.62	Flow Area (sq ft)		271.01		
E.G. Slope (ft/ft)	0.004871	Area (sq ft)		271.01		
Q Total (cfs)	880.00	Flow (cfs)		880.00		
Top Width (ft)	148.62	Top Width (ft)		148.62		
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25		
Max Chl Dpth (ft)	2.81	Hydr. Depth (ft)		1.82		
Conv. Total (cfs)	12608.4	Conv. (cfs)		12608.4		
Length Wtd. (ft)	511.83	Wetted Per. (ft)		151.82		
Min Ch El (ft)	1658.60	Shear (lb/sq ft)		0.54		
Alpha	1.00	Stream Power (lb/ft s)		1.76		
Frctn Loss (ft)	3.04	Cum Volume (acre-ft)	1.08	74.92	0.42	
C & E Loss (ft)	0.00	Cum SA (acres)	0.77	44.29	0.31	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9780.13	9971.10	81.06	52.20	184.34	9.21	0.28	1.55
2	Chan	9971.10	10119.72	568.34	199.08	148.84	64.58	1.34	2.85
3	ROB	10119.72	10390.96	230.60	88.81	121.51	26.20	0.74	2.60

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9971.10	10119.72	880.00	271.01	151.82	100.00	1.82	3.25

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: T4N-R3W-S08W
REACH: REACH-1 RS: 2.476

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.

Station Elevation Data num= 137

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9430.44	1658.3	9444.19	1658.28	9456.42	1658.18	9465.8	1658.12	9466.73	1658.12
9468.65	1658.1	9470.88	1658.11	9473.64	1658.09	9475.13	1658.12	9477.11	1658.12
9480.03	1658.3	9488.8	1658.23	9493.68	1658.23	9495.18	1658.09	9496.81	1658.1
9498.87	1658.11	9499.91	1658.11	9507.2	1658.15	9507.55	1658.15	9508.99	1658.2
9510.03	1658.15	9510.62	1658.15	9511.36	1658.14	9534	1658	9538.24	1658
9553.55	1657.9	9558.4	1657.88	9558.95	1657.9	9560.26	1657.86	9610.99	1657.57
9611.49	1657.57	9647.68	1657.64	9653.87	1657.6	9665.49	1657.67	9667.24	1657.69
9667.73	1657.69	9668.3	1657.67	9684.39	1657.7	9702.65	1657.61	9705.6	1657.59
9711.4	1657.61	9761.13	1657.4	9761.31	1657.4	9785.56	1657.49	9807.09	1657.48
9824.85	1657.32	9852.59	1657.21	9859.36	1657.202	9860.8	1657.2	9905.5	1656.85
9928.57	1656.82	9931.27	1656.82	9956.13	1656.6	9960.72	1656.42	9973.5	1656.31
9974.87	1656.32	9991.45	1656.18	10007.36	165	10010.29	1657.25	10013.13	1657.31
10016.92	1657.02	10024.79	1656.47	10068.09	1656.7	10071.25	1656.69	10072.46	1656.69
10074.9	1656.71	10076.98	1656.72	10088.47	1656.9	10097.19	1657.44	10100.71	1657.464
10133.14	1657.69	10144.16	1657.69	10166.68	1658.14	10176.09	1658.31	10181.47	1658.4
10215.54	1658.8	10237.3	165	10259.95	1659.08	10260.6	1659.09	10261.65	1659.12
10270.71	1659.35	10277.88	1659.5	10279.48	1659.44	10282.57	1659.38	10283.16	1659.37
10296.93	1659.63	10305.52	1659.8	10310.61	1659.84	10311.62	1659.86	10319.97	1659.94
10322	1659.95	10322.42	1660.2	10322.93	1660.25	10323.62	1660.26	10324.53	1660.28
10331.23	1659.98	10342.22	166	10344.86	1659.99	10348.09	1660.01	10350.91	1660.03
10353.5	1660	10371.7	1660.33	10378.63	1660.43	10388.35	1660.03	10389.3	1660.01
10401.75	1659.5	10401.76	1659.49	10401.78	1659.49	10405.36	166	10405.93	1660.09
10410.82	1660.8	10412.06	1661.06	10414.81	1661.47	10416.04	1661.59	10416.08	1661.59
10416.23	1661.6	10454.84	1661.74	10455.01	1661.75	10455.91	1661.75	10461.11	1661.7
10468.33	1661.75	10475.08	1661.79	10501.79	1661.92	10506.5	1661.98	10506.57	1661.9
10513.75	1661.95	10519.77	1661.94	10534.72	1661.91	10546.78	1661.86	10555.04	1661.8
10557	1661.83	10558.52	1661.83	10558.53	1661.82	10560.28	1661.84	10563.36	1661.9
10577.12	166	10602.62	1662.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9430.44	.033	9807.09	.047	10100.71	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9859.36	10013.13	499	535.54	543	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
9680.96	9741.18	1670

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1657.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.038	0.047	0.046
W.S. Elev (ft)	1657.85	Reach Len. (ft)	499.00	535.54	543.00
Crit W.S. (ft)	1657.53	Flow Area (sq ft)	77.47	170.29	107.18
E.G. Slope (ft/ft)	0.006714	Area (sq ft)	77.47	170.29	107.18
Q Total (cfs)	880.00	Flow (cfs)	129.17	472.14	278.69
Top Width (ft)	530.51	Top Width (ft)	237.58	153.77	139.17
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)	1.67	2.77	2.60
Max Chl Dpth (ft)	1.67	Hydr. Depth (ft)	0.33	1.11	0.77
Conv. Total (cfs)	10739.4	Conv. (cfs)	1576.4	5761.9	3401.1

Length Wtd. (ft)	526.29	Wetted Per. (ft)	238.11	153.81	139.22	
Min Ch El (ft)	1656.18	Shear (lb/sq ft)	0.14	0.46	0.32	
Alpha	1.09	Stream Power (lb/ft s)	0.23	1.29	0.84	
Frctn Loss (ft)	3.41	Cum Volume (acre-ft)	21.09	57.43	14.80	
C & E Loss (ft)	0.00	Cum SA (acres)	38.98	42.51	25.72	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1658.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.047	
W.S. Elev (ft)	1658.32	Reach Len. (ft)	499.00	535.54	543.00
Crit W.S. (ft)	1657.74	Flow Area (sq ft)		241.41	
E.G. Slope (ft/ft)	0.007422	Area (sq ft)		241.41	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	153.77	Top Width (ft)		153.77	
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)		3.65	
Max Chl Dpth (ft)	2.14	Hydr. Depth (ft)		1.57	
Conv. Total (cfs)	10214.6	Conv. (cfs)		10214.6	
Length Wtd. (ft)	535.54	Wetted Per. (ft)		155.93	
Min Ch El (ft)	1656.18	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)		2.62	
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	1.08	71.91	0.42
C & E Loss (ft)	0.00	Cum SA (acres)	0.77	42.51	0.31

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9430.44	9644.90	19.00	15.49	83.34	2.16	0.19	1.23
2	LOB	9644.90	9859.36	110.17	61.99	154.77	12.52	0.40	1.78
3	Chan	9859.36	10013.13	472.14	170.29	153.81	53.65	1.11	2.77
4	ROB	10013.13	10307.88	278.69	107.18	139.22	31.67	0.77	2.60

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9859.36	10013.13	880.00	241.41	155.93	100.00	1.57	3.65

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.

CROSS SECTION

RIVER: T4N-R3W-S08W
REACH: REACH-1 RS: 2.375

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 910cfs.
Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not a

Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9504.09	1655.3	9507.03	1655.38	9517.3	1655.61	9519.34	1655.56	9519.64	1655.53
9536.33	1655.1	9543.95	1654.98	9547.74	1654.98	9555.7	1654.81	9574.76	1655.01
9599.88	1655.3	9605.85	1655.14	9606.66	1655.13	9610.73	1654.95	9627.42	1654.19
9640.59	1654.55	9643.27	1654.61	9644.84	1654.62	9675.35	1654.5	9676.92	1654.42
9695.59	1654.24	9708.49	1654.16	9717.05	1654.1	9718.86	1654.1	9726.69	1654.07
9752.35	1654	9756.34	1654	9789.18	1653.81	9814.92	1653.7	9821.08	1653.7
9830.76	1653.72	9879.79	1653.8	9881.45	1653.8	9884.34	1653.77	9884.37	1653.77
9885.68	1653.753	9897.73	1653.6	9897.73	1653.62	9940.79	1653.51	9943.26	1653.51
9952.21	1653.48	9992.87	1652.91	10003.69	1653.12	10013.99	1653.19	10072.91	1653.5
10074.09	1653.51	10074.42	1653.51	10077.45	1653.55	10103.51	1653.85	10107.64	1653.9
10114.53	1654	10131.56	1654.21	10132.55	1654.25	10167.46	1654.74	10221.06	1655.2
10240.9	1655.53	10259.95	1656	10294.45	1656.68	10296.42	1656.71	10309.63	1656.82
10326.03	1657.12	10350.82	1657.35	10378.05	1657.31	10400.01	1657.54	10404.36	1657.57
10405.12	1657.62	10414.08	1657.81	10421.99	1658				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9504.09	.033	9952.21	.041	10072.91	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.21	10072.91	486	518.49	495	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
9608.74	9698.52	1665

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1654.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.033	0.040	0.040
W.S. Elev (ft)	1654.41	Reach Len. (ft)	486.00	518.49	495.00
Crit W.S. (ft)		Flow Area (sq ft)	154.15	140.16	34.10
E.G. Slope (ft/ft)	0.006255	Area (sq ft)	154.15	140.16	34.10
Q Total (cfs)	910.00	Flow (cfs)	393.61	454.88	61.51
Top Width (ft)	445.27	Top Width (ft)	253.69	120.70	70.88
Vel Total (ft/s)	2.77	Avg. Vel. (ft/s)	2.55	3.25	1.80
Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)	0.61	1.16	0.48
Conv. Total (cfs)	11506.4	Conv. (cfs)	4976.9	5751.7	777.8
Length Wtd. (ft)	500.32	Wetted Per. (ft)	253.90	120.71	70.88
Min Ch El (ft)	1652.90	Shear (lb/sq ft)	0.24	0.45	0.19
Alpha	1.08	Stream Power (lb/ft s)	0.61	1.47	0.34
Frctn Loss (ft)	3.37	Cum Volume (acre-ft)	19.76	55.52	13.92
C & E Loss (ft)	0.00	Cum SA (acres)	36.16	40.82	24.41

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 OUTPUT Profile #2

E.G. Elev (ft)	1655.43	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.23	Wt. n-Val.			0.040		
W.S. Elev (ft)	1655.19	Reach Len. (ft)		486.00	518.49	495.00	
Crit W.S. (ft)		Flow Area (sq ft)			235.03		
E.G. Slope (ft/ft)	0.004637	Area (sq ft)			235.03		
Q Total (cfs)	910.00	Flow (cfs)			910.00		
Top Width (ft)	120.70	Top Width (ft)			120.70		
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)			3.87		
Max Chl Dpth (ft)	2.29	Hydr. Depth (ft)			1.95		
Conv. Total (cfs)	13363.4	Conv. (cfs)			13363.4		
Length Wtd. (ft)	512.37	Wetted Per. (ft)			124.12		
Min Ch El (ft)	1652.90	Shear (lb/sq ft)			0.55		
Alpha	1.00	Stream Power (lb/ft s)			2.12		
Frctn Loss (ft)	3.53	Cum Volume (acre-ft)		1.08	68.98	0.42	
C & E Loss (ft)	0.02	Cum SA (acres)		0.77	40.82	0.31	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9504.09	9728.15	11.86	8.12	29.82	1.30	0.27	1.46
2	LOB	9728.15	9952.21	381.74	146.03	224.08	41.95	0.65	2.61
3	Chan	9952.21	10072.91	454.88	140.16	120.71	49.99	1.16	3.25
4	ROB	10072.91	10247.45	61.51	34.10	70.88	6.76	0.48	1.80

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9952.21	10072.91	910.00	235.03	124.12	100.00	1.95	3.87

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.
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: T4N-R3W-S08W
REACH: REACH-1 RS: 2.277

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between

houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.

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Station Elevation Data    num=     121
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9295.62  1652.4 9301.05 1652.56 9303.55  1652.6 9321.27 1652.67 9349.17 1652.48
 9363.28  1652.3 9375.31 1652.37 9394.15  1652.5 9406.25 1652.28 9416.41 1652.13
 9421.56  1652.1  9427.8 1652.15 9429.38  1652.1 9434.23 1652.11 9434.86 1652.17
 9436.26  1652.1 9437.71    1652 9442.97 1651.77 9444.28 1651.72 9444.44  1651.7
 9460.19 1652.06  9469.2  1652.2 9473.08  1652.3 9473.29 1652.28 9473.53 1652.27
 9474.63 1652.28 9502.48  1652.2  9505.7 1652.33 9515.68 1652.32 9526.54 1652.42
 9531.48 1652.46  9533.3  1652.4 9535.76  1652.4 9537.49 1652.38 9539.68 1652.35
  9551.4  1652.1 9555.96    1652 9557.38 1651.96 9573.14 1651.61 9584.59 1651.91
 9588.23    1652 9607.29  1652.5 9607.69 1652.53 9607.86 1652.53 9620.29 1652.74
 9659.44 1652.73 9678.84  1652.7 9684.42 1652.54 9687.94 1652.37 9689.71 1652.32
 9692.24 1652.23 9696.77    1652 9697.79    1652 9705.02 1651.74 9705.14 1651.74
 9705.22 1651.73 9705.26  1651.7  9727.8 1651.11  9732.4 1651.11 9732.64 1651.29
 9738.72 1651.42 9740.27  1651.4 9746.28 1651.69 9746.42  1651.7 9755.23 1651.23
 9759.92 1650.82 9767.15  1650.9 9792.44 1650.82 9814.66 1650.69 9833.87 1650.58
 9850.32 1650.49 9876.471650.142 9879.65  1650.1 9884.87    1650 9912.92 1649.63
 9945.84 1649.72 9961.11  1649.9 9965.32 1649.93 9967.05 1650.01  9969.3 1649.93
  9985.1 1649.8810002.77  1649.610005.65 1649.5910024.04 1649.9810024.79    1650
10025.34 1650.0110027.17  1650.110029.62 1650.07 10033.3  1650.110037.42  1650.1
10043.98 1650.0910054.93    1650 10068.5    165010075.75 1649.9810083.26 1649.94
10086.66 1649.9610088.15    165010090.17    165010103.381650.089 10113.8 1650.16
10143.15 1650.5510153.35 1650.5910199.79 1650.73 10199.8 1650.7310260.27 1651.64
   10290 1651.9710292.55    165210293.16    165210315.84 1652.3210316.28 1652.32
10319.29 1652.37 10331.2  1652.510375.25 1653.0310414.52 1653.3910425.52 1653.48
10430.99 1653.5210433.18  1653.510474.04    165410475.91 1654.0210478.06 1654.05
10480.03 1654.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9295.62    .033 9967.05     .0410027.17     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.0510027.17              509   506.1     501              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
************************
 9833.17 9904.31  1662.5

CROSS SECTION OUTPUT  Profile #1
*************************************************************************************
* E.G. Elev (ft)         * 1651.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.18  * Wt. n-Val.              *   0.033  *   0.040  *   0.040  *
* W.S. Elev (ft)         * 1650.99  * Reach Len. (ft)         *  509.00  *  506.10  *  501.00  *
* Crit W.S. (ft)         * 1650.83  * Flow Area (sq ft)       *   94.89  *   70.67  *  122.78  *
* E.G. Slope (ft/ft)     *0.007277  * Area (sq ft)            *   94.89  *   70.67  *  122.78  *
* Q Total (cfs)          *  910.00  * Flow (cfs)              *  369.66  *  249.39  *  290.94  *
* Top Width (ft)         *  387.91  * Top Width (ft)          *  137.93  *   60.12  *  189.87  *
* Vel Total (ft/s)       *    3.16  * Avg. Vel. (ft/s)        *    3.90  *    3.53  *    2.37  *
* Max Chl Dpth (ft)      *    1.40  * Hydr. Depth (ft)        *    0.69  *    1.18  *    0.65  *
* Conv. Total (cfs)      * 10667.8  * Conv. (cfs)             *  4333.5  *  2923.6  *  3410.7  *
* Length Wtd. (ft)       *  505.68  * Wetted Per. (ft)        *  139.59  *   60.13  *  189.87  *
* Min Ch El (ft)         * 1649.59  * Shear (lb/sq ft)        *    0.31  *    0.53  *    0.29  *
* Alpha                  *    1.14  * Stream Power (lb/ft s)  *    1.20  *    1.88  *    0.70  *
* Frctn Loss (ft)        *    2.59  * Cum Volume (acre-ft)    *   18.37  *   54.27  *   13.03  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   33.98  *   39.75  *   22.93  *
*************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*************************************************************************************
* E.G. Elev (ft)         * 1651.88  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.47  * Wt. n-Val.              *   0.033  *   0.040  *   0.040  *
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W.S. Elev (ft)	1651.42	Reach Len. (ft)	509.00	506.10	501.00
Crit W.S. (ft)	1651.18	Flow Area (sq ft)	35.62	96.27	36.52
E.G. Slope (ft/ft)	0.011302	Area (sq ft)	35.62	96.27	36.52
Q Total (cfs)	910.00	Flow (cfs)	220.23	520.29	169.48
Top Width (ft)	109.93	Top Width (ft)	22.56	60.12	27.25
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	6.18	5.40	4.64
Max Chl Dpth (ft)	1.83	Hydr. Depth (ft)	1.58	1.60	1.34
Conv. Total (cfs)	8559.8	Conv. (cfs)	2071.5	4894.1	1594.2
Length Wtd. (ft)	505.98	Wetted Per. (ft)	24.26	60.13	28.66
Min Ch El (ft)	1649.59	Shear (lb/sq ft)	1.04	1.13	0.90
Alpha	1.03	Stream Power (lb/ft s)	6.40	6.11	4.17
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	0.88	67.01	0.21
C & E Loss (ft)	0.10	Cum SA (acres)	0.64	39.75	0.16

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9631.34	9967.05	369.66	94.89	139.59	40.62	0.69	3.90
2	Chan	9967.05	10027.17	249.39	70.67	60.13	27.41	1.18	3.53
3	ROB	10027.17	10253.60	290.94	122.78	189.87	31.97	0.65	2.37

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9631.34	9967.05	220.23	35.62	24.26	24.20	1.58	6.18
2	Chan	9967.05	10027.17	520.29	96.27	60.13	57.17	1.60	5.40
3	ROB	10027.17	10253.60	169.48	36.52	28.66	18.62	1.34	4.64

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.
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: T4N-R3W-S08W
REACH: REACH-1 RS: 2.181

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were

accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.

```
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9360.98  1649.5 9366.47 1649.49 9398.77 1649.49 9412.82 1649.47 9437.79  1649.5
 9445.81  1649.4 9459.57 1649.35 9468.98 1649.32 9513.47 1648.86 9531.57  1648.7
  9573.7  1648.7 9581.25 1648.71 9586.59 1648.66 9608.94  1648.5 9620.66  1648.5
 9644.36 1648.72 9655.62 1648.74 9683.23 1648.53 9722.69  1648.2 9723.31 1648.21
 9725.64 1648.19 9725.87 1648.19 9747.06 1648.05 9755.81    1648 9762.67    1648
 9767.27 1647.97 9802.88 1647.88 9819.68  1647.9 9826.86  1647.8 9830.27 1647.71
 9891.35 1647.32 9914.531647.174 9949.94 1646.95 9967.51 1647.1310005.11  1647.2
10011.58  1647.210059.29 1647.07 10089.2 1647.4710110.34 1647.5410110.58  1647.5
10116.43 1647.7710120.66 1647.9210137.03 1647.9210151.29  1647.310156.89 1647.37
10163.91 1647.5810176.63    164810182.61 1648.08   101861648.21310193.33  1648.5
10200.16 1648.7610203.21 1648.8710206.57 1648.9710212.71 1649.0110223.24  1649.2
10251.14 1649.33 10268.4    164910307.18 1649.0910320.95  1649.110325.61 1649.05
 10358.5 1649.0510374.45 1649.5210387.98    165010393.76  1650.210396.62 1650.29
10417.31 1650.5510439.37 1650.9310457.07 1651.1810466.41  1651.210485.19 1651.29
10495.23 1651.2610501.19 1651.37 10528.7 1651.76 10558.6 1651.8110561.53 1651.88
10569.31 1651.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9360.98    .033 9819.68    .04210120.66    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.53 10089.2              513  520.95     508             .1       .3
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*****************************************************************************
 9677.72 9745.15  1660.5 9792.14 9872.77  1659.510204.15 10267.9    1661
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1648.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.042	0.036
W.S. Elev (ft)	1648.46	Reach Len. (ft)	513.00	520.95	508.00
Crit W.S. (ft)		Flow Area (sq ft)	71.02	229.98	74.81
E.G. Slope (ft/ft)	0.003806	Area (sq ft)	71.02	229.98	74.81
Q Total (cfs)	910.00	Flow (cfs)	152.52	603.01	154.47
Top Width (ft)	366.51	Top Width (ft)	88.75	174.67	103.09
Vel Total (ft/s)	2.42	Avg. Vel. (ft/s)	2.15	2.62	2.06
Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)	0.80	1.32	0.73
Conv. Total (cfs)	14749.7	Conv. (cfs)	2472.1	9773.9	2503.7
Length Wtd. (ft)	517.55	Wetted Per. (ft)	90.72	174.67	103.13
Min Ch El (ft)	1646.95	Shear (lb/sq ft)	0.19	0.31	0.17
Alpha	1.03	Stream Power (lb/ft s)	0.40	0.82	0.36
Frctn Loss (ft)	2.90	Cum Volume (acre-ft)	17.40	52.52	11.90
C & E Loss (ft)	0.01	Cum SA (acres)	32.65	38.38	21.24

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1649.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.042	
W.S. Elev (ft)	1648.95	Reach Len. (ft)	513.00	520.95	508.00
Crit W.S. (ft)		Flow Area (sq ft)		315.39	
E.G. Slope (ft/ft)	0.003100	Area (sq ft)		315.39	
Q Total (cfs)	910.00	Flow (cfs)		910.00	
Top Width (ft)	174.67	Top Width (ft)		174.67	

```
* Vel Total (ft/s)        *    2.89  * Avg. Vel. (ft/s)        *          *    2.89  *          *
* Max Chl Dpth (ft)       *    2.00  * Hydr. Depth (ft)        *          *    1.81  *          *
* Conv. Total (cfs)       * 16343.3  * Conv. (cfs)             *          * 16343.3  *          *
* Length Wtd. (ft)        *  520.95  * Wetted Per. (ft)        *          *  177.93  *          *
* Min Ch El (ft)          * 1646.95  * Shear (lb/sq ft)        *          *    0.34  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.99  *          *
* Frctn Loss (ft)         *    2.90  * Cum Volume (acre-ft)    *    0.67  *   64.62  *          *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    0.51  *   38.38  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9637.76   * 9914.53   *   152.52 *    71.02 *    90.72 *    16.76 *
0.80 *     2.15 *
* 2         * Chan      * 9914.53   * 10089.20  *   603.01 *   229.98 *   174.67 *    66.27 *
1.32 *     2.62 *
* 3         * ROB       * 10089.20  * 10329.25  *   154.47 *    74.81 *   103.13 *    16.97 *
0.73 *     2.06 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9914.53   * 10089.20  *   910.00 *   315.39 *   177.93 *   100.00 *
1.81 *     2.89 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S08W
REACH: REACH-1            RS: 2.082

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as
             of aerial photography date; n-values are not adjusted to account
             for the house(s), only the houses in or near the floodplain were
             accounted for and some house(s) were projected to the nearest
             cross-section.  The area available for flood flows in between
             houses was considered and, for example, that may have resulted in
             one house per cross-section.  Therefore, not all of the houses
             were projected to the nearest cross-section.
Station Elevation Data    num=      84
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
```

```
*****************************************************************************
 9341.89  1646.7 9367.88 1646.45 9376.18 1646.44 9388.18 1646.58  9390.8  1646.6
 9398.28  1646.6 9426.39 1646.26 9447.01 1646.29  9469.3  1646.5 9485.47 1646.44
 9523.54  1646.1 9538.52 1646.04 9556.29    1646 9558.79 1645.99 9574.88 1645.96
 9587.92  1645.9 9617.17 1645.94 9629.28 1645.93 9637.23 1645.92 9649.04 1645.86
 9693.18  1645.3 9705.79 1645.15 9715.31 1645.16 9745.43 1645.31 9754.13 1645.26
    9773 1645.15 9787.57  1645.2 9833.47 1644.58 9853.28 1644.38 9879.67 1644.07
 9888.94 1644.05 9896.71  1644.1 9901.99 1644.04 9909.27 1644.02 9909.28 1644.03
  9916.8 1644.04 9928.08  1644.1 9953.92 1644.11 9960.58 1644.11 9966.95  1644.1
 9967.22 1644.13 9974.91  1644.1 9981.06    1644 9992.15 1643.9110008.79 1643.79
10014.03 1643.7510016.52  1643.810022.32 1643.9610024.27    164410029.131644.127
10039.21 1644.3910053.24 1644.7110083.35  1644.910103.85 1644.9510129.46 1645.12
10158.83  1645.410205.39    164610206.01    164610241.74 1646.5310292.89 1646.31
10312.93 1646.2410320.69  1646.310325.75 1646.3310336.12 1646.3610378.99 1646.93
10401.34 1647.5810446.68  1647.410453.45 1647.1410470.24 1647.2310472.28 1647.23
10473.12 1647.2810473.75  1647.310474.28 1647.3110503.17    164810511.47 1648.21
10513.15 1648.2510522.85  1648.310558.73 1648.3810615.14 1648.6710626.67 1648.66
10648.87  1648.610680.25  1648.310695.03 1648.4510697.06 1648.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9341.89    .033 9833.47    .04210103.85    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9879.6710029.13               531  503.25     477             .1       .3
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*********************************************************************
  9984.310067.38    165610128.8110197.72    165710208.8210290.37    1658

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1645.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *   0.039  *   0.042  *   0.039  *
* W.S. Elev (ft)          * 1645.43  * Reach Len. (ft)        *  531.00  *  503.25  *  477.00  *
* Crit W.S. (ft)          * 1645.26  * Flow Area (sq ft)      *   95.88  *  141.28  *   29.38  *
* E.G. Slope (ft/ft)      *0.009075  * Area (sq ft)           *   95.88  *  141.28  *   29.38  *
* Q Total (cfs)           *  910.00  * Flow (cfs)              *  268.18  *  576.36  *   65.46  *
* Top Width (ft)          *  362.60  * Top Width (ft)          *  196.54  *  104.63  *   61.43  *
* Vel Total (ft/s)        *    3.41  * Avg. Vel. (ft/s)        *    2.80  *    4.08  *    2.23  *
* Max Chl Dpth (ft)       *    1.45  * Hydr. Depth (ft)        *    0.49  *    1.35  *    0.48  *
* Conv. Total (cfs)       *  9552.7  * Conv. (cfs)             *  2815.3  *  6050.3  *   687.2  *
* Length Wtd. (ft)        *  507.68  * Wetted Per. (ft)        *  196.55  *  106.09  *   62.37  *
* Min Ch El (ft)          * 1643.97  * Shear (lb/sq ft)        *    0.28  *    0.75  *    0.27  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    0.77  *    3.08  *    0.59  *
* Frctn Loss (ft)         *    3.07  * Cum Volume (acre-ft)    *   16.42  *   50.30  *   11.29  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   30.98  *   36.71  *   20.28  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1646.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.45  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)          * 1645.69  * Reach Len. (ft)        *  531.00  *  503.25  *  477.00  *
* Crit W.S. (ft)          * 1645.40  * Flow Area (sq ft)      *          *  168.68  *          *
* E.G. Slope (ft/ft)      *0.012827  * Area (sq ft)           *          *  168.68  *          *
* Q Total (cfs)           *  910.00  * Flow (cfs)              *          *  910.00  *          *
* Top Width (ft)          *  104.63  * Top Width (ft)          *          *  104.63  *          *
* Vel Total (ft/s)        *    5.39  * Avg. Vel. (ft/s)        *          *    5.39  *          *
* Max Chl Dpth (ft)       *    1.72  * Hydr. Depth (ft)        *          *    1.61  *          *
* Conv. Total (cfs)       *  8034.8  * Conv. (cfs)             *          *  8034.8  *          *
* Length Wtd. (ft)        *  503.25  * Wetted Per. (ft)        *          *  107.97  *          *
* Min Ch El (ft)          * 1643.97  * Shear (lb/sq ft)        *          *    1.25  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    6.75  *          *
```

```
* Frctn Loss (ft)        *    3.28  * Cum Volume (acre-ft)   *    0.67  *   61.72  *          *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)         *    0.51  *   36.71  *          *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9610.78   * 9879.67   *   268.18 *    95.88 *   196.55 *    29.47 *
0.49 *     2.80 *
* 2         * Chan      * 9879.67   * 10029.13  *   576.36 *   141.28 *   106.09 *    63.34 *
1.35 *     4.08 *
* 3         * ROB       * 10029.13  * 10363.09  *    65.46 *    29.38 *    62.37 *     7.19 *
0.48 *     2.23 *
*****************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9879.67   * 10029.13  *   910.00 *   168.68 *   107.97 *   100.00 *
1.61 *     5.39 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S08W
REACH: REACH-1-          RS: 1.987

INPUT
Description:
Station Elevation Data     num=      65
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9535.22     1643 9579.45 1642.66 9641.52 1642.69 9653.31 1642.63 9772.98  1642.4
 9776.99 1642.37  9785.7 1642.35 9812.15 1642.18 9836.46 1642.06 9840.07    1642
 9846.54     1642 9850.38 1641.95  9857.51641.868 9866.88 1641.76 9880.36 1641.73
 9892.28  1641.7  9895.6 1641.74 9903.93 1641.86 9907.31 1641.89 9925.71 1641.64
 9928.26 1641.57  9945.4 1641.03  9947.4 1641.01 9948.98 1641.09 9953.34  1641.4
 9972.84 1640.16 9972.95 1640.16 9978.54  1640.1 9984.67    1640 9985.56 1639.99
 9985.63     1640 9991.05 1639.5710000.89  1638.710003.68 1639.0410013.13    1640
10018.77 1640.5510020.98 1640.7710023.09  1640.910027.25 1641.0510028.82 1641.08
10029.19 1641.1110033.42 1641.1810038.42  1641.3 10049.6 1641.4510069.59 1641.68
10078.15 1641.9510080.85 1641.9910081.95    164210086.081642.046 10096.3 1642.16
10098.22 1642.18 10104.3 1642.2310112.18 1642.3110144.65  1642.710146.06 1642.72
10147.09 1642.7410175.93 1643.42 10189.8 1643.6710203.92    164410205.44 1644.03
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10207.71 1644.0910232.64 1644.3210273.22 1644.5310288.44  1644.510327.97 1644.52

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 9535.22    .033 9925.71    .04210069.59    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9925.7110069.59              481  503.55     510              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1642.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)          * 1642.39  * Reach Len. (ft)         *  481.00  *  503.55  *  510.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   62.06  *  241.39  *   13.87  *
* E.G. Slope (ft/ft)      *0.004317  * Area (sq ft)            *   62.06  *  241.39  *   13.87  *
* Q Total (cfs)           *  910.00  * Flow (cfs)              *  101.10  *  791.33  *   17.57  *
* Top Width (ft)          *  345.29  * Top Width (ft)          *  151.87  *  143.88  *   49.54  *
* Vel Total (ft/s)        *    2.87  * Avg. Vel. (ft/s)        *    1.63  *    3.28  *    1.27  *
* Max Chl Dpth (ft)       *    3.69  * Hydr. Depth (ft)        *    0.41  *    1.68  *    0.28  *
* Conv. Total (cfs)       * 13850.6  * Conv. (cfs)             *  1538.8  * 12044.5  *   267.4  *
* Length Wtd. (ft)        *  501.23  * Wetted Per. (ft)        *  151.87  *  144.12  *   49.55  *
* Min Ch El (ft)          * 1638.70  * Shear (lb/sq ft)        *    0.11  *    0.45  *    0.08  *
* Alpha                   *    1.18  * Stream Power (lb/ft s)  *    0.18  *    1.48  *    0.10  *
* Frctn Loss (ft)         *    2.92  * Cum Volume (acre-ft)    *   15.46  *   48.09  *   11.05  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   28.85  *   35.28  *   19.67  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1642.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)          * 1642.60  * Reach Len. (ft)         *  481.00  *  503.55  *  510.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  271.14  *          *
* E.G. Slope (ft/ft)      *0.003942  * Area (sq ft)            *          *  271.14  *          *
* Q Total (cfs)           *  910.00  * Flow (cfs)              *          *  910.00  *          *
* Top Width (ft)          *  143.88  * Top Width (ft)          *          *  143.88  *          *
* Vel Total (ft/s)        *    3.36  * Avg. Vel. (ft/s)        *          *    3.36  *          *
* Max Chl Dpth (ft)       *    3.90  * Hydr. Depth (ft)        *          *    1.88  *          *
* Conv. Total (cfs)       * 14493.3  * Conv. (cfs)             *          * 14493.3  *          *
* Length Wtd. (ft)        *  503.55  * Wetted Per. (ft)        *          *  146.00  *          *
* Min Ch El (ft)          * 1638.70  * Shear (lb/sq ft)        *          *    0.46  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.53  *          *
* Frctn Loss (ft)         *    2.62  * Cum Volume (acre-ft)    *    0.67  *   59.18  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.51  *   35.28  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9730.47   * 9925.71   *   101.10 *    62.06 *   151.87 *    11.11 *
0.41 *     1.63 *
* 2         * Chan      * 9925.71   * 10069.59  *   791.33 *   241.39 *   144.12 *    86.96 *
1.68 *     3.28 *
* 3         * ROB       * 10069.59  * 10198.78  *    17.57 *    13.87 *    49.55 *     1.93 *
0.28 *     1.27 *
*****************************************************************************************
******************

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.

Profile #2

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)
* 1	* Chan	* 9925.71	* 10069.59	* 910.00	* 271.14	* 146.00	* 100.00	* 1.88	* 3.36 *

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.891

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9459.64	1640.7	9460.31	1640.69	9468.85	1640.7	9476.64	1640.68	9516.99	1640.63
9519.45	1640.6	9593.29	1640.26	9605.2	1640.26	9628.53	1640.07	9637.38	1640
9649.7	1639.9	9663.66	1639.79	9674.73	1639.71	9677.31	1639.69	9684.88	1639.6
9721.56	1639.61	9736.73	1639.58	9745.57	1639.52	9759.69	1639.52	9815.53	1639.7
9819.03	1639.62	9845.97	1639.05	9864.36	1638.9	9916.28	1638.4	9928.63	1638.3
9931.78	1638.282	9949.78	1638.18	9956.1	1638.21	9961.54	1638.2	9971.39	1638.07
9982.88	1638.1	9983.18	1638.04	9983.99	1638	9984.77	1637.94	9987.39	1637.76
9999.02	1637.91	10008.63	1638	10020.48	1638.141	10027.08	1638.211	10041.33	1638.52
10042.66	1638.61	10045.33	1638.571	10059.97	1638.683	10083.99	1638.871	10118.58	1638.81
10128.66	1639	10173.67	1639.81	10188.31	1639.861	10200.59	1639.831	10233.27	1639.83
10258.92	1639.71	10275.73	1639.97	10277.7	1640	10292.28	1640.211	10324.63	1640.63
10326.6	1640.61	10329.55	1640.641	10333.67	1640.661	10386.51	1640.171	10394.11	1640.22
10406.53	1640.21	10455.75	1640.161	10486.85	1640.551	10516.96	1640.911	10525.63	1641.01
10555.46	1640.8	10562.1	1640.771	10591.16	1641.651	10594.43	1641.76	10595.3	1641.77
10596.88	1641.81	10600.64	1641.821	10617.67	1642	10619.45	1642.02		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9459.64	.033	9864.36	.042	10083.99	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9916.28	10041.33	484	468	452	.1	.3

CROSS SECTION OUTPUT Profile #1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1639.62	Element				
Vel Head (ft)	0.19	Wt. n-Val.		0.040	0.042	0.038
W.S. Elev (ft)	1639.44	Reach Len. (ft)		484.00	468.00	452.00
Crit W.S. (ft)	1639.22	Flow Area (sq ft)		52.96	161.39	62.64
E.G. Slope (ft/ft)	0.008294	Area (sq ft)		52.96	161.39	62.64
Q Total (cfs)	910.00	Flow (cfs)		135.94	616.34	157.72
Top Width (ft)	325.64	Top Width (ft)		88.64	125.05	111.96
Vel Total (ft/s)	3.29	Avg. Vel. (ft/s)		2.57	3.82	2.52
Max Chl Dpth (ft)	1.68	Hydr. Depth (ft)		0.60	1.29	0.56
Conv. Total (cfs)	9992.0	Conv. (cfs)		1492.7	6767.5	1731.8
Length Wtd. (ft)	468.89	Wetted Per. (ft)		88.64	125.07	111.97
Min Ch El (ft)	1637.76	Shear (lb/sq ft)		0.31	0.67	0.29
Alpha	1.11	Stream Power (lb/ft s)		0.79	2.55	0.73
Frctn Loss (ft)	2.82	Cum Volume (acre-ft)		14.82	45.76	10.60
C & E Loss (ft)	0.03	Cum SA (acres)		27.52	33.72	18.73

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 OUTPUT Profile #2

E.G. Elev (ft)	1640.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.042	
W.S. Elev (ft)	1639.87	Reach Len. (ft)	484.00	468.00	452.00
Crit W.S. (ft)		Flow Area (sq ft)		214.89	
E.G. Slope (ft/ft)	0.007171	Area (sq ft)		214.89	
Q Total (cfs)	910.00	Flow (cfs)		910.00	
Top Width (ft)	125.05	Top Width (ft)		125.05	
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)		4.23	
Max Chl Dpth (ft)	2.11	Hydr. Depth (ft)		1.72	
Conv. Total (cfs)	10745.8	Conv. (cfs)		10745.8	
Length Wtd. (ft)	468.00	Wetted Per. (ft)		127.88	
Min Ch El (ft)	1637.76	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)		3.19	
Frctn Loss (ft)	2.90	Cum Volume (acre-ft)	0.67	56.37	
C & E Loss (ft)	0.04	Cum SA (acres)	0.51	33.72	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9687.96	9916.28	135.94	52.96	88.64	14.94	0.60	2.57
2	Chan	9916.28	10041.33	616.34	161.39	125.07	67.73	1.29	3.82
3	ROB	10041.33	10330.39	157.72	62.64	111.97	17.33	0.56	2.52

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9916.28	10041.33	910.00	214.89	127.88	100.00	1.72	4.23

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.803

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 950cfs.
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9579.52  1638.1 9583.07  1638.1 9589.09 1638.07 9601.45    1638 9606.27 1637.98
 9613.47  1637.9 9621.27 1637.93 9636.87 1637.77 9637.66 1637.76 9637.79 1637.76
 9637.82  1637.8 9637.87 1637.76 9638.83 1637.76 9672.84 1637.86 9676.77  1637.9
 9678.83 1637.91 9679.94 1637.87 9681.59 1637.85 9707.22 1637.41 9728.71  1637.1
 9784.74 1636.25 9800.08 1636.12 9842.48 1636.33 9850.75 1636.34 9854.59  1636.3
 9872.55 1636.14 9888.17    1636 9894.09 1635.93 9919.01 1635.68 9940.53  1635.7
 9948.23 1635.69 9970.59 1635.83 9976.12 1635.85 9976.86 1635.85 9976.95  1635.8
 9977.52 1635.85 9990.32 1635.7510005.59 1635.5910012.53 1635.49 10014.5  1635.5
10045.85 1635.8710070.44 1635.3910074.69  1635.410077.89  1635.410079.57 1635.39
10101.13 1635.5710102.52 1635.5710103.39  1635.610115.58 1635.4210150.98 1635.34
10158.22 1635.5810166.61 1635.6810189.04    163610191.27 1636.0410192.68 1636.06
10236.271636.02410256.27 1636.0110290.27  1636.310298.31 1636.3110357.01 1636.87
10374.62 1637.0310412.69 1637.1310447.99  1637.310451.37 1637.2810461.11 1637.32
10476.79 1637.3310515.79 1637.41 10532.2  1637.410552.13 1637.4110588.98 1637.52
10596.65 1637.5510598.92  1637.610600.21 1637.5810605.48 1637.6410627.33  1637.9
10634.47 1637.9810636.59    163810667.71  1638.210689.51 1638.55

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9579.52     .033 9872.55     .04710192.68     .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.1210192.68               655  552.38     377              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1636.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *    0.043 *    0.047 *    0.033 *
* W.S. Elev (ft)          * 1636.70  * Reach Len. (ft)         *   655.00 *   552.38 *   377.00 *
* Crit W.S. (ft)          * 1636.34  * Flow Area (sq ft)       *   140.17 *   239.26 *    72.42 *
* E.G. Slope (ft/ft)      *0.004603  * Area (sq ft)            *   140.17 *   239.26 *    72.42 *
* Q Total (cfs)           *  950.00  * Flow (cfs)              *   263.48 *   548.40 *   138.12 *
* Top Width (ft)          *  584.58  * Top Width (ft)          *   221.23 *   216.56 *   146.80 *
* Vel Total (ft/s)        *    2.10  * Avg. Vel. (ft/s)        *     1.88 *     2.29 *     1.91 *
* Max Chl Dpth (ft)       *    1.36  * Hydr. Depth (ft)        *     0.63 *     1.10 *     0.49 *
* Conv. Total (cfs)       * 14002.8  * Conv. (cfs)             *   3883.7 *   8083.3 *  2035.8 *
* Length Wtd. (ft)        *  553.19  * Wetted Per. (ft)        *   221.23 *   216.59 *   146.80 *
* Min Ch El (ft)          * 1635.34  * Shear (lb/sq ft)        *     0.18 *     0.32 *     0.14 *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *     0.34 *     0.73 *     0.27 *
* Frctn Loss (ft)         *    2.57  * Cum Volume (acre-ft)     *    13.75 *    43.61 *     9.90 *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    25.80 *    31.89 *    17.39 *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1637.20  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.047 *          *
* W.S. Elev (ft)          * 1637.07  * Reach Len. (ft)         *   655.00 *   552.38 *   377.00 *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *   317.78 *          *
* E.G. Slope (ft/ft)      *0.005437  * Area (sq ft)            *          *   317.78 *          *
* Q Total (cfs)           *  950.00  * Flow (cfs)              *          *   950.00 *          *
* Top Width (ft)          *  216.56  * Top Width (ft)          *          *   216.56 *          *
* Vel Total (ft/s)        *    2.99  * Avg. Vel. (ft/s)        *          *     2.99 *          *
* Max Chl Dpth (ft)       *    1.73  * Hydr. Depth (ft)        *          *     1.47 *          *
* Conv. Total (cfs)       * 12883.9  * Conv. (cfs)             *          *  12883.9 *          *
* Length Wtd. (ft)        *  552.38  * Wetted Per. (ft)        *          *   218.81 *          *
* Min Ch El (ft)          * 1635.34  * Shear (lb/sq ft)        *          *     0.49 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     1.47 *          *
* Frctn Loss (ft)         *    2.83  * Cum Volume (acre-ft)     *     0.67 *    53.51 *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *     0.51 *    31.89 *          *
*****************************************************************************************

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.

  Profile #1
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9579.52   * 9777.82   *     3.74 *     3.99 *    22.93 *     0.39 *
0.17 *     0.94 *
* 2         * LOB       * 9777.82   * 9976.12   *   259.74 *   136.18 *   198.31 *    27.34 *
0.69 *     1.91 *
* 3         * Chan      * 9976.12   * 10192.68  *   548.40 *   239.26 *   216.59 *    57.73 *
1.10 *     2.29 *
* 4         * ROB       * 10192.68  * 10441.09  *   138.12 *    72.42 *   146.80 *    14.54 *
0.49 *     1.91 *
*****************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9976.12   * 10192.68  *   950.00 *   317.78 *   218.81 *   100.00 *
1.47 *     2.99 *
*****************************************************************************************
******************
```

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.698

INPUT
Description: Interpolated points added at (9936.03, 1632.989), (10122.27, 1633.011) to set bank stations.
Station Elevation Data num= 82

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9410.67  1634.4 9424.09 1634.48  9462.5 1634.79 9506.83 1635.03 9526.16 1635.04
 9539.25  1634.9 9579.58 1634.98  9620.6 1634.83 9636.44 1634.76 9680.01  1634.8
 9706.27 1634.75 9715.94 1634.73 9718.38 1634.77 9769.88  1634.5  9783.5 1634.41
 9801.67 1634.24  9824.6 1634.11 9839.83 1634.03 9847.19    1634 9847.71    1634
 9851.79 1633.97 9869.14 1633.82 9887.471633.582 9915.26 1633.22 9936.031632.989
    9944  1632.9 9981.25 1632.88 9991.54 1632.7910008.46 1632.6210016.67 1632.79
10020.72  1632.810025.92 1632.9510029.85 1633.0310051.81 1632.9310058.18 1632.83
10074.76  1632.7 10093.5 1632.35   10102 1632.6410122.271633.01110147.85 1633.48
10149.55  1633.510150.58  1633.510152.08 1633.5410164.621633.72710172.21 1633.84
10179.58 1633.9110186.59 1633.9810189.14  1633.910192.05 1633.9810196.64 1634.04
10201.85 1634.1510216.96 1634.1310225.42  1634.210230.52 1634.2210240.76  1634.3
10264.33 1634.7610267.71 1634.8110271.01  1634.810296.21 1634.3110301.35 1634.76
10333.64 1634.7210353.25 1634.9110370.34  1635.210407.47 1635.7810425.96 1635.89
10430.48 1635.9110437.12 1635.9310453.26    163610457.17 1635.9610463.33 1635.99
10465.42 1635.9810466.08 1635.9810466.58    163610468.83 1636.0410476.62 1636.15
10481.35 1636.2210520.18 1636.9110542.15  1637.210572.17 1637.6410580.92 1637.99
10581.34    163810582.29 1638.02
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9410.67    .033 9869.14    .03310164.62    .033
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
9936.0310122.27              450  495.58     522              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1634.18  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.17  * Wt. n-Val.              *   0.033  *   0.033  *   0.033  *
* W.S. Elev (ft)         * 1634.01  * Reach Len. (ft)         *  450.00  *  495.58  *  522.00  *
* Crit W.S. (ft)         * 1633.70  * Flow Area (sq ft)       *   43.81  *  225.72  *   30.25  *
* E.G. Slope (ft/ft)     *0.004702  * Area (sq ft)            *   43.81  *  225.72  *   30.25  *
* Q Total (cfs)          *  950.00  * Flow (cfs)              *   94.97  *  792.13  *   62.89  *
* Top Width (ft)         *  350.67  * Top Width (ft)          *   92.10  *  186.24  *   72.33  *
* Vel Total (ft/s)       *    3.17  * Avg. Vel. (ft/s)        *    2.17  *    3.51  *    2.08  *
* Max Chl Dpth (ft)      *    1.66  * Hydr. Depth (ft)        *    0.48  *    1.21  *    0.42  *
* Conv. Total (cfs)      * 13855.0  * Conv. (cfs)             *  1385.1  * 11552.6  *   917.3  *
* Length Wtd. (ft)       *  493.64  * Wetted Per. (ft)        *   92.11  *  186.26  *   72.34  *
* Min Ch El (ft)         * 1632.35  * Shear (lb/sq ft)        *    0.14  *    0.36  *    0.12  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.30  *    1.25  *    0.26  *
* Frctn Loss (ft)        *    2.77  * Cum Volume (acre-ft)     *   12.37  *   40.66  *    9.46  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   23.45  *   29.33  *   16.44  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1634.37  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.22  * Wt. n-Val.              *          *   0.033  *          *
* W.S. Elev (ft)         * 1634.15  * Reach Len. (ft)         *  450.00  *  495.58  *  522.00  *
* Crit W.S. (ft)         * 1633.73  * Flow Area (sq ft)       *          *  251.07  *          *
* E.G. Slope (ft/ft)     *0.004821  * Area (sq ft)            *          *  251.07  *          *
* Q Total (cfs)          *  950.00  * Flow (cfs)              *          *  950.00  *          *
* Top Width (ft)         *  186.24  * Top Width (ft)          *          *  186.24  *          *
* Vel Total (ft/s)       *    3.78  * Avg. Vel. (ft/s)        *          *    3.78  *          *
* Max Chl Dpth (ft)      *    1.80  * Hydr. Depth (ft)        *          *    1.35  *          *
* Conv. Total (cfs)      * 13682.5  * Conv. (cfs)             *          * 13682.5  *          *
* Length Wtd. (ft)       *  495.58  * Wetted Per. (ft)        *          *  188.56  *          *
* Min Ch El (ft)         * 1632.35  * Shear (lb/sq ft)        *          *    0.40  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    1.52  *          *
* Frctn Loss (ft)        *    2.57  * Cum Volume (acre-ft)     *    0.67  *   49.90  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *    0.51  *   29.33  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *  -(ft/s) *
* 1        * LOB       * 9673.35   * 9936.03   *    94.97 *    43.81 *    92.11 *    10.00 *
0.48 *     2.17 *
* 2        * Chan      * 9936.03   * 10122.27  *   792.13 *   225.72 *   186.26 *    83.38 *
1.21 *     3.51 *
* 3        * ROB       * 10122.27  * 10352.28  *    62.89 *    30.25 *    72.34 *     6.62 *
0.42 *     2.08 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*          *          * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan     * 9936.03   * 10122.27  *   950.00 *   251.07 *   188.56 *   100.00 *
1.35 *     3.78 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 1.604

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs,
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9430.01    1633 9470.66 1633.31 9471.14 1633.31 9472.67 1633.33 9533.11  1633.7
 9545.34 1633.79 9564.14 1633.46 9602.35    1633 9609.25 1632.88 9611.49  1632.9
 9652.21 1632.35 9660.34 1632.26 9668.42 1632.16 9677.44 1632.03 9679.74    1632
 9693.84  1631.8 9699.97 1631.73 9711.92 1631.63 9716.27  1631.6 9717.73  1631.6
 9782.09 1631.22 9784.34 1631.21 9809.03 1631.28 9845.93  1631.3 9878.71 1631.04
 9905.09 1630.75 9905.86 1630.73 9921.761630.414 9928.49 1630.28 9934.05  1630.1
 9939.91    1630 9951.97 1629.71 9959.91  1629.5 9970.56 1629.55 9995.11  1629.9
 10000.9 1629.7410000.94 1629.7410002.33 1629.6310004.02 1629.5810011.57  1629.2
10011.72 1629.2310014.23 1629.8110014.46 1629.8110014.58  1629.810026.24  1629.7
10038.29 1629.6410039.98 1629.6510069.61 1629.9710070.33    163010070.48 1629.98
10078.631630.11910107.19 1630.6110139.93  1631.3 10156.7 1631.3210167.73 1631.29
10191.59 1631.2310209.46 1631.4910224.56  1631.710237.27 1631.8110274.94 1631.99
10275.34    163210294.47 1632.2310295.24  1632.210344.48 1633.0110361.36  1633.2
10369.35 1633.3610445.33 1633.72 10460.2  1633.8 10475.3 1633.8510504.54 1633.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9430.01    .033 9928.49    .04210078.63    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.9110070.33              493  519.86     509            .1        .3
Left Levee      Station= 9845.93      Elevation=  1631.3
Right Levee     Station= 10156.7      Elevation= 1631.32

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1631.41  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.20  * Wt. n-Val.              *   0.037  *   0.042  *   0.035  *
* W.S. Elev (ft)         * 1631.21  * Reach Len. (ft)         *  493.00  *  519.86  *  509.00  *
* Crit W.S. (ft)         * 1630.85  * Flow Area (sq ft)       *   38.57  *  195.24  *   42.06  *
* E.G. Slope (ft/ft)     *0.006840  * Area (sq ft)            *   38.57  *  195.24  *   42.06  *
* Q Total (cfs)          *  950.00  * Flow (cfs)              *   88.61  *  747.24  *  114.14  *
* Top Width (ft)         *  277.65  * Top Width (ft)          *   82.10  *  130.42  *   65.13  *
* Vel Total (ft/s)       *    3.44  * Avg. Vel. (ft/s)        *    2.30  *    3.83  *    2.71  *
* Max Chl Dpth (ft)      *    2.01  * Hydr. Depth (ft)        *    0.47  *    1.50  *    0.65  *
* Conv. Total (cfs)      * 11486.3  * Conv. (cfs)            *  1071.4  *  9034.8  *  1380.1  *
* Length Wtd. (ft)       *  514.34  * Wetted Per. (ft)        *   82.11  *  130.52  *   65.14  *
* Min Ch El (ft)         * 1629.20  * Shear (lb/sq ft)        *    0.20  *    0.64  *    0.28  *
* Alpha                  *    1.09  * Stream Power (lb/ft s)  *    0.46  *    2.44  *    0.75  *
* Frctn Loss (ft)        *    3.08  * Cum Volume (acre-ft)    *   11.94  *   38.27  *    9.03  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   22.55  *   27.53  *   15.61  *
*****************************************************************************************

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 OUTPUT Profile #2

E.G. Elev (ft)	1631.80	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.24	Wt. n-Val.		0.042		
W.S. Elev (ft)	1631.56	Reach Len. (ft)	493.00	519.86	509.00	
Crit W.S. (ft)	1630.89	Flow Area (sq ft)		241.89		
E.G. Slope (ft/ft)	0.005587	Area (sq ft)		241.89		
Q Total (cfs)	950.00	Flow (cfs)		950.00		
Top Width (ft)	130.42	Top Width (ft)		130.42		
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		3.93		
Max Chl Dpth (ft)	2.36	Hydr. Depth (ft)		1.85		
Conv. Total (cfs)	12709.7	Conv. (cfs)		12709.7		
Length Wtd. (ft)	519.86	Wetted Per. (ft)		133.65		
Min Ch El (ft)	1629.20	Shear (lb/sq ft)		0.63		
Alpha	1.00	Stream Power (lb/ft s)		2.48		
Frctn Loss (ft)	3.18	Cum Volume (acre-ft)	0.67	47.10		
C & E Loss (ft)	0.00	Cum SA (acres)	0.51	27.53		

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9845.93	9939.91	88.61	38.57	82.11	9.33	0.47	2.30
2 Chan	9939.91	10070.33	747.24	195.24	130.52	78.66	1.50	3.83
3 ROB	10070.33	10156.70	114.14	42.06	65.14	12.02	0.65	2.71

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9939.91	10070.33	950.00	241.89	133.65	100.00	1.85	3.93

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.506

INPUT
Description: Interpolated point added at (10135.22, 1627.384) to set bank station.
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9261.42	1630.3	9279.9	1630.28	9293.05	1630.22	9294.75	1630.21	9297.03	1630.2
9299.49	1630.2	9317.41	1630.25	9321.41	1630.25	9325	1630.26	9330.75	1630.27
9366.02	1630.3	9392.52	1630.28	9412.89	1630.23	9429.88	1630.15	9432.89	1630.14
9436.12	1630.1	9439.71	1630.11	9458.87	1630	9477.83	1629.9	9496.5	1629.78
9509.78	1629.7	9520.16	1629.63	9561.55	1629.45	9581.96	1629.5	9588.92	1629.64
9597.38	1629.65	9620.37	1629.52	9642.07	1629.43	9661.45	1628.9	9670.89	1628.77
9699.65	1628.44	9713.93	1628.38	9718.49	1628.35	9751.34	1628.1	9761.16	1628.02
9762.05	1628.02	9770.31	1628	9771.55	1628	9826.39	1627.68	9857.07	1627.65
9875.16	1627.66	9892.02	1627.62	9910.83	1627.511	9931.69	1627.38	9945.69	1627.31
9964.87	1627.23	9973.29	1627.37	9973.77	1627.4	9973.96	1627.36	9979.65	1627.2
9983.13	1626.82	9987.1	1626.41	9991.11	1626.3	9999.05	1626.02	10001.74	1626.4
10008.56	1626.97	10009.34	1626.97	10025.29	1626.81	10028.12	1626.79	10029.93	1626.77
10032.4	1626.74	10066.44	1626.85	10069.03	1626.91	10069.68	1626.86	10111.36	1626.98
10135.22	1627.384	10152.86	1627.682	10168.73	1627.951	10170.87	1627.981	10171.02	1628
10171.08	1627.981	10197.75	1627.81	10210.18	1627.81	10211.57	1627.78	10215.5	1627.9
10223.26	1628	10223.75	1628	10224.61	1628.02	10227.92	1628.09	10230.88	1628.2
10237.34	1628.21	10246.53	1628.35	10310.69	1629.33	10331.5	1629.41	10363.43	1629.8
10386.11	1629.91	10403.29	1630	10429.84	1630.23	10448.67	1630.41	10475.36	1630.6
10480.22	1630.84	10494.31	1630.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9261.42	.033	9892.02	.042	10152.86	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.77	10135.22	502	518.67	533	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1628.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.038	0.042	0.037
W.S. Elev (ft)	1628.18	Reach Len. (ft)	502.00	518.67	533.00
Crit W.S. (ft)	1627.88	Flow Area (sq ft)	119.70	213.32	34.35
E.G. Slope (ft/ft)	0.005297	Area (sq ft)	119.70	213.32	34.35
Q Total (cfs)	950.00	Flow (cfs)	233.60	661.05	55.35
Top Width (ft)	489.16	Top Width (ft)	232.65	161.45	95.06
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.95	3.10	1.61
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)	0.51	1.32	0.36
Conv. Total (cfs)	13053.2	Conv. (cfs)	3209.7	9083.0	760.6
Length Wtd. (ft)	515.44	Wetted Per. (ft)	232.65	161.56	95.08
Min Ch El (ft)	1626.02	Shear (lb/sq ft)	0.17	0.44	0.12
Alpha	1.16	Stream Power (lb/ft s)	0.33	1.35	0.19
Frctn Loss (ft)	3.17	Cum Volume (acre-ft)	11.05	35.83	8.58
C & E Loss (ft)	0.00	Cum SA (acres)	20.77	25.79	14.68

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 OUTPUT Profile #2

E.G. Elev (ft)	1628.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.042	
W.S. Elev (ft)	1628.39	Reach Len. (ft)	502.00	518.67	533.00
Crit W.S. (ft)		Flow Area (sq ft)		248.12	
E.G. Slope (ft/ft)	0.006719	Area (sq ft)		248.12	
Q Total (cfs)	950.00	Flow (cfs)		950.00	
Top Width (ft)	161.45	Top Width (ft)		161.45	
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)		3.83	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)		1.54	
Conv. Total (cfs)	11589.4	Conv. (cfs)		11589.4	
Length Wtd. (ft)	518.67	Wetted Per. (ft)		163.56	
Min Ch El (ft)	1626.02	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)		2.44	

```
* Frctn Loss (ft)        *    3.10  * Cum Volume (acre-ft)   *    0.67  *   44.17  *          *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *    0.51  *   25.79  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9617.60   * 9973.77   *   233.60 *   119.70 *   232.65 *    24.59 *
0.51 *     1.95 *
* 2        * Chan      * 9973.77   * 10135.22  *   661.05 *   213.32 *   161.56 *    69.58 *
1.32 *     3.10 *
* 3        * ROB       * 10135.22  * 10314.76  *    55.35 *    34.35 *    95.08 *     5.83 *
0.36 *     1.61 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9973.77   * 10135.22  *   950.00 *   248.12 *   163.56 *   100.00 *
1.54 *     3.83 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 1.408

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9258.74  1627.5 9275.56  1627.8 9279.12 1627.26 9288.72 1627.37 9336.82 1627.28
 9379.03  1627.3 9396.91 1627.18 9459.61 1626.68 9480.02 1626.48 9538.33 1626.26
 9541.71  1626.2 9541.98 1626.24 9542.65 1626.24 9581.28    1626 9582.25    1626
 9587.03 1625.98 9592.37 1625.93 9603.76 1625.98 9605.98    1626 9612.72    1626
 9646.21 1626.14 9648.18 1626.15 9649.18  1626.1 9652.52 1626.08 9657.13 1626.01
 9657.86    1626 9663.13 1625.92 9682.46  1625.5 9694.81 1625.52 9722.78 1625.48
 9760.65 1625.69 9782.52 1625.46 9798.34  1624.9 9805.71 1624.88  9824.8 1624.76
 9833.62  1624.7 9837.26 1624.68 9878.39  1624.5 9883.641624.445 9914.95 1624.12
 9917.17 1624.11 9917.75 1624.11 9950.41 1624.03 9959.67    1624 9969.56 1623.99
 9977.23 1623.96 9982.72 1623.95 9985.08 1623.94 9987.96  1623.9 9991.79 1623.95
10048.09 1623.8810083.18 1623.7310112.29  1623.610127.06  1623.910131.62    1624
10139.69 1624.1710140.09 1624.1810140.14 1624.1710141.15    162410142.37 1623.77
10145.39 1623.2310146.56 1623.4210148.88    162410150.53  1624.310151.04 1624.37
10153.35 1624.3710156.74  1624.310158.09 1624.1210159.16    162410163.93 1623.43
10163.94 1623.4310167.08 1623.8210167.79 1623.87 10168.9    162410170.56 1624.17
10171.91 1624.3710186.341624.51310191.09 1624.5610239.26 1625.2710250.92  1625.4
10258.77 1625.5310263.46 1625.59 10268.4 1625.66   10277 1625.7710296.01    1626
 10303.7 1626.1310313.51 1626.2710333.04 1626.49 10350.6 1626.32 10361.2  1626.3
10378.27 1626.4610442.71 1626.9610481.66 1627.2110497.43 1627.3510498.68  1627.3
```

10501.04 1627.3210521.92 1626.910560.53 1626.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9258.74	.033	9878.39	.047	10186.34	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9959.67	10171.91	469	490.22	514	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1625.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.044	0.047	0.040
W.S. Elev (ft)	1625.01	Reach Len. (ft)	469.00	490.22	514.00
Crit W.S. (ft)	1624.67	Flow Area (sq ft)	93.90	242.89	17.41
E.G. Slope (ft/ft)	0.007212	Area (sq ft)	93.90	242.89	17.41
Q Total (cfs)	950.00	Flow (cfs)	207.75	712.79	29.46
Top Width (ft)	426.55	Top Width (ft)	164.49	212.24	49.82
Vel Total (ft/s)	2.68	Avg. Vel. (ft/s)	2.21	2.93	1.69
Max Chl Dpth (ft)	1.78	Hydr. Depth (ft)	0.57	1.14	0.35
Conv. Total (cfs)	11186.4	Conv. (cfs)	2446.3	8393.2	346.9
Length Wtd. (ft)	488.77	Wetted Per. (ft)	164.49	212.56	49.83
Min Ch El (ft)	1623.23	Shear (lb/sq ft)	0.26	0.51	0.16
Alpha	1.06	Stream Power (lb/ft s)	0.57	1.51	0.27
Frctn Loss (ft)	3.06	Cum Volume (acre-ft)	9.82	33.11	8.26
C & E Loss (ft)	0.00	Cum SA (acres)	18.48	23.56	13.79

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 OUTPUT Profile #2

E.G. Elev (ft)	1625.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.047	
W.S. Elev (ft)	1625.36	Reach Len. (ft)	469.00	490.22	514.00
Crit W.S. (ft)		Flow Area (sq ft)		317.20	
E.G. Slope (ft/ft)	0.005341	Area (sq ft)		317.20	
Q Total (cfs)	950.00	Flow (cfs)		950.00	
Top Width (ft)	212.24	Top Width (ft)		212.24	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	2.13	Hydr. Depth (ft)		1.49	
Conv. Total (cfs)	12999.7	Conv. (cfs)		12999.7	
Length Wtd. (ft)	490.22	Wetted Per. (ft)		214.91	
Min Ch El (ft)	1623.23	Shear (lb/sq ft)		0.49	
Alpha	1.00	Stream Power (lb/ft s)		1.47	
Frctn Loss (ft)	2.83	Cum Volume (acre-ft)	0.67	40.81	
C & E Loss (ft)	0.01	Cum SA (acres)	0.51	23.56	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9609.21	9959.67	207.75	93.90	164.49	21.87	0.57	2.21
2	Chan	9959.67	10171.91	712.79	242.89	212.56	75.03	1.14	2.93
3	ROB	10171.91	10366.22	29.46	17.41	49.83	3.10	0.35	1.69

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.

Profile #2

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)
* 1	* Chan	* 9959.67	* 10171.91	* 950.00	* 317.20	* 214.91	* 100.00	* 1.49	* 2.99

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.315

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9295.63	1625.2	9296.62	1625.15	9322.95	1624.88	9365.84	1624.5	9397.85	1624.19
9422.79	1623.93	9432.4	1623.84	9443.88	1623.73	9490.31	1623.63	9517.34	1623.6
9537.59	1623.56	9575.54	1623.34	9622.62	1623.3	9644.72	1623.34	9649.74	1623.3
9659.45	1623.25	9680.19	1623.11	9692.44	1623.22	9723.62	1623.43	9760.28	1623
9769.04	1622.78	9820.31	1622.39	9838.46	1622.25	9838.64	1622.25	9839.15	1622.2
9841.7	1622.21	9861.2	1621.97	9923.43	1621.212	9961.37	1620.75	9976.97	1620.7
10012.77	1620.43	10065.41	1620.33	10080.07	1620.33	10092.53	1620.48	10099.37	1620.6
10141.27	1621.18	10143.09	1620.54	10144.68	1619.96	10144.73	1619.91	0144.87	1619.97
10144.91	1619.98	10145.28	1620.04	10145.51	1620.11	0151.06	162	110159.22	1621.127
10167.12	1621.25	10195.29	1621.81	0201.55	1621.89	10209	162	210209.39	1622
10211.38	1622.04	10281.96	1622.93	10286.43	1622.99	10339.97	1623.34	10350.22	1623.4
10366.19	1623.36	10402.17	1623.06	10475.35	1623.19	10490.59	1623.27	10501.29	1623.3
10534.92	1623.12								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9295.63	.033	9923.43	.047	10167.12	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9976.97	10099.37	488	510.63	523	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1622.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.044	0.047	0.046
W.S. Elev (ft)	1621.96	Reach Len. (ft)	488.00	510.63	523.00
Crit W.S. (ft)		Flow Area (sq ft)	79.44	186.17	85.61
E.G. Slope (ft/ft)	0.005471	Area (sq ft)	79.44	186.17	85.61
Q Total (cfs)	950.00	Flow (cfs)	176.49	575.78	197.73
Top Width (ft)	344.36	Top Width (ft)	115.00	122.40	106.96
Vel Total (ft/s)	2.70	Avg. Vel. (ft/s)	2.22	3.09	2.31
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)	0.69	1.52	0.80
Conv. Total (cfs)	12843.3	Conv. (cfs)	2386.0	7784.1	2673.2
Length Wtd. (ft)	509.20	Wetted Per. (ft)	115.01	122.40	107.31
Min Ch El (ft)	1620.33	Shear (lb/sq ft)	0.24	0.52	0.27
Alpha	1.07	Stream Power (lb/ft s)	0.52	1.61	0.63
Frctn Loss (ft)	2.79	Cum Volume (acre-ft)	8.88	30.70	7.65
C & E Loss (ft)	0.00	Cum SA (acres)	16.97	21.68	12.87

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 OUTPUT Profile #2

E.G. Elev (ft)	1622.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.047	
W.S. Elev (ft)	1622.44	Reach Len. (ft)	488.00	510.63	523.00
Crit W.S. (ft)		Flow Area (sq ft)		244.30	
E.G. Slope (ft/ft)	0.006255	Area (sq ft)		244.30	
Q Total (cfs)	950.00	Flow (cfs)		950.00	
Top Width (ft)	122.40	Top Width (ft)		122.40	
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)		3.89	
Max Chl Dpth (ft)	2.11	Hydr. Depth (ft)		2.00	
Conv. Total (cfs)	12011.4	Conv. (cfs)		12011.4	
Length Wtd. (ft)	510.63	Wetted Per. (ft)		125.97	
Min Ch El (ft)	1620.33	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		2.95	
Frctn Loss (ft)	2.97	Cum Volume (acre-ft)	0.67	37.65	
C & E Loss (ft)	0.02	Cum SA (acres)	0.51	21.68	

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9636.30	9976.97	176.49	79.44	115.01	18.58	0.69	2.22
2 Chan	9976.97	10099.37	575.78	186.17	122.40	60.61	1.52	3.09
3 ROB	10099.37	10317.14	197.73	85.61	107.31	20.81	0.80	2.31

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9976.97	10099.37	950.00	244.30	125.97	100.00	2.00	3.89

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.218

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 990cfs.
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9087.34	1622	9099.58	1622.07	9101.83	1622.06	9113.7	1622	9116.8	1622
9203.05	1621.6	9225.04	1621.57	9256.02	1621.45	9281.98	1621.52	9324.53	1621.28

```
 9335.51  1621.2 9398.36 1620.62 9414.91  1620.5 9449.86 1620.33 9453.28  1620.3
 9490.87  1620.1 9495.96 1620.04 9496.75 1620.04 9506.22    1620 9506.33    1620
 9521.27 1619.97 9522.61 1619.96 9537.17 1619.91 9580.16  1619.8 9600.62 1619.62
 9605.63 1619.62 9611.65 1619.64 9612.18 1619.63 9619.97  1619.7 9633.75 1619.74
 9648.65 1619.91 9668.77 1619.93 9684.78    1620 9694.67    1620 9699.53 1620.08
 9700.63 1620.08 9701.07  1620.1 9707.49    1620 9708.32 1619.99 9710.53 1619.97
 9716.52  1619.9 9724.16  1619.8 9762.87 1619.38 9767.41 1619.25 9775.92 1619.18
  9824.1 1619.12 9826.55  1619.1 9881.741618.489  9907.9  1618.2 9927.34 1618.05
 9932.87    1618 9941.97  1617.9 9952.19 1617.84 9977.04 1617.6210035.98 1617.66
10054.97 1617.6510097.97    161810102.26    161810118.341618.12410119.14 1618.13
10124.02  1618.210126.66  1618.210150.82 1618.4610175.17 1618.7710195.06  1619.2
 10229.8  1619.610255.04  1619.610333.82 1619.53

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9087.34    .033 9881.74    .04710150.82    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.8710097.97               475   502.5     526             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1619.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.044  *   0.047  *   0.044  *
* W.S. Elev (ft)          * 1619.17  * Reach Len. (ft)         *  475.00  *  502.50  *  526.00  *
* Crit W.S. (ft)          * 1618.71  * Flow Area (sq ft)       *   70.09  *  236.92  *   68.63  *
* E.G. Slope (ft/ft)      *0.005477  * Area (sq ft)            *   70.09  *  236.92  *   68.63  *
* Q Total (cfs)           *  990.00  * Flow (cfs)              *  135.40  *  705.26  *  149.34  *
* Top Width (ft)          *  409.52  * Top Width (ft)          *  148.72  *  165.10  *   95.70  *
* Vel Total (ft/s)        *    2.64  * Avg. Vel. (ft/s)        *    1.93  *    2.98  *    2.18  *
* Max Chl Dpth (ft)       *    1.55  * Hydr. Depth (ft)        *    0.47  *    1.44  *    0.72  *
* Conv. Total (cfs)       * 13376.8  * Conv. (cfs)             *  1829.5  *  9529.4  *  2017.9  *
* Length Wtd. (ft)        *  501.95  * Wetted Per. (ft)        *  148.73  *  165.10  *   95.70  *
* Min Ch El (ft)          * 1617.62  * Shear (lb/sq ft)        *    0.16  *    0.49  *    0.25  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    0.31  *    1.46  *    0.53  *
* Frctn Loss (ft)         *    2.69  * Cum Volume (acre-ft)    *    8.05  *   28.22  *    6.73  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   15.50  *   20.00  *   11.65  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1619.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *          *   0.047  *          *
* W.S. Elev (ft)          * 1619.51  * Reach Len. (ft)         *  475.00  *  502.50  *  526.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  293.15  *          *
* E.G. Slope (ft/ft)      *0.005437  * Area (sq ft)            *          *  293.15  *          *
* Q Total (cfs)           *  990.00  * Flow (cfs)              *          *  990.00  *          *
* Top Width (ft)          *  165.10  * Top Width (ft)          *          *  165.10  *          *
* Vel Total (ft/s)        *    3.38  * Avg. Vel. (ft/s)        *          *    3.38  *          *
* Max Chl Dpth (ft)       *    1.89  * Hydr. Depth (ft)        *          *    1.78  *          *
* Conv. Total (cfs)       * 13426.4  * Conv. (cfs)             *          * 13426.4  *          *
* Length Wtd. (ft)        *  502.50  * Wetted Per. (ft)        *          *  168.12  *          *
* Min Ch El (ft)          * 1617.62  * Shear (lb/sq ft)        *          *    0.59  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.00  *          *
* Frctn Loss (ft)         *    2.79  * Cum Volume (acre-ft)    *    0.67  *   34.50  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.51  *   20.00  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9510.11    * 9932.87    *   135.40 *    70.09 *   148.73 *    13.68 *
0.47 *     1.93 *
* 2         * Chan      * 9932.87    * 10097.97   *   705.26 *   236.92 *   165.10 *    71.24 *
1.44 *     2.98 *
* 3         * ROB       * 10097.97   * 10215.89   *   149.34 *    68.63 *    95.70 *    15.08 *
0.72 *     2.18 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta   * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9932.87    * 10097.97   *   990.00 *   293.15 *   168.12 *   100.00 *
1.78 *     3.38 *
*****************************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 1.123

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9189.63  1620.1 9196.94 1620.23 9206.85 1620.26 9209.38 1620.19 9214.39    1620
 9220.96  1619.8 9226.94 1619.67 9228.11 1619.65 9238.46  1619.4 9267.54 1619.25
 9299.39  1619.2 9323.45 1619.02  9358.8 1618.69 9381.01  1618.9 9383.36 1618.92
 9386.71  1618.9  9392.8 1618.87 9455.33  1618.4 9462.86 1618.45 9472.63 1618.23
  9481.9  1618.1 9487.77    1618 9505.62 1617.82 9560.85 1617.07 9577.87  1616.9
 9636.04 1616.43 9673.11 1616.29 9691.06 1616.15 9745.21 1616.16 9751.91  1616.4
 9791.24 1616.26 9805.74  1616.1 9813.75    1616 9814.65 1615.99 9816.37    1616
 9826.98 1615.98 9827.17 1615.98 9832.62 1615.99  9834.5 1615.99 9876.731615.435
 9886.97  1615.3 9923.34 1614.92 9967.89 1615.05 9990.53 1615.1210012.66 1615.18
10059.62  1615.310068.72 1615.3210071.35 1615.3210086.29 1615.5210103.511615.745
10122.98    161610127.43  1616.110137.67 1616.1610142.68  1616.210146.87 1616.32
10152.42 1616.2510208.08  1616.310213.88 1616.29   10237 1616.4710237.32 1616.47
10238.82 1616.4910247.59  1616.710297.31 1616.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9189.63    .033 9876.73    .04710103.51    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9876.7310068.72              509  496.42     486             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1616.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.033  *   0.047  *   0.041  *
* W.S. Elev (ft)         * 1616.49  * Reach Len. (ft)         *  509.00  *  496.42  *  486.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   86.36  *  259.16  *   70.40  *
* E.G. Slope (ft/ft)     *0.005245  * Area (sq ft)            *   86.36  *  259.16  *   70.40  *
* Q Total (cfs)          *  990.00  * Flow (cfs)              *  139.46  *  724.75  *  125.79  *
* Top Width (ft)         *  609.71  * Top Width (ft)          *  247.81  *  191.99  *  169.92  *
```

* Vel Total (ft/s)	*	2.38	* Avg. Vel. (ft/s)	*	1.61	*	2.80	*	1.79	*
* Max Chl Dpth (ft)	*	1.57	* Hydr. Depth (ft)	*	0.35	*	1.35	*	0.41	*
* Conv. Total (cfs)	*	13669.5	* Conv. (cfs)	*	1925.6	*	10007.1	*	1736.8	*
* Length Wtd. (ft)	*	497.12	* Wetted Per. (ft)	*	247.82	*	191.99	*	169.93	*
* Min Ch El (ft)	*	1614.92	* Shear (lb/sq ft)	*	0.11	*	0.44	*	0.14	*
* Alpha	*	1.15	* Stream Power (lb/ft s)	*	0.18	*	1.24	*	0.24	*
* Frctn Loss (ft)	*	2.93	* Cum Volume (acre-ft)	*	7.19	*	25.36	*	5.89	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	13.33	*	17.94	*	10.05	*

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.

CROSS SECTION OUTPUT Profile #2

* E.G. Elev (ft)	*	1616.90	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.16	* Wt. n-Val.	*		*	0.047	*		*
* W.S. Elev (ft)	*	1616.74	* Reach Len. (ft)	*	509.00	*	496.42	*	486.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*		*	306.73	*		*
* E.G. Slope (ft/ft)	*	0.005686	* Area (sq ft)	*		*	306.73	*		*
* Q Total (cfs)	*	990.00	* Flow (cfs)	*		*	990.00	*		*
* Top Width (ft)	*	191.99	* Top Width (ft)	*		*	191.99	*		*
* Vel Total (ft/s)	*	3.23	* Avg. Vel. (ft/s)	*		*	3.23	*		*
* Max Chl Dpth (ft)	*	1.82	* Hydr. Depth (ft)	*		*	1.60	*		*
* Conv. Total (cfs)	*	13129.1	* Conv. (cfs)	*		*	13129.1	*		*
* Length Wtd. (ft)	*	496.42	* Wetted Per. (ft)	*		*	194.71	*		*
* Min Ch El (ft)	*	1614.92	* Shear (lb/sq ft)	*		*	0.56	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	1.80	*		*
* Frctn Loss (ft)	*	2.92	* Cum Volume (acre-ft)	*	0.67	*	31.04	*		*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.51	*	17.94	*		*

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.

Profile #1

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)	*
* 1	* LOB	* 9533.18	* 9876.73	* 139.46	* 86.36	* 247.82	* 14.09	* 0.35	* 1.61	*
* 2	* Chan	* 9876.73	* 10068.72	* 724.75	* 259.16	* 191.99	* 73.21	* 1.35	* 2.80	*
* 3	* ROB	* 10068.72	* 10183.01	* 117.93	* 61.79	* 114.30	* 11.91	* 0.54	* 1.91	*
* 4	* ROB	* 10183.01	* 10297.31	* 7.85	* 8.60	* 55.62	* 0.79	* 0.15	* 0.91	*

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.

Profile #2

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)	*
* 1	* Chan	* 9876.73	* 10068.72	* 990.00	* 306.73	* 194.71	* 100.00	* 1.60	* 3.23	*

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: T4N-R3W-S08W
REACH: REACH-1 RS: 1.029

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9419.79	1616	9419.97	1616	9435.65	1615.78	9451.16	1615.64	9468.02	1615.5
9480.74	1615.53	9498.95	1615.53	9507.5	1615.4	9522.12	1615.17	9535.23	1615
9561.07	1614.6	9571.82	1614.52	9591.29	1614.47	9644.94	1614.04	9650.3	1614
9653.5	1613.98	9654.63	1613.97	9656.05	1613.97	9661.52	1614	9678.94	1613.87
9685.45	1613.84	9696.39	1613.72	9727.25	1613.52	9768.97	1613.2	9818.39	1613.05
9835.31	1612.95	9846.7	1612.81	9849.34	1612.77	9851.87	1612.8	9854	1612.75
9880.69	1612.589	9925.06	1612.32	9935.7	1612.22	9937.43	1612.22	9961.54	1612.1
9987.03	1612	9988.96	1611.99	9992.61	1611.98	10000.32	1611.94	10005.74	1612
10007.38	1612	10057.36	1612.41	10070.83	1612.53	10089.24	1612.74	10103.56	1612.92
10164.37	1613.71	10177.34	1613.83	10222	1613.91	10231.35	1613.94	10243.69	1613.95
10253.72	1614	10264.27	1614	10266.87	1614.01	10270	1614	10278.79	1614.04
10283.96	1614.05	10287.33	1614.05	10288.07	1614.06	10290.27	1614	10300.52	1614.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9419.79	.033	9851.87	.047	10089.24	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9880.69	10070.83	538	502.12	469	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1613.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.038	0.047	0.039
W.S. Elev (ft)	1613.53	Reach Len. (ft)	538.00	502.12	469.00
Crit W.S. (ft)	1613.18	Flow Area (sq ft)	71.92	246.35	40.87
E.G. Slope (ft/ft)	0.006653	Area (sq ft)	71.92	246.35	40.87
Q Total (cfs)	990.00	Flow (cfs)	147.45	754.99	87.56
Top Width (ft)	425.44	Top Width (ft)	155.00	190.14	80.30
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	2.05	3.06	2.14
Max Chl Dpth (ft)	1.59	Hydr. Depth (ft)	0.46	1.30	0.51
Conv. Total (cfs)	12137.5	Conv. (cfs)	1807.8	9256.2	1073.5
Length Wtd. (ft)	504.65	Wetted Per. (ft)	155.01	190.14	80.31
Min Ch El (ft)	1611.94	Shear (lb/sq ft)	0.19	0.54	0.21
Alpha	1.08	Stream Power (lb/ft s)	0.40	1.65	0.45
Frctn Loss (ft)	2.99	Cum Volume (acre-ft)	6.27	22.48	5.27
C & E Loss (ft)	0.01	Cum SA (acres)	10.98	15.76	8.65

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1613.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.047	
W.S. Elev (ft)	1613.81	Reach Len. (ft)	538.00	502.12	469.00
Crit W.S. (ft)		Flow Area (sq ft)		299.23	
E.G. Slope (ft/ft)	0.006088	Area (sq ft)		299.23	
Q Total (cfs)	990.00	Flow (cfs)		990.00	
Top Width (ft)	190.14	Top Width (ft)		190.14	
Vel Total (ft/s)	3.31	Avg. Vel. (ft/s)		3.31	
Max Chl Dpth (ft)	1.87	Hydr. Depth (ft)		1.57	
Conv. Total (cfs)	12688.0	Conv. (cfs)		12688.0	
Length Wtd. (ft)	502.12	Wetted Per. (ft)		192.64	
Min Ch El (ft)	1611.94	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		1.95	
Frctn Loss (ft)	3.02	Cum Volume (acre-ft)	0.67	27.59	
C & E Loss (ft)	0.00	Cum SA (acres)	0.51	15.76	

```
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9650.24   * 9880.69   *   147.45 *    71.92 *   155.01 *    14.89 *
0.46 *     2.05 *
* 2         * Chan      * 9880.69   * 10070.83  *   754.99 *   246.35 *   190.14 *    76.26 *
1.30 *     3.06 *
* 3         * ROB       * 10070.83  * 10185.67  *    87.56 *    40.87 *    80.31 *     8.84 *
0.51 *     2.14 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9880.69   * 10070.83  *   990.00 *   299.23 *   192.64 *   100.00 *
1.57 *     3.31 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.934

INPUT
Description: Interpolated point added at (10081.51, 1609.429) to set bank
             station.
Station Elevation Data     num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9519.86  1612.5 9553.46 1612.57 9565.21 1612.67  9579.6 1612.47 9583.21 1612.43
 9591.27  1612.3 9605.48 1612.14 9609.24  1612.1 9615.36    1612 9631.95 1611.77
  9651.8  1611.5 9676.64 1611.19 9678.38 1611.16 9697.66 1610.95 9724.75 1610.65
 9757.61  1610.3 9768.24 1610.26 9806.21    1610  9807.4 1609.99 9807.62 1609.99
 9820.69  1609.9 9841.75 1609.77 9856.16 1609.67 9867.81 1609.56 9880.971609.452
 9884.89 1609.42  9953.2    1609 9961.72 1609.19 9964.37  1609.2 9970.74 1609.26
 9986.23 1609.57 9986.83  1609.5 9990.72 1608.84 9996.91 1609.27 9998.55 1609.36
 9998.93  1609.410024.44  1609.410049.47 1608.98 10065.3  1609.210081.511609.429
10100.61  1609.710125.35 1609.9310127.76  1609.910132.56    161010132.79    1610
10134.88 1610.0210143.251610.11910151.87 1610.2210176.95  1610.5 10186.4 1610.61
10204.34 1610.7910223.18 1610.8810289.38 1611.2510330.57  1611.510333.29 1611.45
10339.86 1611.44

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9519.86    .033 9820.69    .04710125.35    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9884.8910081.51              516  534.27     517             .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1610.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.043	0.047	0.043
W.S. Elev (ft)	1610.56	Reach Len. (ft)	516.00	534.27	517.00
Crit W.S. (ft)	1610.12	Flow Area (sq ft)	87.18	258.68	55.33
E.G. Slope (ft/ft)	0.005313	Area (sq ft)	87.18	258.68	55.33
Q Total (cfs)	990.00	Flow (cfs)	169.70	715.51	104.80
Top Width (ft)	447.97	Top Width (ft)	151.20	196.62	100.15
Vel Total (ft/s)	2.47	Avg. Vel. (ft/s)	1.95	2.77	1.89
Max Chl Dpth (ft)	1.71	Hydr. Depth (ft)	0.58	1.32	0.55
Conv. Total (cfs)	13581.8	Conv. (cfs)	2328.1	9816.0	1437.7
Length Wtd. (ft)	528.37	Wetted Per. (ft)	151.20	196.71	100.16
Min Ch El (ft)	1608.84	Shear (lb/sq ft)	0.19	0.44	0.18
Alpha	1.08	Stream Power (lb/ft s)	0.37	1.21	0.35
Frctn Loss (ft)	3.30	Cum Volume (acre-ft)	5.28	19.57	4.75
C & E Loss (ft)	0.00	Cum SA (acres)	9.09	13.53	7.68

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 OUTPUT Profile #2

E.G. Elev (ft)	1610.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.047	
W.S. Elev (ft)	1610.79	Reach Len. (ft)	516.00	534.27	517.00
Crit W.S. (ft)	1610.16	Flow Area (sq ft)		305.36	
E.G. Slope (ft/ft)	0.005960	Area (sq ft)		305.36	
Q Total (cfs)	990.00	Flow (cfs)		990.00	
Top Width (ft)	196.62	Top Width (ft)		196.62	
Vel Total (ft/s)	3.24	Avg. Vel. (ft/s)		3.24	
Max Chl Dpth (ft)	1.95	Hydr. Depth (ft)		1.55	
Conv. Total (cfs)	12824.1	Conv. (cfs)		12824.1	
Length Wtd. (ft)	532.92	Wetted Per. (ft)		199.45	
Min Ch El (ft)	1608.84	Shear (lb/sq ft)		0.57	
Alpha	1.00	Stream Power (lb/ft s)		1.85	
Frctn Loss (ft)	3.19	Cum Volume (acre-ft)	0.67	24.10	
C & E Loss (ft)	0.01	Cum SA (acres)	0.51	13.53	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9702.38	9884.89	169.70	87.18	151.20	17.14	0.58	1.95
2	Chan	9884.89	10081.51	715.51	258.68	196.71	72.27	1.32	2.77
3	ROB	10081.51	10210.69	104.80	55.33	100.16	10.59	0.55	1.89

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)

```
* 1          * Chan       * 9884.89    * 10081.51  *    990.00 *    305.36 *    199.45 *    100.00 *
1.55 *      3.24 *
*****************************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1             RS: 0.833

INPUT
Description: Interpolated point added at (10101.21, 1606.339) to set bank
             station.
Station Elevation Data     num=       76
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************************
 9343.39   1609.6 9362.86 1609.78 9363.56 1609.79 9364.33 1609.79 9364.46   1609.8
 9367.08   1609.8 9411.06  1609.9 9432.47 1609.78 9434.94  1609.8 9438.98   1609.8
 9462.17 1609.23     9472 1608.96 9510.05  1608.4 9511.27 1608.39 9511.61   1608.4
 9511.85 1608.39 9512.89 1608.38 9561.36 1608.17 9599.53 1608.01 9601.65     1608
 9601.78     1608 9611.66 1607.95     9612 1607.95 9705.69  1607.3 9715.42 1607.27
 9769.28 1607.08 9807.57 1606.76 9813.89  1606.8 9859.15  1606.6 9891.68 1606.45
  9892.51606.445 9899.18  1606.4 9899.83 1606.39 9948.08 1606.32 9949.02   1606.3
 9967.61 1606.12 9992.08 1605.91 9994.24  1605.5 9997.48 1605.0710003.09 1605.93
10003.18 1605.9610003.36    160610003.48    160610003.94 1606.0910005.17 1606.07
10006.72 1606.0810009.01 1606.0710013.39    160610016.83    160610020.79 1605.97
10032.13 1605.8710033.14 1605.8710038.06  1605.910053.67    160610055.27     1606
 10062.2 1606.0310077.15 1606.1410079.11  1606.110081.39 1606.1710083.82 1606.18
10101.211606.33910128.55 1606.5910129.721606.59810184.39 1606.9610232.81   1607.3
10258.02 1607.54 10294.7    160810303.12    160810327.02  1608.210340.98 1608.28
10346.05 1608.3210355.75 1608.3910432.53 1608.9710442.34    1609    10457   1609.1
 10475.9 1609.21

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9343.39     .03 9948.08    .04210101.21    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.0810101.21              508  564.81     507            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)          * 1607.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.030  *   0.042  *   0.042  *
* W.S. Elev (ft)          * 1607.21  * Reach Len. (ft)         *  508.00  *  564.81  *  507.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  108.17  *  180.75  *   48.52  *
* E.G. Slope (ft/ft)      *0.007432  * Area (sq ft)            *  108.17  *  180.75  *   48.52  *
* Q Total (cfs)-          *  990.00  * Flow (cfs)              *  292.89  *  615.31  *   81.80  *
* Top Width (ft)          *  485.41  * Top Width (ft)          *  214.22  *  153.13  *  118.06  *
* Vel Total (ft/s)        *    2.93  * Avg. Vel. (ft/s)        *    2.71  *    3.40  *    1.69  *
* Max Chl Dpth (ft)       *    2.14  * Hydr. Depth (ft)        *    0.50  *    1.18  *    0.41  *
* Conv. Total (cfs)       * 11483.4  * Conv. (cfs)             *  3397.4  *  7137.2  *   948.8  *
* Length Wtd. (ft)        *  542.75  * Wetted Per. (ft)        *  214.23  *  153.29  *  118.06  *
* Min Ch El (ft)          * 1605.07  * Shear (lb/sq ft)        *    0.23  *    0.55  *    0.19  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)  *    0.63  *    1.86  *    0.32  *
* Frctn Loss (ft)         *    3.29  * Cum Volume (acre-ft)    *    4.13  *   16.87  *    4.13  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    6.92  *   11.39  *    6.38  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1607.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *   0.030  *   0.042  *          *
```

W.S. Elev (ft)	1607.55	Reach Len. (ft)	508.00	564.81	507.00	
Crit W.S. (ft)		Flow Area (sq ft)	34.52	233.42		
E.G. Slope (ft/ft)	0.006018	Area (sq ft)	34.52	233.42		
Q Total (cfs)	990.00	Flow (cfs)	146.44	843.56		
Top Width (ft)	181.70	Top Width (ft)	28.57	153.13		
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)	4.24	3.61		
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)	1.21	1.52		
Conv. Total (cfs)	12761.2	Conv. (cfs)	1887.7	10873.5		
Length Wtd. (ft)	560.61	Wetted Per. (ft)	29.76	154.50		
Min Ch El (ft)	1605.07	Shear (lb/sq ft)	0.44	0.57		
Alpha	1.01	Stream Power (lb/ft s)	1.85	2.05		
Frctn Loss (ft)	3.23	Cum Volume (acre-ft)	0.46	20.80		
C & E Loss (ft)	0.00	Cum SA (acres)	0.34	11.39		

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9645.73	9948.08	292.89	108.17	214.23	29.59	0.50	2.71
2	Chan	9948.08	10101.21	615.31	180.75	153.29	62.15	1.18	3.40
3	ROB	10101.21	10288.55	81.80	48.52	118.06	8.26	0.41	1.69

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9645.73	9948.08	146.44	34.52	29.76	14.79	1.21	4.24
2	Chan	9948.08	10101.21	843.56	233.42	154.50	85.21	1.52	3.61

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: T4N-R3W-S08W
REACH: REACH-1 RS: 0.726

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9363.12	1606.2	9365.41	1606.18	9367.01	1606.17	9401.86	1606.09	9406.68	1606.07
9408.42	1606.1	9410.25	1606.07	9410.62	1606.05	9416.66	1606	9417.54	1605.99
9418.09	1606	9421.76	1605.96	9424.92	1605.92	9460.82	1605.57	9485.08	1605.33
9490.08	1605.3	9502.45	1605.26	9544.08	1605.01	9579.74	1604.78	9584.08	1604.75
9598.46	1604.7	9604.42	1604.38	9612.54	1604.11	9625.49	1604.06	9632.42	1604
9633.53	1604	9643.36	1603.9	9643.71	1603.9	9644.25	1603.89	9680.78	1603.85

```
 9705.25  1603.8 9706.62 1603.81 9720.72 1603.95 9725.55    1604 9730.16    1604
 9742.45 1604.19 9742.88  1604.2 9742.88 1604.18 9745.08 1604.54    9755 1606.02
  9755.3 1606.07 9755.36  1606.1 9755.64    1606 9758.01 1605.51 9765.43    1604
 9765.63 1603.98 9765.76    1604 9769.58 1603.97 9776.64 1603.75 9777.78 1603.72
 9778.09 1603.71 9805.88  1603.3 9839.71 1602.82  9849.5 1602.91 9860.79 1602.85
 9888.49 1602.71 9890.05  1602.7 9892.78 1602.37 9894.95 1602.01 9894.96 1602.03
 9898.38 1602.44 9900.41  1602.7 9904.32 1602.76 9921.71 1602.85 9938.59 1602.77
 9958.96 1602.53 9972.111602.685 9990.38  1602.9 9992.84 1602.85 9993.37 1602.77
 9997.83 1602.01 9997.88    1602 9997.91    1602 9999.28  1601.8 9999.51 1601.77
 9999.59 1601.7910000.29    160210003.17 1602.6410014.78 1602.8210019.251602.941
10030.32 1603.2410046.25  1603.210071.22 1603.0910132.37 1603.4210149.42 1603.54
10172.43 1603.8810180.79    160410213.68 1604.5110230.79 1604.7610277.67 1605.37
10305.95 1605.8110330.07  1605.910339.75 1605.9210370.87    160610379.29    1606
 10381.3 1606.0110381.51    160610387.04    1606

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
 9363.12     .03  9849.5    .04210019.25     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9849.510019.25              423  524.94     491             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1604.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.030  *   0.042  *   0.030  *
* W.S. Elev (ft)          * 1603.94  * Reach Len. (ft)         *  423.00  *  524.94  *  491.00  *
* Crit W.S. (ft)          * 1603.59  * Flow Area (sq ft)       *   59.49  *  208.91  *   95.58  *
* E.G. Slope (ft/ft)      *0.005034  * Area (sq ft)            *   59.49  *  208.91  *   95.58  *
* Q Total (cfs)           *  990.00  * Flow (cfs)              *  147.52  *  601.48  *  241.00  *
* Top Width (ft)          *  485.79  * Top Width (ft)          *  158.81  *  169.75  *  157.23  *
* Vel Total (ft/s)        *    2.72  * Avg. Vel. (ft/s)        *    2.48  *    2.88  *    2.52  *
* Max Chl Dpth (ft)       *    2.17  * Hydr. Depth (ft)        *    0.37  *    1.23  *    0.61  *
* Conv. Total (cfs)       * 13953.9  * Conv. (cfs)             *  2079.2  *  8477.8  *  3396.9  *
* Length Wtd. (ft)        *  506.21  * Wetted Per. (ft)        *  158.82  *  170.05  *  157.24  *
* Min Ch El (ft)          * 1601.77  * Shear (lb/sq ft)        *    0.12  *    0.39  *    0.19  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.29  *    1.11  *    0.48  *
* Frctn Loss (ft)         *    2.90  * Cum Volume (acre-ft)    *    3.15  *   14.35  *    3.30  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    4.75  *    9.29  *    4.78  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1604.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)          * 1604.33  * Reach Len. (ft)         *  423.00  *  524.94  *  491.00  *
* Crit W.S. (ft)          * 1603.72  * Flow Area (sq ft)       *          *  275.82  *          *
* E.G. Slope (ft/ft)      *0.005521  * Area (sq ft)            *          *  275.82  *          *
* Q Total (cfs)           *  990.00  * Flow (cfs)              *          *  990.00  *          *
* Top Width (ft)          *  169.75  * Top Width (ft)          *          *  169.75  *          *
* Vel Total (ft/s)        *    3.59  * Avg. Vel. (ft/s)        *          *    3.59  *          *
* Max Chl Dpth (ft)       *    2.56  * Hydr. Depth (ft)        *          *    1.62  *          *
* Conv. Total (cfs)       * 13324.2  * Conv. (cfs)             *          * 13324.2  *          *
* Length Wtd. (ft)        *  524.94  * Wetted Per. (ft)        *          *  172.87  *          *
* Min Ch El (ft)          * 1601.77  * Shear (lb/sq ft)        *          *    0.55  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.97  *          *
* Frctn Loss (ft)         *    3.10  * Cum Volume (acre-ft)    *    0.26  *   17.50  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.17  *    9.29  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9606.31   * 9849.50   *   147.52 *    59.49 *   158.82 *    14.90 *
0.37 *     2.48 *
* 2         * Chan      * 9849.50   * 10019.25  *   601.48 *   208.91 *   170.05 *    60.76 *
1.23 *     2.88 *
* 3         * ROB       * 10019.25  * 10203.14  *   241.00 *    95.58 *   157.24 *    24.34 *
0.61 *     2.52 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9849.50   * 10019.25  *   990.00 *   275.82 *   172.87 *   100.00 *
1.62 *     3.59 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.626

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,030cfs.
Blocked obstruction(s) added to represent
             residential home(s) as of aerial photography date; n-values are
             not adjusted to account for the house(s), only the houses in or
             near the floodplain were accounted for and some house(s) were
             projected to the nearest cross-section.  The area available for
             flood flows in between houses was considered and, for example,
             that may have resulted in one house per cross-section.  Therefore,
             not
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9401.71  1603.5 9417.73  1603.6 9462.18 1603.52 9489.45 1603.57 9510.05 1603.44
 9522.75  1603.4    9558  1603.2 9559.19 1603.19 9579.13 1602.66 9600.78 1602.39
 9619.32  1602.2 9631.51    1602 9633.34    1602 9666.37 1601.58 9668.41 1601.56
 9671.47  1601.5 9702.91 1601.12 9710.74 1601.03 9743.91 1600.81 9775.04 1600.57
 9792.55  1600.3 9809.16 1600.14 9825.03    1600 9835.511599.904 9859.15 1599.69
    9884  1599.8 9913.94 1599.88  9921.5 1599.89 9934.26 1599.87 9937.76 1599.86
 9972.05  1599.8 9976.74 1599.79 9988.51 1599.8310008.47 1599.7310035.98  1599.7
10041.95  1599.710053.92 1599.8910056.84    160010058.95    160010065.39 1600.12
10071.46  1600.210074.26 1600.2310081.39 1600.2810092.98 1600.2810096.65  1600.5
10102.94 1600.28 10107.4 1600.28 10109.6 1600.2810111.66 1600.4910112.79 1600.51
10114.84  1600.410120.37 1600.4110122.71 1600.3510127.29 1600.3810128.29 1600.63
10128.99  1600.810189.28 1601.3510201.53 1601.4410211.46 1601.5210238.38 1601.73
10258.38  1601.910259.43 1601.9410260.83 1601.9610265.25    160210269.04 1602.04
10294.82  1602.2 10307.7 1602.1510319.38 1602.2210328.66 1602.1110354.21 1602.11
 10370.2  1602.110377.53 1602.05 10384.1 1602.0610388.82 1602.0510389.96 1602.05
10399.58    160210407.32 1602.0310411.79 1602.0310419.05 1602.0410428.63 1602.08
10435.68  1602.110440.45 1602.0710451.12 1602.0710456.03 1602.0610459.22  1602.1
 10460.1 1602.0410463.64    160210466.12 1601.99 10471.8  1601.910476.58  1601.8
10480.67 1601.8110487.62 1601.7610506.01 1601.8110506.55 1601.8210506.84  1601.8
```

```
10514.11    160210517.57 1602.0710523.02  1602.210525.81 1602.15

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9401.71    .033 9792.55    .04710081.39    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9835.5110053.92              556  543.51     457            .1        .3
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
************************
 9733.32 9792.93  1612.5

CROSS SECTION OUTPUT  Profile #1
*************************************************************************************************
* E.G. Elev (ft)          * 1601.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.047  *   0.047  *   0.039  *
* W.S. Elev (ft)          * 1601.03  * Reach Len. (ft)         *  556.00  *  543.51  *  457.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   41.66  *  270.13  *   59.91  *
* E.G. Slope (ft/ft)      *0.006529  * Area (sq ft)            *   41.66  *  270.13  *   59.91  *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *   97.57  *  795.09  *  137.35  *
* Top Width (ft)          *  384.62  * Top Width (ft)           *   65.50  *  218.41  *  100.71  *
* Vel Total (ft/s)        *    2.77  * Avg. Vel. (ft/s)         *    2.34  *    2.94  *    2.29  *
* Max Chl Dpth (ft)       *    1.34  * Hydr. Depth (ft)         *    0.64  *    1.24  *    0.59  *
* Conv. Total (cfs)       * 12747.1  * Conv. (cfs)              *  1207.5  *  9839.8  *  1699.8  *
* Length Wtd. (ft)        *  534.51  * Wetted Per. (ft)         *   66.39  *  218.41  *  100.79  *
* Min Ch El (ft)          * 1599.69  * Shear (lb/sq ft)         *    0.26  *    0.50  *    0.24  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *    0.60  *    1.48  *    0.56  *
* Frctn Loss (ft)         *    4.23  * Cum Volume (acre-ft)     *    2.66  *   11.46  *    2.42  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    3.66  *    6.95  *    3.33  *
*************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*************************************************************************************************
* E.G. Elev (ft)          * 1601.43  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *          *   0.047  *          *
* W.S. Elev (ft)          * 1601.26  * Reach Len. (ft)         *  556.00  *  543.51  *  457.00  *
* Crit W.S. (ft)          * 1600.68  * Flow Area (sq ft)       *          *  320.41  *          *
* E.G. Slope (ft/ft)      *0.006306  * Area (sq ft)            *          *  320.41  *          *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *          * 1030.00  *          *
* Top Width (ft)          *  218.41  * Top Width (ft)           *          *  218.41  *          *
* Vel Total (ft/s)        *    3.21  * Avg. Vel. (ft/s)         *          *    3.21  *          *
* Max Chl Dpth (ft)       *    1.57  * Hydr. Depth (ft)         *          *    1.47  *          *
* Conv. Total (cfs)       * 12970.3  * Conv. (cfs)              *          * 12970.3  *          *
* Length Wtd. (ft)        *  543.51  * Wetted Per. (ft)         *          *  221.15  *          *
* Min Ch El (ft)          * 1599.69  * Shear (lb/sq ft)         *          *    0.57  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    1.83  *          *
* Frctn Loss (ft)         *    3.91  * Cum Volume (acre-ft)     *    0.26  *   13.90  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.17  *    6.95  *          *
*************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9618.61   * 9835.51   *    97.57 *    41.66 *    66.39 *     9.47 *
0.64 *     2.34 *
* 2         * Chan      * 9835.51   * 10053.92  *   795.09 *   270.13 *   218.41 *    77.19 *
1.24 *     2.94 *
```

```
* 3          * ROB       * 10053.92  * 10289.87  *   137.35 *    59.91 *   100.79 *    13.33 *
0.59 *     2.29 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9835.51   * 10053.92  *  1030.00 *   320.41 *   221.15 *   100.00 *
1.47 *     3.21 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.523

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as
             of aerial photography date; n-values are not adjusted to account
             for the house(s), only the houses in or near the floodplain were
             accounted for and some house(s) were projected to the nearest
             cross-section.  The area available for flood flows in between
             houses was considered and, for example, that may have resulted in
             one house per cross-section.  Therefore, not all of the houses

The floodplain was mapped to the East edge of the obstruction.
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9598.14  1598.6 9602.27 1598.65 9604.04 1598.64 9611.78 1598.63 9624.87 1598.69
 9628.69  1598.6 9632.44 1598.57 9651.25 1598.35 9660.48 1598.41 9673.41 1598.62
 9673.99  1598.6 9696.74 1597.99 9698.15 1597.95 9708.92  1597.8 9725.34  1597.6
  9733.2 1597.71 9740.37 1597.84 9752.42 1597.56 9766.73  1597.4  9776.8  1597.5
 9799.23  1596.9 9809.97 1596.61 9818.45 1596.48 9841.87 1596.23 9852.31  1596.1
 9865.01     1596  9865.2    1596 9867.99 1595.97 9869.24 1595.99  9872.3 1596.03
 9878.31 1596.12  9879.7  1596.1 9883.22  1596.1 9888.54    1596 9890.97 1595.97
 9895.08 1595.91 9899.96 1595.86 9903.02  1595.8 9903.73 1595.82 9906.18 1595.77
  9912.9 1595.62 9921.71 1595.67 9929.47  1595.7 9937.87 1595.82 9942.58 1595.87
  9942.7 1595.87 9945.88  1595.7 9953.13 1595.56 9955.69 1595.52 9958.28 1595.48
 9979.97 1595.45 9989.85  1595.510009.73 1595.4910034.96 1595.6410036.14  1595.6
10036.76 1595.6410039.09 1595.6310070.75 1595.5610084.77 1595.6610099.73  1595.6
10100.86 1595.5910104.22 1595.6510111.98 1595.8210112.041595.821 10119.5    1596
10122.66    159610130.96 1596.1310135.58 1596.1910151.72 1596.6510172.48  1596.9
 10176.2 1596.8110176.46 1596.8110179.57 1596.7910194.65 1596.8310201.48  1596.8
10224.12 1596.7510229.55 1596.8810232.07 1596.97 10239.1 1597.0810259.95  1597.5
10265.82 1597.51 10280.6 1597.6710296.67 1597.8910302.03 1597.9510302.88  1597.9
 10305.4    159810305.83 1598.0110332.74 1598.4810336.98 1598.5810343.24  1598.6
10364.37 1598.9410366.33 1598.9610383.35 1598.8810392.47 1598.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9598.14     .03 9942.58    .04210084.77    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9942.5810084.77              554  563.26     558             .1        .3
Blocked Obstructions     num=       1
```

```
   Sta L   Sta R    Elev
************************
 9796.84 9864.61  1608.5

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1596.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.030  *   0.042  *   0.042  *
* W.S. Elev (ft)          * 1596.69  * Reach Len. (ft)         *  554.00  *  563.26  *  558.00  *
* Crit W.S. (ft)          * 1596.46  * Flow Area (sq ft)       *   65.13  *  161.86  *   48.34  *
* E.G. Slope (ft/ft)      *0.009774  * Area (sq ft)            *   65.13  *  161.86  *   48.34  *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *  281.21  *  617.22  *  131.56  *
* Top Width (ft)          *  290.59  * Top Width (ft)           *   77.97  *  142.19  *   70.43  *
* Vel Total (ft/s)        *    3.74  * Avg. Vel. (ft/s)         *    4.32  *    3.81  *    2.72  *
* Max Chl Dpth (ft)       *    1.24  * Hydr. Depth (ft)         *    0.84  *    1.14  *    0.69  *
* Conv. Total (cfs)       * 10418.2  * Conv. (cfs)              *  2844.4  *  6243.1  *  1330.7  *
* Length Wtd. (ft)        *  560.36  * Wetted Per. (ft)         *   78.67  *  142.20  *   70.44  *
* Min Ch El (ft)          * 1595.45  * Shear (lb/sq ft)         *    0.51  *    0.69  *    0.42  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)   *    2.18  *    2.65  *    1.14  *
* Frctn Loss (ft)         *    4.47  * Cum Volume (acre-ft)     *    1.98  *    8.77  *    1.85  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    2.74  *    4.70  *    2.43  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1597.50  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.30  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)          * 1597.19  * Reach Len. (ft)         *  554.00  *  563.26  *  558.00  *
* Crit W.S. (ft)          * 1596.73  * Flow Area (sq ft)       *          *  232.99  *          *
* E.G. Slope (ft/ft)      *0.008300  * Area (sq ft)            *          *  232.99  *          *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *          * 1030.00  *          *
* Top Width (ft)          *  142.19  * Top Width (ft)           *          *  142.19  *          *
* Vel Total (ft/s)        *    4.42  * Avg. Vel. (ft/s)         *          *    4.42  *          *
* Max Chl Dpth (ft)       *    1.74  * Hydr. Depth (ft)         *          *    1.64  *          *
* Conv. Total (cfs)       * 11305.8  * Conv. (cfs)              *          * 11305.8  *          *
* Length Wtd. (ft)        *  562.80  * Wetted Per. (ft)         *          *  145.05  *          *
* Min Ch El (ft)          * 1595.45  * Shear (lb/sq ft)         *          *    0.83  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.68  *          *
* Frctn Loss (ft)         *    4.53  * Cum Volume (acre-ft)     *    0.26  *   10.45  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.17  *    4.70  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9770.36   * 9942.58   *   281.21 *    65.13 *    78.67 *    27.30 *
0.84 *     4.32 *
* 2        * Chan      * 9942.58   * 10084.77  *   617.22 *   161.86 *   142.20 *    59.92 *
1.14 *     3.81 *
* 3        * ROB       * 10084.77  * 10238.62  *   131.56 *    48.34 *    70.44 *    12.77 *
0.69 *     2.72 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
```

```
*           * Pos        * Left Sta   * Right Sta *      Flow *      Area *      W.P. *  Percent *
Hydr * Velocity *
*           *            * (ft)       * (ft)      *     (cfs) *  (sq ft) *      (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan       * 9942.58    * 10084.77  *  1030.00 *   232.99 *    145.05 *   100.00 *
1.64 *     4.42 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.417

INPUT
Description:
Station Elevation Data    num=     134
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9533.11  1595.7 9533.88 1595.74 9542.56 1595.74 9552.21 1595.63 9595.84 1594.84
 9596.02  1594.8 9634.77 1594.56 9648.16 1594.35 9657.66 1594.26    9668 1594.24
 9672.89  1594.2 9680.48    1594 9683.31 1593.97 9698.74 1593.83 9702.37 1593.76
  9722.1  1593.1 9735.55 1592.64 9744.94 1592.72 9767.79 1592.88 9792.84 1592.55
 9798.63  1592.5 9825.14 1592.71 9827.48 1592.73 9828.75 1592.75 9832.54  1592.7
  9854.2 1592.04 9854.94 1592.04 9856.94 1592.02 9860.16    1592 9860.88    1592
 9861.79 1591.99 9869.87 1591.95 9912.15 1591.65 9915.21 1591.62 9915.95  1591.6
 9915.95 1591.62 9919.28 1591.59 9939.54 1591.45 9945.41 1591.12 9950.56 1590.83
 9954.45  1590.8 9956.14 1590.37  9957.5    1590 9957.95 1589.77 9958.76 1589.62
 9960.19  1589.8 9961.03    1590 9964.39  1590.5    9965 1590.58 9965.16 1590.58
 9966.56  1590.6 9980.23 1590.72 9994.89 1590.76 9995.51 1590.54 9997.95    1590
 9998.29  1589.910000.76 1589.4310001.07 1589.5210001.66    159010003.23 1590.54
10003.58  1590.710018.75 1590.7310030.98 1590.7510031.66 1590.6210035.03    1590
10035.32  1589.9 10036.5 1589.7610037.71 1589.9310043.14 1590.4810044.34  1590.6
10044.81 1590.6210071.45 1591.1610075.54 1591.2210088.53 1591.22 10093.81591.285
10094.98  1591.310115.32 1591.8410121.93 1591.9610123.01 1591.9910123.81    1592
10124.38    159210127.78 1592.0610132.96 1592.1710133.98  1592.2 10150.2  1592.5
 10160.8    159310162.58 1593.1210175.59 1593.7810182.69    159410182.77    1594
10189.25 1594.1610189.87 1594.1610190.71 1594.18 10193.1  1594.210197.57 1594.23
 10202.5 1594.2710203.92 1594.2910205.56 1594.3110208.06  1594.310221.82 1594.44
10228.88 1594.5810235.96 1594.6410243.69 1594.6710249.49  1594.810255.43 1594.85
10260.42 1594.9810264.62 1595.0510275.32 1595.21 10285.1  1595.310293.59 1595.37
10309.21 1595.4410310.72 1595.4410311.73 1595.4610312.39  1595.510312.67 1595.47
10315.27 1595.4710322.98  1595.510352.79 1595.4810359.88 1595.72 10361.6 1595.78
10369.46    159610375.04  1596.210377.54 1596.2410382.01  1596.210383.44  1596.2
10412.48  1596.110421.03  1596.110427.52 1596.0410434.11 1596.1710444.64 1596.34
10479.07 1596.4510487.05  1596.510496.06 1596.3710502.33 1596.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9533.11     .03 9945.41    .042 10093.8     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.4510044.81               456  459.78     407              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1592.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.21  * Wt. n-Val.              *   0.033  *   0.042  *   0.040  *
* W.S. Elev (ft)         * 1592.23  * Reach Len. (ft)         *  456.00  *  459.78  *  407.00  *
* Crit W.S. (ft)         * 1591.91  * Flow Area (sq ft)       *   58.77  *  155.50  *   76.88  *
* E.G. Slope (ft/ft)     *0.006647  * Area (sq ft)            *   58.77  *  155.50  *   76.88  *
* Q Total (cfs)          * 1030.00  * Flow (cfs)              *  157.49  *  640.09  *  232.42  *
* Top Width (ft)         *  287.65  * Top Width (ft)          *  106.49  *   90.36  *   90.80  *
* Vel Total (ft/s)       *    3.54  * Avg. Vel. (ft/s)        *    2.68  *    4.12  *    3.02  *
* Max Chl Dpth (ft)      *    2.80  * Hydr. Depth (ft)        *    0.55  *    1.72  *    0.85  *
* Conv. Total (cfs)      * 12633.9  * Conv. (cfs)             *  1931.8  *  7851.3  *  2850.8  *
```

```
* Length Wtd. (ft)        *  452.34  * Wetted Per. (ft)        *  106.53  *    91.21  *    90.82  *
* Min Ch El (ft)          * 1589.43  * Shear (lb/sq ft)        *    0.23  *     0.71  *     0.35  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    0.61  *     2.91  *     1.06  *
* Frctn Loss (ft)         *    3.39  * Cum Volume (acre-ft)    *    1.19  *     6.71  *     1.05  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    1.57  *     3.20  *     1.40  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1592.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *   0.038  *    0.042  *          *
* W.S. Elev (ft)          * 1592.58  * Reach Len. (ft)        *  456.00  *   459.78  *  407.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *   22.68  *   186.82  *          *
* E.G. Slope (ft/ft)      *0.007807  * Area (sq ft)           *   22.68  *   186.82  *          *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *  101.40  *   928.60  *          *
* Top Width (ft)          *  105.27  * Top Width (ft)          *   14.91  *    90.36  *          *
* Vel Total (ft/s)        *    4.92  * Avg. Vel. (ft/s)        *    4.47  *     4.97  *          *
* Max Chl Dpth (ft)       *    3.15  * Hydr. Depth (ft)        *    1.52  *     2.07  *          *
* Conv. Total (cfs)       * 11657.5  * Conv. (cfs)             *  1147.6  *  10509.8  *          *
* Length Wtd. (ft)        *  459.59  * Wetted Per. (ft)        *   16.05  *    93.17  *          *
* Min Ch El (ft)          * 1589.43  * Shear (lb/sq ft)        *    0.69  *     0.98  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    3.08  *     4.86  *          *
* Frctn Loss (ft)         *    3.68  * Cum Volume (acre-ft)    *    0.12  *     7.74  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.08  *     3.20  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9743.78   * 9954.45   *   157.49 *    58.77 *   106.53 *    15.29 *
0.55 *     2.68 *
* 2        * Chan      * 9954.45   * 10044.81  *   640.09 *   155.50 *    91.21 *    62.14 *
1.72 *     4.12 *
* 3        * ROB       * 10044.81  * 10273.57  *   232.42 *    76.88 *    90.82 *    22.56 *
0.85 *     3.02 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9743.78   * 9954.45   *   101.40 *    22.68 *    16.05 *     9.84 *
1.52 *     4.47 *
* 2        * Chan      * 9954.45   * 10044.81  *   928.60 *   186.82 *    93.17 *    90.16 *
2.07 *     4.97 *
*****************************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1 RS: 0.330

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9603.45	1592.2	9629.45	1592.22	9631.12	1592.19	9633.68	1592.15	9637.79	1592.08
9642.03	1592	9661.04	1591.62	9667.99	1591.47	9670.37	1591.41	9678.4	1591.24
9707.5	1590.8	9722.4	1590.58	9724.61	1590.54	9743.57	1590.22	9749.21	1590.18
9765.57	1590.5	9765.99	1590.49	9768.51	1590.47	9770.47	1590.44	9777.35	1590.37
9790.97	1590.3	9800.58	1590.28	9817.65	1590.23	9825.87	1590.12	9826.86	1590.11
9833.53	1590	9835.67	1589.89	9837.93	1589.9	9842.28	1589.94	9848.7	1589.78
9861.15	1589.5	9882.14	1588.95	9887.36	1588.52	9893.49	1588.05	9893.57	1588.08
9897.76	1588.2	9898.11	1588.17	9898.94	1588.18	9901.73	1588.27	9902.67	1588.25
9918.38	1588.1	9920.03	1588	9924.58	1587.82	9930.99	1587.638	9943.29	1587.29
9945.53	1587.24	9947.2	1587.2	9949.77	1587.12	9958.68	1587.01	9978.98	1586.73
9998.02	1586.68	10001.05	1586.51	10002.85	1586.51	10005.21	1586.65	10008.85	1586.75
10022.63	1587.08	10034.72	1587.41	10044.69	1587.752	10045.2	1587.77	10048.66	1587.88
10053.23	1588.03	10059.39	1588.21	10062.84	1588.37	10070.03	1588.57	10104.64	1589.45
10111.4	1589.67	10121.01	1590	10129.77	1590.32	10139.79	1590.79	10141.91	1590.86
10159.26	1591.37	10166.64	1591.5	10168.5	1591.58	10170.82	1591.62	10190.05	1592
10221.28	1592.52	10226.5	1592.6	10232.3	1592.75	10242.34	1592.94	10268.77	1592.73
10282.08	1592.63	10292.37	1592.51	10307.88	1592.97	10316.84	1593.13	10337.03	1593.5
10359.98	1594	10362.73	1594	10372.14	1594.07	10375.41	1594.11	10390.06	1594.17
10403.08	1594.19	10411.03	1594.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9603.45	.03	9930.99	.042	10044.69	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9930.99	10044.69	452	455.86	440	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1589.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.030	0.042	0.030
W.S. Elev (ft)	1588.72	Reach Len. (ft)	452.00	455.86	440.00
Crit W.S. (ft)	1588.43	Flow Area (sq ft)	27.71	193.30	14.66
E.G. Slope (ft/ft)	0.008528	Area (sq ft)	27.71	193.30	14.66
Q Total (cfs)	1030.00	Flow (cfs)	90.22	899.42	40.36
Top Width (ft)	191.18	Top Width (ft)	46.10	113.70	31.38
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)	3.26	4.65	2.75
Max Chl Dpth (ft)	2.22	Hydr. Depth (ft)	0.60	1.70	0.47
Conv. Total (cfs)	11153.9	Conv. (cfs)	977.0	9739.8	437.0
Length Wtd. (ft)	454.58	Wetted Per. (ft)	46.15	113.74	31.39
Min Ch El (ft)	1586.50	Shear (lb/sq ft)	0.32	0.90	0.25
Alpha	1.05	Stream Power (lb/ft s)	1.04	4.21	0.68
Frctn Loss (ft)	3.72	Cum Volume (acre-ft)	0.74	4.87	0.62
C & E Loss (ft)	0.01	Cum SA (acres)	0.77	2.12	0.83

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 OUTPUT Profile #2

E.G. Elev (ft)	1589.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.042	
W.S. Elev (ft)	1588.91	Reach Len. (ft)	452.00	455.86	440.00
Crit W.S. (ft)	1588.38	Flow Area (sq ft)		213.93	
E.G. Slope (ft/ft)	0.008204	Area (sq ft)		213.93	
Q Total (cfs)	1030.00	Flow (cfs)		1030.00	
Top Width (ft)	113.70	Top Width (ft)		113.70	
Vel Total (ft/s)	4.81	Avg. Vel. (ft/s)		4.81	
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)		1.88	
Conv. Total (cfs)	11372.0	Conv. (cfs)		11372.0	
Length Wtd. (ft)	455.86	Wetted Per. (ft)		116.16	

```
* Min Ch El (ft)          * 1586.50  * Shear (lb/sq ft)        *          *    0.94  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    4.54  *          *
* Frctn Loss (ft)         *    3.55  * Cum Volume (acre-ft)   *          *    5.62  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *          *    2.12  *          *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
*******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9767.22   * 9930.99   *    90.22 *    27.71 *    46.15 *     8.76 *
0.60 *     3.26 *
* 2         * Chan      * 9930.99   * 10044.69  *   899.42 *   193.30 *   113.74 *    87.32 *
1.70 *     4.65 *
* 3         * ROB       * 10044.69  * 10227.86  *    40.36 *    14.66 *    31.39 *     3.92 *
0.47 *     2.75 *
*****************************************************************************************************
*******************

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.

  Profile #2
*****************************************************************************************************
*******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9930.99   * 10044.69  *  1030.00 *   213.93 *   116.16 *   100.00 *
1.88 *     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.

CROSS SECTION


RIVER: T4N-R3W-S08W
REACH: REACH-1            RS: 0.243

INPUT
Description:
Station Elevation Data    num=     143
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9343.42  1588.4 9370.83 1588.46 9371.15 1588.47 9371.25 1588.47  9371.7 1588.46
 9372.13  1588.5 9402.28 1588.35 9416.28 1588.26 9435.42 1588.15 9461.52  1588.1
 9470.55 1588.05 9484.34    1588 9487.67 1587.99 9489.03 1587.97 9489.67    1588
 9495.16 1587.94 9497.87 1587.95 9511.08 1587.66 9514.79  1587.6 9518.71 1587.53
 9542.14    1587 9547.48 1586.39 9548.81 1586.24 9552.41  1586.7 9557.47  1586.9
 9570.87 1586.72 9577.36 1586.71 9589.73 1586.79 9600.67  1586.6 9635.66 1586.65
 9652.98 1586.54 9655.92  1586.5 9660.22 1586.61 9667.53  1586.3  9671.5 1586.21
 9680.65 1586.04 9682.19 1586.01 9683.17    1586 9690.99  1585.9  9697.2 1585.84
 9699.36 1585.84  9707.5  1585.9 9712.43    1586 9714.11 1585.95    9715 1585.99
 9719.81 1585.38 9721.38 1585.17 9722.15  1585.3 9727.48 1585.84 9733.08    1586
 9751.37 1586.47 9760.23  1586.7 9770.44 1586.79 9786.13 1586.83 9800.11 1587.58
 9806.23 1587.82 9811.27    1588 9815.12 1588.15 9820.23 1588.32 9824.27 1588.49
 9831.29 1588.31 9845.67    1588 9861.61 1587.77 9881.93 1586.93 9882.13 1586.93
 9885.06  1586.8 9915.52    1586 9916.37 1585.99 9917.03 1585.97 9922.77 1585.87
  9934.1  1585.7 9938.26  1585.5 9954.37  1584.2 9957.03    1584 9958.15 1583.91
 9958.761583.863 9967.28  1583.2 9969.43 1582.97 9974.69  1582.4  9979.2 1582.49
 9981.23 1582.59 9993.84  1582.6 9995.15 1582.62 9995.27 1582.58 9997.15    1582
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 9998.97 1580.99 9999.96  1580.810001.64 1581.1910003.39    158210004.38 1582.42
10004.74 1582.6110012.02  1582.810013.39  1582.910014.16 1582.7810015.15 1582.66
10018.26 1582.0710023.19  1582.810025.15 1583.0610028.84 1583.0810037.43 1583.22
10039.17 1583.4510040.48  1583.510040.591583.50710048.73 1584.0110051.75 1584.17
10053.12 1584.2310054.41 1584.2510058.69  1584.310064.47 1584.5110071.77 1584.57
10074.74 1584.6410076.33 1584.7810076.83  1584.810082.83 1585.2410090.69 1585.81
10095.08    158610098.15 1586.1410100.16  1586.310103.65  1586.310118.11 1586.08
10118.98 1586.0510119.98 1586.0910121.14  1586.1 10140.1 1587.0710143.07 1587.27
10148.18 1587.6210152.47 1588.0110154.53  1588.110156.08 1588.2710159.71 1588.43
10173.19  1588.610178.99 1588.7110188.04  1589.210198.39 1589.5210201.35 1589.73
10210.53 1589.92 10210.8 1589.9210214.34  1589.910231.35    159010235.82 1590.05
10236.53 1590.0610250.49 1590.1910262.74  1590.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9343.42     .03 9958.76    .04210040.59     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.2810037.43               414  459.52     479              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1585.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.42  * Wt. n-Val.              *   0.038  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1584.89  * Reach Len. (ft)         *  414.00  *  459.52  *  479.00  *
* Crit W.S. (ft)         * 1584.48  * Flow Area (sq ft)       *   18.18  *  161.85  *   27.14  *
* E.G. Slope (ft/ft)     *0.007848  * Area (sq ft)            *   18.18  *  161.85  *   27.14  *
* Q Total (cfs)          * 1030.00  * Flow (cfs)              *   62.85  *  878.00  *   89.14  *
* Top Width (ft)         *  132.11  * Top Width (ft)           *   21.40  *   70.15  *   40.56  *
* Vel Total (ft/s)       *    4.97  * Avg. Vel. (ft/s)         *    3.46  *    5.42  *    3.28  *
* Max Chl Dpth (ft)      *    4.08  * Hydr. Depth (ft)         *    0.85  *    2.31  *    0.67  *
* Conv. Total (cfs)      * 11626.5  * Conv. (cfs)              *   709.5  *  9910.8  *  1006.3  *
* Length Wtd. (ft)       *  459.00  * Wetted Per. (ft)         *   21.46  *   71.08  *   40.61  *
* Min Ch El (ft)         * 1580.80  * Shear (lb/sq ft)         *    0.41  *    1.12  *    0.33  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)   *    1.43  *    6.05  *    1.08  *
* Frctn Loss (ft)        *    4.29  * Cum Volume (acre-ft)     *    0.50  *    3.01  *    0.41  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *    0.42  *    1.16  *    0.46  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1585.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.48  * Wt. n-Val.              *          *   0.042  *          *
* W.S. Elev (ft)         * 1585.22  * Reach Len. (ft)         *  414.00  *  459.52  *  479.00  *
* Crit W.S. (ft)         * 1584.46  * Flow Area (sq ft)       *          *  185.30  *          *
* E.G. Slope (ft/ft)     *0.007403  * Area (sq ft)            *          *  185.30  *          *
* Q Total (cfs)          * 1030.00  * Flow (cfs)              *          * 1030.00  *          *
* Top Width (ft)         *   70.15  * Top Width (ft)           *          *   70.15  *          *
* Vel Total (ft/s)       *    5.56  * Avg. Vel. (ft/s)         *          *    5.56  *          *
* Max Chl Dpth (ft)      *    4.42  * Hydr. Depth (ft)         *          *    2.64  *          *
* Conv. Total (cfs)      * 11971.3  * Conv. (cfs)              *          * 11971.3  *          *
* Length Wtd. (ft)       *  459.52  * Wetted Per. (ft)         *          *   75.09  *          *
* Min Ch El (ft)         * 1580.80  * Shear (lb/sq ft)         *          *    1.14  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    6.34  *          *
* Frctn Loss (ft)        *    4.10  * Cum Volume (acre-ft)     *          *    3.53  *          *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)           *          *    1.16  *          *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9655.35   * 9967.28   *    62.85 *    18.18 *    21.46 *     6.10 *
0.85 *     3.46 *
* 2         * Chan      * 9967.28   * 10037.43  *   878.00 *   161.85 *    71.08 *    85.24 *
2.31 *     5.42 *
* 3         * ROB       * 10037.43  * 10150.08  *    89.14 *    27.14 *    40.61 *     8.65 *
0.67 *     3.28 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9967.28   * 10037.43  *  1030.00 *   185.30 *    75.09 *   100.00 *
2.64 *     5.56 *
*****************************************************************************************
******************

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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.156

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9405.65  1587.3 9420.41 1586.76 9422.96 1586.64 9423.48 1586.64 9424.02 1586.63
 9426.19  1586.6  9465.8  1586.5 9475.06 1586.35 9497.69 1586.06 9497.72  1586.1
 9499.41    1586 9507.78 1585.73 9509.82 1585.67 9512.08 1585.65 9520.21  1585.7
 9546.16  1584.9 9547.82 1584.87  9562.9 1584.77 9569.53 1584.73 9575.43  1584.6
 9587.47  1584.2 9590.39 1584.13 9595.47    1584 9597.27  1583.9 9601.99 1583.84
 9622.83 1583.34 9626.97 1582.67 9629.41 1582.53 9632.14  1582.7 9633.63 1582.65
 9638.12 1583.44 9639.17 1583.62 9646.06  1583.7 9665.66 1583.91 9670.63    1584
 9684.79  1584.4 9699.75 1584.74 9710.63  1584.5 9737.01 1584.12 9742.63 1584.03
 9743.56 1584.02  9743.9 1584.02 9745.37    1584 9745.75 1583.97 9748.02 1583.88
 9762.01 1583.29 9785.25 1582.19 9791.13    1582    9794 1581.91  9802.4 1581.73
 9806.36 1581.76  9821.4 1581.04 9823.56  1580.5 9826.89 1580.27 9829.59 1580.02
  9829.6 1579.99  9833.7 1580.43 9839.24 1580.99 9849.71 1581.18 9858.45 1581.27
 9873.39    1581 9874.02 1580.99 9896.23  1581.6 9897.45 1581.59 9904.37 1581.38
 9914.96  1581.1 9918.04 1580.94 9923.79 1580.91 9938.62 1580.69 9951.71  1580.5
 9956.23 1580.02 9956.37    1580 9956.95  1579.9 9966.72  1578.4  9977.4  1578.2
 9987.29    1578 9989.83 1577.94 9994.22 1577.84 9995.11 1577.32 9997.69    1576
 9998.16 1575.58 9999.33 1574.9210001.82 1575.64   10003    157610006.34    1577
10009.41 1577.8610010.16 1577.9910010.48 1578.0510021.28 1579.19   10024  1579.5
10026.06 1579.6910026.19  1579.710027.13 1579.8210028.39    158010035.12  1580.8
10046.16    158210047.67 1582.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9405.65     .03 9966.72    .04210010.48     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.7210010.48              521  524.92     461              .1       .3
Left Levee      Station= 9896.23      Elevation=  1581.6
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1580.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.	0.030	0.042	0.030
W.S. Elev (ft)	1580.24	Reach Len. (ft)	521.00	524.92	461.00
Crit W.S. (ft)	1580.02	Flow Area (sq ft)	11.02	118.43	22.35
E.G. Slope (ft/ft)	0.011331	Area (sq ft)	11.02	118.43	22.35
Q Total (cfs)	1030.00	Flow (cfs)	52.98	850.21	126.82
Top Width (ft)	76.17	Top Width (ft)	12.52	43.76	19.89
Vel Total (ft/s)	6.79	Avg. Vel. (ft/s)	4.81	7.18	5.68
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)	0.88	2.71	1.12
Conv. Total (cfs)	9676.2	Conv. (cfs)	497.7	7987.2	1191.4
Length Wtd. (ft)	520.20	Wetted Per. (ft)	12.65	45.00	20.01
Min Ch El (ft)	1574.92	Shear (lb/sq ft)	0.62	1.86	0.79
Alpha	1.04	Stream Power (lb/ft s)	2.96	13.37	4.48
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	0.36	1.54	0.14
C & E Loss (ft)	0.07	Cum SA (acres)	0.26	0.56	0.13

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 OUTPUT Profile #2

E.G. Elev (ft)	1581.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.042	
W.S. Elev (ft)	1580.73	Reach Len. (ft)	521.00	524.92	461.00
Crit W.S. (ft)	1580.11	Flow Area (sq ft)		140.08	
E.G. Slope (ft/ft)	0.010937	Area (sq ft)		140.08	
Q Total (cfs)	1030.00	Flow (cfs)		1030.00	
Top Width (ft)	43.76	Top Width (ft)		43.76	
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)		7.35	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		3.20	
Conv. Total (cfs)	9848.7	Conv. (cfs)		9848.7	
Length Wtd. (ft)	524.92	Wetted Per. (ft)		50.01	
Min Ch El (ft)	1574.92	Shear (lb/sq ft)		1.91	
Alpha	1.00	Stream Power (lb/ft s)		14.06	
Frctn Loss (ft)	4.71	Cum Volume (acre-ft)		1.82	
C & E Loss (ft)	0.06	Cum SA (acres)		0.56	

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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9896.23	9966.72	52.98	11.02	12.65	5.14	0.88	4.81
2	Chan	9966.72	10010.48	850.21	118.43	45.00	82.54	2.71	7.18
3	ROB	10010.48	10029.08	126.73	22.25	18.71	12.30	1.20	5.70
4	ROB	10029.08	10047.67	0.09	0.10	1.30	0.01	0.08	0.91

```
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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9966.72   * 10010.48  *  1030.00 *   140.08 *    50.01 *   100.00 *
3.20 *     7.35 *
*****************************************************************************************************
******************

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find 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: T4N-R3W-S08W
REACH: REACH-1            RS: 0.057

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9528.97  1582.3 9541.83 1582.33 9542.73 1582.33 9571.73    1582    9582  1581.9
 9584.71 1581.86 9599.41 1581.44 9601.59 1581.36 9611.45 1581.09 9617.12  1580.9
 9628.98 1580.63 9651.45    1580 9652.96    1580  9667.5 1579.47  9667.8  1579.5
 9667.94 1579.45 9668.13 1579.45 9672.35  1579.4 9695.69  1579.2 9695.731579.193
 9699.59 1578.56 9699.75 1578.54 9699.77 1578.53 9699.83 1578.54 9706.98  1579.4
 9716.47  1579.7 9735.85 1580.32 9741.49 1580.52 9743.45  1580.6 9745.11 1580.56
 9747.48 1580.51 9752.48  1580.4 9763.32 1580.14 9769.02    1580 9784.02 1579.68
 9798.99 1579.24 9818.28 1578.47 9829.79    1578 9832.04  1577.9 9836.93 1577.83
    9857 1577.28 9859.15 1577.24 9867.62 1577.51 9882.73    1578 9887.14 1578.18
 9890.88  1578.3 9897.71  1578.5 9898.69 1578.51 9901.94 1578.44 9905.21 1578.55
 9925.34    1578 9927.82 1577.93 9930.65 1577.86 9932.48  1577.8  9938.5 1577.65
  9946.2  1576.8 9952.99    1576 9954.55 1575.72 9954.88 1575.68 9955.45 1575.47
 9961.61    1574 9966.05 1572.72 9966.09 1572.71 9966.14 1572.71 9972.75 1574.04
 9972.77    1574 9974.49 1574.32 9974.51 1574.31 9975.35 1574.36 9986.21 1574.37
  9986.5  1574.3 9987.58    1574 9994.89 1572.03    9995    1572 9995.04 1571.99
 9997.41  1571.4 10000.1 1571.7910001.53    157210005.72 1572.6110008.09 1572.97
10015.45  1573.110032.03 1573.1910034.68 1573.8610035.12    157410035.48 1574.12
10041.59    157610043.37 1576.4810046.56 1577.4910056.42 1577.8810061.41 1577.98
10062.16    157810069.86 1578.2210073.79 1578.2210077.06 1578.2510079.85  1578.3
10081.79 1578.32 10108.5 1578.5310111.82 1578.59

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9528.97     .03 9954.55    .04210041.59     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2110035.48                 0       0       0              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
```

E.G. Elev (ft)	1576.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.042	0.042	0.042
W.S. Elev (ft)	1575.66	Reach Len. (ft)			
Crit W.S. (ft)	1575.11	Flow Area (sq ft)	49.20	136.58	3.86
E.G. Slope (ft/ft)	0.007501	Area (sq ft)	49.20	136.58	3.86
Q Total (cfs)	1030.00	Flow (cfs)	201.43	818.91	9.66
Top Width (ft)	85.56	Top Width (ft)	31.28	49.27	5.01
Vel Total (ft/s)	5.43	Avg. Vel. (ft/s)	4.09	6.00	2.50
Max Chl Dpth (ft)	4.26	Hydr. Depth (ft)	1.57	2.77	0.77
Conv. Total (cfs)	11892.3	Conv. (cfs)	2325.7	9455.0	111.5
Length Wtd. (ft)		Wetted Per. (ft)	31.86	49.90	5.24
Min Ch El (ft)	1571.40	Shear (lb/sq ft)	0.72	1.28	0.35
Alpha	1.08	Stream Power (lb/ft s)	2.96	7.69	0.86
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1576.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.042	
W.S. Elev (ft)	1576.17	Reach Len. (ft)			
Crit W.S. (ft)	1575.28	Flow Area (sq ft)		161.46	
E.G. Slope (ft/ft)	0.007501	Area (sq ft)		161.46	
Q Total (cfs)	1030.00	Flow (cfs)		1030.00	
Top Width (ft)	49.27	Top Width (ft)		49.27	
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)		6.38	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		3.28	
Conv. Total (cfs)	11893.0	Conv. (cfs)		11893.0	
Length Wtd. (ft)		Wetted Per. (ft)		53.74	
Min Ch El (ft)	1571.40	Shear (lb/sq ft)		1.41	
Alpha	1.00	Stream Power (lb/ft s)		8.97	
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.
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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9757.59	9986.21	201.43	49.20	31.86	19.56	1.57	4.09
2	Chan	9986.21	10035.48	818.91	136.58	49.90	79.51	2.77	6.00
3	ROB	10035.48	10073.65	9.66	3.86	5.24	0.94	0.77	2.50

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9986.21	10035.48	1030.00	161.46	53.74	100.00	3.28	6.38

Warning: The cross section had to be extended vertically during the critical depth calculations.

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: T4N-R3W-S09
REACH: REACH-1 RS: 2.651

INPUT
Description: Flow rate starting at this cross-section and downstream is 710cfs.
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9280.41	1650.3	9284.28	1650.21	9287.66	1650.18	9295.23	1650.14	9317.73	1650
9321.2	1650	9329.21	1649.93	9329.45	1649.93	9329.94	1649.91	9329.98	1649.9
9330.05	1649.91	9330.44	1649.91	9331.07	1649.9	9374.8	1649.6	9377.02	1649.6
9380.29	1649.57	9421.11	1649.21	9446.54	1648.98	9466.41	1648.7	9493.03	1648.36
9509.93	1648.06	9511.19	1648.04	9511.87	1648.04	9516.55	1648	9517.33	1648
9519.03	1647.99	9545.81	1647.81	9555.16	1647.76	9576.43	1647.5	9599.96	1647.28
9631.35	1647.21	9652.46	1647.17	9664.21	1647.21	9699.78	1647.4	9733.88	1647.21
9749.33	1647.16	9760.19	1647.04	9780.54	1646.78	9794.59	1646.8	9801.51	1646.9
9805.3	1646.94	9811.66	1646.9	9814.07	1646.88	9819.36	1646.8	9824.96	1646.81
9828.54	1646.78	9838.32	1646.72	9839.43	1646.71	9843.91	1646.7	9855.28	1646.75
9862.84	1646.78	9869.47	1646.787	9872.57	1646.79	9884.74	1646.78	9905.3	1646.6
9907.45	1646.61	9909.99	1646.6	9913.12	1646.58	9932.97	1646.9	9938.99	1646.93
9955.08	1646.98	9955.86	1646.72	9964.86	1646.7	9967.68	1646.75	9985.87	1646.53
9988.87	1646.46	9998.35	1646.31	10001.9	1646.3	10006.11	1646.19	10014.87	1646
10015.66	1645.99	10018.55	1645.94	10027.75	1645.91	10077.18	1645.73	10077.61	1645.735
10099.3	1646	10099.91	1646	10110.49	1646.12	10127.09	1646.2	10153.6	1646.53
10173.01	1646.69	10174.13	1646.89	10209.62	1647.26	10226.36	1647.2	10234.49	1647.37
10235.7	1647.39	10237.63	1647.41	10274.45	1647.87	10275.02	1647.9	10282.61	1647.96
10285.53	1648	10315.75	1648.46	10322.65	1648.56	10323.21	1648.6	10324.9	1648.59
10330.44	1648.59	10375.46	1648.52	10391.48	1648.64	10400.71	1648.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9280.41	.035	9869.47	.045	10174.13	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.68	10153.6	525	522.45	520	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1647.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.045	0.043
W.S. Elev (ft)	1647.21	Reach Len. (ft)	525.00	522.45	520.00
Crit W.S. (ft)	1646.92	Flow Area (sq ft)	88.05	204.95	16.96
E.G. Slope (ft/ft)	0.005852	Area (sq ft)	88.05	204.95	16.96
Q Total (cfs)	710.00	Flow (cfs)	131.51	552.42	26.06
Top Width (ft)	504.60	Top Width (ft)	264.86	185.92	53.82
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)	1.49	2.70	1.54
Max Chl Dpth (ft)	1.48	Hydr. Depth (ft)	0.33	1.10	0.32
Conv. Total (cfs)	9281.1	Conv. (cfs)	1719.1	7221.3	340.7
Length Wtd. (ft)	522.78	Wetted Per. (ft)	264.91	185.93	53.84
Min Ch El (ft)	1645.73	Shear (lb/sq ft)	0.12	0.40	0.12
Alpha	1.17	Stream Power (lb/ft s)	0.18	1.09	0.18
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	23.50	58.36	17.44
C & E Loss (ft)	0.00	Cum SA (acres)	53.86	52.05	32.75

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1647.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.045	

```
* W.S. Elev (ft)          * 1647.44  * Reach Len. (ft)        *  525.00  *  522.45  *  520.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  247.75  *          *
* E.G. Slope (ft/ft)      *0.005196  * Area (sq ft)           *          *  247.75  *          *
* Q Total (cfs)           *  710.00  * Flow (cfs)             *          *  710.00  *          *
* Top Width (ft)          *  185.92  * Top Width (ft)         *          *  185.92  *          *
* Vel Total (ft/s)        *    2.87  * Avg. Vel. (ft/s)       *          *    2.87  *          *
* Max Chl Dpth (ft)       *    1.71  * Hydr. Depth (ft)       *          *    1.33  *          *
* Conv. Total (cfs)       *  9849.7  * Conv. (cfs)            *          *  9849.7  *          *
* Length Wtd. (ft)        *  522.45  * Wetted Per. (ft)       *          *  187.53  *          *
* Min Ch El (ft)          * 1645.73  * Shear (lb/sq ft)       *          *    0.43  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    1.23  *          *
* Frctn Loss (ft)         *    3.62  * Cum Volume (acre-ft)   *    2.00  *   74.72  *    1.45  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    1.39  *   52.05  *    1.07  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9624.05   * 9967.68   *   131.51 *    88.05 *   264.91 *    18.52 *
0.33 *     1.49 *
* 2         * Chan      * 9967.68   * 10153.60  *   552.42 *   204.95 *   185.93 *    77.81 *
1.10 *     2.70 *
* 3         * ROB       * 10153.60  * 10277.15  *    26.06 *    16.96 *    53.84 *     3.67 *
0.32 *     1.54 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9967.68   * 10153.60  *   710.00 *   247.75 *   187.53 *   100.00 *
1.33 *     2.87 *
*****************************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 2.552

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9519.92  1644.8 9545.02  1644.4 9553.44 1644.33 9569.85 1644.14 9583.85    1644
 9586.26    1644 9592.25 1643.85 9619.16  1643.7 9631.47  1643.7 9652.57 1643.53
 9671.89  1643.5 9713.26 1643.28 9713.93 1643.28 9714.31 1643.27 9715.38 1643.27
 9718.43 1643.25 9757.09    1643 9786.57 1643.08 9805.17 1643.06 9832.17 1643.04
 9844.24 1643.04 9867.95  1642.9 9890.09  1642.7 9928.11 1642.69 9937.31  1642.7
 9943.35 1642.72 9981.78    1643 9998.72 1642.77 10024.9  1642.510032.58 1642.61
10056.42 1643.0810063.93  1643.210069.24 1643.2510075.22 1643.2910097.31 1643.29
```

```
10107.18 1643.2910133.01 1643.0710144.61    1643 10151.4 1643.11 10151.6 1643.12
 10161.7 1643.2610186.62  1643.810189.46 1643.8210192.55 1643.87   10195 1643.89
10200.59 1643.9410207.94    164410208.63 1644.01 10212.6 1644.0310237.82 1644.08
10239.59  1644.110249.21 1644.1110287.56 1644.2610289.29 1644.2710297.94  1644.4
10320.24 1644.9610328.72 1644.8610346.26 1645.0310349.83 1645.1110369.55  1645.2

Manning's n Values          num=        3
     Sta   n Val     Sta,  n Val     Sta   n Val
***********************************************
 9519.92    .035 9713.93    .04510075.22    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9844.2410075.22              647  517.95     452            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1643.71  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.044  *   0.045  *   0.035  *
* W.S. Elev (ft)          * 1643.62  * Reach Len. (ft)         *  647.00  *  517.95  *  452.00  *
* Crit W.S. (ft)          * 1643.42  * Flow Area (sq ft)       *   82.53  *  184.41  *   39.87  *
* E.G. Slope (ft/ft)      *0.008208  * Area (sq ft)            *   82.53  *  184.41  *   39.87  *
* Q Total (cfs)           *  710.00  * Flow (cfs)              *  153.79  *  474.79  *   81.41  *
* Top Width (ft)          *  536.75  * Top Width (ft)          *  202.72  *  230.98  *  103.05  *
* Vel Total (ft/s)        *    2.31  * Avg. Vel. (ft/s)        *    1.86  *    2.57  *    2.04  *
* Max Chl Dpth (ft)       *    1.12  * Hydr. Depth (ft)        *    0.41  *    0.80  *    0.39  *
* Conv. Total (cfs)       *  7836.6  * Conv. (cfs)             *  1697.5  *  5240.5  *   898.6  *
* Length Wtd. (ft)        *  531.44  * Wetted Per. (ft)        *  202.72  *  230.99  *  103.05  *
* Min Ch El (ft)          * 1642.50  * Shear (lb/sq ft)        *    0.21  *    0.41  *    0.20  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.39  *    1.05  *    0.40  *
* Frctn Loss (ft)         *    2.89  * Cum Volume (acre-ft)    *   22.48  *   56.03  *   17.10  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   51.05  *   49.55  *   31.81  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1643.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)          * 1643.79  * Reach Len. (ft)         *  647.00  *  517.95  *  452.00  *
* Crit W.S. (ft)          * 1643.48  * Flow Area (sq ft)       *          *  223.83  *          *
* E.G. Slope (ft/ft)      *0.009693  * Area (sq ft)            *          *  223.83  *          *
* Q Total (cfs)           *  710.00  * Flow (cfs)              *          *  710.00  *          *
* Top Width (ft)          *  230.98  * Top Width (ft)          *          *  230.98  *          *
* Vel Total (ft/s)        *    3.17  * Avg. Vel. (ft/s)        *          *    3.17  *          *
* Max Chl Dpth (ft)       *    1.29  * Hydr. Depth (ft)        *          *    0.97  *          *
* Conv. Total (cfs)       *  7211.5  * Conv. (cfs)             *          *  7211.5  *          *
* Length Wtd. (ft)        *  517.95  * Wetted Per. (ft)        *          *  232.24  *          *
* Min Ch El (ft)          * 1642.50  * Shear (lb/sq ft)        *          *    0.58  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.85  *          *
* Frctn Loss (ft)         *    2.97  * Cum Volume (acre-ft)    *    2.00  *   71.89  *    1.45  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    1.39  *   49.55  *    1.07  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9519.92   * 9682.08   *     3.23 *     3.99 *    40.56 *     0.46 *
0.10 *     0.81 *
```

```
* 2          * LOB       * 9682.08   * 9844.24   *   150.56 *    78.54 *   162.16 *    21.21 *
0.48 *     1.92 *
* 3          * Chan      * 9844.24   * 10075.22  *   474.79 *   184.41 *   230.99 *    66.87 *
0.80 *     2.57 *
* 4          * ROB       * 10075.22  * 10222.38  *    81.41 *    39.87 *   103.05 *    11.47 *
0.39 *     2.04 *
*****************************************************************************************
******************

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 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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9844.24   * 10075.22  *   710.00 *   223.83 *   232.24 *   100.00 *
0.97 *     3.17 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 2.454

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain and
             joins downstream of this cross-section.
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9337.89  1641.4 9359.02 1641.42 9367.44 1640.98 9399.42 1641.04 9433.27 1641.21
 9456.51  1641.1 9501.86 1640.88 9544.62 1640.48 9557.17 1640.33 9562.88 1640.44
 9611.23  1641.1 9630.68 1640.96 9652.15 1640.95 9661.06 1640.88 9665.16 1640.89
 9674.71  1640.9 9705.03 1640.69 9717.34 1640.69 9757.73  1640.6    9765 1640.58
 9768.69  1641.2 9808.31 1640.69 9817.08 1640.68 9822.78 1640.58 9891.37 1640.02
 9892.87    1640 9893.51    1640 9903.15 1639.9310015.99 1639.1410017.66 1639.12
10099.04  1639.810122.691639.94710131.25    164010133.53 1640.0210143.77  1640.1
10241.23  1641.710262.53  1641.710265.87 1641.7110298.95 1641.7710337.11 1641.85
10352.96    164210358.27    164210362.43 1642.0210380.43 1642.1910395.39 1642.32
10402.72  1642.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9337.89    .035 9903.15    .04510122.69    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9903.1510122.69              495   488.2     481            .1        .3
Left Levee      Station= 9768.69      Elevation=  1641.2

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1640.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.              *   0.035  *   0.045  *   0.035  *
* W.S. Elev (ft)         * 1640.74  * Reach Len. (ft)         *  495.00  *  488.20  *  481.00  *
* Crit W.S. (ft)         * 1640.24  * Flow Area (sq ft)       *   40.22  *  262.86  *   27.54  *
* E.G. Slope (ft/ft)     *0.003864  * Area (sq ft)            *   40.22  *  262.86  *   27.54  *
```

* Q Total (cfs)	*	710.00	* Flow (cfs)	*	58.39	*	608.34	*	43.27	*
* Top Width (ft)	*	378.05	* Top Width (ft)	*	98.57	*	219.54	*	59.94	*
* Vel Total (ft/s)	*	2.15	* Avg. Vel. (ft/s)	*	1.45	*	2.31	*	1.57	*
* Max Chl Dpth (ft)	*	1.62	* Hydr. Depth (ft)	*	0.41	*	1.20	*	0.46	*
* Conv. Total (cfs)	*	11422.0	* Conv. (cfs)	*	939.4	*	9786.5	*	696.1	*
* Length Wtd. (ft)	*	488.24	* Wetted Per. (ft)	*	98.57	*	219.55	*	59.94	*
* Min Ch El (ft)	*	1639.12	* Shear (lb/sq ft)	*	0.10	*	0.29	*	0.11	*
* Alpha	*	1.07	* Stream Power (lb/ft s)	*	0.14	*	0.67	*	0.17	*
* Frctn Loss (ft)	*	2.79	* Cum Volume (acre-ft)	*	21.57	*	53.37	*	16.75	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	48.81	*	46.88	*	30.96	*

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.
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 OUTPUT Profile #2

* E.G. Elev (ft)	*	1640.96	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.09	* Wt. n-Val.	*		*	0.045	*		*
* W.S. Elev (ft)	*	1640.87	* Reach Len. (ft)	*	495.00	*	488.20	*	481.00	*
* Crit W.S. (ft)	*	1640.23	* Flow Area (sq ft)	*		*	291.05	*		*
* E.G. Slope (ft/ft)	*	0.003790	* Area (sq ft)	*		*	291.05	*		*
* Q Total (cfs)	*	710.00	* Flow (cfs)	*		*	710.00	*		*
* Top Width (ft)	*	219.54	* Top Width (ft)	*		*	219.54	*		*
* Vel Total (ft/s)	*	2.44	* Avg. Vel. (ft/s)	*		*	2.44	*		*
* Max Chl Dpth (ft)	*	1.75	* Hydr. Depth (ft)	*		*	1.33	*		*
* Conv. Total (cfs)	*	11532.9	* Conv. (cfs)	*		*	11532.9	*		*
* Length Wtd. (ft)	*	488.21	* Wetted Per. (ft)	*		*	221.40	*		*
* Min Ch El (ft)	*	1639.12	* Shear (lb/sq ft)	*		*	0.31	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	0.76	*		*
* Frctn Loss (ft)	*	2.81	* Cum Volume (acre-ft)	*	2.00	*	68.83	*	1.45	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	1.39	*	46.88	*	1.07	*

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.
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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9768.69	9903.15	58.39	40.22	98.57	8.22	0.41	1.45
* 2	Chan	9903.15	10122.69	608.34	262.86	219.55	85.68	1.20	2.31
* 3	ROB	10122.69	10262.71	43.27	27.54	59.94	6.09	0.46	1.57

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

```
  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9903.15   * 10122.69  *   710.00 *   291.05 *   221.40 *   100.00 *
1.33 *     2.44 *
*****************************************************************************************
******************

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.
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: T4N-R3W-S09
REACH: REACH-1            RS: 2.362

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain and
             joins downstream of this cross-section.
Interpolated point added
             at (9940.89, 1636.887) to set bank station.
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9502.81    1638 9522.49  1638.1 9529.95 1638.04 9537.93 1638.08 9540.49 1638.08
 9561.68    1638 9563.84 1638.05 9578.46 1638.12 9590.95 1638.05 9614.42 1638.16
 9618.53  1638.2 9623.14 1638.14 9628.36 1638.12  9628.8 1638.13 9634.58 1638.09
 9642.53    1638 9647.01    1638 9654.81 1637.95 9667.86 1637.84 9672.26 1637.82
 9677.61  1637.8 9683.51 1637.81 9689.12 1637.81 9697.62 1637.83 9738.52    1638
 9745.24 1638.03 9748.74 1638.04 9756.25 1638.07 9761.67 1638.07  9768.2  1638.1
 9784.75 1638.01 9859.15 1637.76 9864.14  1637.7 9866.34 1637.73 9866.53 1637.73
  9867.2 1637.72 9867.66 1637.72 9900.83  1637.3  9911.81637.187 9940.891636.887
 9997.85  1636.310054.96 1636.8710070.12 1637.0310076.131637.10710099.81 1637.41
10125.19  1637.810140.93    163810153.44 1638.2210156.46 1638.2710160.81 1638.33
10226.14    1639 10245.5 1639.1810270.08  1639.410277.65 1639.4610338.07 1639.84
 10342.8  1639.910346.79 1639.9310355.59 1640.0110367.05 1640.1110411.25 1640.32
10489.48    164110491.01 1641.0510491.97 1641.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9502.81    .035 9900.83    .04510076.13    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.8910054.96               499  500.01     500            .1        .3
Left Levee      Station=  9768.2      Elevation=  1638.1

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1638.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.18  * Wt. n-Val.              *   0.043  *   0.045  *   0.041  *
* W.S. Elev (ft)         * 1637.83  * Reach Len. (ft)         *  499.00  *  500.01  *  500.00  *
* Crit W.S. (ft)         * 1637.60  * Flow Area (sq ft)       *   42.02  *  141.85  *   37.39  *
* E.G. Slope (ft/ft)     *0.009319  * Area (sq ft)            *   42.02  *  141.85  *   37.39  *
* Q Total (cfs)          *  710.00  * Flow (cfs)               *   94.32  *  522.84  *   92.84  *
* Top Width (ft)         *  290.27  * Top Width (ft)           *  103.39  *  114.07  *   72.81  *
* Vel Total (ft/s)       *    3.21  * Avg. Vel. (ft/s)         *    2.24  *    3.69  *    2.48  *
* Max Chl Dpth (ft)      *    1.53  * Hydr. Depth (ft)         *    0.41  *    1.24  *    0.51  *
* Conv. Total (cfs)      *  7354.9  * Conv. (cfs)              *   977.1  *  5416.1  *   961.7  *
* Length Wtd. (ft)       *  499.68  * Wetted Per. (ft)         *  103.40  *  114.08  *   72.81  *
```

```
* Min Ch El (ft)          * 1636.30  * Shear (lb/sq ft)        *    0.24  *    0.72  *    0.30  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)  *    0.53  *    2.67  *    0.74  *
* Frctn Loss (ft)         *    3.30  * Cum Volume (acre-ft)    *   21.10  *   51.10  *   16.39  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *   47.66  *   45.01  *   30.23  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1638.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.045  *   0.045  *   0.045  *
* W.S. Elev (ft)          * 1637.91  * Reach Len. (ft)        *  499.00  *  500.01  *  500.00  *
* Crit W.S. (ft)          * 1637.58  * Flow Area (sq ft)      *   19.97  *  151.09  *   17.71  *
* E.G. Slope (ft/ft)      *0.009805  * Area (sq ft)           *   19.97  *  151.09  *   17.71  *
* Q Total (cfs)           *  710.00  * Flow (cfs)              *   60.06  *  595.82  *   54.12  *
* Top Width (ft)          *  154.68  * Top Width (ft)          *   21.85  *  114.07  *   18.76  *
* Vel Total (ft/s)        *    3.76  * Avg. Vel. (ft/s)        *    3.01  *    3.94  *    3.06  *
* Max Chl Dpth (ft)       *    1.61  * Hydr. Depth (ft)        *    0.91  *    1.32  *    0.94  *
* Conv. Total (cfs)       *  7170.3  * Conv. (cfs)             *   606.5  *  6017.2  *   546.6  *
* Length Wtd. (ft)        *  499.97  * Wetted Per. (ft)        *   22.65  *  114.08  *   19.60  *
* Min Ch El (ft)          * 1636.30  * Shear (lb/sq ft)        *    0.54  *    0.81  *    0.55  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    1.62  *    3.20  *    1.69  *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)    *    1.89  *   66.35  *    1.35  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    1.26  *   45.01  *    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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9768.20   * 9940.89   *    94.32 *    42.02 *   103.40 *    13.29 *
0.41 *     2.24 *
* 2        * Chan      * 9940.89   * 10054.96  *   522.84 *   141.85 *   114.08 *    73.64 *
1.24 *     3.69 *
* 3        * ROB       * 10054.96  * 10273.46  *    92.84 *    37.39 *    72.81 *    13.08 *
0.51 *     2.48 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9768.20   * 9940.89   *    60.06 *    19.97 *    22.65 *     8.46 *
0.91 *     3.01 *
```

```
* 2          * Chan       * 9940.89    * 10054.96  *    595.82 *    151.09 *    114.08 *     83.92 *
1.32 *      3.94 *
* 3          * ROB        * 10054.96   * 10273.46  *     54.12 *     17.71 *     19.60 *      7.62 *
0.94 *      3.06 *
*****************************************************************************************************
******************

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

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 2.267

INPUT
Description:
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
    9367  1634.7 9403.67 1634.84 9430.58 1635.01 9440.64 1634.88 9485.81 1634.55
 9527.01  1634.1  9528.8 1634.13  9530.1 1634.12 9530.63 1634.13 9531.64 1634.13
 9535.87  1634.2 9570.92 1634.37 9592.14 1634.37 9604.08 1634.32 9608.35 1634.34
 9611.25  1634.3  9619.6 1634.35 9621.96 1634.34    9624 1634.34 9624.88  1634.3
 9627.15 1634.32 9639.17 1634.27  9652.5 1634.21 9683.56  1634.1 9687.07 1634.05
 9697.04 1634.08 9700.67 1634.08 9711.18 1634.12 9717.76  1634.1 9719.28 1634.07
  9724.6 1634.06 9726.01 1634.06 9732.19 1634.11 9741.71 1634.13  9751.1 1634.16
 9752.15 1634.17 9756.18  1634.2 9761.43 1634.13 9767.72 1634.08 9773.36 1634.04
 9775.99    1634 9778.82    1634 9820.74 1633.66 9823.49  1633.6 9827.49 1633.66
 9829.31 1633.68 9832.63 1633.72 9840.89 1633.81 9856.89    1634 9862.89    1634
 9865.61 1634.03 9878.54 1634.12 9881.781634.172 9883.47  1634.2 9892.77 1634.12
  9920.3 1634.02 9922.64    1634 9952.11    1634 9991.58 1633.9210015.88 1633.82
10070.05 1633.7510105.91 1633.6410117.02 1633.8410120.38  1633.910122.86    1634
10143.12 1634.4210143.73 1634.43 10143.9 1634.4310159.45  1634.910197.96 1635.27
 10229.7 1635.7910241.97 1635.9210249.33    163610257.43  1636.110314.01 1636.67
10341.74 1636.8610431.07 1637.3710431.72 1637.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
    9367    .035 9883.47    .04510143.12    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9883.4710122.86              494  517.67     517              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1634.68  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.               *   0.035  *   0.045  *   0.045  *
* W.S. Elev (ft)         * 1634.63  * Reach Len. (ft)          *  494.00  *  517.67  *  517.00  *
* Crit W.S. (ft)         * 1634.36  * Flow Area (sq ft)        *  197.29  *  177.30  *    9.23  *
* E.G. Slope (ft/ft)     *0.004928  * Area (sq ft)             *  197.29  *  177.30  *    9.23  *
* Q Total (cfs)          *  710.00  * Flow (cfs)               *  362.13  *  336.42  *   11.45  *
* Top Width (ft)         *  675.05  * Top Width (ft)           *  408.12  *  239.39  *   27.54  *
* Vel Total (ft/s)       *    1.85  * Avg. Vel. (ft/s)         *    1.84  *    1.90  *    1.24  *
* Max Chl Dpth (ft)      *    1.03  * Hydr. Depth (ft)         *    0.48  *    0.74  *    0.34  *
* Conv. Total (cfs)      * 10114.4  * Conv. (cfs)              *  5158.8  *  4792.5  *   163.0  *
* Length Wtd. (ft)       *  508.62  * Wetted Per. (ft)         *  408.14  *  239.40  *   27.55  *
* Min Ch El (ft)         * 1633.64  * Shear (lb/sq ft)         *    0.15  *    0.23  *    0.10  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)   *    0.27  *    0.43  *    0.13  *
* Frctn Loss (ft)        *    2.97  * Cum Volume (acre-ft)     *   19.73  *   49.27  *   16.13  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   44.73  *   42.98  *   29.65  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1635.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.045	
W.S. Elev (ft)	1635.15	Reach Len. (ft)	494.00	517.67	517.00
Crit W.S. (ft)		Flow Area (sq ft)		302.11	
E.G. Slope (ft/ft)	0.003758	Area (sq ft)		302.11	
Q Total (cfs)	710.00	Flow (cfs)		710.00	
Top Width (ft)	239.39	Top Width (ft)		239.39	
Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)		1.26	
Conv. Total (cfs)	11582.3	Conv. (cfs)		11582.3	
Length Wtd. (ft)	517.67	Wetted Per. (ft)		241.49	
Min Ch El (ft)	1633.64	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.69	
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	1.78	63.75	1.25
C & E Loss (ft)	0.01	Cum SA (acres)	1.14	42.98	0.85

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9367.00	9625.23	55.53	44.18	149.89	7.82	0.29	1.26
2	LOB	9625.23	9883.47	306.60	153.10	258.24	43.18	0.59	2.00
3	Chan	9883.47	10122.86	336.42	177.30	239.40	47.38	0.74	1.90
4	ROB	10122.86	10277.29	11.45	9.23	27.55	1.61	0.34	1.24

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9883.47	10122.86	710.00	302.11	241.49	100.00	1.26	2.35

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.

CROSS SECTION

RIVER: T4N-R3W-S09
REACH: REACH-1 RS: 2.169

INPUT

Description:

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9430.88	1632	9431.83	1632	9433.53	1632	9434.05	1631.99	9442.16	1631.96
9443.27	1632	9448.96	1631.92	9449.97	1631.93	9475.95	1631.88	9489.29	1631.83
9527.8	1631.7	9592.33	1631.18	9602.18	1631.12	9615.9	1631.17	9664.62	1631.44
9670.97	1631.4	9680.02	1631.29	9713.34	1631.04	9751.53	1631.38	9767.36	1631.47
9819.99	1631.4	9841.62	1631.32	9856.23	1631.35	9872.28	1631.4	9875.63	1631.4
9883.24	1631.4	9892.96	1631.32	9902.25	1631.22	9947.55	1630.53	9987.3	1630.43
9990.72	1630.51	0007.39	1630.61	10050.09	1631.08	10063.43	1631.14	10078.92	1631.14
10097.49	163110	107.99	1630.88	10116.23	1631.08	10152.58	163110	160.78	1630.93
10166.04	163110	223.13	1631.58	10250.45	1631.87	10262.86	163210	270.05	1632.08
10274.72	1632.11	0279.94	1632.19	10325.42	1632.89	10354.01	1633.17	10433.65	1633.35
10465.68	1633.4	10467	1633.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9430.88	.035	9902.25	.045	10063.43	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9902.25	10063.43	550	548.32	523	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1631.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.035	0.045	0.035
W.S. Elev (ft)	1631.63	Reach Len. (ft)	550.00	548.32	523.00
Crit W.S. (ft)	1631.46	Flow Area (sq ft)	109.91	141.59	79.82
E.G. Slope (ft/ft)	0.007010	Area (sq ft)	109.91	141.59	79.82
Q Total (cfs)	710.00	Flow (cfs)	175.43	359.03	175.53
Top Width (ft)	690.43	Top Width (ft)	365.24	161.18	164.01
Vel Total (ft/s)	2.14	Avg. Vel. (ft/s)	1.60	2.54	2.20
Max Chl Dpth (ft)	1.20	Hydr. Depth (ft)	0.30	0.88	0.49
Conv. Total (cfs)	8479.8	Conv. (cfs)	2095.3	4288.1	2096.5
Length Wtd. (ft)	545.42	Wetted Per. (ft)	365.25	161.19	164.02
Min Ch El (ft)	1630.43	Shear (lb/sq ft)	0.13	0.38	0.21
Alpha	1.11	Stream Power (lb/ft s)	0.21	0.97	0.47
Frctn Loss (ft)	3.19	Cum Volume (acre-ft)	17.99	47.37	15.60
C & E Loss (ft)	0.00	Cum SA (acres)	40.35	40.60	28.52

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 OUTPUT Profile #2

E.G. Elev (ft)	1632.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.045	
W.S. Elev (ft)	1631.91	Reach Len. (ft)	550.00	548.32	523.00
Crit W.S. (ft)		Flow Area (sq ft)		187.47	
E.G. Slope (ft/ft)	0.010886	Area (sq ft)		187.47	
Q Total (cfs)	710.00	Flow (cfs)		710.00	
Top Width (ft)	161.18	Top Width (ft)		161.18	
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)		3.79	
Max Chl Dpth (ft)	1.48	Hydr. Depth (ft)		1.16	
Conv. Total (cfs)	6805.0	Conv. (cfs)		6805.0	
Length Wtd. (ft)	548.32	Wetted Per. (ft)		162.65	
Min Ch El (ft)	1630.43	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		2.97	
Frctn Loss (ft)	3.41	Cum Volume (acre-ft)	1.78	60.84	1.25
C & E Loss (ft)	0.04	Cum SA (acres)	1.14	40.60	0.85

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.

Profile #1

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9430.88   * 9666.56   *    63.89 *    39.61 *   129.56 *     9.00 *
0.31 *     1.61 *
* 2         * LOB       * 9666.56   * 9902.25   *   111.54 *    70.30 *   235.69 *    15.71 *
0.30 *     1.59 *
* 3         * Chan      * 9902.25   * 10063.43  *   359.03 *   141.59 *   161.19 *    50.57 *
0.88 *     2.54 *
* 4         * ROB       * 10063.43  * 10265.21  *   175.53 *    79.82 *   164.02 *    24.72 *
0.49 *     2.20 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9902.25   * 10063.43  *   710.00 *   187.47 *   162.65 *   100.00 *
1.16 *     3.79 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 2.065

INPUT
Description:
Station Elevation Data    num=     109
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9210.19  1628.5 9211.38 1628.51 9230.42 1628.42 9295.11 1628.36 9310.43 1628.34
 9314.86  1628.4 9318.29 1628.35 9348.21 1628.48 9356.35  1628.5 9356.61  1628.5
 9357.53  1628.5 9358.29 1628.51 9407.69 1628.38 9411.06 1628.37 9414.97 1628.37
 9415.37  1628.4 9418.68 1628.37 9421.87 1628.38 9424.78 1628.38 9469.35 1628.27
 9475.13  1628.3 9485.77 1628.26  9486.6 1628.25 9490.54 1628.27 9499.64 1628.28
 9531.66  1628.4 9536.25 1628.39 9541.24 1628.39 9545.79  1628.4 9547.02 1628.38
 9554.22  1628.4 9596.21 1628.17 9610.08 1628.25 9615.66 1628.15 9645.09 1628.17
 9650.87  1628.2 9653.67  1628.2 9656.97  1628.2 9660.43  1628.2 9671.29 1628.24
 9677.69  1628.2 9682.97 1628.21 9727.66 1628.47 9731.48 1628.49 9734.82 1628.51
 9736.32  1628.5 9778.53 1628.41 9779.27 1628.42 9779.35 1628.42 9779.94 1628.42
 9781.06  1628.4 9783.44 1628.46  9823.4 1628.78 9824.13 1628.79 9850.25  1628.5
 9888.67  1628.2 9894.87 1628.13 9897.19 1628.13 9899.48 1628.12    9902 1628.11
 9905.26  1628.1 9909.76 1628.09 9933.78 1628.05 9936.65 1628.04    9940 1628.02
 9941.16    1628 9941.67 1628.03 9979.85 1627.36  9985.3 1627.24 9992.71 1627.25
10022.54  1627.310030.51 1627.2610039.34  1627.210047.53 1627.2910051.13 1627.18
10074.08  1627.210104.76 1627.0710116.22 1627.1510119.28 1627.1710125.17 1627.16
10136.54  1627.210157.67 1627.2510165.99 1627.2810173.06 1627.4810177.99 1627.59
10180.61  1627.710184.46 1627.7510192.89    162810200.36 1628.2210205.44 1628.35
10227.25  1628.810266.06 1629.6810291.04 1629.7910318.19 1629.9510324.14    1630
10334.56  1630.110342.89 1630.1410351.49 1630.19 10362.2 1630.2510400.18  1630.6
10402.04  1630.610403.24 1630.6210403.27 1630.6210404.32 1630.6210405.47 1630.61
10406.88  1630.610408.68  1630.610411.43 1630.5810411.87 1630.58
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9210.19    .033    9940     .0510192.89    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994010192.89               444  496.36     579            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1628.52  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.033  *   0.050  *   0.033  *
* W.S. Elev (ft)          * 1628.44  * Reach Len. (ft)        *  444.00  *  496.36  *  579.00  *
* Crit W.S. (ft)          * 1627.95  * Flow Area (sq ft)      *   79.08  *  280.76  *    3.52  *
* E.G. Slope (ft/ft)      *0.004955  * Area (sq ft)           *   79.08  *  280.76  *    3.52  *
* Q Total (cfs)           *  710.00  * Flow (cfs)             *   76.43  *  629.69  *    3.88  *
* Top Width (ft)          *  827.14  * Top Width (ft)         *  557.14  *  252.89  *   17.11  *
* Vel Total (ft/s)        *    1.95  * Avg. Vel. (ft/s)       *    0.97  *    2.24  *    1.10  *
* Max Chl Dpth (ft)       *    1.37  * Hydr. Depth (ft)       *    0.14  *    1.11  *    0.21  *
* Conv. Total (cfs)       * 10086.5  * Conv. (cfs)            *  1085.7  *  8945.6  *    55.2  *
* Length Wtd. (ft)        *  500.11  * Wetted Per. (ft)       *  557.15  *  252.91  *   17.11  *
* Min Ch El (ft)          * 1627.07  * Shear (lb/sq ft)       *    0.04  *    0.34  *    0.06  *
* Alpha                   *    1.20  * Stream Power (lb/ft s) *    0.04  *    0.77  *    0.07  *
* Frctn Loss (ft)         *    3.26  * Cum Volume (acre-ft)   *   16.79  *   44.72  *   15.10  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *   34.52  *   37.99  *   27.43  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1628.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)          * 1628.61  * Reach Len. (ft)        *  444.00  *  496.36  *  579.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  322.04  *          *
* E.G. Slope (ft/ft)      *0.004013  * Area (sq ft)           *          *  322.04  *          *
* Q Total (cfs)           *  710.00  * Flow (cfs)             *          *  710.00  *          *
* Top Width (ft)          *  252.89  * Top Width (ft)         *          *  252.89  *          *
* Vel Total (ft/s)        *    2.20  * Avg. Vel. (ft/s)       *          *    2.20  *          *
* Max Chl Dpth (ft)       *    1.54  * Hydr. Depth (ft)       *          *    1.27  *          *
* Conv. Total (cfs)       * 11207.8  * Conv. (cfs)            *          * 11207.8  *          *
* Length Wtd. (ft)        *  501.23  * Wetted Per. (ft)       *          *  254.11  *          *
* Min Ch El (ft)          * 1627.07  * Shear (lb/sq ft)       *          *    0.32  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.70  *          *
* Frctn Loss (ft)         *    3.03  * Cum Volume (acre-ft)   *    1.78  *   57.63  *    1.25  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    1.14  *   37.99  *    0.85  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9210.19   * 9575.10   *    15.47 *    25.49 *   306.28 *     2.18 *
0.08 *     0.61 *
* 2        * LOB       * 9575.10   * 9940.00   *    60.96 *    53.59 *   250.87 *     8.59 *
0.21 *     1.14 *
* 3        * Chan      * 9940.00   * 10192.89  *   629.69 *   280.76 *   252.91 *    88.69 *
1.11 *     2.24 *
* 4        * ROB       * 10192.89  * 10302.38  *     3.88 *     3.52 *    17.11 *     0.55 *
0.21 *     1.10 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9940.00   * 10192.89  *   710.00 *   322.04 *   254.11 *   100.00 *
1.27 *     2.20 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 1.971

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 740cfs.
Station Elevation Data    num=     127
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9514.9  1625.8 9524.53 1625.69 9545.97 1625.85 9557.15 1625.95 9557.54 1625.95
 9557.66    1626 9557.89 1625.95 9558.19 1625.95 9585.91 1625.78 9609.07 1625.59
 9631.08  1625.6 9681.32 1625.55 9690.19 1625.38 9765.65  1625.5 9767.43  1625.5
 9769.42 1625.49 9778.14 1625.83 9778.76 1625.82  9780.7  1625.9 9783.46 1625.83
 9785.88  1625.8 9793.61 1625.58 9816.65 1625.36 9816.69  1625.4 9816.72 1625.36
 9816.89 1625.36 9823.93 1624.67 9827.04 1624.48 9833.92  1624.5 9836.43 1624.48
 9846.87 1624.53 9863.78 1624.62  9869.1  1624.6 9887.04 1624.56 9887.91 1624.55
 9888.18 1624.55 9888.34  1624.6 9888.54 1624.55 9888.78 1624.54 9909.91 1624.32
 9912.46 1624.33 9915.42  1624.3 9920.56 1624.22 9929.071624.195 9930.71 1624.19
 9931.48 1624.19 9932.46  1624.2 9936.93  1624.1 9940.85    1624 9945.05 1623.86
 9947.68  1623.8 9954.01  1623.7 9957.41  1623.8 9958.05 1623.78 9961.84 1623.77
 9974.64 1623.82 9979.95 1623.86 9981.43  1623.9 9982.65 1623.86 9983.11 1623.86
 9988.14  1623.9 9989.59  1623.9  9992.2 1623.94 9995.23 1623.96  9997.9 1623.99
 9998.96    162410003.72    162410006.37 1624.0410012.65    162410015.83    1624
10016.52 1624.0310019.17 1624.0510022.27  1624.110023.98 1624.1310026.14  1624.2
10026.14 1624.1610027.94 1624.2210030.44 1624.1810039.46  1624.2 10069.9  1624.2
10083.77 1624.3610089.69 1624.3710090.881624.41610095.92 1624.6110112.33  1624.3
10112.36 1624.3410114.67 1624.4310121.75 1624.7810134.14 1625.46 10135.2  1625.5
 10142.6  1625.510152.16 1625.5310156.19 1625.6610158.64 1625.6710160.48  1625.6
10176.15 1625.3210177.39 1625.3210180.79 1625.3310235.38 1625.0510246.32  1625.1
10250.04 1625.1910279.87 1625.6110287.14 1625.6710307.85 1625.8110309.59  1625.8
10317.45 1625.8410340.31    162610356.23    162610359.05  1625.910377.26 1625.92
 10400.4 1625.9210401.92 1625.9110420.84 1625.86   10459  1625.810463.82 1625.76
10468.14 1625.7410486.61 1625.8410518.85    162610520.04    162610528.46 1626.06
 10529.8 1626.0510536.67 1626.0210537.68  1626.110598.06 1626.0410616.15    1626
 10627.6 1626.0110692.91  1626.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
  9514.9    .033 9888.78     .0510090.88    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9912.4610027.94              489  503.99     482             .1       .3
Right Levee     Station=10158.64      Elevation= 1625.67
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1625.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.037	0.050	0.045
W.S. Elev (ft)	1625.12	Reach Len. (ft)	489.00	503.99	482.00
Crit W.S. (ft)	1624.85	Flow Area (sq ft)	54.01	131.24	75.79
E.G. Slope (ft/ft)	0.008821	Area (sq ft)	54.01	131.24	75.79
Q Total (cfs)	740.00	Flow (cfs)	141.33	398.80	199.87
Top Width (ft)	308.53	Top Width (ft)	93.09	115.48	99.95
Vel Total (ft/s)	2.83	Avg. Vel. (ft/s)	2.62	3.04	2.64
Max Chl Dpth (ft)	1.42	Hydr. Depth (ft)	0.58	1.14	0.76
Conv. Total (cfs)	7879.2	Conv. (cfs)	1504.8	4246.2	2128.2
Length Wtd. (ft)	496.11	Wetted Per. (ft)	93.14	115.54	100.00
Min Ch El (ft)	1623.70	Shear (lb/sq ft)	0.32	0.63	0.42
Alpha	1.02	Stream Power (lb/ft s)	0.84	1.90	1.10
Frctn Loss (ft)	3.44	Cum Volume (acre-ft)	16.11	42.37	14.57
C & E Loss (ft)	0.02	Cum SA (acres)	31.21	35.89	26.65

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 OUTPUT Profile #2

E.G. Elev (ft)	1625.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.050	0.050	0.050
W.S. Elev (ft)	1625.42	Reach Len. (ft)	489.00	503.99	482.00
Crit W.S. (ft)	1624.97	Flow Area (sq ft)	6.18	166.38	29.46
E.G. Slope (ft/ft)	0.009869	Area (sq ft)	6.18	166.38	29.46
Q Total (cfs)	740.00	Flow (cfs)	17.23	626.43	96.34
Top Width (ft)	145.19	Top Width (ft)	5.67	115.48	24.04
Vel Total (ft/s)	3.66	Avg. Vel. (ft/s)	2.79	3.76	3.27
Max Chl Dpth (ft)	1.72	Hydr. Depth (ft)	1.09	1.44	1.23
Conv. Total (cfs)	7449.0	Conv. (cfs)	173.5	6305.7	969.8
Length Wtd. (ft)	502.38	Wetted Per. (ft)	6.74	115.54	25.26
Min Ch El (ft)	1623.70	Shear (lb/sq ft)	0.57	0.89	0.72
Alpha	1.01	Stream Power (lb/ft s)	1.58	3.34	2.35
Frctn Loss (ft)	3.40	Cum Volume (acre-ft)	1.75	54.85	1.06
C & E Loss (ft)	0.03	Cum SA (acres)	1.11	35.89	0.69

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9713.68	9912.46	141.33	54.01	93.14	19.10	0.58	2.62
2	Chan	9912.46	10027.94	398.80	131.24	115.54	53.89	1.14	3.04
3	ROB	10027.94	10158.64	199.87	75.79	100.00	27.01	0.76	2.64

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9713.68	9912.46	17.23	6.18	6.74	2.33	1.09	2.79
* 2	Chan	9912.46	10027.94	626.43	166.38	115.54	84.65	1.44	3.76
* 3	ROB	10027.94	10158.64	96.34	29.46	25.26	13.02	1.23	3.27

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: T4N-R3W-S09
REACH: REACH-1 RS: 1.876

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9320.21	1623.3	9321.7	1623.33	9348.96	1623.14	9382.89	1623.03	9396.56	1623.1
9412.66	1623.2	9428.97	1623.23	9438.79	1623.02	9472.9	1622.74	9498.35	1622.28
9530.21	1622.4	9530.79	1622.42	9531.73	1622.41	9532.97	1622.4	9544.02	1622.4
9578.26	1622.34	9591.51	1622.21	9616.5	1622.21	9618.93	1622.18	9620.29	1622.2
9646.83	1622.11	9657.13	1622.04	9664.86	1622.07	9683.58	1622.02	9688.35	1622
9688.47	1622	9733.37	1621.9	9737.01	1621.93	9743.7	1621.89	9750.37	1621.9
9770.58	1621.95	9784.52	1621.93	9797	1621.86	9804.06	1621.8	9807.71	1621.82
9810.07	1621.82	9812.06	1621.8	9864.91	1621.35	9865.7	1621.35	9867.51	1621.34
9890.66	1621.14	9896.19	1621.102	9911.18	1621	9937.31	1621.048	9948.82	1621.069
9960.23	1621.09	9972.72	1621.12	10015.35	1620.82	10017.91	1620.81	10066.63	1620.57
10071.18	1620.61	10076.09	1620.59	10077.19	1620.52	10122.41	1620.71	10154.94	1620.79
10169.77	1620.88	10182.02	1620.95	10195.81	1621.03	10201.37	1621.01	10229.98	1621
10237.57	1620.96	10248.41	1621.04	10255.32	1621.17	10275.6	1621.33	10309.22	1622
10310.81	1621.99	10311.58	1622.01	10313.45	1622.07	10314.24	1622.07	10315.86	1622.1
10319.47	1622.11	10326.24	1622.06	10338.97	1622	10343.5	1622	10346.29	1621.99
10349.88	1621.97	10353.15	1621.88	10360.19	1621.6	10382.65	1621.23	10382.97	1621.22
10383.47	1621.23	10402.47	1621.8	10414.77	1621.78	10421.75	1621.79	10428.7	1621.87
10450.61	1621.85	10459.61	1621.9	10471.69	1621.85	10490.25	1621.85	10502.03	1621.83
10504.03	1621.84	10523.56	1621.9	10536.24	1621.96	10551.79	1622	10553.25	1622
10555.77	1622.01	10557.05	1622.01	10562.2	1622.03	10593.09	1622.16	10596.68	1622.2
10609.6	1622.22	10623.07	1622.28	10637.4	1622.37	10649.69	1622.43	10660.32	1622.5
10664.95	1622.55	10667.26	1622.56	10672.57	1622.56	10681.95	1622.8	10683.11	1622.8
10701.32	1622.99	10729.7	1623.16	10757.43	1623.31	10784.58	1623.49	10796.41	1623.5
10798.13	1623.55	10800.91	1623.56	10811.82	1623.8	10817.68	1623.78	10829.9	1623.7
10835.37	1623.79								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9320.21	.033	9972.72	.05	10195.81	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.72	10195.81	483	501.91	539	.1	.3

Right Levee Station=10315.86 Elevation= 1622.1

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1621.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.050	0.033
W.S. Elev (ft)	1621.72	Reach Len. (ft)	483.00	501.91	539.00
Crit W.S. (ft)	1621.39	Flow Area (sq ft)	74.67	212.27	55.64
E.G. Slope (ft/ft)	0.005587	Area (sq ft)	74.67	212.27	55.64
Q Total (cfs)	740.00	Flow (cfs)	156.76	456.13	127.11
Top Width (ft)	474.18	Top Width (ft)	151.59	223.09	99.50
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	2.10	2.15	2.28
Max Chl Dpth (ft)	1.20	Hydr. Depth (ft)	0.49	0.95	0.56
Conv. Total (cfs)	9900.4	Conv. (cfs)	2097.3	6102.5	1700.6
Length Wtd. (ft)	507.87	Wetted Per. (ft)	151.59	223.10	99.51
Min Ch El (ft)	1620.52	Shear (lb/sq ft)	0.17	0.33	0.20
Alpha	1.00	Stream Power (lb/ft s)	0.36	0.71	0.45
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	15.39	40.38	13.84
C & E Loss (ft)	0.00	Cum SA (acres)	29.84	33.93	25.55

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 OUTPUT Profile #2

E.G. Elev (ft)	1622.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.050	
W.S. Elev (ft)	1622.10	Reach Len. (ft)	483.00	501.91	539.00
Crit W.S. (ft)	1621.47	Flow Area (sq ft)		295.90	
E.G. Slope (ft/ft)	0.004919	Area (sq ft)		295.90	
Q Total (cfs)	740.00	Flow (cfs)		740.00	
Top Width (ft)	223.09	Top Width (ft)		223.09	
Vel Total (ft/s)	2.50	Avg. Vel. (ft/s)		2.50	
Max Chl Dpth (ft)	1.58	Hydr. Depth (ft)		1.33	
Conv. Total (cfs)	10551.1	Conv. (cfs)		10551.1	
Length Wtd. (ft)	501.91	Wetted Per. (ft)		225.14	
Min Ch El (ft)	1620.52	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.01	
Frctn Loss (ft)	3.11	Cum Volume (acre-ft)	1.71	52.18	0.89
C & E Loss (ft)	0.01	Cum SA (acres)	1.08	33.93	0.56

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9646.47	9972.72	156.76	74.67	151.59	21.18	0.49	2.10
2 Chan	9972.72	10195.81	456.13	212.27	223.10	61.64	0.95	2.15
3 ROB	10195.81	10315.86	127.11	55.64	99.51	17.18	0.56	2.28

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9972.72   * 10195.81  *   740.00 *   295.90 *   225.14 *   100.00 *
1.33 *     2.50 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 1.781

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9673.24  1619.4 9686.72 1619.17 9691.52 1619.13 9698.62 1618.95 9700.77 1618.88
 9705.89  1618.9 9715.49 1618.99 9719.38 1619.04 9721.38 1619.04 9764.09 1618.53
 9768.22  1618.5 9776.23 1618.47 9803.82 1618.28  9810.9 1618.25 9816.78 1618.23
 9823.17  1618.2 9846.78 1618.05 9855.14    1618 9878.911617.849 9889.84 1617.78
 9893.63 1617.76 9894.53  1617.8 9896.01 1617.74 9938.38 1617.58 9941.61 1617.58
 9958.07  1617.5 9969.35 1617.46 9991.83 1617.4210021.57 1617.7810030.47 1617.87
10041.32    161810042.76    161810043.97 1618.02 10044.9    161810048.18    1618
10063.51 1617.9710076.23 1617.9610098.44 1617.8910107.291617.89510116.25  1617.9
 10129.2 1617.8710137.54  1617.810138.03 1617.9310141.81    161810143.81    1618
10150.91 1618.19 10172.6 1618.8610175.91 1618.9610177.46 1619.0110178.44    1619
10219.83 1619.1210220.64 1619.1210231.73  1619.3   10267 1619.8310270.08  1619.9
10281.49  1618.810282.25 1618.7310302.86 1618.7910309.85 1618.8410310.62  1618.8
10312.68 1618.8610348.91 1619.1210356.94 1619.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9673.24    .033 9855.14     .0510043.97    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9855.1410043.97              547  496.44     453              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1618.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.033  *   0.050  *   0.033  *
* W.S. Elev (ft)         * 1618.67  * Reach Len. (ft)         *  547.00  *  496.44  *  453.00  *
* Crit W.S. (ft)         * 1618.35  * Flow Area (sq ft)       *   37.76  *  187.90  *   82.11  *
* E.G. Slope (ft/ft)     *0.006375  * Area (sq ft)            *   37.76  *  187.90  *   82.11  *
* Q Total (cfs)          *  740.00  * Flow (cfs)               *   69.60  *  444.36  *  226.04  *
* Top Width (ft)         *  414.21  * Top Width (ft)           *  102.87  *  188.83  *  122.52  *
* Vel Total (ft/s)       *    2.40  * Avg. Vel. (ft/s)         *    1.84  *    2.36  *    2.75  *
* Max Chl Dpth (ft)      *    1.25  * Hydr. Depth (ft)         *    0.37  *    1.00  *    0.67  *
* Conv. Total (cfs)      *  9268.4  * Conv. (cfs)              *   871.7  *  5565.6  *  2831.1  *
* Length Wtd. (ft)       *  495.50  * Wetted Per. (ft)         *  102.87  *  188.84  *  122.54  *
* Min Ch El (ft)         * 1617.42  * Shear (lb/sq ft)         *    0.15  *    0.40  *    0.27  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)   *    0.27  *    0.94  *    0.73  *
* Frctn Loss (ft)        *    3.27  * Cum Volume (acre-ft)     *   14.77  *   38.08  *   12.99  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   28.42  *   31.56  *   24.18  *
*****************************************************************************************

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 OUTPUT Profile #2

E.G. Elev (ft)	1619.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.050	
W.S. Elev (ft)	1618.94	Reach Len. (ft)	547.00	496.44	453.00
Crit W.S. (ft)	1618.45	Flow Area (sq ft)		239.03	
E.G. Slope (ft/ft)	0.008030	Area (sq ft)		239.03	
Q Total (cfs)	740.00	Flow (cfs)		740.00	
Top Width (ft)	188.83	Top Width (ft)		188.83	
Vel Total (ft/s)	3.10	Avg. Vel. (ft/s)		3.10	
Max Chl Dpth (ft)	1.52	Hydr. Depth (ft)		1.27	
Conv. Total (cfs)	8257.8	Conv. (cfs)		8257.8	
Length Wtd. (ft)	496.44	Wetted Per. (ft)		190.70	
Min Ch El (ft)	1617.42	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		1.95	
Frctn Loss (ft)	3.40	Cum Volume (acre-ft)	1.71	49.10	0.89
C & E Loss (ft)	0.00	Cum SA (acres)	1.08	31.56	0.56

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9673.24	9764.19	0.50	0.85	11.92	0.07	0.07	0.59
2	LOB	9764.19	9855.14	69.10	36.91	90.95	9.34	0.41	1.87
3	Chan	9855.14	10043.97	444.36	187.90	188.84	60.05	1.00	2.36
4	ROB	10043.97	10200.46	226.04	82.11	122.54	30.55	0.67	2.75

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9855.14	10043.97	740.00	239.03	190.70	100.00	1.27	3.10

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: T4N-R3W-S09
REACH: REACH-1 RS: 1.686

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of levee appears to be minor tributary flowing into floodplain and joins downstream of this cross-section.
Station Elevation Data num= 101

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9245.88    1616  9251.1    1616 9252.01 1615.99 9263.17 1615.93 9315.76  1615.8
 9340.01 1615.57 9363.42 1615.39 9397.03  1615.4 9405.43 1615.48 9440.13  1615.4
 9451.42 1615.38 9452.39 1615.37 9452.78 1615.38 9460.78 1615.45 9460.93  1615.4
 9472.19 1615.58 9483.74 1615.54 9486.75 1615.56 9499.45 1615.51 9515.12  1615.5
 9537.41  1615.6 9546.59 1615.68 9555.38 1615.67 9579.17 1615.62  9583.6  1615.6
 9585.56 1615.61 9596.61 1615.58 9614.17 1615.41 9620.18 1615.36 9629.58  1615.3
 9644.66 1615.15 9651.35 1615.09  9674.1 1614.98 9689.62 1615.04 9694.68    1615
  9697.9 1615.06 9713.89 1615.18 9718.39 1615.19 9727.86 1615.15 9746.87  1615.1
 9753.46 1615.03 9757.89    1615 9765.65 1614.94 9799.931615.009 9820.48 1615.05
 9826.34  1615.1 9827.51 1615.06 9830.48 1615.06 9857.97 1614.78 9877.76  1614.6
 9889.03 1614.49  9895.9 1614.45 9921.34 1614.32 9927.67 1614.29 9950.23 1614.37
 9989.45 1614.53 9997.15 1614.6310002.92  1614.710017.86 1614.6510020.35  1614.3
10021.91    161410023.33 1613.7210023.61  1613.710023.86 1613.6610024.45  1613.7
10024.94 1613.7210032.63    161410032.64    161410033.35 1614.0310036.11 1614.57
10036.54 1614.6410038.36 1614.61   10044  1614.610047.19 1614.1110047.86    1614
10048.17 1613.95 10050.8 1613.61 10053.7  1613.910054.12    161410054.44 1614.04
10058.24 1614.48 10064.7 1614.7910066.34  1614.910068.26 1614.9710077.681615.021
10095.24 1615.1210099.79 1615.1610136.11  1615.510141.07 1615.4810142.54 1615.49
10144.65  1615.510160.49  1615.5 10174.9 1615.5610187.35 1615.6310212.85 1615.64
10234.48  1615.710241.95 1615.7810242.02  1615.810249.45 1615.9210256.04    1616
10257.46    1616

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9245.88    .033 9830.48     .0410095.24    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9830.4810068.26              565  490.56     450            .1        .3
Left Levee      Station= 9546.59      Elevation= 1615.68

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1615.50  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.033   *   0.040   *   0.038  *
* W.S. Elev (ft)          * 1615.39  * Reach Len. (ft)         *  565.00   *  490.56   *  450.00  *
* Crit W.S. (ft)          * 1615.22  * Flow Area (sq ft)       *   66.21   *  213.60   *   13.30  *
* E.G. Slope (ft/ft)      *0.006816  * Area (sq ft)            *   66.21   *  213.60   *   13.30  *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *  112.62   *  609.38   *   18.00  *
* Top Width (ft)          *  507.81  * Top Width (ft)          *  213.92   *  237.78   *   56.11  *
* Vel Total (ft/s)        *    2.52  * Avg. Vel. (ft/s)        *    1.70   *    2.85   *    1.35  *
* Max Chl Dpth (ft)       *    1.78  * Hydr. Depth (ft)        *    0.31   *    0.90   *    0.24  *
* Conv. Total (cfs)       *  8963.2  * Conv. (cfs)             *  1364.1   *  7381.1   *   218.0  *
* Length Wtd. (ft)        *  491.06  * Wetted Per. (ft)        *  213.93   *  238.07   *   56.11  *
* Min Ch El (ft)          * 1613.61  * Shear (lb/sq ft)        *    0.13   *    0.38   *    0.10  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    0.22   *    1.09   *    0.14  *
* Frctn Loss (ft)         *    3.76  * Cum Volume (acre-ft)    *   14.12   *   35.79   *   12.49  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   26.44   *   29.13   *   23.25  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1615.68  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *           *   0.040   *          *
* W.S. Elev (ft)          * 1615.55  * Reach Len. (ft)         *  565.00   *  490.56   *  450.00  *
* Crit W.S. (ft)          * 1615.16  * Flow Area (sq ft)       *           *  250.75   *          *
* E.G. Slope (ft/ft)      *0.005924  * Area (sq ft)            *           *  250.75   *          *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *           *  740.00   *          *
* Top Width (ft)          *  237.78  * Top Width (ft)          *           *  237.78   *          *
* Vel Total (ft/s)        *    2.95  * Avg. Vel. (ft/s)        *           *    2.95   *          *
* Max Chl Dpth (ft)       *    1.94  * Hydr. Depth (ft)        *           *    1.05   *          *
* Conv. Total (cfs)       *  9614.0  * Conv. (cfs)             *           *  9614.0   *          *
* Length Wtd. (ft)        *  487.98  * Wetted Per. (ft)        *           *  239.14   *          *
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```
* Min Ch El (ft)          * 1613.61  * Shear (lb/sq ft)        *          *    0.39  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    1.14  *          *
* Frctn Loss (ft)         *    3.68  * Cum Volume (acre-ft)   *    1.71  *   46.30  *    0.89  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    1.08  *   29.13  *    0.56  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9546.59   * 9830.48   *   112.62 *    66.21 *   213.93 *    15.22 *
0.31 *     1.70 *
* 2         * Chan      * 9830.48   * 10068.26  *   609.38 *   213.60 *   238.07 *    82.35 *
0.90 *     2.85 *
* 3         * ROB       * 10068.26  * 10162.86  *    18.00 *    13.30 *    56.11 *     2.43 *
0.24 *     1.35 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9830.48   * 10068.26  *   740.00 *   250.75 *   239.14 *   100.00 *
1.05 *     2.95 *
*****************************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 1.594

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain and
             joins downstream of this cross-section.
Interpolated point added
             at (9870.72, 1610.91) to set bank station.
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9327.39    1612 9329.47 1612.01 9330.49    1612 9351.45 1611.88 9378.13 1611.69
 9391.84  1611.6  9414.3 1611.47 9418.61 1611.45 9440.65 1611.33 9455.48  1611.5
  9469.3 1611.65 9527.31 1611.77 9565.93  1611.7 9600.41 1611.83 9622.07  1611.9
 9641.94 1611.98 9652.11    1612 9653.64 1612.01 9659.98 1612.06 9667.14    1612
```

```
 9678.84 1612.04 9718.03    1612 9756.15 1611.97 9764.76 1611.95 9767.21    1612
 9775.87  1611.9 9777.11 1611.88 9778.61 1611.88 9785.75 1611.81 9787.68  1611.8
 9789.99 1611.76 9823.72 1611.45 9825.33 1611.43 9826.63 1611.42 9832.41  1611.4
 9870.72 1610.91 9885.61 1610.72 9890.46  1610.7 9894.22  1610.7 9913.23 1610.67
 9928.381610.636 9944.76  1610.6 9951.33 1610.5810001.22 1610.5910007.19 1610.59
10013.22 1610.6310018.72  1610.910066.34 1610.8210067.041610.82310087.66 1610.91
10099.62 1611.0210159.61 1611.4310162.43  1611.510192.98 1611.9710194.61 1611.12
10194.62 1611.1110194.81 1611.1110195.01  1611.110205.17 1611.0110210.67 1611.67
10211.71 1611.7910213.26 1611.9810213.85  1611.810218.07 1610.4910220.16 1610.92
 10221.6 1611.2910224.52 1611.5510229.52    161210229.69 1612.0210231.13 1612.16
10249.98 1612.13 10257.5 1612.1110268.42  1612.210277.96 1612.3310284.53 1612.41
10290.51  1612.510293.44 1612.4810297.75 1612.4910304.71  1612.5 10328.9 1612.65
10355.45  1612.610357.55 1612.6510358.42 1612.6410391.83  1612.910403.48    1613
10426.29  1613.310439.87 1613.4610482.34 1613.7710495.62 1613.8810499.48 1613.91
10501.16  1613.910504.86 1613.9410506.65 1613.9210508.47 1613.9310509.86 1613.93

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9327.39    .033 9832.41     .0410099.62    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9870.7210018.72              502  558.56     570            .1        .3
Left Levee      Station= 9678.84      Elevation= 1612.04

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1611.74  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.040  *   0.040  *   0.038  *
* W.S. Elev (ft)          * 1611.59  * Reach Len. (ft)         *  502.00  *  558.56  *  570.00  *
* Crit W.S. (ft)          * 1611.40  * Flow Area (sq ft)       *   19.41  *  140.05  *   92.98  *
* E.G. Slope (ft/ft)      *0.008687  * Area (sq ft)            *   19.41  *  140.05  *   92.98  *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *   36.02  *  467.37  *  236.60  *
* Top Width (ft)          *  387.13  * Top Width (ft)          *   62.56  *  148.00  *  176.56  *
* Vel Total (ft/s)        *    2.93  * Avg. Vel. (ft/s)        *    1.86  *    3.34  *    2.54  *
* Max Chl Dpth (ft)       *    1.10  * Hydr. Depth (ft)        *    0.31  *    0.95  *    0.53  *
* Conv. Total (cfs)       *  7939.4  * Conv. (cfs)             *   386.5  *  5014.4  *  2538.5  *
* Length Wtd. (ft)        *  551.44  * Wetted Per. (ft)        *   62.57  *  148.01  *  176.99  *
* Min Ch El (ft)          * 1610.58  * Shear (lb/sq ft)        *    0.17  *    0.51  *    0.28  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)  *    0.31  *    1.71  *    0.73  *
* Frctn Loss (ft)         *    3.18  * Cum Volume (acre-ft)    *   13.56  *   33.80  *   11.95  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   24.64  *   26.96  *   22.05  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1611.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *          *   0.040  *   0.040  *
* W.S. Elev (ft)          * 1611.75  * Reach Len. (ft)         *  502.00  *  558.56  *  570.00  *
* Crit W.S. (ft)          * 1611.51  * Flow Area (sq ft)       *          *  163.61  *   28.21  *
* E.G. Slope (ft/ft)      *0.009954  * Area (sq ft)            *          *  163.61  *   28.21  *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *          *  645.81  *   94.19  *
* Top Width (ft)          *  180.09  * Top Width (ft)          *          *  148.00  *   32.09  *
* Vel Total (ft/s)        *    3.86  * Avg. Vel. (ft/s)        *          *    3.95  *    3.34  *
* Max Chl Dpth (ft)       *    1.17  * Hydr. Depth (ft)        *          *    1.11  *    0.88  *
* Conv. Total (cfs)       *  7417.2  * Conv. (cfs)             *          *  6473.2  *   944.1  *
* Length Wtd. (ft)        *  553.92  * Wetted Per. (ft)        *          *  148.85  *   33.00  *
* Min Ch El (ft)          * 1610.58  * Shear (lb/sq ft)        *          *    0.68  *    0.53  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *          *    2.70  *    1.77  *
* Frctn Loss (ft)         *    2.92  * Cum Volume (acre-ft)    *    1.71  *   43.97  *    0.75  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    1.08  *   26.96  *    0.40  *
*****************************************************************************************
```

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

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9678.84   * 9870.72   *    36.02 *    19.41 *    62.57 *     4.87 *
0.31 *     1.86 *
* 2         * Chan      * 9870.72   * 10018.72  *   467.37 *   140.05 *   148.01 *    63.16 *
0.95 *     3.34 *
* 3         * ROB       * 10018.72  * 10264.29  *   236.60 *    92.98 *   176.99 *    31.97 *
0.53 *     2.54 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9870.72   * 10018.72  *   645.81 *   163.61 *   148.85 *    87.27 *
1.11 *     3.95 *
* 2         * ROB       * 10018.72  * 10264.29  *    94.19 *    28.21 *    33.00 *    12.73 *
0.88 *     3.34 *
*****************************************************************************************************
******************

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

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 1.488

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 780cfs.
Station Elevation Data    num=     119
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9166.94    1610 9172.65 1609.94 9173.13 1609.94 9219.38 1609.76 9248.35 1609.43
 9280.94  1609.2  9355.9 1608.82 9377.38 1608.77 9382.88 1608.78 9403.27 1608.71
 9438.15  1608.7 9473.45 1608.55 9505.58 1608.99  9508.2 1609.03 9525.25 1609.03
```

```
 9585.22  1608.9 9599.56 1608.79 9608.78 1608.74 9611.58 1608.73 9615.66  1608.7
 9651.86  1608.4 9678.25 1608.23 9702.96 1608.03 9703.16 1608.04 9707.47 1608.02
 9714.67    1608 9722.63 1608.02 9726.36    1608 9736.96    1608  9761.4 1608.12
 9789.02  1608.4 9820.69 1608.17 9823.83 1608.16 9864.43 1608.24 9866.39 1608.23
 9872.07  1608.2 9872.88 1608.25 9874.76 1608.22 9877.68 1608.19 9881.21 1608.15
 9885.61  1608.1 9890.96    1608 9894.92 1607.93 9907.92 1607.71 9910.41 1607.67
 9911.04  1607.7 9913.24 1607.63 9935.88 1607.62  9947.6 1607.65 9978.81 1607.59
 9983.98  1607.6 9987.29 1607.5710018.07 1607.4710035.79 1607.3810063.62 1607.21
10071.76  1607.210131.46 1607.5210135.82 1607.5210137.62 1607.5310141.78 1607.55
10162.33  1607.610171.67 1607.6810172.37 1607.68 10174.2  1607.7 10176.4 1607.71
10186.81  1607.810196.58 1607.8310212.55 1607.9210213.56 1607.9410213.69 1607.95
10218.33    160810243.41 1608.4210248.17 1608.4510274.34 1608.4810276.84 1608.48
10278.88  1608.510305.35 1609.0110317.96 1609.3110321.36 1609.3910321.66 1609.26
10321.66  1609.310323.69 1608.39   10324 1608.2610324.33 1608.1210324.34 1608.12
10325.08  1608.110328.83    160810330.32 1607.9510332.58 1607.8910332.88 1607.93
10333.39    160810333.47 1607.9910335.88 1608.4410340.07 1608.9210343.57 1608.38
10346.64    1608 10347.4  1608.110349.65 1608.4710350.22 1608.5510350.56 1608.59
10355.82  1609.210372.15 1609.0810387.73 1608.8210408.34 1608.91 10451.5 1609.06
10464.63  1609.110484.81 1609.1710492.87 1609.2410514.83 1609.4510546.82 1609.95
10549.38    161010550.37    161010552.78 1610.0410555.84 1610.0910570.42 1610.09
10577.89  1610.110593.76 1610.0910596.32 1610.09 10628.3  1610.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9166.94    .033 9983.98     .0410171.67    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.9810131.46              541  495.23     444             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1608.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.033  *   0.040  *   0.037  *
* W.S. Elev (ft)          * 1608.46  * Reach Len. (ft)         *  541.00  *  495.23  *  444.00  *
* Crit W.S. (ft)          * 1608.14  * Flow Area (sq ft)       *  142.73  *  159.05  *   78.39  *
* E.G. Slope (ft/ft)      *0.004167  * Area (sq ft)            *  142.73  *  159.05  *   78.39  *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *  232.67  *  401.10  *  146.23  *
* Top Width (ft)          *  635.29  * Top Width (ft)          *  339.83  *  147.48  *  147.99  *
* Vel Total (ft/s)        *    2.05  * Avg. Vel. (ft/s)        *    1.63  *    2.52  *    1.87  *
* Max Chl Dpth (ft)       *    1.26  * Hydr. Depth (ft)        *    0.42  *    1.08  *    0.53  *
* Conv. Total (cfs)       * 12083.0  * Conv. (cfs)             *  3604.2  *  6213.5  *  2265.3  *
* Length Wtd. (ft)        *  507.59  * Wetted Per. (ft)        *  339.84  *  147.48  *  148.18  *
* Min Ch El (ft)          * 1607.20  * Shear (lb/sq ft)        *    0.11  *    0.28  *    0.14  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)  *    0.18  *    0.71  *    0.26  *
* Frctn Loss (ft)         *    2.71  * Cum Volume (acre-ft)    *   12.63  *   31.88  *   10.82  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   22.32  *   25.06  *   19.92  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1609.04  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.033  *   0.040  *          *
* W.S. Elev (ft)          * 1608.91  * Reach Len. (ft)         *  541.00  *  495.23  *  444.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   47.58  *  225.21  *          *
* E.G. Slope (ft/ft)      *0.003331  * Area (sq ft)            *   47.58  *  225.21  *          *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *  143.69  *  636.31  *          *
* Top Width (ft)          *  184.20  * Top Width (ft)          *   36.72  *  147.48  *          *
* Vel Total (ft/s)        *    2.86  * Avg. Vel. (ft/s)        *    3.02  *    2.83  *          *
* Max Chl Dpth (ft)       *    1.71  * Hydr. Depth (ft)        *    1.30  *    1.53  *          *
* Conv. Total (cfs)       * 13514.4  * Conv. (cfs)             *  2489.6  * 11024.8  *          *
* Length Wtd. (ft)        *  499.45  * Wetted Per. (ft)        *   37.98  *  148.87  *          *
* Min Ch El (ft)          * 1607.20  * Shear (lb/sq ft)        *    0.26  *    0.31  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.79  *    0.89  *          *
* Frctn Loss (ft)         *    2.48  * Cum Volume (acre-ft)    *    1.44  *   41.48  *    0.56  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    0.87  *   25.06  *    0.19  *
*****************************************************************************************
```

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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9575.46	9983.98	232.67	142.73	339.84	29.83	0.42	1.63
* 2	Chan	9983.98	10131.46	401.10	159.05	147.48	51.42	1.08	2.52
* 3	ROB	10131.46	10379.88	146.23	78.39	148.18	18.75	0.53	1.87

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9575.46	9983.98	143.69	47.58	37.98	18.42	1.30	3.02
* 2	Chan	9983.98	10131.46	636.31	225.21	148.87	81.58	1.53	2.83

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.

CROSS SECTION

RIVER: T4N-R3W-S09
REACH: REACH-1 RS: 1.394

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9380.83	1607	9407.18	1606.84	9442.85	1606.5	9511.78	1606.03	9521.6	1605.97
9544.38	1605.81	9558.65	1605.72	9575.18	1605.64	9604.73	1605.6	9606.47	1605.54
9624.06	1605.43	9704.45	1605.41	9716.78	1605.41	9720.4	1605.4	9778.01	1604.861
9787.71	1604.77	9788.33	1604.78	9788.57	1604.78	9829.96	1605	9869.58	1604.71
9871.82	1604.67	9871.85	1604.67	9875.99	1604.61	9884.31	1604.6	9900.82	1604.5
9909.67	1604.51	9935.64	1604.49	9939.62	1604.48	9944.18	1604.5	9954.45	1605.11
9958.18	1605.11	9965.01	1605.02	9971.03	1604.9	9993.07	1604.51	10006.42	1604.49
10039.28	1604.65	10046.16	1604.62	10079.98	1604.51	10116.26	1604.85	10125.36	1604.96

```
 10155.4 1605.7110158.33 1605.7710161.27  1605.710172.851605.60210190.82 1605.45
10232.32 1605.6610234.99 1605.7110248.61    160610248.71    160610252.14 1606.07
10256.24 1606.0510264.46    160610265.74    160610273.92 1605.9610278.37 1605.92
10290.97 1605.9410291.12 1605.9410291.17  1605.910291.26 1605.9410296.54 1606.07
10310.92 1606.3910335.16 1606.17   10342  1606.110342.01 1606.1110345.69 1606.11
10355.75 1606.1810371.34  1606.310412.59  1606.410417.28 1606.4710424.28 1606.49
 10455.8 1606.6110463.77 1606.6310471.91  1606.610495.67 1606.5310508.76 1606.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9380.83    .033 9778.01     .0410125.36    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.1810125.36              487  483.54     482            .1        .3
Blocked Obstructions      num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*********************************************************************
 9574.48 9659.83  1617.5 9688.94 9717.92  1617.5 9882.05 9942.02  1616.5
 9967.7110021.31  1616.5

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1605.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.038  *   0.040  *   0.033  *
* W.S. Elev (ft)          * 1605.70  * Reach Len. (ft)         *  487.00  *  483.54  *  482.00  *
* Crit W.S. (ft)          * 1605.46  * Flow Area (sq ft)       *  144.94  *  115.77  *   20.33  *
* E.G. Slope (ft/ft)      *0.007103  * Area (sq ft)            *  144.94  *  115.77  *   20.33  *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *  386.46  *  363.13  *   30.41  *
* Top Width (ft)          *  435.91  * Top Width (ft)          *  220.31  *  113.58  *  102.02  *
* Vel Total (ft/s)        *    2.78  * Avg. Vel. (ft/s)        *    2.67  *    3.14  *    1.50  *
* Max Chl Dpth (ft)       *    1.21  * Hydr. Depth (ft)        *    0.66  *    1.02  *    0.20  *
* Conv. Total (cfs)       *  9254.7  * Conv. (cfs)             *  4585.3  *  4308.6  *   360.8  *
* Length Wtd. (ft)        *  485.25  * Wetted Per. (ft)        *  223.53  *  115.45  *  102.03  *
* Min Ch El (ft)          * 1604.50  * Shear (lb/sq ft)        *    0.29  *    0.44  *    0.09  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.77  *    1.39  *    0.13  *
* Frctn Loss (ft)         *    2.95  * Cum Volume (acre-ft)    *   10.84  *   30.32  *   10.32  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   18.85  *   23.58  *   18.65  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1606.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.30  * Wt. n-Val.              *          *   0.040  *          *
* W.S. Elev (ft)          * 1606.24  * Reach Len. (ft)         *  487.00  *  483.54  *  482.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  177.41  *          *
* E.G. Slope (ft/ft)      *0.008219  * Area (sq ft)            *          *  177.41  *          *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *          *  780.00  *          *
* Top Width (ft)          *  113.58  * Top Width (ft)          *          *  113.58  *          *
* Vel Total (ft/s)        *    4.40  * Avg. Vel. (ft/s)        *          *    4.40  *          *
* Max Chl Dpth (ft)       *    1.74  * Hydr. Depth (ft)        *          *    1.56  *          *
* Conv. Total (cfs)       *  8603.8  * Conv. (cfs)             *          *  8603.8  *          *
* Length Wtd. (ft)        *  483.54  * Wetted Per. (ft)        *          *  118.94  *          *
* Min Ch El (ft)          * 1604.50  * Shear (lb/sq ft)        *          *    0.77  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.36  *          *
* Frctn Loss (ft)         *    3.06  * Cum Volume (acre-ft)    *    1.14  *   39.19  *    0.56  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    0.64  *   23.58  *    0.19  *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9380.83   * 9669.51   *     3.09 *     2.96 *    20.91 *     0.40 *
0.14 *     1.04 *
* 2         * LOB       * 9669.51   * 9958.18   *   383.37 *   141.98 *   202.62 *    49.15 *
0.71 *     2.70 *
* 3         * Chan      * 9958.18   * 10125.36  *   363.13 *   115.77 *   115.45 *    46.56 *
1.02 *     3.14 *
* 4         * ROB       * 10125.36  * 10317.06  *    30.41 *    20.33 *   102.03 *     3.90 *
0.20 *     1.50 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9958.18   * 10125.36  *   780.00 *   177.41 *   118.94 *   100.00 *
1.56 *     4.40 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S09
REACH: REACH-1            RS: 1.302

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as
             of aerial photography date; n-values are not adjusted to account
             for the house(s), only the houses in or near the floodplain were
             accounted for and some house(s) were projected to the nearest
             cross-section.  The area available for flood flows in between
             houses was considered and, for example, that may have resulted in
             one house per cross-section.  Therefore, not all of the houses
             were projected to the nearest cross-section.
Station Elevation Data    num=     102
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9426.6  1604.2 9433.17 1604.15 9443.56 1604.01 9444.69    1604 9460.07 1603.81
 9480.66  1603.6 9491.32 1603.39 9509.77  1603.3 9571.01 1602.88 9587.69 1602.77
 9589.37  1602.8 9598.05 1602.69 9624.46 1602.47 9631.07 1602.49  9652.6 1602.44
 9674.54  1602.4 9690.64 1602.31  9700.1 1602.26 9701.47 1602.25 9701.52 1602.25
 9704.37 1602.24 9730.52  1602.1 9769.34    1602 9776.56 1601.97 9780.28    1602
 9783.84    1602 9787.09 1602.01 9790.19    1602 9790.48 1602.01 9791.19    1602
  9794.4    1602 9796.17 1601.94 9796.56 1601.96 9799.58 1601.26 9803.34 1600.71
 9809.49  1600.9 9817.38 1600.82 9820.15 1601.13 9822.11  1601.3 9824.77 1601.26
 9834.66  1600.7 9839.01 1600.68 9842.03 1600.68 9857.15 1600.83 9864.81 1600.94
 9867.28  1600.9 9871.99 1600.94 9873.95 1601.15 9880.12    1602 9881.68 1602.16
 9882.02  1602.2 9883.57 1602.35 9887.12 1602.32 9888.25 1602.32    9893  1602.3
 9921.39    1602  9938.2 1601.84 9939.47 1601.83 9956.46    1602 9967.04    1602
 9970.22 1602.01 9971.34    1602 9976.43 1601.98 9981.01 1601.9510006.23 1601.66
10010.64 1601.6910028.63  1601.810044.72    160210053.13 1602.0810055.75 1602.09
 10063.8 1602.1510075.961602.23810126.08  1602.610152.74 1602.7110202.82 1603.12
10228.19  1603.210232.06 1603.1810239.09  1603.210266.22 1603.1810274.06 1603.32
10288.83 1603.5210319.37 1603.52   10323  1603.510352.82 1603.3210359.81 1603.44
10386.05 1603.9210390.15    160410393.23  1604.110394.63 1604.0910394.69 1604.08
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 10396.5 1604.0810398.51  1604.1 10404.7    160410420.04 1603.8210437.72 1603.62
10441.69 1603.6410478.47  1603.910481.45 1603.94 10481.8 1603.9510488.05 1603.95
10495.23  1603.910509.39 1603.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9426.6    .035 9674.54     .0410075.96    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.5710075.96              521  534.72     485            .1        .3
Blocked Obstructions      num=       6
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*********************************************************************
 9529.41 9580.32    1615 9613.89 9668.27  1614.5 9679.78 9726.16  1614.5
 9843.46 9884.92  1612.510212.61 10244.5  1615.510267.4610337.38  1615.5

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)         * 1602.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.040  *   0.040  *   0.035  *
* W.S. Elev (ft)         * 1602.76  * Reach Len. (ft)         *  521.00  *  534.72  *  485.00  *
* Crit W.S. (ft)         * 1602.46  * Flow Area (sq ft)       *  143.20  *  150.81  *   20.30  *
* E.G. Slope (ft/ft)     *0.005270  * Area (sq ft)            *  143.20  *  150.81  *   20.30  *
* Q Total (cfs)          *  780.00  * Flow (cfs)              *  408.74  *  346.85  *   24.41  *
* Top Width (ft)         *  424.72  * Top Width (ft)          *  150.41  *  191.04  *   83.27  *
* Vel Total (ft/s)       *    2.48  * Avg. Vel. (ft/s)        *    2.85  *    2.30  *    1.20  *
* Max Chl Dpth (ft)      *    2.08  * Hydr. Depth (ft)        *    0.95  *    0.79  *    0.24  *
* Conv. Total (cfs)      * 10745.0  * Conv. (cfs)             *  5630.7  *  4778.0  *   336.3  *
* Length Wtd. (ft)       *  521.57  * Wetted Per. (ft)        *  154.24  *  191.47  *   83.27  *
* Min Ch El (ft)         * 1601.66  * Shear (lb/sq ft)        *    0.31  *    0.26  *    0.08  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)  *    0.87  *    0.60  *    0.10  *
* Frctn Loss (ft)        *    2.69  * Cum Volume (acre-ft)    *    9.23  *   28.84  *   10.10  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   16.77  *   21.89  *   17.62  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)         * 1603.43  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *          *   0.040  *          *
* W.S. Elev (ft)         * 1603.28  * Reach Len. (ft)         *  521.00  *  534.72  *  485.00  *
* Crit W.S. (ft)         * 1602.77  * Flow Area (sq ft)       *          *  249.66  *          *
* E.G. Slope (ft/ft)     *0.005019  * Area (sq ft)            *          *  249.66  *          *
* Q Total (cfs)          *  780.00  * Flow (cfs)              *          *  780.00  *          *
* Top Width (ft)         *  191.04  * Top Width (ft)          *          *  191.04  *          *
* Vel Total (ft/s)       *    3.12  * Avg. Vel. (ft/s)        *          *    3.12  *          *
* Max Chl Dpth (ft)      *    1.62  * Hydr. Depth (ft)        *          *    1.31  *          *
* Conv. Total (cfs)      * 11009.8  * Conv. (cfs)             *          * 11009.8  *          *
* Length Wtd. (ft)       *  534.72  * Wetted Per. (ft)        *          *  193.03  *          *
* Min Ch El (ft)         * 1601.66  * Shear (lb/sq ft)        *          *    0.41  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    1.27  *          *
* Frctn Loss (ft)        *    2.82  * Cum Volume (acre-ft)    *    1.14  *   36.82  *    0.56  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    0.64  *   21.89  *    0.19  *
*********************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9426.60   * 9655.09   *     1.74 *     2.41 *    21.81 *     0.22 *
0.11 *     0.72 *
```

```
* 2          * LOB       * 9655.09   * 9883.57   *   407.01 *   140.78 *   132.43 *    52.18 *
1.09 *     2.89 *
* 3          * Chan      * 9883.57   * 10075.96  *   346.85 *   150.81 *   191.47 *    44.47 *
0.79 *     2.30 *
* 4          * ROB       * 10075.96  * 10292.67  *    24.41 *    20.30 *    83.27 *     3.13 *
0.24 *     1.20 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9883.57   * 10075.96  *   780.00 *   249.66 *   193.03 *   100.00 *
1.31 *     3.12 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 1.201

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as
             of aerial photography date; n-values are not adjusted to account
             for the house(s), only the houses in or near the floodplain were
             accounted for and some house(s) were projected to the nearest
             cross-section. The area available for flood flows in between
             houses was considered and, for example, that may have resulted in
             one house per cross-section. Therefore, not all of the houses were
             projected to the nearest cross-section. Interp. pnt. 10106.81
Station Elevation Data    num=     118
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9442.75  1602.4 9443.75 1602.39 9468.79 1602.98 9490.12 1602.85 9505.75 1602.66
 9515.18  1602.6 9524.63 1602.42  9536.5 1602.25 9539.22 1602.22 9541.45  1602.2
 9548.13 1602.08    9552 1601.95 9552.33  1601.9 9554.85 1601.35 9554.99 1601.32
 9555.44 1601.23 9556.98 1601.58 9557.99  1601.8 9558.06 1601.83 9564.07  1601.8
 9578.56 1601.63 9598.49  1601.7 9609.18  1601.7 9638.32 1601.51 9640.12  1601.5
 9647.72 1601.47 9663.79 1601.42 9698.38  1601.3 9708.49 1601.18 9719.26 1601.13
 9734.76 1601.07 9745.71 1601.03  9756.2    1601    9757    1601 9763.94 1600.96
 9798.77 1600.64 9807.67 1600.53 9812.49  1600.5 9814.82 1600.44 9818.32 1600.38
 9837.57    1600 9843.74 1599.91 9855.77  1599.8  9861.5 1599.68 9893.57 1599.32
 9896.631599.279 9914.55 1599.04 9919.88 1598.95 9928.48  1598.7 9937.12 1598.81
 9955.51 1599.01 9964.96 1599.12 9969.92 1599.12 9995.48  1599.1 9997.33 1598.24
 9997.76    1598 9998.35 1597.6510000.01 1596.9810000.77  1597.310002.13    1598
10004.13 1598.9210004.51 1599.1210009.99 1599.17   10030  1599.310031.86 1599.28
10034.04 1599.3110050.83 1599.3110083.19 1598.9910088.14    159910106.811599.089
10123.64 1599.1710137.46 1599.3410143.99 1599.34 10151.6 1599.3410161.31 1599.37
10172.57  1599.410201.41 1599.4310231.59 1599.4710248.53 1599.5410271.91 1599.51
10287.74  1599.510293.89 1599.5510329.92 1599.6210335.73 1599.5510355.28 1599.94
10360.99 1600.0710378.75 1600.5210380.72  1600.510383.09 1600.4910391.01  1600.4
10396.15 1600.3710406.21 1600.3410440.95 1600.3410468.59 1600.4710477.61  1600.5
10499.44  1600.8 10518.7 1600.8810553.47 1600.8410565.72 1600.8710617.84 1601.24
10625.23 1601.2910641.28 1601.1810646.41 1601.1510659.29  1601.210666.63 1601.25
 10670.7 1601.3510683.14 1601.6710698.48 1601.7910701.64  1601.8 10703.7 1601.79
10708.72 1601.8210724.27 1601.8910744.74    160210746.85    160210749.32 1602.02
10751.11 1602.02 10766.4 1602.2910770.21  1602.3
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9442.75    .035 9914.55     .0510106.81    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.5510106.81               493  511.87     522            .1        .3
Blocked Obstructions      num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
***********************************************
 9741.66 9803.51    161310169.6610247.72  1611.5

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1600.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.035  *   0.050  *   0.033  *
* W.S. Elev (ft)          * 1600.09  * Reach Len. (ft)         *  493.00  *  511.87  *  522.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   44.07  *  202.54  *  106.53  *
* E.G. Slope (ft/ft)      *0.005042  * Area (sq ft)            *   44.07  *  202.54  *  106.53  *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *   88.06  *  441.00  *  250.95  *
* Top Width (ft)          *  450.92  * Top Width (ft)          *   81.65  *  192.26  *  177.00  *
* Vel Total (ft/s)        *    2.21  * Avg. Vel. (ft/s)        *    2.00  *    2.18  *    2.36  *
* Max Chl Dpth (ft)       *    3.11  * Hydr. Depth (ft)        *    0.54  *    1.05  *    0.60  *
* Conv. Total (cfs)       * 10985.3  * Conv. (cfs)             *  1240.2  *  6210.8  *  3534.2  *
* Length Wtd. (ft)        *  512.68  * Wetted Per. (ft)        *   81.66  *  193.23  *  178.27  *
* Min Ch El (ft)          * 1596.98  * Shear (lb/sq ft)        *    0.17  *    0.33  *    0.19  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.34  *    0.72  *    0.44  *
* Frctn Loss (ft)         *    2.99  * Cum Volume (acre-ft)    *    8.11  *   26.67  *    9.39  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   15.39  *   19.54  *   16.17  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1600.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)          * 1600.49  * Reach Len. (ft)         *  493.00  *  511.87  *  522.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  278.70  *          *
* E.G. Slope (ft/ft)      *0.005550  * Area (sq ft)            *          *  278.70  *          *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *          *  780.00  *          *
* Top Width (ft)          *  192.26  * Top Width (ft)          *          *  192.26  *          *
* Vel Total (ft/s)        *    2.80  * Avg. Vel. (ft/s)        *          *    2.80  *          *
* Max Chl Dpth (ft)       *    3.51  * Hydr. Depth (ft)        *          *    1.45  *          *
* Conv. Total (cfs)       * 10470.2  * Conv. (cfs)             *          * 10470.2  *          *
* Length Wtd. (ft)        *  511.87  * Wetted Per. (ft)        *          *  196.08  *          *
* Min Ch El (ft)          * 1596.98  * Shear (lb/sq ft)        *          *    0.49  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.38  *          *
* Frctn Loss (ft)         *    3.12  * Cum Volume (acre-ft)    *    1.14  *   33.58  *    0.56  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.64  *   19.54  *    0.19  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9678.65   * 9914.55   *    88.06 *    44.07 *    81.66 *    11.29 *
0.54 *     2.00 *
* 2        * Chan      * 9914.55   * 10106.81  *   441.00 *   202.54 *   193.23 *    56.54 *
1.05 *     2.18 *
* 3        * ROB       * 10106.81  * 10438.51  *   250.95 *   106.53 *   178.27 *    32.17 *
0.60 *     2.36 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9914.55   * 10106.81  *   780.00 *   278.70 *   196.08 *   100.00 *
1.45 *     2.80 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 1.104

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain and
             joins downstream of this cross-section.   Interpolated points
             added at (9917, 1596.21)  and  (10095, 1596.20) to set bank
             station.
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9447.8  1598.7  9482.3 1598.64 9485.45 1598.63 9486.24 1598.62 9488.59  1598.6
 9501.76  1598.5 9505.85 1598.49  9514.8  1598.4 9536.66 1598.36 9564.96 1598.56
 9568.18  1598.6 9568.64 1598.34 9569.23    1598 9570.33 1597.24  9571.5 1596.64
 9572.14  1596.9 9574.82 1597.88  9575.2 1597.87 9578.64 1597.95 9581.34    1598
 9582.74    1598 9587.24  1598.1 9589.88 1598.14  9593.2 1598.17 9595.06 1598.21
 9596.91  1598.2  9599.8 1598.22 9605.42 1598.18 9626.63    1598 9628.91 1597.97
 9631.33    1598 9641.56 1597.87 9652.38 1597.84 9660.63 1597.83  9685.1 1597.73
 9705.82  1597.3 9707.81 1597.33 9709.77 1597.32 9747.11 1597.23  9786.5 1596.92
 9811.28  1597.4 9830.81 1597.33 9842.02 1597.27 9878.16 1596.61 9881.24 1596.57
 9883.371596.508 9883.63  1596.5 9885.74 1596.53    99171596.207 9936.97    1596
 9937.81 1595.99 9944.55  1595.9 9952.81 1595.81 9953.02  1595.8 9954.96  1595.8
 9993.13    159610034.51 1595.6910045.31 1595.6510059.29 1595.8210072.82    1596
10081.84 1596.07   100951596.20410107.43 1596.3310112.45 1596.3110114.24 1596.32
10121.94  1596.310135.021596.32410159.97 1596.3710172.67 1596.4710182.95 1596.58
10216.24  1596.710240.07  1596.7 10242.5 1596.7110248.38 1596.7710275.52 1597.03
10281.45 1597.0510297.56  1596.910316.51 1596.81 10325.9 1596.84 10332.8 1596.86
 10339.1 1596.93 10350.6  1596.910361.77 1597.0310378.67 1597.18   10399 1597.25
10414.11 1597.2510416.59  1597.210467.36 1597.7510477.72 1597.8610494.41 1597.95
10508.93    159810509.25    159810515.29 1598.0210539.48 1598.1610549.23 1598.17
10574.66 1598.3810581.95  1598.4 10583.6 1598.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
  9447.8    .035 9885.74     .0510107.43     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9917   10095              438  478.95     515            .1        .3
Left Levee      Station=  9599.8      Elevation= 1598.22

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1597.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.046  *   0.050  *   0.050  *
```

W.S. Elev (ft)	1597.08	Reach Len. (ft)	438.00	478.95	515.00	
Crit W.S. (ft)	1596.76	Flow Area (sq ft)	34.43	208.48	109.36	
E.G. Slope (ft/ft)	0.006840	Area (sq ft)	34.43	208.48	109.36	
Q Total (cfs)	780.00	Flow (cfs)	60.61	569.35	150.05	
Top Width (ft)	543.00	Top Width (ft)	92.78	178.00	272.21	
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)	1.76	2.73	1.37	
Max Chl Dpth (ft)	1.43	Hydr. Depth (ft)	0.37	1.17	0.40	
Conv. Total (cfs)	9431.3	Conv. (cfs)	732.8	6884.2	1814.3	
Length Wtd. (ft)	481.04	Wetted Per. (ft)	92.79	178.01	272.22	
Min Ch El (ft)	1595.65	Shear (lb/sq ft)	0.16	0.50	0.17	
Alpha	1.23	Stream Power (lb/ft s)	0.28	1.37	0.24	
Frctn Loss (ft)	2.59	Cum Volume (acre-ft)	7.66	24.25	8.10	
C & E Loss (ft)	0.01	Cum SA (acres)	14.40	17.36	13.48	

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 OUTPUT Profile #2

E.G. Elev (ft)	1597.48	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.15	Wt. n-Val.		0.050		
W.S. Elev (ft)	1597.34	Reach Len. (ft)	438.00	478.95	515.00	
Crit W.S. (ft)	1596.75	Flow Area (sq ft)		254.18		
E.G. Slope (ft/ft)	0.006744	Area (sq ft)		254.18		
Q Total (cfs)	780.00	Flow (cfs)		780.00		
Top Width (ft)	178.00	Top Width (ft)		178.00		
Vel Total (ft/s)	3.07	Avg. Vel. (ft/s)		3.07		
Max Chl Dpth (ft)	1.69	Hydr. Depth (ft)		1.43		
Conv. Total (cfs)	9498.4	Conv. (cfs)		9498.4		
Length Wtd. (ft)	478.95	Wetted Per. (ft)		180.27		
Min Ch El (ft)	1595.65	Shear (lb/sq ft)		0.59		
Alpha	1.00	Stream Power (lb/ft s)		1.82		
Frctn Loss (ft)	2.52	Cum Volume (acre-ft)	1.14	30.45	0.56	
C & E Loss (ft)	0.02	Cum SA (acres)	0.64	17.36	0.19	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9599.80	9917.00	60.61	34.43	92.79	7.77	0.37	1.76
2	Chan	9917.00	10095.00	569.35	208.48	178.01	72.99	1.17	2.73
3	ROB	10095.00	10339.30	148.16	106.11	244.30	19.00	0.43	1.40
4	ROB	10339.30	10583.60	1.88	3.25	27.92	0.24	0.12	0.58

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.

```
  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9917.00   * 10095.00  *   780.00 *   254.18 *   180.27 *   100.00 *
1.43 *     3.07 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 1.013

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9351.74  1596.1 9355.18    1596 9363.09 1595.86 9375.51 1595.66 9390.96 1595.82
 9413.93  1595.8 9424.15 1595.72 9430.75 1595.68 9432.06 1595.67 9436.52 1595.63
 9457.82  1595.5 9499.67  1595.4 9519.86 1595.13 9551.88 1594.88 9567.05 1595.04
  9575.6  1595.1 9577.37 1594.65 9579.95 1594.08 9580.28  1594.1 9581.52  1594.1
 9582.53 1594.13 9583.03 1594.14 9583.56 1594.16 9600.57 1594.44 9601.33  1594.4
 9603.95 1594.41 9607.55 1594.39 9619.22 1594.32 9627.21 1594.28 9668.88  1594.1
 9669.99 1594.05 9672.17 1594.06  9676.2 1594.06 9687.78  1594.1 9738.02 1594.49
 9756.51 1594.58 9766.34  1594.6 9798.69 1594.44 9810.09  1594.4 9823.73 1594.32
 9834.741594.247 9854.01 1594.12 9867.75 1594.06 9868.79 1594.05 9875.92    1594
 9892.34 1593.91 9905.22 1593.82 9918.39 1593.72 9928.88 1593.63  9941.9  1593.5
 9962.72 1593.3810030.47 1593.4110034.43 1593.4410034.53 1593.4410038.27  1593.4
10042.52 1593.3910101.34 1593.2210107.17 1593.2210130.871593.48110134.42 1593.52
10141.07  1593.610170.17 1593.7910177.38 1593.8210177.77 1593.8210181.51 1593.83
10185.78  1593.810228.82  1593.910230.65  1593.910232.42 1593.9110232.82  1593.9
10237.97 1593.9610240.74    159410250.73 1594.1110264.02  1594.310268.03  1594.3
10270.34 1594.31 10294.8 1594.3710325.57 1594.7110325.73  1594.7 10325.9 1594.72
10359.66 1595.0510366.38 1595.0710379.26 1595.14 10406.9  1595.310420.61 1595.59
10430.67 1595.7710453.89 1595.4810460.65 1595.47 10465.2  1595.610471.73 1595.71
10482.49 1595.9810482.72 1595.9910482.93 1595.9910485.88    159610488.39    1596
10491.74 1596.0110503.51 1596.0410523.84 1596.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9351.74    .035 9834.74     .0510170.17    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.8810141.07              460  491.21     515             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1594.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.044  *   0.050  *   0.038  *
* W.S. Elev (ft)          * 1594.51  * Reach Len. (ft)         *  460.00  *  491.21  *  515.00  *
* Crit W.S. (ft)          * 1594.12  * Flow Area (sq ft)       *  101.09  *  239.82  *   85.40  *
* E.G. Slope (ft/ft)      *0.004353  * Area (sq ft)            *  101.09  *  239.82  *   85.40  *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *  121.91  *  510.20  *  147.89  *
* Top Width (ft)          *  688.73  * Top Width (ft)          *  309.84  *  212.19  *  166.70  *
* Vel Total (ft/s)        *    1.83  * Avg. Vel. (ft/s)        *    1.21  *    2.13  *    1.73  *
* Max Chl Dpth (ft)       *    1.29  * Hydr. Depth (ft)        *    0.33  *    1.13  *    0.51  *
* Conv. Total (cfs)       * 11822.5  * Conv. (cfs)             *  1847.8  *  7733.1  *  2241.6  *
```

* Length Wtd. (ft)	*	490.06	* Wetted Per. (ft)	*	309.90	*	212.19	*	166.70 *
* Min Ch El (ft)	*	1593.22	* Shear (lb/sq ft)	*	0.09	*	0.31	*	0.14 *
* Alpha	*	1.12	* Stream Power (lb/ft s)	*	0.11	*	0.65	*	0.24 *
* Frctn Loss (ft)	*	2.32	* Cum Volume (acre-ft)	*	6.98	*	21.79	*	6.95 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	12.37	*	15.22	*	10.89 *

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.

CROSS SECTION OUTPUT Profile #2

* E.G. Elev (ft)	*	1594.96	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.10	* Wt. n-Val.	*		*	0.050	*	*
* W.S. Elev (ft)	*	1594.86	* Reach Len. (ft)	*	460.00	*	491.21	*	515.00 *
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*		*	314.06	*	*
* E.G. Slope (ft/ft)	*	0.004206	* Area (sq ft)	*		*	314.06	*	*
* Q Total (cfs)	*	780.00	* Flow (cfs)	*		*	780.00	*	*
* Top Width (ft)	*	212.19	* Top Width (ft)	*		*	212.19	*	*
* Vel Total (ft/s)	*	2.48	* Avg. Vel. (ft/s)	*		*	2.48	*	*
* Max Chl Dpth (ft)	*	1.64	* Hydr. Depth (ft)	*		*	1.48	*	*
* Conv. Total (cfs)	*	12027.3	* Conv. (cfs)	*		*	12027.3	*	*
* Length Wtd. (ft)	*	491.21	* Wetted Per. (ft)	*		*	214.69	*	*
* Min Ch El (ft)	*	1593.22	* Shear (lb/sq ft)	*		*	0.38	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	0.95	*	*
* Frctn Loss (ft)	*	2.09	* Cum Volume (acre-ft)	*	1.14	*	27.32	*	0.56 *
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	0.64	*	15.22	*	0.19 *

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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9351.74	9640.31	13.39	13.23	62.37	1.72	0.21	1.01
* 2	LOB	9640.31	9928.88	108.52	87.86	247.53	13.91	0.35	1.24
* 3	Chan	9928.88	10141.07	510.20	239.82	212.19	65.41	1.13	2.13
* 4	ROB	10141.07	10332.46	147.89	85.40	166.70	18.96	0.51	1.73

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9928.88	10141.07	780.00	314.06	214.69	100.00	1.48	2.48

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: T4N-R3W-S09
REACH: REACH-1 RS: 0.920

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 820cfs.

Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9279.82	1594	9290.27	1593.8	9323.05	1593.32	9333.66	1593.29	9339.02	1593.32
9366.75	1593.3	9391.89	1593.25	9423.36	1593.49	9423.65	1593.49	9427.03	1593.45
9430.81	1593.4	9492.12	1592.54	9516.96	1592.4	9533.58	1592.29	9596.67	1592.16
9600.58	1592.2	9613.38	1592.21	9624.78	1592.26	9634.91	1592.32	9642.11	1592
9643.8	1591.92	9646.97	1591.78	9654.22	1591.83	9656.23	1591.87	9663.36	1591.9
9666.05	1591.84	9673.33	1591.75	9700.57	1591.83	9709.39	1591.86	9752.47	1591.8
9755.17	1591.81	9755.55	1591.69	9758.31	1591	9760.58	1590.4	9761.77	1590.6
9765.27	1591.35	9784.86	1591.28	9785.19	1591.29	9787.1	1591.4	9789.47	1590.755
9791.51	1590.2	9794.56	1590.95	9796.21	1591.38	9804.03	1591.5	9827.2	1591.68
9838.03	1591.61	9883.76	1591.35	9911.07	1591.39	9911.69	1591.4	9924.56	1591.29
9982.54	1590.86	9983.54	1590.86	10044.81	1591.51	10067.67	1591.51	10078.04	1591.41
10128.42	1591.23	10164.1	1591.61	10207.69	159	10208.18	159	10212.29	1592.042
10215.99	1592.08	10218.52	1592.06	10245.82	1591.91	10246.94	1591.91	10250.99	1591.87
10257.73	1591.98	10259.23	159	10262.62	1592.04	10289.03	1592.4	10296.2	1592.41
10311.7	1592.37	10315.68	1592.61	10328.09	1592.72	10342.95	1592.61	10361.74	1592.25
10362.46	1592.22	10370.64	1592.03	10372.56	1592.05	10376.11	159	10398.16	1592.08
10400.39	1592.07	10446.12	1592.28	10451.71	1592.31	10507.36	1592.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9279.82	.035	9827.2	.05	10164.1	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9827.2	10044.81	483	538.08	584	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1592.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.035	0.050	0.047
W.S. Elev (ft)	1592.18	Reach Len. (ft)	483.00	538.08	584.00
Crit W.S. (ft)	1591.84	Flow Area (sq ft)	103.77	197.91	128.01
E.G. Slope (ft/ft)	0.005165	Area (sq ft)	103.77	197.91	128.01
Q Total (cfs)	820.00	Flow (cfs)	211.32	396.76	211.92
Top Width (ft)	707.03	Top Width (ft)	201.04	217.61	288.38
Vel Total (ft/s)	1.91	Avg. Vel. (ft/s)	2.04	2.00	1.66
Max Chl Dpth (ft)	1.98	Hydr. Depth (ft)	0.52	0.91	0.44
Conv. Total (cfs)	11410.2	Conv. (cfs)	2940.5	5520.8	2948.8
Length Wtd. (ft)	515.93	Wetted Per. (ft)	201.64	217.62	288.39
Min Ch El (ft)	1590.86	Shear (lb/sq ft)	0.17	0.29	0.14
Alpha	1.02	Stream Power (lb/ft s)	0.34	0.59	0.24
Frctn Loss (ft)	3.35	Cum Volume (acre-ft)	5.90	19.32	5.68
C & E Loss (ft)	0.00	Cum SA (acres)	9.68	12.79	8.20

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1592.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.050	
W.S. Elev (ft)	1592.76	Reach Len. (ft)	483.00	538.08	584.00
Crit W.S. (ft)	1592.03	Flow Area (sq ft)		324.46	
E.G. Slope (ft/ft)	0.004307	Area (sq ft)		324.46	
Q Total (cfs)	820.00	Flow (cfs)		820.00	
Top Width (ft)	217.61	Top Width (ft)		217.61	
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)		2.53	
Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)		1.49	

```
* Conv. Total (cfs)       * 12494.7  * Conv. (cfs)            *          * 12494.7  *          *
* Length Wtd. (ft)        *  522.78  * Wetted Per. (ft)       *          *  219.96  *          *
* Min Ch El (ft)          * 1590.86  * Shear (lb/sq ft)       *          *    0.40  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    1.00  *          *
* Frctn Loss (ft)         *    2.87  * Cum Volume (acre-ft)   *    1.14  *   23.72  *    0.56  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    0.64  *   12.79  *    0.19  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
*******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9553.51   * 9827.20   *   211.32 *   103.77 *   201.64 *    25.77 *
0.52 *     2.04 *
* 2         * Chan      * 9827.20   * 10044.81  *   396.76 *   197.91 *   217.62 *    48.39 *
0.91 *     2.00 *
* 3         * ROB       * 10044.81  * 10276.08  *   207.79 *   122.04 *   228.12 *    25.34 *
0.53 *     1.70 *
* 4         * ROB       * 10276.08  * 10507.36  *     4.13 *     5.97 *    60.28 *     0.50 *
0.10 *     0.69 *
*****************************************************************************************************
*******************

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.

  Profile #2
*****************************************************************************************************
*******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9827.20   * 10044.81  *   820.00 *   324.46 *   219.96 *   100.00 *
1.49 *     2.53 *
*****************************************************************************************************
*******************

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: T4N-R3W-S09
REACH: REACH-1-          RS: 0.819

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9428.75  1590.1 9429.61 1590.06 9432.51    1590 9472.54 1589.55 9477.58 1589.49
 9479.81  1589.5 9517.34 1589.16 9535.62 1588.94 9546.51 1588.73  9574.5 1588.48
 9641.42  1588.5 9647.32 1588.51 9648.16 1588.51 9650.62 1588.49  9708.5  1588.1
 9710.91  1588.1 9711.07 1588.09 9714.29 1588.08 9729.021588.049 9753.01    1588
    9779 1587.93 9785.42  1587.9 9814.25 1587.91 9824.51 1587.89  9850.1 1587.95
 9867.37    1588 9911.18    1588 9915.27 1587.99 9916.83 1587.96 9916.84 1587.96
 9918.94 1588.01 9922.74    1588 9943.68 1588.19  9961.1 1588.46  9972.4 1588.22
 9978.62 1588.19 9983.94  1588.2 9992.82 1588.07 10001.5 1588.0110003.85    1588
10004.38    158810007.25 1587.9910009.09 1587.9910010.05    158810012.11    1588
10028.85 1588.4910030.89 1588.4310035.38 1588.1110041.81 1588.1110054.18  1588.1
10058.38 1588.1110065.351588.18710080.93 1588.3610092.45 1588.8110130.41 1589.21
 10139.9  1589.210175.12 1589.9110180.25 1590.0210183.65 1590.0910194.41  1590.1
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10202.54 1590.1710222.95 1590.1810235.18 1590.1810246.16 1590.1510255.99  1590.1
10262.23 1589.9410272.55 1589.7810310.35 1589.9910311.68    159010320.64 1590.05
10336.87 1590.0910351.12  1590.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9428.75    .035 9922.74     .0510080.93    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9961.110028.85              285   744.4     527             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1588.89  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.036  *   0.050  *   0.049  *
* W.S. Elev (ft)          * 1588.78  * Reach Len. (ft)        *  285.00  *  744.40  *  527.00  *
* Crit W.S. (ft)          * 1588.60  * Flow Area (sq ft)      *  250.79  *   41.19  *   33.10  *
* E.G. Slope (ft/ft)      *0.008404  * Area (sq ft)           *  250.79  *   41.19  *   33.10  *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *  676.98  *   80.52  *   62.50  *
* Top Width (ft)          *  547.90  * Top Width (ft)         *  417.27  *   67.75  *   62.88  *
* Vel Total (ft/s)        *    2.52  * Avg. Vel. (ft/s)       *    2.70  *    1.95  *    1.89  *
* Max Chl Dpth (ft)       *    0.89  * Hydr. Depth (ft)       *    0.60  *    0.61  *    0.53  *
* Conv. Total (cfs)       *  8944.8  * Conv. (cfs)            *  7384.7  *   878.3  *   681.8  *
* Length Wtd. (ft)        *  521.39  * Wetted Per. (ft)       *  417.28  *   67.76  *   62.90  *
* Min Ch El (ft)          * 1587.99  * Shear (lb/sq ft)       *    0.32  *    0.32  *    0.28  *
* Alpha                   *    1.05  * Stream Power (lb/ft s) *    0.85  *    0.62  *    0.52  *
* Frctn Loss (ft)         *    3.74  * Cum Volume (acre-ft)   *    3.94  *   17.84  *    4.60  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *    6.25  *   11.03  *    5.84  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1589.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.042  *   0.050  *          *
* W.S. Elev (ft)          * 1589.76  * Reach Len. (ft)        *  285.00  *  744.40  *  527.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *  109.73  *  107.47  *          *
* E.G. Slope (ft/ft)      *0.007220  * Area (sq ft)           *  109.73  *  107.47  *          *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *  455.48  *  364.52  *          *
* Top Width (ft)          *  134.40  * Top Width (ft)         *   66.65  *   67.75  *          *
* Vel Total (ft/s)        *    3.78  * Avg. Vel. (ft/s)       *    4.15  *    3.39  *          *
* Max Chl Dpth (ft)       *    1.80  * Hydr. Depth (ft)       *    1.65  *    1.59  *          *
* Conv. Total (cfs)       *  9650.4  * Conv. (cfs)            *  5360.5  *  4289.9  *          *
* Length Wtd. (ft)        *  616.81  * Wetted Per. (ft)       *   68.41  *   69.03  *          *
* Min Ch El (ft)          * 1587.99  * Shear (lb/sq ft)       *    0.72  *    0.70  *          *
* Alpha                   *    1.03  * Stream Power (lb/ft s) *    3.00  *    2.38  *          *
* Frctn Loss (ft)         *    4.74  * Cum Volume (acre-ft)   *    0.53  *   21.05  *    0.56  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *    0.27  *   11.03  *    0.19  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9428.75   * 9694.93   *    76.43 *    46.63 *   151.10 *     9.32 *
0.31 *     1.64 *
* 2        * LOB       * 9694.93   * 9961.10   *   600.55 *   204.16 *   266.18 *    73.24 *
0.77 *     2.94 *
* 3        * Chan      * 9961.10   * 10028.85  *    80.52 *    41.19 *    67.76 *     9.82 *
0.61 *     1.95 *
* 4        * ROB       * 10028.85  * 10189.98  *    62.50 *    33.10 *    62.90 *     7.62 *
0.53 *     1.89 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9694.93   * 9961.10   *   455.48 *   109.73 *    68.41 *    55.55 *
1.65 *     4.15 *
* 2        * Chan      * 9961.10   * 10028.85  *   364.52 *   107.47 *    69.03 *    44.45 *
1.59 *     3.39 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 0.678

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9535.45  1587.9 9537.87 1587.91 9541.81 1587.91 9543.53 1587.91 9549.98  1587.9
 9555.39  1587.9 9571.44 1587.93 9591.78 1587.91  9601.8 1587.65 9623.12 1587.21
 9651.87  1587.1 9655.23 1587.11 9657.58 1587.06 9708.95 1586.01 9710.62 1585.98
 9710.92    1586 9723.51 1585.75 9751.93 1585.08 9829.99  1584.3 9836.23 1584.24
 9841.11  1584.2 9866.14    1584  9890.9 1583.83 9894.56 1583.81 9897.04  1583.8
 9898.76  1583.8 9903.92 1583.76  9916.4 1583.73 9972.26  1583.610002.54 1583.87
 10010.8  1583.8 10028.2 1583.9910029.35    158410044.33 1584.1510050.29 1584.21
10053.15  1584.2 10057.8 1584.2610064.04  1584.310090.37 1584.4410111.84 1584.67
10145.85  1584.910171.67 1585.1410172.23 1585.1510216.91    158610216.99    1586
 10217.1    158610239.45  1586.410255.87 1586.5210265.97 1586.6710300.21 1587.18
10308.74  1587.210331.92 1587.3510347.94 1587.4410352.72 1587.4410364.89 1587.45
10404.79  1587.510425.24 1587.6710477.23 1587.8610502.71 1587.9810515.02 1587.99
10517.79    158810518.74    158810520.38 1588.0110523.09 1588.0110538.07    1588
10540.25    158810544.37    158810552.96 1587.9910556.23 1587.9910557.21 1587.98
10557.23    158810561.61 1587.3310561.63 1587.3310561.68 1587.3210561.69 1587.32
10561.85  1587.310571.19 1587.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9535.45    .035 9829.99     .0510090.37    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9829.9910050.29              737  326.34     446             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1585.15  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.035  *   0.050  *   0.044  *
* W.S. Elev (ft)         * 1585.05  * Reach Len. (ft)         *  737.00  *  326.34  *  446.00  *
* Crit W.S. (ft)         * 1584.63  * Flow Area (sq ft)       *   28.03  *  261.36  *   49.62  *
* E.G. Slope (ft/ft)     *0.006191  * Area (sq ft)            *   28.03  *  261.36  *   49.62  *
* Q Total (cfs)          *  820.00  * Flow (cfs)              *   48.62  *  684.90  *   86.48  *
* Top Width (ft)         *  406.74  * Top Width (ft)          *   74.91  *  220.30  *  111.53  *
* Vel Total (ft/s)       *    2.42  * Avg. Vel. (ft/s)        *    1.73  *    2.62  *    1.74  *
* Max Chl Dpth (ft)      *    1.45  * Hydr. Depth (ft)        *    0.37  *    1.19  *    0.44  *
* Conv. Total (cfs)      * 10421.6  * Conv. (cfs)             *   618.0  *  8704.5  *  1099.1  *
```

* Length Wtd. (ft)	*	385.13	* Wetted Per. (ft)	*	74.91	*	220.31	*	111.53	*
* Min Ch El (ft)	*	1583.60	* Shear (lb/sq ft)	*	0.14	*	0.46	*	0.17	*
* Alpha	*	1.07	* Stream Power (lb/ft s)	*	0.25	*	1.20	*	0.30	*
* Frctn Loss (ft)	*	2.12	* Cum Volume (acre-ft)	*	3.02	*	15.26	*	4.10	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	4.64	*	8.57	*	4.79	*

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 OUTPUT Profile #2

* E.G. Elev (ft)	*	1585.23	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.14	* Wt. n-Val.	*		*	0.050	*		*
* W.S. Elev (ft)	*	1585.08	* Reach Len. (ft)	*	737.00	*	326.34	*	446.00	*
* Crit W.S. (ft)	*	1584.61	* Flow Area (sq ft)	*		*	268.43	*		*
* E.G. Slope (ft/ft)	*	0.008200	* Area (sq ft)	*		*	268.43	*		*
* Q Total (cfs)	*	820.00	* Flow (cfs)	*		*	820.00	*		*
* Top Width (ft)	*	220.30	* Top Width (ft)	*		*	220.30	*		*
* Vel Total (ft/s)	*	3.05	* Avg. Vel. (ft/s)	*		*	3.05	*		*
* Max Chl Dpth (ft)	*	1.48	* Hydr. Depth (ft)	*		*	1.22	*		*
* Conv. Total (cfs)	*	9055.4	* Conv. (cfs)	*		*	9055.4	*		*
* Length Wtd. (ft)	*	326.34	* Wetted Per. (ft)	*		*	221.96	*		*
* Min Ch El (ft)	*	1583.60	* Shear (lb/sq ft)	*		*	0.62	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	1.89	*		*
* Frctn Loss (ft)	*	1.83	* Cum Volume (acre-ft)	*	0.17	*	17.84	*	0.56	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	0.05	*	8.57	*	0.19	*

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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9682.72	9829.99	48.62	28.03	74.91	5.93	0.37	1.73
* 2	Chan	9829.99	10050.29	684.90	261.36	220.31	83.52	1.19	2.62
* 3	ROB	10050.29	10310.74	86.48	49.62	111.53	10.55	0.44	1.74

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9829.99	10050.29	820.00	268.43	221.96	100.00	1.22	3.05

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.

CROSS SECTION

RIVER: T4N-R3W-S09
REACH: REACH-1 RS: 0.616

INPUT
Description:
Station Elevation Data num= 66

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9603.66	1585.3	9632.11	1585.55	9644.33	1585.45	9670.63	1585.26	9697.09	1585.52
9704.56	1585.6	9729.25	1584.82	9752.67	1584	9758.23	1583.82	9759.3	1583.78
9782.71	1583.3	9800.92	1582.98	9863.21	582.222	9869.07	1582.15	9881.76	1582
9891.68	1581.88	9897.04	1581.8	9903.56	1581.89	9909.77	1581.96	9914.39	1582
9919.93	1582.06	9934.4	1582.2	9936.5	1582	9940.27	1581.65	9942.95	1581.38
9943.92	1581.3	9945.72	1580.63	9947.51	1579.99	9947.61	1579.95	9947.81	1579.96
9948.06	1580	9948.1	1580	9949.26	1581.05	9949.59	1581.29	9989.32	1581.64
9991.47	1581.7	9991.83	1581.61	10000.2	1580.13	10001.42	1580.36	10006	1581.16
10008.14	1581.1	10010.71	1581.12	10011.81	1581.15	10011.86	1581.15	10056.57	1581.5
10062.9	1581.6	10063.6	1581.58	10064.49	1581.59	10064.56	1581.59	10065.77	1581.62
10067.46	1581.68	110067.99	1581.71	0073.82	1581.78	10083.49	158	210090.78	1582.14
10119.04	1582.76	10146.61	1583.51	0159.88	1583.92	10162.92	158	410202.27	1585.11
10214.37	1585.1	10260.89	1585.01	10292.38	1584.91	0321.12	1584.91	10324.65	1585.11
10341.43	1585.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9603.66	.035	9863.2	.05	10090.78	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.41	10090.78	642	607.64	522	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1583.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.047	0.050	0.033
W.S. Elev (ft)	1582.92	Reach Len. (ft)	642.00	607.64	522.00
Crit W.S. (ft)	1582.37	Flow Area (sq ft)	83.92	235.21	13.62
E.G. Slope (ft/ft)	0.004944	Area (sq ft)	83.92	235.21	13.62
Q Total (cfs)	820.00	Flow (cfs)	154.16	642.44	23.39
Top Width (ft)	318.66	Top Width (ft)	128.21	156.38	34.07
Vel Total (ft/s)	2.46	Avg. Vel. (ft/s)	1.84	2.73	1.72
Max Chl Dpth (ft)	2.97	Hydr. Depth (ft)	0.65	1.50	0.40
Conv. Total (cfs)	11662.1	Conv. (cfs)	2192.5	9136.9	332.7
Length Wtd. (ft)	601.96	Wetted Per. (ft)	128.22	157.39	34.08
Min Ch El (ft)	1579.95	Shear (lb/sq ft)	0.20	0.46	0.12
Alpha	1.08	Stream Power (lb/ft s)	0.37	1.26	0.21
Frctn Loss (ft)	3.20	Cum Volume (acre-ft)	2.08	13.40	3.78
C & E Loss (ft)	0.00	Cum SA (acres)	2.92	7.16	4.04

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 OUTPUT Profile #2

E.G. Elev (ft)	1583.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.050	
W.S. Elev (ft)	1583.27	Reach Len. (ft)	642.00	607.64	522.00
Crit W.S. (ft)	1582.36	Flow Area (sq ft)		290.40	
E.G. Slope (ft/ft)	0.004064	Area (sq ft)		290.40	
Q Total (cfs)	820.00	Flow (cfs)		820.00	
Top Width (ft)	156.38	Top Width (ft)		156.38	
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.82	
Max Chl Dpth (ft)	3.32	Hydr. Depth (ft)		1.86	
Conv. Total (cfs)	12863.1	Conv. (cfs)		12863.1	
Length Wtd. (ft)	607.64	Wetted Per. (ft)		159.59	
Min Ch El (ft)	1579.95	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.30	
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	0.17	15.75	0.56
C & E Loss (ft)	0.01	Cum SA (acres)	0.05	7.16	0.19

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 parabolic search method failed to converge on critical depth. The program will try the
cross section slice/secant method to find critical depth.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9769.03	9934.40	154.16	83.92	128.22	18.80	0.65	1.84
* 2	Chan	9934.40	10090.78	642.44	235.21	157.39	78.35	1.50	2.73
* 3	ROB	10090.78	10216.11	23.39	13.62	34.08	2.85	0.40	1.72

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9934.40	10090.78	820.00	290.40	159.59	100.00	1.86	2.82

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 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: T4N-R3W-S09
REACH: REACH-1 RS: 0.501

INPUT
Description:
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9693.66	1582.4	9712.92	1582.43	9737.04	1582.9	9756.92	1583.28	9770.83	1582.78
9774.11	1582.7	9779.29	1582.6	9796.36	1582.36	9807.03	1582.17	9810.24	1582.06
9811.67	1582	9812.39	1581.91	9847.25	1580.96	9865.31	1580.43	9866.62	1580.39
9867.21	1580.4	9869.25	1580.29	9880.66	1580.02	9881.42	1580	9897.69	1579.66
9920.37	1579.1	9947.19	1578.51	9958.91	1578.306	9975.85	1578.01	9976.32	1578
9976.96	1577.99	9992.71	1577.6	9998.46	1576.02	9998.52	1576.01	9998.53	1576.01
9998.54	1576	9998.56	1576	9998.64	1575.98	9999.32	1575.8	9999.71	1575.85
9999.9	1575.89	10000.02	1575.91	10000.24	1575.96	10000.33	1576	10000.36	1576
10001.85	1576.7	10002.35	1576.87	10003.41	1577.09	10005.32	1577.4	10007.92	1577.88
10008.36	1577.89	10008.71	1577.89	10010.95	1577.94	10013.17	1577.9	10013.46	1577.91
10013.65	1577.91	10013.67	1577.9	10013.86	1577.89	10013.86	1577.9	10016.62	1577.21
10017.4	1577.05	10017.75	1577.01	10018.08	1576.98	10018.39	1577	10019.29	1577.02
10023.89	1577.62	10024.62	1577.65	10026.44	1577.72	10032.28	1577.92	10032.62	1577.92
10034.33	1578	10035.42	1578	10040.41	1578.2	10053.46	1578.66	10054.81	1578.1
10055.04	1578	10056.87	1577.29	10058.71	1576.5	10059.08	1576.67	10061.2	1578
10061.21	1578.1	10061.31	1578.14	10064.29	1578.1	10067.62	1578.06	10071.29	1578.03
10072.35	1578.02	10075.79	1578.02	10079.25	1578	10079.75	1578.04	10084.54	1578.06
10086.12	1578.16	10086.36	1578.2	10086.41	1578.07	10087.92	1577.52	10088.11	1577.36

```
10088.83 1577.5110090.73    157810091.14 1578.0910091.37 1578.1410094.64 1578.26
10098.25 1578.42 10101.1  1578.510103.71 1578.6610105.81 1578.75 10107.5 1578.83
10113.491578.99910135.04 1579.61 10168.2  1579.710182.79 1579.7510192.85 1579.82
10213.29 1579.9910214.69    158010230.88  1580.110232.79 1580.1310233.68 1580.13
10264.13 1580.8110279.81  1581.210296.99  1581.210376.53 1581.3610382.46  1581.4
10417.73 1581.9410421.33    158210423.91 1582.0510429.33 1582.1510430.06 1582.17
10430.75 1582.1710432.25  1582.210461.45 1582.31

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
 9693.66    .033 9947.19     .0610053.46     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.1910053.46              552  539.54     478             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1579.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.033  *   0.060  *   0.060  *
* W.S. Elev (ft)          * 1579.71  * Reach Len. (ft)         *  552.00  *  539.54  *  478.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   32.03  *  198.60  *  104.65  *
* E.G. Slope (ft/ft)      *0.005728  * Area (sq ft)            *   32.03  *  198.60  *  104.65  *
* Q Total (cfs)           *  820.00  * Flow (cfs)              *   78.92  *  562.23  *  178.85  *
* Top Width (ft)          *  277.23  * Top Width (ft)          *   52.09  *  106.27  *  118.87  *
* Vel Total (ft/s)        *    2.45  * Avg. Vel. (ft/s)        *    2.46  *    2.83  *    1.71  *
* Max Chl Dpth (ft)       *    3.91  * Hydr. Depth (ft)        *    0.61  *    1.87  *    0.88  *
* Conv. Total (cfs)       * 10834.2  * Conv. (cfs)             *  1042.7  *  7428.4  *  2363.1  *
* Length Wtd. (ft)        *  531.34  * Wetted Per. (ft)        *   52.10  *  107.00  *  120.19  *
* Min Ch El (ft)          * 1575.80  * Shear (lb/sq ft)        *    0.22  *    0.66  *    0.31  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)  *    0.54  *    1.88  *    0.53  *
* Frctn Loss (ft)         *    3.93  * Cum Volume (acre-ft)    *    1.22  *   10.37  *    3.07  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    1.59  *    5.33  *    3.13  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1580.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *          *   0.060  *          *
* W.S. Elev (ft)          * 1580.12  * Reach Len. (ft)         *  552.00  *  539.54  *  478.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  241.96  *          *
* E.G. Slope (ft/ft)      *0.006552  * Area (sq ft)            *          *  241.96  *          *
* Q Total (cfs)           *  820.00  * Flow (cfs)              *          *  820.00  *          *
* Top Width (ft)          *  106.27  * Top Width (ft)          *          *  106.27  *          *
* Vel Total (ft/s)        *    3.39  * Avg. Vel. (ft/s)        *          *    3.39  *          *
* Max Chl Dpth (ft)       *    4.32  * Hydr. Depth (ft)        *          *    2.28  *          *
* Conv. Total (cfs)       * 10130.1  * Conv. (cfs)             *          * 10130.1  *          *
* Length Wtd. (ft)        *  539.54  * Wetted Per. (ft)        *          *  110.07  *          *
* Min Ch El (ft)          * 1575.80  * Shear (lb/sq ft)        *          *    0.90  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.05  *          *
* Frctn Loss (ft)         *    4.24  * Cum Volume (acre-ft)    *    0.17  *   12.04  *    0.56  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.05  *    5.33  *    0.19  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9820.43   * 9947.19   *    78.92 *    32.03 *    52.10 *     9.62 *
0.61 *     2.46 *
* 2        * Chan      * 9947.19   * 10053.46  *   562.23 *   198.60 *   107.00 *    68.56 *
1.87 *     2.83 *
```

```
* 3          * ROB       * 10053.46  * 10257.46  *   178.85 *   104.65 *   120.19 *    21.81 *
0.88 *     1.71 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9947.19   * 10053.46  *   820.00 *   241.96 *   110.07 *   100.00 *
2.28 *     3.39 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 0.398

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 850cfs.
Station Elevation Data    num=     124
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9391.26  1580.7 9412.26 1580.55  9412.6 1580.55 9414.18 1580.54 9430.19 1580.47
 9454.46 1580.78  9457.1 1580.81 9463.47 1580.87 9501.21 1580.59 9509.13  1580.6
 9533.89 1580.23 9539.05 1580.18 9545.17  1580.1 9552.41 1580.06 9561.97    1580
 9562.36 1580.01 9563.34 1580.01 9565.37    1580 9570.65 1579.97 9579.92  1579.9
 9589.03 1579.94 9595.85 1579.91 9601.81 1579.87 9612.98 1579.79  9624.2  1579.7
 9633.24 1579.56 9649.79 1579.24 9694.44 1579.33 9712.01 1579.34 9724.43  1579.1
 9736.36 1578.91  9760.1 1578.81 9763.29 1578.81 9774.93  1578.9 9779.12 1578.89
  9782.6 1578.92 9785.52 1578.89 9787.25 1578.84 9790.78  1578.7 9803.89 1578.33
  9807.5 1578.24 9813.02 1578.14 9814.48 1578.13 9818.27 1578.04 9818.82 1578.03
 9819.39    1578 9820.19 1577.96 9823.52 1577.73  9830.4 1577.28 9830.56 1577.28
 9836.06  1576.9 9836.47  1576.9 9836.53 1576.89 9841.52 1576.69 9841.64  1576.7
 9843.82 1576.61  9854.9 1576.29 9860.88 1576.18 9865.97  1576.1 9867.66    1576
 9870.37  1575.9 9872.61 1575.71 9874.73  1575.5 9887.36  1574.6 9889.71 1574.42
 9891.42 1574.41 9912.34 1574.09 9915.82 1574.04 9916.04    1574 9916.24 1574.04
 9920.93 1574.17 9932.931574.074 9942.46    1574 9944.16    1574 9948.97 1573.93
 9958.76 1573.85 9959.06 1573.85 9965.24  1573.4 9967.21 1573.26 9968.77 1573.35
 9973.53 1573.62    9974 1573.65 9975.05  1573.7  9981.9    1574 9988.73 1574.23
 9996.22 1574.45 9996.54 1574.24 9996.95    1574 9999.91 1572.1610000.15 1571.99
10000.16    157210000.35 1572.0610007.47    157410008.93 1574.3610009.26 1574.46
10024.081574.88910032.04 1575.12 10043.8 1575.4710053.22  1575.610071.62    1576
10074.85 1576.0610087.25 1576.2810117.55 1576.2410128.96  1576.410148.59 1576.95
10166.72 1577.5210186.06 1577.1610206.76 1576.8410230.42  1577.3   10242 1577.51
10242.85 1577.5110243.27  1577.510243.99 1577.5210274.35    157810278.85  1578.1
 10292.4 1578.2910320.24 1578.7910338.23 1579.1110357.51  1579.210379.89  1579.2
10384.68 1579.3210418.97    158010423.17 1580.0810432.24 1580.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9391.26    .033 9887.36     .0610024.08    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9887.3610009.26              506  527.92     507              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
```

E.G. Elev (ft)	1575.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.060	0.049
W.S. Elev (ft)	1575.70	Reach Len. (ft)	506.00	527.92	507.00
Crit W.S. (ft)		Flow Area (sq ft)	8.40	214.08	27.26
E.G. Slope (ft/ft)	0.009796	Area (sq ft)	8.40	214.08	27.26
Q Total (cfs)	850.00	Flow (cfs)	25.81	759.25	64.94
Top Width (ft)	185.08	Top Width (ft)	14.64	121.90	48.54
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)	3.07	3.55	2.38
Max Chl Dpth (ft)	3.71	Hydr. Depth (ft)	0.57	1.76	0.56
Conv. Total (cfs)	8588.0	Conv. (cfs)	260.8	7671.1	656.1
Length Wtd. (ft)	525.97	Wetted Per. (ft)	14.69	123.01	48.55
Min Ch El (ft)	1571.99	Shear (lb/sq ft)	0.35	1.06	0.34
Alpha	1.03	Stream Power (lb/ft s)	1.08	3.77	0.82
Frctn Loss (ft)	4.15	Cum Volume (acre-ft)	0.97	7.82	2.35
C & E Loss (ft)	0.02	Cum SA (acres)	1.17	3.91	2.21

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 OUTPUT Profile #2

E.G. Elev (ft)	1576.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.060	
W.S. Elev (ft)	1575.86	Reach Len. (ft)	506.00	527.92	507.00
Crit W.S. (ft)		Flow Area (sq ft)		233.07	
E.G. Slope (ft/ft)	0.009516	Area (sq ft)		233.07	
Q Total (cfs)	850.00	Flow (cfs)		850.00	
Top Width (ft)	121.90	Top Width (ft)		121.90	
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)		3.65	
Max Chl Dpth (ft)	3.87	Hydr. Depth (ft)		1.91	
Conv. Total (cfs)	8713.5	Conv. (cfs)		8713.5	
Length Wtd. (ft)	527.92	Wetted Per. (ft)		125.66	
Min Ch El (ft)	1571.99	Shear (lb/sq ft)		1.10	
Alpha	1.00	Stream Power (lb/ft s)		4.02	
Frctn Loss (ft)	4.25	Cum Volume (acre-ft)	0.17	9.09	0.56
C & E Loss (ft)	0.02	Cum SA (acres)	0.05	3.91	0.19

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9639.31	9887.36	25.81	8.40	14.69	3.04	0.57	3.07
2	Chan	9887.36	10009.26	759.25	214.08	123.01	89.32	1.76	3.55
3	ROB	10009.26	10220.75	64.94	27.26	48.55	7.64	0.56	2.38

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9887.36	10009.26	850.00	233.07	125.66	100.00	1.91	3.65

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*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 0.299

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data    num=     219
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
  9152.8  1576.6 9167.88 1576.63 9171.64 1576.62 9174.67 1576.63 9178.28 1576.65
 9182.51  1576.7 9239.78 1576.68 9246.05 1576.73 9252.79 1576.79 9259.82 1576.81
 9284.34 1576.77 9295.54 1576.67  9300.3 1576.86 9306.52  1576.9 9340.11 1576.35
 9357.38 1576.23 9359.13 1576.23 9395.19 1576.04 9405.32    1576 9407.63    1576
 9408.37 1575.99 9449.93 1575.97 9450.13    1576 9450.14 1575.97 9450.26 1575.97
 9483.02 1575.76 9493.25 1575.79 9507.34 1575.82 9507.75 1575.83 9511.91  1575.9
 9516.96 1575.93 9519.76 1575.52 9521.07 1575.32 9525.68 1575.75 9528.29    1576
 9528.38 1576.02 9528.39 1576.01 9528.63 1576.03  9531.3 1576.04 9536.19  1576.1
 9566.49 1576.82 9577.39 1576.81 9586.79 1576.66 9589.34 1576.67 9599.03  1576.4
 9600.53 1576.43 9601.84 1576.42 9603.74  1576.4 9606.41  1576.3 9610.81  1576.2
 9612.27 1576.18 9612.57 1576.18 9632.64  1576.1 9645.24 1576.12 9691.23 1576.06
 9693.74 1576.04 9696.63 1576.01 9696.96    1576 9697.64    1576 9699.25 1575.98
  9700.4 1575.99 9705.68 1575.34 9705.83  1575.3 9709.51 1574.86 9716.22 1574.58
 9733.38 1574.35 9751.29 1574.17 9761.76    1574 9768.88 1573.87 9769.28 1573.86
 9769.85 1573.87 9811.05 1573.11 9814.34  1573.1 9814.58 1573.05 9814.69 1573.05
 9814.82 1573.04 9814.91 1573.04 9815.12    1573 9815.25 1573.04  9816.9 1573.02
 9819.77  1573.1 9820.19 1573.11 9824.29  1573.2  9827.5  1573.3 9829.15 1573.33
 9832.71 1573.37 9836.09 1573.38 9838.66  1573.4 9844.66 1573.44 9847.69 1573.47
 9852.01 1573.49 9854.82  1573.5 9857.18 1573.47 9858.59  1573.4 9860.94 1573.38
 9863.92  1573.2 9865.66 1573.18 9868.34 1573.12 9871.43 1573.09 9875.03 1572.96
 9878.31     1573 9881.77 1572.95 9885.04 1572.79  9888.5 1572.56 9890.51 1572.42
 9895.43     1572 9896.37 1571.91 9900.65 1571.51 9908.42 1570.77 9910.07 1570.64
 9911.78  1570.7  9913.3 1570.76 9914.91 1570.75 9916.76 1570.78 9919.39 1570.71
 9921.08  1570.7 9934.44  1570.3 9936.75 1570.21 9940.33    1570 9943.26 1569.86
 9944.74  1569.8 9946.38 1569.74 9949.86 1569.63  9952.1  1569.6 9953.561569.606
 9954.37 1569.61    9958  1569.6 9959.76 1569.54 9960.49 1569.55  9961.3 1569.57
 9961.41 1569.56 9961.93  1569.6 9962.21 1569.58 9963.01 1569.57 9964.18 1569.55
  9966.4 1569.43 9972.13  1569.5 9980.93  1569.7 9984.85 1569.75 9991.34 1569.73
 9994.81 1569.66 9995.03 1569.710001.19 1569.6910001.44 1569.64 10001.6 1569.61
10002.56 1569.4110005.72 1568.810006.33  1568.6 10007.8 1569.0810009.74 1569.59
10009.83  1569.610009.88 1569.610010.38 1569.6110015.07 1569.69 10016.4 1569.69
10021.87  1569.710026.01 1569.710032.73 1569.6910036.48 1569.6910045.16 1569.68
10046.04  1569.310047.53 1568.78 10050.5 1569.3810053.28 1569.9510053.74 1569.97
 10054.5    157010066.351570.56910078.86 1571.1710097.77 1571.9910098.58    1572
10098.84 1572.05 10102.5    157210110.62    1572 10117.3 1571.9810117.65    1572
10127.23 1571.9610138.43 1571.9210139.42 1571.9210141.96  1571.9 10143.3 1571.63
10145.95 1571.5810146.23 1571.5910151.76  1571.9   10152  1571.910155.48    1572
10156.57 1571.9910156.78    1572 10157.9    157210158.87 1572.0610176.82 1572.69
10194.71 1573.2610195.51  1573.310203.75 1573.3410236.67 1573.5910244.79 1573.71
10266.94    157410269.87    157410274.42  1574.1 10276.5 1574.2810279.39 1574.28
10285.72 1574.2910294.75  1574.710304.33 1574.9610307.15 1574.6810311.25 1574.35
10313.37 1574.3910317.92  1574.410319.14 1574.4610320.77 1574.5210343.04 1574.96
10355.56 1575.0910356.88  1575.110357.28 1575.1110357.74 1575.1310372.65 1575.51
10392.61 1576.0110393.07    157610394.28 1576.0410410.33 1576.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9152.8    .033 9921.08     .0610066.35    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9921.0810066.35              495  496.42     470             .1       .3
Right Levee     Station=10098.84      Elevation= 1572.05
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1571.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.033	0.060	0.033
W.S. Elev (ft)	1571.59	Reach Len. (ft)	495.00	496.42	470.00
Crit W.S. (ft)	1570.81	Flow Area (sq ft)	14.37	264.60	10.95
E.G. Slope (ft/ft)	0.006487	Area (sq ft)	14.37	264.60	10.95
Q Total (cfs)	850.00	Flow (cfs)	40.10	785.04	24.86
Top Width (ft)	188.61	Top Width (ft)	21.24	145.27	22.10
Vel Total (ft/s)	2.93	Avg. Vel. (ft/s)	2.79	2.97	2.27
Max Chl Dpth (ft)	2.99	Hydr. Depth (ft)	0.68	1.82	0.50
Conv. Total (cfs)	10553.3	Conv. (cfs)	497.8	9746.8	308.6
Length Wtd. (ft)	493.71	Wetted Per. (ft)	21.29	145.87	22.12
Min Ch El (ft)	1568.60	Shear (lb/sq ft)	0.27	0.73	0.20
Alpha	1.01	Stream Power (lb/ft s)	0.76	2.18	0.46
Frctn Loss (ft)	4.08	Cum Volume (acre-ft)	0.83	4.92	2.13
C & E Loss (ft)	0.01	Cum SA (acres)	0.96	2.29	1.80

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 OUTPUT Profile #2

E.G. Elev (ft)	1571.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.060	
W.S. Elev (ft)	1571.65	Reach Len. (ft)	495.00	496.42	470.00
Crit W.S. (ft)	1570.78	Flow Area (sq ft)		273.98	
E.G. Slope (ft/ft)	0.006897	Area (sq ft)		273.98	
Q Total (cfs)	850.00	Flow (cfs)		850.00	
Top Width (ft)	145.27	Top Width (ft)		145.27	
Vel Total (ft/s)	3.10	Avg. Vel. (ft/s)		3.10	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)		1.89	
Conv. Total (cfs)	10234.7	Conv. (cfs)		10234.7	
Length Wtd. (ft)	496.42	Wetted Per. (ft)		147.90	
Min Ch El (ft)	1568.60	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		2.47	
Frctn Loss (ft)	3.33	Cum Volume (acre-ft)	0.17	6.02	0.56
C & E Loss (ft)	0.01	Cum SA (acres)	0.05	2.29	0.19

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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9536.94	9921.08	40.10	14.37	21.29	4.72	0.68	2.79
2	Chan	9921.08	10066.35	785.04	264.60	145.87	92.36	1.82	2.97
3	ROB	10066.35	10098.84	24.86	10.95	22.12	2.92	0.50	2.27

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9921.08	10066.35	850.00	273.98	147.90	100.00	1.89	3.10

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 parabolic search method failed to converge on critical depth. The program will try the
cross section slice/secant method to find 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: T4N-R3W-S09
REACH: REACH-1 RS: 0.204

INPUT
Description:
Station Elevation Data num= 186

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9150.96	1572	9152.7	1572	9161.43	1572.06	9190.03	1572.36	9202.16	1572.4
9219.87	1572.55	9236.81	1572.68	9254.65	1572.72	9270.46	1572.8	9288.17	1572.8
9318.28	1572.74	9330.11	1572.7	9338.31	1572.68	9374.92	1573.08	9380.34	1573.1
9422.58	1573.27	9423.87	1573.26	9425.2	1573.27	9470.88	1573.11	9471.31	1573.1
9483.83	1573.28	9515.78	1573.87	9523.93	1573.78	9529.47	1573.82	9561.69	1573.8
9563.31	1573.86	9568.19	1573.9	9568.32	1573.91	9577.14	1573.95	9580.73	1574
9581.32	1574.01	9594.7	1574	9602.66	1574	9607.24	1574.06	9610.83	1574.06
9612.49	1574.05	9618.19	1574	9625.34	1573.97	9633.51	1573.8	9634.08	1573.8
9644.27	1573.74	9648.17	1573.6	9648.43	1573.59	9648.56	1573.59	9658.7	1573.3
9659.81	1573.25	9668.21	1573	9674.73	1572.82	9681.29	1572.62	9686.11	1572.46
9690.91	1572.28	9695.87	1572	9696.53	1572	9700.16	1571.84	9701.83	1571.73
9703.74	1571.6	9706.17	1571.4	9708.92	1571.29	9710.66	1571.18	9713.24	1571.13
9715.66	1570.95	9718.29	1570.9	9720.43	1570.89	9721.8	1570.89	9725.34	1570.62
9726.71	1570.62	9727.99	1570.6	9730.08	1570.58	9732.36	1570.53	9735.11	1570.49
9737.8	1570.48	9742.14	1570.5	9745.08	1570.49	9747.27	1570.39	9750.25	1570.29
9753.85	1570.16	9757.14	1570	9757.42	1570.02	9757.48	1570	9762.21	1569.7
9763.4	1569.6	9764.21	1569.5	9767.47	1569.59	9768.47	1569.53	9771.56	1569.56
9772.7	1569.52	9775.59	1569.5	9776.83	1569.48	9782.85	1569.32	9788.02	1569.18
9790.26	1569.17	9793.02	1569.2	9797.57	1569.03	9801.14	1569.02	9807.21	1568.9
9810.17	1568.8	9812.04	1568.81	9815.2	1568.75	9816.55	1568.74	9819.74	1568.73
9820.68	1568.7	9823.94	1568.74	9827.99	1568.68	9831.03	1568.67	9834.4	1568.61
9835.61	1568.6	9855.75	1568.01	9856.67	1568	9881.59	1567.59	9887.23	1567.55
9893.2	1567.4	9895.85	1567.37	9898.24	1567.3	9900.85	1567.23	9903.45	1567.15
9905.72	1567.1	9908.64	1567.02	9911.07	1566.96	9914.07	1566.89	9922.28	1566.71
9942.73	1566.3	9945.56	1566.21	9948.51	1566.146	9950.15	1566.11	9953.4	1566
9963.17	1565.38	9968.2	1565	9971.3	1564.88	9971.7	1564.73	9974.33	1565.14
9975.14	1565.32	9982.98	1565.7	9996.4	1565.99	9996.53	1565.94	10000.74	1564.34
10002.59	1564.71	10006.6	1565.6	10014.04	1565.76	10027.1	1566	10029.48	1566.05
10031.2	1566.08	10031.49	1566.07	10033.52	1566	10034.67	1566	10036.86	1565.94
10037.28	1565.94	10037.28	1565.91	0039.79	1566	10040.34	1566.01	10052.01	1566.27
10064.68	1566.5	10067.83	1566.5	10072.49	1566.64	10072.79	1566.65	10074.53	1566.73
10081.5	1566.91	10081.74	1566.91	0081.84	1566.91	10084.84	1567.16	10084.94	1567.2
10089.44	1567.36	10101.21	1568	10107.78	1568.17	10118.47	1568.57	10128.32	1568.2
10130.52	1568.17	10139.65	1568	10142.53	1567.94	10144.45	1567.93	10145.54	1567.9
10146.25	1567.94	10147.32	1567.95	10148.04	1568	10148.05	1568	10151.43	1568.1

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10152.34 1568.1510153.03 1568.1910157.92 1568.41 10159.8  1568.510163.15  1568.6
   10193 1569.58 10198.7 1569.7410202.83 1569.8610207.73 1569.9910208.17    1570
 10211.6 1570.09

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9150.96    .033 9942.73     .06 10031.2     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9942.73 10031.2               474  531.77     547            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1567.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *   0.033  *   0.060  *   0.060  *
* W.S. Elev (ft)          * 1567.44  * Reach Len. (ft)         *  474.00  *  531.77  *  547.00  *
* Crit W.S. (ft)          * 1566.99  * Flow Area (sq ft)       *   30.38  *  159.50  *   56.94  *
* E.G. Slope (ft/ft)      *0.010857  * Area (sq ft)            *   30.38  *  159.50  *   56.94  *
* Q Total (cfs)           *  850.00  * Flow (cfs)              *  100.71  *  607.06  *  142.23  *
* Top Width (ft)          *  199.31  * Top Width (ft)          *   51.12  *   88.47  *   59.71  *
* Vel Total (ft/s)        *    3.44  * Avg. Vel. (ft/s)        *    3.32  *    3.81  *    2.50  *
* Max Chl Dpth (ft)       *    3.10  * Hydr. Depth (ft)        *    0.59  *    1.80  *    0.95  *
* Conv. Total (cfs)       *  8157.6  * Conv. (cfs)             *   966.6  *  5826.1  *  1365.0  *
* Length Wtd. (ft)        *  530.52  * Wetted Per. (ft)        *   51.14  *   89.04  *   59.79  *
* Min Ch El (ft)          * 1564.34  * Shear (lb/sq ft)        *    0.40  *    1.21  *    0.65  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    1.33  *    4.62  *    1.61  *
* Frctn Loss (ft)         *    3.74  * Cum Volume (acre-ft)    *    0.58  *    2.50  *    1.76  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.55  *    0.96  *    1.35  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1568.46  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *          *   0.060  *          *
* W.S. Elev (ft)          * 1568.25  * Reach Len. (ft)         *  474.00  *  531.77  *  547.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  231.54  *          *
* E.G. Slope (ft/ft)      *0.006528  * Area (sq ft)            *          *  231.54  *          *
* Q Total (cfs)           *  850.00  * Flow (cfs)              *          *  850.00  *          *
* Top Width (ft)          *   88.47  * Top Width (ft)          *          *   88.47  *          *
* Vel Total (ft/s)        *    3.67  * Avg. Vel. (ft/s)        *          *    3.67  *          *
* Max Chl Dpth (ft)       *    3.91  * Hydr. Depth (ft)        *          *    2.62  *          *
* Conv. Total (cfs)       * 10520.6  * Conv. (cfs)             *          * 10520.6  *          *
* Length Wtd. (ft)        *  532.90  * Wetted Per. (ft)        *          *   93.17  *          *
* Min Ch El (ft)          * 1564.34  * Shear (lb/sq ft)        *          *    1.01  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.72  *          *
* Frctn Loss (ft)         *    3.84  * Cum Volume (acre-ft)    *    0.17  *    3.14  *    0.56  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    0.05  *    0.96  *    0.19  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9546.85   * 9942.73   *   100.71 *    30.38 *    51.14 *    11.85 *
0.59 *     3.32 *
* 2        * Chan      * 9942.73   * 10031.20  *   607.06 *   159.50 *    89.04 *    71.42 *
1.80 *     3.81 *
* 3        * ROB       * 10031.20  * 10121.40  *   142.23 *    56.94 *    59.79 *    16.73 *
0.95 *     2.50 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9942.73   * 10031.20  *   850.00 *   231.54 *    93.17 *   100.00 *
2.62 *     3.67 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 0.104

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain
Station Elevation Data    num=     211
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9125.57     1569 9130.21 1568.99 9143.08 1569.08 9171.28 1569.14 9184.74  1569.2
 9198.28 1569.08 9212.65 1569.07 9227.75 1569.05 9239.93 1568.74 9247.34  1568.8
  9258.9 1568.92 9260.67 1568.94 9261.71 1568.96  9262.3 1568.94 9268.53  1568.6
 9269.39 1568.57 9281.86 1568.64 9290.11  1569.1 9297.71 1569.42 9303.98  1569.6
 9303.99 1569.55 9305.55 1569.59 9316.13 1569.36 9319.34 1569.34 9326.04  1569.1
 9348.34  1568.5  9348.7 1568.47 9354.13    1568 9365.33 1567.04 9378.91 1565.88
 9380.76 1565.55 9385.99 1564.41 9391.03  1565.1 9398.05    1566 9402.92 1566.61
 9404.38 1566.74 9407.18 1567.02  9411.2  1567.5 9411.34 1567.48 9411.46  1567.5
  9413.5 1567.67 9414.48 1567.76 9419.06    1568  9424.6 1568.23 9426.33 1568.29
 9427.59 1568.31 9452.93 1569.13 9453.92  1569.1 9454.66 1569.15 9460.13 1569.35
  9465.3 1569.37 9466.15 1569.35 9471.22  1569.3 9474.24  1569.2 9475.73 1569.16
 9478.55  1569.1 9480.07 1569.14 9489.07  1569.4 9498.63 1568.81 9502.12 1568.73
 9504.06 1568.68 9519.67  1568.6 9525.49  1568.8 9527.27 1568.32 9529.07    1568
 9529.25 1567.97 9531.75 1567.37 9538.79  1567.8 9540.15 1567.98 9541.33 1568.03
 9541.49    1568 9543.05    1568 9543.41 1568.03 9545.04 1568.01 9549.45 1568.02
 9557.94 1568.03 9557.95    1568 9558.16    1568 9561.24 1567.59 9565.45 1567.09
 9567.06 1567.25 9573.91    1568 9579.42 1568.61 9583.52 1569.09 9593.16 1569.37
 9597.01 1569.48 9603.51  1569.7 9613.82 1569.93 9615.92 1569.98 9617.04 1569.99
 9617.29 1570.03 9618.69    1570 9619.32 1569.92 9633.21 1569.32 9646.85 1568.61
 9650.35 1568.31  9654.5    1568  9662.8 1567.35  9664.5 1567.27 9666.29 1567.15
 9668.86 1566.96 9672.88  1566.7 9675.77 1566.48    9682 1566.88 9699.76    1568
 9702.43 1568.17  9705.4  1568.3 9719.84 1568.26  9766.2 1568.77 9768.66 1568.84
 9779.06  1568.3 9785.33    1568 9796.01 1567.33 9800.62 1567.17    9803 1567.07
 9806.67  1566.9 9817.01 1566.36 9824.19    1566 9829.05 1565.76 9835.91 1565.39
  9837.4    1565 9841.45    1564 9841.75 1563.91 9842.24  1563.8 9843.18 1563.62
  9843.2  1563.6 9845.83 1563.94  9846.3    1564 9853.75 1564.89 9859.67 1565.67
 9861.42  1565.8 9865.36 1565.97 9865.83    1566 9867.29 1566.08 9880.89  1566.8
 9888.57  1567.2  9892.9    1567 9896.03 1566.87  9910.3    1566 9914.56 1565.56
 9918.14  1565.3  9918.6 1565.34 9918.68 1565.33 9923.58 1565.39  9955.6 1564.17
 9956.25  1564.1 9959.13    1564 9964.87 1563.76  9968.9 1563.54 9969.51 1563.47
 9973.721562.889 9977.99  1562.3 9979.39 1562.17 9979.87 1562.12 9980.87    1562
 9986.55 1561.34 9988.03  1561.2 9988.15 1561.12 9989.82 1560.63 9990.41 1560.43
 9991.51    1560 9993.37  1559.4 9995.71 1558.47 9995.74 1558.45 9995.78 1558.46
10004.15    156010006.56  1560.510007.04 1560.5410014.67 1561.16 10015.2 1561.21
10022.611561.34310026.33 1561.4110032.21  1561.510036.72 1560.8910038.84 1560.57
10039.22 1560.5110040.75 1561.4410041.07  1561.610041.88 1561.7110044.64    1562
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 10046.2 1562.1510047.06 1562.1910048.86  1562.310056.64 1562.6610057.63  1562.7
10058.79 1562.7510059.25 1562.7810087.01  1562.710094.31 1562.8810094.92 1562.89
10095.74 1562.9110096.06 1562.9110097.38    156310101.42 1563.3210109.75    1564
10117.85 1564.68 10129.5  1565.610135.39    156610137.55 1566.1610140.37 1566.39
10142.79 1566.5510144.06  1566.610144.72 1566.6510145.64 1566.6710168.11 1566.82
10168.26 1566.8310168.38  1566.810170.53 1566.9210171.37 1566.9510176.05  1567.1
10186.72 1567.43

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9125.57    .033 9977.99     .0610048.86    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.5510022.61              355  379.25     363            .1        .3
Left Levee      Station= 9888.57      Elevation=  1567.2

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1563.89  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *   0.052  *   0.060  *   0.048  *
* W.S. Elev (ft)          * 1563.70  * Reach Len. (ft)         *  355.00  *  379.25  *  363.00  *
* Crit W.S. (ft)          * 1562.85  * Flow Area (sq ft)       *   23.23  *  121.57  *  109.52  *
* E.G. Slope (ft/ft)      *0.004948  * Area (sq ft)            *   23.23  *  121.57  *  109.52  *
* Q Total (cfs)           *  850.00  * Flow (cfs)              *   58.33  *  469.92  *  321.75  *
* Top Width (ft)          *  140.10  * Top Width (ft)          *   20.58  *   36.06  *   83.46  *
* Vel Total (ft/s)        *    3.34  * Avg. Vel. (ft/s)        *    2.51  *    3.87  *    2.94  *
* Max Chl Dpth (ft)       *    5.25  * Hydr. Depth (ft)        *    1.13  *    3.37  *    1.31  *
* Conv. Total (cfs)       * 12084.0  * Conv. (cfs)             *   829.3  *  6680.5  *  4574.2  *
* Length Wtd. (ft)        *  370.22  * Wetted Per. (ft)        *   20.72  *   36.78  *   83.91  *
* Min Ch El (ft)          * 1558.45  * Shear (lb/sq ft)        *    0.35  *    1.02  *    0.40  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    0.87  *    3.95  *    1.18  *
* Frctn Loss (ft)         *    2.32  * Cum Volume (acre-ft)    *    0.29  *    0.78  *    0.71  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    0.16  *    0.20  *    0.46  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1564.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *          *   0.060  *   0.060  *
* W.S. Elev (ft)          * 1564.23  * Reach Len. (ft)         *  355.00  *  379.25  *  363.00  *
* Crit W.S. (ft)          * 1562.79  * Flow Area (sq ft)       *          *  140.70  *   33.24  *
* E.G. Slope (ft/ft)      *0.007982  * Area (sq ft)            *          *  140.70  *   33.24  *
* Q Total (cfs)           *  850.00  * Flow (cfs)              *          *  724.08  *  125.92  *
* Top Width (ft)          *   47.85  * Top Width (ft)          *          *   36.06  *   11.79  *
* Vel Total (ft/s)        *    4.89  * Avg. Vel. (ft/s)        *          *    5.15  *    3.79  *
* Max Chl Dpth.(ft)       *    5.78  * Hydr. Depth (ft)        *          *    3.90  *    2.82  *
* Conv. Total (cfs)       *  9513.7  * Conv. (cfs)             *          *  8104.3  *  1409.4  *
* Length Wtd. (ft)        *  372.93  * Wetted Per. (ft)        *          *   39.67  *   14.84  *
* Min Ch El (ft)          * 1558.45  * Shear (lb/sq ft)        *          *    1.77  *    1.12  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *          *    9.10  *    4.23  *
* Frctn Loss (ft)         *    3.02  * Cum Volume (acre-ft)    *    0.17  *    0.87  *    0.36  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    0.05  *    0.20  *    0.11  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9888.57   * 9986.55   *    58.33 *    23.23 *    20.72 *     6.86 *
1.13 *     2.51 *
* 2         * Chan      * 9986.55   * 10022.61  *   469.92 *   121.57 *    36.78 *    55.28 *
3.37 *     3.87 *
* 3         * ROB       * 10022.61  * 10104.67  *   321.71 *   109.44 *    82.50 *    37.85 *
1.33 *     2.94 *
* 4         * ROB       * 10104.67  * 10186.72  *     0.04 *     0.08 *     1.41 *     0.00 *
0.06 *     0.47 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9986.55   * 10022.61  *   724.08 *   140.70 *    39.67 *    85.19 *
3.90 *     5.15 *
* 2         * ROB       * 10022.61  * 10104.67  *   125.92 *    33.24 *    14.84 *    14.81 *
2.82 *     3.79 *
*****************************************************************************************
******************

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: T4N-R3W-S09
REACH: REACH-1            RS: 0.032

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into floodplain
Station Elevation Data    num=     188
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9224.46  1566.5 9237.78 1566.24 9241.65 1566.18 9242.89 1566.18 9246.99 1566.15
 9260.16  1566.1 9264.42 1566.11 9267.04 1566.07 9267.68 1566.12 9269.34 1566.03
 9270.08    1566 9295.63 1564.67 9299.19 1564.46 9299.87 1564.41 9301.89 1564.25
 9305.33    1564 9310.91 1563.52 9312.87 1563.36 9314.32 1563.27 9318.96 1563.75
 9321.28    1564 9322.67 1564.14 9327.67 1564.68 9335.19 1565.17 9338.27 1565.29
 9351.83  1565.7 9352.48 1565.74 9353.39 1565.75 9353.56 1565.81 9354.25 1565.75
 9355.03  1565.7 9364.29 1565.26 9365.63 1565.17 9371.26 1564.73 9372.77  1564.6
 9378.78  1564.2 9380.47 1564.04 9381.11 1564.04 9383.28 1564.49 9384.56 1564.74
 9385.54  1564.9 9385.84 1564.95 9394.78 1564.12 9395.56    1564 9396.07  1563.9
 9397.06  1563.8 9402.44    1564 9403.71 1564.05 9406.02 1564.16 9409.94  1564.3
 9416.82 1564.89 9441.12 1564.99 9446.17 1564.93 9458.74    1564 9459.87 1563.92
 9461.78 1563.77 9463.49 1563.87 9466.09    1564 9468.86  1564.2 9475.36  1564.5
 9475.91 1564.52 9476.03 1564.53 9480.38 1564.46 9502.62  1565.3 9509.83  1565.3
    9511 1565.31 9511.88 1565.29  9521.3  1565.4 9528.09    1565 9535.86 1564.67
  9542.4 1564.32 9544.31  1564.3  9550.2  1564.3 9555.03  1564.4 9559.27 1564.45
 9564.21 1564.62 9573.26 1564.77 9578.75 1564.39 9582.94    1564 9595.78 1563.18
 9601.29  1562.7 9616.17 1562.65 9634.93 1562.68 9641.06  1562.1 9642.71    1562
 9643.99 1561.88 9646.18 1561.62 9654.69 1561.93 9656.52    1562 9656.99 1562.02
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 9657.86 1562.06 9657.87 1562.06 9660.76    1562 9662.48 1561.97 9662.81 1561.97
 9663.15 1561.95 9670.31 1561.69 9683.38  1561.7  9684.9 1561.62 9686.32 1561.62
 9694.34    1561 9702.03 1560.28 9705.25  1560.3 9709.07 1560.32 9714.35 1560.25
 9715.12 1560.07 9715.33    1560 9719.89  1558.6 9720.95  1558.3 9721.27 1558.35
  9729.8 1559.55 9730.16 1559.57  9731.4  1559.6 9751.09 1559.91 9751.92 1559.94
 9755.16 1559.94 9772.74 1559.67 9777.76  1559.6 9782.63 1559.15    9783 1559.11
 9784.45 1559.04 9787.33 1559.17 9792.36  1559.5  9794.6 1559.64 9798.69 1560.02
 9799.18 1560.07  9799.7 1560.13 9800.22  1560.2 9802.21 1560.28 9804.09  1560.3
  9805.9 1560.31 9817.34 1560.76 9821.66 1560.84 9825.22 1560.75 9827.65 1560.87
 9831.88 1560.85 9835.32  1560.8 9841.85 1560.85  9852.1 1560.89 9859.41 1561.04
 9866.92 1561.25 9874.56  1561.4 9880.66 1561.33 9887.04 1561.23 9893.75 1561.11
 9895.25 1561.07 9904.87  1560.9 9911.19 1560.83 9916.22 1560.84 9928.19 1560.67
 9941.13 1560.78 9944.68  1560.8 9945.48 1560.77 9946.79 1560.77 9950.11 1560.85
 9968.98 1561.37 9974.61  1561.5    99761561.138 9976.03 1561.13  9980.1    1560
 9982.49 1559.24 9987.31    1558  9989.2  1557.4 9994.82    1556 9999.25  1554.9
10000.01 1554.7210001.87 1555.1910005.16    155610006.58 1556.3610006.96 1556.45
10007.94 1556.63 10011.1 1557.1510012.28  1557.410014.57    155810018.35 1558.83
10025.01    156010026.37 1560.2910030.23  1560.910032.351561.21510033.06 1561.32
10041.34 1561.4510043.96 1561.4710046.05 1561.4710048.08  1561.610055.42 1561.82
10062.21    156210075.08 1562.2810075.28 1562.29

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9224.46    .033    9976     .0610032.35    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9994.8210005.16                 0       0       0             .1       .3
Left Levee      Station= 9974.61      Elevation=  1561.5

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1561.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.50  * Wt. n-Val.              *   0.060  *   0.060  *   0.060  *
* W.S. Elev (ft)         * 1561.03  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)         * 1559.73  * Flow Area (sq ft)       *   47.52  *   58.62  *   61.76  *
* E.G. Slope (ft/ft)     *0.008214  * Area (sq ft)            *   47.52  *   58.62  *   61.76  *
* Q Total (cfs)          *  850.00  * Flow (cfs)              *  195.80  *  410.18  *  244.02  *
* Top Width (ft)         *   54.71  * Top Width (ft)          *   18.43  *   10.34  *   25.94  *
* Vel Total (ft/s)       *    5.06  * Avg. Vel. (ft/s)        *    4.12  *    7.00  *    3.95  *
* Max Chl Dpth (ft)      *    6.31  * Hydr. Depth (ft)        *    2.58  *    5.67  *    2.38  *
* Conv. Total (cfs)      *  9378.4  * Conv. (cfs)             *  2160.4  *  4525.7  *  2692.4  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *   19.11  *   10.65  *   26.44  *
* Min Ch El (ft)         * 1554.72  * Shear (lb/sq ft)        *    1.28  *    2.82  *    1.20  *
* Alpha                  *    1.25  * Stream Power (lb/ft s)  *    5.25  *   19.75  *    4.73  *
* 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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1561.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.54  * Wt. n-Val.              *   0.060  *   0.060  *   0.060  *
* W.S. Elev (ft)         * 1561.04  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)         * 1559.72  * Flow Area (sq ft)       *   42.69  *   58.74  *   52.10  *
* E.G. Slope (ft/ft)     *0.008202  * Area (sq ft)            *   42.69  *   58.74  *   52.10  *
* Q Total (cfs)          *  850.00  * Flow (cfs)              *  195.07  *  411.26  *  243.67  *
* Top Width (ft)         *   37.93  * Top Width (ft)          *   12.50  *   10.34  *   15.09  *
* Vel Total (ft/s)       *    5.54  * Avg. Vel. (ft/s)        *    4.57  *    7.00  *    4.68  *
* Max Chl Dpth (ft)      *    6.32  * Hydr. Depth (ft)        *    3.41  *    5.68  *    3.45  *
* Conv. Total (cfs)      *  9385.6  * Conv. (cfs)             *  2154.0  *  4541.1  *  2690.5  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *   14.68  *   10.65  *   17.30  *
* Min Ch El (ft)         * 1554.72  * Shear (lb/sq ft)        *    1.49  *    2.82  *    1.54  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)  *    6.81  *   19.77  *    7.21  *
* 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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9974.61	9994.82	195.80	47.52	19.11	23.04	2.58	4.12
2	Chan	9994.82	10005.16	410.18	58.62	10.65	48.26	5.67	7.00
3	ROB	10005.16	10040.22	244.02	61.76	26.44	28.71	2.38	3.95

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

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9974.61	9994.82	195.07	42.69	14.68	22.95	3.41	4.57
2	Chan	9994.82	10005.16	411.26	58.74	10.65	48.38	5.68	7.00
3	ROB	10005.16	10040.22	243.67	52.10	17.30	28.67	3.45	4.68

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

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 6.912

INPUT
Description: Flow rate starting at this cross-section and downstream is 380cfs.

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9513.2	1749.41	9557.18	1748.64	9601.29	1747.68	9644.79	1747.23	9689.06	1746.25
9733.18	1745.42	9762.92	1745.189	9777.01	1745.08	9821.28	1744.79	9865.31	1745
9908.84	1744.53	9953.13	1744.42	9955.26	1744.46	9959.86	1742.98	9963.15	1742.77
9965.42	1742.39	9967.22	1742.15	9971.49	1742.95	9993.24	1743.45	9998.88	1741.87
10004.12	1741.98	10009.45	1744.171	10040.62	1744.711	10069.78	1745.011	10085.29	1745.17
10129.45	1745.62	10173.45	1746.09	10216.9	1746.84	10260.98	1747.61	10305.48	1749.39
10349.16	1750.32								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9513.2	.033	9955.26	.045	10009.45	.033

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.2610009.45              500  536.18     527            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1744.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *   0.033  *   0.045  *   0.033  *
* W.S. Elev (ft)          * 1744.70  * Reach Len. (ft)         *  500.00  *  536.18  *  527.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   11.66  *   96.04  *    8.01  *
* E.G. Slope (ft/ft)      *0.005995  * Area (sq ft)            *   11.66  *   96.04  *    8.01  *
* Q Total (cfs)           *  380.00  * Flow (cfs)              *   13.35  *  355.17  *   11.47  *
* Top Width (ft)          *  146.46  * Top Width (ft)          *   61.86  *   54.19  *   30.41  *
* Vel Total (ft/s)        *    3.28  * Avg. Vel. (ft/s)        *    1.15  *    3.70  *    1.43  *
* Max Chl Dpth (ft)       *    2.83  * Hydr. Depth (ft)        *    0.19  *    1.77  *    0.26  *
* Conv. Total (cfs)       *  4907.6  * Conv. (cfs)             *   172.5  *  4587.0  *   148.2  *
* Length Wtd. (ft)        *  526.34  * Wetted Per. (ft)        *   61.87  *   55.21  *   30.41  *
* Min Ch El (ft)          * 1741.87  * Shear (lb/sq ft)        *    0.07  *    0.65  *    0.10  *
* Alpha                   *    1.20  * Stream Power (lb/ft s)  *    0.08  *    2.41  *    0.14  *
* Frctn Loss (ft)         *    3.38  * Cum Volume (acre-ft)    *  221.44  *  263.49  *  175.06  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *  145.68  *   99.39  *  126.92  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1745.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)          * 1744.86  * Reach Len. (ft)         *  500.00  *  536.18  *  527.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  104.91  *          *
* E.G. Slope (ft/ft)      *0.005247  * Area (sq ft)            *          *  104.91  *          *
* Q Total (cfs)           *  380.00  * Flow (cfs)              *          *  380.00  *          *
* Top Width (ft)          *   54.19  * Top Width (ft)          *          *   54.19  *          *
* Vel Total (ft/s)        *    3.62  * Avg. Vel. (ft/s)        *          *    3.62  *          *
* Max Chl Dpth (ft)       *    2.99  * Hydr. Depth (ft)        *          *    1.94  *          *
* Conv. Total (cfs)       *  5245.8  * Conv. (cfs)             *          *  5245.8  *          *
* Length Wtd. (ft)        *  530.23  * Wetted Per. (ft)        *          *   56.30  *          *
* Min Ch El (ft)          * 1741.87  * Shear (lb/sq ft)        *          *    0.61  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.21  *          *
* Frctn Loss (ft)         *    2.77  * Cum Volume (acre-ft)    *   57.97  *  315.20  *   41.88  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   15.28  *   99.39  *   13.76  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9734.23   * 9955.26   *    13.35 *    11.66 *    61.87 *     3.51 *
0.19 *     1.15 *
* 2        * Chan      * 9955.26   * 10009.45  *   355.17 *    96.04 *    55.21 *    93.47 *
1.77 *     3.70 *
* 3        * ROB       * 10009.45  * 10179.30  *    11.47 *     8.01 *    30.41 *     3.02 *
0.26 *     1.43 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*          *          * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan     * 9955.26   * 10009.45  *   380.00 *   104.91 *    56.30 *   100.00 *
1.94 *     3.62 *
*****************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 6.811

INPUT
Description:
Station Elevation Data num= 26

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9681.78  1744.6 9724.66    1744  9767.9 1743.54 9810.76 1742.45 9854.02 1741.77
 9896.61 1740.99 9931.111740.637 9939.58 1740.55  9983.3 1740.71 9991.47 1740.12
 9993.12 1739.66 9996.81  1739.410000.21 1740.2710026.17 1740.7610067.651740.885
10069.16 1740.8910112.13  1741.210155.27 1741.62 10198.1 1742.0110241.26 1742.65
10284.18 1742.8810327.07 1744.1410370.29 1744.9510413.28 1747.05 10456.3  1747.5
10499.03 1747.72
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9681.78    .033  9983.3    .04510026.17    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9983.310026.17              586  666.45     577             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)          * 1741.50  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.033  *   0.045  *   0.033  *
* W.S. Elev (ft)          * 1741.39  * Reach Len. (ft)         *  586.00  *  666.45  *  577.00  *
* Crit W.S. (ft)          * 1741.19  * Flow Area (sq ft)       *   64.31  *   45.34  *   41.06  *
* E.G. Slope (ft/ft)      *0.006894  * Area (sq ft)            *   64.31  *   45.34  *   41.06  *
* Q Total (cfs)           *  380.00  * Flow (cfs)              *  169.59  *  128.62  *   81.79  *
* Top Width (ft)          *  257.00  * Top Width (ft)          *  108.57  *   42.87  *  105.56  *
* Vel Total (ft/s)        *    2.52  * Avg. Vel. (ft/s)        *    2.64  *    2.84  *    1.99  *
* Max Chl Dpth (ft)       *    1.99  * Hydr. Depth (ft)        *    0.59  *    1.06  *    0.39  *
* Conv. Total (cfs)       *  4576.5  * Conv. (cfs)             *  2042.4  *  1549.0  *   985.1  *
* Length Wtd. (ft)        *  617.43  * Wetted Per. (ft)        *  108.58  *   43.08  *  105.56  *
* Min Ch El (ft)          * 1739.40  * Shear (lb/sq ft)        *    0.25  *    0.45  *    0.17  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.67  *    1.29  *    0.33  *
* Frctn Loss (ft)         *    4.03  * Cum Volume (acre-ft)    *  221.00  *  262.62  *  174.77  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  144.70  *   98.80  *  126.09  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)          * 1742.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *   0.033  *   0.045  *          *
* W.S. Elev (ft)          * 1742.09  * Reach Len. (ft)         *  586.00  *  666.45  *  577.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   31.75  *   75.30  *          *
* E.G. Slope (ft/ft)      *0.005205  * Area (sq ft)            *   31.75  *   75.30  *          *
* Q Total (cfs)           *  380.00  * Flow (cfs)              *  124.94  *  255.06  *          *
* Top Width (ft)          *   65.22  * Top Width (ft)          *   22.35  *   42.87  *          *
* Vel Total (ft/s)        *    3.55  * Avg. Vel. (ft/s)        *    3.94  *    3.39  *          *
* Max Chl Dpth (ft)       *    2.69  * Hydr. Depth (ft)        *    1.42  *    1.76  *          *
* Conv. Total (cfs)       *  5267.3  * Conv. (cfs)             *  1731.8  *  3535.5  *          *
* Length Wtd. (ft)        *  653.22  * Wetted Per. (ft)        *   23.81  *   44.41  *          *
```

```
* Min Ch El (ft)          * 1739.40  * Shear (lb/sq ft)       *    0.43  *    0.55  *          *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    1.70  *    1.87  *          *
* Frctn Loss (ft)         *    4.35  * Cum Volume (acre-ft)   *   57.79  *  314.09  *   41.88  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   15.15  *   98.79  *   13.76  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9832.54   * 9983.30   *   169.59 *    64.31 *   108.58 *    44.63 *
0.59 *     2.64 *
* 2         * Chan      * 9983.30   * 10026.17  *   128.62 *    45.34 *    43.08 *    33.85 *
1.06 *     2.84 *
* 3         * ROB       * 10026.17  * 10262.60  *    81.79 *    41.06 *   105.56 *    21.52 *
0.39 *     1.99 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9832.54   * 9983.30   *   124.94 *    31.75 *    23.81 *    32.88 *
1.42 *     3.94 *
* 2         * Chan      * 9983.30   * 10026.17  *   255.06 *    75.30 *    44.41 *    67.12 *
1.76 *     3.39 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 6.685

INPUT
Description:   .
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9505.69 1742.35  9544.6 1742.01 9583.62 1741.28 9622.01 1740.43 9661.48 1739.73
 9700.41 1738.91 9739.42 1738.17 9778.78  1737.7 9817.62 1737.36 9855.84 1737.31
 9875.091737.281 9895.35 1737.25 9929.78 1737.12 9930.74 1735.63  9932.7 1735.65
 9934.82 1737.11 9973.29 1736.38 9995.59 1736.09 9999.19 1734.9310005.24 1735.03
10008.63 1736.8710012.79 1736.8610051.41  1736.410078.681736.72810090.54 1736.87
10129.57 1738.1210168.63 1739.5210207.53 1740.8910246.83 1742.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9505.69    .033 9934.82    .04510008.63    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.8210008.63              574  552.85     514             .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1737.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.033	0.045	0.033
W.S. Elev (ft)	1737.37	Reach Len. (ft)	574.00	552.85	514.00
Crit W.S. (ft)		Flow Area (sq ft)	17.32	75.08	63.01
E.G. Slope (ft/ft)	0.006190	Area (sq ft)	17.32	75.08	63.01
Q Total (cfs)	380.00	Flow (cfs)	16.95	196.11	166.94
Top Width (ft)	289.20	Top Width (ft)	117.97	73.81	97.42
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)	0.98	2.61	2.65
Max Chl Dpth (ft)	2.44	Hydr. Depth (ft)	0.15	1.02	0.65
Conv. Total (cfs)	4830.0	Conv. (cfs)	215.5	2492.7	2121.8
Length Wtd. (ft)	541.90	Wetted Per. (ft)	119.23	74.47	97.43
Min Ch El (ft)	1734.93	Shear (lb/sq ft)	0.06	0.39	0.25
Alpha	1.11	Stream Power (lb/ft s)	0.05	1.02	0.66
Frctn Loss (ft)	3.27	Cum Volume (acre-ft)	220.45	261.70	174.08
C & E Loss (ft)	0.01	Cum SA (acres)	143.18	97.90	124.75

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 OUTPUT Profile #2

E.G. Elev (ft)	1737.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.045	
W.S. Elev (ft)	1737.72	Reach Len. (ft)	574.00	552.85	514.00
Crit W.S. (ft)		Flow Area (sq ft)		101.25	
E.G. Slope (ft/ft)	0.008801	Area (sq ft)		101.25	
Q Total (cfs)	380.00	Flow (cfs)		380.00	
Top Width (ft)	73.81	Top Width (ft)		73.81	
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)		3.75	
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)		1.37	
Conv. Total (cfs)	4050.6	Conv. (cfs)		4050.6	
Length Wtd. (ft)	552.85	Wetted Per. (ft)		75.93	
Min Ch El (ft)	1734.93	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		2.75	
Frctn Loss (ft)	3.06	Cum Volume (acre-ft)	57.57	312.74	41.88
C & E Loss (ft)	0.04	Cum SA (acres)	15.00	97.90	13.76

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9720.26	9934.82	16.95	17.32	119.23	4.46	0.15	0.98
2	Chan	9934.82	10008.63	196.11	75.08	74.47	51.61	1.02	2.61
3	ROB	10008.63	10127.73	166.94	63.01	97.43	43.93	0.65	2.65

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.

Profile #2

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *      (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9934.82    * 10008.63   *   380.00 *   101.25 *    75.93 *   100.00 *
1.37 *     3.75 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 6.578

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into
             floodplain
Interpolated point added at (10071.6, 1733.804) to set
             bank station
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9359.91 1738.56 9424.19 1737.65 9488.28 1736.82 9551.99 1736.02 9615.95 1735.08
 9680.03 1734.68 9701.53 1734.56  9722.8 1734.31 9744.22 1733.96 9765.57 1734.27
 9786.83 1734.63 9808.19 1734.24 9871.55 1734.36 9878.45 1732.82 9887.51 1732.76
 9897.28 1733.96 9936.23 1733.86 9957.61 1733.51 9979.12  1733.4   10000 1733.02
10021.52 1733.14 10042.9 1733.5110063.99 1733.6910107.14 1733.7310127.95 1733.75
10191.99  1733.610219.291733.80410256.25 1734.0810320.22 1734.7310384.38 1735.16
10448.27  1736.4 10512.4 1738.26 10576.2 1741.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9359.91    .033 9957.61    .04510219.29    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.6110063.99              549  555.83     482            .1        .3
Left Levee      Station= 9786.83      Elevation= 1734.63

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1734.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.033  *   0.045  *   0.044  *
* W.S. Elev (ft)         * 1734.13  * Reach Len. (ft)         *  549.00  *  555.83  *  482.00  *
* Crit W.S. (ft)         * 1733.96  * Flow Area (sq ft)       *   41.75  *   84.91  *   74.50  *
* E.G. Slope (ft/ft)     *0.005886  * Area (sq ft)            *   41.75  *   84.91  *   74.50  *
* Q Total (cfs)          *  380.00  * Flow (cfs)              *   89.60  *  185.07  *  105.33  *
* Top Width (ft)         *  388.78  * Top Width (ft)          *   85.04  *  106.38  *  197.37  *
* Vel Total (ft/s)       *    1.89  * Avg. Vel. (ft/s)        *    2.15  *    2.18  *    1.41  *
* Max Chl Dpth (ft)      *    1.37  * Hydr. Depth (ft)        *    0.49  *    0.80  *    0.38  *
* Conv. Total (cfs)      *  4953.1  * Conv. (cfs)             *  1167.9  *  2412.3  *  1373.0  *
* Length Wtd. (ft)       *  544.39  * Wetted Per. (ft)        *   85.26  *  106.39  *  197.37  *
* Min Ch El (ft)         * 1733.02  * Shear (lb/sq ft)        *    0.18  *    0.29  *    0.14  *
* Alpha                  *    1.11  * Stream Power (lb/ft s)  *    0.39  *    0.64  *    0.20  *
* Frctn Loss (ft)        *    3.18  * Cum Volume (acre-ft)    *  220.06  *  260.68  *  173.27  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *  141.84  *   96.76  *  123.01  *
*****************************************************************************************

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

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1734.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.045	
W.S. Elev (ft)	1734.75	Reach Len. (ft)	549.00	555.83	482.00
Crit W.S. (ft)	1734.07	Flow Area (sq ft)		150.43	
E.G. Slope (ft/ft)	0.003794	Area (sq ft)		150.43	
Q Total (cfs)	380.00	Flow (cfs)		380.00	
Top Width (ft)	106.38	Top Width (ft)		106.38	
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)		2.53	
Max Chl Dpth (ft)	1.73	Hydr. Depth (ft)		1.41	
Conv. Total (cfs)	6169.5	Conv. (cfs)		6169.5	
Length Wtd. (ft)	555.83	Wetted Per. (ft)		108.68	
Min Ch El (ft)	1733.02	Shear (lb/sq ft)		0.33	
Alpha	1.00	Stream Power (lb/ft s)		0.83	
Frctn Loss (ft)	3.00	Cum Volume (acre-ft)	57.57	311.14	41.88
C & E Loss (ft)	0.02	Cum SA (acres)	15.00	96.76	13.76

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9786.83	9957.61	89.60	41.75	85.26	23.58	0.49	2.15
2	Chan	9957.61	10063.99	185.07	84.91	106.39	48.70	0.80	2.18
3	ROB	10063.99	10320.10	105.33	74.50	197.37	27.72	0.38	1.41

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

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9957.61	10063.99	380.00	150.43	108.68	100.00	1.41	2.53

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: WASH 3-WEST

REACH: REACH-1 RS: 6.476

INPUT
Description: Flow rate starting at this cross-section and downstream is 670cfs.
Interpolated point added at (10040.2, 1730.138) to set bank station.

Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9413.91	1734.94	9467.77	1734.8	9522.06	1734.12	9575.77	1732.63	9630.06	1731.8
9683.9	1731.33	9737.85	1731.62	9791.79	1730.94	9845.82	1729.89	9899.78	1729.93
9953.78	1730.15	9983.61	1729.981	9996.14	1729.91	9997.72	1727.81	10002.6	1727.48
10006.24	1729.751	0008.06	1729.221	0040.22	1730.138	10062.34	1730.771	0116.29	1731.35
10170.55	1731.581	0178.03	1731.711	0179.29	1730.971	0183.86	1730.771	0186.77	1731.18
10224.32	1731.761	0278.32	1732.261	0332.58	1732.851	0386.33	1733.51	0440.73	1733.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9413.91	.033	9953.78	.045	10040.22	.033

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9953.78 10040.22 425 470.32 480 .1 .3
Right Levee Station=10178.03 Elevation= 1731.71

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1731.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.033	0.045	0.033
W.S. Elev (ft)	1730.88	Reach Len. (ft)	425.00	470.32	480.00
Crit W.S. (ft)	1730.54	Flow Area (sq ft)	123.60	104.76	10.13
E.G. Slope (ft/ft)	0.005811	Area (sq ft)	123.60	104.76	10.13
Q Total (cfs)	670.00	Flow (cfs)	358.44	295.67	15.89
Top Width (ft)	278.31	Top Width (ft)	159.13	86.44	32.75
Vel Total (ft/s)	2.81	Avg. Vel. (ft/s)	2.90	2.82	1.57
Max Chl Dpth (ft)	3.40	Hydr. Depth (ft)	0.78	1.21	0.31
Conv. Total (cfs)	8789.4	Conv. (cfs)	4702.2	3878.8	208.4
Length Wtd. (ft)	450.90	Wetted Per. (ft)	159.14	88.24	32.76
Min Ch El (ft)	1727.48	Shear (lb/sq ft)	0.28	0.43	0.11
Alpha	1.02	Stream Power (lb/ft s)	0.82	1.22	0.18
Frctn Loss (ft)	2.75	Cum Volume (acre-ft)	219.02	259.47	172.80
C & E Loss (ft)	0.01	Cum SA (acres)	140.30	95.53	121.74

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 OUTPUT Profile #2

E.G. Elev (ft)	1731.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.045	
W.S. Elev (ft)	1731.59	Reach Len. (ft)	425.00	470.32	480.00
Crit W.S. (ft)	1730.91	Flow Area (sq ft)		165.40	
E.G. Slope (ft/ft)	0.006796	Area (sq ft)		165.40	
Q Total (cfs)	670.00	Flow (cfs)		670.00	
Top Width (ft)	86.44	Top Width (ft)		86.44	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	4.11	Hydr. Depth (ft)		1.91	
Conv. Total (cfs)	8127.3	Conv. (cfs)		8127.3	
Length Wtd. (ft)	470.32	Wetted Per. (ft)		91.12	
Min Ch El (ft)	1727.48	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		3.12	
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)	57.57	309.13	41.88
C & E Loss (ft)	0.03	Cum SA (acres)	15.00	95.53	13.76

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9683.85   * 9953.78   *   358.44 *   123.60 *   159.14 *    53.50 *
0.78 *     2.90 *
* 2         * Chan      * 9953.78   * 10040.22  *   295.67 *   104.76 *    88.24 *    44.13 *
1.21 *     2.82 *
* 3         * ROB       * 10040.22  * 10178.03  *    15.89 *    10.13 *    32.76 *     2.37 *
0.31 *     1.57 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9953.78   * 10040.22  *   670.00 *   165.40 *    91.12 *   100.00 *
1.91 *     4.05 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 6.387

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9400.09 1731.68 9467.01  1732.3 9534.18 1731.49 9601.12 1729.98 9668.26 1729.08
 9735.34 1728.44 9802.04 1728.44 9868.94 1727.18 9936.19 1727.34 9978.811727.244
 9998.08  1727.2 9999.43 1725.78   10007  1725.310010.69 1727.2710070.74 1727.46
10137.21 1727.6810204.02 1728.4910270.96 1729.06 10338.2 1729.6910404.94 1730.14
10472.25 1730.6310539.15 1731.0610605.94 1731.8710673.22 1733.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9400.09    .033 9936.19    .04510070.74    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.1910070.74               334  363.05     374             .1       .3

CROSS SECTION OUTPUT  Profile #1
```

E.G. Elev (ft)	1728.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.033	0.045	0.033
W.S. Elev (ft)	1728.14	Reach Len. (ft)	334.00	363.05	374.00
Crit W.S. (ft)	1727.86	Flow Area (sq ft)	83.83	129.34	46.78
E.G. Slope (ft/ft)	0.006408	Area (sq ft)	83.83	129.34	46.78
Q Total (cfs)	670.00	Flow (cfs)	240.17	331.18	98.65
Top Width (ft)	357.40	Top Width (ft)	118.31	134.55	104.54
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	2.86	2.56	2.11
Max Chl Dpth (ft)	2.84	Hydr. Depth (ft)	0.71	0.96	0.45
Conv. Total (cfs)	8369.6	Conv. (cfs)	3000.2	4137.1	1232.3
Length Wtd. (ft)	358.15	Wetted Per. (ft)	118.32	135.67	104.55
Min Ch El (ft)	1725.30	Shear (lb/sq ft)	0.28	0.38	0.18
Alpha	1.03	Stream Power (lb/ft s)	0.81	0.98	0.38
Frctn Loss (ft)	2.20	Cum Volume (acre-ft)	218.01	258.21	172.48
C & E Loss (ft)	0.00	Cum SA (acres)	138.95	94.34	120.98

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 OUTPUT Profile #2

E.G. Elev (ft)	1728.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.045	
W.S. Elev (ft)	1728.70	Reach Len. (ft)	334.00	363.05	374.00
Crit W.S. (ft)		Flow Area (sq ft)		204.94	
E.G. Slope (ft/ft)	0.005800	Area (sq ft)		204.94	
Q Total (cfs)	670.00	Flow (cfs)		670.00	
Top Width (ft)	134.55	Top Width (ft)		134.55	
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)		3.27	
Max Chl Dpth (ft)	3.40	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	8797.2	Conv. (cfs)		8797.2	
Length Wtd. (ft)	363.05	Wetted Per. (ft)		138.27	
Min Ch El (ft)	1725.30	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)		1.75	
Frctn Loss (ft)	2.26	Cum Volume (acre-ft)	57.57	307.13	41.88
C & E Loss (ft)	0.00	Cum SA (acres)	15.00	94.33	13.76

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9668.14	9936.19	240.17	83.83	118.32	35.85	0.71	2.86
2	Chan	9936.19	10070.74	331.18	129.34	135.67	49.43	0.96	2.56
3	ROB	10070.74	10371.98	98.65	46.78	104.55	14.72	0.45	2.11

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9936.19	10070.74	670.00	204.94	138.27	100.00	1.52	3.27

```
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 6.318

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9594.98 1728.99 9647.23 1728.28 9699.31 1727.44 9751.28 1726.71 9802.96 1725.96
 9855.02 1725.24    9907 1725.29 9958.86 1725.1410010.76 1724.9710062.77 1725.26
10114.98  1724.710167.26 1725.6610219.03 1726.1210270.82 1726.0910322.82 1726.36
10375.15 1726.5910427.24 1727.07 10479.1 1727.7510531.29  1728.710582.93 1729.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9594.98    .033    9907    .04510062.77    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990710062.77              558   579.9     558            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1726.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.033  *   0.045  *   0.033  *
* W.S. Elev (ft)         * 1725.95  * Reach Len. (ft)        *  558.00  *  579.90  *  558.00  *
* Crit W.S. (ft)         * 1725.68  * Flow Area (sq ft)      *   54.26  *  128.63  *   96.20  *
* E.G. Slope (ft/ft)     *0.005880  * Area (sq ft)           *   54.26  *  128.63  *   96.20  *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *  121.70  *  286.68  *  261.62  *
* Top Width (ft)         *  396.97  * Top Width (ft)          *  103.62  *  155.77  *  137.59  *
* Vel Total (ft/s)       *    2.40  * Avg. Vel. (ft/s)        *    2.24  *    2.23  *    2.72  *
* Max Chl Dpth (ft)      *    1.25  * Hydr. Depth (ft)        *    0.52  *    0.83  *    0.70  *
* Conv. Total (cfs)      *  8737.6  * Conv. (cfs)             *  1587.1  *  3738.7  *  3411.9  *
* Length Wtd. (ft)       *  568.61  * Wetted Per. (ft)        *  103.62  *  155.77  *  137.60  *
* Min Ch El (ft)         * 1724.97  * Shear (lb/sq ft)        *    0.19  *    0.30  *    0.26  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.43  *    0.68  *    0.70  *
* Frctn Loss (ft)        *    3.88  * Cum Volume (acre-ft)    *  217.48  *  257.13  *  171.87  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *  138.10  *   93.13  *  119.94  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1726.62  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.16  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)         * 1726.46  * Reach Len. (ft)        *  558.00  *  579.90  *  558.00  *
* Crit W.S. (ft)         * 1725.96  * Flow Area (sq ft)      *          *  207.32  *          *
* E.G. Slope (ft/ft)     *0.006676  * Area (sq ft)           *          *  207.32  *          *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *          *  670.00  *          *
* Top Width (ft)         *  155.77  * Top Width (ft)          *          *  155.77  *          *
* Vel Total (ft/s)       *    3.23  * Avg. Vel. (ft/s)        *          *    3.23  *          *
* Max Chl Dpth (ft)      *    1.49  * Hydr. Depth (ft)        *          *    1.33  *          *
* Conv. Total (cfs)      *  8200.0  * Conv. (cfs)             *          *  8200.0  *          *
* Length Wtd. (ft)       *  579.90  * Wetted Per. (ft)        *          *  158.14  *          *
* Min Ch El (ft)         * 1724.97  * Shear (lb/sq ft)        *          *    0.55  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    1.77  *          *
* Frctn Loss (ft)        *    3.65  * Cum Volume (acre-ft)    *   57.57  *  305.41  *   41.88  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   15.00  *   93.12  *   13.76  *
*****************************************************************************************
```

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9750.99	9907.00	121.70	54.26	103.62	18.16	0.52	2.24
2 Chan	9907.00	10062.77	286.68	128.63	155.77	42.79	0.83	2.23
3 ROB	10062.77	10322.85	261.62	96.20	137.60	39.05	0.70	2.72

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9907.00	10062.77	670.00	207.32	158.14	100.00	1.33	3.23

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: WASH 3-WEST
REACH: REACH-1 RS: 6.209

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9472.58	1724.02	9528.68	1723.53	9584.71	1723.24	9640.6	1723.11	9696.7	1723.06
9752.52	1722.93	9808.98	1722.92	9864.71	1722.37	9921.06	1721.64	9938.49	1721.408
9976.64	1720.9	9994.8	1721.2	9998	1719.04	10002.91	1718.93	10004.2	1721.02
10028.74	1721.06	10029.67	1719.37	10032.7	1719.01	10033.86	1721.16	10034.05	1721.31
10090.2	1721.29	10146.69	1721.36	10202.55	1721.51	10221.66	1721.74	10258.3	1722.18
10314.16	1722.81	10370.41	1723.56	10426.34	1724.62	10482.16	1725.58	10538.29	1725.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9472.58	.033	9921.06	.045	10221.66	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9938.49	10034.05	494	512.79	482	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1722.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.041	0.045	0.045
W.S. Elev (ft)	1722.04	Reach Len. (ft)	494.00	512.79	482.00
Crit W.S. (ft)	1721.82	Flow Area (sq ft)	15.21	112.97	127.60
E.G. Slope (ft/ft)	0.008006	Area (sq ft)	15.21	112.97	127.60
Q Total (cfs)	670.00	Flow (cfs)	25.70	362.64	281.66

* Top Width (ft)	* 356.60	* Top Width (ft)	* 48.38	* 95.56	* 212.66	*
* Vel Total (ft/s)	* 2.62	* Avg. Vel. (ft/s)	* 1.69	* 3.21	* 2.21	*
* Max Chl Dpth (ft)	* 3.11	* Hydr. Depth (ft)	* 0.31	* 1.18	* 0.60	*
* Conv. Total (cfs)	* 7487.9	* Conv. (cfs)	* 287.3	* 4052.8	* 3147.8	*
* Length Wtd. (ft)	* 500.47	* Wetted Per. (ft)	* 48.38	* 99.75	* 212.67	*
* Min Ch El (ft)	* 1718.93	* Shear (lb/sq ft)	* 0.16	* 0.57	* 0.30	*
* Alpha	* 1.13	* Stream Power (lb/ft s)	* 0.27	* 1.82	* 0.66	*
* Frctn Loss (ft)	* 3.07	* Cum Volume (acre-ft)	* 217.03	* 255.52	* 170.44	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 137.12	* 91.45	* 117.70	*

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 OUTPUT Profile #2

* E.G. Elev (ft)	* 1722.96	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.21	* Wt. n-Val.	*	* 0.045	*	*
* W.S. Elev (ft)	* 1722.75	* Reach Len. (ft)	* 494.00	* 512.79	* 482.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 180.40	*	*
* E.G. Slope (ft/ft)	*0.005955	* Area (sq ft)	*	* 180.40	*	*
* Q Total (cfs)	* 670.00	* Flow (cfs)	*	* 670.00	*	*
* Top Width (ft)	* 95.56	* Top Width (ft)	*	* 95.56	*	*
* Vel Total (ft/s)	* 3.71	* Avg. Vel. (ft/s)	*	* 3.71	*	*
* Max Chl Dpth (ft)	* 3.82	* Hydr. Depth (ft)	*	* 1.89	*	*
* Conv. Total (cfs)	* 8682.2	* Conv. (cfs)	*	* 8682.2	*	*
* Length Wtd. (ft)	* 512.79	* Wetted Per. (ft)	*	* 102.52	*	*
* Min Ch El (ft)	* 1718.93	* Shear (lb/sq ft)	*	* 0.65	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 2.43	*	*
* Frctn Loss (ft)	* 3.41	* Cum Volume (acre-ft)	* 57.57	* 302.83	* 41.88	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 15.00	* 91.45	* 13.76	*

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.

Profile #1

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)
* 1	* LOB	* 9705.54	* 9938.49	* 25.70	* 15.21	* 48.38	* 3.84	* 0.31	* 1.69
* 2	* Chan	* 9938.49	* 10034.05	* 362.64	* 112.97	* 99.75	* 54.13	* 1.18	* 3.21
* 3	* ROB	* 10034.05	* 10286.17	* 281.66	* 127.60	* 212.67	* 42.04	* 0.60	* 2.21

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.

Profile #2

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)
* 1	* Chan	* 9938.49	* 10034.05	* 670.00	* 180.40	* 102.52	* 100.00	* 1.89	* 3.71

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: WASH 3-WEST
REACH: REACH-1 RS: 6.111

INPUT
Description: Interpolated point added at (10126.43.6, 1718.48) to set bank station.
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9505.53	1720.41	9548.25	1720.01	9591.63	1719.52	9634.38	1718.98	9677.32	1718.7
9720.45	1718.58	9763.3	1718.66	9806.33	1718.9	9849.49	1718.74	9892.39	1718.48
9935.41	1718.12	9945.58	1718.082	9978.46	1717.96	9989.1	1717.7	9992.05	1716.01
9998.26	1716.71	10000.88	1717.83	10021.6	1717.89	10064.7	1718.05	10107.19	1718
10126.43	1718.48	10150.61	1719.09	10193.25	1720.17	10236.5	1720.35	10279.59	1721.09
10289.54	1721.25	10322.34	1721.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9505.53	.033	9892.39	.045	10126.43	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.58	10064.7	519	563.28	529	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1719.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.038	0.045	0.044
W.S. Elev (ft)	1719.01	Reach Len. (ft)	519.00	563.28	529.00
Crit W.S. (ft)	1718.69	Flow Area (sq ft)	114.98	141.11	62.15
E.G. Slope (ft/ft)	0.004846	Area (sq ft)	114.98	141.11	62.15
Q Total (cfs)	670.00	Flow (cfs)	178.33	361.69	129.98
Top Width (ft)	515.39	Top Width (ft)	313.56	119.12	82.71
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.55	2.56	2.09
Max Chl Dpth (ft)	3.00	Hydr. Depth (ft)	0.37	1.18	0.75
Conv. Total (cfs)	9624.8	Conv. (cfs)	2561.7	5195.8	1867.2
Length Wtd. (ft)	541.89	Wetted Per. (ft)	313.56	119.85	82.73
Min Ch El (ft)	1716.01	Shear (lb/sq ft)	0.11	0.36	0.23
Alpha	1.14	Stream Power (lb/ft s)	0.17	0.91	0.48
Frctn Loss (ft)	3.44	Cum Volume (acre-ft)	216.30	254.03	169.39
C & E Loss (ft)	0.00	Cum SA (acres)	135.07	90.19	116.06

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 OUTPUT Profile #2

E.G. Elev (ft)	1719.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.045	
W.S. Elev (ft)	1719.35	Reach Len. (ft)	519.00	563.28	529.00
Crit W.S. (ft)	1718.82	Flow Area (sq ft)		181.02	
E.G. Slope (ft/ft)	0.007457	Area (sq ft)		181.02	
Q Total (cfs)	670.00	Flow (cfs)		670.00	
Top Width (ft)	119.12	Top Width (ft)		119.12	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	3.33	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	7758.5	Conv. (cfs)		7758.5	
Length Wtd. (ft)	557.61	Wetted Per. (ft)		122.40	
Min Ch El (ft)	1716.01	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)		2.55	
Frctn Loss (ft)	2.91	Cum Volume (acre-ft)	57.57	300.70	41.88
C & E Loss (ft)	0.02	Cum SA (acres)	15.00	90.19	13.76

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9505.53   * 9725.56   *    33.47 *    25.45 *    93.53 *     5.00 *
0.27 *     1.32 *
* 2         * LOB       * 9725.56   * 9945.58   *   144.86 *    89.54 *   220.03 *    21.62 *
0.41 *     1.62 *
* 3         * Chan      * 9945.58   * 10064.70  *   361.69 *   141.11 *   119.85 *    53.98 *
1.18 *     2.56 *
* 4         * ROB       * 10064.70  * 10193.52  *   129.98 *    62.15 *    82.73 *    19.40 *
0.75 *     2.09 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9945.58   * 10064.70  *   670.00 *   181.02 *   122.40 *   100.00 *
1.52 *     3.70 *
*****************************************************************************************
******************

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: 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: WASH 3-WEST
REACH: REACH-1            RS: 6.005

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9540.95 1715.94 9577.97 1715.69  9614.9 1715.31 9652.13 1715.24 9688.98 1715.13
 9726.07 1715.17  9763.2 1715.17 9800.23 1715.14 9811.291715.095 9837.16 1714.99
 9874.01 1714.85 9891.29 1714.61 9893.41 1713.88 9895.21 1713.68 9896.99 1714.35
 9911.26 1715.01 9948.19 1714.94 9985.15 1715.01 9994.43 1715.48 9997.55 1711.49
10002.48 1711.4610007.36 1712.02 10011.7 1714.9910022.66  1714.510059.07 1715.28
10096.21 1716.0210133.37  1717.210170.05 1718.7610207.23 1719.1710244.11 1719.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9540.95    .033 9811.29    .04510059.07    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9994.4310059.07              477  524.74     485             .1       .3

CROSS SECTION OUTPUT  Profile #1
```

E.G. Elev (ft)	1715.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.041	0.045	0.033
W.S. Elev (ft)	1715.51	Reach Len. (ft)	477.00	524.74	485.00
Crit W.S. (ft)	1715.37	Flow Area (sq ft)	176.28	84.36	1.34
E.G. Slope (ft/ft)	0.008697	Area (sq ft)	176.28	84.36	1.34
Q Total (cfs)	670.00	Flow (cfs)	367.44	301.22	1.34
Top Width (ft)	475.35	Top Width (ft)	399.10	64.64	11.61
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)	2.08	3.57	1.00
Max Chl Dpth (ft)	4.05	Hydr. Depth (ft)	0.44	1.31	0.12
Conv. Total (cfs)	7184.6	Conv. (cfs)	3940.1	3230.1	14.4
Length Wtd. (ft)	499.02	Wetted Per. (ft)	399.38	67.56	11.61
Min Ch El (ft)	1711.46	Shear (lb/sq ft)	0.24	0.68	0.06
Alpha	1.24	Stream Power (lb/ft s)	0.50	2.42	0.06
Frctn Loss (ft)	3.09	Cum Volume (acre-ft)	214.56	252.57	169.00
C & E Loss (ft)	0.00	Cum SA (acres)	130.83	89.00	115.49

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1716.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.045	
W.S. Elev (ft)	1716.48	Reach Len. (ft)	477.00	524.74	485.00
Crit W.S. (ft)		Flow Area (sq ft)	66.94	146.77	
E.G. Slope (ft/ft)	0.003847	Area (sq ft)	66.94	146.77	
Q Total (cfs)	670.00	Flow (cfs)	171.64	498.36	
Top Width (ft)	110.88	Top Width (ft)	46.24	64.64	
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	2.56	3.40	
Max Chl Dpth (ft)	5.02	Hydr. Depth (ft)	1.45	2.27	
Conv. Total (cfs)	10801.7	Conv. (cfs)	2767.1	8034.6	
Length Wtd. (ft)	519.77	Wetted Per. (ft)	47.79	68.75	
Min Ch El (ft)	1711.46	Shear (lb/sq ft)	0.34	0.51	
Alpha	1.04	Stream Power (lb/ft s)	0.86	1.74	
Frctn Loss (ft)	3.04	Cum Volume (acre-ft)	57.18	298.58	41.88
C & E Loss (ft)	0.03	Cum SA (acres)	14.72	89.00	13.76

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9540.95	9767.69	93.10	50.41	172.36	13.89	0.29	1.85
2	LOB	9767.69	9994.43	274.34	125.87	227.02	40.95	0.56	2.18
3	Chan	9994.43	10059.07	301.22	84.36	67.56	44.96	1.31	3.57
4	ROB	10059.07	10151.59	1.34	1.34	11.61	0.20	0.12	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.
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.

Profile #2

```
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9767.69   * 9994.43   *   171.64 *    66.94 *    47.79 *    25.62 *
1.45 *     2.56 *
* 2         * Chan      * 9994.43   * 10059.07  *   498.36 *   146.77 *    68.75 *    74.38 *
2.27 *     3.40 *
*****************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 5.905

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 980cfs.
Interpolated point added at (10045.07,1711.429) to set bank station.

```
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9550.14 1714.78 9596.92 1714.62 9643.89 1714.16  9691.1 1713.32 9738.17 1712.71
 9784.72 1712.26 9831.95 1711.87 9879.21 1711.85 9926.04 1710.27    9973 1711.41
 9985.42 1710.48 9987.87  1709.4  9994.3  1709.210004.37 1710.45 10020.2 1710.81
10045.071711.42910066.84 1711.97 10114.3 1712.3810161.22 1712.58 10207.8 1713.41
10254.85 1713.7910302.24 1714.1510349.04 1714.75   10396 1715.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9550.14    .033 9879.21    .04510066.84    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997310045.07              606  549.67     524            .1        .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)        * 1712.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.14  * Wt. n-Val.              *   0.043  *   0.045  *   0.041  *
* W.S. Elev (ft)        * 1712.41  * Reach Len. (ft)         *  606.00  *  549.67  *  524.00  *
* Crit W.S. (ft)        * 1711.91  * Flow Area (sq ft)       *  179.81  *  130.34  *   26.51  *
* E.G. Slope (ft/ft)    *0.005052  * Area (sq ft)            *  179.81  *  130.34  *   26.51  *
* Q Total (cfs)         *  980.00  * Flow (cfs)               *  486.28  *  452.60  *   41.11  *
* Top Width (ft)        *  351.16  * Top Width (ft)           *  203.50  *   72.07  *   75.59  *
* Vel Total (ft/s)      *    2.91  * Avg. Vel. (ft/s)         *    2.70  *    3.47  *    1.55  *
* Max Chl Dpth (ft)     *    3.21  * Hydr. Depth (ft)         *    0.88  *    1.81  *    0.35  *
* Conv. Total (cfs)     * 13787.6  * Conv. (cfs)              *  6841.5  *  6367.7  *   578.4  *
* Length Wtd. (ft)      *  574.88  * Wetted Per. (ft)         *  203.54  *   72.42  *   75.60  *
* Min Ch El (ft)        * 1709.20  * Shear (lb/sq ft)         *    0.28  *    0.57  *    0.11  *
* Alpha                 *    1.10  * Stream Power (lb/ft s)   *    0.75  *    1.97  *    0.17  *
* Frctn Loss (ft)       *    2.83  * Cum Volume (acre-ft)     *  212.61  *  251.28  *  168.85  *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)           *  127.53  *   88.18  *  115.01  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)        * 1713.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.45  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)        * 1713.13  * Reach Len. (ft)         *  606.00  *  549.67  *  524.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)       *          *  182.09  *          *
* E.G. Slope (ft/ft)    *0.008263  * Area (sq ft)            *          *  182.09  *          *
```

```
* Q Total (cfs)          *  980.00  * Flow (cfs)              *          *  980.00  *          *
* Top Width (ft)         *   72.07  * Top Width (ft)          *          *   72.07  *          *
* Vel Total (ft/s)       *    5.38  * Avg. Vel. (ft/s)        *          *    5.38  *          *
* Max Chl Dpth (ft)      *    3.93  * Hydr. Depth (ft)        *          *    2.53  *          *
* Conv. Total (cfs)      * 10781.1  * Conv. (cfs)             *          * 10781.1  *          *
* Length Wtd. (ft)       *  549.67  * Wetted Per. (ft)        *          *   75.84  *          *
* Min Ch El (ft)         * 1709.20  * Shear (lb/sq ft)        *          *    1.24  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    6.67  *          *
* Frctn Loss (ft)        *    3.05  * Cum Volume (acre-ft)    *   56.81  *  296.60  *   41.88  *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)          *   14.47  *   88.18  *   13.76  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9761.57   * 9973.00   *   486.28 *   179.81 *   203.54 *    49.62 *
0.88 *     2.70 *
* 2         * Chan      * 9973.00   * 10045.07  *   452.60 *   130.34 *    72.42 *    46.18 *
1.81 *     3.47 *
* 3         * ROB       * 10045.07  * 10220.54  *    41.11 *    26.51 *    75.60 *     4.20 *
0.35 *     1.55 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9973.00   * 10045.07  *   980.00 *   182.09 *    75.84 *   100.00 *
2.53 *     5.38 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 5.801

INPUT
Description: Interpolated point added at (10066.67,1708.966) to set bank
             station.
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9505.55 1712.82 9549.71 1711.35  9593.4 1710.81 9637.59 1709.18 9681.66 1708.93
 9725.83 1708.83 9769.82 1708.68 9813.71  1708.6  9825.71708.589 9857.87 1708.56
 9901.58 1707.95 9928.661708.524 9942.64 1708.82 9944.06 1708.49 9945.33 1708.41
 9947.39 1708.85 9989.42 1708.96 9993.42  1708.8 9995.71 1708.27 9999.53 1708.94
10003.72 1708.2610007.19 1708.1610007.86 1708.91 10031.3 1708.6310033.48 1708.07
10037.65 1708.0310042.83 1708.6610066.671708.96610078.63 1709.1210122.77 1709.65
```

```
10167.01    171010210.85  1710.310254.83 1710.4210299.08 1711.0910342.93 1711.02

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9505.55    .033 9769.82    .04510066.67    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9857.8710042.83              614  600.96    546            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1709.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.039  *   0.045  *   0.040  *
* W.S. Elev (ft)          * 1709.62  * Reach Len. (ft)         *  614.00  *  600.96  *  546.00  *
* Crit W.S. (ft)          * 1709.25  * Flow Area (sq ft)       *  186.23  *  199.61  *   36.23  *
* E.G. Slope (ft/ft)      *0.004795  * Area (sq ft)            *  186.23  *  199.61  *   36.23  *
* Q Total (cfs)           *  980.00  * Flow (cfs)              *  438.30  *  478.93  *   62.77  *
* Top Width (ft)          *  494.15  * Top Width (ft)          *  232.09  *  184.96  *   77.09  *
* Vel Total (ft/s)        *    2.32  * Avg. Vel. (ft/s)        *    2.35  *    2.40  *    1.73  *
* Max Chl Dpth (ft)       *    1.67  * Hydr. Depth (ft)        *    0.80  *    1.08  *    0.47  *
* Conv. Total (cfs)       * 14153.1  * Conv. (cfs)             *  6329.9  *  6916.6  *   906.6  *
* Length Wtd. (ft)        *  596.17  * Wetted Per. (ft)        *  232.10  *  185.69  *   77.10  *
* Min Ch El (ft)          * 1707.95  * Shear (lb/sq ft)        *    0.24  *    0.32  *    0.14  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.57  *    0.77  *    0.24  *
* Frctn Loss (ft)         *    3.69  * Cum Volume (acre-ft)    *  210.06  *  249.19  *  168.47  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  124.50  *   86.56  *  114.09  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1710.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)          * 1710.30  * Reach Len. (ft)         *  614.00  *  600.96  *  546.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  326.90  *          *
* E.G. Slope (ft/ft)      *0.003972  * Area (sq ft)            *          *  326.90  *          *
* Q Total (cfs)           *  980.00  * Flow (cfs)              *          *  980.00  *          *
* Top Width (ft)          *  184.96  * Top Width (ft)          *          *  184.96  *          *
* Vel Total (ft/s)        *    3.00  * Avg. Vel. (ft/s)        *          *    3.00  *          *
* Max Chl Dpth (ft)       *    2.35  * Hydr. Depth (ft)        *          *    1.77  *          *
* Conv. Total (cfs)       * 15549.9  * Conv. (cfs)             *          * 15549.9  *          *
* Length Wtd. (ft)        *  600.96  * Wetted Per. (ft)        *          *  189.07  *          *
* Min Ch El (ft)          * 1707.95  * Shear (lb/sq ft)        *          *    0.43  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.29  *          *
* Frctn Loss (ft)         *    4.09  * Cum Volume (acre-ft)    *   56.81  *  293.39  *   41.88  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   14.47  *   86.55  *   13.76  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9505.55   * 9681.71   *    52.05 *    27.32 *    55.94 *     5.31 *
0.49 *     1.91 *
* 2        * LOB       * 9681.71   * 9857.87   *   386.25 *   158.91 *   176.16 *    39.41 *
0.90 *     2.43 *
* 3        * Chan      * 9857.87   * 10042.83  *   478.93 *   199.61 *   185.69 *    48.87 *
1.08 *     2.40 *
* 4        * ROB       * 10042.83  * 10192.88  *    62.77 *    36.23 *    77.10 *     6.41 *
0.47 *     1.73 *
```

```
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9857.87   * 10042.83  *   980.00 *   326.90 *   189.07 *   100.00 *
1.77 *     3.00 *
*****************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 5.687

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9584.9 1707.03 9625.79 1706.65 9666.98 1706.27 9707.92    1706 9748.99 1705.74
 9789.96 1705.68 9830.73 1705.06 9872.02 1704.89 9874.991704.882    9913 1704.78
 9953.81 1704.97 9994.64 1705.4110001.14 1704.6310002.36 1704.1410007.77 1704.35
10009.25 1705.3410031.11 1704.8210035.74 1704.7110076.74 1705.1110117.87 1705.08
10158.69  1705.110199.98 1705.6710240.65 1705.9110281.95 1706.5110322.82 1706.51
10363.79    1707

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9584.9    .033 9872.02    .04510076.74    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9872.0210076.74              495  522.64     483            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1706.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.033  *   0.045  *   0.033  *
* W.S. Elev (ft)         * 1705.89  * Reach Len. (ft)         *  495.00  *  522.64  *  483.00  *
* Crit W.S. (ft)         * 1705.61  * Flow Area (sq ft)       *   67.91  *  193.98  *   90.08  *
* E.G. Slope (ft/ft)     *0.008289  * Area (sq ft)            *   67.91  *  193.98  *   90.08  *
* Q Total (cfs)          *  980.00  * Flow (cfs)              *  166.77  *  561.74  *  251.48  *
* Top Width (ft)         *  511.49  * Top Width (ft)          *  146.50  *  204.72  *  160.27  *
* Vel Total (ft/s)       *    2.78  * Avg. Vel. (ft/s)        *    2.46  *    2.90  *    2.79  *
* Max Chl Dpth (ft)      *    1.75  * Hydr. Depth (ft)        *    0.46  *    0.95  *    0.56  *
* Conv. Total (cfs)      * 10763.7  * Conv. (cfs)             *  1831.7  *  6169.8  *  2762.1  *
* Length Wtd. (ft)       *  506.62  * Wetted Per. (ft)        *  146.50  *  205.18  *  160.27  *
* Min Ch El (ft)         * 1704.14  * Shear (lb/sq ft)        *    0.24  *    0.49  *    0.29  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    0.59  *    1.42  *    0.81  *
* Frctn Loss (ft)        *    3.54  * Cum Volume (acre-ft)    *  208.27  *  246.48  *  167.68  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *  121.83  *   83.87  *  112.60  *
*****************************************************************************************

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 OUTPUT Profile #2

E.G. Elev (ft)	1706.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.045	
W.S. Elev (ft)	1706.07	Reach Len. (ft)	495.00	522.64	483.00
Crit W.S. (ft)	1705.82	Flow Area (sq ft)		231.19	
E.G. Slope (ft/ft)	0.014252	Area (sq ft)		231.19	
Q Total (cfs)	980.00	Flow (cfs)		980.00	
Top Width (ft)	204.72	Top Width (ft)		204.72	
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)		4.24	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.13	
Conv. Total (cfs)	8209.1	Conv. (cfs)		8209.1	
Length Wtd. (ft)	514.82	Wetted Per. (ft)		207.32	
Min Ch El (ft)	1704.14	Shear (lb/sq ft)		0.99	
Alpha	1.00	Stream Power (lb/ft s)		4.21	
Frctn Loss (ft)	3.39	Cum Volume (acre-ft)	56.81	289.54	41.88
C & E Loss (ft)	0.03	Cum SA (acres)	14.47	83.87	13.76

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9584.90	9728.46	0.00	0.03	2.94	0.00	0.01	0.18
2 LOB	9728.46	9872.02	166.77	67.89	143.57	17.02	0.47	2.46
3 Chan	9872.02	10076.74	561.75	193.98	205.18	57.32	0.95	2.90
4 ROB	10076.74	10220.27	251.05	89.25	143.53	25.62	0.62	2.81
5 ROB	10220.27	10363.79	0.43	0.83	16.74	0.04	0.05	0.52

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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9872.02	10076.74	980.00	231.19	207.32	100.00	1.13	4.24

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.
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: WASH 3-WEST
REACH: REACH-1 RS: 5.589

INPUT

Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9233.71	1707.62	9304.5	1706.78	9375.77	1705.7	9446.91	1705.01	9517.65	1704.55
9588.71	1704.01	9659.68	1703.59	9730.83	1703.15	9801.62	1702.8	9872.75	1702.25
9943.88	1701.81	9975.59	1701.46	9976.49	1700.18	9991.39	1700	9992.52	1699.44
9997.66	1699.61	10001.13	1698.68	10006.86	1698.79	10009.54	1700.03	10022.65	1700.66
10027	1701.41	10042.49	1701.52	10078.59	1700.59	10083.23	1699.15	10086.39	1699.17
10088.89	1701.86	10091.75	1701.64	10095.18	1699.8	10097.73	1699.99	10099.44	1701.21
10107.23	1701.35	10110.64	1701.77	10113.2	1701.65	10184.84	1701.99	10255.79	1702.39
10326.69	1702.56	10397.78	1702.98	10468.74	1703.35	10539.56	1704.31	10610.38	1705.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9233.71	.033	9975.59	.045	10107.23	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.59	10042.49	316	318.33	300	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1702.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.033	0.045	0.043
W.S. Elev (ft)	1702.29	Reach Len. (ft)	316.00	318.33	300.00
Crit W.S. (ft)		Flow Area (sq ft)	39.01	133.78	138.93
E.G. Slope (ft/ft)	0.005961	Area (sq ft)	39.01	133.78	138.93
Q Total (cfs)	980.00	Flow (cfs)	68.97	534.61	376.42
Top Width (ft)	369.47	Top Width (ft)	107.59	66.90	194.98
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	1.77	4.00	2.71
Max Chl Dpth (ft)	3.61	Hydr. Depth (ft)	0.36	2.00	0.71
Conv. Total (cfs)	12693.0	Conv. (cfs)	893.3	6924.3	4875.5
Length Wtd. (ft)	313.07	Wetted Per. (ft)	107.59	68.17	197.29
Min Ch El (ft)	1698.68	Shear (lb/sq ft)	0.13	0.73	0.26
Alpha	1.19	Stream Power (lb/ft s)	0.24	2.92	0.71
Frctn Loss (ft)	1.56	Cum Volume (acre-ft)	207.67	244.51	166.41
C & E Loss (ft)	0.02	Cum SA (acres)	120.38	82.24	110.63

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 OUTPUT Profile #2

E.G. Elev (ft)	1702.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.045	0.045
W.S. Elev (ft)	1702.74	Reach Len. (ft)	316.00	318.33	300.00
Crit W.S. (ft)		Flow Area (sq ft)		164.38	127.37
E.G. Slope (ft/ft)	0.003786	Area (sq ft)		164.38	127.37
Q Total (cfs)	980.00	Flow (cfs)		593.12	386.88
Top Width (ft)	135.05	Top Width (ft)		66.90	68.15
Vel Total (ft/s)	3.36	Avg. Vel. (ft/s)		3.61	3.04
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)		2.46	1.87
Conv. Total (cfs)	15927.6	Conv. (cfs)		9639.7	6287.8
Length Wtd. (ft)	314.29	Wetted Per. (ft)		69.46	71.42
Min Ch El (ft)	1698.68	Shear (lb/sq ft)		0.56	0.42
Alpha	1.02	Stream Power (lb/ft s)		2.02	1.28
Frctn Loss (ft)	1.08	Cum Volume (acre-ft)	56.81	287.17	41.18
C & E Loss (ft)	0.00	Cum SA (acres)	14.47	82.24	13.38

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.

Profile #1

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent Hydr	Velocity

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9604.65    * 9975.59    *    68.97 *    39.01 *   107.59 *     7.04 *
0.36 *     1.77 *
* 2         * Chan      * 9975.59    * 10042.49   *   534.61 *   133.78 *    68.17 *    54.55 *
2.00 *     4.00 *
* 3         * ROB       * 10042.49   * 10326.44   *   376.42 *   138.93 *   197.29 *    38.41 *
0.71 *     2.71 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta   * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9975.59    * 10042.49   *   593.12 *   164.38 *    69.46 *    60.52 *
2.46 *     3.61 *
* 2         * ROB       * 10042.49   * 10326.44   *   386.88 *   127.37 *    71.42 *    39.48 *
1.87 *     3.04 *
*****************************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 5.528

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9447.77 1703.25 9499.49 1702.56 9551.74 1702.04 9603.43 1701.73 9655.51 1701.33
 9707.72 1700.96 9759.66 1700.58 9811.72 1700.17 9860.651699.858 9863.51 1699.84
 9915.85 1699.74 9967.77 1699.21 9990.37 1699.52 9993.34 1698.17 9997.48 1697.64
10001.03 1697.6110004.49 1698.91 10019.9 1699.0310058.531699.69510072.19 1699.93
10124.18 1700.4810175.92 1700.4410227.91 1700.6910280.14 1701.0610304.94  1701.3
10308.13 1700.7910312.74 1700.6910314.54 1700.9610331.89 1701.6310384.05 1702.38
   10436 1703.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9447.77    .033 9860.65    .04510058.53    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9990.3710058.53              626  625.97     583            .1       .3
Right Levee     Station=10304.94      Elevation=  1701.3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)          * 1700.89  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.042  *   0.045  *   0.033  *
* W.S. Elev (ft)          * 1700.79  * Reach Len. (ft)         *  626.00  *  625.97  *  583.00  *
* Crit W.S. (ft)          * 1700.37  * Flow Area (sq ft)       *  217.86  *  120.84  *   73.08  *
* E.G. Slope (ft/ft)      *0.004206  * Area (sq ft)            *  217.86  *  120.84  *   73.08  *
* Q Total (cfs)           *  980.00  * Flow (cfs)              *  487.48  *  376.95  *  115.56  *
* Top Width (ft)          *  510.82  * Top Width (ft)          *  259.29  *   68.16  *  183.37  *
* Vel Total (ft/s)        *    2.38  * Avg. Vel. (ft/s)        *    2.24  *    3.12  *    1.58  *
* Max Chl Dpth (ft)       *    3.18  * Hydr. Depth (ft)        *    0.84  *    1.77  *    0.40  *
* Conv. Total (cfs)       * 15111.1  * Conv. (cfs)             *  7516.7  *  5812.4  *  1781.9  *
```

```
* Length Wtd. (ft)        *  613.90  * Wetted Per. (ft)        *  259.30  *   68.73  *  183.37  *
* Min Ch El (ft)          * 1697.61  * Shear (lb/sq ft)        *    0.22  *    0.46  *    0.10  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)  *    0.49  *    1.44  *    0.17  *
* Frctn Loss (ft)         *    2.99  * Cum Volume (acre-ft)    *  206.73  *  243.58  *  165.68  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *  119.05  *   81.75  *  109.33  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1701.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.045  *   0.045  *          *
* W.S. Elev (ft)          * 1701.67  * Reach Len. (ft)        *  626.00  *  625.97  *  583.00  *
* Crit W.S. (ft)          * 1700.48  * Flow Area (sq ft)      *  112.76  *  180.89  *          *
* E.G. Slope (ft/ft)      *0.003135  * Area (sq ft)           *  112.76  *  180.89  *          *
* Q Total (cfs)           *  980.00  * Flow (cfs)              *  354.43  *  625.57  *          *
* Top Width (ft)          *  116.83  * Top Width (ft)          *   48.67  *   68.16  *          *
* Vel Total (ft/s)        *    3.34  * Avg. Vel. (ft/s)        *    3.14  *    3.46  *          *
* Max Chl Dpth (ft)       *    4.06  * Hydr. Depth (ft)        *    2.32  *    2.65  *          *
* Conv. Total (cfs)       * 17502.8  * Conv. (cfs)             *  6330.1  * 11172.7  *          *
* Length Wtd. (ft)        *  625.98  * Wetted Per. (ft)        *   50.87  *   70.70  *          *
* Min Ch El (ft)          * 1697.61  * Shear (lb/sq ft)        *    0.43  *    0.50  *          *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    1.36  *    1.73  *          *
* Frctn Loss (ft)         *    3.59  * Cum Volume (acre-ft)    *   56.40  *  285.91  *   40.74  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   14.29  *   81.74  *   13.15  *
*********************************************************************************************

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.
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.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9719.07   * 9990.37   *   487.48 *   217.86 *   259.30 *    49.74 *
0.84 *     2.24 *
* 2        * Chan      * 9990.37   * 10058.53  *   376.95 *   120.84 *    68.73 *    38.46 *
1.77 *     3.12 *
* 3        * ROB       * 10058.53  * 10304.94  *   115.56 *    73.08 *   183.37 *    11.79 *
0.40 *     1.58 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9719.07   * 9990.37   *   354.43 *   112.76 *    50.87 *    36.17 *
2.32 *     3.14 *
```

```
* 2          * Chan       * 9990.37   * 10058.53  *   625.57 *   180.89 *    70.70 *    63.83 *
2.65 *     3.46 *
*****************************************************************************************
******************
```

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

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 5.410

INPUT
Description: Interpolated point added at (9840.22,1697.066) to set bank station.
Station Elevation Data num= 28

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9409.95 1699.14  9472.9 1698.96 9535.84 1698.83    9599 1699.18 9662.24 1698.39
 9725.02 1698.23 9787.98 1697.68 9840.221697.066 9850.93 1696.94 9914.35 1696.72
 9976.81 1696.6810039.92 1697.0710103.07 1697.3410141.01 1697.2410144.56 1696.58
10147.37 1696.4310150.67 1697.2310166.39 1697.0510188.56 1696.9510191.07  1696.4
10195.58 1696.91 10229.3 1697.15 10292.1 1696.9810355.26 1697.6510418.51 1698.09
10481.39 1698.9710544.39 1700.2710607.02 1701.69
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9409.95    .033 9850.93    .045 10229.3    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9840.2210039.92               450  459.32     466             .1       .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1697.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033	0.044	0.040
W.S. Elev (ft)	1697.81	Reach Len. (ft)	450.00	459.32	466.00
Crit W.S. (ft)	1697.51	Flow Area (sq ft)	23.81	199.20	210.87
E.G. Slope (ft/ft)	0.005722	Area (sq ft)	23.81	199.20	210.87
Q Total (cfs)	980.00	Flow (cfs)	40.63	504.10	435.26
Top Width (ft)	605.23	Top Width (ft)	67.15	199.70	338.38
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	1.71	2.53	2.06
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)	0.35	1.00	0.62
Conv. Total (cfs)	12955.3	Conv. (cfs)	537.2	6664.1	5754.1
Length Wtd. (ft)	463.43	Wetted Per. (ft)	67.16	199.70	338.64
Min Ch El (ft)	1696.68	Shear (lb/sq ft)	0.13	0.36	0.22
Alpha	1.04	Stream Power (lb/ft s)	0.22	0.90	0.46
Frctn Loss (ft)	2.68	Cum Volume (acre-ft)	205.00	241.28	163.78
C & E Loss (ft)	0.01	Cum SA (acres)	116.71	79.82	105.84

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 OUTPUT Profile #2

E.G. Elev (ft)	1698.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.044	
W.S. Elev (ft)	1697.96	Reach Len. (ft)	450.00	459.32	466.00
Crit W.S. (ft)	1697.72	Flow Area (sq ft)		229.08	
E.G. Slope (ft/ft)	0.013716	Area (sq ft)		229.08	
Q Total (cfs)	980.00	Flow (cfs)		980.00	
Top Width (ft)	199.70	Top Width (ft)		199.70	
Vel Total (ft/s)	4.28	Avg. Vel. (ft/s)		4.28	

```
* Max Chl Dpth (ft)      *    1.28  * Hydr. Depth (ft)       *          *    1.15  *          *
* Conv. Total (cfs)      *  8367.8  * Conv. (cfs)            *          *  8367.8  *          *
* Length Wtd. (ft)       *  462.54  * Wetted Per. (ft)       *          *  201.49  *          *
* Min Ch El (ft)         * 1696.68  * Shear (lb/sq ft)       *          *    0.97  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    4.16  *          *
* Frctn Loss (ft)        *    2.81  * Cum Volume (acre-ft)   *   55.59  *  282.96  *   40.74  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *   13.94  *   79.82  *   13.15  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9625.09   * 9840.22   *    40.63 *    23.81 *    67.16 *     4.15 *
0.35 *     1.71 *
* 2         * Chan      * 9840.22   * 10039.92  *   504.10 *   199.20 *   199.70 *    51.44 *
1.00 *     2.53 *
* 3         * ROB       * 10039.92  * 10323.47  *   420.49 *   198.57 *   283.80 *    42.91 *
0.70 *     2.12 *
* 4         * ROB       * 10323.47  * 10607.02  *    14.78 *    12.30 *    54.84 *     1.51 *
0.22 *     1.20 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9840.22   * 10039.92  *   980.00 *   229.08 *   201.49 *   100.00 *
1.15 *     4.28 *
*****************************************************************************************************
******************

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.

CROSS SECTION _


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 5.323

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,220cfs.
Embankment is stock tank, flood flows go
             around on left side and downstream dam is ignored for floodplain
             mapping.
Interpolated points added at (10255.31, 1694.47),
             (10139.81, 1693.193), (10058.53, 1693.191) to set bank stations
             and for n-value location.
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9604.56 1695.67 9645.17 1695.77 9668.88 1695.63 9702.28 1695.35 9735.56 1695.38
```

```
 9774.83    1695 9814.56 1694.77 9855.23 1694.67 9894.89 1694.69 9934.88 1694.41
 9960.19 1694.45 9984.52 1694.2410016.14 1694.9610029.75 1695.7810043.19 1695.05
10058.531693.19110064.15 1692.5110094.99  1692.910135.45 1693.0610139.811693.193
10174.95 1694.2610215.29 1693.8510255.31 1694.4710295.09 1695.2110335.18 1696.34
 10375.2 1697.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9604.56    .033 9894.89    .04510255.31    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9894.8910016.14              472  596.28     542            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1695.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.033  *   0.045  *   0.045  *
* W.S. Elev (ft)         * 1695.06  * Reach Len. (ft)         *  472.00  *  596.28  *  542.00  *
* Crit W.S. (ft)         * 1694.62  * Flow Area (sq ft)       *   35.95  *   68.20  *  324.74  *
* E.G. Slope (ft/ft)     *0.005837  * Area (sq ft)            *   35.95  *   68.20  *  324.74  *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *   53.55  *  117.24  * 1049.22  *
* Top Width (ft)         *  493.06  * Top Width (ft)          *  126.19  *  121.25  *  245.62  *
* Vel Total (ft/s)       *    2.84  * Avg. Vel. (ft/s)        *    1.49  *    1.72  *    3.23  *
* Max Chl Dpth (ft)      *    2.55  * Hydr. Depth (ft)        *    0.28  *    0.56  *    1.32  *
* Conv. Total (cfs)      * 15968.5  * Conv. (cfs)            *   700.9  *  1534.5  * 13733.1  *
* Length Wtd. (ft)       *  542.30  * Wetted Per. (ft)        *  126.19  *  121.26  *  245.81  *
* Min Ch El (ft)         * 1694.24  * Shear (lb/sq ft)        *    0.10  *    0.20  *    0.48  *
* Alpha                  *    1.16  * Stream Power (lb/ft s)  *    0.15  *    0.35  *    1.56  *
* Frctn Loss (ft)        *    3.06  * Cum Volume (acre-ft)    *  204.69  *  239.87  *  160.91  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *  115.71  *   78.13  *  102.71  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1695.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.11  * Wt. n-Val.              *          *   0.045  *   0.045  *
* W.S. Elev (ft)         * 1695.27  * Reach Len. (ft)         *  472.00  *  596.28  *  542.00  *
* Crit W.S. (ft)         * 1694.62  * Flow Area (sq ft)       *          *   94.06  *  377.91  *
* E.G. Slope (ft/ft)     *0.003778  * Area (sq ft)            *          *   94.06  *  377.91  *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *          *  160.65  * 1059.35  *
* Top Width (ft)         *  374.34  * Top Width (ft)          *          *  121.25  *  253.09  *
* Vel Total (ft/s)       *    2.58  * Avg. Vel. (ft/s)        *          *    1.71  *    2.80  *
* Max Chl Dpth (ft)      *    2.76  * Hydr. Depth (ft)        *          *    0.78  *    1.49  *
* Conv. Total (cfs)      * 19848.1  * Conv. (cfs)            *          *  2613.7  * 17234.5  *
* Length Wtd. (ft)       *  567.72  * Wetted Per. (ft)        *          *  121.84  *  253.50  *
* Min Ch El (ft)         * 1694.24  * Shear (lb/sq ft)        *          *    0.18  *    0.35  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)  *          *    0.31  *    0.99  *
* Frctn Loss (ft)        *    2.33  * Cum Volume (acre-ft)    *   55.59  *  281.26  *   38.72  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   13.94  *   78.13  *   11.79  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9749.73   * 9894.89   *    53.55 *    35.95 *   126.19 *     4.39 *
0.28 *     1.49 *
* 2         * Chan      * 9894.89   * 10016.14  *   117.24 *    68.20 *   121.26 *     9.61 *
0.56 *     1.72 *
```

```
* 3          * ROB       * 10016.14  * 10195.67  *   895.54 *   257.64 *   154.48 *    73.40 *
1.67 *     3.48 *
* 4          * ROB       * 10195.67  * 10375.20  *   153.68 *    67.10 *    91.33 *    12.60 *
0.73 *     2.29 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9894.89   * 10016.14  *   160.65 *    94.06 *   121.84 *    13.17 *
0.78 *     1.71 *
* 2         * ROB       * 10016.14  * 10195.67  *   871.83 *   291.34 *   161.96 *    71.46 *
1.80 *     2.99 *
* 3         * ROB       * 10195.67  * 10375.20  *   187.51 *    86.57 *    91.54 *    15.37 *
0.95 *     2.17 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 5.210

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9289.65 1694.28  9337.5 1693.86 9385.56 1693.69 9433.45 1693.49 9481.46 1693.21
 9529.69 1693.05 9577.39 1692.78 9589.971692.725 9625.63 1692.57 9673.28 1692.23
 9721.75 1691.93 9769.67 1691.52 9817.46 1691.27 9865.79 1690.82 9913.39 1690.68
 9941.491690.598  9961.5 1690.54 9994.47 1690.34 9998.25 1687.7410001.88 1688.55
10004.77 1689.9910009.56 1690.3610057.54  1690.710105.68 1692.79 10153.3 1695.08
10201.61 1695.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9289.65    .033 9941.49    .04510057.54    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.4910057.54              299   331.1     320             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1692.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.033  *   0.045  *   0.033  *
* W.S. Elev (ft)         * 1691.99  * Reach Len. (ft)         *  299.00  *  331.10  *  320.00  *
* Crit W.S. (ft)         * 1691.55  * Flow Area (sq ft)       *  183.71  *  191.07  *   19.12  *
* E.G. Slope (ft/ft)     *0.005458  * Area (sq ft)            *  183.71  *  191.07  *   19.12  *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *  527.36  *  645.23  *   47.41  *
* Top Width (ft)         *  374.90  * Top Width (ft)           *  229.17  *  116.05  *   29.68  *
* Vel Total (ft/s)       *    3.10  * Avg. Vel. (ft/s)         *    2.87  *    3.38  *    2.48  *
* Max Chl Dpth (ft)      *    4.25  * Hydr. Depth (ft)         *    0.80  *    1.65  *    0.64  *
* Conv. Total (cfs)      * 16514.4  * Conv. (cfs)              *  7138.5  *  8734.1  *   641.7  *
* Length Wtd. (ft)       *  316.30  * Wetted Per. (ft)         *  229.17  *  117.30  *   29.70  *
* Min Ch El (ft)         * 1687.74  * Shear (lb/sq ft)         *    0.27  *    0.55  *    0.22  *
```

```
* Alpha                  *    1.02  * Stream Power (lb/ft s) *    0.78  *    1.87  *    0.54  *
* Frctn Loss (ft)        *    1.88  * Cum Volume (acre-ft)   *  203.50  *  238.10  *  158.77  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *  113.78  *   76.51  *  101.00  *
*****************************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1693.04  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.25  * Wt. n-Val.              *   0.033  *   0.045  *          *
* W.S. Elev (ft)         * 1692.79  * Reach Len. (ft)         *  299.00  *  331.10  *  320.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   22.01  *  284.56  *          *
* E.G. Slope (ft/ft)     *0.004479  * Area (sq ft)            *   22.01  *  284.56  *          *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *   97.98  * 1122.02  *          *
* Top Width (ft)         *  126.14  * Top Width (ft)           *   10.09  *  116.05  *          *
* Vel Total (ft/s)       *    3.98  * Avg. Vel. (ft/s)         *    4.45  *    3.94  *          *
* Max Chl Dpth (ft)      *    5.05  * Hydr. Depth (ft)         *    2.18  *    2.45  *          *
* Conv. Total (cfs)      * 18229.8  * Conv. (cfs)              *  1464.1  * 16765.7  *          *
* Length Wtd. (ft)       *  327.33  * Wetted Per. (ft)         *   12.26  *  119.40  *          *
* Min Ch El (ft)         * 1687.74  * Shear (lb/sq ft)         *    0.50  *    0.67  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *    2.24  *    2.63  *          *
* Frctn Loss (ft)        *    1.86  * Cum Volume (acre-ft)     *   55.47  *  278.66  *   36.37  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *   13.89  *   76.50  *   10.22  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9615.57   * 9941.49   *   527.36 *   183.71 *   229.17 *    43.23 *
0.80 *     2.87 *
* 2        * Chan      * 9941.49   * 10057.54  *   645.23 *   191.07 *   117.30 *    52.89 *
1.65 *     3.38 *
* 3        * ROB       * 10057.54  * 10129.58  *    47.41 *    19.12 *    29.70 *     3.89 *
0.64 *     2.48 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9615.57   * 9941.49   *    97.98 *    22.01 *    12.26 *     8.03 *
2.18 *     4.45 *
* 2        * Chan      * 9941.49   * 10057.54  *  1122.02 *   284.56 *   119.40 *    91.97 *
2.45 *     3.94 *
*****************************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 5.147

INPUT
Description:
Station Elevation Data num= 29

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9401.2 1692.02 9457.16 1691.62 9513.16 1691.28 9569.09 1690.99 9625.26 1690.83
 9681.24 1690.46 9737.12 1690.25 9793.14 1689.95 9849.16 1689.93 9888.521689.235
 9905.25 1688.94  9961.3 1688.49 9994.58 1689.08 9997.81 1685.7310002.73 1685.37
10005.16 1688.5510017.35 1688.7210073.18 1689.0110082.041689.09410159.54 1689.83
10215.11 1689.9610271.57 1689.5210327.69 1689.7710362.08 1689.8610365.05 1689.34
10367.25 1689.3710369.18 1689.8710383.47 1689.9410439.66 1691.33
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9401.2    .033 9888.52    .04510082.04    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9994.5810082.04              643   661.7     646            .1        .3
```

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1690.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.044	0.045	0.033
W.S. Elev (ft)	1690.11	Reach Len. (ft)	643.00	661.70	646.00
Crit W.S. (ft)	1689.79	Flow Area (sq ft)	171.90	135.63	126.71
E.G. Slope (ft/ft)	0.006498	Area (sq ft)	171.90	135.63	126.71
Q Total (cfs)	1220.00	Flow (cfs)	492.97	472.86	254.18
Top Width (ft)	626.92	Top Width (ft)	231.18	87.46	308.27
Vel Total (ft/s)	2.81	Avg. Vel. (ft/s)	2.87	3.49	2.01
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)	0.74	1.55	0.41
Conv. Total (cfs)	15134.8	Conv. (cfs)	6115.6	5866.1	3153.2
Length Wtd. (ft)	652.43	Wetted Per. (ft)	231.20	90.47	308.39
Min Ch El (ft)	1685.37	Shear (lb/sq ft)	0.30	0.61	0.17
Alpha	1.12	Stream Power (lb/ft s)	0.86	2.12	0.33
Frctn Loss (ft)	4.12	Cum Volume (acre-ft)	202.28	236.86	158.24
C & E Loss (ft)	0.00	Cum SA (acres)	112.20	75.73	99.76

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 OUTPUT Profile #2

E.G. Elev (ft)	1691.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.045	0.045	0.033
W.S. Elev (ft)	1690.82	Reach Len. (ft)	643.00	661.70	646.00
Crit W.S. (ft)	1690.16	Flow Area (sq ft)	35.46	197.42	24.79
E.G. Slope (ft/ft)	0.007486	Area (sq ft)	35.46	197.42	24.79
Q Total (cfs)	1220.00	Flow (cfs)	144.93	948.89	126.18
Top Width (ft)	121.13	Top Width (ft)	18.65	87.46	15.02
Vel Total (ft/s)	4.73	Avg. Vel. (ft/s)	4.09	4.81	5.09
Max Chl Dpth (ft)	5.45	Hydr. Depth (ft)	1.90	2.26	1.65
Conv. Total (cfs)	14100.6	Conv. (cfs)	1675.0	10967.2	1458.4
Length Wtd. (ft)	659.78	Wetted Per. (ft)	20.72	90.47	16.60
Min Ch El (ft)	1685.37	Shear (lb/sq ft)	0.80	1.02	0.70
Alpha	1.01	Stream Power (lb/ft s)	3.27	4.90	3.55
Frctn Loss (ft)	4.13	Cum Volume (acre-ft)	55.27	276.83	36.27
C & E Loss (ft)	0.02	Cum SA (acres)	13.79	75.73	10.16

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: The parabolic search method failed to converge on critical depth. The program will try the
cross section slice/secant method to find critical depth.

Profile #1

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9697.89   * 9994.58   *   492.97 *   171.90 *   231.20 *    40.41 *
0.74 *     2.87 *
* 2         * Chan      * 9994.58   * 10082.04  *   472.85 *   135.63 *    90.47 *    38.76 *
1.55 *     3.49 *
* 3         * ROB       * 10082.04  * 10260.85  *   159.26 *    77.05 *   178.81 *    13.05 *
0.43 *     2.07 *
* 4         * ROB       * 10260.85  * 10439.66  *    94.92 *    49.66 *   129.58 *     7.78 *
0.38 *     1.91 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9697.89   * 9994.58   *   144.93 *    35.46 *    20.72 *    11.88 *
1.90 *     4.09 *
* 2         * Chan      * 9994.58   * 10082.04  *   948.89 *   197.42 *    90.47 *    77.78 *
2.26 *     4.81 *
* 3         * ROB       * 10082.04  * 10260.85  *   126.18 *    24.79 *    16.60 *    10.34 *
1.65 *     5.09 *
*****************************************************************************************
******************

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: 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: WASH 3-WEST
REACH: REACH-1            RS: 5.022

INPUT
Description: Interpolated point added at (9941.25, 1685.022) to set bank
             station.
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9471.76 1687.83 9527.06 1687.38  9564.7 1687.28 9638.64 1686.76 9693.47 1686.66
 9748.56 1686.42 9803.45 1686.04 9858.29 1685.76 9913.63 1685.46 9941.251685.022
 9968.47 1684.59 9995.17 1684.7610001.29  1682.910006.96 1683.2510011.95 1684.46
 10023.9 1684.7510078.79 1685.0710133.81 1684.9510188.74    168510237.82 1685.29
10239.81 1684.5310241.35 1684.4410242.81 1685.1310298.94 1685.5710353.86 1686.56
 10409.1 1686.3410463.58 1686.8710518.56 1687.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9471.76    .037 9913.63    .04110353.86    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.2510078.79               454  494.13     433              .1       .3

CROSS SECTION OUTPUT  Profile #1
```

```
*****************************************************************************************
* E.G. Elev (ft)          * 1686.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *    0.039 *    0.041 *    0.041 *
* W.S. Elev (ft)          * 1686.00  * Reach Len. (ft)         *   454.00 *   494.13 *   433.00 *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    48.06 *   184.82 *   200.39 *
* E.G. Slope (ft/ft)      *0.006128  * Area (sq ft)            *    48.06 *   184.82 *   200.39 *
* Q Total (cfs)           * 1220.00  * Flow (cfs)              *    84.61 *   637.14 *   498.26 *
* Top Width (ft)          *  511.26  * Top Width (ft)          *   129.77 *   137.54 *   243.95 *
* Vel Total (ft/s)        *    2.82  * Avg. Vel. (ft/s)        *     1.76 *     3.45 *     2.49 *
* Max Chl Dpth (ft)       *    3.10  * Hydr. Depth (ft)        *     0.37 *     1.34 *     0.82 *
* Conv. Total (cfs)       * 15584.5  * Conv. (cfs)             *   1080.8 *   8138.9 *   6364.8 *
* Length Wtd. (ft)        *  466.07  * Wetted Per. (ft)        *   129.77 *   137.98 *   244.25 *
* Min Ch El (ft)          * 1682.90  * Shear (lb/sq ft)        *     0.14 *     0.51 *     0.31 *
* Alpha                   *    1.13  * Stream Power (lb/ft s)   *     0.25 *     1.77 *     0.78 *
* Frctn Loss (ft)         *    2.56  * Cum Volume (acre-ft)     *   200.65 *   234.42 *   155.81 *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *   109.54 *    74.02 *    95.66 *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1687.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.              *          *    0.041 *          *
* W.S. Elev (ft)          * 1686.75  * Reach Len. (ft)         *   454.00 *   494.13 *   433.00 *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *   287.72 *          *
* E.G. Slope (ft/ft)      *0.005308  * Area (sq ft)            *          *   287.72 *          *
* Q Total (cfs)           * 1220.00  * Flow (cfs)              *          *  1220.00 *          *
* Top Width (ft)          *  137.54  * Top Width (ft)          *          *   137.54 *          *
* Vel Total (ft/s)        *    4.24  * Avg. Vel. (ft/s)        *          *     4.24 *          *
* Max Chl Dpth (ft)       *    3.85  * Hydr. Depth (ft)        *          *     2.09 *          *
* Conv. Total (cfs)       * 16745.4  * Conv. (cfs)             *          *  16745.4 *          *
* Length Wtd. (ft)        *  493.19  * Wetted Per. (ft)        *          *   141.38 *          *
* Min Ch El (ft)          * 1682.90  * Shear (lb/sq ft)        *          *     0.67 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     2.86 *          *
* Frctn Loss (ft)         *    2.42  * Cum Volume (acre-ft)     *    55.01 *   273.15 *    36.09 *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    13.65 *    74.02 *    10.05 *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9706.51   * 9941.25   *    84.61 *    48.06 *   129.77 *     6.94 *
0.37 *     1.76 *
* 2        * Chan      * 9941.25   * 10078.79  *   637.14 *   184.82 *   137.98 *    52.22 *
1.34 *     3.45 *
* 3        * ROB       * 10078.79  * 10298.67  *   493.10 *   195.17 *   220.19 *    40.42 *
0.89 *     2.53 *
* 4        * ROB       * 10298.67  * 10518.56  *     5.16 *     5.22 *    24.07 *     0.42 *
0.22 *     0.99 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * Chan       * 9941.25   * 10078.79  *  1220.00 *   287.72 *   141.38 *   100.00 *
2.09 *     4.24 *
*****************************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 4.928

INPUT
Description:
Station Elevation Data num= 26

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9377.58 1685.56  9427.6 1684.95 9477.73 1684.48 9527.75 1684.13 9577.78 1684.02
 9627.64 1683.83 9677.84 1683.72 9727.82 1683.68 9777.75 1683.51 9827.85 1683.14
 9877.49 1682.68 9920.94 1682.21  9922.5  1681.7  9924.5 1681.63 9927.56 1682.17
 9956.49 1681.69 9962.28 1680.83 9967.15 1680.52 9970.63 1682.12 9978.21  1681.8
10027.85 1682.0610078.09    168210128.24 1682.26 10178.1 1683.5910228.13  1685.3
10278.14 1686.52
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9377.58    .037 9920.94    .04110128.24    .037
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9920.9410027.85              457  480.24     466             .1        .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1683.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.037  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1683.43  * Reach Len. (ft)         *  457.00  *  480.24  *  466.00  *
* Crit W.S. (ft)         * 1682.95  * Flow Area (sq ft)       *   74.10  *  172.67  *  160.97  *
* E.G. Slope (ft/ft)     *0.004965  * Area (sq ft)            *   74.10  *  172.67  *  160.97  *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *  142.58  *  604.85  *  472.57  *
* Top Width (ft)         *  383.25  * Top Width (ft)           *  132.15  *  106.91  *  144.20  *
* Vel Total (ft/s)       *    2.99  * Avg. Vel. (ft/s)         *    1.92  *    3.50  *    2.94  *
* Max Chl Dpth (ft)      *    2.91  * Hydr. Depth (ft)         *    0.56  *    1.62  *    1.12  *
* Conv. Total (cfs)      * 17314.1  * Conv. (cfs)              *  2023.5  *  8584.0  *  6706.6  *
* Length Wtd. (ft)       *  470.74  * Wetted Per. (ft)         *  132.16  *  107.47  *  144.21  *
* Min Ch El (ft)         * 1680.52  * Shear (lb/sq ft)         *    0.17  *    0.50  *    0.35  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.33  *    1.74  *    1.02  *
* Frctn Loss (ft)        *    2.52  * Cum Volume (acre-ft)     *  200.02  *  232.40  *  154.02  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *  108.17  *   72.64  *   93.73  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)         * 1684.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.30  * Wt. n-Val.              *          *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1684.31  * Reach Len. (ft)         *  457.00  *  480.24  *  466.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  267.26  *   11.46  *
* E.G. Slope (ft/ft)     *0.004539  * Area (sq ft)            *          *  267.26  *   11.46  *
* Q Total (cfs)          * 1220.00  * Flow (cfs)              *          * 1182.33  *   37.67  *
* Top Width (ft)         *  111.99  * Top Width (ft)           *          *  106.91  *    5.08  *
* Vel Total (ft/s)       *    4.38  * Avg. Vel. (ft/s)         *          *    4.42  *    3.29  *
* Max Chl Dpth (ft)      *    3.79  * Hydr. Depth (ft)         *          *    2.50  *    2.26  *
* Conv. Total (cfs)      * 18109.2  * Conv. (cfs)              *          * 17550.0  *   559.1  *
* Length Wtd. (ft)       *  480.04  * Wetted Per. (ft)         *          *  109.58  *    7.34  *
* Min Ch El (ft)         * 1680.52  * Shear (lb/sq ft)         *          *    0.69  *    0.44  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)   *          *    3.06  *    1.45  *
```

```
* Frctn Loss (ft)        *    2.69  * Cum Volume (acre-ft)   *   55.01  *  270.00  *   36.03  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   13.65  *   72.63  *   10.03  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9649.26   * 9920.94   *   142.58 *    74.10 *   132.16 *    11.69 *
0.56 *     1.92 *
* 2         * Chan      * 9920.94   * 10027.85  *   604.85 *   172.67 *   107.47 *    49.58 *
1.62 *     3.50 *
* 3         * ROB       * 10027.85  * 10152.99  *   467.15 *   156.13 *   125.15 *    38.29 *
1.25 *     2.99 *
* 4         * ROB       * 10152.99  * 10278.14  *     5.41 *     4.84 *    19.06 *     0.44 *
0.25 *     1.12 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9920.94   * 10027.85  *  1182.33 *   267.26 *   109.58 *    96.91 *
2.50 *     4.42 *
* 2         * ROB       * 10027.85  * 10152.99  *    37.67 *    11.46 *     7.34 *     3.09 *
2.26 *     3.29 *
*****************************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 4.837

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,430cfs.
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9392.57 1681.85 9437.65 1681.38 9482.47 1681.33  9527.5 1680.87 9572.46 1680.89
 9617.56 1680.77 9662.71 1680.75 9707.54 1680.82 9752.49 1680.35 9797.73 1680.18
 9812.44 1680.15 9827.66 1680.08 9842.66 1679.97 9857.42  1679.9 9872.77  1679.3
 9887.65 1679.02 9901.53 1679.43 9903.06 1679.38 9918.16 1679.38 9933.33 1679.24
 9948.12 1679.59 9956.02 1679.31 9957.62 1678.35 9959.51  1678.5 9962.41 1679.34
10002.31 1679.6810003.43 1678.2610007.14 1677.6310008.99 1679.6610023.65 1679.64
10068.65 1679.6210082.64 1679.5910084.75 1679.2510087.41 1679.29 10091.7 1679.81
10113.65 1679.9510158.37 1680.3710203.71 1682.1510248.58 1682.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9392.57    .037 9948.12    .041 10091.7    .037
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.12 10091.7               648  676.29    650            .1        .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1681.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.037  *   0.041  *   0.037  *
* W.S. Elev (ft)          * 1680.92  * Reach Len. (ft)         *  648.00  *  676.29  *  650.00  *
* Crit W.S. (ft)          * 1680.46  * Flow Area (sq ft)       *  256.58  *  207.35  *   60.50  *
* E.G. Slope (ft/ft)      *0.005742  * Area (sq ft)            *  256.58  *  207.35  *   60.50  *
* Q Total (cfs)           * 1430.00  * Flow (cfs)              *  557.47  *  720.54  *  152.00  *
* Top Width (ft)          *  649.51  * Top Width (ft)          *  425.30  *  143.58  *   80.62  *
* Vel Total (ft/s)        *    2.73  * Avg. Vel. (ft/s)        *    2.17  *    3.47  *    2.51  *
* Max Chl Dpth (ft)       *    3.29  * Hydr. Depth (ft)        *    0.60  *    1.44  *    0.75  *
* Conv. Total (cfs)       * 18871.4  * Conv. (cfs)             * 7356.8   * 9508.8   * 2005.9   *
* Length Wtd. (ft)        *  665.15  * Wetted Per. (ft)        *  425.33  *  145.67  *   80.64  *
* Min Ch El (ft)          * 1677.63  * Shear (lb/sq ft)        *    0.22  *    0.51  *    0.27  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.47  *    1.77  *    0.68  *
* Frctn Loss (ft)         *    4.46  * Cum Volume (acre-ft)    *  198.28  *  230.30  *  152.83  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *  105.25  *   71.26  *   92.53  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1681.91  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.35  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)          * 1681.56  * Reach Len. (ft)         *  648.00  *  676.29  *  650.00  *
* Crit W.S. (ft)          * 1680.92  * Flow Area (sq ft)       *          *  299.66  *          *
* E.G. Slope (ft/ft)      *0.006854  * Area (sq ft)            *          *  299.66  *          *
* Q Total (cfs)           * 1430.00  * Flow (cfs)              *          * 1430.00  *          *
* Top Width (ft)          *  143.58  * Top Width (ft)          *          *  143.58  *          *
* Vel Total (ft/s)        *    4.77  * Avg. Vel. (ft/s)        *          *    4.77  *          *
* Max Chl Dpth (ft)       *    3.93  * Hydr. Depth (ft)        *          *    2.09  *          *
* Conv. Total (cfs)       * 17273.2  * Conv. (cfs)             *          * 17273.2  *          *
* Length Wtd. (ft)        *  676.29  * Wetted Per. (ft)        *          *  149.40  *          *
* Min Ch El (ft)          * 1677.63  * Shear (lb/sq ft)        *          *    0.86  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    4.10  *          *
* Frctn Loss (ft)         *    4.75  * Cum Volume (acre-ft)    *   55.01  *  266.87  *   35.97  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   13.65  *   71.25  *   10.00  *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9392.57   * 9670.35   *     7.36 *    14.14 *   147.53 *     0.51 *
0.10 *     0.52 *
* 2        * LOB       * 9670.35   * 9948.12   *   550.11 *   242.45 *   277.80 *    38.47 *
0.87 *     2.27 *
* 3        * Chan      * 9948.12   * 10091.70  *   720.54 *   207.35 *   145.67 *    50.39 *
1.44 *     3.48 *
* 4        * ROB       * 10091.70  * 10170.14  *   151.96 *    60.40 *    78.45 *    10.63 *
0.77 *     2.52 *
* 5        * ROB       * 10170.14  * 10248.58  *     0.03 *     0.09 *     2.19 *     0.00 *
0.04 *     0.37 *
*********************************************************************************************
******************

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.

  Profile #2
```

```
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9948.12   * 10091.70  *  1430.00 *   299.66 *   149.40 *   100.00 *
2.09 *     4.77 *
*****************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 4.709

INPUT
Description:
Station Elevation Data num= 27

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9199.48 1677.63  9264.3 1677.59 9329.35 1677.41 9394.53 1677.04 9459.54 1676.92
 9524.42 1676.84  9589.1 1676.51 9654.07 1676.63 9719.05 1676.38 9784.17 1676.06
 9849.04 1675.39  9914.4  1675.1 9973.02 1674.95 9977.38 1672.46 9980.35 1672.31
 9986.78 1675.09 9998.25 1674.7410001.17 1672.8810003.86 1672.6610007.34 1675.28
10050.33 1675.2810115.18 1675.8810180.13 1676.0410245.21 1676.7210310.48 1677.12
10375.12  1678.310440.11 1679.51
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9199.48    .037 9849.04    .04110115.18    .037
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
       9849.0410007.34              412  450.63     450             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1676.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.22  * Wt. n-Val.              *   0.037  *   0.041  *   0.040  *
* W.S. Elev (ft)         * 1676.37  * Reach Len. (ft)         *  412.00  *  450.63  *  450.00  *
* Crit W.S. (ft)         * 1676.12  * Flow Area (sq ft)       *   51.54  *  235.10  *  129.80  *
* E.G. Slope (ft/ft)     *0.007948  * Area (sq ft)            *   51.54  *  235.10  *  129.80  *
* Q Total (cfs)          * 1430.00  * Flow (cfs)              *  100.70  *  977.85  *  351.45  *
* Top Width (ft)         *  490.44  * Top Width (ft)           *  127.83  *  158.30  *  204.31  *
* Vel Total (ft/s)       *    3.43  * Avg. Vel. (ft/s)         *    1.95  *    4.16  *    2.71  *
* Max Chl Dpth (ft)      *    4.06  * Hydr. Depth (ft)         *    0.40  *    1.49  *    0.64  *
* Conv. Total (cfs)      * 16039.9  * Conv. (cfs)              *  1129.5  * 10968.3  *  3942.1  *
* Length Wtd. (ft)       *  446.59  * Wetted Per. (ft)         *  127.83  *  160.97  *  204.32  *
* Min Ch El (ft)         * 1672.31  * Shear (lb/sq ft)         *    0.20  *    0.72  *    0.32  *
* Alpha                  *    1.18  * Stream Power (lb/ft s)   *    0.39  *    3.01  *    0.85  *
* Frctn Loss (ft)        *    2.97  * Cum Volume (acre-ft)     *  195.99  *  226.87  *  151.41  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *  101.14  *   68.91  *   90.41  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)         * 1677.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.34  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)         * 1676.82  * Reach Len. (ft)         *  412.00  *  450.63  *  450.00  *
* Crit W.S. (ft)         * 1676.24  * Flow Area (sq ft)       *          *  306.35  *          *
* E.G. Slope (ft/ft)     *0.007207  * Area (sq ft)            *          *  306.35  *          *
* Q Total (cfs)          * 1430.00  * Flow (cfs)              *          * 1430.00  *          *
* Top Width (ft)         *  158.30  * Top Width (ft)           *          *  158.30  *          *
```

```
* Vel Total (ft/s)        *    4.67  * Avg. Vel. (ft/s)        *          *    4.67  *          *
* Max Chl Dpth (ft)       *    4.51  * Hydr. Depth (ft)        *          *    1.94  *          *
* Conv. Total (cfs)       * 16844.0  * Conv. (cfs)             *          * 16844.0  *          *
* Length Wtd. (ft)        *  450.63  * Wetted Per. (ft)        *          *  163.94  *          *
* Min Ch El (ft)          * 1672.31  * Shear (lb/sq ft)        *          *    0.84  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    3.92  *          *
* Frctn Loss (ft)         *    2.73  * Cum Volume (acre-ft)    *   55.01  *  262.17  *   35.97  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   13.65  *   68.91  *   10.00  *
*****************************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9524.26   * 9849.04   *   100.70 *    51.54 *   127.83 *     7.04 *
0.40 *     1.95 *
* 2         * Chan      * 9849.04   * 10007.34  *   977.85 *   235.10 *   160.97 *    68.38 *
1.49 *     4.16 *
* 3         * ROB       * 10007.34  * 10223.72  *   351.45 *   129.80 *   204.32 *    24.58 *
0.64 *     2.71 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9849.04   * 10007.34  *  1430.00 *   306.35 *   163.94 *   100.00 *
1.94 *     4.67 *
*****************************************************************************************************
******************

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 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: WASH 3-WEST
REACH: REACH-1            RS: 4.624

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9633.73 1674.19 9639.43 1674.17 9644.12 1674.16 9657.42 1673.96 9676.73 1673.51
 9681.12 1673.41 9687.95 1673.32 9704.81 1673.16 9714.02 1673.07 9728.51 1673.05
 9751.32 1672.82 9755.69 1672.77  9775.9 1672.63 9788.62 1672.56 9799.59 1672.52
 9820.16 1672.44 9823.29 1672.42 9825.92  1672.4 9863.21 1672.26 9870.68 1672.23
 9879.64 1672.23 9894.37 1672.16 9900.51 1672.17 9918.07 1672.17 9926.57 1672.19
 9937.81  1672.3 9941.76 1672.32 9963.45 1672.42 9965.45 1672.42 9975.11 1672.49
 9989.15 1672.48 9993.61  1672.410001.85 1668.37 10004.4 1672.81 10012.4 1672.71
```

```
10012.84 1672.7110030.66  1672.310036.54 1672.27 10049.7 1672.2510073.24 1672.25
10083.93 1672.26   10087 1672.2810107.62 1672.3110120.01 1672.39 10124.3 1672.45
10131.32 1672.5210155.01 1672.8210160.35 1672.8910161.59 1672.8410178.71 1672.82
10198.89 1672.85 10202.4 1672.9210202.92 1672.89 10226.1 1673.8310235.54 1674.17
10236.19 1674.1110249.79 1674.3210273.49 1674.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9633.73    .037 9820.16    .04110178.71    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9820.16 10004.4               509  554.74     532              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1673.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.037  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1673.46  * Reach Len. (ft)        *  509.00  *  554.74  *  532.00  *
* Crit W.S. (ft)          * 1673.07  * Flow Area (sq ft)      *   85.50  *  233.66  *  193.07  *
* E.G. Slope (ft/ft)      *0.005646  * Area (sq ft)           *   85.50  *  233.66  *  193.07  *
* Q Total (cfs)           * 1430.00  * Flow (cfs)             *  184.45  *  736.23  *  509.32  *
* Top Width (ft)          *  538.35  * Top Width (ft)          *  141.42  *  184.24  *  212.68  *
* Vel Total (ft/s)        *    2.79  * Avg. Vel. (ft/s)        *    2.16  *    3.15  *    2.64  *
* Max Chl Dpth (ft)       *    5.09  * Hydr. Depth (ft)        *    0.60  *    1.27  *    0.91  *
* Conv. Total (cfs)       * 19031.3  * Conv. (cfs)            *  2454.8  *  9798.2  *  6778.3  *
* Length Wtd. (ft)        *  536.79  * Wetted Per. (ft)        *  141.43  *  187.75  *  212.71  *
* Min Ch El (ft)          * 1668.37  * Shear (lb/sq ft)        *    0.21  *    0.44  *    0.32  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.46  *    1.38  *    0.84  *
* Frctn Loss (ft)         *    3.17  * Cum Volume (acre-ft)    *  195.34  *  224.44  *  149.74  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   99.86  *   67.14  *   88.25  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1674.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)          * 1674.15  * Reach Len. (ft)        *  509.00  *  554.74  *  532.00  *
* Crit W.S. (ft)          * 1673.43  * Flow Area (sq ft)      *          *  359.95  *          *
* E.G. Slope (ft/ft)      *0.005155  * Area (sq ft)           *          *  359.95  *          *
* Q Total (cfs)           * 1430.00  * Flow (cfs)             *          * 1430.00  *          *
* Top Width (ft)          *  184.24  * Top Width (ft)          *          *  184.24  *          *
* Vel Total (ft/s)        *    3.97  * Avg. Vel. (ft/s)        *          *    3.97  *          *
* Max Chl Dpth (ft)       *    5.78  * Hydr. Depth (ft)        *          *    1.95  *          *
* Conv. Total (cfs)       * 19917.2  * Conv. (cfs)            *          * 19917.2  *          *
* Length Wtd. (ft)        *  554.74  * Wetted Per. (ft)        *          *  190.79  *          *
* Min Ch El (ft)          * 1668.37  * Shear (lb/sq ft)        *          *    0.61  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.41  *          *
* Frctn Loss (ft)         *    3.09  * Cum Volume (acre-ft)    *   55.01  *  258.72  *   35.97  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   13.65  *   67.14  *   10.00  *
*****************************************************************************************

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9633.73   * 9726.95   *    14.91 *    12.96 *    48.21 *     1.04 *
0.27 *     1.15 *
```

```
* 2          * LOB       * 9726.95   * 9820.16   *   169.54 *    72.54 *    93.22 *    11.86 *
0.78 *     2.34 *
* 3          * Chan      * 9820.16   * 10004.40  *   736.23 *   233.66 *   187.75 *    51.48 *
1.27 *     3.15 *
* 4          * ROB       * 10004.40  * 10138.95  *   418.39 *   147.13 *   134.55 *    29.26 *
1.09 *     2.84 *
* 5          * ROB       * 10138.95  * 10273.49  *    90.93 *    45.94 *    78.15 *     6.36 *
0.59 *     1.98 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*            * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*            *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9820.16   * 10004.40  *  1430.00 *   359.95 *   190.79 *   100.00 *
1.95 *     3.97 *
*****************************************************************************************************
******************

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: 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: WASH 3-WEST
REACH: REACH-1            RS: 4.519

INPUT
Description:
Station Elevation Data    num=     114
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9155.61    1672 9171.06    1672 9179.57 1671.92 9192.64 1671.83 9225.69  1671.7
 9234.99 1671.63 9243.69  1671.6 9265.67 1671.54 9277.55 1671.46 9298.05 1671.55
 9299.56 1671.57 9304.89  1671.6 9334.22 1671.65 9342.49 1671.67 9358.91 1671.53
 9361.02 1671.53 9368.08  1671.5 9390.83 1671.45 9412.59 1671.29 9435.72 1671.29
 9436.56  1671.3 9437.32 1671.28 9477.14 1671.01 9492.59 1670.97 9538.26 1671.01
 9547.69    1671 9559.35  1670.8    9562 1670.74 9574.93 1670.68 9582.04 1670.64
 9619.48  1670.2 9619.79 1670.22 9619.87 1670.22 9630.04 1670.24 9635.58 1670.26
 9640.86  1670.3 9682.98 1670.45 9694.01 1670.37 9703.81 1670.23 9719.26    1670
 9756.72  1669.5 9777.25 1669.29 9779.74 1669.23 9786.74 1669.16 9841.43 1669.65
 9841.85  1669.7 9842.62 1669.65 9882.56 1669.33 9896.091669.193 9898.33 1669.17
 9909.92 1669.07 9947.32  1669.1 9959.05 1669.12 9977.42 1669.23 9979.78 1669.23
 9991.47  1669.2 9992.75  1669.2 9994.47  1668.5 9996.22    1668 9999.22 1667.02
10000.72  1666.610004.58 1667.9410004.87    166810006.91 1668.8110007.26 1668.94
 10007.9  1668.9 10032.2    166910070.17  1669.110116.81  1669.110137.93 1669.31
10161.91 1669.6210169.121669.672 10181.5  1669.810184.86 1669.86 10186.8 1669.95
10187.67    167010189.42 1670.0710190.73  1670.110191.34 1670.1710198.03 1670.62
10205.22 1670.7510229.15  1671.110239.53 1671.2310243.66 1671.2810246.31 1671.31
10247.16 1671.3310252.22  1671.110253.79 1671.0710258.39  1670.910260.46 1670.86
10262.24 1670.8510274.19  1670.910274.69 1670.9510278.37 1670.9510282.29 1670.84
10289.17  1670.710305.05    167110317.44 1671.8310320.14    167210325.29 1672.34
10328.07  1672.510342.83 1673.09 10346.9 1673.1110368.15 1673.1110376.88  1673.2
 10390.8 1673.2910418.21 1673.6110447.07 1673.5310461.38 1673.5510465.07  1673.6
10476.29 1673.5410507.64  1673.610528.15 1673.6210533.14 1673.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
```

```
 9155.61    .037 9841.85    .04110169.12    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.4210137.93              451  490.71     516            .1        .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1670.42  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.040  *   0.041  *   0.040  *
* W.S. Elev (ft)          * 1670.27  * Reach Len. (ft)         *  451.00  *  490.71  *  516.00  *
* Crit W.S. (ft)          * 1669.92  * Flow Area (sq ft)       *  238.05  *  208.87  *   33.80  *
* E.G. Slope (ft/ft)      *0.006196  * Area (sq ft)            *  238.05  *  208.87  *   33.80  *
* Q Total (cfs)           * 1430.00  * Flow (cfs)              *  647.74  *  707.73  *   74.53  *
* Top Width (ft)          *  515.94  * Top Width (ft)          *  300.49  *  160.51  *   54.93  *
* Vel Total (ft/s)        *    2.97  * Avg. Vel. (ft/s)        *    2.72  *    3.39  *    2.20  *
* Max Chl Dpth (ft)       *    3.67  * Hydr. Depth (ft)        *    0.79  *    1.30  *    0.62  *
* Conv. Total (cfs)       * 18167.5  * Conv. (cfs)             *  8229.2  *  8991.3  *   946.9  *
* Length Wtd. (ft)        *  479.74  * Wetted Per. (ft)        *  300.51  *  161.34  *   54.95  *
* Min Ch El (ft)          * 1666.60  * Shear (lb/sq ft)        *    0.31  *    0.50  *    0.24  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.83  *    1.70  *    0.52  *
* Frctn Loss (ft)         *    3.34  * Cum Volume (acre-ft)    *  193.45  *  221.62  *  148.36  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   97.28  *   64.95  *   86.62  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1671.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.30  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)          * 1670.99  * Reach Len. (ft)         *  451.00  *  490.71  *  516.00  *
* Crit W.S. (ft)          * 1670.32  * Flow Area (sq ft)       *          *  323.57  *          *
* E.G. Slope (ft/ft)      *0.006047  * Area (sq ft)            *          *  323.57  *          *
* Q Total (cfs)           * 1430.00  * Flow (cfs)              *          * 1430.00  *          *
* Top Width (ft)          *  160.51  * Top Width (ft)          *          *  160.51  *          *
* Vel Total (ft/s)        *    4.42  * Avg. Vel. (ft/s)        *          *    4.42  *          *
* Max Chl Dpth (ft)       *    4.39  * Hydr. Depth (ft)        *          *    2.02  *          *
* Conv. Total (cfs)       * 18388.7  * Conv. (cfs)             *          * 18388.7  *          *
* Length Wtd. (ft)        *  486.95  * Wetted Per. (ft)        *          *  164.78  *          *
* Min Ch El (ft)          * 1666.60  * Shear (lb/sq ft)        *          *    0.74  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.28  *          *
* Frctn Loss (ft)         *    3.44  * Cum Volume (acre-ft)    *   55.01  *  254.37  *   35.97  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   13.65  *   64.94  *   10.00  *
*********************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9566.52   * 9977.42   *   647.74 *   238.05 *   300.51 *    45.30 *
0.79 *     2.72 *
* 2        * Chan      * 9977.42   * 10137.93  *   707.73 *   208.87 *   161.34 *    49.49 *
1.30 *     3.39 *
* 3        * ROB       * 10137.93  * 10335.54  *    74.53 *    33.80 *    54.95 *     5.21 *
0.62 *     2.20 *
*********************************************************************************************
******************

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.

Profile #2
****
****
* * Pos * Left Sta * Right Sta * Flow * Area * W.P. * Percent *
Hydr * Velocity *
* * * (ft) * (ft) * (cfs) * (sq ft) * (ft) * Conv
*Depth(ft) * (ft/s) *
* 1 * Chan * 9977.42 * 10137.93 * 1430.00 * 323.57 * 164.78 * 100.00 *
2.02 * 4.42 *
****
****

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 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: WASH 3-WEST
REACH: REACH-1 RS: 4.421

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 1,450cfs.
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9015	1668.8	9032.86	1668.94	9085.53	1668.59	9113.41	1668.51	9127	1668.5
9138.3	1668.47	9185.33	1668.57	9210.59	1668.35	9232.84	1668.22	9255.91	1668.2
9268.8	1668.12	9284.2	1668.05	9307.93	1668.13	9338.67	1668.25	9342.45	1668.2
9345.28	1668.2	9390.05	1668.03	9391.8	1668.03	9400.16	1668	9406.22	1668
9410.25	1667.98	9439.83	1667.9	9455.75	1667.79	9458.8	1667.79	9466.63	1667.84
9467.53	1667.83	9472.61	1667.8	9491.25	1667.8	9496.87	1667.79	9498.02	1667.79
9500.33	1667.8	9501.58	1667.81	9525.4	1667.79	9533.03	1667.74	9536.26	1667.51
9540.76	1667.2	9544.85	1667.07	9549.36	1666.78	9552.76	1666.71	9555.94	1666.78
9557.59	1666.8	9566.23	1666.87	9572.36	1666.81	9579.26	1666.81	9581.29	1666.85
9581.35	1666.8	9591.15	1666.72	9595.15	1666.74	9600.02	1666.7	9610.42	1666.765
9612.9	1666.78	9628.79	1666.8	9641.39	1666.61	9650.79	1666.59	9660.29	1666.56
9676.74	1666.54	9683.21	1666.5	9685.09	1666.46	9686.48	1666.45	9705.37	1666.45
9734.1	1666.41	9737.98	1666.4	9744.33	1666.39	9762.02	1666.48	9782.5	1666.4
9804.7	1666.48	9834.43	1666.38	9848.34	1666.32	9860.48	1666.26	9871.45	1666.27
9891.16	1666.3	9897.24	1666.26	9899.99	1666.26	9901.51	1666.23	9905.83	1666.2
9920.56	1666	9933.65	1665.83	9941.63	1665.74	9959.9	1665.44	9998.22	1664.9
9999.22	1664.87	10000	1664.85	10000.68	1664.86	10004.93	1664.87	10010.56	1664.9
10053.02	1665.39	10056.7	1665.41	10058.52	1665.41	10093.3	1665.78	10101.24	1665.9
10103.04	1665.89	10109.36	1665.95	10115.03	1666	10117.1	1666	10128.08	1666.116
10144.49	1666.29	10185.81	1667.25	10205.09	1667.57	10229.46	1667.91	10229.66	1667.87
10235.05	1668	10235.09	1668	10238.14	1668.05	10283.79	1669	10293.4	1669.14
10329.13	1669.56	10351.76	1669.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9015	.037	9891.16	.041	10144.49	.037

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9959.91	10053.02	498	586.93	582	.1	.3

CROSS SECTION OUTPUT Profile #1
****

* E.G. Elev (ft)	* 1667.07	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.22	* Wt. n-Val.	* 0.039	* 0.041	* 0.041	*
* W.S. Elev (ft)	* 1666.85	* Reach Len. (ft)	* 498.00	* 586.93	* 582.00	*
* Crit W.S. (ft)	* 1666.70	* Flow Area (sq ft)	* 176.03	* 160.86	* 99.65	*
* E.G. Slope (ft/ft)	*0.007860	* Area (sq ft)	* 176.03	* 160.86	* 99.65	*
* Q Total (cfs)	* 1450.00	* Flow (cfs)	* 393.86	* 744.03	* 312.11	*

* Top Width (ft)	*	614.77	* Top Width (ft)	*	406.21	*	93.12	*	115.44 *
* Vel Total (ft/s)	*	3.32	* Avg. Vel. (ft/s)	*	2.24	*	4.63	*	3.13 *
* Max Chl Dpth (ft)	*	2.00	* Hydr. Depth (ft)	*	0.43	*	1.73	*	0.86 *
* Conv. Total (cfs)	*	16355.7	* Conv. (cfs)	*	4442.6	*	8392.6	*	3520.5 *
* Length Wtd. (ft)	*	557.20	* Wetted Per. (ft)	*	406.24	*	93.13	*	115.45 *
* Min Ch El (ft)	*	1664.85	* Shear (lb/sq ft)	*	0.21	*	0.85	*	0.42 *
* Alpha	*	1.31	* Stream Power (lb/ft s)	*	0.48	*	3.92	*	1.33 *
* Frctn Loss (ft)	*	3.43	* Cum Volume (acre-ft)	*	191.31	*	219.54	*	147.57 *
* C & E Loss (ft)	*	0.03	* Cum SA (acres)	*	93.62	*	63.52	*	85.61 *

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.

CROSS SECTION OUTPUT Profile #2

* E.G. Elev (ft)	*	1667.83	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.46	* Wt. n-Val.	*	0.041	*	0.041	*	*
* W.S. Elev (ft)	*	1667.37	* Reach Len. (ft)	*	498.00	*	586.93	*	582.00 *
* Crit W.S. (ft)	*	1666.88	* Flow Area (sq ft)	*	60.32	*	209.69	*	*
* E.G. Slope (ft/ft)	*	0.008366	* Area (sq ft)	*	60.32	*	209.69	*	*
* Q Total (cfs)	*	1450.00	* Flow (cfs)	*	272.52	*	1177.48	*	*
* Top Width (ft)	*	129.62	* Top Width (ft)	*	36.50	*	93.12	*	*
* Vel Total (ft/s)	*	5.37	* Avg. Vel. (ft/s)	*	4.52	*	5.62	*	*
* Max Chl Dpth (ft)	*	2.52	* Hydr. Depth (ft)	*	1.65	*	2.25	*	*
* Conv. Total (cfs)	*	15853.0	* Conv. (cfs)	*	2979.5	*	12873.5	*	*
* Length Wtd. (ft)	*	560.57	* Wetted Per. (ft)	*	37.91	*	95.11	*	*
* Min Ch El (ft)	*	1664.85	* Shear (lb/sq ft)	*	0.83	*	1.15	*	*
* Alpha	*	1.02	* Stream Power (lb/ft s)	*	3.75	*	6.47	*	*
* Frctn Loss (ft)	*	3.24	* Cum Volume (acre-ft)	*	54.70	*	251.37	*	35.97 *
* C & E Loss (ft)	*	0.07	* Cum SA (acres)	*	13.46	*	63.51	*	10.00 *

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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9487.45	9959.90	393.86	176.03	406.24	27.16	0.43	2.24
* 2	Chan	9959.90	10053.02	744.03	160.86	93.13	51.31	1.73	4.63
* 3	ROB	10053.02	10202.39	312.11	99.65	115.45	21.52	0.86	3.13

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9487.45	9959.90	272.52	60.32	37.91	18.79	1.65	4.52
* 2	Chan	9959.90	10053.02	1177.48	209.69	95.11	81.21	2.25	5.62

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: WASH 3-WEST
REACH: REACH-1 RS: 4.310

INPUT
Description: Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in one house per cross-section. Therefore, not all of the houses were projected to the nearest cross-section.

Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9233.89	1665.59	9237.93	1665.24	9244.34	1665.2	9252.97	1664.16	9264.74	1664.75
9269.34	1664.58	9274.37	1664.81	9291.55	1665.21	9304.39	1665.23	9318.37	1665.15
9319.29	1664.99	9334.42	1664.97	9342.89	1665.04	9345.18	1664.95	9357.61	1665.04
9364.45	1664.98	9372	1664.95	9394.47	1664.93	9424.5	1664.72	9425.62	1664.72
9452.44	1664.62	9453.82	1664.6	9454.52	1664.6	9479.25	1664.35	9484.55	1664.33
9506.07	1664.47	9514.58	1664.51	9525.79	1664.56	9532.88	1664.55	9544.6	1664.51
9559.69	1664.37	9574.63	1664.27	9586.51	1664.15	9591.9	1664.08	9604.66	1663.97
9613.32	1663.87	9633.82	1663.64	9634.68	1663.65	9640.14	1663.69	9664.71	1664.08
9666.95	1664.1	9691.29	1664.1	9693.76	1664.09	9719.1	1663.32	9720.58	1663.33
9724.76	1663.3	9742.59	1663.32	9743.18	1663.31	9747.39	1663.26	9754.79	1663.22
9774.21	1663.06	9784.81	1662.99	9793.24	1662.87	9801.02	1662.8	9814.84	1662.61
9827.83	1662.38	9844.87	1662.2	9850.24	1662.19	9854.65	1662.16	9874.89	1662.18
9881.46	1662.2	9903.23	1662.3	9904.92	1662.28	9908.28	1662.32	9934.94	1662.53
9935.09	1662.53	9949.23	1662.48	9961.91	1661.88	9964.97	1661.75	9972.57	1661.23
9988.72	1661.13	9990.34	1660.95	9995	1661.16	10001.36	1658.89	10008.61	1661.1
10015.53	1661.64	10025.02	1661.89	10027.9	1662.18	10042.35	1662.11	10055.05	1661.98
10058.44	1661.82	10069.16	1661.91	10085.08	1662.25	10095.98	1662.44	10103.17	1662.54
10115.1	1662.39	10122.79	1662.29	10137.87	1662.08	10145.13	1662.14	10149.6	1662.17
10175.15	1662.66	10176.42	1662.68	10176.46	1662.66	10203.23	1662.79	10205.18	1662.82
10210.97	1662.99	10230.05	1663.38	10235.21	1663.48	10256.86	1663.63	10261.87	1663.66
10265.23	1663.66	10283.67	1663.71	10295.26	1663.76	10308.21	1663.83	10310.49	1663.89
10325.29	1664.09	10337.3	1664.31	10355.31	1664.54	10359.93	1664.57	10364.12	1664.63
10385.34	1664.91	10390.93	1664.98	10415.36	1665.27	10417.74	1665.29	10424.1	1665.35
10445.39	1665.35	10467.27	1665.36	10471.37	1665.41	10475.42	1665.45	10498.19	1665.6
10505.44	1665.69	10511.28	1665.77	10525	1666.08	10535.47	1666.31	10543.59	1666.47

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9233.89	.033	9814.84	.05	10230.05	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9972.57	10008.61	611	599.78	564	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
10166.62	10253.14	1675	10109.11	10120.84	1674

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1663.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.048	0.050	0.050
W.S. Elev (ft)	1663.49	Reach Len. (ft)	611.00	599.78	564.00
Crit W.S. (ft)		Flow Area (sq ft)	232.95	99.90	201.20
E.G. Slope (ft/ft)	0.004943	Area (sq ft)	232.95	99.90	201.20
Q Total (cfs)	1450.00	Flow (cfs)	529.69	406.34	513.97
Top Width (ft)	441.29	Top Width (ft)	258.97	36.04	146.28
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)	2.27	4.07	2.55
Max Chl Dpth (ft)	4.60	Hydr. Depth (ft)	0.90	2.77	1.38
Conv. Total (cfs)	20624.1	Conv. (cfs)	7534.0	5779.6	7310.5

```
* Length Wtd. (ft)        *  593.63  * Wetted Per. (ft)        *  259.02  *   36.78  *  149.52  *
* Min Ch El (ft)          * 1658.89  * Shear (lb/sq ft)        *    0.28  *    0.84  *    0.42  *
* Alpha                   *    1.20  * Stream Power (lb/ft s)  *    0.63  *    3.41  *    1.06  *
* Frctn Loss (ft)         *    4.00  * Cum Volume (acre-ft)    *  188.97  *  217.78  *  145.56  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   89.82  *   62.65  *   83.86  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1664.52  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *   0.050  *   0.050  *   0.050  *
* W.S. Elev (ft)          * 1664.31  * Reach Len. (ft)        *  611.00  *  599.78  *  564.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)      *  185.78  *  129.45  *   90.10  *
* E.G. Slope (ft/ft)      *0.004224  * Area (sq ft)           *  185.78  *  129.45  *   90.10  *
* Q Total (cfs)           * 1450.00  * Flow (cfs)             *  570.23  *  578.53  *  301.23  *
* Top Width (ft)          *  163.92  * Top Width (ft)          *   90.59  *   36.04  *   37.29  *
* Vel Total (ft/s)        *    3.58  * Avg. Vel. (ft/s)        *    3.07  *    4.47  *    3.34  *
* Max Chl Dpth (ft)       *    5.42  * Hydr. Depth (ft)        *    2.05  *    3.59  *    2.42  *
* Conv. Total (cfs)       * 22310.4  * Conv. (cfs)             *  8773.8  *  8901.6  *  4634.9  *
* Length Wtd. (ft)        *  599.92  * Wetted Per. (ft)        *   92.73  *   36.78  *   39.56  *
* Min Ch El (ft)          * 1658.89  * Shear (lb/sq ft)        *    0.53  *    0.93  *    0.60  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    1.62  *    4.15  *    2.01  *
* Frctn Loss (ft)         *    4.14  * Cum Volume (acre-ft)    *   53.29  *  249.08  *   35.37  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   12.74  *   62.64  *    9.75  *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9603.23   * 9972.57   *   529.69 *   232.95 *   259.02 *    36.53 *
0.90 *     2.27 *
* 2         * Chan      * 9972.57   * 10008.61  *   406.34 *    99.90 *    36.78 *    28.02 *
2.77 *     4.07 *
* 3         * ROB       * 10008.61  * 10276.10  *   513.97 *   201.20 *   149.52 *    35.45 *
1.38 *     2.55 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9603.23   * 9972.57   *   570.23 *   185.78 *    92.73 *    39.33 *
2.05 *     3.07 *
* 2         * Chan      * 9972.57   * 10008.61  *   578.53 *   129.45 *    36.78 *    39.90 *
3.59 *     4.47 *
```

```
* 3          * ROB        * 10008.61  * 10276.10  *   301.23 *    90.10 *    39.56 *    20.77 *
2.42 *      3.34 *
*****************************************************************************************************
******************
```

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.

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 4.196

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of levee appears to be minor tributary flowing into floodplain
Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in

Station Elevation Data num= 267

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8732.65	1661.2	8742.87	1661.1	8759	1661.02	8774.16	1661.04	8783.98	1660.79
8786.19	1660.8	8811	1660.78	8822.92	1660.79	8843.91	1660.44	8853.73	1660.33
8854.29	1660.3	8854.34	1660.32	8859.12	1660.3	8870.96	1660.27	8881.61	1660.35
8888.39	1660.3	8897.91	1660.25	8901.16	1660.27	8904.76	1660.24	8916.14	1660.23
8935.29	1660.1	8943.18	1660.04	8948.89	1660	8953.64	1659.97	8972.92	1659.86
8981.85	1659.9	8982.68	1659.86	8985.21	1659.84	9028.62	1659.66	9032.45	1659.68
9042.02	1659.7	9046.01	1659.74	9046.97	1659.73	9047.7	1659.73	9064.18	1659.69
9072.44	1659.5	9074.84	1659.47	9076.26	1659.43	9102.65	1658.99	9112.64	1658.93
9120.76	1658.9	9151.09	1659.02	9155.72	1659.25	9157.54	1659.33	9157.58	1659.33
9168.04	1659.15	9174.18	1659.06	9178.9	1659.04	9187.6	1659	9193.82	1658.9
9198.94	1658.84	9203.14	1658.9	9219.18	1658.8	9222.18	1658.88	9224.71	1658.89
9227.76	1658.89	9233.09	1658.9	9241	1658.92	9254.72	1659.05	9257.78	1659.07
9271.46	1659.15	9291.66	1659.3	9293.8	1659.27	9294.74	1659.27	9308.01	1659.19
9314.12	1659.1	9320.58	1659.08	9330.85	1658.99	9341.59	1658.84	9342.18	1658.83
9348.53	1658.8	9357.1	1658.82	9371.79	1658.96	9383.91	1659.08	9398.41	1659.1
9409.04	1659.1	9430.4	1659.46	9440.47	1659.57	9443.81	1659.52	9456.12	1659.5
9485.09	1659.66	9503.54	1659.82	9520.74	1659.62	9539.43	1659.56	9540.72	1659.6
9567.71	1660	9574.25	1660.08	9577.63	1660.09	9578.05	1660.1	9588.06	1660.1
9589.85	1660.17	9594.37	1660.2	9599.8	1660.28	9606.48	1660.36	9610.49	1660.4
9611.9	1660.43	9612.78	1660.47	9634.24	1660.24	9637.57	1660.2	9638.56	1660.2
9639.56	1660.22	9647.27	1660.3	9652.65	1660.4	9655.15	1660.5	9657.08	1660.4
9659.08	1660.31	9660.74	1660.24	9661.94	1660.2	9664.91	1660.15	9668.1	1660.09
9669.72	1660	9672.34	1659.9	9677.98	1659.5	9680.85	1659.37	9681.3	1659.37
9693.78	1659.34	9698.99	1659.34	9700.44	1659.3	9701.91	1659.41	9702.68	1659.42
9703.12	1659.43	9720.24	1659.79	9720.34	1659.8	9721.88	1659.76	9723.2	1659.75
9737.33	1659.57	9737.75	1659.57	9739.59	1659.5	9758.24	1659.46	9763.98	1659.47
9772.88	1659.27	9788.49	1659.01	9796.38	1658.9	9799.79	1658.83	9817.81	1658.9
9827.6	1658.73	9829.65	1658.7	9831.5	1658.7	9837.64	1658.69	9842.03	1658.68
9844.07	1658.68	9847.98	1658.7	9853.63	1658.62	9853.87	1658.62	9861.4	1658.64
9862.48	1658.6	9866.36	1658.643	9867.85	1658.66	9873.78	1658.66	9885.04	1658.64
9897.06	1658.48	9901.71	1658.4	9902.21	1658.42	9909.41	1658.36	9932.92	1658.18
9944.16	1658.13	9989.39	1658.4	9991.92	1658.36	9992.05	1658.34	9994.72	1658
9999.96	1657.39	10002.36	1657	10005.28	1657.63	10006.59	1657.9	10006.76	1657.94
10007.02	1658	10007.03	1658.01	10007.08	1658.02	10007.51	1658.11	10008.94	1658.13
10029.62	1658.41	10037.03	1658.13	10041.46	1658	10050.64	1657.69	10050.9	1657.69
10053.93	1657.81	10066.65	1658	10074.99	1658.16	10081.2	1658.24	10082.66	1658.263
10085.06	1658.31	10085.82	1658.27	10087.11	1658.26	10088.3	1658.37	10092	1658.37
10092.23	1658.41	10097.71	1658.19	10102.51	1658.14	10107.48	1658.05	10112.38	1658.03
10113.04	1658.11	10113.21	1658.13	10114.17	1658.13	10114.79	1658.11	10115.66	1658.14
10117.2	1658.17	10119.82	1658.25	10124.98	1658.39	10128.28	1658.5	10128.98	1658.46
10130.73	1658.41	10155.24	1658.99	10174.33	1658.82	10182.23	1658.7	10182.51	1658.74

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10222.38 1659.6810224.71 1659.74 10226.1  1659.810227.02  1659.810232.72 1659.88
10244.39 1659.9610254.11    166010254.82    166010278.23 1660.0710285.39 1660.09
10296.31  1660.210306.54 1660.3310327.31 1661.0910327.83  1661.110328.06 1661.11
10328.16  1661.110328.26 1661.1110328.35 1661.1110351.77 1660.8510354.64 1660.86
10390.77  1660.9 10408.3 1660.8210430.75 1661.4410434.94  1661.5 10450.8 1661.91
10451.82 1661.9410455.07    166210481.38  1662.610483.36 1662.6510509.98 1662.43
10534.41  1662.1 10537.5 1662.1410541.05 1662.1210543.51 1662.13 10544.4 1662.14
 10547.2  1662.110599.93 1662.5810609.23 1662.6710612.27 1662.6910614.74 1662.72
10618.35  1662.710654.15    166310684.35 1662.9310697.18 1662.8710699.47 1662.85
10707.37  1662.810716.97 1662.89 10722.5 1662.9910744.29 1663.6510756.65 1663.72
10766.97  1663.610780.21  1663.610785.13 1663.6410790.05 1663.6710793.42 1663.54
10795.49  1663.510801.25 1663.4810812.65  1663.410844.63 1663.1110844.91 1663.11
10844.98  1663.110846.37 1663.09

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8732.65    .033 9885.04     .0510092.23    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.3910092.23               618  631.85     629            .1        .3
Left Levee       Station= 9655.15      Elevation=  1660.5
Blocked Obstructions      num=       6
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*************************************************************************
 8973.06 9061.33    1672  9241.1 9305.87    1671 9397.25 9462.02    1671
  9553.4 9610.46    1672 9709.13 9798.64    1672 10246.5   10331    1672

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1659.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *   0.044  *   0.050  *   0.033  *
* W.S. Elev (ft)          * 1659.44  * Reach Len. (ft)         *  618.00  *  631.85  *  629.00  *
* Crit W.S. (ft)          * 1659.16  * Flow Area (sq ft)       *  181.81  *  142.56  *   91.20  *
* E.G. Slope (ft/ft)      *0.009702  * Area (sq ft)            *  181.81  *  142.56  *   91.20  *
* Q Total (cfs)           * 1450.00  * Flow (cfs)              *  595.03  *  517.97  *  337.00  *
* Top Width (ft)          *  437.62  * Top Width (ft)          *  214.90  *  102.84  *  119.88  *
* Vel Total (ft/s)        *    3.49  * Avg. Vel. (ft/s)        *    3.27  *    3.63  *    3.70  *
* Max Chl Dpth (ft)       *    2.44  * Hydr. Depth (ft)        *    0.85  *    1.39  *    0.76  *
* Conv. Total (cfs)       * 14721.2  * Conv. (cfs)             *  6041.1  *  5258.8  *  3421.4  *
* Length Wtd. (ft)        *  627.98  * Wetted Per. (ft)        *  215.50  *  103.08  *  119.92  *
* Min Ch El (ft)          * 1657.00  * Shear (lb/sq ft)        *    0.51  *    0.84  *    0.46  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    1.67  *    3.04  *    1.70  *
* Frctn Loss (ft)         *    4.11  * Cum Volume (acre-ft)    *  186.06  *  216.12  *  143.67  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   86.50  *   61.69  *   82.14  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1660.37  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.050  *   0.050  *          *
* W.S. Elev (ft)          * 1659.96  * Reach Len. (ft)         *  618.00  *  631.85  *  629.00  *
* Crit W.S. (ft)          * 1659.53  * Flow Area (sq ft)       *   88.83  *  196.60  *          *
* E.G. Slope (ft/ft)      *0.013262  * Area (sq ft)            *   88.83  *  196.60  *          *
* Q Total (cfs)           * 1450.00  * Flow (cfs)              *  425.54  * 1024.46  *          *
* Top Width (ft)          *  154.67  * Top Width (ft)          *   51.83  *  102.84  *          *
* Vel Total (ft/s)        *    5.08  * Avg. Vel. (ft/s)        *    4.79  *    5.21  *          *
* Max Chl Dpth (ft)       *    2.96  * Hydr. Depth (ft)        *    1.71  *    1.91  *          *
* Conv. Total (cfs)       * 12591.1  * Conv. (cfs)             *  3695.2  *  8895.9  *          *
* Length Wtd. (ft)        *  629.82  * Wetted Per. (ft)        *   53.64  *  104.64  *          *
* Min Ch El (ft)          * 1657.00  * Shear (lb/sq ft)        *    1.37  *    1.56  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    6.57  *    8.11  *          *
```

```
* Frctn Loss (ft)        *    4.29  * Cum Volume (acre-ft)   *   51.37  *  246.84  *   34.79  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *   11.74  *   61.69  *    9.51  *
*****************************************************************************************************

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

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9655.15   * 9989.39   *   595.03 *   181.81 *   215.50 *    41.04 *
0.85 *     3.27 *
* 2         * Chan      * 9989.39   * 10092.23  *   517.97 *   142.56 *   103.08 *    35.72 *
1.39 *     3.63 *
* 3         * ROB       * 10092.23  * 10469.30  *   337.00 *    91.20 *   119.92 *    23.24 *
0.76 *     3.70 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9655.15   * 9989.39   *   425.54 *    88.83 *    53.64 *    29.35 *
1.71 *     4.79 *
* 2         * Chan      * 9989.39   * 10092.23  *  1024.46 *   196.60 *   104.64 *    70.65 *
1.91 *     5.21 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 4.077

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of
             levee appears to be minor tributary flowing into
             floodplain
Blocked obstruction(s) added to represent residential
             home(s) as of aerial photography date; n-values are not adjusted
```

to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted in

```
Station Elevation Data    num=     206
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8987.16  1657.2 9007.51 1657.18 9037.85 1656.82 9051.26 1656.73 9055.81 1656.84
 9100.68  1656.7 9106.61 1656.64 9129.48 1656.78 9129.73 1656.76 9129.74  1656.8
  9129.9 1656.75 9130.58 1656.71 9131.31 1656.69 9132.28 1656.67 9133.16  1656.7
 9135.65  1656.7 9152.23 1656.32  9169.6 1656.26  9177.4 1656.04 9179.09    1656
  9215.7 1655.02 9230.71 1654.94 9238.59 1654.89 9255.74 1654.77 9266.59  1654.7
 9287.72 1654.69 9293.79 1654.77 9301.92 1655.08 9336.15 1654.94  9337.9  1654.9
 9341.01 1654.91 9344.91 1654.96 9385.96 1654.59 9419.96 1655.52  9434.5  1655.7
 9468.89 1655.58  9486.3 1655.46 9506.63 1655.55 9531.41 1655.73 9533.93  1655.7
 9536.59 1655.78 9537.75 1655.75 9542.17 1655.75 9556.95 1655.85 9569.24  1655.8
 9572.56 1655.83 9575.45 1655.84 9581.65    1656 9591.02    1656 9600.65 1656.05
 9605.47 1656.05 9605.47  1656.1 9607.76    1656 9614.44 1655.82 9614.77 1655.82
 9614.91  1655.8 9615.11 1655.82 9618.32 1655.82 9640.78 1655.89 9641.28 1655.89
 9645.41  1655.9 9647.45 1655.86 9685.37 1655.75 9705.36  1655.7 9707.36 1655.71
 9707.48  1655.7  9707.6 1655.71 9707.72 1655.71 9723.06  1655.8  9725.3  1655.8
 9760.96 1655.52    9763 1655.52 9764.03  1655.5 9765.04 1655.51 9766.01 1655.51
 9766.92  1655.5 9777.48 1655.41 9778.52  1655.4 9807.12 1655.42 9807.89 1655.41
 9808.62 1655.41 9816.42 1655.34 9826.78  1655.2 9839.69 1655.27 9864.53 1655.06
 9872.751654.985 9935.69 1654.41 9942.99 1654.14  9946.5    1654 9948.35 1653.92
 9962.65 1653.37 9980.24 1653.86 9986.65    1654 9986.92    1654 9989.44 1654.06
 9989.56 1654.04 9989.75    1654 9991.93 1653.37 9996.95    165210002.65 1652.12
10003.22 1652.1310011.48 1653.6610013.55 1653.8410013.87  1653.910015.72 1653.89
10019.15 1653.9210021.73 1653.9410023.31 1653.9510024.29    165410025.26 1653.97
10032.38 1654.0810039.92  1654.210045.87 1654.06   10068  1653.510072.83 1653.39
10075.22  1653.310080.63 1653.2110088.26 1653.4310092.57 1653.5610099.27  1653.8
10105.31    165410108.71 1654.1310114.42 1654.3310130.77 1654.4410181.83  1654.8
10190.91  1654.610193.47 1654.5610197.47 1654.52 10202.1 1654.5110206.141654.469
10232.73  1654.210242.29 1654.2710274.68 1654.9210285.42 1654.9510290.24 1654.97
10306.66    165510329.02 1655.13 10329.5 1655.1510364.06 1655.5510372.71  1655.6
10388.93 1655.4110400.97 1655.2310407.09 1655.3410410.11 1655.41 10416.2  1655.5
10423.75 1655.7610423.77 1655.7610434.03 1655.92 10436.2  1655.910439.42    1656
10442.44 1656.0510451.24 1656.1510453.39  1656.2 10483.6 1656.1710510.65 1656.23
10529.52 1656.1310554.54 1656.7610563.28  1657.110572.23 1657.1510591.34 1656.65
10597.89 1656.8610601.04 1656.9810602.78    16710603.69 1657.0610626.36  1657.8
10626.39 1657.7810627.95 1657.7810630.44  1657.810633.58 1657.7510636.85 1657.71
10654.64 1657.6510670.96 1657.6910704.29  1657.510712.95 1657.4810716.03 1657.55
10749.07 1657.9910756.84 1658.1210773.36  1658.510774.92 1658.5510786.08 1658.79
10793.72 1658.9310812.29 1658.6510848.34    165810848.58    165810850.87 1657.98
10854.14    165810854.57    165810914.68  1658.5 10918.6  1658.510924.53 1658.43
10934.42 1658.4110942.72 1658.4710949.69  1658.610959.92 1658.6310966.21 1658.67
10979.72 1658.5410987.11 1658.4610991.51  1658.410993.64  1658.411002.41 1658.51
11006.37 1658.6211016.42 1658.9311025.33  1659.2 11035.1 1659.1411040.01  1659.1
11048.51 1659.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8987.16    .037 9872.75    .04110181.83    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.6910114.42              567  627.22     611            .1        .3
Left Levee      Station= 9605.47      Elevation=  1656.1
Right Levee     Station=10372.71      Elevation=  1655.6
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
*******************************************************************
 9428.82 9519.96    1668 9781.45 9855.08    166810445.4510523.45    1668

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)        * 1655.50  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.16  * Wt. n-Val.           *   0.041  *   0.041  *   0.038  *
* W.S. Elev (ft)        * 1655.35  * Reach Len. (ft)      *  567.00  *  627.22  *  611.00  *
* Crit W.S. (ft)        * 1654.92  * Flow Area (sq ft)    *   45.91  *  300.50  *  153.55  *
```

```
* E.G. Slope (ft/ft)      *0.004718  * Area (sq ft)            *   45.91  *  300.50  *  153.55  *
* Q Total (cfs)           * 1450.00  * Flow (cfs)              *   82.31  * 1055.73  *  311.95  *
* Top Width (ft)          *  491.47  * Top Width (ft)          *   80.61  *  178.73  *  232.13  *
* Vel Total (ft/s)        *    2.90  * Avg. Vel. (ft/s)        *    1.79  *    3.51  *    2.03  *
* Max Chl Dpth (ft)       *    3.35  * Hydr. Depth (ft)        *    0.57  *    1.68  *    0.66  *
* Conv. Total (cfs)       * 21110.2  * Conv. (cfs)             * 1198.4  * 15370.2  *  4541.7  *
* Length Wtd. (ft)        *  620.52  * Wetted Per. (ft)        *   80.82  *  179.23  *  232.15  *
* Min Ch El (ft)          * 1652.00  * Shear (lb/sq ft)        *    0.17  *    0.49  *    0.19  *
* Alpha                   *    1.20  * Stream Power (lb/ft s)  *    0.30  *    1.73  *    0.40  *
* Frctn Loss (ft)         *    3.89  * Cum Volume (acre-ft)    *  184.45  *  212.90  *  141.90  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   84.40  *   59.65  *   79.60  *
*****************************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1656.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *          *    0.041  *          *
* W.S. Elev (ft)          * 1655.80  * Reach Len. (ft)         *  567.00  *  627.22  *  611.00  *
* Crit W.S. (ft)          * 1654.94  * Flow Area (sq ft)       *          *  380.50  *          *
* E.G. Slope (ft/ft)      *0.004138  * Area (sq ft)            *          *  380.50  *          *
* Q Total (cfs)           * 1450.00  * Flow (cfs)              *          * 1450.00  *          *
* Top Width (ft)          *  178.73  * Top Width (ft)          *          *  178.73  *          *
* Vel Total (ft/s)        *    3.81  * Avg. Vel. (ft/s)        *          *    3.81  *          *
* Max Chl Dpth (ft)       *    3.80  * Hydr. Depth (ft)        *          *    2.13  *          *
* Conv. Total (cfs)       * 22540.9  * Conv. (cfs)             *          * 22540.9  *          *
* Length Wtd. (ft)        *  626.27  * Wetted Per. (ft)        *          *  182.08  *          *
* Min Ch El (ft)          * 1652.00  * Shear (lb/sq ft)        *          *    0.54  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.06  *          *
* Frctn Loss (ft)         *    3.96  * Cum Volume (acre-ft)    *   50.74  *  242.65  *   34.79  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   11.37  *   59.65  *    9.51  *
*****************************************************************************************************

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

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *  (ft/s) *
* 1        * LOB       * 9605.47   * 9935.69   *    82.31 *    45.91 *    80.82 *     5.68 *
0.57 *     1.79 *
* 2        * Chan      * 9935.69   * 10114.42  *  1055.73 *   300.50 *   179.23 *    72.81 *
1.68 *     3.51 *
* 3        * ROB       * 10114.42  * 10372.71  *   311.95 *   153.55 *   232.15 *    21.51 *
0.66 *     2.03 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
```

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*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9935.69   * 10114.42  *  1450.00 *   380.50 *   182.08 *   100.00 *
2.13 *     3.81 *
*****************************************************************************************
******************
```

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.
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: WASH 3-WEST
REACH: REACH-1 RS: 3.959

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground right of levee appears to be minor tributary flowing into floodplain
Blocked obstruction(s) added to represent residential home(s) as of aerial photography date; n-values are not adjusted to account for the house(s), only the houses in or near the floodplain were accounted for and some house(s) were projected to the nearest cross-section. The area available for flood flows in between houses was considered and, for example, that may have resulted i

Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9739.85	1652.37	9765.86	1652.43	9776.62	1652.41	9791.88	1652.22	9802.4	1652.02
9817.89	1651.74	9825.11	1651.57	9833.67	1651.67	9843.91	1651.85	9864.95	1652.11
9869.92	1652.14	9874.36	1652.1	9895.94	1652.02	9896.22	1652.02	9914.33	1651.53
9921.95	1651.3	9927.5	1651.11	9947.97	1650.24	9958.77	1649.83	9964.79	1649.71
9973.98	1649.57	9990.05	1649.43	10000	1649.41	10021.32	1649.53	10023.55	1649.6
10026.01	1649.61	10052.03	1649.93	10052.59	1649.94	10065.83	1650.21	10078.04	1650.33
10083.87	1650.44	10104.06	1650.83	10115.14	1650.97	10123.1	1651.05	10130.07	1651.03
10146.42	1650.85	10156.09	1650.69	10169.66	1650.44	10177.69	1650.4	10182.1	1650.38
10204.52	1650.38	10208.12	1650.39	10208.97	1650.39	10234.13	1650.51	10240.24	1650.56
10257.25	1650.67	10260.15	1650.67	10271.52	1650.72	10286.16	1650.77	10302.79	1650.84
10312.18	1650.95	10313.91	1650.92	10334.06	1651.22	10338.19	1651.31	10349.74	1651.45
10364.21	1651.55	10365.34	1651.55	10390.22	1651.45	10396.61	1651.46	10416.24	1651.58
10427.89	1651.62	10442.25	1651.64	10453.12	1651.61	10459.16	1651.51	10468.27	1651.34
10490.44	1651.12	10494.28	1651.14	10494.81	1651.14	10520.3	1651.55	10521.71	1651.55
10528.7	1651.58	10546.31	1651.37	10552.99	1651.21	10562.57	1650.96	10572.33	1651.02
10584.26	1651.15	10598.34	1651.2	10615.53	1651.27	10624.36	1651.31	10634.68	1651.33
10646.81	1651.26	10650.37	1651.27	10676.38	1651.51	10678.08	1651.54	10691.81	1651.79
10702.4	1651.74	10709.36	1651.68	10728.41	1651.58	10740.63	1651.59	10740.87	1651.53
10754.43	1651.77	10771.91	1652.11	10780.44	1652.25	10789.8	1652.36	10803.18	1652.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9739.85	.037	9947.97	.03	10234.13	.037

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9947.97 10065.83 600 618.09 564 .1 .3
Right Levee Station=10442.25 Elevation= 1651.64
Blocked Obstructions num= 1

Sta L	Sta R	Elev
9785.59	9892.46	1663.5

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1651.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.037	0.038	0.038
W.S. Elev (ft)	1651.30	Reach Len. (ft)	600.00	618.09	564.00
Crit W.S. (ft)	1651.22	Flow Area (sq ft)	13.38	190.08	169.30
E.G. Slope (ft/ft)	0.008757	Area (sq ft)	13.38	190.08	169.30
Q Total (cfs)	1450.00	Flow (cfs)	32.19	956.46	461.36
Top Width (ft)	416.47	Top Width (ft)	26.09	117.86	272.52
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	2.41	5.03	2.73
Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)	0.51	1.61	0.62
Conv. Total (cfs)	15495.1	Conv. (cfs)	343.9	10221.0	4930.2
Length Wtd. (ft)	604.98	Wetted Per. (ft)	26.11	117.88	272.54
Min Ch El (ft)	1649.40	Shear (lb/sq ft)	0.28	0.88	0.34
Alpha	1.27	Stream Power (lb/ft s)	0.67	4.44	0.93
Frctn Loss (ft)	3.70	Cum Volume (acre-ft)	184.06	209.37	139.63
C & E Loss (ft)	0.05	Cum SA (acres)	83.71	57.51	76.06

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 OUTPUT Profile #2

E.G. Elev (ft)	1652.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.		0.038	0.038
W.S. Elev (ft)	1651.50	Reach Len. (ft)	600.00	618.09	564.00
Crit W.S. (ft)	1651.32	Flow Area (sq ft)		213.30	42.90
E.G. Slope (ft/ft)	0.010845	Area (sq ft)		213.30	42.90
Q Total (cfs)	1450.00	Flow (cfs)		1280.76	169.24
Top Width (ft)	162.26	Top Width (ft)		117.86	44.40
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		6.00	3.94
Max Chl Dpth (ft)	2.10	Hydr. Depth (ft)		1.81	0.97
Conv. Total (cfs)	13923.4	Conv. (cfs)		12298.3	1625.1
Length Wtd. (ft)	614.98	Wetted Per. (ft)		119.14	45.00
Min Ch El (ft)	1649.40	Shear (lb/sq ft)		1.21	0.65
Alpha	1.05	Stream Power (lb/ft s)		7.28	2.55
Frctn Loss (ft)	3.34	Cum Volume (acre-ft)	50.74	238.38	34.49
C & E Loss (ft)	0.10	Cum SA (acres)	11.37	57.51	9.20

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

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9843.91	9947.97	32.19	13.38	26.11	2.22	0.51	2.41
2 Chan	9947.97	10065.83	956.46	190.08	117.88	65.96	1.61	5.03
3 ROB	10065.83	10442.25	461.36	169.30	272.54	31.82	0.62	2.73

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	Chan	9947.97	10065.83	1280.76	213.30	119.14	88.33	1.81	6.00
* 2	ROB	10065.83	10442.25	169.24	42.90	45.00	11.67	0.97	3.94

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

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 3.840

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground right of levee appears to be minor tributary flowing into floodplain
Flow rate starting at this cross-section and downstream is increased to 1,490cfs.
Interpolated point added at (10143.73, 1646.701) to set bank station.
Station Elevation Data num= 184

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8874.63	1650.3	8876.75	1650.33	8915.75	1650.71	8932.73	1650.68	8933.03	1650.67
8933.67	1650.7	8934.56	1650.65	8941.21	1650.57	8959.14	1650.26	8969.93	1650.36
8998.5	1650.6	9047.66	1650.21	9065.73	1650.04	9102.9	1650.76	9110.23	1650.89
9111.9	1650.9	9112.11	1650.86	9112.38	1650.85	9112.69	1650.85	9157.94	1650.34
9158.77	1650.3	9159.75	1650.34	9200.94	1650.52	9206.92	1650.6	9212.98	1650.54
9218.57	1650.5	9255.23	1650.21	9257.42	1650.2	9258.39	1650.2	9264.46	1650.22
9306.03	1650.41	9313.88	1650.42	9322.34	1650.3	9328.73	1650.27	9352.45	1650
9352.78	1650	9356.06	1649.97	9359.27	1649.9	9359.89	1649.93	9360.26	1649.93
9360.5	1649.92	9368.46	1649.84	9419.64	1649.2	9433.62	1649.09	9450.83	1648.62
9455.08	1648.5	9471.05	1648.08	9474.22	1648	9475.25	1647.98	9475.89	1647.95
9477.68	1647.98	9479.34	1648	9482.3	1648	9486.76	1648.05	9518.53	1648.73
9555.81	1649.32	9590.25	1649.03	9615.85	1648.6	9640.97	1648.85	9643.11	1648.86
9683.9	1648.94	9721.63	1648	9757.88	1647.09	9766.91	1646.87	9784.66	1647.14
9790.44	1647.24	9797.21	1647.367	9815.01	1647.7	9829.78	1647.92	9853.08	1647.28
9895.39	1646.07	9922.2	1646.37	9948.12	1646.6	9955.42	1646.73	9956.14	1646.73
9961.17	1646.59	9962.66	1646.5	9988.63	1646	9990.35	1645.7	9990.52	1645.66
9990.79	1645.61	9991.15	1645.56	9991.66	1645.5	9993.15	1645.26	9993.78	1645.14
9999.22	1645.22	10000.04	1645.2	10000.38	1645.25	10000.5	1645.24	10000.69	1645.29
10001.12	1645.35	10005.26	1646	10005.42	1646.03	10005.64	1646.05	10008.04	1646.3
10008.82	1646.35	10009.33	1646.3	10009.38	1646.31	10010.84	1646.25	10011.01	1646.25
10012.35	1646.28	10013.47	1646.3	10013.78	1646.34	10020.53	1646.42	10028.76	1646.43
10029.61	1646.42	10030.39	1646.4	10031.1	1646.38	10031.99	1646.36	10055.27	1646.13
10064.77	1646.13	10076.97	1646	10087.16	1645.91	10091.92	1645.87	10092.42	1645.86
10093.36	1645.9	10094.42	1645.87	10098.94	1645.92	10107.66	1646.01	10125.47	1646.2
10143.73	1646.7	10110163.36	1647.24	10164.63	1647.27	10209.39	1647.5	10210.92	1647.51
10226.97	1647.4	10243.67	1647.26	10271.52	1647.04	10274.1	1647.04	10275.5	1647.06
10277.4	1647.09	10278.74	1647.1	10280.94	1647.15	10285.63	1647.24	10326.42	1648
10327.35	1648.02	10333.39	1648.1	10334.76	1648.11	10336.09	1648.1	10341.12	1648.07
10348.17	1648.02	10353.37	1648	10359.66	1647.95	10369.21	1647.9	10375.81	1647.85
10376.44	1647.87	10383.2	1647.9	10390.78	1647.89	10401.41	1647.95	10407.65	1648

```
10414.45 1648.03 10420.1  1648.110430.68 1648.1710476.21 1648.3310497.84 1648.45
10507.12 1648.3910509.89  1648.410518.14 1648.3310555.96 1648.0810557.87 1648.06
10565.43    164810568.93    164810572.08 1647.9510575.03  1647.910599.13 1647.81
10608.77 1647.9910610.09    164810610.97    164810633.56 1648.1810634.14 1648.19
10635.98  1648.210636.68 1648.1910637.33  1648.210639.28 1648.16   10649 1648.05
 10658.2 1648.0110660.69 1648.0210663.27    164810679.74 1647.8810689.33 1647.78
10695.53 1647.7410715.51    164810725.04    1648 10735.7 1648.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8874.63    .037 9853.08    .04110210.92    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.4210143.73               658  597.61     515            .1        .3
Right Levee     Station=10497.84      Elevation= 1648.45

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1647.86  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.040  *   0.041  *   0.039  *
* W.S. Elev (ft)          * 1647.72  * Reach Len. (ft)         *  658.00  *  597.61  *  515.00  *
* Crit W.S. (ft)          * 1647.23  * Flow Area (sq ft)       *  163.81  *  296.67  *   71.57  *
* E.G. Slope (ft/ft)      *0.004544  * Area (sq ft)            *  163.81  *  296.67  *   71.57  *
* Q Total (cfs)           * 1490.00  * Flow (cfs)              *  404.08  *  980.64  *  105.28  *
* Top Width (ft)          *  557.56  * Top Width (ft)          *  201.68  *  188.31  *  167.57  *
* Vel Total (ft/s)        *    2.80  * Avg. Vel. (ft/s)        *    2.47  *    3.31  *    1.47  *
* Max Chl Dpth (ft)       *    2.58  * Hydr. Depth (ft)        *    0.81  *    1.58  *    0.43  *
* Conv. Total (cfs)       * 22104.7  * Conv. (cfs)             *  5994.7  * 14548.1  *  1561.9  *
* Length Wtd. (ft)        *  579.23  * Wetted Per. (ft)        *  201.72  *  188.50  *  167.58  *
* Min Ch El (ft)          * 1645.14  * Shear (lb/sq ft)        *    0.23  *    0.45  *    0.12  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)  *    0.57  *    1.48  *    0.18  *
* Frctn Loss (ft)         *    3.63  * Cum Volume (acre-ft)    *  182.84  *  205.92  *  138.07  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   82.14  *   55.34  *   73.21  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1648.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)          * 1648.39  * Reach Len. (ft)         *  658.00  *  597.61  *  515.00  *
* Crit W.S. (ft)          * 1647.39  * Flow Area (sq ft)       *          *  422.78  *          *
* E.G. Slope (ft/ft)      *0.003297  * Area (sq ft)            *          *  422.78  *          *
* Q Total (cfs)           * 1490.00  * Flow (cfs)              *          * 1490.00  *          *
* Top Width (ft)          *  188.31  * Top Width (ft)          *          *  188.31  *          *
* Vel Total (ft/s)        *    3.52  * Avg. Vel. (ft/s)        *          *    3.52  *          *
* Max Chl Dpth (ft)       *    3.25  * Hydr. Depth (ft)        *          *    2.25  *          *
* Conv. Total (cfs)       * 25948.2  * Conv. (cfs)             *          * 25948.2  *          *
* Length Wtd. (ft)        *  585.03  * Wetted Per. (ft)        *          *  191.84  *          *
* Min Ch El (ft)          * 1645.14  * Shear (lb/sq ft)        *          *    0.45  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.60  *          *
* Frctn Loss (ft)         *    3.27  * Cum Volume (acre-ft)    *   50.74  *  233.87  *   34.21  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   11.37  *   55.34  *    8.91  *
*****************************************************************************************

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.
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.
```

```
  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9415.03   * 9955.42   *   404.08 *   163.81 *   201.72 *    27.12 *
0.81 *     2.47 *
* 2         * Chan      * 9955.42   * 10143.73  *   980.64 *   296.67 *   188.50 *    65.81 *
1.58 *     3.31 *
* 3         * ROB       * 10143.73  * 10497.84  *   105.28 *    71.57 *   167.58 *     7.07 *
0.43 *     1.47 *
*****************************************************************************************
******************

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

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9955.42   * 10143.73  *  1490.00 *   422.78 *   191.84 *   100.00 *
2.25 *     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.
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: WASH 3-WEST
REACH: REACH-1            RS: 3.727

INPUT
Description:
Station Elevation Data    num=     105
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9399.42 1646.16 9399.61 1646.16 9422.24 1645.99 9437.75 1645.86 9445.73 1645.81
 9446.05 1645.79 9469.22 1645.97 9475.89 1646.03 9492.71 1645.93 9494.83 1646.01
 9514.03 1645.52  9516.2 1645.47 9539.69 1644.96 9541.26 1644.88 9552.17 1644.84
 9563.17 1644.86 9586.66 1644.82 9590.31  1644.8 9610.15 1644.74 9621.15 1644.75
 9628.46  1644.8 9633.64 1644.82 9657.13 1645.02  9666.6 1645.01 9673.93 1645.06
 9680.61 1644.94  9704.1  1644.4 9704.74 1644.39 9727.59 1643.92 9738.64 1643.76
 9742.88 1643.82 9751.08 1643.78 9774.57 1643.91 9779.05 1643.91 9781.02  1643.9
 9798.05 1643.84 9819.16 1643.73 9821.44 1643.71 9821.54 1643.72 9845.03 1643.79
 9857.31 1643.78 9862.61 1643.79 9868.52 1643.71 9892.01 1643.45 9895.45  1643.4
 9915.46 1643.12 9915.49 1643.16 9933.59 1642.93 9938.98 1642.86 9962.47  1642.6
 9971.73 1642.57 9980.86 1642.53 9985.96 1642.5910009.45  1643.110009.87 1643.11
10032.93 1643.5210038.17 1643.5410048.01 1643.4210056.42 1643.3310079.91 1642.78
10090.98 1642.55 10103.4 1642.33 10124.3 1641.9910126.89 1641.97 10131.5    1642
10150.38 1642.4610162.44 1642.8510173.86 1643.1710181.17 1643.3410197.35 1643.24
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10220.84 1642.9510225.69 1642.9310238.72 1643.1310244.33 1643.2410267.82 1643.78
10271.37 1643.8210276.86 1643.83 10291.3 1643.8210314.79 1643.7710330.22 1643.77
10338.28 1643.9110353.15 1644.2410361.77 1644.4410385.26 1644.8510389.56 1644.88
10391.29 1644.8710408.74 1644.8210429.43 1644.7510431.08 1644.7710432.23 1644.73
10455.72 1644.7210467.57 1644.6810479.21 1644.7610483.46 1644.67 10502.7 1645.12
10505.71 1645.1510526.18 1645.2210543.85 1645.31 10546.3 1645.2910549.67 1645.35
10573.16 1645.55   10582 1645.5810592.89 1645.5710596.65 1645.5410620.14 1645.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
 9399.42    .033 9845.03     .0510267.82    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.4610009.45              731  722.38     692             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1644.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.14  * Wt. n-Val.              *   0.042  *   0.050  *   0.049  *
* W.S. Elev (ft)         * 1644.09  * Reach Len. (ft)        *  731.00  *  722.38  *  692.00  *
* Crit W.S. (ft)         * 1643.73  * Flow Area (sq ft)      *   70.64  *  122.10  *  314.51  *
* E.G. Slope (ft/ft)     *0.009168  * Area (sq ft)           *   70.64  *  122.10  *  314.51  *
* Q Total (cfs)          * 1490.00  * Flow (cfs)             *  128.99  *  413.54  *  947.47  *
* Top Width (ft)         *  626.79  * Top Width (ft)         *  195.99  *   93.99  *  336.81  *
* Vel Total (ft/s)       *    2.94  * Avg. Vel. (ft/s)       *    1.83  *    3.39  *    3.01  *
* Max Chl Dpth (ft)      *    2.12  * Hydr. Depth (ft)       *    0.36  *    1.30  *    0.93  *
* Conv. Total (cfs)      * 15561.8  * Conv. (cfs)            *  1347.2  *  4319.1  *  9895.5  *
* Length Wtd. (ft)       *  709.88  * Wetted Per. (ft)       *  196.00  *   94.02  *  336.86  *
* Min Ch El (ft)         * 1642.53  * Shear (lb/sq ft)       *    0.21  *    0.74  *    0.53  *
* Alpha                  *    1.07  * Stream Power (lb/ft s) *    0.38  *    2.52  *    1.61  *
* Frctn Loss (ft)        *    4.05  * Cum Volume (acre-ft)   *  181.07  *  203.04  *  135.79  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   79.13  *   53.40  *   70.23  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1645.29  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.38  * Wt. n-Val.              *          *   0.050  *   0.050  *
* W.S. Elev (ft)         * 1644.91  * Reach Len. (ft)        *  731.00  *  722.38  *  692.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *          *  199.55  *  106.03  *
* E.G. Slope (ft/ft)     *0.011474  * Area (sq ft)           *          *  199.55  *  106.03  *
* Q Total (cfs)          * 1490.00  * Flow (cfs)             *          * 1036.06  *  453.94  *
* Top Width (ft)         *  159.94  * Top Width (ft)         *          *   93.99  *   65.95  *
* Vel Total (ft/s)       *    4.88  * Avg. Vel. (ft/s)       *          *    5.19  *    4.28  *
* Max Chl Dpth (ft)      *    2.38  * Hydr. Depth (ft)       *          *    2.12  *    1.61  *
* Conv. Total (cfs)      * 13909.8  * Conv. (cfs)            *          *  9672.0  *  4237.7  *
* Length Wtd. (ft)       *  717.75  * Wetted Per. (ft)       *          *   95.81  *   67.99  *
* Min Ch El (ft)         * 1642.53  * Shear (lb/sq ft)       *          *    1.49  *    1.12  *
* Alpha                  *          * Stream Power (lb/ft s) *          *    7.75  *    4.78  *
* Frctn Loss (ft)        *    4.67  * Cum Volume (acre-ft)   *   50.74  *  229.60  *   33.58  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)         *   11.37  *   53.40  *    8.52  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9657.44   * 9915.46   *   128.99 *    70.64 *   196.00 *     8.66 *
0.36 *     1.83 *
* 2          * Chan      * 9915.46   * 10009.45  *   413.54 *   122.10 *    94.02 *    27.75 *
1.30 *     3.39 *
* 3          * ROB       * 10009.45  * 10314.79  *   934.80 *   306.93 *   305.39 *    62.74 *
1.01 *     3.05 *
* 4          * ROB       * 10314.79  * 10620.14  *    12.67 *     7.59 *    31.47 *     0.85 *
0.24 *     1.67 *
*****************************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9915.46   * 10009.45  *  1036.06 *   199.55 *    95.81 *    69.53 *
2.12 *     5.19 *
* 2          * ROB       * 10009.45  * 10314.79  *   453.94 *   106.03 *    67.99 *    30.47 *
1.61 *     4.28 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 3.590

INPUT
Description: Interpolated point added at (10197.71, 1638.727) to set bank
             station.
Station Elevation Data    num=     144
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9087.91  1642.1 9093.02  1642.1 9095.11 1642.13 9098.22 1642.11 9105.03 1642.11
 9124.28  1642.1 9137.79 1642.07 9143.02 1642.06  9146.7 1642.06 9149.23    1642
 9149.72 1642.05 9152.49 1642.03 9155.44    1642 9196.78 1641.89 9212.89  1641.8
 9221.23 1641.87 9241.96 1641.89 9266.58 1641.78 9268.92  1641.8 9271.59 1641.77
 9309.88 1641.52 9312.17  1641.5 9315.68 1641.48 9317.77  1641.5 9318.75 1641.47
 9334.39 1641.47 9361.49 1641.49 9373.94  1641.4 9428.52 1641.02 9457.22 1640.94
 9478.15 1640.91 9493.93 1640.96 9509.29  1641.1 9512.08 1641.09 9529.07 1641.15
 9562.93 1640.86 9596.47 1640.77  9606.9  1640.7 9613.16 1640.66 9643.62 1640.41
 9647.36 1640.43 9676.81 1640.73 9689.92  1641.1 9707.41 1641.39 9747.16 1640.27
 9753.09  1640.1 9754.57  1640.1 9756.13 1640.09 9767.28 1640.08 9787.28 1640.05
 9798.93  1640.1 9805.54 1640.04 9808.78 1640.05 9811.62 1640.03 9818.18    1640
 9818.63    1640 9828.72 1639.95 9842.55 1639.87 9846.44 1639.85 9847.03 1639.84
    9851  1639.8 9895.92  1639.8 9898.43 1639.77 9900.36 1639.75 9916.131639.387
 9946.01  1638.7  9968.3  1638.5 9976.02 1638.43 9999.43  1638.210022.18 1638.39
10047.99 1638.5310071.99  1638.510098.07  1638.710138.27 1638.2910141.57 1638.25
10141.81 1638.25 10142.1  1638.210142.18 1638.2510144.42 1638.2510173.99  1638.2
10176.21 1638.2410177.04 1638.2310197.711638.72710210.32 1639.0310216.17 1639.13
10267.58  1638.910280.48 1638.8910280.77 1639.2110297.12 1639.2710330.86 1638.95
10359.57  1639.410386.88 1639.8110388.31  1639.810391.11  1639.810425.83 1639.78
10429.41  1639.810432.94 1639.7910433.68 1639.7710436.72 1639.8110441.69 1639.85
10448.81  1639.910455.74    1640 10457.6 1640.02 10462.7 1640.0810476.46 1640.26
10484.03  1640.410497.13 1640.5310512.91 1640.7510530.57    164110543.25 1641.17
10563.84  1641.4 10598.8 1641.67 10611.4  1641.910617.05    164210635.12 1642.33
10640.28  1642.410662.93 1642.9910691.79 1643.6910715.45 1643.64 10743.1  1643.4
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10784.12  1643.710788.48 1643.7610792.12 1643.7910793.48 1643.8110795.78 1643.83
10809.11    164410816.83 1644.0910840.17 1644.3910870.53 1644.7110881.98 1644.68
10896.39  1644.710909.81 1644.9710941.53 1645.1110969.12 1645.0710977.44 1645.19
10992.61  1645.2 11012.5 1645.2311022.54 1645.4311040.43 1645.6711044.83 1645.56
11067.39  1645.111096.37 1645.2411098.27 1645.2311106.11 1645.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9087.91    .033 9916.13     .0510359.57    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.0110197.71              697  783.51     711             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1640.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.044  *   0.050  *   0.048  *
* W.S. Elev (ft)         * 1640.07  * Reach Len. (ft)        *  697.00  *  783.51  *  711.00  *
* Crit W.S. (ft)         * 1639.45  * Flow Area (sq ft)      *   58.41  *  412.12  *  193.18  *
* E.G. Slope (ft/ft)     *0.003893  * Area (sq ft)           *   58.41  *  412.12  *  193.18  *
* Q Total (cfs)          * 1490.00  * Flow (cfs)             *   87.92  * 1061.47  *  340.61  *
* Top Width (ft)         *  680.90  * Top Width (ft)         *  164.81  *  251.70  *  264.40  *
* Vel Total (ft/s)       *    2.24  * Avg. Vel. (ft/s)       *    1.51  *    2.58  *    1.76  *
* Max Chl Dpth (ft)      *    1.87  * Hydr. Depth (ft)       *    0.35  *    1.64  *    0.73  *
* Conv. Total (cfs)      * 23881.4  * Conv. (cfs)            *  1409.2  * 17013.0  *  5459.2  *
* Length Wtd. (ft)       *  756.09  * Wetted Per. (ft)       *  164.82  *  251.73  *  264.56  *
* Min Ch El (ft)         * 1638.20  * Shear (lb/sq ft)       *    0.09  *    0.40  *    0.18  *
* Alpha                  *    1.11  * Stream Power (lb/ft s) *    0.13  *    1.02  *    0.31  *
* Frctn Loss (ft)        *    4.66  * Cum Volume (acre-ft)   *  179.99  *  198.61  *  131.76  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   76.11  *   50.54  *   65.45  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1640.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.14  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)         * 1640.41  * Reach Len. (ft)        *  697.00  *  783.51  *  711.00  *
* Crit W.S. (ft)         * 1639.46  * Flow Area (sq ft)      *          *  497.17  *          *
* E.G. Slope (ft/ft)     *0.004178  * Area (sq ft)           *          *  497.17  *          *
* Q Total (cfs)          * 1490.00  * Flow (cfs)             *          * 1490.00  *          *
* Top Width (ft)         *  251.70  * Top Width (ft)         *          *  251.70  *          *
* Vel Total (ft/s)       *    3.00  * Avg. Vel. (ft/s)       *          *    3.00  *          *
* Max Chl Dpth (ft)      *    2.21  * Hydr. Depth (ft)       *          *    1.98  *          *
* Conv. Total (cfs)      * 23051.5  * Conv. (cfs)            *          * 23051.5  *          *
* Length Wtd. (ft)       *  770.88  * Wetted Per. (ft)       *          *  255.13  *          *
* Min Ch El (ft)         * 1638.20  * Shear (lb/sq ft)       *          *    0.51  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    1.52  *          *
* Frctn Loss (ft)        *    4.70  * Cum Volume (acre-ft)   *   50.74  *  223.82  *   32.74  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   11.37  *   50.53  *    8.00  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9516.96   * 9946.01   *    87.92 *    58.41 *   164.82 *     5.90 *
0.35 *     1.51 *
* 2          * Chan      * 9946.01   * 10197.71  *  1061.47 *   412.12 *   251.73 *    71.24 *
1.64 *     2.58 *
* 3          * ROB       * 10197.71  * 10651.91  *   340.61 *   193.18 *   264.56 *    22.86 *
0.73 *     1.76 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9946.01   * 10197.71  *  1490.00 *   497.17 *   255.13 *   100.00 *
1.98 *     3.00 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 3.441

INPUT
Description: Interpolated point added at (10059.38, 1633.757) to set bank
             station.
Station Elevation Data    num=     130
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9249.8 1637.04 9273.36 1637.03 9287.63 1637.02 9296.93 1637.02 9315.86 1636.95
 9344.05 1636.95 9363.28 1636.93 9365.01 1636.94 9367.62 1636.93 9391.18 1636.69
 9414.74 1636.43 9418.12 1636.38 9438.31 1636.29 9438.93 1636.29 9461.87 1636.35
 9471.69 1636.34 9476.75 1636.35 9485.43 1636.34    9509  1636.3 9514.58 1636.27
 9526.45 1636.21 9532.56 1636.13  9552.4 1635.73 9556.12 1635.66 9575.27 1635.36
 9579.69 1635.34 9590.23 1635.38 9603.25 1635.44 9626.81 1635.66 9628.05 1635.66
 9633.26 1635.71 9650.38 1635.82 9665.88 1635.85 9673.94 1635.84 9681.49 1635.81
  9703.7 1635.74 9721.07 1635.68 9722.41 1635.69 9741.53 1635.51 9744.63 1635.51
 9766.42 1635.53 9768.19 1635.52 9779.35 1635.54 9791.75 1635.51 9809.99 1635.39
 9817.18 1635.31 9838.88 1634.99 9851.35 1634.78    9855 1634.71 9862.44 1634.57
 9886.01 1634.24 9886.44  1634.2 9892.83 1634.29 9909.57 1634.55 9930.65 1634.68
 9933.13 1634.68  9956.7 1634.04 9966.84 1633.75 9968.48 1633.79 9980.26 1633.59
 9989.46 1633.4410000.75 1631.8210003.82 1632.88 10006.3 1632.9310006.39  1633.6
10023.01 1633.0910027.39 1633.2610032.79 1633.3110036.01 1632.5110042.53 1633.16
10044.13 1633.5410050.95 1633.6610059.381633.75710074.51 1633.9310081.96 1634.01
10098.08    163410105.37 1634.2810119.78 1633.9610121.64 1633.9610124.31 1633.85
 10145.2 1634.5710151.76  1634.810157.61 1634.8710168.77 1635.0310192.33 1635.13
10195.43 1635.1710195.63 1635.1710215.89 1635.4110233.26 1635.6510239.46 1635.73
10248.61 1635.8810263.02 1636.1610271.08 1636.2510286.58 1636.4510299.29 1636.53
10308.91 1636.4910310.15 1636.4910333.71  1636.410346.73 1636.4910348.94 1636.48
10357.27 1636.6410380.84 1637.1410384.56 1637.1810385.06  1637.2 10404.4 1637.22
 10418.2 1637.3310422.38 1637.4610427.96 1637.5910442.63 1637.9210451.53 1638.06
10460.21 1638.17   10474 1638.1910475.09 1638.2510498.03 1638.6710522.22 1639.07
10528.59 1639.1410535.86 1639.1210545.78 1639.1410569.34 1639.0910573.68  1639.1
10579.41 1639.0910592.91  1639.110611.51 1639.1510616.47 1639.16 10627.5 1639.21
10640.03 1639.3410649.33 1639.48 10663.6 1639.6910676.01 1639.8110687.16 1639.85
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
  9249.8    .033    9855     .05 10145.2    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.4810059.38               715  754.58     732             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1635.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *   0.049  *   0.050  *   0.049  *
* W.S. Elev (ft)          * 1635.21  * Reach Len. (ft)        *  715.00  *  754.58  *  732.00  *
* Crit W.S. (ft)          * 1634.98  * Flow Area (sq ft)      *   99.51  *  176.79  *  110.93  *
* E.G. Slope (ft/ft)      *0.011208  * Area (sq ft)           *   99.51  *  176.79  *  110.93  *
* Q Total (cfs)           * 1490.00  * Flow (cfs)             *  265.93  *  859.94  *  364.13  *
* Top Width (ft)          *  374.51  * Top Width (ft)         *  144.28  *   90.90  *  139.33  *
* Vel Total (ft/s)        *    3.85  * Avg. Vel. (ft/s)       *    2.67  *    4.86  *    3.28  *
* Max Chl Dpth (ft)       *    3.39  * Hydr. Depth (ft)       *    0.69  *    1.94  *    0.80  *
* Conv. Total (cfs)       * 14074.4  * Conv. (cfs)            *  2511.9  *  8122.9  *  3439.6  *
* Length Wtd. (ft)        *  738.52  * Wetted Per. (ft)       *  144.31  *   91.97  *  139.36  *
* Min Ch El (ft)          * 1631.82  * Shear (lb/sq ft)       *    0.48  *    1.35  *    0.56  *
* Alpha                   *    1.19  * Stream Power (lb/ft s) *    1.29  *    6.54  *    1.83  *
* Frctn Loss (ft)         *    4.46  * Cum Volume (acre-ft)   *  178.72  *  193.32  *  129.28  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)         *   73.63  *   47.46  *   62.16  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1635.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *   0.050  *   0.050  *   0.050  *
* W.S. Elev (ft)          * 1635.50  * Reach Len. (ft)        *  715.00  *  754.58  *  732.00  *
* Crit W.S. (ft)          * 1635.06  * Flow Area (sq ft)      *   66.51  *  203.23  *   70.35  *
* E.G. Slope (ft/ft)      *0.009745  * Area (sq ft)           *   66.51  *  203.23  *   70.35  *
* Q Total (cfs)           * 1490.00  * Flow (cfs)             *  209.29  * 1011.46  *  269.25  *
* Top Width (ft)          *  195.80  * Top Width (ft)         *   58.91  *   90.90  *   45.99  *
* Vel Total (ft/s)        *    4.38  * Avg. Vel. (ft/s)       *    3.15  *    4.98  *    3.83  *
* Max Chl Dpth (ft)       *    3.68  * Hydr. Depth (ft)       *    1.13  *    2.24  *    1.53  *
* Conv. Total (cfs)       * 15093.8  * Conv. (cfs)            *  2120.2  * 10246.1  *  2727.5  *
* Length Wtd. (ft)        *  742.92  * Wetted Per. (ft)       *   59.87  *   91.97  *   47.21  *
* Min Ch El (ft)          * 1631.82  * Shear (lb/sq ft)       *    0.68  *    1.34  *    0.91  *
* Alpha                   *    1.09  * Stream Power (lb/ft s) *    2.13  *    6.69  *    3.47  *
* Frctn Loss (ft)         *    4.01  * Cum Volume (acre-ft)   *   50.20  *  217.52  *   32.17  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)         *   10.90  *   47.45  *    7.62  *
*****************************************************************************************

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9609.14   * 9968.48   *   265.93 *    99.51 *   144.31 *    17.85 *
0.69 *     2.67 *
* 2        * Chan      * 9968.48   * 10059.38  *   859.94 *   176.79 *    91.97 *    57.71 *
1.94 *     4.86 *
```

```
* 3          * ROB       * 10059.38  * 10373.27  *   364.13 *   110.93 *   139.36 *    24.44 *
0.80 *     3.28 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9609.14   * 9968.48   *   209.29 *    66.51 *    59.87 *    14.05 *
1.13 *     3.15 *
* 2         * Chan      * 9968.48   * 10059.38  *  1011.46 *   203.23 *    91.97 *    67.88 *
2.24 *     4.98 *
* 3         * ROB       * 10059.38  * 10373.27  *   269.25 *    70.35 *    47.21 *    18.07 *
1.53 *     3.83 *
*****************************************************************************************
******************

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: 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: WASH 3-WEST
REACH: REACH-1            RS: 3.298

INPUT
Description:
Station Elevation Data    num=     162
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9245.64  1632.9 9258.73 1632.78 9269.47 1632.71 9280.41 1632.62 9287.87 1632.58
 9343.65  1633.1 9347.34 1633.02 9357.84 1632.92 9364.19 1632.84 9414.21 1632.22
 9418.55  1632.2  9422.4 1632.19 9430.56 1632.08 9435.99 1632.02 9438.66    1632
 9442.24 1631.97 9447.77 1631.95 9450.96 1631.99 9470.47 1631.99 9472.47    1632
 9481.29 1632.01 9483.98 1631.98 9495.75 1631.97 9504.78 1631.95 9517.02  1631.9
 9532.51 1631.91 9567.09 1631.54  9567.8 1631.53 9569.16  1631.5 9618.37 1631.02
 9626.52 1630.92 9644.64 1630.66 9675.66 1630.11 9711.72  1630.1 9712.92 1630.09
 9713.72 1630.08 9739.28 1630.08 9827.87 1630.11  9831.8  1630.1 9834.86 1630.05
 9839.02 1630.05 9853.51    1630 9854.78 1629.99 9860.97    1630 9862.22 1629.97
 9872.09 1629.94 9885.21 1629.92 9888.83 1629.92  9902.6  1629.9 9912.65 1629.88
 9920.74 1629.88 9922.03 1629.84 9928.74  1629.8 9932.65  1629.8 9950.971629.744
 9955.49 1629.73 9970.75 1629.78 9972.41 1629.78 9973.36 1629.55 9977.53  1628.6
 9982.24  1628.7 9983.11 1628.73 9983.87 1628.47 9985.29    1628 9986.21  1627.7
 9991.49 1626.23 9991.78 1626.21 9992.49 1626.18 9994.49 1626.42  9994.8  1626.4
  9997.1 1626.49 9997.57  1626.4 9998.12 1626.23  9999.1    1626  9999.3  1625.9
10000.21 1625.6710000.63 1625.8510000.85    162610002.77 1627.1910003.96    1628
10004.58 1628.5310005.12 1628.8910010.14 1629.1410011.56 1629.1810012.64  1629.2
10013.14 1629.0910017.53    162810018.63 1627.4910018.67 1627.4910020.37    1628
10020.41    162810026.68 1629.6810026.86 1629.7310035.94 1629.3110048.37  1629.5
10051.75 1629.5210065.65 1629.7110066.09  1629.7 10067.4 1629.7510071.06  1629.8
10072.07 1629.7610073.71 1629.7610076.39 1629.7710138.75 1629.8710144.71  1629.9
 10157.5    163010162.821630.03710193.32 1630.2510250.43 1630.6710263.77 1630.97
10281.77  1631.210300.67 1631.4310305.42 1631.4210315.36 1631.7210365.94 1631.98
10371.28    163210371.41    163210378.23 1632.0410438.17 1632.7710439.84  1632.8
10446.79 1632.8610451.96 1632.8910511.59 1633.0410537.33 1632.9110541.89  1632.9
10542.46 1632.8810543.53 1632.8910543.74 1632.8910546.35  1632.910572.74 1633.19
```

```
 10588.7 1633.0310610.55 1632.7810639.21  1632.810649.34  1632.810661.81 1632.88
10684.99    163310689.33 1632.8810722.18 1632.8810724.71  1632.910727.16 1632.96
 10732.4  1633.410735.41 1633.6510738.71 1633.6410752.08  1633.4 10761.7 1633.42
10782.83 1633.4510792.69 1633.3910808.74  1633.310815.84  1633.310819.97 1633.42
10835.46    163410836.02 1634.0410845.43 1634.3710877.02  1634.210888.44 1634.14
10956.39 1634.9310957.03 1634.9410957.14 1634.9410957.38  1634.910957.55 1634.94
10957.95 1634.9411024.53 1635.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9245.64    .033 9885.21     .05 10157.5    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.75 10067.4               678  774.09     705             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1630.97  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.038  *   0.050  *   0.044  *
* W.S. Elev (ft)         * 1630.87  * Reach Len. (ft)         *  678.00  *  774.09  *  705.00  *
* Crit W.S. (ft)         * 1630.44  * Flow Area (sq ft)       *  275.42  *  211.47  *  144.82  *
* E.G. Slope (ft/ft)     *0.003773  * Area (sq ft)            *  275.42  *  211.47  *  144.82  *
* Q Total (cfs)          * 1490.00  * Flow (cfs)              *  584.32  *  640.98  *  264.70  *
* Top Width (ft)         *  629.80  * Top Width (ft)          *  341.04  *   96.65  *  192.11  *
* Vel Total (ft/s)       *    2.36  * Avg. Vel. (ft/s)        *    2.12  *    3.03  *    1.83  *
* Max Chl Dpth (ft)      *    5.20  * Hydr. Depth (ft)        *    0.81  *    2.19  *    0.75  *
* Conv. Total (cfs)      * 24256.6  * Conv. (cfs)             *  9512.5  * 10435.0  *  4309.2  *
* Length Wtd. (ft)       *  723.20  * Wetted Per. (ft)        *  341.05  *   98.84  *  192.12  *
* Min Ch El (ft)         * 1625.67  * Shear (lb/sq ft)        *    0.19  *    0.50  *    0.18  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)  *    0.40  *    1.53  *    0.32  *
* Frctn Loss (ft)        *    4.06  * Cum Volume (acre-ft)    *  175.65  *  189.96  *  127.13  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   69.65  *   45.83  *   59.37  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1631.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.16  * Wt. n-Val.              *   0.046  *   0.050  *          *
* W.S. Elev (ft)         * 1631.61  * Reach Len. (ft)         *  678.00  *  774.09  *  705.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  188.07  *  282.20  *          *
* E.G. Slope (ft/ft)     *0.003421  * Area (sq ft)            *  188.07  *  282.20  *          *
* Q Total (cfs)          * 1490.00  * Flow (cfs)              *  514.98  *  975.02  *          *
* Top Width (ft)         *  203.67  * Top Width (ft)          *  107.02  *   96.65  *          *
* Vel Total (ft/s)       *    3.17  * Avg. Vel. (ft/s)        *    2.74  *    3.46  *          *
* Max Chl Dpth (ft)      *    5.94  * Hydr. Depth (ft)        *    1.76  *    2.92  *          *
* Conv. Total (cfs)      * 25475.3  * Conv. (cfs)             *  8804.8  * 16670.5  *          *
* Length Wtd. (ft)       *  740.12  * Wetted Per. (ft)        *  108.66  *  100.70  *          *
* Min Ch El (ft)         * 1625.67  * Shear (lb/sq ft)        *    0.37  *    0.60  *          *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    1.01  *    2.07  *          *
* Frctn Loss (ft)        *    4.24  * Cum Volume (acre-ft)    *   48.11  *  213.32  *   31.57  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *    9.54  *   45.83  *    7.23  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9608.20   * 9970.75   *   584.32 *   275.42 *   341.05 *    39.22 *
0.81 *     2.12 *
* 2          * Chan      * 9970.75   * 10067.40  *   640.98 *   211.47 *    98.84 *    43.02 *
2.19 *     3.03 *
* 3          * ROB       * 10067.40  * 10545.96  *   264.70 *   144.82 *   192.12 *    17.76 *
0.75 *     1.83 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9608.20   * 9970.75   *   514.98 *   188.07 *   108.66 *    34.56 *
1.76 *     2.74 *
* 2          * Chan      * 9970.75   * 10067.40  *   975.02 *   282.20 *   100.70 *    65.44 *
2.92 *     3.46 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 3.152

INPUT
Description: Interpolated point added at (10018.08, 1625.512) to set bank
             station.
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9403.02 1628.35 9428.58 1628.37 9454.13 1628.33 9467.27 1628.24 9479.69  1628.2
  9499.4 1627.93 9505.24  1627.8  9530.8 1627.48 9531.53 1627.48 9546.82 1627.36
 9556.35 1627.28 9563.66 1627.25 9581.91 1627.23 9595.78  1627.2 9607.47 1627.19
 9618.88 1627.11 9627.91 1627.09 9658.58 1626.97 9660.04 1626.97 9684.13 1626.86
 9692.17 1626.81 9709.69 1626.72 9724.29 1626.62 9730.89 1626.61 9735.25 1626.53
 9756.42 1626.31  9760.8 1626.26 9786.36 1625.88 9788.55 1625.85 9805.92 1625.69
 9811.91 1625.68 9820.67 1625.73 9837.47 1625.88  9852.8    1626 9860.54 1626.03
 9863.02 1626.01 9884.93 1625.89 9888.58 1625.86 9914.14 1625.64 9917.06 1625.62
 9930.47 1625.52 9939.69 1625.52 9949.18 1625.46 9965.25 1625.43 9981.31 1625.26
 9988.66 1625.07  9990.8 1624.75  9993.3 1624.9910000.56 1623.2410004.27 1626.23
10005.58 1626.2310010.31 1623.7810013.44 1624.7910016.36 1625.0210018.081625.512
10020.59 1626.2310041.92 1626.2410045.57 1626.1710067.47 1625.6710077.69 1625.52
10088.24 1625.3610093.03 1625.4110109.82 1625.4910118.58 1625.5810141.95 1625.84
10169.69 1626.2310174.08  1626.310195.25  1626.6 10206.2 1626.7610220.81 1626.93
   10231 1627.0310238.33 1627.1210246.36 1627.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9403.02    .033 9786.36     .0410141.95    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.6910018.08              509  514.16     493             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
```

E.G. Elev (ft)	1626.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.039	0.040	0.039
W.S. Elev (ft)	1626.67	Reach Len. (ft)	509.00	514.16	493.00
Crit W.S. (ft)	1626.49	Flow Area (sq ft)	158.45	120.85	136.95
E.G. Slope (ft/ft)	0.009194	Area (sq ft)	158.45	120.85	136.95
Q Total (cfs)	1490.00	Flow (cfs)	490.78	564.28	434.95
Top Width (ft)	483.46	Top Width (ft)	222.98	78.39	182.09
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)	3.10	4.67	3.18
Max Chl Dpth (ft)	3.43	Hydr. Depth (ft)	0.71	1.54	0.75
Conv. Total (cfs)	15539.2	Conv. (cfs)	5118.3	5884.8	4536.0
Length Wtd. (ft)	508.45	Wetted Per. (ft)	222.99	80.53	182.21
Min Ch El (ft)	1623.24	Shear (lb/sq ft)	0.41	0.86	0.43
Alpha	1.12	Stream Power (lb/ft s)	1.26	4.02	1.37
Frctn Loss (ft)	2.93	Cum Volume (acre-ft)	172.27	187.00	124.85
C & E Loss (ft)	0.02	Cum SA (acres)	65.26	44.28	56.34

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1627.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (ft)	1627.04	Reach Len. (ft)	509.00	514.16	493.00
Crit W.S. (ft)	1626.87	Flow Area (sq ft)	85.49	149.61	47.62
E.G. Slope (ft/ft)	0.011497	Area (sq ft)	85.49	149.61	47.62
Q Total (cfs)	1490.00	Flow (cfs)	407.92	900.59	181.49
Top Width (ft)	191.88	Top Width (ft)	64.10	78.39	49.39
Vel Total (ft/s)	5.27	Avg. Vel. (ft/s)	4.77	6.02	3.81
Max Chl Dpth (ft)	3.80	Hydr. Depth (ft)	1.33	1.91	0.96
Conv. Total (cfs)	13896.0	Conv. (cfs)	3804.3	8399.1	1692.6
Length Wtd. (ft)	512.18	Wetted Per. (ft)	65.20	80.53	50.87
Min Ch El (ft)	1623.24	Shear (lb/sq ft)	0.94	1.33	0.67
Alpha	1.08	Stream Power (lb/ft s)	4.49	8.03	2.56
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	45.99	209.48	31.19
C & E Loss (ft)	0.08	Cum SA (acres)	8.21	44.27	6.84

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.
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 parabolic search method failed to converge on critical depth. The program will try the
cross section slice/secant method to find critical depth.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9671.36	9939.69	490.78	158.45	222.99	32.94	0.71	3.10
2	Chan	9939.69	10018.08	564.27	120.85	80.53	37.87	1.54	4.67
3	ROB	10018.08	10132.22	347.92	104.00	114.25	23.35	0.91	3.35
4	ROB	10132.22	10246.36	87.03	32.95	67.96	5.84	0.48	2.64

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.
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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9671.36	9939.69	407.92	85.49	65.20	27.38	1.33	4.77
* 2	Chan	9939.69	10018.08	900.59	149.61	80.53	60.44	1.91	6.02
* 3	ROB	10018.08	10132.22	181.49	47.62	50.87	12.18	0.96	3.81

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.
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 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: WASH 3-WEST
REACH: REACH-1 RS: 3.054

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 1,520cfs.
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9407.41	1625.1	9421.03	1625.13	9437.35	1625.09	9503.64	1624.35	9527.83	1624.14
9543.68	1624.1	9600.17	1624.12	9623.89	1624.07	9647.51	1624	9710.95	1623.98
9724.55	1623.9	9772.78	1623.54	9801.88	1623.4	9810.17	1623.349	9818.13	1623.3
9847.04	1623.31	9857.21	1623.06	9868.72	1622.85	9875.01	1622.83	9897.86	1622.6
9898.55	1622.55	9900.8	1622.14	9901.93	1622	9905.64	1621.26	9905.68	1621.3
9905.71	1621.25	9909.53	1622	9909.68	1622.02	9910.2	1622.12	9911.7	1622.3
9914.41	1622.31	9944.97	1622.11	9945.26	1622.05	9945.67	1622	9948.69	1621.4
9951	1620.81	9952.21	1621.33	9953.61	1622	9954.34	1622.41	9954.61	1622.5
9957.71	1622.52	9976.59	1622.15	9983.82	1622.03	9986.15	1622	9992.36	1621.9
9994.05	1621.89	9995.23	1621.58	10000.57	1620	10000.67	1619.97	10000.85	1619.9
10001.06	1619.91	10001.13	1619.91	10001.16	1619.93	10005.55	1621.61	10006.25	1621.89
10007.27	1621.91	10021.74	1622	10032.92	1622	10050.27	1622.15	10056.13	1622.19
10080.9	1622.46	10095.2	1622.61	10109.65	1622.81	10120.08	1622.91	10129.33	1622.993
10137.89	1623.07	10146.08	1623.22	10150.38	1623.21	10158.68	1622.11	10159.08	1622
10159.1	1622	10159.73	1621.91	10159.74	1621.91	10160.08	1622	10160.56	1622.04
10167.76	1623.38	10169.84	1623.41	10181.67	1623.37	10184.54	1623.3	10199.7	1623.59
10206.32	1623.58	10215.24	1623.67	10250.17	1623.44	10258.44	1623.3	10277.8	1623.44
10338.64	1623.51	10365.8	1623.9	10371.7	1624	10376.69	1624.11	10398.81	1624.48
10453.67	1624.75	10457.42	1624.78	10517.43	1625.22				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9407.41	.033	9847.04	.04	10146.08	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9897.86	10095.2	450	594.89	533	.1	.3

CROSS SECTION OUTPUT Profile #1

*		*		*		*		*		*	
* E.G. Elev (ft)		* 1623.94	* Element		* Left OB	* Channel	* Right OB				
* Vel Head (ft)		* 0.14	* Wt. n-Val.		* 0.038	* 0.040	* 0.036				
* W.S. Elev (ft)		* 1623.80	* Reach Len. (ft)		* 450.00	* 594.89	* 533.00				
* Crit W.S. (ft)		* 1623.29	* Flow Area (sq ft)		* 82.47	* 341.77	* 127.19				

E.G. Slope (ft/ft)	0.003965	Area (sq ft)	82.47	341.77	127.19	
Q Total (cfs)	1520.00	Flow (cfs)	151.61	1147.29	221.09	
Top Width (ft)	620.77	Top Width (ft)	159.83	197.34	263.59	
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	1.84	3.36	1.74	
Max Chl Dpth (ft)	3.90	Hydr. Depth (ft)	0.52	1.73	0.48	
Conv. Total (cfs)	24139.1	Conv. (cfs)	2407.8	18220.1	3511.2	
Length Wtd. (ft)	558.95	Wetted Per. (ft)	159.84	198.79	263.84	
Min Ch El (ft)	1619.90	Shear (lb/sq ft)	0.13	0.43	0.12	
Alpha	1.22	Stream Power (lb/ft s)	0.23	1.43	0.21	
Frctn Loss (ft)	2.96	Cum Volume (acre-ft)	170.86	184.27	123.35	
C & E Loss (ft)	0.00	Cum SA (acres)	63.02	42.65	53.82	

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1624.39	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.21	Wt. n-Val.		0.040		
W.S. Elev (ft)	1624.19	Reach Len. (ft)	450.00	594.89	533.00	
Crit W.S. (ft)		Flow Area (sq ft)		417.91		
E.G. Slope (ft/ft)	0.003635	Area (sq ft)		417.91		
Q Total (cfs)	1520.00	Flow (cfs)		1520.00		
Top Width (ft)	197.34	Top Width (ft)		197.34		
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)		3.64		
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)		2.12		
Conv. Total (cfs)	25209.5	Conv. (cfs)		25209.5		
Length Wtd. (ft)	594.89	Wetted Per. (ft)		201.96		
Min Ch El (ft)	1619.90	Shear (lb/sq ft)		0.47		
Alpha	1.00	Stream Power (lb/ft s)		1.71		
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	45.49	206.13	30.92	
C & E Loss (ft)	0.01	Cum SA (acres)	7.83	42.65	6.56	

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9652.64	9897.86	151.61	82.47	159.84	9.97	0.52	1.84
2	Chan	9897.86	10095.20	1147.29	341.77	198.79	75.48	1.73	3.36
3	ROB	10095.20	10306.31	206.98	114.32	211.35	13.62	0.54	1.81
4	ROB	10306.31	10517.43	14.11	12.87	52.48	0.93	0.25	1.10

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9897.86	10095.20	1520.00	417.91	201.96	100.00	2.12	3.64

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: WASH 3-WEST
REACH: REACH-1 RS: 2.942

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9630.77	1621.39	9639.43	1621.38	9659.68	1621.2	9667.13	1621.11	9677.6	1621
9688.59	1620.86	9694.83	1620.8	9717.5	1620.61	9722.52	1620.56	9746.41	1620.33
9775.32	1620.03	9777.92	1620	9804.23	1619.78	9805.62	1619.77	9817.31	1619.72
9833.14	1619.77	9833.31	1619.77	9861.01	1619.94	9862.05	1619.95	9863.14	1619.9
9869.18	1618.76	9874.63	1620.11	9888.71	1619.98	9890.96	1619.94	9916.41	1619.38
9918.45	1619.34	9919.87	1619.33	9944.11	1619.25	9948.78	1619.28	9971.8	1619.28
9975.68	1619.21	9977.69	1619.28	9999.5	1619.65	10006.6	1619.72	10027.2	1619.85
10035.5	1619.88	10046.61	1619.94	10054.9	1619.95	10064.41	1619.98	10082.59	1620.01
10093.32	1620.02	10110.29	1620.04	10122.23	1620.05	10137.99	1620.09	10146.99	1620.1
10151.14	1620.12	10165.69	1620.18	10180.05	1620.25	10193.38	1620.32	10208.96	1620.39
10220.18	1620.41	10221.08	1620.42	10237.87	1620.49	10248.78	1620.53	10266.78	1620.6
10295.69	1620.72	10304.18	1620.77	10323.84	1620.86	10324.6	1620.87	10331.87	1620.91
10353.51	1621.08	10359.57	1621.13	10376.04	1621.25	10382.42	1621.31	10387.27	1621.35
10411.33	1621.49	10414.97	1621.52	10442.66	1621.64	10446.42	1621.69	10469.15	1621.9
10470.36	1621.91	10498.06	1622.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9630.77	.033	9777.92	.041	10082.59	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9874.63	10082.59	673	664.74	553	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1620.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.039	0.040	0.033
W.S. Elev (ft)	1620.82	Reach Len. (ft)	673.00	664.74	553.00
Crit W.S. (ft)	1620.58	Flow Area (sq ft)	133.51	243.09	109.22
E.G. Slope (ft/ft)	0.007447	Area (sq ft)	133.51	243.09	109.22
Q Total (cfs)	1520.00	Flow (cfs)	398.26	864.67	257.08
Top Width (ft)	621.11	Top Width (ft)	181.48	207.96	231.67
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)	2.98	3.56	2.35
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)	0.74	1.17	0.47
Conv. Total (cfs)	17614.3	Conv. (cfs)	4615.2	10020.1	2979.1
Length Wtd. (ft)	641.20	Wetted Per. (ft)	181.76	207.97	231.68
Min Ch El (ft)	1619.21	Shear (lb/sq ft)	0.34	0.54	0.22
Alpha	1.07	Stream Power (lb/ft s)	1.02	1.93	0.52
Frctn Loss (ft)	4.00	Cum Volume (acre-ft)	169.75	180.28	121.91
C & E Loss (ft)	0.00	Cum SA (acres)	61.26	39.88	50.79

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 OUTPUT Profile #2

E.G. Elev (ft)	1621.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.		0.040	
W.S. Elev (ft)	1621.43	Reach Len. (ft)	673.00	664.74	553.00
Crit W.S. (ft)	1620.82	Flow Area (sq ft)		369.71	
E.G. Slope (ft/ft)	0.005788	Area (sq ft)		369.71	
Q Total (cfs)	1520.00	Flow (cfs)		1520.00	
Top Width (ft)	207.96	Top Width (ft)		207.96	
Vel Total (ft/s)	4.11	Avg. Vel. (ft/s)		4.11	
Max Chl Dpth (ft)	2.22	Hydr. Depth (ft)		1.78	

```
* Conv. Total (cfs)      * 19979.9  * Conv. (cfs)            *          * 19979.9  *          *
* Length Wtd. (ft)       *  664.74  * Wetted Per. (ft)       *          *  210.70  *          *
* Min Ch El (ft)         * 1619.21  * Shear (lb/sq ft)       *          *    0.63  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    2.61  *          *
* Frctn Loss (ft)        *    4.15  * Cum Volume (acre-ft)   *   45.49  *  200.75  *   30.92  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    7.83  *   39.88  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9630.77   * 9752.70   *    24.86 *    15.82 *    59.55 *     1.64 *
0.27 *     1.57 *
* 2         * LOB       * 9752.70   * 9874.63   *   373.39 *   117.69 *   122.21 *    24.57 *
0.97 *     3.17 *
* 3         * Chan      * 9874.63   * 10082.59  *   864.67 *   243.09 *   207.97 *    56.89 *
1.17 *     3.56 *
* 4         * ROB       * 10082.59  * 10290.32  *   256.28 *   107.81 *   207.74 *    16.86 *
0.52 *     2.38 *
* 5         * ROB       * 10290.32  * 10498.06  *     0.79 *     1.41 *    23.94 *     0.05 *
0.06 *     0.56 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9874.63   * 10082.59  *  1520.00 *   369.71 *   210.70 *   100.00 *
1.78 *     4.11 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 2.816

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9423.76  1617.9 9440.58 1617.76 9481.33 1617.74 9494.21 1617.71 9504.98 1617.69
 9505.17  1617.7 9512.34 1617.65  9516.6 1617.63 9537.25 1617.64 9618.56 1617.71
 9673.39  1617.5 9718.54 1617.33 9724.13 1617.25 9752.36  1616.9 9810.15 1616.11
  9812.1  1616.1 9816.31 1616.02 9824.61 1615.92 9826.02  1615.9 9835.98    1616
 9855.361615.877  9878.6 1615.73 9892.08 1615.68 9895.61  1615.7 9917.88 1615.62
  9918.8 1615.61  9920.5  1615.6 9938.92  1615.6  9970.1 1615.73 9974.92  1614.1
 9974.94 1614.04 9975.04 1614.02 9975.15 1614.05 9975.82 1614.22 9979.98  1615.6
 9990.85  1615.7 10014.1 1615.7410023.24  1615.710057.74 1615.7510086.62  1615.8
 10100.8 1615.7510103.93 1615.7510122.15  1615.910129.72 1615.9410137.52 1615.93
10143.12 1615.9710143.54 1615.9810150.01    161610153.88    161610162.88 1616.01
10174.07 1616.1510174.42  1616.110176.79 1616.1510223.71 1616.2110248.58 1616.26
```

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10250.79 1616.2610255.04  1616.310269.81 1616.3710280.691616.42610314.59  1616.6
10356.46  1616.510386.48 1616.3510395.21  1616.310430.38 1616.6210446.17 1616.74
10463.69 1616.8610500.25 1617.1310529.57  1617.310535.84 1617.4110578.17 1617.92
10585.51    161810586.63 1618.01 10592.3  1618.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9423.76    .033 9855.36    .03310280.69     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9878.610086.62              638  599.24     504             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1616.98  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.033  *   0.033  *   0.035  *
* W.S. Elev (ft)          * 1616.82  * Reach Len. (ft)         *  638.00  *  599.24  *  504.00  *
* Crit W.S. (ft)          * 1616.60  * Flow Area (sq ft)       *   80.97  *  242.78  *  195.09  *
* E.G. Slope (ft/ft)      *0.005306  * Area (sq ft)            *   80.97  *  242.78  *  195.09  *
* Q Total (cfs)           * 1520.00  * Flow (cfs)              *  210.64  *  881.12  *  428.24  *
* Top Width (ft)          *  700.05  * Top Width (ft)           *  120.52  *  208.02  *  371.51  *
* Vel Total (ft/s)        *    2.93  * Avg. Vel. (ft/s)         *    2.60  *    3.63  *    2.20  *
* Max Chl Dpth (ft)       *    2.80  * Hydr. Depth (ft)         *    0.67  *    1.17  *    0.53  *
* Conv. Total (cfs)       * 20867.2  * Conv. (cfs)              *  2891.7  * 12096.4  *  5879.0  *
* Length Wtd. (ft)        *  579.64  * Wetted Per. (ft)         *  120.53  *  208.58  *  371.52  *
* Min Ch El (ft)          * 1614.02  * Shear (lb/sq ft)         *    0.22  *    0.39  *    0.17  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)   *    0.58  *    1.40  *    0.38  *
* Frctn Loss (ft)         *    3.30  * Cum Volume (acre-ft)     *  168.09  *  176.57  *  119.98  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   58.93  *   36.71  *   46.96  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1617.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.36  * Wt. n-Val.              *          *   0.033  *          *
* W.S. Elev (ft)          * 1617.17  * Reach Len. (ft)         *  638.00  *  599.24  *  504.00  *
* Crit W.S. (ft)          * 1616.84  * Flow Area (sq ft)       *          *  315.00  *          *
* E.G. Slope (ft/ft)      *0.006747  * Area (sq ft)            *          *  315.00  *          *
* Q Total (cfs)           * 1520.00  * Flow (cfs)              *          * 1520.00  *          *
* Top Width (ft)          *  208.02  * Top Width (ft)           *          *  208.02  *          *
* Vel Total (ft/s)        *    4.83  * Avg. Vel. (ft/s)         *          *    4.83  *          *
* Max Chl Dpth (ft)       *    3.15  * Hydr. Depth (ft)         *          *    1.51  *          *
* Conv. Total (cfs)       * 18504.4  * Conv. (cfs)              *          * 18504.4  *          *
* Length Wtd. (ft)        *  599.24  * Wetted Per. (ft)         *          *  211.39  *          *
* Min Ch El (ft)          * 1614.02  * Shear (lb/sq ft)         *          *    0.63  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.03  *          *
* Frctn Loss (ft)         *    3.24  * Cum Volume (acre-ft)     *   45.49  *  195.53  *   30.92  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *    7.83  *   36.71  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9651.18   * 9878.60   *   210.64 *    80.97 *   120.53 *    13.86 *
0.67 *     2.60 *
* 2        * Chan      * 9878.60   * 10086.62  *   881.13 *   242.78 *   208.58 *    57.97 *
1.17 *     3.63 *
* 3        * ROB       * 10086.62  * 10339.46  *   391.68 *   158.25 *   252.85 *    25.77 *
0.63 *     2.48 *
```

```
* 4          * ROB        * 10339.46  * 10592.30  *    36.55 *    36.84 *   118.67 *     2.40 *
0.31 *     0.99 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos        * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *            * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan       * 9878.60   * 10086.62  *  1520.00 *   315.00 *   211.39 *   100.00 *
1.51 *     4.83 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 2.703

INPUT
Description: Interpolated point added at (9883.4, 1612.431) to set bank station.
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9607.48 1614.06 9614.17 1614.05 9629.52 1613.99 9651.57    1614 9655.05 1614.01
 9673.61 1614.02 9695.65 1614.08 9702.61 1614.09 9705.02 1614.09  9717.7 1614.11
 9739.74 1614.14 9750.18 1614.13 9761.78 1614.11  9781.7 1613.99 9783.83 1613.99
 9805.87  1613.8 9827.91 1613.55 9849.95 1613.27 9860.84 1613.08    9872 1612.78
  9883.41612.431 9892.88 1612.14 9894.04 1612.11 9898.03 1611.98 9916.08 1611.98
 9938.13 1612.11 9940.45 1612.11 9948.37 1612.06 9955.67 1612.06 9960.17 1612.01
 9982.21 1611.91 9988.01 1611.89 9995.14 1611.8510004.26 1611.88 10026.3 1611.87
10035.58 1611.8610048.34  1611.810070.39 1611.8210072.86 1611.8210083.15 1611.88
10092.43 1611.9410114.47 1612.1810130.72 1612.3410136.52 1612.4110158.56 1612.54
10177.22 1612.64 10180.6 1612.6710202.65 1612.7610224.69 1612.8410225.85 1612.84
10246.73 1612.9710248.71 1612.9810268.78 1613.1610273.42  1613.210290.82 1613.36
10312.86 1613.5810320.65 1613.6610320.98 1613.66 10334.9 1613.7710356.95 1613.94
10368.55 1614.0510378.99 1614.14 10387.3 1614.1910401.03 1614.2210416.12 1614.19
10420.12  1614.210423.08 1614.2210445.12 1614.4110463.68 1614.6610467.16 1614.71
10478.22 1614.7710489.21 1614.8210511.25 1614.89

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9607.48    .033    9872     .0510202.65    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9892.8810114.47              448  460.71     433             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1613.68  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.14  * Wt. n-Val.           *   0.045  *   0.050  *   0.044  *
* W.S. Elev (ft)         * 1613.54  * Reach Len. (ft)      *  448.00  *  460.71  *  433.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)    *   36.25  *  354.43  *  138.84  *
* E.G. Slope (ft/ft)     *0.006128  * Area (sq ft)         *   36.25  *  354.43  *  138.84  *
* Q Total (cfs)          * 1520.00  * Flow (cfs)           *   77.60  * 1127.65  *  314.74  *
* Top Width (ft)         *  480.29  * Top Width (ft)       *   64.24  *  221.59  *  194.46  *
* Vel Total (ft/s)       *    2.87  * Avg. Vel. (ft/s)     *    2.14  *    3.18  *    2.27  *
* Max Chl Dpth (ft)      *    1.74  * Hydr. Depth (ft)     *    0.56  *    1.60  *    0.71  *
* Conv. Total (cfs)      * 19417.7  * Conv. (cfs)          *   991.4  * 14405.5  *  4020.8  *
* Length Wtd. (ft)       *  453.97  * Wetted Per. (ft)     *   64.26  *  221.60  *  194.47  *
```

```
* Min Ch El (ft)          * 1611.80  * Shear (lb/sq ft)        *    0.22  *    0.61  *    0.27  *
* Alpha                   *    1.07  * Stream Power (lb/ft s) *    0.46  *    1.95  *    0.62  *
* Frctn Loss (ft)         *    2.97  * Cum Volume (acre-ft)   *  167.23  *  172.46  *  118.04  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   57.58  *   33.75  *   43.69  *
*********************************************************************************************

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 OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1614.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *          *    0.050  *          *
* W.S. Elev (ft)          * 1614.06  * Reach Len. (ft)        *  448.00  *  460.71  *  433.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  470.20  *          *
* E.G. Slope (ft/ft)      *0.004439  * Area (sq ft)           *          *  470.20  *          *
* Q Total (cfs)           * 1520.00  * Flow (cfs)              *          * 1520.00  *          *
* Top Width (ft)          *  221.59  * Top Width (ft)          *          *  221.59  *          *
* Vel Total (ft/s)        *    3.23  * Avg. Vel. (ft/s)        *          *    3.23  *          *
* Max Chl Dpth (ft)       *    2.26  * Hydr. Depth (ft)        *          *    2.12  *          *
* Conv. Total (cfs)       * 22813.4  * Conv. (cfs)             *          * 22813.4  *          *
* Length Wtd. (ft)        *  460.71  * Wetted Per. (ft)        *          *  225.40  *          *
* Min Ch El (ft)          * 1611.80  * Shear (lb/sq ft)        *          *    0.58  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    1.87  *          *
* Frctn Loss (ft)         *    2.66  * Cum Volume (acre-ft)   *   45.49  *  190.13  *   30.92  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    7.83  *   33.75  *    6.56  *
*********************************************************************************************

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.

  Profile #1
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9750.18   * 9892.88   *    77.60 *    36.25 *    64.26 *     5.11 *
0.56 *     2.14 *
* 2        * Chan      * 9892.88   * 10114.47  *  1127.65 *   354.43 *   221.60 *    74.19 *
1.60 *     3.18 *
* 3        * ROB       * 10114.47  * 10312.86  *   314.74 *   138.84 *   194.47 *    20.71 *
0.71 *     2.27 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9892.88   * 10114.47  *  1520.00 *   470.20 *   225.40 *   100.00 *
2.12 *     3.23 *
*********************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 2.615
```

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs, low ground left of levee appears to be minor tributary flowing into floodplain.
Interpolated point added at (10160.32, 1609.324) to set bank station.

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9238.28	1611.1	9241.49	1611.1	9272.9	1610.96	9309.47	1610.64	9323.24	1610.55
9340.24	1610.6	9391.06	1610.68	9417.28	1610.46	9470.24	1610.56	9494.5	1610.79
9502.31	1610.8	9516.31	1610.96	9521.18	1611.06	9565.74	1611.38	9598.18	1611.12
9608.15	1611	9653.49	1610.91	9677.35	1610.93	9702.74	1610.8	9752.1	1610.36
9771.28	1610.2	9774.56	1610.1	9782.85	1610	9785.03	1610	9792.76	1609.85
9798.53	1609.82	9823.04	1609.52	9838.54	1609.348	9840.13	1609.33	9865.47	1609.3
9888.94	1609.23	9893.24	1609.05	9916.98	1609.19	9962.03	1609.26	10000	1609
10060.83	1609.04	10070.9	1608.88	10075.89	1608.77	10082.06	1608.88	10119.33	1609.324
10142.49	1609.61	10144.67	1609.642	10146.68	1609.68	10148.11	1609.71	10165.49	1610
10186.17	1610.41	10195.78	1610.52	10210.1	1610.56	10221.95	1610.59	10224.23	1610.6
10225.73	1610.61	10228.25	1610.61	10228.76	1610.61	10229.18	1610.62	10229.83	1610.62
10232.92	1610.66	10234.79	1610.71	10301.54	1611.45	10326.83	1611.92	10331.45	1612.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9238.28	.033	9838.54	.05	10119.33	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9962.03	10119.33	397	450.44	510	.1	.3

Left Levee Station= 9565.74 Elevation= 1611.38

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1610.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.046	0.050	0.050
W.S. Elev (ft)	1610.56	Reach Len. (ft)	397.00	450.44	510.00
Crit W.S. (ft)	1610.08	Flow Area (sq ft)	226.16	237.16	51.20
E.G. Slope (ft/ft)	0.007025	Area (sq ft)	226.16	237.16	51.20
Q Total (cfs)	1520.00	Flow (cfs)	655.31	776.70	88.00
Top Width (ft)	478.55	Top Width (ft)	231.92	157.30	89.33
Vel Total (ft/s)	2.95	Avg. Vel. (ft/s)	2.90	3.27	1.72
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)	0.98	1.51	0.57
Conv. Total (cfs)	18135.6	Conv. (cfs)	7818.7	9267.0	1049.9
Length Wtd. (ft)	439.87	Wetted Per. (ft)	231.93	157.31	89.34
Min Ch El (ft)	1608.77	Shear (lb/sq ft)	0.43	0.66	0.25
Alpha	1.06	Stream Power (lb/ft s)	1.24	2.17	0.43
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	165.88	169.34	117.10
C & E Loss (ft)	0.00	Cum SA (acres)	56.05	31.75	42.28

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 OUTPUT Profile #2

E.G. Elev (ft)	1611.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.050	
W.S. Elev (ft)	1611.26	Reach Len. (ft)	397.00	450.44	510.00
Crit W.S. (ft)	1610.48	Flow Area (sq ft)		347.40	
E.G. Slope (ft/ft)	0.007789	Area (sq ft)		347.40	
Q Total (cfs)	1520.00	Flow (cfs)		1520.00	
Top Width (ft)	157.30	Top Width (ft)		157.30	
Vel Total (ft/s)	4.38	Avg. Vel. (ft/s)		4.38	
Max Chl Dpth (ft)	2.49	Hydr. Depth (ft)		2.21	
Conv. Total (cfs)	17222.6	Conv. (cfs)		17222.6	
Length Wtd. (ft)	450.44	Wetted Per. (ft)		161.24	
Min Ch El (ft)	1608.77	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		4.58	

```
* Frctn Loss (ft)        *    3.20  * Cum Volume (acre-ft)   *   45.49  *  185.80  *   30.92  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *    7.83  *   31.75  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9565.74   * 9962.03   *   655.31 *   226.16 *   231.93 *    43.11 *
0.98 *     2.90 *
* 2        * Chan      * 9962.03   * 10119.33  *   776.70 *   237.16 *   157.31 *    51.10 *
1.51 *     3.27 *
* 3        * ROB       * 10119.33  * 10225.39  *    88.00 *    51.20 *    89.34 *     5.79 *
0.57 *     1.72 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9962.03   * 10119.33  *  1520.00 *   347.40 *   161.24 *   100.00 *
2.21 *     4.38 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 2.530

INPUT
Description:
Station Elevation Data    num=     119
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9251.98 1610.25 9276.91 1610.37 9285.48 1610.29 9301.84 1610.31 9318.98 1610.22
 9326.77 1610.19 9336.04 1610.15  9351.7 1609.99 9376.63 1609.66 9385.98 1609.51
 9401.56 1609.27 9419.48 1609.02 9426.49 1608.92 9441.47 1608.77 9452.98  1608.7
 9476.35 1608.59 9486.49 1608.56 9501.28  1608.5 9519.99 1608.49 9526.21  1608.5
 9540.17  1608.5 9551.14 1608.53 9553.49 1608.55 9576.07 1608.71 9586.99 1608.79
    9601 1608.87 9620.49 1608.83 9623.17 1608.78 9625.93 1608.74    9632 1608.08
 9650.86 1608.27 9651.46 1608.13 9653.99 1608.22  9662.5 1608.37 9675.79 1608.26
 9687.49 1608.25  9713.9 1608.03 9720.99 1608.06 9725.65 1608.01 9750.58 1607.81
 9754.49 1607.77 9775.51 1607.34 9787.99 1607.21 9800.44 1607.02 9816.49 1606.67
 9821.49 1606.52 9825.37 1606.49  9850.3 1606.26 9854.99 1606.21 9875.23 1606.16
```

```
 9888.49 1606.12 9899.74 1606.11 9900.17  1606.1 9921.99 1606.02  9925.1 1606.02
 9950.03 1605.93  9955.5 1605.92 9974.96 1605.85    9989 1605.81 9999.89  1605.8
10008.67 1605.79 10022.5 1605.8110024.82 1605.8110049.75 1605.91   10056 1605.96
10074.68 1606.0910089.21 1606.21 10089.5 1606.2410099.61 1606.33   10123 1606.57
10124.54 1606.5910149.47 1606.86 10156.5 1606.9310168.77 1607.07 10174.4 1607.14
   10190 1607.3210199.33 1607.44 10223.5 1607.7310224.26 1607.74 10230.3 1607.78
10249.19 1607.96   10257 1608.0210274.12 1608.0910286.52 1608.11 10290.5 1608.11
10299.05  1608.110323.98 1608.05   10324 1608.0510348.91 1608.11   10356 1608.15
 10357.5 1608.1510373.84 1608.2710391.01 1608.4310398.77 1608.53 10423.7 1608.87
10424.51 1608.8810433.05 1609.0310448.63 1609.1910458.01 1609.2810473.56 1609.45
10491.51 1609.6910498.49 1609.85 10501.3 1609.9210523.42 1610.3510531.51 1610.35
10539.41  1610.210548.35 1610.2410551.02 1610.2710558.51 1610.3710573.28 1610.62
10576.01 1610.6410592.01 1611.0110598.21 1611.1310623.14 1611.5310625.51 1611.55
10648.07 1611.6610657.27 1611.6810659.01 1611.6910692.51 1611.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9251.98    .033 9800.44     .0510124.54    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9899.7410074.68               429  438.56     439              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1607.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.049  *   0.050  *   0.044  *
* W.S. Elev (ft)         * 1607.52  * Reach Len. (ft)         *  429.00  *  438.56  *  439.00  *
* Crit W.S. (ft)         * 1607.04  * Flow Area (sq ft)       *  124.39  *  281.24  *   98.68  *
* E.G. Slope (ft/ft)     *0.006753  * Area (sq ft)            *  124.39  *  281.24  *   98.68  *
* Q Total (cfs)          * 1520.00  * Flow (cfs)              *  325.25  *  942.57  *  252.19  *
* Top Width (ft)         *  439.70  * Top Width (ft)          *  133.18  *  174.94  *  131.58  *
* Vel Total (ft/s)       *    3.01  * Avg. Vel. (ft/s)        *    2.61  *    3.35  *    2.56  *
* Max Chl Dpth (ft)      *    1.73  * Hydr. Depth (ft)        *    0.93  *    1.61  *    0.75  *
* Conv. Total (cfs)      * 18496.8  * Conv. (cfs)             *  3957.9  * 11470.1  *  3068.8  *
* Length Wtd. (ft)       *  436.58  * Wetted Per. (ft)        *  133.19  *  174.94  *  131.59  *
* Min Ch El (ft)         * 1605.79  * Shear (lb/sq ft)        *    0.39  *    0.68  *    0.32  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)  *    1.03  *    2.27  *    0.81  *
* Frctn Loss (ft)        *    2.87  * Cum Volume (acre-ft)    *  164.29  *  166.65  *  116.22  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   54.39  *   30.03  *   40.98  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1608.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.25  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)         * 1608.10  * Reach Len. (ft)         *  429.00  *  438.56  *  439.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  382.47  *          *
* E.G. Slope (ft/ft)     *0.006496  * Area (sq ft)            *          *  382.47  *          *
* Q Total (cfs)          * 1520.00  * Flow (cfs)              *          * 1520.00  *          *
* Top Width (ft)         *  174.94  * Top Width (ft)          *          *  174.94  *          *
* Vel Total (ft/s)       *    3.97  * Avg. Vel. (ft/s)        *          *    3.97  *          *
* Max Chl Dpth (ft)      *    2.31  * Hydr. Depth (ft)        *          *    2.19  *          *
* Conv. Total (cfs)      * 18859.6  * Conv. (cfs)             *          * 18859.6  *          *
* Length Wtd. (ft)       *  438.56  * Wetted Per. (ft)        *          *  178.94  *          *
* Min Ch El (ft)         * 1605.79  * Shear (lb/sq ft)        *          *    0.87  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    3.44  *          *
* Frctn Loss (ft)        *    3.02  * Cum Volume (acre-ft)    *   45.49  *  182.03  *   30.92  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    7.83  *   30.03  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9575.86   * 9899.74   *   325.25 *   124.39 *   133.19 *    21.40 *
0.93 *     2.61 *
* 2         * Chan      * 9899.74   * 10074.68  *   942.57 *   281.24 *   174.94 *    62.01 *
1.61 *     3.35 *
* 3         * ROB       * 10074.68  * 10383.59  *   252.19 *    98.68 *   131.59 *    16.59 *
0.75 *     2.56 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9899.74   * 10074.68  *  1520.00 *   382.47 *   178.94 *   100.00 *
2.19 *     3.97 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 2.447

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,540cfs.
Station Elevation Data    num=     103
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************
 9314.42     1608 9317.19 1608.03 9339.23 1608.06  9353.1     1608 9358.18     1608
 9402.59   1607.8 9421.01 1607.72 9440.66 1607.64 9446.81   1607.8 9452.34     1608
 9452.62     1608 9454.13 1607.48 9459.13 1606.07 9463.63 1606.07 9466.56   1607.7
 9467.02     1608 9467.32     1608 9479.68 1607.79 9516.78 1607.05 9541.77 1606.81
 9600.66  1606.34 9634.67     1606 9667.56   1605.6 9674.39 1605.51 9695.73 1605.27
 9704.12   1605.1 9723.28 1604.85 9754.81   1604.4 9778.29 1604.09 9779.47 1604.08
 9781.53     1604 9781.73 1604.06 9788.06 1604.04 9798.96     1604 9800.58 1603.99
 9801.86     1604     98071603.961 9822.86 1603.84 9858.08   1603.6 9859.08   1603.6
 9859.23  1603.59 9859.83   1603.6 9864.43 1603.54 9871.37 1603.52 9912.31 1603.43
 9962.21  1603.09 9966.79   1603.1 9969.37 1603.06 9992.79 1603.17 9995.36 1603.13
 9995.96  1602.98 9998.99    1602 9999.04 1601.99 9999.44   1601.8 9999.71 1601.73
10000.51     1602 10000.6     160210001.06 1602.1610004.22 1603.0710022.41 1603.27
10042.59   1603.1 10065.2 1603.1510094.79 1603.2910120.13 1603.4210146.17 1603.54
10156.93   1603.610157.311603.60310192.61 1603.8810205.04     160410227.98 1604.19
10230.68   1604.210242.21 1604.3410299.41 1605.0210337.97 1605.4310369.63 1605.63
10421.62     1606 10425.2 1605.9910425.85     160610439.96 1606.1110444.66 1606.14
10464.57   1606.210490.25   1606.510497.98 1606.6410539.54 1607.5110570.61   1607.7
10575.15 1607.7110577.68 1607.7410581.03 1607.7910587.36 1607.9210590.83     1608
10608.36 1608.3910627.49 1608.6410628.69 1608.64 10629.5  1608.610667.08 1608.91
10677.33 1608.9110692.81 1608.9210696.04 1608.9110703.02     160910708.64 1609.01
10717.35 1608.5910737.59 1608.5710738.15 1608.61

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
*********************************************
 9314.42     .033     9807      .0510205.04     .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
9912.3110120.13              422  428.52     382              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1604.80  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.047  *   0.050  *   0.047  *
* W.S. Elev (ft)          * 1604.67  * Reach Len. (ft)         *  422.00  *  428.52  *  382.00  *
* Crit W.S. (ft)          * 1604.22  * Flow Area (sq ft)       *  140.73  *  310.34  *  108.86  *
* E.G. Slope (ft/ft)      *0.006390  * Area (sq ft)            *  140.73  *  310.34  *  108.86  *
* Q Total (cfs)           * 1540.00  * Flow (cfs)              *  331.90  *  961.87  *  246.23  *
* Top Width (ft)          *  534.20  * Top Width (ft)          *  176.47  *  207.82  *  149.91  *
* Vel Total (ft/s)        *    2.75  * Avg. Vel. (ft/s)        *    2.36  *    3.10  *    2.26  *
* Max Chl Dpth (ft)       *    2.94  * Hydr. Depth (ft)        *    0.80  *    1.49  *    0.73  *
* Conv. Total (cfs)       * 19265.0  * Conv. (cfs)             *  4151.9  * 12032.8  *  3080.3  *
* Length Wtd. (ft)        *  419.93  * Wetted Per. (ft)        *  176.49  *  208.25  *  149.91  *
* Min Ch El (ft)          * 1601.73  * Shear (lb/sq ft)        *    0.32  *    0.59  *    0.29  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.75  *    1.84  *    0.66  *
* Frctn Loss (ft)         *    2.61  * Cum Volume (acre-ft)    *  162.98  *  163.68  *  115.18  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   52.86  *   28.11  *   39.57  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1605.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)          * 1605.09  * Reach Len. (ft)         *  422.00  *  428.52  *  382.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  398.04  *          *
* E.G. Slope (ft/ft)      *0.007298  * Area (sq ft)            *          *  398.04  *          *
* Q Total (cfs)           * 1540.00  * Flow (cfs)              *          * 1540.00  *          *
* Top Width (ft)          *  207.82  * Top Width (ft)          *          *  207.82  *          *
* Vel Total (ft/s)        *    3.87  * Avg. Vel. (ft/s)        *          *    3.87  *          *
* Max Chl Dpth (ft)       *    3.36  * Hydr. Depth (ft)        *          *    1.92  *          *
* Conv. Total (cfs)       * 18026.6  * Conv. (cfs)             *          * 18026.6  *          *
* Length Wtd. (ft)        *  427.97  * Wetted Per. (ft)        *          *  211.59  *          *
* Min Ch El (ft)          * 1601.73  * Shear (lb/sq ft)        *          *    0.86  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.32  *          *
* Frctn Loss (ft)         *    2.38  * Cum Volume (acre-ft)    *   45.49  *  178.10  *   30.92  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    7.83  *   28.10  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9613.37   * 9912.31   *   331.90 *   140.73 *   176.49 *    21.55 *
0.80 *     2.36 *
* 2        * Chan      * 9912.31   * 10120.13  *   961.87 *   310.34 *   208.25 *    62.46 *
1.49 *     3.10 *
* 3        * ROB       * 10120.13  * 10429.14  *   246.23 *   108.86 *   149.91 *    15.99 *
0.73 *     2.26 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)       * (ft)       *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9912.31    * 10120.13   *  1540.00 *   398.04 *   211.59 *   100.00 *
1.92 *     3.87 *
*****************************************************************************************************
******************
```

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: WASH 3-WEST
REACH: REACH-1 RS: 2.366

INPUT
Description: Interpolated point added at (10092.58, 1600.5) to set bank station.
Station Elevation Data num= 71

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9650.71604.412 9650.731604.412 9654.021604.381 9674.761604.161 9686.751604.009
  9698.81603.875 9722.811603.603 9722.841603.602 9746.881603.309 9757.351603.172
 9758.861603.157 9770.911602.993 9794.921602.662 9794.951602.662 9818.991602.323
 9830.971602.145 9843.021601.987 9867.031601.644 9867.061601.644  9891.11601.299
 9891.15  1601.3 9903.081601.124 9915.141600.922 9939.141600.586 9939.171600.586
 9951.171600.524 9955.961599.626  9959.91600.278 9963.211600.173  9975.21600.513
 9987.251599.738 9992.031600.052 9999.96 1597.2310007.761599.56810011.251599.669
10011.281599.67210035.321600.10610047.311600.09310059.361600.18410075.561600.344
10083.361600.39510083.391600.39610092.58  1600.510107.431600.66810119.421600.799
10131.47 1600.9910154.51 1601.3610155.471601.43110155.511601.43110179.541601.948
10183.151602.04210191.53  1602.110203.581602.16310227.581602.25310227.621602.253
10251.661602.28210263.641602.38310275.691602.49510299.69 1602.9410299.731602.941
10323.771603.29610335.751603.516 10347.81603.734 10348.7 1603.76 10371.81603.953
10371.841603.95310395.881604.02410407.861604.18410419.921604.34110443.911604.646
10443.951604.647
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9650.7    .033 9939.17     .0510107.43    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9975.210092.58              642  662.46     617              .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1602.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.19  * Wt. n-Val.              *   0.042  *   0.050  *   0.038  *
* W.S. Elev (ft)         * 1602.00  * Reach Len. (ft)         *  642.00  *  662.46  *  617.00  *
* Crit W.S. (ft)         * 1601.43  * Flow Area (sq ft)       *  128.70  *  246.89  *   76.67  *
* E.G. Slope (ft/ft)     *0.006049  * Area (sq ft)            *  128.70  *  246.89  *   76.67  *
* Q Total (cfs)          * 1540.00  * Flow (cfs)              *  385.59  *  932.18  *  222.23  *
* Top Width (ft)         *  339.52  * Top Width (ft)          *  133.18  *  117.38  *   88.96  *
* Vel Total (ft/s)       *    3.41  * Avg. Vel. (ft/s)        *    3.00  *    3.78  *    2.90  *
* Max Chl Dpth (ft)      *    4.77  * Hydr. Depth (ft)        *    0.97  *    2.10  *    0.86  *
* Conv. Total (cfs)      * 19800.5  * Conv. (cfs)             *  4957.7  * 11985.5  *  2857.4  *
* Length Wtd. (ft)       *  650.58  * Wetted Per. (ft)        *  133.33  *  118.25  *   88.98  *
* Min Ch El (ft)         * 1597.23  * Shear (lb/sq ft)        *    0.36  *    0.79  *    0.33  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    1.09  *    2.98  *    0.94  *
* Frctn Loss (ft)        *    4.45  * Cum Volume (acre-ft)    *  161.67  *  160.94  *  114.36  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   51.36  *   26.51  *   38.52  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)         * 1602.94  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.22  * Wt. n-Val.              *   0.050  *   0.050  *          *
```

```
* W.S. Elev (ft)          * 1602.72  * Reach Len. (ft)         *  642.00  *  662.46  *  617.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   76.43  *  331.49  *          *
* E.G. Slope (ft/ft)      *0.004382  * Area (sq ft)            *   76.43  *  331.49  *          *
* Q Total (cfs)           * 1540.00  * Flow (cfs)              *  259.47  * 1280.54  *          *
* Top Width (ft)          *  148.79  * Top Width (ft)          *   31.41  *  117.38  *          *
* Vel Total (ft/s)        *    3.78  * Avg. Vel. (ft/s)        *    3.40  *    3.86  *          *
* Max Chl Dpth (ft)       *    5.49  * Hydr. Depth (ft)        *    2.43  *    2.82  *          *
* Conv. Total (cfs)       * 23263.1  * Conv. (cfs)             *  3919.5  * 19343.6  *          *
* Length Wtd. (ft)        *  660.74  * Wetted Per. (ft)        *   33.71  *  120.47  *          *
* Min Ch El (ft)          * 1597.23  * Shear (lb/sq ft)        *    0.62  *    0.75  *          *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    2.11  *    2.91  *          *
* Frctn Loss (ft)         *    4.53  * Cum Volume (acre-ft)    *   45.12  *  174.51  *   30.92  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *    7.68  *   26.50  *    6.56  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9812.95   * 9975.20   *   385.59 *   128.70 *   133.33 *    25.04 *
0.97 *     3.00 *
* 2         * Chan      * 9975.20   * 10092.58  *   932.18 *   246.89 *   118.25 *    60.53 *
2.10 *     3.78 *
* 3         * ROB       * 10092.58  * 10268.27  *   222.23 *    76.67 *    88.98 *    14.43 *
0.86 *     2.90 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9812.95   * 9975.20   *   259.47 *    76.43 *    33.71 *    16.85 *
2.43 *     3.40 *
* 2         * Chan      * 9975.20   * 10092.58  *  1280.54 *   331.49 *   120.47 *    83.15 *
2.82 *     3.86 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 2.240

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9793.55  1600.5 9796.75 1600.43 9806.88  1600.1 9820.24 1599.56 9831.69 1599.07
  9831.9 1599.18 9843.73 1598.66 9854.05 1598.44 9867.21 1598.01 9869.83 1597.97
```

```
  9883.1 1597.66  9890.7 1597.68 9907.97  1597.6 9914.19 1597.49 9937.68  1596.6
 9941.27 1596.35 9946.11 1596.29 9951.15 1596.25 9961.17 1596.15 9984.25 1595.99
  9984.9 1595.99 9997.19 1595.9110004.95 1594.1810008.14 1595.3310012.73 1595.69
10022.39 1595.6410026.42 1595.7110031.63 1595.7510055.12  1595.710060.53 1595.69
10078.61 1595.6910098.67  1595.8 10102.1 1595.8210125.59 1596.2410136.81 1596.45
10149.08 1596.6210172.56 1596.8410174.95 1596.8810196.05 1597.3210203.88 1597.49
10213.09 1597.7210219.54 1597.9210243.03  1598.610251.23 1598.7710266.52  1599.2
10290.01 1599.9510313.49 1600.6410327.51 1601.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9793.55    .033  9984.9    .03810098.67    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9984.910098.67              434  471.47     489              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1597.72  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.32  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)         * 1597.40  * Reach Len. (ft)         *  434.00  *  471.47  *  489.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   66.30  *  198.27  *   83.55  *
* E.G. Slope (ft/ft)     *0.007797  * Area (sq ft)            *   66.30  *  198.27  *   83.55  *
* Q Total (cfs)          * 1540.00  * Flow (cfs)              *  258.33  *  989.04  *  292.63  *
* Top Width (ft)         *  283.15  * Top Width (ft)           *   68.33  *  113.77  *  101.05  *
* Vel Total (ft/s)       *    4.42  * Avg. Vel. (ft/s)         *    3.90  *    4.99  *    3.50  *
* Max Chl Dpth (ft)      *    3.22  * Hydr. Depth (ft)         *    0.97  *    1.74  *    0.83  *
* Conv. Total (cfs)      * 17440.4  * Conv. (cfs)              *  2925.5  * 11200.8  *  3314.0  *
* Length Wtd. (ft)       *  470.61  * Wetted Per. (ft)         *   68.35  *  114.18  *  101.06  *
* Min Ch El (ft)         * 1594.18  * Shear (lb/sq ft)         *    0.47  *    0.85  *    0.40  *
* Alpha                  *    1.07  * Stream Power (lb/ft s)   *    1.84  *    4.22  *    1.41  *
* Frctn Loss (ft)        *    3.68  * Cum Volume (acre-ft)     *  160.24  *  157.55  *  113.23  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   49.88  *   24.75  *   37.17  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1598.37  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.70  * Wt. n-Val.              *          *   0.038  *          *
* W.S. Elev (ft)         * 1597.67  * Reach Len. (ft)         *  434.00  *  471.47  *  489.00  *
* Crit W.S. (ft)         * 1597.44  * Flow Area (sq ft)       *          *  228.64  *          *
* E.G. Slope (ft/ft)     *0.012243  * Area (sq ft)            *          *  228.64  *          *
* Q Total (cfs)          * 1540.00  * Flow (cfs)              *          * 1540.00  *          *
* Top Width (ft)         *  113.77  * Top Width (ft)           *          *  113.77  *          *
* Vel Total (ft/s)       *    6.74  * Avg. Vel. (ft/s)         *          *    6.74  *          *
* Max Chl Dpth (ft)      *    3.49  * Hydr. Depth (ft)         *          *    2.01  *          *
* Conv. Total (cfs)      * 13917.8  * Conv. (cfs)              *          * 13917.8  *          *
* Length Wtd. (ft)       *  471.47  * Wetted Per. (ft)         *          *  117.72  *          *
* Min Ch El (ft)         * 1594.18  * Shear (lb/sq ft)         *          *    1.48  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *   10.00  *          *
* Frctn Loss (ft)        *    3.56  * Cum Volume (acre-ft)     *   44.55  *  170.25  *   30.92  *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)           *    7.45  *   24.74  *    6.56  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9889.23   * 9984.90   *   258.33 *    66.30 *    68.35 *    16.77 *
0.97 *     3.90 *
* 2          * Chan      * 9984.90   * 10098.67  *   989.04 *   198.27 *   114.18 *    64.22 *
1.74 *     4.99 *
* 3          * ROB       * 10098.67  * 10213.09  *   292.63 *    83.55 *   101.06 *    19.00 *
0.83 *     3.50 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9984.90   * 10098.67  *  1540.00 *   228.64 *   117.72 *   100.00 *
2.01 *     6.74 *
*****************************************************************************************************
******************

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.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 2.151

INPUT
Description:
Station Elevation Data    num=     138
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9524.68  1597.8 9530.37 1597.85 9536.07 1597.91 9538.28 1597.93 9540.23 1597.93
 9570.25  1597.4  9579.4 1597.34 9585.12 1597.37 9597.63 1597.43 9605.57  1597.5
 9611.25 1597.52 9625.14 1597.67 9627.87 1597.68 9632.73 1597.72 9634.07  1597.7
  9635.2 1597.71  9639.4 1597.62 9663.94 1597.53 9685.47 1597.41 9691.28  1597.4
  9715.2 1596.92 9718.33 1597.06 9721.39 1597.14 9725.89 1597.15 9730.42  1597.2
 9734.45 1597.28 9738.87  1597.4 9740.68 1597.39  9750.8  1597.4 9753.53 1597.42
 9757.17 1597.41 9775.95 1597.05 9780.71 1597.01 9790.59  1596.9 9794.06 1596.78
 9799.61 1596.35 9804.53 1596.21 9808.67 1596.08 9810.87    1596 9811.39 1595.96
 9829.68 1595.16 9835.24 1594.94 9840.67 1594.82 9852.98  1594.6 9855.28 1594.49
 9864.87 1594.38 9875.41  1594.1 9878.85    1594 9882.13    1594 9898.85  1593.8
 9902.34 1593.77    9912  1593.5 9917.54 1593.49 9921.62  1593.4 9924.07 1593.33
 9928.87 1593.23 9943.64  1592.9 9946.01 1592.78  9958.1 1592.48 9960.67 1592.44
 9961.63 1592.42 9967.751592.206  9970.8  1592.1 9971.42 1592.13 9974.95 1592.11
 9978.83 1592.07 9983.65    1592 9986.17  1591.9  9986.2 1591.88 9987.49 1591.52
 9992.33 1590.46 9994.18 1590.8210001.78  1591.810003.47  1591.810012.35 1591.85
10016.98  1591.810023.98 1591.7910042.24 1591.6910044.14 1591.2210047.78 1590.35
10050.15 1590.7910054.87  1591.610058.28 1591.7810061.52    159210062.25 1592.07
10067.66 1592.1810075.96  1592.510099.421592.66810110.86 1592.7510112.66 1592.76
10113.71 1592.7710151.66 1593.0110166.42  1593.210187.78 1593.5110201.52 1593.73
10201.91 1593.7310208.09 1593.72 10224.6  1593.710231.23 1593.6410250.12 1593.74
10254.44 1593.7710255.67  1593.810256.25  1593.710261.04 1593.0210267.02 1593.76
10267.18 1593.78 10277.2  1593.910284.55    159410290.89 1594.0810302.93 1594.44
10306.04 1594.5610307.45  1594.610321.15  1595.310329.93 1595.7310337.98    1596
10352.21 1596.6510353.42  1596.710353.97  1596.710355.31 1596.7110369.57  1596.7
10372.99 1596.7110382.33 1596.6510399.22    159710402.85 1597.0410415.26 1597.31
10442.14 1597.9410445.95    159810448.02    159810448.48 1598.0710449.35 1598.06
 10450.7 1598.0710455.19 1598.0810470.07    159810482.87 1598.1510494.01 1598.18
10497.92  1598.210501.38 1598.2110527.47  1598.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
**********************************************
 9524.68    .033  9958.1    .03810075.96    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9958.110075.96              467  477.22     469            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1594.04  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.37  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)         * 1593.67  * Reach Len. (ft)         *  467.00  *  477.22  *  469.00  *
* Crit W.S. (ft)         * 1593.48  * Flow Area (sq ft)       *   28.59  *  224.63  *   88.11  *
* E.G. Slope (ft/ft)     *0.007848  * Area (sq ft)            *   28.59  *  224.63  *   88.11  *
* Q Total (cfs)          * 1540.00  * Flow (cfs)              *   76.29  * 1192.35  *  271.36  *
* Top Width (ft)         *  311.39  * Top Width (ft)           *   52.24  *  117.86  *  141.29  *
* Vel Total (ft/s)       *    4.51  * Avg. Vel. (ft/s)         *    2.67  *    5.31  *    3.08  *
* Max Chl Dpth (ft)      *    3.32  * Hydr. Depth (ft)         *    0.55  *    1.91  *    0.62  *
* Conv. Total (cfs)      * 17383.2  * Conv. (cfs)              *   861.2  * 13459.0  *  3063.0  *
* Length Wtd. (ft)       *  474.22  * Wetted Per. (ft)         *   52.26  *  118.43  *  141.38  *
* Min Ch El (ft)         * 1590.35  * Shear (lb/sq ft)         *    0.27  *    0.93  *    0.31  *
* Alpha                  *    1.17  * Stream Power (lb/ft s)   *    0.72  *    4.93  *    0.94  *
* Frctn Loss (ft)        *    3.76  * Cum Volume (acre-ft)     *  159.77  *  155.26  *  112.27  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   49.28  *   23.49  *   35.81  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1594.73  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.41  * Wt. n-Val.              *          *   0.038  *          *
* W.S. Elev (ft)         * 1594.32  * Reach Len. (ft)         *  467.00  *  477.22  *  469.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  301.53  *          *
* E.G. Slope (ft/ft)     *0.005111  * Area (sq ft)            *          *  301.53  *          *
* Q Total (cfs)          * 1540.00  * Flow (cfs)              *          * 1540.00  *          *
* Top Width (ft)         *  117.86  * Top Width (ft)           *          *  117.86  *          *
* Vel Total (ft/s)       *    5.11  * Avg. Vel. (ft/s)         *          *    5.11  *          *
* Max Chl Dpth (ft)      *    3.97  * Hydr. Depth (ft)         *          *    2.56  *          *
* Conv. Total (cfs)      * 21542.0  * Conv. (cfs)              *          * 21542.0  *          *
* Length Wtd. (ft)       *  476.96  * Wetted Per. (ft)         *          *  122.10  *          *
* Min Ch El (ft)         * 1590.35  * Shear (lb/sq ft)         *          *    0.79  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    4.02  *          *
* Frctn Loss (ft)        *    3.28  * Cum Volume (acre-ft)     *   44.55  *  167.38  *   30.92  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)           *    7.45  *   23.49  *    6.56  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9741.39   * 9958.10   *    76.29 *    28.59 *    52.26 *     4.95 *
0.55 *     2.67 *
* 2        * Chan      * 9958.10   * 10075.96  *  1192.35 *   224.63 *   118.43 *    77.43 *
1.91 *     5.31 *
* 3        * ROB       * 10075.96  * 10301.71  *   271.36 *    88.11 *   141.38 *    17.62 *
0.62 *     3.08 *
*****************************************************************************************
******************

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.
```

Profile #2

*	* Pos	* Left Sta (ft)	* Right Sta (ft)	* Flow (cfs)	* Area (sq ft)	* W.P. (ft)	* Percent Conv	* Hydr Depth(ft)	* Velocity (ft/s)
* 1	* Chan	* 9958.10	* 10075.96	* 1540.00	* 301.53	* 122.10	* 100.00	* 2.56	* 5.11

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: WASH 3-WEST
REACH: REACH-1 RS: 2.061

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 1,590cfs.
Interpolated point added at (9961.67, 1588.158) to set bank station.

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9667.07	1594.59	9683.13	1594.19	9710.12	1593.24	9736.56	1592.25	9740.28	1592.15
9763.28	1591.42	9770.45	1591.35	9789.99	1591.26	9800.61	1590.98	9811.55	1590.91
9816.71	1590.69	9830.78	1590.52	9843.43	1590.35	9860.95	1590.14	9869.82	1589.81
9870.14	1589.94	9891.11	1589.45	9896.86	1589.37	9921.28	1588.82	9923.57	1588.77
9930.46	1588.64	9950.29	1588.33	9951.44	1588.31	9961.67	1588.158	9968.99	1588.05
9976.73	1587.53	9977.01	1587.31	9981.61	1587.2	9991.18	1587.79	9996.11	1586.42
10003.72	1588	10005.88	1588.06	10011.77	1588.18	10018.09	1588.04	10023.2	1587.18
10029.1	1588.17	10030.44	1588.23	10041.94	1588.32	10057.16	1588.45	10072.1	1588.67
10073.73	1588.59	10083.87	1588.81	10102.27	1589.32	10110.59	1589.61	10132.43	1590.57
10137.3	1590.81	10139.32	1590.94	10162.6	1592.23	10164.02	1592.29	10176.73	1592.76
10190.74	1592.89	10192.76	1592.93	10206.07	1592.78	10217.45	1592.25	10222.93	1592.14
10239.14	1591.78	10244.17	1592.11	10253.09	1592.03	10270.89	1592.08	10272.16	1592.55
10283.26	1592.31	10287.56	1591.96	10297.6	1593	10301.02	1592.12	10313.42	1592.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9667.07	.033	9968.99	.03	10041.94	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9961.67	10030.44	408	428.26	417	.1	.3

CROSS SECTION OUTPUT Profile #1

*	*	*	*	*	*	*	*	*	*
* E.G. Elev (ft)	* 1590.28	* Element	* Left OB	* Channel	* Right OB				
* Vel Head (ft)	* 0.42	* Wt. n-Val.	* 0.033	* 0.038	* 0.034				
* W.S. Elev (ft)	* 1589.87	* Reach Len. (ft)	* 408.00	* 428.26	* 417.00				
* Crit W.S. (ft)	* 1589.66	* Flow Area (sq ft)	* 81.40	* 150.12	* 92.90				
* E.G. Slope (ft/ft)	*0.008016	* Area (sq ft)	* 81.40	* 150.12	* 92.90				
* Q Total (cfs)	* 1590.00	* Flow (cfs)	* 310.48	* 891.13	* 388.39				
* Top Width (ft)	* 244.63	* Top Width (ft)	* 89.92	* 68.77	* 85.95				
* Vel Total (ft/s)	* 4.90	* Avg. Vel. (ft/s)	* 3.81	* 5.94	* 4.18				
* Max Chl Dpth (ft)	* 3.44	* Hydr. Depth (ft)	* 0.91	* 2.18	* 1.08				
* Conv. Total (cfs)	* 17759.4	* Conv. (cfs)	* 3467.9	* 9953.4	* 4338.1				
* Length Wtd. (ft)	* 422.47	* Wetted Per. (ft)	* 89.95	* 69.39	* 85.97				
* Min Ch El (ft)	* 1586.42	* Shear (lb/sq ft)	* 0.45	* 1.08	* 0.54				
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 1.73	* 6.43	* 2.26				
* Frctn Loss (ft)	* 3.13	* Cum Volume (acre-ft)	* 159.18	* 153.21	* 111.29				
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 48.52	* 22.47	* 34.59				

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1591.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.88	Wt. n-Val.		0.038	0.038
W.S. Elev (ft)	1590.52	Reach Len. (ft)	408.00	428.26	417.00
Crit W.S. (ft)	1590.12	Flow Area (sq ft)		195.44	17.52
E.G. Slope (ft/ft)	0.009630	Area (sq ft)		195.44	17.52
Q Total (cfs)	1590.00	Flow (cfs)		1492.15	97.86
Top Width (ft)	76.51	Top Width (ft)		68.77	7.74
Vel Total (ft/s)	7.47	Avg. Vel. (ft/s)		7.63	5.59
Max Chl Dpth (ft)	4.10	Hydr. Depth (ft)		2.84	2.26
Conv. Total (cfs)	16202.9	Conv. (cfs)		15205.7	997.2
Length Wtd. (ft)	427.63	Wetted Per. (ft)		71.76	9.97
Min Ch El (ft)	1586.42	Shear (lb/sq ft)		1.64	1.06
Alpha	1.02	Stream Power (lb/ft s)		12.50	5.90
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	44.55	164.66	30.82
C & E Loss (ft)	0.08	Cum SA (acres)	7.45	22.47	6.51

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9814.37	9961.67	310.48	81.40	89.95	19.53	0.91	3.81
2	Chan	9961.67	10030.44	891.13	150.12	69.39	56.05	2.18	5.94
3	ROB	10030.44	10171.93	388.39	92.90	85.97	24.43	1.08	4.18

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9961.67	10030.44	1492.15	195.44	71.76	93.85	2.84	7.63
2	ROB	10030.44	10171.93	97.86	17.52	9.97	6.15	2.26	5.59

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: WASH 3-WEST
REACH: REACH-1 RS: 1.979

INPUT
Description: Interpolated point added at (9966.79, 1584.893) to set bank station.

```
Station Elevation Data     num=      186
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9563.87  1592.6 9598.27 1592.55  9612.6 1592.35 9640.14 1592.19 9653.31 1592.16
 9659.96  1592.1 9666.97    1592 9686.73 1591.77 9690.83 1591.72  9691.1 1591.72
 9691.11  1591.7 9691.61 1591.71 9692.77 1591.67 9692.88 1591.66 9693.65 1591.64
 9695.05  1591.6 9698.38 1591.42 9731.07    1590 9731.86    1590 9736.87 1589.98
 9739.69  1589.9  9745.7 1589.82 9749.22 1589.76 9767.01  1589.5 9772.08 1589.29
 9779.82     1589  9780.2 1589.01  9787.5  1588.5 9790.82 1588.25 9793.62    1588
 9795.28  1587.9  9796.8 1587.73 9806.85 1587.47 9810.57 1587.37 9813.58 1587.33
 9817.92  1587.2 9819.18 1587.12 9822.64 1586.97 9827.23 1586.41 9830.24 1586.17
 9832.11     1586 9832.36 1586.01 9834.03 1586.07 9839.51 1586.16  9841.7 1586.23
 9849.86  1586.5 9853.31 1586.67 9856.96 1586.91  9861.3 1586.94 9863.21 1586.91
 9869.33  1586.9 9879.99 1586.87 9880.25 1586.87 9880.72 1586.86 9897.57 1586.55
 9906.27  1586.3 9909.91 1586.33 9911.17 1586.31 9916.06 1586.22 9916.99  1586.2
 9927.56  1586.1 9931.18    1586 9931.34    1586 9943.89 1585.88 9952.33  1585.8
 9958.11 1585.79 9962.82 1585.36 9966.791584.893 9969.54 1584.57 9972.36 1584.49
 9976.56  1584.4 9991.21 1584.18 9991.41 1584.15 9991.75    1584 9996.69 1582.86
 9999.16  1582.410001.13 1583.1110004.28    158410004.88 1584.2610004.91 1584.27
10021.77  1584.710024.61 1584.7710027.67 1584.8110032.85 1584.8510041.66 1584.95
   10047  1584.5 10047.2 1584.4310049.15 1584.5610053.88 1584.8510071.24  1585.3
10072.951585.34810082.58 1585.6210089.84 1585.7710090.43 1585.7810090.74 1585.79
10093.43  1585.910096.95 1585.9710106.51 1586.2510111.31 1586.41 10114.9 1586.68
10127.57  1587.210137.04  1587.910138.11 1587.9710151.71 1588.79 10171.3    1590
10171.47 1589.9910171.53    159010172.11    159010186.23  1590.810192.76 1590.91
10201.08 1590.9810213.26 1591.43 10214.8  1591.410219.09 1591.5410225.94 1591.43
10228.51  1591.5 10229.4 1591.5110230.43  1591.510231.45 1591.48 10242.6 1591.22
10246.84 1591.0610252.64    159110254.04 1590.9810256.34 1590.9310260.28  1590.7
10262.98 1590.6110266.32  1590.610270.43 1590.5710275.58 1590.4610280.12  1590.4
10281.38 1590.3910291.24  1590.410291.97 1590.4510292.17 1590.4710295.66 1590.74
10297.11 1590.77 10300.7  1590.910303.33 1591.1510305.18 1591.1510309.13 1591.16
10314.84 1591.4610317.26  1591.610319.77  1591.710322.19  1591.8 10323.6 1591.83
10325.67 1591.76 10327.4  1591.810329.24 1591.8110333.47 1592.0210333.76 1592.04
10335.93  1592.210340.16  1592.610340.79 1592.6210344.37 1592.7110346.06 1592.73
10357.67    159310371.85 1593.3710376.29 1593.4410377.88 1593.4410379.58  1593.4
10396.21 1593.6610410.18 1593.8410420.14    159410424.21 1594.0810427.22  1594.1
10439.61 1594.38 10444.1 1594.4810447.88  1594.510455.35  1594.510458.49  1594.6
10468.06 1594.8410470.62 1594.8610472.57 1594.86 10474.6 1594.92   10492  1595.2
10504.08 1595.3810522.08  1595.610532.01 1595.68   10568 1595.6910573.53  1595.7
10587.55 1595.6410607.07 1595.6510611.42 1595.6310613.61 1595.6310621.26  1595.6
10657.86 1595.49

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9563.87    .033 9958.11    .03810090.43    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.7910041.66              398  450.11     447             .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1587.15  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.41  * Wt. n-Val.              *   0.034  *   0.038  *   0.038  *
* W.S. Elev (ft)          * 1586.74  * Reach Len. (ft)         *  398.00  *  450.11  *  447.00  *
* Crit W.S. (ft)          * 1586.51  * Flow Area (sq ft)       *   64.72  *  180.27  *   90.82  *
* E.G. Slope (ft/ft)      *0.006849  * Area (sq ft)            *   64.72  *  180.27  *   90.82  *
* Q Total (cfs)           * 1590.00  * Flow (cfs)              *  176.68  * 1042.99  *  370.34  *
* Top Width (ft)          *  258.63  * Top Width (ft)          *  109.14  *   74.87  *   74.62  *
* Vel Total (ft/s)        *    4.73  * Avg. Vel. (ft/s)        *    2.73  *    5.79  *    4.08  *
* Max Chl Dpth (ft)       *    4.34  * Hydr. Depth (ft)        *    0.59  *    2.41  *    1.22  *
* Conv. Total (cfs)       * 19213.0  * Conv. (cfs)             *  2134.9  * 12603.0  *  4475.0  *
* Length Wtd. (ft)        *  441.54  * Wetted Per. (ft)        *  109.25  *   75.41  *   74.70  *
* Min Ch El (ft)          * 1582.40  * Shear (lb/sq ft)        *    0.25  *    1.02  *    0.52  *
* Alpha                   *    1.19  * Stream Power (lb/ft s)  *    0.69  *    5.91  *    2.12  *
* Frctn Loss (ft)         *    3.12  * Cum Volume (acre-ft)    *  158.49  *  151.59  *  110.41  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   47.58  *   21.77  *   33.82  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1588.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.038	0.038
W.S. Elev (ft)	1587.49	Reach Len. (ft)	398.00	450.11	447.00
Crit W.S. (ft)		Flow Area (sq ft)		236.92	17.24
E.G. Slope (ft/ft)	0.006043	Area (sq ft)		236.92	17.24
Q Total (cfs)	1590.00	Flow (cfs)		1510.35	79.65
Top Width (ft)	81.02	Top Width (ft)		74.87	6.15
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)		6.37	4.62
Max Chl Dpth (ft)	5.09	Hydr. Depth (ft)		3.16	2.80
Conv. Total (cfs)	20453.3	Conv. (cfs)		19428.7	1024.6
Length Wtd. (ft)	445.68	Wetted Per. (ft)		78.01	9.20
Min Ch El (ft)	1582.40	Shear (lb/sq ft)		1.15	0.71
Alpha	1.01	Stream Power (lb/ft s)		7.30	3.26
Frctn Loss (ft)	3.48	Cum Volume (acre-ft)	44.55	162.54	30.66
C & E Loss (ft)	0.03	Cum SA (acres)	7.45	21.76	6.45

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9765.33	9966.79	176.68	64.72	109.25	11.11	0.59	2.73
2	Chan	9966.79	10041.66	1042.99	180.27	75.41	65.60	2.41	5.79
3	ROB	10041.66	10349.76	370.34	90.82	74.70	23.29	1.22	4.08

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9966.79	10041.66	1510.35	236.92	78.01	94.99	3.16	6.37
2	ROB	10041.66	10349.76	79.65	17.24	9.20	5.01	2.80	4.62

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: WASH 3-WEST
REACH: REACH-1 RS: 1.894

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*******************************************************************************
  9826.6 1587.14 9833.75 1586.86 9858.19 1585.86  9861.4 1585.71 9882.63 1584.88
 9896.19 1584.55 9907.07 1584.29 9930.99  1583.3 9931.51 1583.28 9938.57 1582.91
 9955.96 1582.59 9965.78 1581.57 9967.59 1581.66  9980.4 1580.83 9994.57 1580.53
10000.58 1580.0710000.71  1578.810004.84 1580.0410006.01 1580.8810028.89 1581.25
10029.28 1581.2410035.38 1581.2610047.65 1581.2610053.72 1581.4810070.17 1582.55
10078.16 1583.18 10102.6 1585.0910104.97 1585.2610126.13 1585.8610127.04 1586.57
10138.21 1587.6610139.76 1587.5710151.48 1588.4410174.56 1589.5510175.92  1589.6
10200.36 1589.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9826.6    .033 9965.78    .03810047.65    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9980.410006.01              425  413.55     392             .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
* E.G. Elev (ft)          * 1584.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.53  * Wt. n-Val.              *   0.036  *   0.038  *   0.037  *
* W.S. Elev (ft)          * 1583.49  * Reach Len. (ft)         *  425.00  *  413.55  *  392.00  *
* Crit W.S. (ft)          * 1583.12  * Flow Area (sq ft)       *   62.33  *   79.93  *  140.31  *
* E.G. Slope (ft/ft)      *0.007298  * Area (sq ft)            *   62.33  *   79.93  *  140.31  *
* Q Total (cfs)           * 1590.00  * Flow (cfs)              *  278.52  *  547.40  *  764.08  *
* Top Width (ft)          *  155.82  * Top Width (ft)          *   54.06  *   25.61  *   76.15  *
* Vel Total (ft/s)        *    5.63  * Avg. Vel. (ft/s)        *    4.47  *    6.85  *    5.45  *
* Max Chl Dpth (ft)       *    4.69  * Hydr. Depth (ft)        *    1.15  *    3.12  *    1.84  *
* Conv. Total (cfs)       * 18612.7  * Conv. (cfs)             *  3260.4  *  6407.9  *  8944.4  *
* Length Wtd. (ft)        *  407.75  * Wetted Per. (ft)        *   54.16  *   27.23  *   76.23  *
* Min Ch El (ft)          * 1578.80  * Shear (lb/sq ft)        *    0.52  *    1.34  *    0.84  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    2.34  *    9.16  *    4.57  *
* Frctn Loss (ft)         *    3.09  * Cum Volume (acre-ft)    *  157.91  *  150.24  *  109.23  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *   46.84  *   21.25  *   33.05  *
*********************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*********************************************************************************************
* E.G. Elev (ft)          * 1584.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.93  * Wt. n-Val.              *   0.038  *   0.038  *   0.038  *
* W.S. Elev (ft)          * 1583.67  * Reach Len. (ft)         *  425.00  *  413.55  *  392.00  *
* Crit W.S. (ft)          * 1583.35  * Flow Area (sq ft)       *   34.79  *   84.49  *   90.06  *
* E.G. Slope (ft/ft)      *0.010503  * Area (sq ft)            *   34.79  *   84.49  *   90.06  *
* Q Total (cfs)           * 1590.00  * Flow (cfs)              *  226.98  *  720.33  *  642.68  *
* Top Width (ft)          *   75.71  * Top Width (ft)          *   14.62  *   25.61  *   35.48  *
* Vel Total (ft/s)        *    7.60  * Avg. Vel. (ft/s)        *    6.52  *    8.53  *    7.14  *
* Max Chl Dpth (ft)       *    4.87  * Hydr. Depth (ft)        *    2.38  *    3.30  *    2.54  *
* Conv. Total (cfs)       * 15514.7  * Conv. (cfs)             *  2214.8  *  7028.8  *  6271.1  *
* Length Wtd. (ft)        *  408.39  * Wetted Per. (ft)        *   16.75  *   27.23  *   37.89  *
* Min Ch El (ft)          * 1578.80  * Shear (lb/sq ft)        *    1.36  *    2.03  *    1.56  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    8.89  *   17.35  *   11.12  *
* Frctn Loss (ft)         *    3.70  * Cum Volume (acre-ft)    *   44.39  *  160.87  *   30.11  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    7.38  *   21.24  *    6.23  *
*********************************************************************************************

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: The parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9903.50   * 9980.40   *   278.52 *    62.33 *    54.16 *    17.52 *
1.15 *     4.47 *
* 2         * Chan      * 9980.40   * 10006.01  *   547.40 *    79.93 *    27.23 *    34.43 *
3.12 *     6.85 *
* 3         * ROB       * 10006.01  * 10103.19  *   764.08 *   140.31 *    76.23 *    48.06 *
1.84 *     5.45 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9903.50   * 9980.40   *   226.98 *    34.79 *    16.75 *    14.28 *
2.38 *     6.52 *
* 2         * Chan      * 9980.40   * 10006.01  *   720.33 *    84.49 *    27.23 *    45.30 *
3.30 *     8.53 *
* 3         * ROB       * 10006.01  * 10103.19  *   642.68 *    90.06 *    37.89 *    40.42 *
2.54 *     7.14 *
*****************************************************************************************************
******************

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: 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: WASH 3-WEST
REACH: REACH-1            RS: 1.816

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9915.94 1582.32 9920.68  1582.3 9924.22  1582.3 9925.91 1582.28 9926.09 1582.27
 9931.56    1582 9931.69    1582 9950.371581.023 9969.94    1580 9970.25    1580
 9971.24 1579.93 9975.491578.932 9979.46    1578 9979.48    1578 9986.03  1576.5
 9986.36 1576.42  9989.5 1576.16 9990.09 1576.06 9990.35    1576 9994.48  1574.9
 9997.83    1574 9998.15 1573.89 9998.51  1573.8 9998.91 1573.88 9999.31    1574
10004.21 1575.5110004.99    157610006.42 1576.5210007.71 1577.05   10013    1577
10016.54  1576.910019.61 1577.5510021.57    157810024.75 1578.6110026.13  1578.9
10039.81 1578.8810041.611578.84710046.95 1578.7510061.72 1579.0310076.37 1579.32
10082.26  1579.310092.91 1579.5810099.18 1579.8910101.03    158010101.14    1580
10105.62 1580.4510113.13 1580.3610114.19 1580.4410120.21  1580.610120.77 1580.64
10120.82 1580.6410126.55  1580.910129.45 1581.0210135.58  1581.310139.66 1581.43
10142.52 1581.5610145.77  1581.710149.75 1581.7110154.51  1581.910157.32    1582
10161.36 1582.15 10161.5 1582.1610163.18 1582.2310173.83  1582.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9915.94    .033 9975.49    .03810026.13    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.4610021.57               460  498.13     464              .1       .3

CROSS SECTION OUTPUT  Profile #1
```

E.G. Elev (ft)	1580.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.037	0.038	0.034
W.S. Elev (ft)	1579.99	Reach Len. (ft)	460.00	498.13	464.00
Crit W.S. (ft)	1579.99	Flow Area (sq ft)	8.43	158.00	70.01
E.G. Slope (ft/ft)	0.007886	Area (sq ft)	8.43	158.00	70.01
Q Total (cfs)	1590.00	Flow (cfs)	32.94	1300.12	256.94
Top Width (ft)	130.38	Top Width (ft)	9.03	42.11	79.24
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	3.91	8.23	3.67
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)	0.93	3.75	0.88
Conv. Total (cfs)	17904.3	Conv. (cfs)	370.9	14640.1	2893.3
Length Wtd. (ft)	492.79	Wetted Per. (ft)	9.25	43.32	79.35
Min Ch El (ft)	1573.80	Shear (lb/sq ft)	0.45	1.80	0.43
Alpha	1.28	Stream Power (lb/ft s)	1.75	14.78	1.59
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	157.57	149.11	108.28
C & E Loss (ft)	0.11	Cum SA (acres)	46.53	20.93	32.35

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 OUTPUT Profile #2

E.G. Elev (ft)	1580.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.037	0.038	0.034
W.S. Elev (ft)	1579.99	Reach Len. (ft)	460.00	498.13	464.00
Crit W.S. (ft)	1579.99	Flow Area (sq ft)	8.43	158.00	70.01
E.G. Slope (ft/ft)	0.007886	Area (sq ft)	8.43	158.00	70.01
Q Total (cfs)	1590.00	Flow (cfs)	32.94	1300.12	256.94
Top Width (ft)	130.38	Top Width (ft)	9.03	42.11	79.24
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	3.91	8.23	3.67
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)	0.93	3.75	0.88
Conv. Total (cfs)	17904.3	Conv. (cfs)	370.9	14640.1	2893.3
Length Wtd. (ft)	493.89	Wetted Per. (ft)	9.25	43.32	79.35
Min Ch El (ft)	1573.80	Shear (lb/sq ft)	0.45	1.80	0.43
Alpha	1.28	Stream Power (lb/ft s)	1.75	14.78	1.59
Frctn Loss (ft)	1.89	Cum Volume (acre-ft)	44.18	159.72	29.39
C & E Loss (ft)	0.15	Cum SA (acres)	7.27	20.92	5.72

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.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)

```
* 1          * LOB       * 9947.70   * 9979.46   *    32.94 *     8.43 *     9.25 *     2.07 *
0.93 *     3.91 *
* 2          * Chan      * 9979.46   * 10021.57  *  1300.12 *   158.00 *    43.32 *    81.77 *
3.75 *     8.23 *
* 3          * ROB       * 10021.57  * 10097.70  *   256.72 *    69.73 *    76.23 *    16.15 *
0.92 *     3.68 *
* 4          * ROB       * 10097.70  * 10173.83  *     0.22 *     0.28 *     3.12 *     0.01 *
0.09 *     0.78 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9947.70   * 9979.46   *    32.94 *     8.43 *     9.25 *     2.07 *
0.93 *     3.91 *
* 2          * Chan      * 9979.46   * 10021.57  *  1300.12 *   158.00 *    43.32 *    81.77 *
3.75 *     8.23 *
* 3          * ROB       * 10021.57  * 10097.70  *   256.72 *    69.73 *    76.23 *    16.15 *
0.92 *     3.68 *
* 4          * ROB       * 10097.70  * 10173.83  *     0.22 *     0.28 *     3.12 *     0.01 *
0.09 *     0.78 *
*****************************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 1.721

INPUT
Description:
Station Elevation Data    num=     129
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
  9910.6  1578.5 9924.23    1578 9955.25 1577.04 9969.69  1576.6 9972.66 1576.66
  9975.6  1576.2 9976.46    1576 9976.891575.923 9978.42 1575.65 9980.44  1575.3
 9987.37 1574.33 9988.66  1574.1 9988.67 1574.08 9988.79 1574.01 9989.03 1573.89
    9993    1572 9995.97  1570.5 9996.51 1570.22  9997.2 1570.3610000.86 1571.17
```

```
10001.83 1571.38 10004.4    157210007.98 1572.7610008.04 1572.7710008.12 1572.77
10008.24  1572.810031.85  1573.510035.96  1573.910044.14 1573.5910046.83  1573.9
10047.57    157410048.27 1574.0810052.56 1574.5910058.94 1575.6210061.11    1576
10062.94  1576.3 10063.9 1576.4710066.82 1576.4410069.12 1576.7410078.321576.462
10080.37  1576.410081.65 1576.1110082.99    157610083.38 1575.9410085.75  1575.7
10086.85  1575.610089.47 1575.6910096.31 1575.7710097.99 1575.8110099.18 1575.79
10102.75  1575.610103.86 1575.66 10104.8 1575.7510107.36    157610108.98 1576.15
10113.08  1576.610120.03 1577.7310122.68    157810123.52 1578.1110129.92 1578.86
10134.62  1579.310137.77 1579.44 10142.9 1579.8810144.56    158010146.43 1580.15
10148.58  1580.310153.59 1580.7810155.71 1581.0110162.52    158210166.39 1582.27
10171.83  1582.810177.74 1582.6910178.94 1582.7810180.09 1582.8510181.06  1582.9
10193.36  1583.410193.97 1583.4510194.43 1583.4510202.21 1583.3110202.68  1583.3
10204.74  1583.2 10215.4 1582.4210219.88    158210227.41 1581.2110227.42 1581.21
10227.42  1581.210231.53    158210237.46 1583.1810237.85 1583.2410242.42 1584.01
10243.03  1584.110243.71 1584.2110251.21 1584.6210266.12 1585.3310273.19 1585.83
10287.48 1585.9510293.13 1585.9610297.82 1585.7910301.86 1585.87 10310.6    1586
10315.01 1586.0110320.78 1586.0710328.19 1586.13 10333.1 1586.1810351.36  1586.5
10358.33 1586.3310368.17 1586.0110368.97    158610388.62 1585.4510400.01  1585.4
10421.59 1585.5410428.28 1585.5210433.61 1585.4910443.01 1585.4910486.81  1585.5
10494.41 1585.4910504.02 1585.5610515.49  1585.710545.67 1585.8310563.48  1585.9
10591.49    158610600.27 1586.0410621.15 1586.2510624.36  1586.310640.95 1586.37
10674.79 1586.5310703.39 1586.9210734.48  1586.710740.02 1586.72

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
  9910.6    .033 9972.66    .03810069.12    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.6610048.27               455  508.12     497              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1577.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.53  * Wt. n-Val.              *   0.038  *   0.038  *   0.036  *
* W.S. Elev (ft)          * 1576.68  * Reach Len. (ft)         *  455.00  *  508.12  *  497.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   21.72  *  227.32  *   51.98  *
* E.G. Slope (ft/ft)      *0.004245  * Area (sq ft)            *   21.72  *  227.32  *   51.98  *
* Q Total (cfs)           * 1590.00  * Flow (cfs)              *   66.05  * 1394.09  *  129.86  *
* Top Width (ft)          *  144.14  * Top Width (ft)          *   21.63  *   59.61  *   62.91  *
* Vel Total (ft/s)        *    5.28  * Avg. Vel. (ft/s)        *    3.04  *    6.13  *    2.50  *
* Max Chl Dpth (ft)       *    6.46  * Hydr. Depth (ft)        *    1.00  *    3.81  *    0.83  *
* Conv. Total (cfs)       * 24403.5  * Conv. (cfs)             *  1013.7  * 21396.7  *  1993.1  *
* Length Wtd. (ft)        *  500.73  * Wetted Per. (ft)        *   21.84  *   60.87  *   63.23  *
* Min Ch El (ft)          * 1570.22  * Shear (lb/sq ft)        *    0.26  *    0.99  *    0.22  *
* Alpha                   *    1.21  * Stream Power (lb/ft s)  *    0.80  *    6.07  *    0.54  *
* Frctn Loss (ft)         *    2.25  * Cum Volume (acre-ft)    *  157.41  *  146.91  *  107.63  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *   46.37  *   20.34  *   31.59  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1578.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.038  *   0.038  *   0.038  *
* W.S. Elev (ft)          * 1577.67  * Reach Len. (ft)         *  455.00  *  508.12  *  497.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    7.69  *  286.24  *   25.01  *
* E.G. Slope (ft/ft)      *0.002251  * Area (sq ft)            *    7.69  *  286.24  *   25.01  *
* Q Total (cfs)           * 1590.00  * Flow (cfs)              *   17.83  * 1490.41  *   81.76  *
* Top Width (ft)          *   70.05  * Top Width (ft)          *    2.28  *   59.61  *    8.16  *
* Vel Total (ft/s)        *    4.99  * Avg. Vel. (ft/s)        *    2.32  *    5.21  *    3.27  *
* Max Chl Dpth (ft)       *    7.45  * Hydr. Depth (ft)        *    3.37  *    4.80  *    3.07  *
* Conv. Total (cfs)       * 33516.1  * Conv. (cfs)             *   375.9  * 31416.8  *  1723.4  *
* Length Wtd. (ft)        *  505.68  * Wetted Per. (ft)        *    5.51  *   60.87  *   10.70  *
* Min Ch El (ft)          * 1570.22  * Shear (lb/sq ft)        *    0.20  *    0.66  *    0.33  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.45  *    3.44  *    1.07  *
* Frctn Loss (ft)         *    2.06  * Cum Volume (acre-ft)    *   44.10  *  157.18  *   28.88  *
* C & E Loss (ft)         *    0.14  * Cum SA (acres)          *    7.21  *   20.34  *    5.25  *
```

```
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9949.63   * 9988.66   *    66.05 *    21.72 *    21.84 *     4.15 *
1.00 *     3.04 *
* 2         * Chan      * 9988.66   * 10048.27  *  1394.09 *   227.32 *    60.87 *    87.68 *
3.81 *     6.13 *
* 3         * ROB       * 10048.27  * 10394.14  *   129.86 *    51.98 *    63.23 *     8.17 *
0.83 *     2.50 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9949.63   * 9988.66   *    17.83 *     7.69 *     5.51 *     1.12 *
3.37 *     2.32 *
* 2         * Chan      * 9988.66   * 10048.27  *  1490.41 *   286.24 *    60.87 *    93.74 *
4.80 *     5.21 *
* 3         * ROB       * 10048.27  * 10394.14  *    81.76 *    25.01 *    10.70 *     5.14 *
3.07 *     3.27 *
*****************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 1.625

INPUT
Description: Flow rate starting at this cross-section and downstream is
             increased to 1,970cfs.
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9855.25 1577.02 9878.95 1576.78 9879.18 1576.97 9892.51 1576.28 9902.66 1575.58
 9926.36 1574.19 9929.77 1574.09 9934.03 1573.94 9950.07 1573.56 9967.03 1572.71
 9970.82 1572.63 9973.77 1572.21 9987.41 1569.45 9995.91 1566.11 9997.48 1566.42
10002.76 1566.2910004.28 1567.5410008.49  1569.610018.64 1572.3110021.18 1572.34
10038.88 1572.6910041.54 1572.7410044.89 1572.7910068.59 1573.41 10078.8 1573.49
```

```
 10092.3 1573.5510105.65 1573.85   10116 1573.7310116.06 1573.7410117.97 1573.75
10130.16 1574.3510139.71 1574.7610153.32 1575.6210163.41 1576.2610187.12  1577.8
10190.58 1578.0910197.23 1578.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9855.25    .033 9970.82    .03810021.18    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.4110008.49              418  423.53     430             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1574.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.89  * Wt. n-Val.              *   0.037  *   0.038  *   0.035  *
* W.S. Elev (ft)          * 1574.04  * Reach Len. (ft)         *  418.00  *  423.53  *  430.00  *
* Crit W.S. (ft)          * 1574.04  * Flow Area (sq ft)       *   73.78  *  139.81  *  114.09  *
* E.G. Slope (ft/ft)      *0.004699  * Area (sq ft)            *   73.78  *  139.81  *  114.09  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *  320.58  * 1260.31  *  389.10  *
* Top Width (ft)          *  192.57  * Top Width (ft)          *   56.16  *   21.08  *  115.33  *
* Vel Total (ft/s)        *    6.01  * Avg. Vel. (ft/s)        *    4.35  *    9.01  *    3.41  *
* Max Chl Dpth (ft)       *    7.93  * Hydr. Depth (ft)        *    1.31  *    6.63  *    0.99  *
* Conv. Total (cfs)       * 28737.8  * Conv. (cfs)             *  4676.6  * 18385.1  *  5676.1  *
* Length Wtd. (ft)        *  423.69  * Wetted Per. (ft)        *   56.49  *   22.67  *  115.71  *
* Min Ch El (ft)          * 1566.11  * Shear (lb/sq ft)        *    0.38  *    1.81  *    0.29  *
* Alpha                   *    1.59  * Stream Power (lb/ft s)  *    1.66  *   16.31  *    0.99  *
* Frctn Loss (ft)         *    2.93  * Cum Volume (acre-ft)    *  156.91  *  144.77  *  106.68  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)          *   45.96  *   19.87  *   30.57  *
*****************************************************************************************

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 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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1575.88  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.83  * Wt. n-Val.              *   0.038  *   0.038  *   0.037  *
* W.S. Elev (ft)          * 1574.04  * Reach Len. (ft)         *  418.00  *  423.53  *  430.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   13.54  *  139.89  *   42.71  *
* E.G. Slope (ft/ft)      *0.007805  * Area (sq ft)            *   13.54  *  139.89  *   42.71  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *   71.36  * 1625.89  *  272.75  *
* Top Width (ft)          *   41.17  * Top Width (ft)          *    3.17  *   21.08  *   16.92  *
* Vel Total (ft/s)        *   10.04  * Avg. Vel. (ft/s)        *    5.27  *   11.62  *    6.39  *
* Max Chl Dpth (ft)       *    7.93  * Hydr. Depth (ft)        *    4.27  *    6.64  *    2.52  *
* Conv. Total (cfs)       * 22298.7  * Conv. (cfs)             *   807.7  * 18403.7  *  3087.3  *
* Length Wtd. (ft)        *  423.95  * Wetted Per. (ft)        *    7.18  *   22.67  *   18.89  *
* Min Ch El (ft)          * 1566.11  * Shear (lb/sq ft)        *    0.92  *    3.01  *    1.10  *
* Alpha                   *    1.17  * Stream Power (lb/ft s)  *    4.84  *   34.95  *    7.03  *
* Frctn Loss (ft)         *    3.23  * Cum Volume (acre-ft)    *   43.99  *  154.70  *   28.50  *
* C & E Loss (ft)         *    0.15  * Cum SA (acres)          *    7.18  *   19.87  *    5.11  *
*****************************************************************************************

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.
```

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9921.33	9987.41	320.58	73.78	56.49	16.27	1.31	4.35
2	Chan	9987.41	10008.49	1260.32	139.81	22.67	63.98	6.63	9.01
3	ROB	10008.49	10102.86	384.15	109.49	94.74	19.50	1.16	3.51
4	ROB	10102.86	10197.23	4.95	4.60	20.97	0.25	0.22	1.08

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 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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9921.33	9987.41	71.36	13.54	7.18	3.62	4.27	5.27
2	Chan	9987.41	10008.49	1625.89	139.89	22.67	82.53	6.64	11.62
3	ROB	10008.49	10102.86	272.75	42.71	18.89	13.84	2.52	6.39

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: WASH 3-WEST
REACH: REACH-1 RS: 1.545

INPUT
Description:
Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9677.27	1577.6	9682.16	1577.63	9682.33	1577.65	9701.31	1577.31	9723.58	1577.11
9730.11	1576.8	9733.18	1576.77	9741.4	1576.69	9750.61	1576.84	9754.01	1576.84
9763.9	1576.9	9766.79	1576.75	9768.3	1576.71	9782.11	1576.63	9793.77	1576.25
9799.33	1576	9799.63	1576	9805.36	1575.78	9815.49	1575.26	9818.57	1575.18
9837.71	1574	9838.59	1574	9839.94	1573.96	9846.21	1573.76	9847.28	1573.78

```
  9859.3  1573.1 9877.09 1572.31 9878.72 1572.13 9880.09    1572 9880.16    1572
 9882.71  1571.7 9884.55  1571.6 9890.63 1571.43 9893.04 1571.51 9900.07 1571.59
 9900.51  1571.6 9913.03 1571.28 9914.91 1571.22 9921.62 1571.03 9928.47 1570.92
 9943.97  1570.8 9955.63  1570.6 9962.97 1570.34 9964.43 1570.33 9966.14 1570.12
 9967.05    1570 9970.05 1569.63 9982.24 1568.01 9982.27 1568.03 9982.31 1568.06
 9982.67    1568 9983.66 1567.27 9985.78    1566 9986.37 1565.59 9987.75 1564.26
 9988.37  1564.5 9988.99 1564.64 9992.12 1565.27 9993.07 1565.31 9993.75 1565.16
 9996.29    1564 9996.75  1563.8 9997.56 1563.23 10001.9 1563.0710003.21 1563.13
10003.47  1563.410004.26    156410004.85 1564.89   10005 1564.9310005.82 1565.19
10005.84  1565.610006.36    156610006.55 1566.3810006.98 1566.5610007.45 1566.82
 10007.7  1567.2 10016.5 1567.6810019.29 1567.8810019.41  1567.910019.98    1568
10022.86  1568.610028.06 1569.5410030.39 1569.9110031.31    157010038.61 1571.02
10039.85  1571.110039.88 1571.0910045.74 1571.5410050.88 1572.0110054.61 1572.35
10055.59  1572.410056.25 1572.4510057.91 1572.5410058.59 1572.5510070.36 1573.01
10077.44  1573.410081.97 1573.5810086.84 1573.8410089.17 1573.9210091.01    1574
10091.42    1574 10095.6 1574.2110098.68 1574.3810100.81  1574.510124.45    1576
10143.46    157710163.43 1577.8910165.94 1578.0510167.72 1578.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9677.27    .033 9982.24    .03810019.98    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.2410019.98               345   343.1     341             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1571.86  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.64  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)          * 1570.22  * Reach Len. (ft)         *  345.00  *  343.10  *  341.00  *
* Crit W.S. (ft)          * 1570.22  * Flow Area (sq ft)       *   18.54  *  170.99  *   13.13  *
* E.G. Slope (ft/ft)      *0.011175  * Area (sq ft)            *   18.54  *  170.99  *   13.13  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *   93.13  * 1814.36  *   62.51  *
* Top Width (ft)          *   67.62  * Top Width (ft)          *   16.95  *   37.74  *   12.93  *
* Vel Total (ft/s)        *    9.72  * Avg. Vel. (ft/s)        *    5.02  *   10.61  *    4.76  *
* Max Chl Dpth (ft)       *    7.15  * Hydr. Depth (ft)        *    1.09  *    4.53  *    1.02  *
* Conv. Total (cfs)       * 18635.9  * Conv. (cfs)             *   881.0  * 17163.6  *   591.3  *
* Length Wtd. (ft)        *  343.45  * Wetted Per. (ft)        *   17.09  *   41.58  *   13.13  *
* Min Ch El (ft)          * 1563.07  * Shear (lb/sq ft)        *    0.76  *    2.87  *    0.70  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)  *    3.80  *   30.44  *    3.32  *
* Frctn Loss (ft)         *    1.62  * Cum Volume (acre-ft)    *  156.46  *  143.26  *  106.05  *
* C & E Loss (ft)         *    0.38  * Cum SA (acres)          *   45.61  *   19.59  *   29.94  *
*****************************************************************************************

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 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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1572.49  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.34  * Wt. n-Val.              *          *   0.038  *   0.033  *
* W.S. Elev (ft)          * 1571.16  * Reach Len. (ft)         *  345.00  *  343.10  *  341.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  206.13  *    8.22  *
* E.G. Slope (ft/ft)      *0.007460  * Area (sq ft)            *          *  206.13  *    8.22  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *          * 1928.18  *   41.82  *
```

```
* Top Width (ft)          *   40.62  * Top Width (ft)          *          *   37.74  *    2.88  *
* Vel Total (ft/s)        *    9.19  * Avg. Vel. (ft/s)        *          *    9.35  *    5.09  *
* Max Chl Dpth (ft)       *    8.09  * Hydr. Depth (ft)        *          *    5.46  *    2.86  *
* Conv. Total (cfs)       * 22808.0  * Conv. (cfs)             *          * 22323.7  *   484.2  *
* Length Wtd. (ft)        *  343.43  * Wetted Per. (ft)        *          *   44.72  *    5.50  *
* Min Ch El (ft)          * 1563.07  * Shear (lb/sq ft)        *          *    2.15  *    0.70  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *          *   20.08  *    3.54  *
* Frctn Loss (ft)         *    1.55  * Cum Volume (acre-ft)    *   43.92  *  153.02  *   28.24  *
* C & E Loss (ft)         *    0.22  * Cum SA (acres)          *    7.16  *   19.58  *    5.01  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9829.76   * 9982.24   *    93.13 *    18.54 *    17.09 *     4.73 *
1.09 *     5.02 *
* 2        * Chan      * 9982.24   * 10019.98  *  1814.36 *   170.99 *    41.58 *    92.10 *
4.53 *    10.61 *
* 3        * ROB       * 10019.98  * 10093.85  *    62.51 *    13.13 *    13.13 *     3.17 *
1.02 *     4.76 *
*****************************************************************************************************
******************

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 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.

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9982.24   * 10019.98  *  1928.18 *   206.13 *    44.72 *    97.88 *
5.46 *     9.35 *
* 2        * ROB       * 10019.98  * 10093.85  *    41.82 *     8.22 *     5.50 *     2.12 *
2.86 *     5.09 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1 RS: 1.480

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9784.5	1572.65	9812.33	1572.47	9813.25	1572.46	9828.91	1572.26	9840.17	1572.01
9842	1571.98	9867.54	1571.25	9868.01	1571.15	9870.75	1571.04	9895.86	1569.49
9899.5	1569.31	9923.71	1568.17	9926.46	1568.01	9928.25	1568.01	9932.83	1566.9
9939.84	1567.27	9950.36	1566.55	9951.54	1565.87	9955.45	1565.15	9957	1565.45
9960.69	1565.92	9974.8	1565.85	9979.38	1566.03	9985.75	1564.93	9991.07	1566.09
9997.11	1561.3	10004.32	1561.8	110007.23	1564.05	110011.75	1564.78	10013.7	1564.99
10014.49	1565.54	10022.28	1566.09	10035.07	1567.95	10043.24	1568.14	10062.91	1569.44
10071.99	1570.38	10090.75	1571.19	10100.74	1571.41	10118.58	1571.48	10129.49	1571.59
10133.51	1571.51	10146.42	1571.43	10158.24	1571.37	10174.26	1571.07	10186.99	1571.23
10202.12	1572.41	10214.29	1573.27	10215.74	1572.99	10229.96	1573.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9784.5	.033	9991.07	.038	10022.28	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9991.07	10022.28	380	389.42	386	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1569.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.033	0.038	0.033
W.S. Elev (ft)	1569.29	Reach Len. (ft)	380.00	389.42	386.00
Crit W.S. (ft)		Flow Area (sq ft)	213.79	169.05	49.34
E.G. Slope (ft/ft)	0.002578	Area (sq ft)	213.79	169.05	49.34
Q Total (cfs)	1970.00	Flow (cfs)	857.84	979.26	132.90
Top Width (ft)	160.84	Top Width (ft)	91.22	31.21	38.41
Vel Total (ft/s)	4.56	Avg. Vel. (ft/s)	4.01	5.79	2.69
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)	2.34	5.42	1.28
Conv. Total (cfs)	38800.7	Conv. (cfs)	16895.9	19287.2	2617.6
Length Wtd. (ft)	385.88	Wetted Per. (ft)	91.95	33.92	38.59
Min Ch El (ft)	1561.30	Shear (lb/sq ft)	0.37	0.80	0.21
Alpha	1.16	Stream Power (lb/ft s)	1.50	4.65	0.55
Frctn Loss (ft)	1.51	Cum Volume (acre-ft)	155.54	141.92	105.81
C & E Loss (ft)	0.08	Cum SA (acres)	45.18	19.32	29.74

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1570.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.033	0.038	
W.S. Elev (ft)	1570.11	Reach Len. (ft)	380.00	389.42	386.00
Crit W.S. (ft)		Flow Area (sq ft)	120.27	194.56	
E.G. Slope (ft/ft)	0.003035	Area (sq ft)	120.27	194.56	
Q Total (cfs)	1970.00	Flow (cfs)	723.58	1246.42	
Top Width (ft)	58.63	Top Width (ft)	27.42	31.21	
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)	6.02	6.41	

```
* Max Chl Dpth (ft)      *    8.81  * Hydr. Depth (ft)       *    4.39  *    6.23  *          *
* Conv. Total (cfs)      * 35756.5  * Conv. (cfs)            * 13133.3  * 22623.2  *          *
* Length Wtd. (ft)       *  386.54  * Wetted Per. (ft)       *   31.85  *   37.94  *          *
* Min Ch El (ft)         * 1561.30  * Shear (lb/sq ft)       *    0.72  *    0.97  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *    4.31  *    6.23  *          *
* Frctn Loss (ft)        *    1.61  * Cum Volume (acre-ft)   *   43.45  *  151.44  *   28.21  *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)         *    7.05  *   19.31  *    5.00  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9887.79   * 9991.07   *   857.84 *   213.79 *    91.95 *    43.55 *
2.34 *     4.01 *
* 2         * Chan      * 9991.07   * 10022.28  *   979.26 *   169.05 *    33.92 *    49.71 *
5.42 *     5.79 *
* 3         * ROB       * 10022.28  * 10126.12  *   132.90 *    49.34 *    38.59 *     6.75 *
1.28 *     2.69 *
*****************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9887.79   * 9991.07   *   723.58 *   120.27 *    31.85 *    36.73 *
4.39 *     6.02 *
* 2         * Chan      * 9991.07   * 10022.28  *  1246.42 *   194.56 *    37.94 *    63.27 *
6.23 *     6.41 *
*****************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 1.406

INPUT
Description: Interpolated point added at (10008.97, 1562.531) to set bank
```

```
              station.
Station Elevation Data     num=       72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9907.31  1568.1 9916.97  1568.4 9918.25 1568.38 9918.76 1568.35  9922.5 1568.06
 9923.33    1568 9928.66 1567.71  9934.4 1567.27 9937.49 1567.06 9939.31 1566.91
 9942.59  1566.7 9947.84 1566.34 9952.68    1566 9968.65 1564.91 9977.04 1564.38
 9977.82  1564.3 9978.94    1564 9988.03 1562.48 9989.96    1562 9990.65 1561.82
 9991.49  1561.7 9993.19 1561.21 9995.49 1560.28 10001.4 1560.1510003.09 1560.13
10003.45  1560.3 10006.5 1561.9910006.53 1562.0110006.76 1562.0310007.11 1562.06
 10007.6  1562.210008.971562.53110015.05    1564 10023.1 1565.8310023.89 1565.99
10023.96 1566.0110024.08    156610038.96 1567.2410043.51 1567.7210046.23 1567.43
10052.41 1567.0110053.28  1567.110055.22  1567.110056.68 1567.18 10062.3  1567.4
10065.27 1567.4810067.06  1567.510067.65 1567.5310068.17 1567.5310068.62 1567.54
10069.83 1567.5710074.87  1567.710075.49 1567.7410075.86 1567.7810076.35 1567.83
 10081.3 1567.8510087.15  1567.910087.46 1567.9210087.72 1567.9410087.92 1567.94
10088.11 1567.9410088.27  1567.910112.46 1567.9610112.63 1567.9710114.38    1568
10115.14 1568.0110116.06    156810118.62 1568.0310124.37 1568.0510127.48 1568.05
10131.02 1568.0610145.62  1568.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9907.31    .033 9977.04    .03810015.05    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.0310008.97               335  335.21     321             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1568.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.18  * Wt. n-Val.              *   0.036  *   0.038  *   0.036  *
* W.S. Elev (ft)          * 1566.90  * Reach Len. (ft)        *  335.00  *  335.21  *  321.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   86.15  *  122.56  *   43.87  *
* E.G. Slope (ft/ft)      *0.006671  * Area (sq ft)            *   86.15  *  122.56  *   43.87  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *  485.03  * 1236.76  *  248.22  *
* Top Width (ft)          *   95.40  * Top Width (ft)          *   48.55  *   20.94  *   25.90  *
* Vel Total (ft/s)        *    7.80  * Avg. Vel. (ft/s)        *    5.63  *   10.09  *    5.66  *
* Max Chl Dpth (ft)       *    6.77  * Hydr. Depth (ft)        *    1.77  *    5.85  *    1.69  *
* Conv. Total (cfs)       * 24119.5  * Conv. (cfs)             *  5938.4  * 15142.2  *  3039.0  *
* Length Wtd. (ft)        *  333.93  * Wetted Per. (ft)        *   48.81  *   21.82  *   26.34  *
* Min Ch El (ft)          * 1560.13  * Shear (lb/sq ft)        *    0.74  *    2.34  *    0.69  *
* Alpha                   *    1.25  * Stream Power (lb/ft s)  *    4.14  *   23.60  *    3.92  *
* Frctn Loss (ft)         *    1.99  * Cum Volume (acre-ft)    *  154.24  *  140.61  *  105.40  *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)          *   44.57  *   19.08  *   29.45  *
*****************************************************************************************

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.
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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1569.04  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.42  * Wt. n-Val.              *   0.037  *   0.038  *   0.038  *
* W.S. Elev (ft)          * 1567.62  * Reach Len. (ft)        *  335.00  *  335.21  *  321.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   61.66  *  137.63  *   18.46  *
* E.G. Slope (ft/ft)      *0.006038  * Area (sq ft)            *   61.66  *  137.63  *   18.46  *
* Q Total (cfs)           * 1970.00  * Flow (cfs)              *  446.48  * 1427.49  *   96.03  *
* Top Width (ft)          *   40.94  * Top Width (ft)          *   15.99  *   20.94  *    4.01  *
* Vel Total (ft/s)        *    9.05  * Avg. Vel. (ft/s)        *    7.24  *   10.37  *    5.20  *
* Max Chl Dpth (ft)       *    7.49  * Hydr. Depth (ft)        *    3.86  *    6.57  *    4.60  *
* Conv. Total (cfs)       * 25352.6  * Conv. (cfs)             *  5745.9  * 18370.9  *  1235.8  *
* Length Wtd. (ft)        *  334.95  * Wetted Per. (ft)        *   19.09  *   21.82  *    8.25  *
* Min Ch El (ft)          * 1560.13  * Shear (lb/sq ft)        *    1.22  *    2.38  *    0.84  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)  *    8.81  *   24.66  *    4.39  *
* Frctn Loss (ft)         *    2.18  * Cum Volume (acre-ft)    *   42.65  *  149.95  *   28.13  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    6.86  *   19.08  *    4.98  *
*****************************************************************************************
```

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.
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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9907.31	9947.67	3.24	2.21	8.21	0.16	0.27	1.47
* 2	LOB	9947.67	9988.03	481.79	83.95	40.60	24.46	2.08	5.74
* 3	Chan	9988.03	10008.97	1236.76	122.56	21.82	62.78	5.85	10.09
* 4	ROB	10008.97	10077.29	248.21	43.87	26.34	12.60	1.69	5.66

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.
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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9947.67	9988.03	446.48	61.66	19.09	22.66	3.86	7.24
* 2	Chan	9988.03	10008.97	1427.49	137.63	21.82	72.46	6.57	10.37
* 3	ROB	10008.97	10077.29	96.03	18.46	8.25	4.87	4.60	5.20

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.

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 1.343

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 3,750cfs.

River mile 1.343 on Wash 3-West is the downstream limit of the Wittmann Phase II Zone AE Floodplain Delineation Study Contract FCD 2004C066 and the upstream limit of the Wittmann Area Drainage Master Study Update Contract FCD 2002C029.

Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9769.6	1568.77	9795.63	1567.4	9797.47	1567.18	9821.67	1564.88	9832.08	1564.24
9847.7	1564.32	9863.32	1564.65	9869.97	1564.99	9873.74	1564.63	9894.56	1564.6
9899.77	1564.49	9925.8	1562.94	9949.16	1561.33	9951.84	1561.22	9957.05	1561.06
9965.87	1560.88	9977.87	1560.78	9984.08	1560.51	9988.29	1559.22	9991.45	1557.08

```
10003.23 1557.6410003.91 1559.0810007.19 1560.4110019.53 1562.1410029.94 1563.18
10050.77 1564.1710055.98 1564.3610082.01 1564.8910113.25 1565.6710134.08  1565.8
10144.49 1565.9210160.11 1566.2110175.73 1566.6810186.15 1566.9910206.97 1567.66
10212.18 1567.7910236.42 1568.3410238.21 1568.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9769.6    .033 9949.16    .03810019.53    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.1610019.53              276  263.27     276            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1566.00  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.90  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)         * 1565.10  * Reach Len. (ft)        *  276.00  *  263.27  *  276.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *  149.77  *  350.86  *   72.80  *
* E.G. Slope (ft/ft)     *0.005629  * Area (sq ft)           *  149.77  *  350.86  *   72.80  *
* Q Total (cfs)          * 3750.00  * Flow (cfs)              *  556.09  * 2943.95  *  249.96  *
* Top Width (ft)         *  271.15  * Top Width (ft)          *  129.82  *   70.37  *   70.96  *
* Vel Total (ft/s)       *    6.54  * Avg. Vel. (ft/s)        *    3.71  *    8.39  *    3.43  *
* Max Chl Dpth (ft)      *    8.02  * Hydr. Depth (ft)        *    1.15  *    4.99  *    1.03  *
* Conv. Total (cfs)      * 49983.3  * Conv. (cfs)             *  7412.1  * 39239.5  *  3331.7  *
* Length Wtd. (ft)       *  267.75  * Wetted Per. (ft)        *  129.98  *   72.54  *   71.04  *
* Min Ch El (ft)         * 1557.08  * Shear (lb/sq ft)        *    0.40  *    1.70  *    0.36  *
* Alpha                  *    1.36  * Stream Power (lb/ft s)  *    1.50  *   14.26  *    1.24  *
* Frctn Loss (ft)        *    1.27  * Cum Volume (acre-ft)    *  153.33  *  138.79  *  104.97  *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)          *   43.89  *   18.73  *   29.10  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1566.83  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.34  * Wt. n-Val.              *   0.033  *   0.038  *          *
* W.S. Elev (ft)         * 1565.49  * Reach Len. (ft)        *  276.00  *  263.27  *  276.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *   28.04  *  378.06  *          *
* E.G. Slope (ft/ft)     *0.006793  * Area (sq ft)           *   28.04  *  378.06  *          *
* Q Total (cfs)          * 3750.00  * Flow (cfs)              *  195.98  * 3554.02  *          *
* Top Width (ft)         *   77.54  * Top Width (ft)          *    7.17  *   70.37  *          *
* Vel Total (ft/s)       *    9.23  * Avg. Vel. (ft/s)        *    6.99  *    9.40  *          *
* Max Chl Dpth (ft)      *    8.41  * Hydr. Depth (ft)        *    3.91  *    5.37  *          *
* Conv. Total (cfs)      * 45499.7  * Conv. (cfs)             *  2377.9  * 43121.8  *          *
* Length Wtd. (ft)       *  266.57  * Wetted Per. (ft)        *   10.85  *   75.89  *          *
* Min Ch El (ft)         * 1557.08  * Shear (lb/sq ft)        *    1.10  *    2.11  *          *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    7.66  *   19.86  *          *
* Frctn Loss (ft)        *    1.01  * Cum Volume (acre-ft)    *   42.31  *  147.97  *   28.06  *
* C & E Loss (ft)        *    0.25  * Cum SA (acres)          *    6.78  *   18.73  *    4.97  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9769.60   * 9859.38   *    64.59 *    26.42 *    40.07 *     1.72 *
0.66 *     2.44 *
```

```
* 2          * LOB       * 9859.38   * 9949.16   *   491.50 *   123.35 *    89.91 *    13.11 *
1.37 *     3.98 *
* 3          * Chan      * 9949.16   * 10019.53  *  2943.95 *   350.86 *    72.54 *    78.51 *
4.99 *     8.39 *
* 4          * ROB       * 10019.53  * 10128.87  *   249.96 *    72.80 *    71.04 *     6.67 *
1.03 *     3.43 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9859.38   * 9949.16   *   195.98 *    28.04 *    10.85 *     5.23 *
3.91 *     6.99 *
* 2          * Chan      * 9949.16   * 10019.53  *  3554.02 *   378.06 *    75.89 *    94.77 *
5.37 *     9.40 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 1.289

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9795.97 1568.99 9818.84  1567.8 9824.18 1567.51  9847.2 1566.32  9852.4    1566
 9861.97 1565.22 9875.55  1564.1  9880.6 1563.31 9880.61 1563.79 9892.61 1562.71
 9903.91 1562.92 9904.37 1563.13 9908.82 1562.55 9909.82 1562.77 9924.34 1561.34
 9932.27 1560.93 9937.03  1561.1 9960.62 1560.56 9965.25 1560.06 9972.53 1560.64
 9980.65 1558.73 9982.84 1556.27 9988.98 1556.96 9993.46 1557.13 9997.05  1557.4
10002.67  1560.210017.34 1560.4210018.97 1560.3710021.67 1560.5610044.74 1562.21
10045.69 1562.1410049.88 1562.1710065.12 1561.7210074.05 1561.86 10078.1 1561.94
10102.41 1562.5710106.31 1562.7910130.76 1564.2910134.52  1564.510159.12 1565.77
10162.73 1565.9510187.48  1567.110190.95 1567.2110191.23 1567.2910207.16 1567.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9795.97    .033 9965.25    .03810018.97    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.2510018.97          491.506 492.301 475.917              .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)         * 1564.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.56  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)         * 1564.07  * Reach Len. (ft)         *  491.51  *  492.30  *  475.92  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  194.29  *  269.60  *  206.10  *
* E.G. Slope (ft/ft)     *0.004045  * Area (sq ft)            *  194.29  *  269.60  *  206.10  *
* Q Total (cfs)          * 3750.00  * Flow (cfs)              *  927.20  * 1916.72  *  906.09  *
```

```
* Top Width (ft)          *  251.47  * Top Width (ft)          *   89.52  *   53.72  *  108.23  *
* Vel Total (ft/s)        *    5.60  * Avg. Vel. (ft/s)        *    4.77  *    7.11  *    4.40  *
* Max Chl Dpth (ft)       *    7.80  * Hydr. Depth (ft)        *    2.17  *    5.02  *    1.90  *
* Conv. Total (cfs)       * 58959.7  * Conv. (cfs)             * 14577.9  * 30135.7  * 14246.0  *
* Length Wtd. (ft)        *  487.67  * Wetted Per. (ft)        *   90.32  *   55.78  *  108.36  *
* Min Ch El (ft)          * 1556.27  * Shear (lb/sq ft)        *    0.54  *    1.22  *    0.48  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)  *    2.59  *    8.68  *    2.11  *
* Frctn Loss (ft)         *    2.40  * Cum Volume (acre-ft)    *  152.24  *  136.92  *  104.08  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   43.19  *   18.36  *   28.53  *
*****************************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1565.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.51  * Wt. n-Val.              *   0.033  *   0.038  *   0.033  *
* W.S. Elev (ft)          * 1565.06  * Reach Len. (ft)         *  491.51  *  492.30  *  475.92  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  154.14  *  322.52  *  188.43  *
* E.G. Slope (ft/ft)      *0.002424  * Area (sq ft)            *  154.14  *  322.52  *  188.43  *
* Q Total (cfs)           * 3750.00  * Flow (cfs)              *  836.49  * 2000.32  *  913.19  *
* Top Width (ft)          *  145.00  * Top Width (ft)          *   36.25  *   53.72  *   55.03  *
* Vel Total (ft/s)        *    5.64  * Avg. Vel. (ft/s)        *    5.43  *    6.20  *    4.85  *
* Max Chl Dpth (ft)       *    8.79  * Hydr. Depth (ft)        *    4.25  *    6.00  *    3.42  *
* Conv. Total (cfs)       * 76162.5  * Conv. (cfs)             * 16989.0  * 40626.5  * 18546.9  *
* Length Wtd. (ft)        *  488.15  * Wetted Per. (ft)        *   40.25  *   55.78  *   58.30  *
* Min Ch El (ft)          * 1556.27  * Shear (lb/sq ft)        *    0.58  *    0.88  *    0.49  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    3.15  *    5.43  *    2.37  *
* Frctn Loss (ft)         *    2.25  * Cum Volume (acre-ft)    *   41.73  *  145.85  *   27.46  *
* C & E Loss (ft)         *    0.11  * Cum SA (acres)          *    6.64  *   18.35  *    4.79  *
*****************************************************************************************************
```

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.

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.

Profile #1

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9795.97   * 9880.61   *     2.56 *     1.86 *     5.36 *     0.07 *
0.38 *     1.37 *
* 2        * LOB       * 9880.61   * 9965.25   *   924.64 *   192.43 *    84.96 *    24.66 *
2.27 *     4.81 *
* 3        * Chan      * 9965.25   * 10018.97  *  1916.72 *   269.60 *    55.78 *    51.11 *
5.02 *     7.11 *
* 4        * ROB       * 10018.97  * 10113.06  *   896.57 *   199.97 *    94.20 *    23.91 *
2.13 *     4.48 *
* 5        * ROB       * 10113.06  * 10207.16  *     9.52 *     6.13 *    14.16 *     0.25 *
0.43 *     1.55 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9880.61   * 9965.25   *   836.49 *   154.14 *    40.25 *    22.31 *
4.25 *     5.43 *
* 2          * Chan      * 9965.25   * 10018.97  *  2000.32 *   322.52 *    55.78 *    53.34 *
6.00 *     6.20 *
* 3          * ROB       * 10018.97  * 10113.06  *   913.19 *   188.43 *    58.30 *    24.35 *
3.42 *     4.85 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 1.196

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9892.61 1562.83 9896.04 1562.88 9918.06 1562.51  9922.7 1562.17 9922.81 1562.16
 9949.58 1558.95 9952.79 1558.72 9955.57 1558.41 9976.35  1558.4 9982.88 1558.21
 9996.36 1557.6610003.11 1554.5810005.49 1553.4710012.97 1554.7210014.07 1553.63
10016.67 1557.5110022.99  1557.410029.88 1558.0110043.06 1558.97 10055.6 1559.79
10056.65 1559.7910073.15 1560.0910083.42 1559.9610098.04 1559.9410103.25 1560.06
10110.19 1560.0410133.34 1560.1410136.96 1560.1510137.78 1560.1210163.43 1560.37
10163.72 1560.3810167.05 1560.5410174.11 1561.1210190.49 1561.7810199.28 1562.01
10217.26 1562.2610223.61 1562.3610244.03 1562.79 10253.7 1562.95 10270.8 1563.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9892.61    .033 9976.35    .04210029.88    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.3510029.88          150.213 146.404 151.914             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1562.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.66  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1561.57  * Reach Len. (ft)         *  150.21  *  146.40  *  151.91  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  111.32  *  257.12  *  240.81  *
* E.G. Slope (ft/ft)     *0.006100  * Area (sq ft)            *  111.32  *  257.12  *  240.81  *
* Q Total (cfs)          * 3750.00  * Flow (cfs)               *  678.72  * 1937.20  * 1134.09  *
* Top Width (ft)         *  257.41  * Top Width (ft)           *   48.58  *   53.53  *  155.29  *
* Vel Total (ft/s)       *    6.16  * Avg. Vel. (ft/s)         *    6.10  *    7.53  *    4.71  *
* Max Chl Dpth (ft)      *    8.10  * Hydr. Depth (ft)         *    2.29  *    4.80  *    1.55  *
* Conv. Total (cfs)      * 48013.4  * Conv. (cfs)              *  8690.0  * 24803.1  * 14520.4  *
* Length Wtd. (ft)       *  148.66  * Wetted Per. (ft)         *   48.77  *   57.11  *  155.40  *
* Min Ch El (ft)         * 1553.47  * Shear (lb/sq ft)         *    0.87  *    1.71  *    0.59  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)   *    5.30  *   12.92  *    2.78  *
* Frctn Loss (ft)        *    0.59  * Cum Volume (acre-ft)     *  150.51  *  133.94  *  101.64  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *   42.41  *   17.75  *   27.09  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1563.20  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.57  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
```

```
* W.S. Elev (ft)          * 1561.63  * Reach Len. (ft)         *  150.21  *  146.40  *  151.91  *
* Crit W.S. (ft)          * 1561.58  * Flow Area (sq ft)       *    4.36  *  260.68  *  116.99  *
* E.G. Slope (ft/ft)      *0.012030  * Area (sq ft)            *    4.36  *  260.68  *  116.99  *
* Q Total (cfs)           * 3750.00  * Flow (cfs)              *   20.85  * 2783.37  *  945.78  *
* Top Width (ft)          *  109.00  * Top Width (ft)          *    1.35  *   53.53  *   54.12  *
* Vel Total (ft/s)        *    9.82  * Avg. Vel. (ft/s)        *    4.78  *   10.68  *    8.08  *
* Max Chl Dpth (ft)       *    8.16  * Hydr. Depth (ft)        *    3.23  *    4.87  *    2.16  *
* Conv. Total (cfs)       * 34190.4  * Conv. (cfs)             *   190.1  * 25377.2  *  8623.1  *
* Length Wtd. (ft)        *  148.23  * Wetted Per. (ft)        *    4.58  *   57.11  *   55.86  *
* Min Ch El (ft)          * 1553.47  * Shear (lb/sq ft)        *    0.72  *    3.43  *    1.57  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    3.42  *   36.60  *   12.72  *
* Frctn Loss (ft)         *    0.52  * Cum Volume (acre-ft)    *   40.84  *  142.56  *   25.80  *
* C & E Loss (ft)         *    0.35  * Cum SA (acres)          *    6.43  *   17.75  *    4.20  *
*****************************************************************************************************

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.
Warning: The cross section had to be extended vertically during the critical depth calculations.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9892.61   * 9934.48   *     4.83 *     2.70 *     6.76 *     0.13 *
0.40 *     1.79 *
* 2         * LOB       * 9934.48   * 9976.35   *   673.88 *   108.62 *    42.00 *    17.97 *
2.59 *     6.20 *
* 3         * Chan      * 9976.35   * 10029.88  *  1937.20 *   257.12 *    57.11 *    51.66 *
4.80 *     7.53 *
* 4         * ROB       * 10029.88  * 10150.34  *  1051.31 *   212.63 *   120.53 *    28.03 *
1.77 *     4.94 *
* 5         * ROB       * 10150.34  * 10270.80  *    82.77 *    28.18 *    34.87 *     2.21 *
0.81 *     2.94 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9934.48   * 9976.35   *    20.85 *     4.36 *     4.58 *     0.56 *
3.23 *     4.78 *
* 2         * Chan      * 9976.35   * 10029.88  *  2783.37 *   260.68 *    57.11 *    74.22 *
4.87 *    10.68 *
* 3         * ROB       * 10029.88  * 10150.34  *   945.78 *   116.99 *    55.86 *    25.22 *
2.16 *     8.08 *
*****************************************************************************************************
******************

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.
Warning: The cross section had to be extended vertically during the critical depth calculations.
```

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: WASH 3-WEST
REACH: REACH-1 RS: 1.168

INPUT
Description: Flow rate starting at this cross-section and downstream is increased to 4,250cfs.
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9897.44	1561.77	9900.08	1561.6	9917.7	1561.43	9922.58	1560.38	9933.08	1557.46
9945.09	1553.07	9947.72	1553.23	9958.99	1556.11	9966.09	1555.52	9972.86	1556.11
9979.2	1556.83	9988.07	1552.48	9997.45	1552.61	9998	1553.06	9999.1	1553.21
10005.74	1557.28	10018.03	1557.68	10023.14	1556.81	10026.77	1556.46	10032.1	1556.79
10048.29	1557.65	10065.11	1558.27	10073.43	1558.54	10098.11	1559.21	10098.57	1559.21
10123.71	1559.59	10131.12	1559.75	10148.85	1560.14	10164.12	1560.48	10173.99	1560.63
10197.13	1560.81	10199.14	1560.83	10224.28	1561.01	10230.13	1561.07	10249.42	1561.34
10263.14	1561.65	10274.56	1561.88	10276.16	1561.84	10282.1	1561.59	10296.14	1561.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9897.44	.033	9958.99	.042	10032.1	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.99	10032.1	266.86	296.403	270	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9897.44	9938.86	1561.75	F

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1561.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1561.04	Reach Len. (ft)	266.86	296.40	270.00
Crit W.S. (ft)	1559.74	Flow Area (sq ft)	135.07	392.04	287.31
E.G. Slope (ft/ft)	0.002866	Area (sq ft)	185.11	392.04	287.31
Q Total (cfs)	4250.00	Flow (cfs)	1129.58	2223.76	896.66
Top Width (ft)	307.54	Top Width (ft)	39.47	73.11	194.96
Vel Total (ft/s)	5.22	Avg. Vel. (ft/s)	8.36	5.67	3.12
Max Chl Dpth (ft)	8.56	Hydr. Depth (ft)	6.71	5.36	1.47
Conv. Total (cfs)	79392.5	Conv. (cfs)	21101.3	41541.2	16750.1
Length Wtd. (ft)	286.13	Wetted Per. (ft)	20.90	75.64	195.02
Min Ch El (ft)	1552.48	Shear (lb/sq ft)	1.16	0.93	0.26
Alpha	1.38	Stream Power (lb/ft s)	9.67	5.26	0.82
Frctn Loss (ft)	1.26	Cum Volume (acre-ft)	150.00	132.85	100.72
C & E Loss (ft)	0.03	Cum SA (acres)	42.26	17.54	26.48

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1562.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1561.93	Reach Len. (ft)	266.86	296.40	270.00
Crit W.S. (ft)	1559.63	Flow Area (sq ft)	164.63	457.22	221.90
E.G. Slope (ft/ft)	0.001760	Area (sq ft)	164.63	457.22	221.90
Q Total (cfs)	4250.00	Flow (cfs)	994.63	2251.99	1003.38

```
* Top Width (ft)          *  152.00  * Top Width (ft)          *   21.99  *   73.11  *   56.90  *
* Vel Total (ft/s)        *    5.04  * Avg. Vel. (ft/s)        *    6.04  *    4.93  *    4.52  *
* Max Chl Dpth (ft)       *    9.45  * Hydr. Depth (ft)        *    7.49  *    6.25  *    3.90  *
* Conv. Total (cfs)       *101301.9  * Conv. (cfs)            * 23707.8  * 53677.9  * 23916.2  *
* Length Wtd. (ft)        *  289.43  * Wetted Per. (ft)        *   28.78  *   75.64  *   59.92  *
* Min Ch El (ft)          * 1552.48  * Shear (lb/sq ft)        *    0.63  *    0.66  *    0.41  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    3.80  *    3.27  *    1.84  *
* Frctn Loss (ft)         *    1.00  * Cum Volume (acre-ft)    *   40.54  *  141.35  *   25.21  *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)          *    6.39  *   17.53  *    4.00  *
*****************************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9897.44   * 9938.86   *     0.00 *    50.04 *    20.18 *     0.00 *
2.59 *     0.00 *
* 2        * LOB       * 9938.86   * 9958.99   *  1129.58 *   135.07 *    20.90 *    26.58 *
6.71 *     8.36 *
* 3        * Chan      * 9958.99   * 10032.10  *  2223.76 *   392.04 *    75.64 *    52.32 *
5.36 *     5.67 *
* 4        * ROB       * 10032.10  * 10164.12  *   884.27 *   271.71 *   132.08 *    20.81 *
2.06 *     3.25 *
* 5        * ROB       * 10164.12  * 10296.14  *    12.38 *    15.60 *    62.94 *     0.29 *
0.25 *     0.79 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9897.44   * 9938.86   *    25.26 *    11.61 *     7.88 *     0.59 *
6.24 *     2.18 *
* 2        * LOB       * 9938.86   * 9958.99   *   969.37 *   153.01 *    20.90 *    22.81 *
7.60 *     6.34 *
* 3        * Chan      * 9958.99   * 10032.10  *  2251.99 *   457.22 *    75.64 *    52.99 *
6.25 *     4.93 *
* 4        * ROB       * 10032.10  * 10164.12  *  1003.38 *   221.90 *    59.92 *    23.61 *
3.90 *     4.52 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1 RS: 1.112

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9666.42	1562.3	9676	1561.82	9699.42	1561.17	9701.14	1561.13	9718.91	1560.86
9726.29	1560.79	9732.42	1560.72	9751.43	1560.56	9765.42	1560.4	9776.58	1560.25
9780.32	1560.24	9798.42	1559.81	9801.72	1559.67	9826.87	1558.76	9831.42	1558.69
9852.01	1558.54	9853.29	1558.55	9864.41	1558.46	9877.15	1558.28	9897.41	1558.02
9902.3	1557.93	9927.44	1557.32	9930.41	1557.25	9935.15	1557.11	9952.59	1556.87
9963.41	1556.87	9977.73	1556.63	9984.08	1556.02	9994.43	1551.8	9996.41	1552.6
10002.88	1551.44	10010.63	1552.12	10026.26	1556.33	10028.02	1556.55	10029.41	1556.64
10046.67	1557.57	10053.16	1558.26	10062.41	1558.91	10072.92	1559.45	10078.31	1559.63
10095.41	1560.13	10103.45	1560.36	10128.41	1561	10128.6	156	110134.53	1561.11
10153.74	1561.21	10161.41	1561.13	10178.89	1560.94	10194.41	1561.12	10200.43	1561.21
10204.03	1561.27	10227.4	1561.52						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9666.42	.033	9952.59	.042	10046.67	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.59	10046.67	331.609	335.12	291.129	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1560.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1559.50	Reach Len. (ft)	331.61	335.12	291.13
Crit W.S. (ft)		Flow Area (sq ft)	198.81	401.43	22.16
E.G. Slope (ft/ft)	0.007597	Area (sq ft)	198.81	401.43	22.16
Q Total (cfs)	4250.00	Flow (cfs)	958.14	3216.96	74.90
Top Width (ft)	267.81	Top Width (ft)	146.08	94.08	27.65
Vel Total (ft/s)	6.83	Avg. Vel. (ft/s)	4.82	8.01	3.38
Max Chl Dpth (ft)	8.06	Hydr. Depth (ft)	1.36	4.27	0.80
Conv. Total (cfs)	48759.3	Conv. (cfs)	10992.5	36907.5	859.3
Length Wtd. (ft)	327.13	Wetted Per. (ft)	146.11	95.83	27.72
Min Ch El (ft)	1551.44	Shear (lb/sq ft)	0.65	1.99	0.38
Alpha	1.16	Stream Power (lb/ft s)	3.11	15.92	1.28
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	148.83	130.15	99.76
C & E Loss (ft)	0.13	Cum SA (acres)	41.69	16.97	25.79

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1561.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.38	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1559.86	Reach Len. (ft)	331.61	335.12	291.13
Crit W.S. (ft)		Flow Area (sq ft)	16.48	435.23	0.75
E.G. Slope (ft/ft)	0.009590	Area (sq ft)	16.48	435.23	0.75
Q Total (cfs)	4250.00	Flow (cfs)	112.95	4135.60	1.45

* Top Width (ft)	* 100.00	* Top Width (ft)	* 5.59	* 94.08	* 0.33	*
* Vel Total (ft/s)	* 9.39	* Avg. Vel. (ft/s)	* 6.86	* 9.50	* 1.93	*
* Max Chl Dpth (ft)	* 8.42	* Hydr. Depth (ft)	* 2.95	* 4.63	* 2.27	*
* Conv. Total (cfs)	* 43398.7	* Conv. (cfs)	* 1153.4	* 42230.5	* 14.8	*
* Length Wtd. (ft)	* 328.11	* Wetted Per. (ft)	* 8.50	* 95.83	* 2.58	*
* Min Ch El (ft)	* 1551.44	* Shear (lb/sq ft)	* 1.16	* 2.72	* 0.17	*
* Alpha	* 1.01	* Stream Power (lb/ft s)	* 7.96	* 25.84	* 0.34	*
* Frctn Loss (ft)	* 1.22	* Cum Volume (acre-ft)	* 39.99	* 138.31	* 24.52	*
* C & E Loss (ft)	* 0.28	* Cum SA (acres)	* 6.30	* 16.97	* 3.83	*

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.
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.

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9666.42	9809.51	0.09	0.16	3.00	0.00	0.05	0.55
* 2	LOB	9809.51	9952.59	958.05	198.65	143.11	22.54	1.39	4.82
* 3	Chan	9952.59	10046.67	3216.96	401.43	95.83	75.69	4.27	8.01
* 4	ROB	10046.67	10137.04	74.90	22.16	27.72	1.76	0.80	3.38

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9809.51	9952.59	112.95	16.48	8.50	2.66	2.95	6.86
* 2	Chan	9952.59	10046.67	4135.60	435.23	95.83	97.31	4.63	9.50
* 3	ROB	10046.67	10137.04	1.45	0.75	2.58	0.03	2.27	1.93

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.
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: WASH 3-WEST
REACH: REACH-1 RS: 1.049

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9721.09	1563.32	9742.52	1561.96	9742.93	1561.67	9758.31	1559.9	9764.78	1559.43
9770.84	1559.2	9786.62	1558.75	9800.5	1558.52	9808.46	1558.55	9820.58	1558.13
9830.31	1557.84	9852.15	1557.33	9858.6	1557.1	9870.33	1556.88	9873.58	1556.86
9873.99	1556.8	9895.83	1556.62	9917.68	1556.14	9920.08	1556.11	9939.52	1555.76
9961.36	1555.38	9969.82	1555.23	9983.21	1554.15	9984.28	1554.58	9993.61	1550.14
10005.05	1549.61	10009.86	1549.95	10019.57	1552.56	10020.34	1554.55	10026.89	1554.02
10028.49	1553.63	10047.72	1554.89	10048.74	1554.14	10053.57	1553.92	10066.14	1555.65
10069.32	1555.71	10070.58	1555.82	10092.42	155	610114.26	1557.03	10114.51	1557.19
10119.06	1557.28	10136.11	1557.84	10157.95	1558.44	10168.81	1558.55	10179.79	1558.62
10190.18	1558.68	10201.64	1558.77	10218.56	1559.07	10223.48	1559.16	10245.32	1559.44
10267.17	1559.74	10268.3	1559.76	10289.01	1560.07	10305.68	1560.19	10310.85	1560.18
10318.05	1560.32	10332.7	1560.54	10354.54	1561.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9721.09	.033	9969.82	.042	10020.34	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.82	10020.34	531.466	532.281	515.565	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1558.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1558.40	Reach Len. (ft)	531.47	532.28	515.57
Crit W.S. (ft)		Flow Area (sq ft)	274.59	322.36	317.12
E.G. Slope (ft/ft)	0.002766	Area (sq ft)	274.59	322.36	317.12
Q Total (cfs)	4250.00	Flow (cfs)	944.13	1989.14	1316.73
Top Width (ft)	343.49	Top Width (ft)	156.94	50.52	136.04
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	3.44	6.17	4.15
Max Chl Dpth (ft)	8.80	Hydr. Depth (ft)	1.75	6.38	2.33
Conv. Total (cfs)	80804.0	Conv. (cfs)	17950.5	37819.0	25034.5
Length Wtd. (ft)	528.74	Wetted Per. (ft)	156.98	53.38	136.61
Min Ch El (ft)	1549.60	Shear (lb/sq ft)	0.30	1.04	0.40
Alpha	1.19	Stream Power (lb/ft s)	1.04	6.44	1.66
Frctn Loss (ft)	2.20	Cum Volume (acre-ft)	147.03	127.37	98.63
C & E Loss (ft)	0.04	Cum SA (acres)	40.54	16.41	25.24

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.
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 OUTPUT Profile #2

E.G. Elev (ft)	1559.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1559.30	Reach Len. (ft)	531.47	532.28	515.57
Crit W.S. (ft)		Flow Area (sq ft)	199.59	367.82	235.81
E.G. Slope (ft/ft)	0.001951	Area (sq ft)	199.59	367.82	235.81
Q Total (cfs)	4250.00	Flow (cfs)	895.55	2081.37	1273.08
Top Width (ft)	155.00	Top Width (ft)	55.82	50.52	48.66
Vel Total (ft/s)	5.29	Avg. Vel. (ft/s)	4.49	5.66	5.40
Max Chl Dpth (ft)	9.70	Hydr. Depth (ft)	3.58	7.28	4.85
Conv. Total (cfs)	96215.4	Conv. (cfs)	20274.2	47120.0	28821.1
Length Wtd. (ft)	529.66	Wetted Per. (ft)	58.90	53.38	52.73
Min Ch El (ft)	1549.60	Shear (lb/sq ft)	0.41	0.84	0.54
Alpha	1.02	Stream Power (lb/ft s)	1.85	4.75	2.94
Frctn Loss (ft)	1.82	Cum Volume (acre-ft)	39.17	135.22	23.73
C & E Loss (ft)	0.08	Cum SA (acres)	6.07	16.41	3.66

```
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.
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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9721.09   * 9845.46   *    22.14 *    16.14 *    32.58 *     0.52 *
0.50 *     1.37 *
* 2         * LOB       * 9845.46   * 9969.82   *   921.99 *   258.45 *   124.39 *    21.69 *
2.08 *     3.57 *
* 3         * Chan      * 9969.82   * 10020.34  *  1989.14 *   322.36 *    53.38 *    46.80 *
6.38 *     6.17 *
* 4         * ROB       * 10020.34  * 10187.44  *  1316.73 *   317.12 *   136.61 *    30.98 *
2.33 *     4.15 *
*****************************************************************************************************
******************

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.
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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9845.46   * 9969.82   *   895.55 *   199.59 *    58.90 *    21.07 *
3.58 *     4.49 *
* 2         * Chan      * 9969.82   * 10020.34  *  2081.37 *   367.82 *    53.38 *    48.97 *
7.28 *     5.66 *
* 3         * ROB       * 10020.34  * 10187.44  *  1273.08 *   235.81 *    52.73 *    29.95 *
4.85 *     5.40 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 0.948

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9697.42 1561.51  9709.6 1561.41 9730.58 1560.77 9751.56 1560.18 9763.67 1560.11
 9772.53 1560.03 9793.51 1560.13 9814.49 1559.74 9829.92  1559.1 9835.47 1558.78
 9856.45 1557.72 9857.41 1557.34 9877.43 1555.54 9888.86 1554.63 9896.18 1554.39
 9898.41 1554.27 9919.39  1553.8 9928.93 1553.61 9940.36 1553.27 9961.34 1552.54
 9962.43 1552.55 9963.34 1552.46 9982.32 1552.65 9990.57 1552.14 9999.72 1548.75
```

```
 10003.3 1548.45 10015.8 1548.7410024.28  1551.910024.84 1552.1210028.68  1552.3
10045.26 1553.1710066.24 1554.1110087.22 1554.6910094.93 1554.8410108.19 1555.11
10129.17  1555.710150.15 1555.8810161.18 1556.0510171.13 1556.2110192.11 1556.58
10213.09 1556.6110227.44 1556.6610234.07  1556.710255.05 1556.9810276.02 1557.44
10293.69 1557.81   10297 1557.8810317.98 1558.2710338.96 1558.2310359.94 1558.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9697.42    .033 9961.34    .04210045.26    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.3410045.26          462.142 464.365 450.244             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1556.56  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.79  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1555.77  * Reach Len. (ft)         *  462.14  *  464.37  *  450.24  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  163.21  *  371.56  *   99.47  *
* E.G. Slope (ft/ft)     *0.006936  * Area (sq ft)            *  163.21  *  371.56  *   99.47  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              *  934.39  * 2922.28  *  393.33  *
* Top Width (ft)         *  262.18  * Top Width (ft)           *   86.44  *   83.92  *   91.82  *
* Vel Total (ft/s)       *    6.70  * Avg. Vel. (ft/s)         *    5.73  *    7.86  *    3.95  *
* Max Chl Dpth (ft)      *    7.32  * Hydr. Depth (ft)         *    1.89  *    4.43  *    1.08  *
* Conv. Total (cfs)      * 51029.7  * Conv. (cfs)              * 11219.3  * 35087.7  *  4722.7  *
* Length Wtd. (ft)       *  461.84  * Wetted Per. (ft)         *   86.52  *   85.20  *   91.86  *
* Min Ch El (ft)         * 1548.45  * Shear (lb/sq ft)         *    0.82  *    1.89  *    0.47  *
* Alpha                  *    1.14  * Stream Power (lb/ft s)   *    4.68  *   14.85  *    1.85  *
* Frctn Loss (ft)        *    2.38  * Cum Volume (acre-ft)     *  144.36  *  123.13  *   96.16  *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)           *   39.06  *   15.59  *   23.89  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1557.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.24  * Wt. n-Val.              *   0.033  *   0.042  *          *
* W.S. Elev (ft)         * 1556.60  * Reach Len. (ft)         *  462.14  *  464.37  *  450.24  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   36.42  *  440.71  *          *
* E.G. Slope (ft/ft)     *0.007600  * Area (sq ft)            *   36.42  *  440.71  *          *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              *  282.97  * 3967.03  *          *
* Top Width (ft)         *   93.00  * Top Width (ft)           *    9.34  *   83.66  *          *
* Vel Total (ft/s)       *    8.91  * Avg. Vel. (ft/s)         *    7.77  *    9.00  *          *
* Max Chl Dpth (ft)      *    8.15  * Hydr. Depth (ft)         *    3.90  *    5.27  *          *
* Conv. Total (cfs)      * 48751.0  * Conv. (cfs)              *  3245.9  * 45505.1  *          *
* Length Wtd. (ft)       *  463.36  * Wetted Per. (ft)         *   13.08  *   88.39  *          *
* Min Ch El (ft)         * 1548.45  * Shear (lb/sq ft)         *    1.32  *    2.37  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *   10.26  *   21.29  *          *
* Frctn Loss (ft)        *    2.37  * Cum Volume (acre-ft)     *   37.73  *  130.28  *   22.33  *
* C & E Loss (ft)        *    0.17  * Cum SA (acres)           *    5.67  *   15.59  *    3.37  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9829.38   * 9961.34   *   934.39 *   163.21 *    86.52 *    21.99 *
1.89 *     5.73 *
* 2          * Chan      * 9961.34   * 10045.26  *  2922.28 *   371.56 *    85.20 *    68.76 *
4.43 *     7.86 *
* 3          * ROB       * 10045.26  * 10202.60  *   393.33 *    99.47 *    91.86 *     9.25 *
1.08 *     3.95 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9829.38   * 9961.34   *   282.97 *    36.42 *    13.08 *     6.66 *
3.90 *     7.77 *
* 2          * Chan      * 9961.34   * 10045.26  *  3967.03 *   440.71 *    88.39 *    93.34 *
5.27 *     9.00 *
*****************************************************************************************************
******************

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.
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: WASH 3-WEST
REACH: REACH-1            RS: 0.86

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9591.76 1559.68 9603.92 1559.73 9612.64 1559.71 9619.34 1559.66 9633.52 1559.53
  9654.4 1559.27 9669.57 1558.92 9675.28 1558.73 9688.96  1558.1 9696.16 1557.83
 9717.04 1557.92 9737.92 1557.69 9754.88 1557.55 9758.59 1557.58  9758.8 1557.58
 9779.68 1557.23 9800.56 1557.42 9821.44 1556.36 9828.21  1555.8 9842.32 1554.17
  9853.1 1552.27  9863.2 1551.13  9869.2 1551.81  9883.9 1550.77 9884.08 1550.86
 9890.62 1550.92 9897.83 1550.62 9904.96 1550.59 9913.88 1550.04 9920.29 1548.66
 9925.84 1549.33 9933.22 1550.33 9946.72 1551.05 9958.01 1551.27 9967.46 1551.31
  9967.6 1551.31 9976.92 1550.65 9988.25 1547.03 9988.48 1547.44 10006.2 1547.04
10009.36 1548.0110018.68 1550.3310030.24 1551.44   10031 1551.5710037.08 1551.56
10051.12 1551.48   10072 1551.5610077.81 1551.8410092.88 1551.9710106.71 1552.19
10113.76 1552.2810134.64 1552.7210142.01 1552.8810155.52 1553.1210176.33 1553.57
 10176.4 1553.5710197.28 1553.9910218.16  1554.310239.04 1554.5410243.62 1554.57
10245.95 1554.4710259.92 1554.31 10280.8 1553.7710301.68 1553.6810315.58 1553.66
10321.72 1553.6710322.56 1553.7910337.22 1555.1910343.44 1555.2510364.32 1555.91
 10385.2 1556.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9591.76    .033 9967.46    .04210030.24    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.4610030.24          419.393  418.74 364.022             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
```

E.G. Elev (ft)	1554.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1553.62	Reach Len. (ft)	419.39	418.74	364.02
Crit W.S. (ft)		Flow Area (sq ft)	332.37	286.17	199.60
E.G. Slope (ft/ft)	0.003967	Area (sq ft)	332.37	286.17	199.60
Q Total (cfs)	4250.00	Flow (cfs)	1832.55	1729.10	688.35
Top Width (ft)	333.64	Top Width (ft)	122.04	62.78	148.82
Vel Total (ft/s)	5.19	Avg. Vel. (ft/s)	5.51	6.04	3.45
Max Chl Dpth (ft)	6.59	Hydr. Depth (ft)	2.72	4.56	1.34
Conv. Total (cfs)	67475.9	Conv. (cfs)	29094.9	27452.3	10928.7
Length Wtd. (ft)	406.58	Wetted Per. (ft)	122.62	64.10	148.85
Min Ch El (ft)	1547.03	Shear (lb/sq ft)	0.67	1.11	0.33
Alpha	1.11	Stream Power (lb/ft s)	3.70	6.68	1.15
Frctn Loss (ft)	1.78	Cum Volume (acre-ft)	141.73	119.62	94.62
C & E Loss (ft)	0.00	Cum SA (acres)	37.95	14.81	22.65

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1555.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1554.62	Reach Len. (ft)	419.39	418.74	364.02
Crit W.S. (ft)		Flow Area (sq ft)	241.45	348.97	57.89
E.G. Slope (ft/ft)	0.003678	Area (sq ft)	241.45	348.97	57.89
Q Total (cfs)	4250.00	Flow (cfs)	1630.53	2317.27	302.19
Top Width (ft)	139.00	Top Width (ft)	57.46	62.78	18.76
Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)	6.75	6.64	5.22
Max Chl Dpth (ft)	7.59	Hydr. Depth (ft)	4.20	5.56	3.09
Conv. Total (cfs)	70078.8	Conv. (cfs)	26886.1	38209.8	4982.9
Length Wtd. (ft)	411.55	Wetted Per. (ft)	62.09	64.10	21.90
Min Ch El (ft)	1547.03	Shear (lb/sq ft)	0.89	1.25	0.61
Alpha	1.01	Stream Power (lb/ft s)	6.03	8.30	3.17
Frctn Loss (ft)	1.73	Cum Volume (acre-ft)	36.25	126.08	22.03
C & E Loss (ft)	0.01	Cum SA (acres)	5.32	14.81	3.28

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9779.61	9967.46	1832.55	332.37	122.62	43.12	2.72	5.51
2	Chan	9967.46	10030.24	1729.10	286.17	64.10	40.68	4.56	6.04
3	ROB	10030.24	10207.72	688.35	199.60	148.85	16.20	1.34	3.45

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9779.61	9967.46	1630.53	241.45	62.09	38.37	4.20	6.75

```
* 2          * Chan       * 9967.46   * 10030.24  *  2317.27 *   348.97 *    64.10 *    54.52 *
5.56 *     6.64 *
* 3          * ROB        * 10030.24  * 10207.72  *   302.19 *    57.89 *    21.90 *     7.11 *
3.09 *     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: WASH 3-WEST
REACH: REACH-1 RS: 0.781

INPUT
Description:
Station Elevation Data num= 45

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9746.73 1553.06 9766.73 1552.67 9786.74 1552.31 9806.74 1551.96 9826.75 1551.64
 9835.45  1551.5 9846.75 1551.33 9866.75 1550.96 9886.76 1550.55  9890.4 1550.44
 9906.76 1550.07 9908.53 1550.03 9921.12  1549.1 9926.76 1549.05 9946.77 1549.29
 9966.77 1549.23 9974.66 1549.01 9985.09 1545.38 9986.78  1545.610004.96 1545.22
10006.78 1546.1910013.99 1548.7710026.78 1549.2110046.79    1549 10052.3 1548.84
10063.05  1546.510066.79 1547.6610073.87 1549.2310086.79 1549.78 10106.8 1549.97
10111.92 1550.03 10126.8 1550.3410146.81  1550.710161.74 1551.1210166.81 1551.36
10186.81 1552.4910206.82 1553.68   10209 1553.6210226.82 1554.53 10244.1 1555.74
10246.82 1555.8710266.83 1556.3110286.41 1556.3810286.83 1556.3610306.84 1556.42
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9746.73    .033 9966.77    .04210046.79    .033
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
       9966.7710046.79          426.411 420.403 395.114             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1552.31  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.47  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)          * 1551.84  * Reach Len. (ft)         *  426.41  *  420.40  *  395.11  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  227.77  *  331.58  *  252.09  *
* E.G. Slope (ft/ft)      *0.004848  * Area (sq ft)            *  227.77  *  331.58  *  252.09  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *  931.89  * 2084.13  * 1233.97  *
* Top Width (ft)          *  361.32  * Top Width (ft)          *  152.73  *   80.02  *  128.57  *
* Vel Total (ft/s)        *    5.24  * Avg. Vel. (ft/s)        *    4.09  *    6.29  *    4.89  *
* Max Chl Dpth (ft)       *    6.62  * Hydr. Depth (ft)        *    1.49  *    4.14  *    1.96  *
* Conv. Total (cfs)       * 61038.9  * Conv. (cfs)             * 13383.9  * 29932.5  * 17722.4  *
* Length Wtd. (ft)        *  414.87  * Wetted Per. (ft)        *  152.78  *   81.35  *  129.22  *
* Min Ch El (ft)          * 1545.22  * Shear (lb/sq ft)        *    0.45  *    1.23  *    0.59  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    1.85  *    7.75  *    2.89  *
* Frctn Loss (ft)         *    1.82  * Cum Volume (acre-ft)    *  139.03  *  116.65  *   92.73  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   36.63  *   14.12  *   21.49  *
*****************************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1553.56  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.81  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)          * 1552.75  * Reach Len. (ft)         *  426.41  *  420.40  *  395.11  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   79.37  *  403.94  *  107.57  *
* E.G. Slope (ft/ft)      *0.004830  * Area (sq ft)            *   79.37  *  403.94  *  107.57  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *  519.25  * 2890.74  *  840.01  *
* Top Width (ft)          *  125.00  * Top Width (ft)          *   22.77  *   80.02  *   22.21  *
* Vel Total (ft/s)        *    7.19  * Avg. Vel. (ft/s)        *    6.54  *    7.16  *    7.81  *
```

Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)	3.49	5.05	4.84
Conv. Total (cfs)	61151.7	Conv. (cfs)	7471.3	41593.7	12086.6
Length Wtd. (ft)	416.78	Wetted Per. (ft)	26.26	81.35	27.29
Min Ch El (ft)	1545.22	Shear (lb/sq ft)	0.91	1.50	1.19
Alpha	1.01	Stream Power (lb/ft s)	5.96	10.71	9.28
Frctn Loss (ft)	1.76	Cum Volume (acre-ft)	34.71	122.46	21.34
C & E Loss (ft)	0.03	Cum SA (acres)	4.93	14.12	3.11

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9746.73	9856.75	19.58	14.57	42.72	0.46	0.34	1.34
2	LOB	9856.75	9966.77	912.31	213.20	110.07	21.47	1.94	4.28
3	Chan	9966.77	10046.79	2084.14	331.58	81.35	49.04	4.14	6.29
4	ROB	10046.79	10176.81	1233.97	252.09	129.22	29.03	1.96	4.89

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9856.75	9966.77	519.25	79.37	26.26	12.22	3.49	6.54
2	Chan	9966.77	10046.79	2890.74	403.94	81.35	68.02	5.05	7.16
3	ROB	10046.79	10176.81	840.01	107.57	27.29	19.77	4.84	7.81

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.

CROSS SECTION .

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 0.701

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9620.45	1553.16	9640.45	1552.66	9660.45	1552.19	9680.45	1551.72	9696.78	1551.36
9700.45	1551.36	9720.45	1550.99	9740.45	1550.72	9760.46	1550.37	9766.3	1550.34
9780.46	1550	9800.46	1549.68	9820.46	1549.4	9840.46	1549.27	9850.2	1549.39
9860.46	1549.36	9880.46	1549.23	9887.12	1549.42	9900.46	1549.4	9910.02	1548.52
9920.46	1547.58	9933.65	1546.16	9939.28	1544.63	9940.46	1545.3	9947.64	1546.23
9960.46	1546.81	9980.46	1546.66	9982.6	1546.68	9991.94	1543.5410000.47		1543.22
10007.48	1543.7510020.47		1545.9910022.26		1546.2110040.47		1546.9510060.47		1547.34
10080.47	1547.7410085.96		1547.8610100.47		1548.0210120.47		1548.1710140.47		1548.42

```
 10149.6 1548.5610160.47 1549.0610180.47 1549.7510200.47 1550.7310209.33 1551.23
10220.47 1551.9210240.47 1552.6910241.66 1552.5910260.48 1551.74

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9620.45    .033 9980.46    .04210040.47    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.4610040.47           424.627 439.349 428.831             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1550.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.42  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1550.05  * Reach Len. (ft)         *  424.63  *  439.35  *  428.83  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  319.26  *  293.93  *  267.25  *
* E.G. Slope (ft/ft)     *0.004001  * Area (sq ft)            *  319.26  *  293.93  *  267.25  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1230.67  * 1881.36  * 1137.98  *
* Top Width (ft)         *  408.32  * Top Width (ft)          *  202.15  *   60.01  *  146.16  *
* Vel Total (ft/s)       *    4.83  * Avg. Vel. (ft/s)        *    3.85  *    6.40  *    4.26  *
* Max Chl Dpth (ft)      *    6.83  * Hydr. Depth (ft)        *    1.58  *    4.90  *    1.83  *
* Conv. Total (cfs)      * 67187.5  * Conv. (cfs)             * 19455.4  * 29742.0  * 17990.1  *
* Length Wtd. (ft)       *  432.76  * Wetted Per. (ft)        *  202.77  *   60.77  *  146.20  *
* Min Ch El (ft)         * 1543.22  * Shear (lb/sq ft)        *    0.39  *    1.21  *    0.46  *
* Alpha                  *    1.17  * Stream Power (lb/ft s)  *    1.52  *    7.73  *    1.94  *
* Frctn Loss (ft)        *    2.00  * Cum Volume (acre-ft)    *  136.35  *  113.63  *   90.37  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   34.89  *   13.45  *   20.25  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1551.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.72  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1551.04  * Reach Len. (ft)         *  424.63  *  439.35  *  428.83  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  152.24  *  353.48  *  119.36  *
* E.G. Slope (ft/ft)     *0.003743  * Area (sq ft)            *  152.24  *  353.48  *  119.36  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1030.71  * 2474.51  *  744.79  *
* Top Width (ft)         *  126.00  * Top Width (ft)          *   34.46  *   60.01  *   31.53  *
* Vel Total (ft/s)       *    6.80  * Avg. Vel. (ft/s)        *    6.77  *    7.00  *    6.24  *
* Max Chl Dpth (ft)      *    7.82  * Hydr. Depth (ft)        *    4.42  *    5.89  *    3.79  *
* Conv. Total (cfs)      * 69470.5  * Conv. (cfs)             * 16848.0  * 40448.3  * 12174.3  *
* Length Wtd. (ft)       *  435.16  * Wetted Per. (ft)        *   39.51  *   60.77  *   35.01  *
* Min Ch El (ft)         * 1543.22  * Shear (lb/sq ft)        *    0.90  *    1.36  *    0.80  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    6.09  *    9.51  *    4.97  *
* Frctn Loss (ft)        *    2.05  * Cum Volume (acre-ft)    *   33.58  *  118.80  *   20.31  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    4.65  *   13.45  *    2.86  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9620.45   * 9800.46   *     3.85 *     4.29 *    22.15 *     0.09 *
0.19 *     0.90 *
* 2        * LOB       * 9800.46   * 9980.46   *  1226.81 *   314.97 *   180.62 *    28.87 *
1.75 *     3.89 *
* 3        * Chan      * 9980.46   * 10040.47  *  1881.36 *   293.93 *    60.77 *    44.27 *
4.90 *     6.40 *
* 4        * ROB       * 10040.47  * 10150.47  *  1082.27 *   241.18 *   110.02 *    25.47 *
2.19 *     4.49 *
```

```
* 5          * ROB       * 10150.47  * 10260.48  *    55.71 *    26.07 *    36.18 *     1.31 *
0.72 *     2.14 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9800.46   * 9980.46   *  1030.71 *   152.24 *    39.51 *    24.25 *
4.42 *     6.77 *
* 2         * Chan      * 9980.46   * 10040.47  *  2474.51 *   353.48 *    60.77 *    58.22 *
5.89 *     7.00 *
* 3         * ROB       * 10040.47  * 10150.47  *   744.79 *   119.36 *    35.01 *    17.52 *
3.79 *     6.24 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 0.618

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9663.43 1549.34 9683.43 1548.92 9703.44 1548.49 9719.61 1548.16 9723.44 1548.08
 9743.44 1547.64 9763.44 1547.29 9783.45 1547.08 9787.26 1547.02 9803.45 1546.82
 9822.07 1546.53 9823.45 1546.54 9831.36 1545.78 9840.47 1546.36 9843.45 1546.34
 9863.46 1546.21 9883.46 1546.19 9903.46 1546.28 9923.46 1546.37 9923.52 1546.37
 9943.47 1546.13 9963.47 1545.49 9972.14 1544.98 9983.47 1542.16 9985.63 1541.71
 9997.57 1541.7410003.47 1543.5710008.46 1545.0610023.48 1543.9610028.21 1543.75
10043.48 1544.3110063.48  1545.510069.94 1545.8410083.48 1546.3310103.49 1547.01
10123.49 1547.9510127.26 1548.0510143.49 1549.7510158.03 1551.0810163.49 1551.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9663.43    .033 9963.47    .04210043.48    .033

Bank Sta: Left.  Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.4710043.48          310.115  391.99 413.854             .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1548.46  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.52  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)          * 1547.94  * Reach Len. (ft)         *  310.12  *  391.99  *  413.85  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  319.79  *  340.29  *  135.42  *
* E.G. Slope (ft/ft)      *0.005415  * Area (sq ft)            *  319.79  *  340.29  *  135.42  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              * 1305.20  * 2307.29  *  637.51  *
* Top Width (ft)          *  393.75  * Top Width (ft)          *  233.85  *   80.01  *   79.88  *
* Vel Total (ft/s)        *    5.34  * Avg. Vel. (ft/s)        *    4.08  *    6.78  *    4.71  *
* Max Chl Dpth (ft)       *    6.23  * Hydr. Depth (ft)        *    1.37  *    4.25  *    1.70  *
* Conv. Total (cfs)       * 57752.6  * Conv. (cfs)             * 17736.1  * 31353.4  *  8663.1  *
* Length Wtd. (ft)        *  374.85  * Wetted Per. (ft)        *  233.93  *   80.97  *   79.97  *
* Min Ch El (ft)          * 1541.71  * Shear (lb/sq ft)        *    0.46  *    1.42  *    0.57  *
* Alpha                   *    1.17  * Stream Power (lb/ft s)   *    1.89  *    9.63  *    2.70  *
* Frctn Loss (ft)         *    1.43  * Cum Volume (acre-ft)     *  133.24  *  110.43  *   88.39  *
```

```
* C & E Loss (ft)        *    0.06  * Cum SA (acres)         *   32.77  *   12.74  *   19.13  *
*****************************************************************************************
```

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 OUTPUT Profile #2

```
*****************************************************************************************
* E.G. Elev (ft)          * 1549.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.96  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)          * 1548.73  * Reach Len. (ft)         *  310.12  *  391.99  *  413.85  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   75.07  *  403.47  *   64.96  *
* E.G. Slope (ft/ft)      *0.006096  * Area (sq ft)            *   75.07  *  403.47  *   64.96  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *  497.48  * 3251.49  *  501.03  *
* Top Width (ft)          *  123.00  * Top Width (ft)           *   26.47  *   80.01  *   16.52  *
* Vel Total (ft/s)        *    7.82  * Avg. Vel. (ft/s)         *    6.63  *    8.06  *    7.71  *
* Max Chl Dpth (ft)       *    7.02  * Hydr. Depth (ft)         *    2.84  *    5.04  *    3.93  *
* Conv. Total (cfs)       * 54433.5  * Conv. (cfs)              *  6371.7  * 41644.6  *  6417.2  *
* Length Wtd. (ft)        *  378.60  * Wetted Per. (ft)         *   29.01  *   80.97  *   19.99  *
* Min Ch El (ft)          * 1541.71  * Shear (lb/sq ft)         *    0.98  *    1.90  *    1.24  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)   *    6.53  *   15.28  *    9.54  *
* Frctn Loss (ft)         *    1.42  * Cum Volume (acre-ft)     *   32.47  *  114.98  *   19.40  *
* C & E Loss (ft)         *    0.14  * Cum SA (acres)           *    4.35  *   12.74  *    2.63  *
*****************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9663.43   * 9813.45   *   143.28 *    58.88 *    83.84 *     3.37 *
0.70 *     2.43 *
* 2        * LOB       * 9813.45   * 9963.47   *  1161.91 *   260.91 *   150.09 *    27.34 *
1.74 *     4.45 *
* 3        * Chan      * 9963.47   * 10043.48  *  2307.29 *   340.29 *    80.97 *    54.29 *
4.25 *     6.78 *
* 4        * ROB       * 10043.48  * 10103.49  *   620.74 *   126.13 *    60.07 *    14.61 *
2.10 *     4.92 *
* 5        * ROB       * 10103.49  * 10163.49  *    16.77 *     9.29 *    19.90 *     0.39 *
0.47 *     1.81 *
*****************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9813.45   * 9963.47   *   497.48 *    75.07 *    29.01 *    11.71 *
2.84 *     6.63 *
* 2        * Chan      * 9963.47   * 10043.48  *  3251.49 *   403.47 *    80.97 *    76.51 *
5.04 *     8.06 *
* 3        * ROB       * 10043.48  * 10103.49  *   501.03 *    64.96 *    19.99 *    11.79 *
3.93 *     7.71 *
*****************************************************************************************
******************
```

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.

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: WASH 3-WEST
REACH: REACH-1 RS: 0.544

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9725.58	1549.13	9738.43	1548.92	9747.57	1548.76	9763.35	1548.44	9769.56	1548.29
9786.54	1547.89	9791.55	1547.79	9813.54	1547.24	9834.65	1546.62	9835.53	1546.6
9846.06	1546.28	9857.52	1545.86	9879.51	1544.77	9882.76	1544.62	9901.32	1543.81
9901.5	1543.85	9923.49	1543.28	9930.87	1543.13	9945.48	1542.81	9963.96	1542.52
9967.47	1541.43	9976.16	1540.52	9978.98	1540.72	9981.39	1540.43	9989.46	1540.56
10004.97	1540.53	10011.45	1542.11	10021.93	1543.31	10027.08	1544.33	10033.44	1544.89
10044	1544.77	10055.44	1544.37	10075.19	1544.12	10077.43	1544.09	10078.61	1544.08
10099.42	1544.41	10121.41	1544.64	10123.3	1544.67	10143.4	1544.96	10150.7	1545.04
10165.39	1545.24	10171.41	1545.34	10187.38	1545.57	10209.37	1546.16	10213.85	1546.35
10219.52	1546.92	10231.36	1547.93	10253.35	1549.62	10267.63	1550.51	10275.34	1550.93
10291.39	1552.16	10297.33	1552.22	10315.74	1552.37	10319.32	1552.35	10341.31	1552.4
10355.35	1552.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9725.58	.033	9945.48	.042	10033.44	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.48	10033.44	230.902	320.516	325.895	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1546.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1546.64	Reach Len. (ft)	230.90	320.52	325.90
Crit W.S. (ft)		Flow Area (sq ft)	236.68	418.22	316.77
E.G. Slope (ft/ft)	0.002840	Area (sq ft)	236.68	418.22	316.77
Q Total (cfs)	4250.00	Flow (cfs)	936.75	2219.00	1094.26
Top Width (ft)	382.94	Top Width (ft)	111.65	87.96	183.33
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)	3.96	5.31	3.45
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)	2.12	4.75	1.73
Conv. Total (cfs)	79754.8	Conv. (cfs)	17578.8	41641.3	20534.6
Length Wtd. (ft)	298.49	Wetted Per. (ft)	111.73	88.58	183.38
Min Ch El (ft)	1540.43	Shear (lb/sq ft)	0.38	0.84	0.31
Alpha	1.11	Stream Power (lb/ft s)	1.49	4.44	1.06
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	131.26	107.02	86.24
C & E Loss (ft)	0.06	Cum SA (acres)	31.54	11.99	17.88

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 OUTPUT Profile #2

E.G. Elev (ft)	1548.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1547.64	Reach Len. (ft)	230.90	320.52	325.90
Crit W.S. (ft)		Flow Area (sq ft)	192.63	506.12	63.43
E.G. Slope (ft/ft)	0.002537	Area (sq ft)	192.63	506.12	63.43
Q Total (cfs)	4250.00	Flow (cfs)	1098.49	2882.63	268.88
Top Width (ft)	154.00	Top Width (ft)	44.48	87.96	21.56
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)	5.70	5.70	4.24
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)	4.33	5.75	2.94
Conv. Total (cfs)	84372.1	Conv. (cfs)	21807.6	57226.6	5337.9
Length Wtd. (ft)	302.29	Wetted Per. (ft)	48.32	88.58	24.82
Min Ch El (ft)	1540.43	Shear (lb/sq ft)	0.63	0.91	0.40

```
* Alpha                    *    1.01  * Stream Power (lb/ft s) *    3.60  *    5.15  *    1.72  *
* Frctn Loss (ft)          *    0.62  * Cum Volume (acre-ft)   *   31.51  *  110.89  *   18.79  *
* C & E Loss (ft)          *    0.03  * Cum SA (acres)         *    4.10  *   11.98  *    2.45  *
*****************************************************************************************************

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9725.58   * 9835.53   *     0.01 *     0.04 *     1.70 *     0.00 *
0.02 *     0.19 *
* 2         * LOB       * 9835.53   * 9945.48   *   936.74 *   236.64 *   110.03 *    22.04 *
2.15 *     3.96 *
* 3         * Chan      * 9945.48   * 10033.44  *  2219.00 *   418.22 *    88.58 *    52.21 *
4.75 *     5.31 *
* 4         * ROB       * 10033.44  * 10194.39  *  1074.87 *   304.34 *   160.98 *    25.29 *
1.89 *     3.53 *
* 5         * ROB       * 10194.39  * 10355.35  *    19.39 *    12.43 *    22.40 *     0.46 *
0.56 *     1.56 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9835.53   * 9945.48   *  1098.49 *   192.63 *    48.32 *    25.85 *
4.33 *     5.70 *
* 2         * Chan      * 9945.48   * 10033.44  *  2882.63 *   506.12 *    88.58 *    67.83 *
5.75 *     5.70 *
* 3         * ROB       * 10033.44  * 10194.39  *   268.88 *    63.43 *    24.82 *     6.33 *
2.94 *     4.24 *
*****************************************************************************************************
******************

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 0.483

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9540.5 1549.61 9568.78 1548.89 9587.35 1548.65 9597.07 1548.54 9625.35  1548.3
 9653.64 1548.08 9669.83  1547.9 9681.92 1547.85 9710.21  1547.8 9738.49 1547.56
 9751.37 1547.35 9766.77 1546.87 9795.06 1545.67 9823.34 1543.95 9845.99 1543.18
 9851.63 1543.06 9879.91 1543.04  9908.2 1543.22 9919.33 1543.12 9936.48  1542.9
 9964.76 1542.54 9981.37 1541.87 9993.05 1539.34 9993.45 1539.2910011.55 1539.72
10021.33  1539.810034.82 1539.8310049.62 1541.4710053.86 1542.11 10077.9 1543.13
10106.19 1543.5410107.24 1543.4810134.47 1542.9710162.75 1543.2910191.04 1543.97
10219.32 1544.7710247.61 1545.5810275.89 1546.6310304.18 1548.2110332.46 1549.25
10340.93 1549.6610360.74 1549.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9540.5    .033 9964.76    .04210049.62    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

9964,7610049,62 334.018 421.216 448.599 .1 .3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1546.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1546.38	Reach Len. (ft)	334.02	421.22	448.60
Crit W.S. (ft)		Flow Area (sq ft)	515.95	502.32	554.56
E.G. Slope (ft/ft)	0.000802	Area (sq ft)	515.95	502.32	554.56
Q Total (cfs)	4250.00	Flow (cfs)	1296.52	1642.28	1311.20
Top Width (ft)	490.92	Top Width (ft)	186.48	84.86	219.58
Vel Total (ft/s)	2.70	Avg. Vel. (ft/s)	2.51	3.27	2.36
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)	2.77	5.92	2.53
Conv. Total (cfs)	150041.5	Conv. (cfs)	45772.3	57978.9	46290.3
Length Wtd. (ft)	390.15	Wetted Per. (ft)	186.56	85.24	219.71
Min Ch El (ft)	1539.29	Shear (lb/sq ft)	0.14	0.30	0.13
Alpha	1.07	Stream Power (lb/ft s)	0.35	0.97	0.30
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	129.26	103.63	82.98
C & E Loss (ft)	0.00	Cum SA (acres)	30.75	11.35	16.38

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1547.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.033	0.042	0.033
W.S. Elev (ft)	1547.10	Reach Len. (ft)	334.02	421.22	448.60
Crit W.S. (ft)		Flow Area (sq ft)	150.87	563.42	146.42
E.G. Slope (ft/ft)	0.001681	Area (sq ft)	150.87	563.42	146.42
Q Total (cfs)	4250.00	Flow (cfs)	687.72	2878.12	684.16
Top Width (ft)	152.00	Top Width (ft)	34.76	84.86	32.38
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)	4.56	5.11	4.67
Max Chl Dpth (ft)	7.81	Hydr. Depth (ft)	4.34	6.64	4.52
Conv. Total (cfs)	103665.1	Conv. (cfs)	16774.8	70202.5	16687.8
Length Wtd. (ft)	402.88	Wetted Per. (ft)	38.88	85.24	36.36
Min Ch El (ft)	1539.29	Shear (lb/sq ft)	0.41	0.69	0.42
Alpha	1.01	Stream Power (lb/ft s)	1.86	3.54	1.97
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	30.60	106.96	18.01
C & E Loss (ft)	0.02	Cum SA (acres)	3.89	11.35	2.24

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9752.63	9964.76	1296.52	515.95	186.56	30.51	2.77	2.51
2	Chan	9964.76	10049.62	1642.28	502.32	85.24	38.64	5.92	3.27
3	ROB	10049.62	10205.18	1226.77	486.14	155.65	28.87	3.13	2.52
4	ROB	10205.18	10360.74	84.42	68.41	64.06	1.99	1.07	1.23

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9752.63	9964.76	687.72	150.87	38.88	16.18	4.34	4.56
2	Chan	9964.76	10049.62	2878.12	563.42	85.24	67.72	6.64	5.11
3	ROB	10049.62	10205.18	684.16	146.42	36.36	16.10	4.52	4.67

```
*****************************************************************************************
******************

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 0.403

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9549.87 1548.47 9557.48 1548.19 9578.49 1547.59 9599.51 1547.25    9615 1547.27
 9620.52 1547.29 9641.54 1547.26 9653.48 1547.09 9662.56 1546.75 9680.13 1546.57
 9683.57 1546.51 9704.59    1546  9725.6 1545.23 9726.21 1545.32 9745.27 1544.34
 9746.62 1544.27 9767.63 1544.08 9781.61 1543.99 9788.65 1543.66 9809.66 1542.93
  9810.4 1542.91 9830.68 1542.15 9851.69 1541.44 9857.55 1541.29 9872.71 1540.98
 9875.53 1540.94 9893.72 1540.72 9914.74 1540.46 9920.48 1540.41 9935.75 1540.34
 9940.66 1540.34 9956.77 1540.34    9975 1540.23 9977.79 1540.05 9986.87 1539.69
 9997.01 1538.35  9998.8 1538.3810005.79 1538.5610014.71 1538.3110018.65  1539.5
10019.82 1539.3710031.18 1540.5510039.39    154210040.83  1542.510061.85 1546.61
10065.08 1547.3210070.92 1547.3610082.86 1548.1510102.27  1549.610103.88 1549.64
10109.01 1549.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9549.87    .033 9940.66    .04210031.18    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.6610031.18          271.255  246.43 233.107             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1546.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1546.08  * Reach Len. (ft)         *  271.26  *  246.43  *  233.11  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  819.66  *  583.44  *   77.74  *
* E.G. Slope (ft/ft)     *0.000689  * Area (sq ft)            *  819.66  *  583.44  *   77.74  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 2199.58  * 1871.16  *  179.26  *
* Top Width (ft)         *  357.86  * Top Width (ft)          *  239.38  *   90.52  *   27.96  *
* Vel Total (ft/s)       *    2.87  * Avg. Vel. (ft/s)        *    2.68  *    3.21  *    2.31  *
* Max Chl Dpth (ft)      *    7.77  * Hydr. Depth (ft)        *    3.42  *    6.45  *    2.78  *
* Conv. Total (cfs)      *161958.7  * Conv. (cfs)             * 83821.5  * 71305.9  *  6831.3  *
* Length Wtd. (ft)       *  255.90  * Wetted Per. (ft)        *  239.48  *   90.87  *   28.52  *
* Min Ch El (ft)         * 1538.31  * Shear (lb/sq ft)        *    0.15  *    0.28  *    0.12  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.39  *    0.89  *    0.27  *
* Frctn Loss (ft)        *    0.09  * Cum Volume (acre-ft)    *  124.14  *   98.39  *   79.73  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   29.11  *   10.50  *   15.10  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1546.91  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.30  * Wt. n-Val.              *   0.033  *   0.042  *   0.033  *
* W.S. Elev (ft)         * 1546.61  * Reach Len. (ft)         *  271.26  *  246.43  *  233.11  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  292.24  *  631.44  *   46.55  *
* E.G. Slope (ft/ft)     *0.001121  * Area (sq ft)            *  292.24  *  631.44  *   46.55  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1365.59  * 2723.30  *  161.11  *
* Top Width (ft)         *  147.00  * Top Width (ft)          *   47.66  *   90.52  *    8.82  *
* Vel Total (ft/s)       *    4.38  * Avg. Vel. (ft/s)        *    4.67  *    4.31  *    3.46  *
* Max Chl Dpth (ft)      *    8.30  * Hydr. Depth (ft)        *    6.13  *    6.98  *    5.28  *
* Conv. Total (cfs)      *126953.8  * Conv. (cfs)             * 40792.1  * 81349.0  *  4812.7  *
* Length Wtd. (ft)       *  252.96  * Wetted Per. (ft)        *   53.54  *   90.87  *   13.38  *
* Min Ch El (ft)         * 1538.31  * Shear (lb/sq ft)        *    0.38  *    0.49  *    0.24  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    1.78  *    2.10  *    0.84  *
```

```
* Frctn Loss (ft)        *    0.18  * Cum Volume (acre-ft)   *   28.91  *  101.18  *   17.01  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *    3.57  *   10.50  *    2.03  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9549.87   * 9745.27   *    31.59 *    34.22 *    44.03 *     0.74 *
0.78 *     0.92 *
* 2        * LOB       * 9745.27   * 9940.66   *  2167.99 *   785.44 *   195.45 *    51.01 *
4.02 *     2.76 *
* 3        * Chan      * 9940.66   * 10031.18  *  1871.16 *   583.44 *    90.87 *    44.03 *
6.45 *     3.21 *
* 4        * ROB       * 10031.18  * 10070.09  *   179.26 *    77.74 *    28.52 *     4.22 *
2.78 *     2.31 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9745.27   * 9940.66   *  1365.59 *   292.24 *    53.54 *    32.13 *
6.13 *     4.67 *
* 2        * Chan      * 9940.66   * 10031.18  *  2723.30 *   631.44 *    90.87 *    64.08 *
6.98 *     4.31 *
* 3        * ROB       * 10031.18  * 10070.09  *   161.11 *    46.55 *    13.38 *     3.79 *
5.28 *     3.46 *
*****************************************************************************************
******************

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: WASH 3-WEST
REACH: REACH-1            RS: 0.356

INPUT
Description:
Station Elevation Data    num=      67
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9502.45  1546.7 9519.47 1546.68 9525.09 1546.66 9544.93 1546.44 9545.15 1546.43
 9547.72  1546.4 9570.36 1546.03 9587.85 1545.53    9593 1545.41 9597.79 1545.31
 9615.63 1544.82 9623.98 1544.55 9630.55 1544.75 9638.27 1544.54 9660.91 1544.73
 9673.25 1544.85 9683.54  1544.8 9697.93 1544.71 9706.18 1544.45 9715.95 1544.19
 9728.82 1543.51 9751.45 1543.39 9758.65 1543.01 9774.09 1542.15 9796.72 1541.31
 9801.35 1541.17 9812.93 1540.88 9819.36 1540.72    9842 1540.37 9844.05 1540.35
 9864.63 1540.05 9880.32 1539.85 9886.76 1539.66 9887.27 1539.66 9900.36 1539.11
 9909.91 1539.38 9912.36  1539.5 9929.46 1539.53 9932.54 1539.52 9955.18 1539.45
 9965.13 1539.38 9970.04 1539.24 9972.16 1539.13 9977.56 1539.04 9977.82 1538.83
 9981.62 1537.53 9994.81 1536.9810000.45 1538.3510001.31 1538.7710014.86 1539.11
10023.09 1539.2810045.73 1539.4910057.56 1539.6510068.36 1539.85   10091 1540.39
10100.26 1540.7310113.64 1541.3810136.27 1543.1510142.96 1543.8710158.91 1545.14
10181.55 1545.8210185.66 1545.8710204.18 1546.2310226.82 1547.3610228.36 1547.44
```

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10249.45 1548.3110271.06 1548.36

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 9502.45    .035 9932.54    .03510023.09    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9932.5410023.09          439.033 416.326 370.915              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1546.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.035  *   0.035  *   0.035  *
* W.S. Elev (ft)          * 1546.05  * Reach Len. (ft)         *  439.03  *  416.33  *  370.92  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1237.57  *  654.15  *  689.38  *
* E.G. Slope (ft/ft)      *0.000206  * Area (sq ft)            * 1237.57  *  654.15  *  689.38  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              * 1706.66  * 1483.45  * 1059.89  *
* Top Width (ft)          *  625.77  * Top Width (ft)          *  363.40  *   90.55  *  171.83  *
* Vel Total (ft/s)        *    1.65  * Avg. Vel. (ft/s)        *    1.38  *    2.27  *    1.54  *
* Max Chl Dpth (ft)       *    9.07  * Hydr. Depth (ft)        *    3.41  *    7.22  *    4.01  *
* Conv. Total (cfs)       *296085.0  * Conv. (cfs)             *118898.1  *103347.7  * 73839.2  *
* Length Wtd. (ft)        *  407.87  * Wetted Per. (ft)        *  363.54  *   91.12  *  172.03  *
* Min Ch El (ft)          * 1536.98  * Shear (lb/sq ft)        *    0.04  *    0.09  *    0.05  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.06  *    0.21  *    0.08  *
* Frctn Loss (ft)         *    0.06  * Cum Volume (acre-ft)    *  117.74  *   94.88  *   77.68  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   27.24  *    9.99  *   14.57  *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1546.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *   0.035  *   0.035  *   0.035  *
* W.S. Elev (ft)          * 1546.50  * Reach Len. (ft)         *  439.03  *  416.33  *  370.92  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  369.83  *  695.13  *  156.02  *
* E.G. Slope (ft/ft)      *0.000511  * Area (sq ft)            *  369.83  *  695.13  *  156.02  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              * 1203.93  * 2585.54  *  460.53  *
* Top Width (ft)          *  165.00  * Top Width (ft)          *   52.54  *   90.55  *   21.91  *
* Vel Total (ft/s)        *    3.48  * Avg. Vel. (ft/s)        *    3.26  *    3.72  *    2.95  *
* Max Chl Dpth (ft)       *    9.52  * Hydr. Depth (ft)        *    7.04  *    7.68  *    7.12  *
* Conv. Total (cfs)       *187981.2  * Conv. (cfs)             * 53251.0  *114360.7  * 20369.6  *
* Length Wtd. (ft)        *  415.24  * Wetted Per. (ft)        *   59.21  *   91.12  *   28.93  *
* Min Ch El (ft)          * 1536.98  * Shear (lb/sq ft)        *    0.20  *    0.24  *    0.17  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.65  *    0.91  *    0.51  *
* Frctn Loss (ft)         *    0.24  * Cum Volume (acre-ft)    *   26.84  *   97.43  *   16.47  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    3.26  *    9.99  *    1.95  *
*****************************************************************************************

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9502.45   * 9717.50   *    97.35 *   170.82 *   148.39 *     2.29 *
1.15 *     0.57 *
* 2        * LOB       * 9717.50   * 9932.54   *  1609.32 *  1066.74 *   215.15 *    37.87 *
4.96 *     1.51 *
* 3        * Chan      * 9932.54   * 10023.09  *  1483.45 *   654.15 *    91.12 *    34.90 *
7.22 *     2.27 *
* 4        * ROB       * 10023.09  * 10147.07  *  1047.80 *   658.45 *   124.14 *    24.65 *
5.31 *     1.59 *
* 5        * ROB       * 10147.07  * 10271.06  *    12.09 *    30.93 *    47.89 *     0.28 *
0.65 *     0.39 *
*****************************************************************************************
******************

  Profile #2
*****************************************************************************************
******************
```

```
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9717.50   * 9932.54   *  1203.93 *   369.83 *    59.21 *    28.33 *
7.04 *     3.26 *
* 2         * Chan      * 9932.54   * 10023.09  *  2585.54 *   695.13 *    91.12 *    60.84 *
7.68 *     3.72 *
* 3         * ROB       * 10023.09  * 10147.07  *   460.53 *   156.02 *    28.93 *    10.84 *
7.12 *     2.95 *
*****************************************************************************************************
******************

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 0.277

INPUT
Description:
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9502.14 1547.29 9527.86 1546.59 9533.95 1546.41 9553.58 1545.81 9565.75 1545.43
 9579.31 1544.95 9597.56 1544.31 9605.03 1544.13 9629.36 1543.88 9630.75 1543.85
 9653.81  1543.1 9656.47 1542.94 9661.17 1542.79 9668.22  1542.5 9682.19 1543.05
 9682.47 1542.82 9692.97 1543.39 9701.11 1543.83 9707.91 1543.62 9724.78 1543.12
 9733.64  1542.8 9756.59  1542.9 9759.36  1542.9 9762.43 1542.95 9785.08 1542.84
 9788.39 1542.83 9795.89 1542.81  9810.8 1542.59  9820.2 1542.29 9836.52 1541.78
    9852 1541.04 9852.84 1541.08 9862.24 1540.41 9874.28 1539.74 9883.81 1539.18
 9887.97 1538.96 9903.12 1538.12 9913.69  1538.1 9915.62 1538.01    9919 1537.89
 9923.56 1537.12  9929.1 1537.34 9939.41 1537.45 9946.34  1537.5 9947.42 1537.55
 9965.13 1537.63 9975.71 1537.73 9979.23 1537.92 9990.85 1537.54 9991.68 1537.95
 9995.92 1536.6110007.02 1536.6510011.03 1537.6210015.83 1538.0610016.57 1537.99
 10042.3 1538.0110042.84   153810068.02 1537.9110074.64 1537.9110082.39 1537.92
10093.74 1537.9310106.45 1537.9610119.46 1538.1310138.26 1538.3610145.18 1538.49
10170.06 1538.82 10170.9 1538.8410196.63 1539.4510201.87 1539.5910222.35  1540.1
10233.67  1540.410248.07 1540.7110265.48 1541.1910267.78 1541.2910273.79 1541.44
10297.28 1542.3910299.51 1542.5210305.31 1542.7210325.23  1545.210329.09 1545.48
10350.96  1546.8 10360.9 1547.2110376.68 1547.59 10392.7 1547.81 10402.4 1547.81
10424.51 1548.1510428.12  1548.210453.84 1548.2910456.31 1548.3310479.56 1548.63
 10487.4  1548.810488.12 1548.7910505.29 1549.1510519.93 1549.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9502.14    .035 9852.84    .07210119.46    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.6210082.39          416.958  368.34 341.759            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1546.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *   0.047  *   0.072  *   0.040  *
* W.S. Elev (ft)          * 1546.01  * Reach Len. (ft)         *  416.96  *  368.34  *  341.76  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1237.47  * 1392.16  * 1462.23  *
* E.G. Slope (ft/ft)      *0.000118  * Area (sq ft)            * 1237.47  * 1392.16  * 1462.23  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              * 1060.13  * 1282.73  * 1907.14  *
* Top Width (ft)          *  790.77  * Top Width (ft)          *  368.54  *  166.77  *  255.46  *
* Vel Total (ft/s)        *    1.04  * Avg. Vel. (ft/s)        *    0.86  *    0.92  *    1.30  *
* Max Chl Dpth (ft)       *    9.40  * Hydr. Depth (ft)        *    3.36  *    8.35  *    5.72  *
* Conv. Total (cfs)       *390905.2  * Conv. (cfs)             * 97508.7  *117982.7  *175413.8  *
* Length Wtd. (ft)        *  372.24  * Wetted Per. (ft)        *  368.86  *  167.30  *  255.71  *
* Min Ch El (ft)          * 1536.61  * Shear (lb/sq ft)        *    0.02  *    0.06  *    0.04  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)  *    0.02  *    0.06  *    0.06  *
* Frctn Loss (ft)         *    0.04  * Cum Volume (acre-ft)    *  105.26  *   85.11  *   68.52  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   23.55  *    8.76  *   12.75  *
*****************************************************************************************
```

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1546.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.072	0.072	0.072
W.S. Elev (ft)	1546.35	Reach Len. (ft)	416.96	368.34	341.76
Crit W.S. (ft)		Flow Area (sq ft)	257.50	1449.08	306.72
E.G. Slope (ft/ft)	0.000645	Area (sq ft)	257.50	1449.08	306.72
Q Total (cfs)	4250.00	Flow (cfs)	468.65	3202.23	579.11
Top Width (ft)	236.00	Top Width (ft)	32.62	166.77	36.61
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	1.82	2.21	1.89
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)	7.89	8.69	8.38
Conv. Total (cfs)	167401.6	Conv. (cfs)	18459.6	126131.5	22810.5
Length Wtd. (ft)	372.06	Wetted Per. (ft)	39.78	167.30	44.84
Min Ch El (ft)	1536.61	Shear (lb/sq ft)	0.26	0.35	0.28
Alpha	1.02	Stream Power (lb/ft s)	0.47	0.77	0.52
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	23.68	87.18	14.50
C & E Loss (ft)	0.02	Cum SA (acres)	2.83	8.76	1.70

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9502.14	9708.88	233.36	325.50	161.98	5.49	2.01	0.72
2	LOB	9708.88	9915.62	826.77	911.96	206.88	19.45	4.41	0.91
3	Chan	9915.62	10082.39	1282.73	1392.16	167.30	30.18	8.35	0.92
4	ROB	10082.39	10301.16	1871.03	1402.58	218.83	44.02	6.41	1.33
5	ROB	10301.16	10519.93	36.11	59.65	36.87	0.85	1.63	0.61

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9708.88	9915.62	468.65	257.50	39.78	11.03	7.89	1.82
2	Chan	9915.62	10082.39	3202.23	1449.08	167.30	75.35	8.69	2.21
3	ROB	10082.39	10301.16	579.11	306.72	44.84	13.63	8.38	1.89

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: WASH 3-WEST
REACH: REACH-1 RS: 0.207

INPUT
Description:
Station Elevation Data num= 120

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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*****************************************************************************
 9313.77 1547.29 9341.47  1546.5 9342.68 1546.46 9369.17 1545.59 9371.58 1545.52
 9396.87 1545.14 9400.49  1545.1 9413.52 1545.11 9424.58 1545.07 9429.39 1545.09
 9452.28 1545.19  9458.3 1545.21 9479.98 1545.18  9487.2 1545.17 9507.68 1545.18
 9516.11 1545.16 9535.38 1545.08 9545.02 1545.01 9560.11 1544.78 9563.08 1544.76
 9573.92 1544.63 9590.78 1544.33 9602.83 1543.95 9618.48 1543.43 9629.31 1543.06
 9631.73 1543.03 9646.19 1542.57 9660.64 1542.24 9673.89 1542.08 9689.54 1541.99
 9701.59 1541.75 9718.45 1541.32 9729.29 1541.37 9747.36 1540.75 9752.72 1540.44
 9756.99 1540.17 9776.26 1539.46 9784.69 1539.16 9790.31 1539.04 9805.17  1538.5
 9812.39 1538.31 9814.49 1538.21 9834.07 1537.98 9840.09 1537.92 9850.81 1537.81
 9862.98 1537.48  9867.8 1537.36 9882.73 1536.96 9891.88 1536.87  9895.5 1536.83
 9920.79 1536.58 9920.86 1536.61  9923.2 1536.54 9938.93 1536.19  9949.7 1536.29
  9950.9 1536.31 9974.45 1536.52  9978.6 1536.4910000.89 1535.89 10006.3 1535.33
10006.36 1535.3410007.51 1535.3910013.43 1535.1910021.27 1537.63   10034 1537.29
10036.41 1537.2510041.04 1537.19 10061.7 1536.8910065.32 1536.8710089.41 1536.85
10094.22 1536.9110095.92 1536.9310117.11  1537.310123.13 1537.3910144.81 1537.37
10147.06 1537.6210152.03 1537.31 10156.5 1537.17 10165.9 1537.5710172.51 1537.34
 10177.3 1538.1510180.94  1537.710190.27  1537.510200.21 1538.4210205.35 1538.38
10209.85 1538.5810227.91 1539.0810238.75 1539.3510255.61 1539.7710267.66 1539.99
10283.31 1540.4210296.56 1540.7910306.78 1541.1510311.02 1541.4310325.47 1542.28
10331.54  1542.710338.72 1543.0610354.37 1543.9810366.42 1544.1910383.28  1544.6
10394.12 1544.69 10401.1 1545.0510412.19 1545.1510421.82 1545.1310441.09 1545.51
10449.52 1545.75   10470 1546.2110477.22  1546.610483.12 1546.78 10498.9 1547.25
10504.93 1547.4810527.81  1547.810532.63 1547.8710556.71 1547.9710560.33 1548.08
10585.62 1548.9510588.03    154910614.53 1548.8610615.73 1548.8410643.43 1549.32

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9313.77    .035 9776.26    .07210255.61    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9891.8810123.13           455.73 413.811 355.159            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1545.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.01  * Wt. n-Val.              *   0.054  *   0.072  *   0.059  *
* W.S. Elev (ft)          * 1545.98  * Reach Len. (ft)         *  455.73  *  413.81  *  355.16  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       * 1863.06  * 2154.25  * 1588.21  *
* E.G. Slope (ft/ft)      *0.000082  * Area (sq ft)            * 1863.06  * 2154.25  * 1588.21  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              * 1304.07  * 1775.16  * 1170.77  *
* Top Width (ft)          * 1102.40  * Top Width (ft)          *  534.56  *  231.25  *  336.59  *
* Vel Total (ft/s)        *    0.76  * Avg. Vel. (ft/s)        *    0.70  *    0.82  *    0.74  *
* Max Chl Dpth (ft)       *   10.79  * Hydr. Depth (ft)        *    3.49  *    9.32  *    4.72  *
* Conv. Total (cfs)       *470656.8  * Conv. (cfs)             *144416.3  *196586.2  *129654.4  *
* Length Wtd. (ft)        *  412.31  * Wetted Per. (ft)        *  534.69  *  231.69  *  336.92  *
* Min Ch El (ft)          * 1535.19  * Shear (lb/sq ft)        *    0.02  *    0.05  *    0.02  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)   *    0.01  *    0.04  *    0.02  *
* Frctn Loss (ft)         *    0.03  * Cum Volume (acre-ft)     *   90.42  *   70.11  *   56.55  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *   19.23  *    7.08  *   10.42  *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1546.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *   0.072  *   0.072  *   0.072  *
* W.S. Elev (ft)          * 1546.28  * Reach Len. (ft)         *  455.73  *  413.81  *  355.16  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       *  901.06  * 2224.34  *  743.24  *
* E.G. Slope (ft/ft)      *0.000155  * Area (sq ft)            *  901.06  * 2224.34  *  743.24  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *  912.42  * 2579.25  *  758.34  *
* Top Width (ft)          *  425.00  * Top Width (ft)          *  107.88  *  231.25  *   85.87  *
* Vel Total (ft/s)        *    1.10  * Avg. Vel. (ft/s)        *    1.01  *    1.16  *    1.02  *
* Max Chl Dpth (ft)       *   11.09  * Hydr. Depth (ft)        *    8.35  *    9.62  *    8.66  *
* Conv. Total (cfs)       *341684.2  * Conv. (cfs)             * 73355.0  *207361.8  * 60967.4  *
* Length Wtd. (ft)        *  416.70  * Wetted Per. (ft)        *  115.01  *  231.69  *   93.79  *
* Min Ch El (ft)          * 1535.19  * Shear (lb/sq ft)        *    0.08  *    0.09  *    0.08  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)   *    0.08  *    0.11  *    0.08  *
* Frctn Loss (ft)         *    0.09  * Cum Volume (acre-ft)     *   18.14  *   71.65  *   10.38  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    2.16  *    7.08  *    1.22  *
*****************************************************************************************
```

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9313.77	9602.82	72.14	225.25	245.53	1.70	0.92	0.32
2	LOB	9602.82	9891.88	1231.93	1637.81	289.17	28.99	5.67	0.75
3	Chan	9891.88	10123.13	1775.16	2154.25	231.69	41.77	9.32	0.82
4	ROB	10123.13	10383.28	1153.98	1531.36	260.46	27.15	5.89	0.75
5	ROB	10383.28	10643.43	16.79	56.85	76.46	0.40	0.74	0.30

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9602.82	9891.88	912.42	901.06	115.01	21.47	8.35	1.01
2	Chan	9891.88	10123.13	2579.25	2224.34	231.69	60.69	9.62	1.16
3	ROB	10123.13	10383.28	758.34	743.24	93.79	17.84	8.66	1.02

CROSS SECTION

RIVER: WASH 3-WEST
REACH: REACH-1 RS: 0.129

INPUT
Description:
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9080.98	1544.41	9086.23	1544.18	9109.14	1544.33	9110.48	1544.31	9110.5	1544.31
9134.73	1544.11	9145.86	1544.06	9158.98	1543.96	9181.23	1544.11	9183.23	1544.11
9207.48	1544.05	9216.01	1544.15	9216.59	1543.99	9231.73	1543.91	9251.96	1544
9255.98	1544	9280.23	1543.85	9287.32	1543.87	9304.48	1543.69	9322.69	1543.55
9328.73	1543.54	9352.98	1543.24	9358.05	1543.34	9377.23	1543.29	9393.42	1542.94
9401.48	1542.87	9425.73	1542.76	9428.78	1542.74	9449.98	1542.49	9464.15	1542.47
9474.23	1542.38	9498.48	1542.33	9499.51	1542.32	9522.74	1542.05	9534.88	1542.08
9546.99	1542.15	9570.24	1542.07	9571.24	1542.08	9595.49	1542.05	9605.61	1542.08
9619.74	1542.15	9640.97	1541.46	9643.99	1541.45	9668.24	1540.55	9676.34	1540.25
9692.49	1539.7	9711.7	1538.78	9714.08	1538.57	9716.74	1538.69	9725.93	1538.15
9740.99	1538.4	9747.07	1538.3	9759.28	1537.97	9765.24	1537.77	9782.43	1537.43
9789.49	1537.34	9813.74	1537.31	9817.79	1537.23	9828.15	1537.01	9837.99	1536.27
9847.18	1535.74	9853.16	1535.86	9862.24	1535.83	9886.49	1535.9	9888.52	1536.08
9910.74	1536.48	9923.89	1536.3	9934.99	1536.43	9942.51	1535.88	9959.24	1536.07
9959.25	1536.07	9983.49	1536.78	9991.61	1535.74	9994.62	1536.22	10007.74	1536.45
10029.98	1534.86	10032	1534.82	10056.25	1534.96	10065.35	1533.83	10080.5	1533.69
10100.71	1533.69	10104.75	1533.73	10129	1534.03	10136.08	1533.73	10153.25	1533.95
10171.44	1534.64	10171.45	1534.61	10177.5	1534.76	10201.75	1535.31	10206.81	1535.33
10226	1535.79	10227.09	1535.44	10235.57	1536.26	10242.17	1536.38	10250.25	1536.87
10274.5	1536.21	10277.54	1536.26	10298.75	1536.35	10312.9	1536.92	10313.61	1537.09
10323	1537.06	10347.25	1537.61	10348.27	1537.64	10353.14	1537.83	10362.62	1538.75
10371.5	1538.86	10382.3	1539.07	10383.63	1539.62	10395.75	1540.15	10404.13	1540.77
10419	1541.75	10420	1541.82	10444.25	1542.22	10454.36	1542.05	10468.5	1542.34

```
10489.73    154310492.75 1543.1110517.01  1543.910525.09 1543.7810541.26  1543.6
10545.18 1543.2310560.46 1544.7610565.51 1545.0210589.76 1546.0210595.82 1546.22
10614.01 1546.8110620.66 1547.2910631.19 1547.4310638.26 1547.4910662.51 1547.45
10666.55 1547.4210684.36 1547.1910686.76 1546.9510701.92 1546.9110711.01 1546.89
10725.02 1547.0110735.26 1547.1810737.28 1547.1610743.32    154710746.84 1547.28
10759.51 1547.1310772.65 1547.2910783.76 1547.3410808.01 1547.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9080.98    .035 9692.49    .07210362.62    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9813.74 10274.5          455.653 435.323 524.317              .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
 9082.99    9357    1550       F
    9920   10210    1550       F
   10570 10807.4    1550       F

CROSS SECTION OUTPUT  Profile #1
**************************************************************************************
* E.G. Elev (ft)         * 1545.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.01  * Wt. n-Val.              *   0.049  *   0.072  *   0.052  *
* W.S. Elev (ft)         * 1545.95  * Reach Len. (ft)         *  455.65  *  435.32  *  524.32  *
* Crit W.S. (ft)         * 1538.57  * Flow Area (sq ft)       * 2236.52  * 1659.43  * 1553.44  *
* E.G. Slope (ft/ft)     *0.000068  * Area (sq ft)            * 2788.81  * 4834.30  * 1560.13  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1738.57  * 1289.83  * 1221.60  *
* Top Width (ft)         * 1507.03  * Top Width (ft)          *  732.76  *  460.76  *  313.51  *
* Vel Total (ft/s)       *    0.78  * Avg. Vel. (ft/s)        *    0.78  *    0.78  *    0.79  *
* Max Chl Dpth (ft)      *   12.26  * Hydr. Depth (ft)        *    4.88  *    9.72  *    5.26  *
* Conv. Total (cfs)      *513510.2  * Conv. (cfs)             *210064.0  *155844.8  *147601.4  *
* Length Wtd. (ft)       *  466.18  * Wetted Per. (ft)        *  460.41  *  170.94  *  295.91  *
* Min Ch El (ft)         * 1533.69  * Shear (lb/sq ft)        *    0.02  *    0.04  *    0.02  *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    0.02  *    0.03  *    0.02  *
* Frctn Loss (ft)        *    0.06  * Cum Volume (acre-ft)    *   66.09  *   36.92  *   43.71  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   12.60  *    3.79  *    7.77  *
**************************************************************************************

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 OUTPUT  Profile #2
**************************************************************************************
* E.G. Elev (ft)         * 1546.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.072  *   0.072  *   0.072  *
* W.S. Elev (ft)         * 1546.18  * Reach Len. (ft)         *  455.65  *  435.32  *  524.32  *
* Crit W.S. (ft)         * 1538.73  * Flow Area (sq ft)       *  830.21  * 1698.14  *  232.20  *
* E.G. Slope (ft/ft)     *0.000297  * Area (sq ft)            *  830.21  * 4938.74  *  232.20  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1155.44  * 2793.09  *  301.47  *
* Top Width (ft)         *  584.00  * Top Width (ft)          *   99.74  *  460.76  *   23.50  *
* Vel Total (ft/s)       *    1.54  * Avg. Vel. (ft/s)        *    1.39  *    1.64  *    1.30  *
* Max Chl Dpth (ft)      *   12.48  * Hydr. Depth (ft)        *    8.32  *    9.94  *    9.88  *
* Conv. Total (cfs)      *246426.5  * Conv. (cfs)             * 66995.6  *161950.6  * 17480.3  *
* Length Wtd. (ft)       *  452.45  * Wetted Per. (ft)        *  107.37  *  170.94  *   33.33  *
* Min Ch El (ft)         * 1533.69  * Shear (lb/sq ft)        *    0.14  *    0.18  *    0.13  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    0.20  *    0.30  *    0.17  *
* Frctn Loss (ft)        *    0.16  * Cum Volume (acre-ft)    *    9.08  *   37.63  *    6.41  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *    1.07  *    3.79  *    0.77  *
**************************************************************************************

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

  Profile #1
```

```
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9080.98   * 9082.99   *     1.04 *     3.18 *     3.55 *     0.02 *
1.58 *     0.33 *
* 2        * LOB       * 9082.99   * 9357.00   *     0.00 *   552.29 *   274.04 *     0.00 *
2.02 *     0.00 *
* 3        * LOB       * 9357.00   * 9813.74   *  1737.53 *  2233.34 *   456.86 *    40.88 *
4.89 *     0.78 *
* 4        * Chan      * 9813.74   * 9920.00   *   799.25 *  1029.80 *   106.32 *    18.81 *
9.69 *     0.78 *
* 5        * Chan      * 9920.00   * 10210.00  *     0.00 *  3174.87 *   290.32 *     0.00 *
10.95 *     0.00 *
* 6        * Chan      * 10210.00  * 10274.50  *   490.58 *   629.63 *    64.62 *    11.54 *
9.76 *     0.78 *
* 7        * ROB       * 10274.50  * 10570.00  *  1221.60 *  1553.44 *   295.91 *    28.74 *
5.26 *     0.79 *
* 8        * ROB       * 10570.00  * 10807.40  *     0.00 *     6.69 *    18.03 *     0.00 *
0.37 *     0.00 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9357.00   * 9813.74   *  1155.44 *   830.21 *   107.37 *    27.19 *
8.32 *     1.39 *
* 2        * Chan      * 9813.74   * 9920.00   *  1730.92 *  1053.89 *   106.32 *    40.73 *
9.92 *     1.64 *
* 3        * Chan      * 9920.00   * 10210.00  *     0.00 *  3240.60 *   290.32 *     0.00 *
11.17 *     0.00 *
* 4        * Chan      * 10210.00  * 10274.50  *  1062.16 *   644.25 *    64.62 *    24.99 *
9.99 *     1.65 *
* 5        * ROB       * 10274.50  * 10570.00  *   301.47 *   232.20 *    33.33 *     7.09 *
9.88 *     1.30 *
*****************************************************************************************
******************

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

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 0.047

INPUT
Description:
Station Elevation Data    num=     143
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8846.43 1541.35 8871.03 1541.64 8880.79 1541.56 8895.62 1541.62 8915.14 1541.28
 8920.22 1541.28 8944.82 1541.23  8949.5 1541.25 8969.42 1541.48 8983.85 1541.43
 8994.01 1541.52 9018.21 1541.15 9018.61 1541.15 9043.21  1541.5 9052.57 1541.48
```

```
 9067.81 1541.65 9086.92 1541.11  9092.4 1541.09    9117 1541.21 9121.28 1541.19
  9141.6 1541.23 9155.64 1541.05  9166.2 1541.07 9189.99 1540.75 9190.79 1540.75
 9215.39 1540.74 9224.35  1540.7 9239.99 1540.76  9258.7 1540.58 9264.29 1540.58
 9287.65 1540.63  9297.4 1540.58 9311.02 1540.64 9334.38 1540.34  9336.1 1540.32
 9351.56 1540.46 9357.74 1540.37  9374.8 1540.28  9381.1 1540.27 9404.46 1540.45
 9413.49 1540.36 9427.83 1540.19 9451.19 1540.12 9452.19 1540.12 9474.55 1540.19
 9490.89 1540.18 9497.91 1540.23 9521.28 1540.21 9529.58 1540.15 9544.64 1540.16
    9568 1539.73 9568.28 1539.72 9570.34 1539.66 9591.36 1539.49 9606.98 1539.14
 9614.09 1539.03 9635.54  1538.9 9656.98 1538.91 9662.37 1538.87 9665.21  1538.9
 9678.43 1538.91 9690.35 1538.81 9699.88  1538.7 9717.77 1538.29 9721.32 1538.23
 9742.77 1538.99 9764.22 1537.87 9773.16  1537.7 9785.66 1537.63 9807.11 1537.45
 9828.56 1537.39 9844.69 1537.33 9850.83  1537.3 9873.11 1537.35 9873.97 1537.36
 9890.89 1537.51 9895.39 1537.44 9917.66 1537.64 9919.38 1537.65 9939.94 1537.57
 9962.22 1537.47  9964.8 1537.43 9979.34 1537.32  9985.1 1537.4310002.13 1537.38
10010.03 1537.3710034.95 1537.5210035.65 1537.5210059.87 1537.6210069.17 1537.71
10084.79 1537.6710102.69 1538.1710109.71 1538.2110134.64 1538.0710136.21 1538.09
10159.56  1538.210169.73 1538.4610191.24 1538.3910193.68 1538.3510217.64 1538.16
10227.58 1538.1310230.31  1537.410241.59 1537.6410244.24 1537.8610248.31 1537.54
10263.92 1537.5810265.55 1537.58 10289.5 1537.7710300.25 1538.0910306.85 1538.14
10313.46 1538.5110336.59 1539.1410337.41 1539.1710361.36 1539.81 10363.7 1540.06
10372.93 1540.1910385.32 1540.6610409.27 1541.8610434.51 1542.2410435.62 1542.51
10442.07 1541.5910459.74 1541.55 10472.1 1542.6310474.88 1541.7810484.97 1541.59
10507.68 1541.26 10510.2 1541.1810523.65 1542.4610535.44 1540.5210540.48 1540.68
10560.67 1541.1510573.28 1541.33 10585.9 1541.4410606.09 1541.4810611.13 1541.54
10636.37  1541.210638.89 1541.17 10661.6 1541.2210671.69 1541.1810686.83 1541.21
10704.49 1541.3510712.06 1541.57 10737.3 1541.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8846.43    .035 9721.32    .07210361.36    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9917.6610084.79          255.445 249.085 259.833             .1        .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 8846.43 9826.16    1548       F
   10185 10737.3 1548.01       F

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1545.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.03  * Wt. n-Val.              *   0.072  *   0.072  *   0.072  *
* W.S. Elev (ft)         * 1545.86  * Reach Len. (ft)         *  255.45  *  249.09  *  259.83  *
* Crit W.S. (ft)         * 1539.34  * Flow Area (sq ft)       *  773.34  * 1395.41  *  771.19  *
* E.G. Slope (ft/ft)     *0.000297  * Area (sq ft)            * 6290.69  * 1395.41  * 3804.69  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              * 1140.46  * 2041.19  * 1068.35  *
* Top Width (ft)         * 1890.87  * Top Width (ft)          * 1071.23  *  167.13  *  652.51  *
* Vel Total (ft/s)       *    1.45  * Avg. Vel. (ft/s)        *    1.47  *    1.46  *    1.39  *
* Max Chl Dpth (ft)      *    8.56  * Hydr. Depth (ft)        *    8.45  *    8.35  *    7.70  *
* Conv. Total (cfs)      *246772.9  * Conv. (cfs)             * 66219.9  *118520.0  * 62033.0  *
* Length Wtd. (ft)       *  251.48  * Wetted Per. (ft)        *   91.50  *  167.13  *  100.22  *
* Min Ch El (ft)         * 1537.32  * Shear (lb/sq ft)        *    0.16  *    0.15  *    0.14  *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    0.23  *    0.23  *    0.20  *
* Frctn Loss (ft)        *    0.13  * Cum Volume (acre-ft)    *   18.60  *    5.79  *   11.43  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)          *    3.16  *    0.65  *    1.96  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
```

* E.G. Elev (ft)	* 1546.06	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.04	* Wt. n-Val.	* 0.072	* 0.072	* 0.072	*
* W.S. Elev (ft)	* 1546.01	* Reach Len. (ft)	* 255.45	* 249.09	* 259.83	*
* Crit W.S. (ft)	* 1539.48	* Flow Area (sq ft)	* 580.46	* 1420.14	* 556.51	*
* E.G. Slope (ft/ft)	*0.000406	* Area (sq ft)	* 580.46	* 1420.14	* 556.51	*
* Q Total (cfs)	* 4250.00	* Flow (cfs)	* 933.22	* 2459.39	* 857.39	*
* Top Width (ft)	* 305.00	* Top Width (ft)	* 67.66	* 167.13	* 70.21	*
* Vel Total (ft/s)	* 1.66	* Avg. Vel. (ft/s)	* 1.61	* 1.73	* 1.54	*
* Max Chl Dpth (ft)	* 8.71	* Hydr. Depth (ft)	* 8.58	* 8.50	* 7.93	*
* Conv. Total (cfs)	*210895.3	* Conv. (cfs)	* 46308.4	*122041.0	* 42546.0	*
* Length Wtd. (ft)	* 250.87	* Wetted Per. (ft)	* 76.37	* 167.13	* 78.05	*
* Min Ch El (ft)	* 1537.32	* Shear (lb/sq ft)	* 0.19	* 0.22	* 0.18	*
* Alpha	* 1.01	* Stream Power (lb/ft s)	* 0.31	* 0.37	* 0.28	*
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 1.70	* 5.85	* 1.66	*
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 0.20	* 0.65	* 0.21	*

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,
water surface was used.

Profile #1

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity	*
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)	*
* 1	* LOB	* 8846.43	* 9336.30	* 0.00	* 2326.72	* 494.41	* 0.00	* 4.75	* 0.00	*
* 2	* LOB	* 9336.30	* 9826.16	* 0.00	* 3190.63	* 489.93	* 0.00	* 6.51	* 0.00	*
* 3	* LOB	* 9826.16	* 9917.66	* 1140.46	* 773.34	* 91.50	* 26.83	* 8.45	* 1.47	*
* 4	* Chan	* 9917.66	* 10084.79	* 2041.19	* 1395.41	* 167.13	* 48.03	* 8.35	* 1.46	*
* 5	* ROB	* 10084.79	* 10185.00	* 1068.35	* 771.19	* 100.22	* 25.14	* 7.70	* 1.39	*
* 6	* ROB	* 10185.00	* 10461.15	* 0.00	* 1792.57	* 276.46	* 0.00	* 6.49	* 0.00	*
* 7	* ROB	* 10461.15	* 10737.30	* 0.00	* 1240.94	* 281.30	* 0.00	* 4.49	* 0.00	*

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

Profile #2

*	* Pos	* Left Sta	* Right Sta	* Flow	* Area	* W.P.	* Percent	* Hydr	* Velocity	*
*	*	* (ft)	* (ft)	* (cfs)	* (sq ft)	* (ft)	* Conv	*Depth(ft)	* (ft/s)	*
* 1	* LOB	* 9826.16	* 9917.66	* 933.22	* 580.46	* 76.37	* 21.96	* 8.58	* 1.61	*

```
* 2          * Chan       * 9917.66   * 10084.79  *  2459.39 *  1420.14 *   167.13 *    57.87 *
8.50 *     1.73 *
* 3          * ROB        * 10084.79  * 10185.00  *   857.39 *   556.51 *    78.05 *    20.17 *
7.93 *     1.54 *
*****************************************************************************************************
******************

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,
         water surface was used.

CROSS SECTION


RIVER: WASH 3-WEST
REACH: REACH-1            RS: 0

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9910.94 1546.68 9931.37 1546.87 9935.41 1546.81 9959.32 1546.73 9959.87 1540.49
 9963.23  1533.7 9966.09  1538.4 9984.34 1534.8110000.82 1533.7410008.81 1533.95
10027.22 1533.9110032.79 1546.9310033.27 1546.4910035.54 1547.1310057.74 1547.35
10070.26 1547.19 10082.2 1547.0610104.99 1547.0110106.67 1546.7710131.13 1547.23
10139.71 1547.03 10155.6 1545.9110174.44 1546.1210180.13 1545.7510202.04 1546.42
10204.86 1546.8110208.43 1546.69 10229.6 1546.5610242.41  1546.510254.34  1545.7
 10276.4  1546.210279.07 1546.0310303.81 1546.9810310.39  1546.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9910.94    .035 9966.09    .03510027.22    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.0910027.22                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)          * 1545.71  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.61  * Wt. n-Val.              *   0.035  *   0.035  *   0.035  *
* W.S. Elev (ft)          * 1545.10  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          * 1539.96  * Flow Area (sq ft)       *   53.71  *  628.99  *   26.79  *
* E.G. Slope (ft/ft)      *0.001029  * Area (sq ft)            *   53.71  *  628.99  *   26.79  *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *  153.28  * 4035.00  *   61.71  *
* Top Width (ft)          *   72.54  * Top Width (ft)           *    6.63  *   61.13  *    4.79  *
* Vel Total (ft/s)        *    5.99  * Avg. Vel. (ft/s)         *    2.85  *    6.42  *    2.30  *
* Max Chl Dpth (ft)       *   11.40  * Hydr. Depth (ft)         *    8.11  *   10.29  *    5.60  *
* Conv. Total (cfs)       *132500.7  * Conv. (cfs)              *  4778.9  *125797.8  *  1924.1  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)         *   17.71  *   61.52  *   12.17  *
* Min Ch El (ft)          * 1533.74  * Shear (lb/sq ft)         *    0.19  *    0.66  *    0.14  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)   *    0.56  *    4.21  *    0.33  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)     *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)           *          *          *          *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************************
* E.G. Elev (ft)          * 1545.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.71  * Wt. n-Val.              *   0.035  *   0.035  *          *
* W.S. Elev (ft)          * 1545.10  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          * 1540.15  * Flow Area (sq ft)       *    0.61  *  626.53  *          *
* E.G. Slope (ft/ft)      *0.001439  * Area (sq ft)            *    0.61  *  626.53  *          *
* Q Total (cfs)           * 4250.00  * Flow (cfs)              *    0.19  * 4249.81  *          *
* Top Width (ft)          *   61.00  * Top Width (ft)           *    0.09  *   60.91  *          *
```

```
* Vel Total (ft/s)       *    6.78  * Avg. Vel. (ft/s)       *    0.32  *    6.78  *          *
* Max Chl Dpth (ft)      *   11.36  * Hydr. Depth (ft)       *    6.77  *   10.29  *          *
* Conv. Total (cfs)      *112033.7  * Conv. (cfs)            *     5.1  *112028.6  *          *
* Length Wtd. (ft)       *          * Wetted Per. (ft)       *    7.02  *   72.49  *          *
* Min Ch El (ft)         * 1533.74  * Shear (lb/sq ft)       *    0.01  *    0.78  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *    0.00  *    5.27  *          *
* 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.
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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9938.52   * 9966.09   *   153.28 *    53.71 *    17.71 *     3.61 *
8.11 *     2.85 *
* 2         * Chan      * 9966.09   * 10027.22  *  4035.00 *   628.99 *    61.52 *    94.94 *
10.29 *     6.42 *
* 3         * ROB       * 10027.22  * 10168.80  *    61.71 *    26.79 *    12.17 *     1.45 *
5.60 *     2.30 *
*****************************************************************************************
******************

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9938.52   * 9966.09   *     0.19 *     0.61 *     7.02 *     0.00 *
6.77 *     0.32 *
* 2         * Chan      * 9966.09   * 10027.22  *  4249.81 *   626.53 *    72.49 *   100.00 *
10.29 *     6.78 *
*****************************************************************************************
******************

Warning: The cross section had to be extended vertically during the critical depth calculations.
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.

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:T4N-R3W-S08W
*****************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*REACH-1         *    3.254       *     .033*     .044*     .033*
*REACH-1         *    3.156       *     .033*     .044*     .033*
*REACH-1         *    3.055       *     .035*     .047*     .035*
*REACH-1         *    2.960       *     .035*     .047*     .035*
*REACH-1         *    2.865       *     .035*     .047*     .035*
*REACH-1         *    2.769       *     .033*     .047*     .033*
*REACH-1         *    2.671       *     .033*     .047*     .033*
*REACH-1         *    2.573       *     .033*     .047*     .033*
*REACH-1         *    2.476       *     .033*     .047*     .033*
*REACH-1         *    2.375       *     .033*      .04*      .04*
*REACH-1         *    2.277       *     .033*      .04*      .04*
*REACH-1         *    2.181       *     .033*     .042*     .033*
*REACH-1         *    2.082       *     .033*     .042*     .033*
```

*REACH-1	*	1.987	*	.033*	.042*	.033*
*REACH-1	*	1.891	*	.033*	.042*	.033*
*REACH-1	*	1.803	*	.033*	.047*	.033*
*REACH-1	*	1.698	*	.033*	.033*	.033*
*REACH-1	*	1.604	*	.033*	.042*	.033*
*REACH-1	*	1.506	*	.033*	.042*	.033*
*REACH-1	*	1.408	*	.033*	.047*	.033*
*REACH-1	*	1.315	*	.033*	.047*	.033*
*REACH-1	*	1.218	*	.033*	.047*	.033*
*REACH-1	*	1.123	*	.033*	.047*	.033*
*REACH-1	*	1.029	*	.033*	.047*	.033*
*REACH-1	*	0.934	*	.033*	.047*	.033*
*REACH-1	*	0.833	*	.03*	.042*	.042*
*REACH-1	*	0.726	*	.03*	.042*	.03*
*REACH-1	*	0.626	*	.033*	.047*	.033*
*REACH-1	*	0.523	*	.03*	.042*	.042*
*REACH-1	*	0.417	*	.03*	.042*	.03*
*REACH-1	*	0.330	*	.03*	.042*	.03*
*REACH-1	*	0.243	*	.03*	.042*	.03*
*REACH-1	*	0.156	*	.03*	.042*	.03*
*REACH-1	*	0.057	*	.03*	.042*	.03*

River:T4N-R3W-S09

* Reach	*	River Sta.	*	n1	*	n2	*	n3	*
*REACH-1	*	2.651	*	.035*		.045*		.035*	
*REACH-1	*	2.552	*	.035*		.045*		.035*	
*REACH-1	*	2.454	*	.035*		.045*		.035*	
*REACH-1	*	2.362	*	.035*		.045*		.035*	
*REACH-1	*	2.267	*	.035*		.045*		.035*	
*REACH-1	*	2.169	*	.035*		.045*		.035*	
*REACH-1	*	2.065	*	.033*		.05*		.033*	
*REACH-1	*	1.971	*	.033*		.05*		.033*	
*REACH-1	*	1.876	*	.033*		.05*		.033*	
*REACH-1	*	1.781	*	.033*		.05*		.033*	
*REACH-1	*	1.686	*	.033*		.04*		.033*	
*REACH-1	*	1.594	*	.033*		.04*		.033*	
*REACH-1	*	1.488	*	.033*		.04*		.033*	
*REACH-1	*	1.394	*	.033*		.04*		.033*	
*REACH-1	*	1.302	*	.035*		.04*		.035*	
*REACH-1	*	1.201	*	.035*		.05*		.033*	
*REACH-1	*	1.104	*	.035*		.05*		.05*	
*REACH-1	*	1.013	*	.035*		.05*		.033*	
*REACH-1	*	0.920	*	.035*		.05*		.033*	
*REACH-1	*	0.819	*	.035*		.05*		.033*	
*REACH-1	*	0.678	*	.035*		.05*		.033*	
*REACH-1	*	0.616	*	.035*		.05*		.033*	
*REACH-1	*	0.501	*	.033*		.06*		.06*	
*REACH-1	*	0.398	*	.033*		.06*		.033*	
*REACH-1	*	0.299	*	.033*		.06*		.033*	
*REACH-1	*	0.204	*	.033*		.06*		.06*	
*REACH-1	*	0.104	*	.033*		.06*		.033*	
*REACH-1	*	0.032	*	.033*		.06*		.033*	

River:WASH 3-WEST

* Reach	*	River Sta.	*	n1	*	n2	*	n3	*
*REACH-1	*	6.912	*	.033*		.045*		.033*	
*REACH-1	*	6.811	*	.033*		.045*		.033*	
*REACH-1	*	6.685	*	.033*		.045*		.033*	
*REACH-1	*	6.578	*	.033*		.045*		.033*	
*REACH-1	*	6.476	*	.033*		.045*		.033*	
*REACH-1	*	6.387	*	.033*		.045*		.033*	
*REACH-1	*	6.318	*	.033*		.045*		.033*	
*REACH-1	*	6.209	*	.033*		.045*		.033*	
*REACH-1	*	6.111	*	.033*		.045*		.033*	
*REACH-1	*	6.005	*	.033*		.045*		.033*	

*REACH-1	*	5.905	*	.033*	.045*	.033*
*REACH-1	*	5.801	*	.033*	.045*	.033*
*REACH-1	*	5.687	*	.033*	.045*	.033*
*REACH-1	*	5.589	*	.033*	.045*	.033*
*REACH-1	*	5.528	*	.033*	.045*	.033*
*REACH-1	*	5.410	*	.033*	.045*	.033*
*REACH-1	*	5.323	*	.033*	.045*	.033*
*REACH-1	*	5.210	*	.033*	.045*	.033*
*REACH-1	*	5.147	*	.033*	.045*	.033*
*REACH-1	*	5.022	*	.037*	.041*	.037*
*REACH-1	*	4.928	*	.037*	.041*	.037*
*REACH-1	*	4.837	*	.037*	.041*	.037*
*REACH-1	*	4.709	*	.037*	.041*	.037*
*REACH-1	*	4.624	*	.037*	.041*	.037*
*REACH-1	*	4.519	*	.037*	.041*	.037*
*REACH-1	*	4.421	*	.037*	.041*	.037*
*REACH-1	*	4.310	*	.033*	.05*	.033*
*REACH-1	*	4.196	*	.033*	.05*	.033*
*REACH-1	*	4.077	*	.037*	.041*	.037*
*REACH-1	*	3.959	*	.037*	.038*	.037*
*REACH-1	*	3.840	*	.037*	.041*	.037*
*REACH-1	*	3.727	*	.033*	.05*	.033*
*REACH-1	*	3.590	*	.033*	.05*	.033*
*REACH-1	*	3.441	*	.033*	.05*	.033*
*REACH-1	*	3.298	*	.033*	.05*	.033*
*REACH-1	*	3.152	*	.033*	.04*	.033*
*REACH-1	*	3.054	*	.033*	.04*	.033*
*REACH-1	*	2.942	*	.033*	.04*	.033*
*REACH-1	*	2.816	*	.033*	.033*	.05*
*REACH-1	*	2.703	*	.033*	.05*	.033*
*REACH-1	*	2.615	*	.033*	.05*	.05*
*REACH-1	*	2.530	*	.033*	.05*	.033*
*REACH-1	*	2.447	*	.033*	.05*	.033*
*REACH-1	*	2.366	*	.033*	.05*	.033*
*REACH-1	*	2.240	*	.033*	.038*	.033*
*REACH-1	*	2.151	*	.033*	.038*	.033*
*REACH-1	*	2.061	*	.033*	.038*	.033*
*REACH-1	*	1.979	*	.033*	.038*	.033*
*REACH-1	*	1.894	*	.033*	.038*	.033*
*REACH-1	*	1.816	*	.033*	.038*	.033*
*REACH-1	*	1.721	*	.033*	.038*	.033*
*REACH-1	*	1.625	*	.033*	.038*	.033*
*REACH-1	*	1.545	*	.033*	.038*	.033*
*REACH-1	*	1.480	*	.033*	.038*	.033*
*REACH-1	*	1.406	*	.033*	.038*	.033*
*REACH-1	*	1.343	*	.033*	.038*	.033*
*REACH-1	*	1.289	*	.033*	.038*	.033*
*REACH-1	*	1.196	*	.033*	.042*	.033*
*REACH-1	*	1.168	*	.033*	.042*	.033*
*REACH-1	*	1.112	*	.033*	.042*	.033*
*REACH-1	*	1.049	*	.033*	.042*	.033*
*REACH-1	*	0.948	*	.033*	.042*	.033*
*REACH-1	*	0.86	*	.033*	.042*	.033*
*REACH-1	*	0.781	*	.033*	.042*	.033*
*REACH-1	*	0.701	*	.033*	.042*	.033*
*REACH-1	*	0.618	*	.033*	.042*	.033*
*REACH-1	*	0.544	*	.033*	.042*	.033*
*REACH-1	*	0.483	*	.033*	.042*	.033*
*REACH-1	*	0.403	*	.033*	.042*	.033*
*REACH-1	*	0.356	*	.035*	.035*	.035*
*REACH-1	*	0.277	*	.035*	.072*	.035*
*REACH-1	*	0.207	*	.035*	.072*	.035*
*REACH-1	*	0.129	*	.035*	.072*	.035*
*REACH-1	*	0.047	*	.035*	.072*	.035*
*REACH-1	*	0	*	.035*	.035*	.035*

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SUMMARY OF REACH LENGTHS

River: T4N-R3W-S08W

Reach	River Sta.	Left	Channel	Right
REACH-1	3.254	483	518.274	495
REACH-1	3.156	568	533.15	492
REACH-1	3.055	527	497.15	464
REACH-1	2.960	517	506.44	484
REACH-1	2.865	490	506.86	549
REACH-1	2.769	504	516.76	517
REACH-1	2.671	505	514.67	502
REACH-1	2.573	498	511.83	501
REACH-1	2.476	499	535.54	543
REACH-1	2.375	486	518.49	495
REACH-1	2.277	509	506.1	501
REACH-1	2.181	513	520.95	508
REACH-1	2.082	531	503.25	477
REACH-1	1.987	481	503.55	510
REACH-1	1.891	484	468	452
REACH-1	1.803	655	552.38	377
REACH-1	1.698	450	495.58	522
REACH-1	1.604	493	519.86	509
REACH-1	1.506	502	518.67	533
REACH-1	1.408	469	490.22	514
REACH-1	1.315	488	510.63	523
REACH-1	1.218	475	502.5	526
REACH-1	1.123	509	496.42	486
REACH-1	1.029	538	502.12	469
REACH-1	0.934	516	534.27	517
REACH-1	0.833	508	564.81	507
REACH-1	0.726	423	524.94	491
REACH-1	0.626	556	543.51	457
REACH-1	0.523	554	563.26	558
REACH-1	0.417	456	459.78	407
REACH-1	0.330	452	455.86	440
REACH-1	0.243	414	459.52	479
REACH-1	0.156	521	524.92	461
REACH-1	0.057	0	0	0

River: T4N-R3W-S09

Reach	River Sta.	Left	Channel	Right
REACH-1	2.651	525	522.45	520
REACH-1	2.552	647	517.95	452
REACH-1	2.454	495	488.2	481
REACH-1	2.362	499	500.01	500
REACH-1	2.267	494	517.67	517
REACH-1	2.169	550	548.32	523
REACH-1	2.065	444	496.36	579
REACH-1	1.971	489	503.99	482
REACH-1	1.876	483	501.91	539
REACH-1	1.781	547	496.44	453
REACH-1	1.686	565	490.56	450
REACH-1	1.594	502	558.56	570
REACH-1	1.488	541	495.23	444
REACH-1	1.394	487	483.54	482
REACH-1	1.302	521	534.72	485
REACH-1	1.201	493	511.87	522
REACH-1	1.104	438	478.95	515
REACH-1	1.013	460	491.21	515
REACH-1	0.920	483	538.08	584
REACH-1	0.819	285	744.4	527
REACH-1	0.678	737	326.34	446
REACH-1	0.616	642	607.64	522
REACH-1	0.501	552	539.54	478
REACH-1	0.398	506	527.92	507
REACH-1	0.299	495	496.42	470
REACH-1	0.204	474	531.77	547
REACH-1	0.104	355	379.25	363

*REACH-1	* 0.032	* 0*	0*	0*

River: WASH 3-WEST

* Reach	* River Sta.	* Left	* Channel	* Right *
*REACH-1	* 6.912	* 500*	536.18*	527*
*REACH-1	* 6.811	* 586*	666.45*	577*
*REACH-1	* 6.685	* 574*	552.85*	514*
*REACH-1	* 6.578	* 549*	555.83*	482*
*REACH-1	* 6.476	* 425*	470.32*	480*
*REACH-1	* 6.387	* 334*	363.05*	374*
*REACH-1	* 6.318	* 558*	579.9*	558*
*REACH-1	* 6.209	* 494*	512.79*	482*
*REACH-1	* 6.111	* 519*	563.28*	529*
*REACH-1	* 6.005	* 477*	524.74*	485*
*REACH-1	* 5.905	* 606*	549.67*	524*
*REACH-1	* 5.801	* 614*	600.96*	546*
*REACH-1	* 5.687	* 495*	522.64*	483*
*REACH-1	* 5.589	* 316*	318.33*	300*
*REACH-1	* 5.528	* 626*	625.97*	583*
*REACH-1	* 5.410	* 450*	459.32*	466*
*REACH-1	* 5.323	* 472*	596.28*	542*
*REACH-1	* 5.210	* 299*	331.1*	320*
*REACH-1	* 5.147	* 643*	661.7*	646*
*REACH-1	* 5.022	* 454*	494.13*	433*
*REACH-1	* 4.928	* 457*	480.24*	466*
*REACH-1	* 4.837	* 648*	676.29*	650*
*REACH-1	* 4.709	* 412*	450.63*	450*
*REACH-1	* 4.624	* 509*	554.74*	532*
*REACH-1	* 4.519	* 451*	490.71*	516*
*REACH-1	* 4.421	* 498*	586.93*	582*
*REACH-1	* 4.310	* 611*	599.78*	564*
*REACH-1	* 4.196	* 618*	631.85*	629*
*REACH-1	* 4.077	* 567*	627.22*	611*
*REACH-1	* 3.959	* 600*	618.09*	564*
*REACH-1	* 3.840	* 658*	597.61*	515*
*REACH-1	* 3.727	* 731*	722.38*	692*
*REACH-1	* 3.590	* 697*	783.51*	711*
*REACH-1	* 3.441	* 715*	754.58*	732*
*REACH-1	* 3.298	* 678*	774.09*	705*
*REACH-1	* 3.152	* 509*	514.16*	493*
*REACH-1	* 3.054	* 450*	594.89*	533*
*REACH-1	* 2.942	* 673*	664.74*	553*
*REACH-1	* 2.816	* 638*	599.24*	504*
*REACH-1	* 2.703	* 448*	460.71*	433*
*REACH-1	* 2.615	* 397*	450.44*	510*
*REACH-1	* 2.530	* 429*	438.56*	439*
*REACH-1	* 2.447	* 422*	428.52*	382*
*REACH-1	* 2.366	* 642*	662.46*	617*
*REACH-1	* 2.240	* 434*	471.47*	489*
*REACH-1	* 2.151	* 467*	477.22*	469*
*REACH-1	* 2.061	* 408*	428.26*	417*
*REACH-1	* 1.979	* 398*	450.11*	447*
*REACH-1	* 1.894	* 425*	413.55*	392*
*REACH-1	* 1.816	* 460*	498.13*	464*
*REACH-1	* 1.721	* 455*	508.12*	497*
*REACH-1	* 1.625	* 418*	423.53*	430*
*REACH-1	* 1.545	* 345*	343.1*	341*
*REACH-1	* 1.480	* 380*	389.42*	386*
*REACH-1	* 1.406	* 335*	335.21*	321*
*REACH-1	* 1.343	* 276*	263.27*	276*
*REACH-1	* 1.289	* 491.506*	492.301*	475.917*
*REACH-1	* 1.196	* 150.213*	146.404*	151.914*
*REACH-1	* 1.168	* 266.86*	296.403*	270*
*REACH-1	* 1.112	* 331.609*	335.12*	291.129*
*REACH-1	* 1.049	* 531.466*	532.281*	515.565*
*REACH-1	* 0.948	* 462.142*	464.365*	450.244*
*REACH-1	* 0.86	* 419.393*	418.74*	364.022*
*REACH-1	* 0.781	* 426.411*	420.403*	395.114*

*REACH-1	*	0.701	* 424.627*	439.349*	428.831*
*REACH-1	*	0.618	* 310.115*	391.99*	413.854*
*REACH-1	*	0.544	* 230.902*	320.516*	325.895*
*REACH-1	*	0.483	* 334.018*	421.216*	448.599*
*REACH-1	*	0.403	* 271.255*	246.43*	233.107*
*REACH-1	*	0.356	* 439.033*	416.326*	370.915*
*REACH-1	*	0.277	* 416.958*	368.34*	341.759*
*REACH-1	*	0.207	* 455.73*	413.811*	355.159*
*REACH-1	*	0.129	* 455.653*	435.323*	524.317*
*REACH-1	*	0.047	* 255.445*	249.085*	259.833*
*REACH-1	*	0	* 0*	0*	0*

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: T4N-R3W-S08W

Reach	River Sta.	Contr.	Expan.
*REACH-1	* 3.254	* .1*	.3*
*REACH-1	* 3.156	* .1*	.3*
*REACH-1	* 3.055	* .1*	.3*
*REACH-1	* 2.960	* .1*	.3*
*REACH-1	* 2.865	* .1*	.3*
*REACH-1	* 2.769	* .1*	.3*
*REACH-1	* 2.671	* .1*	.3*
*REACH-1	* 2.573	* .1*	.3*
*REACH-1	* 2.476	* .1*	.3*
*REACH-1	* 2.375	* .1*	.3*
*REACH-1	* 2.277	* .1*	.3*
*REACH-1	* 2.181	* .1*	.3*
*REACH-1	* 2.082	* .1*	.3*
*REACH-1	* 1.987	* .1*	.3*
*REACH-1	* 1.891	* .1*	.3*
*REACH-1	* 1.803	* .1*	.3*
*REACH-1	* 1.698	* .1*	.3*
*REACH-1	* 1.604	* .1*	.3*
*REACH-1	* 1.506	* .1*	.3*
*REACH-1	* 1.408	* .1*	.3*
*REACH-1	* 1.315	* .1*	.3*
*REACH-1	* 1.218	* .1*	.3*
*REACH-1	* 1.123	* .1*	.3*
*REACH-1	* 1.029	* .1*	.3*
*REACH-1	* 0.934	* .1*	.3*
*REACH-1	* 0.833	* .1*	.3*
*REACH-1	* 0.726	* .1*	.3*
*REACH-1	* 0.626	* .1*	.3*
*REACH-1	* 0.523	* .1*	.3*
*REACH-1	* 0.417	* .1*	.3*
*REACH-1	* 0.330	* .1*	.3*
*REACH-1	* 0.243	* .1*	.3*
*REACH-1	* 0.156	* .1*	.3*
*REACH-1	* 0.057	* .1*	.3*

River: T4N-R3W-S09

Reach	River Sta.	Contr.	Expan.
*REACH-1	* 2.651	* .1*	.3*
*REACH-1	* 2.552	* .1*	.3*
*REACH-1	* 2.454	* .1*	.3*
*REACH-1	* 2.362	* .1*	.3*
*REACH-1	* 2.267	* .1*	.3*
*REACH-1	* 2.169	* .1*	.3*
*REACH-1	* 2.065	* .1*	.3*
*REACH-1	* 1.971	* .1*	.3*
*REACH-1	* 1.876	* .1*	.3*
*REACH-1	* 1.781	* .1*	.3*

*REACH-1	*	1.686	* .1*	.3*
*REACH-1	*	1.594	* .1*	.3*
*REACH-1	*	1.488	* .1*	.3*
*REACH-1	*	1.394	* .1*	.3*
*REACH-1	*	1.302	* .1*	.3*
*REACH-1	*	1.201	* .1*	.3*
*REACH-1	*	1.104	* .1*	.3*
*REACH-1	*	1.013	* .1*	.3*
*REACH-1	*	0.920	* .1*	.3*
*REACH-1	*	0.819	* .1*	.3*
*REACH-1	*	0.678	* .1*	.3*
*REACH-1	*	0.616	* .1*	.3*
*REACH-1	*	0.501	* .1*	.3*
*REACH-1	*	0.398	* .1*	.3*
*REACH-1	*	0.299	* .1*	.3*
*REACH-1	*	0.204	* .1*	.3*
*REACH-1	*	0.104	* .1*	.3*
*REACH-1	*	0.032	* .1*	.3*

River: WASH 3-WEST

* Reach *	River Sta.	* Contr.	* Expan. *
*REACH-1 *	6.912	* .1*	.3*
*REACH-1 *	6.811	* .1*	.3*
*REACH-1 *	6.685	* .1*	.3*
*REACH-1 *	6.578	* .1*	.3*
*REACH-1 *	6.476	* .1*	.3*
*REACH-1 *	6.387	* .1*	.3*
*REACH-1 *	6.318	* .1*	.3*
*REACH-1 *	6.209	* .1*	.3*
*REACH-1 *	6.111	* .1*	.3*
*REACH-1 *	6.005	* .1*	.3*
*REACH-1 *	5.905	* .1*	.3*
*REACH-1 *	5.801	* .1*	.3*
*REACH-1 *	5.687	* .1*	.3*
*REACH-1 *	5.589	* .1*	.3*
*REACH-1 *	5.528	* .1*	.3*
*REACH-1 *	5.410	* .1*	.3*
*REACH-1 *	5.323	* .1*	.3*
*REACH-1 *	5.210	* .1*	.3*
*REACH-1 *	5.147	* .1*	.3*
*REACH-1 *	5.022	* .1*	.3*
*REACH-1 *	4.928	* .1*	.3*
*REACH-1 *	4.837	* .1*	.3*
*REACH-1 *	4.709	* .1*	.3*
*REACH-1 *	4.624	* .1*	.3*
*REACH-1 *	4.519	* .1*	.3*
*REACH-1 *	4.421	* .1*	.3*
*REACH-1 *	4.310	* .1*	.3*
*REACH-1 *	4.196	* .1*	.3*
*REACH-1 *	4.077	* .1*	.3*
*REACH-1 *	3.959	* .1*	.3*
*REACH-1 *	3.840	* .1*	.3*
*REACH-1 *	3.727	* .1*	.3*
*REACH-1 *	3.590	* .1*	.3*
*REACH-1 *	3.441	* .1*	.3*
*REACH-1 *	3.298	* .1*	.3*
*REACH-1 *	3.152	* .1*	.3*
*REACH-1 *	3.054	* .1*	.3*
*REACH-1 *	2.942	* .1*	.3*
*REACH-1 *	2.816	* .1*	.3*
*REACH-1 *	2.703	* .1*	.3*
*REACH-1 *	2.615	* .1*	.3*
*REACH-1 *	2.530	* .1*	.3*
*REACH-1 *	2.447	* .1*	.3*
*REACH-1 *	2.366	* .1*	.3*
*REACH-1 *	2.240	* .1*	.3*
*REACH-1 *	2.151	* .1*	.3*
*REACH-1 *	2.061	* .1*	.3*

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*REACH-1          *    1.979   *        .1*        .3*
*REACH-1          *    1.894   *        .1*        .3*
*REACH-1          *    1.816   *        .1*        .3*
*REACH-1          *    1.721   *        .1*        .3*
*REACH-1          *    1.625   *        .1*        .3*
*REACH-1          *    1.545   *        .1*        .3*
*REACH-1          *    1.480   *        .1*        .3*
*REACH-1          *    1.406   *        .1*        .3*
*REACH-1          *    1.343   *        .1*        .3*
*REACH-1          *    1.289   *        .1*        .3*
*REACH-1          *    1.196   *        .1*        .3*
*REACH-1          *    1.168   *        .1*        .3*
*REACH-1          *    1.112   *        .1*        .3*
*REACH-1          *    1.049   *        .1*        .3*
*REACH-1          *    0.948   *        .1*        .3*
*REACH-1          *    0.86    *        .1*        .3*
*REACH-1          *    0.781   *        .1*        .3*
*REACH-1          *    0.701   *        .1*        .3*
*REACH-1          *    0.618   *        .1*        .3*
*REACH-1          *    0.544   *        .1*        .3*
*REACH-1          *    0.483   *        .1*        .3*
*REACH-1          *    0.403   *        .1*        .3*
*REACH-1          *    0.356   *        .1*        .3*
*REACH-1          *    0.277   *        .1*        .3*
*REACH-1          *    0.207   *        .1*        .3*
*REACH-1          *    0.129   *        .1*        .3*
*REACH-1          *    0.047   *        .1*        .3*
*REACH-1          *    0       *        .1*        .3*
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HEC-RAS Plan: FP River: T4N-R3W-S10N Reach: Reach-1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	1.492	1	930.00	1590.83	1593.82		1593.99	0.007486	3.67	317.51	434.50	0.49
Reach-1	1.492	2	930.00	1590.83	1593.95		1594.14	0.007041	3.73	268.13	191.28	0.48
Reach-1	1.395	1	930.00	1588.56	1591.21	1590.77	1591.29	0.004035	2.62	421.74	490.98	0.36
Reach-1	1.395	2	930.00	1588.56	1591.43		1591.56	0.003938	2.79	324.31	218.15	0.36
Reach-1	1.292	1	930.00	1586.10	1588.55	1587.98	1588.64	0.006667	2.60	406.56	473.88	0.36
Reach-1	1.292	2	930.00	1586.10	1588.70	1588.01	1588.82	0.007310	2.89	342.24	221.55	0.38
Reach-1	1.184	1	930.00	1581.14	1585.65	1585.19	1585.70	0.004389	2.42	504.76	730.78	0.30
Reach-1	1.184	2	930.00	1581.14	1585.93	1585.15	1586.01	0.003767	2.44	428.68	269.71	0.28
Reach-1	1.093	1	930.00	1581.89	1582.88	1582.61	1582.93	0.008884	1.81	546.56	1015.99	0.36
Reach-1	1.093	2	930.00	1581.89	1583.84	1582.92	1583.92	0.004827	2.28	418.52	250.19	0.30
Reach-1	0.993	1	930.00	1579.20	1580.36	1579.86	1580.40	0.004667	1.66	577.55	710.37	0.28
Reach-1	0.993	2	930.00	1579.20	1581.16		1581.28	0.006782	2.86	328.54	174.95	0.37
Reach-1	0.901	1	930.00	1575.29	1577.39	1577.10	1577.48	0.008070	2.82	386.25	576.35	0.48
Reach-1	0.901	2	930.00	1575.29	1578.00		1578.17	0.006055	3.25	285.92	167.90	0.44
Reach-1	0.803	1	930.00	1571.54	1574.37	1573.95	1574.44	0.004528	2.35	470.57	623.37	0.37
Reach-1	0.803	2	930.00	1571.54	1574.73	1574.06	1574.90	0.005604	3.31	281.05	171.98	0.46
Reach-1	0.705	1	930.00	1569.10	1571.04	1570.88	1571.18	0.009876	3.19	320.26	554.90	0.59
Reach-1	0.705	2	930.00	1569.10	1571.48	1570.95	1571.64	0.005972	3.23	287.52	211.97	0.49
Reach-1	0.590	1	930.00	1566.81	1568.07	1567.62	1568.13	0.003421	1.77	498.82	669.38	0.31
Reach-1	0.590	2	930.00	1566.81	1568.64		1568.74	0.004092	2.60	366.18	238.16	0.36
Reach-1	0.488	1	930.00	1564.43	1565.56	1565.37	1565.66	0.008878	2.83	385.41	657.52	0.53
Reach-1	0.488	2	930.00	1564.43	1565.88	1565.42	1566.03	0.006965	3.08	302.33	251.34	0.49
Reach-1	0.384	1	930.00	1559.04	1562.75		1562.79	0.003368	2.01	583.15	739.86	0.31
Reach-1	0.384	2	930.00	1559.04	1563.59		1563.69	0.002869	2.57	361.26	171.31	0.31
Reach-1	0.279	1	930.00	1557.60	1559.65	1559.55	1559.79	0.019424	3.29	306.37	598.68	0.69
Reach-1	0.279	2	930.00	1557.60	1560.11	1559.87	1560.41	0.018347	4.43	209.96	179.50	0.72
Reach-1	0.184	1	930.00	1555.23	1557.00		1557.04	0.002504	1.42	645.30	923.88	0.26
Reach-1	0.184	2	930.00	1555.23	1557.67		1557.73	0.002381	1.97	471.65	294.41	0.27
Reach-1	0.072	1	930.00	1552.05	1553.47	1553.47	1553.71	0.032671	4.31	250.07	547.50	0.90
Reach-1	0.072	2	930.00	1552.05	1553.63	1553.63	1554.08	0.040055	5.41	171.89	196.49	1.02
Reach-1	0.000	1	930.00	1548.48	1553.48	1551.15	1553.48	0.000058	0.50	2332.13	1272.05	0.05
Reach-1	0.000	2	930.00	1548.48	1553.48	1551.15	1553.49	0.000157	0.82	1253.84	446.63	0.08

HEC-RAS Plan: FP River: T4N-R3W-S10N Reach: Reach-1

Reach	River Sta	Profile	Max Chl Dpth (ft)	Hydr Depth (ft)	Top Wdth Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
Reach-1	1.492	1	2.99	0.73	434.50	317.51	2.93	1593.82	1593.82	
Reach-1	1.492	2	3.12	1.40	191.28	268.13	3.47	1593.95	1593.82	0.12
Reach-1	1.395	1	2.65	0.86	490.98	421.74	2.21	1591.21	1591.21	
Reach-1	1.395	2	2.87	1.49	218.15	324.31	2.87	1591.43	1591.21	0.22
Reach-1	1.292	1	2.45	0.86	473.88	406.56	2.29	1588.55	1588.55	
Reach-1	1.292	2	2.60	1.54	221.55	342.24	2.72	1588.70	1588.55	0.15
Reach-1	1.184	1	4.50	0.69	730.78	504.76	1.84	1585.65	1585.65	
Reach-1	1.184	2	4.79	1.59	269.71	428.68	2.17	1585.93	1585.65	0.28
Reach-1	1.093	1	1.24	0.54	1015.99	546.56	1.70	1582.88	1582.88	
Reach-1	1.093	2	1.95	1.67	250.19	418.52	2.22	1583.84	1582.88	0.96
Reach-1	0.993	1	1.28	0.81	710.37	577.55	1.61	1580.36	1580.36	
Reach-1	0.993	2	1.96	1.88	174.95	328.54	2.83	1581.16	1580.36	0.80
Reach-1	0.901	1	2.10	0.67	576.35	386.25	2.41	1577.39	1577.39	
Reach-1	0.901	2	2.71	1.70	167.90	285.92	3.25	1578.00	1577.39	0.62
Reach-1	0.803	1	2.83	0.75	623.37	470.57	1.98	1574.37	1574.37	
Reach-1	0.803	2	3.19	1.63	171.98	281.05	3.31	1574.73	1574.37	0.36
Reach-1	0.705	1	1.94	0.58	554.90	320.26	2.90	1571.04	1571.04	
Reach-1	0.705	2	2.38	1.36	211.97	287.52	3.23	1571.48	1571.04	0.45
Reach-1	0.590	1	1.26	0.75	669.38	498.82	1.86	1568.07	1568.07	
Reach-1	0.590	2	1.83	1.55	238.16	368.18	2.53	1568.64	1568.07	0.57
Reach-1	0.488	1	1.13	0.59	657.52	385.41	2.41	1565.56	1565.56	
Reach-1	0.488	2	1.45	1.20	251.34	302.33	3.08	1565.88	1565.56	0.32
Reach-1	0.364	1	3.71	0.79	739.86	583.15	1.59	1562.75	1562.75	
Reach-1	0.364	2	4.55	2.11	171.31	361.26	2.57	1563.59	1562.75	0.84
Reach-1	0.279	1	2.05	0.51	598.68	306.37	3.04	1559.65	1559.65	
Reach-1	0.279	2	2.51	1.17	179.50	209.96	4.43	1560.11	1559.65	0.46
Reach-1	0.184	1	1.77	0.70	923.88	645.30	1.44	1557.00	1557.00	
Reach-1	0.184	2	2.44	1.60	294.41	471.65	1.97	1557.67	1557.00	0.67
Reach-1	0.072	1	1.42	0.46	547.50	250.07	3.72	1553.47	1553.47	
Reach-1	0.072	2	1.58	0.87	196.49	171.89	5.41	1553.63	1553.47	0.16
Reach-1	0.000	1	5.00	1.83	1272.05	2332.13	0.40	1553.48	1553.48	
Reach-1	0.000	2	5.00	2.81	446.63	1253.84	0.74	1553.48	1553.48	0.00

CHECK-RAS Report for Wash:
T4N-R3W-S10N

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.prj
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Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.f02
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.nt
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:52:49 PM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
T4N-R3W-S10N,Reach-1						
1.492		0.033	0.05	0.05	0.1	0.3
1.395		0.033	0.05	0.05	0.1	0.3
1.292		0.035	-----	-----	0.1	0.3
		0.065	-----	-----		
1.184		0.035	-----	-----	0.1	0.3
		0.065	-----	-----		
1.093		0.035	-----	-----	0.1	0.3
		0.065	-----	-----		
.993		0.035	-----	-----	0.1	0.3
		0.065	-----	-----		
.901		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.803		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.705		0.033	0.033	0.05	0.1	0.3
		-----	0.05	0.033		
.59		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.488		0.033	0.05	-----	0.1	0.3
		0.05	0.033	-----		
.384		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.279		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.184		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
.072		0.033	-----	-----	0.1	0.3
		0.05	-----	-----		
0		0.033	-----	0	0.1	0.3
		0.05	-----	0.033		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.033	0.065
Right Overbank n Value:	0	0.05
Channel n Value:	0.033	0.05
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

RS: 1.492

```
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.492
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.05 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      1.395
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:      1.395
NT RC 05 The left overbank n value of 0.033 and the right overbank n value
         of 0.05 are less than or equal to the channel n value of 0.05
         The overbank n values should be reevaluated.

RS:      0.705
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

TRANSITION LOSS COEFFICIENT CHECK
---------------------------------

ROUGHNESS COEFFICIENT AT STRUCTURES
-----------------------------------

---END---
```

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.p01
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.f02
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.xs
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:54:44 PM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
T4N-R3W-S10N,Reach-1						
1.492	455.72	510.161	510.15	434.5	930	D
1.395	499.8	541.066	506.27	490.98	930	
1.292	514.03	574.601	537.1	473.88	930	D
1.184	601.61	478.32	318.12	730.78	930	D
1.093	255.11	527.143	632.77	1015.99	930	
.993	487.65	486.309	458.47	710.37	930	
.901	531.31	516.239	482.52	576.35	930	
.803	485.77	517.23	497.03	623.37	930	D
.705	514.37	607.28	549.44	554.9	930	D
.59	399.49	542.532	520.57	669.38	930	
.488	567.7	545.941	539.58	657.52	930	
.384	272.08	553.653	511.93	739.86	930	
.279	539.49	505.967	415.07	598.68	930	
.184	415.2	587.698	576.86	923.88	930	
.072	297.44	381.419	358.1	547.5	930	C
0	0	0	0	1272.05	930	

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

RS: 1.292
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

RS: 1.184
XS IF 01 Right Levee option is used at this river station
Please investigate whether the NFIP requirements
for levees are met.

```
RS:       1.093
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       1.093
XS IF 01 Right Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.

RS:       0.705
XS IF 01 Left Levee option is used at this river station
         Please investigate whether the NFIP requirements
         for levees are met.


DISCHARGE CHECK
---------------

XS DC 02 Constant dicharge used for the T4N-R3W-S10N,Reach-1


LOCATION CHECK
--------------


BOUNDARY CONDITION CHECK
------------------------

XS BC 02 The name of the stream is T4N-R3W-S10N,Reach-1
         Known WS = 1553.48 is specified as the downstream boundary
         for profile 1

XS BC 03 Maximum number of iterations is 0
         It should not be less than 20.


LATERAL WEIRS CHECK
-------------------

---END---
```

CHECK-RAS Program: Floodway Check
Encroachment Method, Starting WSEL, Floodway Width, and Surcharge Review

Project File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.prj
Plan File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.p01
Geometry File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.g01
Flow File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.f02
Report File: P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.fw
Selected profiles: 1;2
Date: 6/6/2006
Time: 3:54:55 PM

SECNO	Method	Surcharge	EncStaL	EncStaR	LStaEff	RStaEff	Structure
T4N-R3W-S10N,Reach-1							
1.492					9689.35	10150.12	
1.492	19	0.12	9887.16	10078.44	9887.16	10078.44	
1.395					9741.65	10232.62	
1.395	19	0.22	9877.48	10095.63	9877.48	10095.63	
1.292					9773.53	10365.11	
1.292	19	0.15	9904.36	10125.91	9904.36	10125.91	
1.184					9747.76	10531.5	
1.184	19	0.28	9870.27	10139.98	9870.27	10139.98	
1.093					9472.41	10488.4	
1.093	19	0.96	9804.75	10054.94	9804.75	10054.94	
0.993					9487.31	10197.68	
0.993	19	0.8	9925.71	10100.66	9925.71	10100.66	
0.901					9591.35	10167.7	
0.901	1	0.62	9857.2	10025.1	9857.2	10025.1	
0.803					9651.35	10286.2	
0.803	19	0.36	9908.23	10080.21	9908.23	10080.21	
0.705					9569.03	10199.14	
0.705	19	0.45	9797.63	10009.6	9797.63	10009.6	
0.59					9522.48	10191.87	
0.59	19	0.57	9827.81	10065.97	9827.81	10065.97	
0.488					9607.24	10264.76	
0.488	19	0.32	9969.71	10221.05	9969.71	10221.05	
0.384					9479.86	10219.71	
0.384	19	0.84	9941.56	10112.87	9941.56	10112.87	
0.279					9709.05	10307.74	
0.279	19	0.46	9891.61	10071.11	9891.61	10071.11	
0.184					9364.59	10288.47	
0.184	19	0.67	9845.05	10139.46	9845.05	10139.46	
0.072					9676.65	10224.14	
0.072	19	0.16	9821.59	10018.08	9821.59	10018.08	
0					9251.15	10523.2	
0	19	0	9691.12	10137.75	9691.12	10137.75	

ENCROACHMENT METHOD CHECK

FLOODWAY WIDTH CHECK

RS: 1.492
FW FW 03 The Left channel bank station may not be at the proper location.

```
RS:        1.292
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.993
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.901
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.901
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.803
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.488
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.279
FW FW 03   The Left channel bank station may not be at the proper
           location.

RS:        0.184
FW FW 03   The right channel bank station may not be at the proper
           location.

RS:        0.072
FW FW 03   The right channel bank station may not be at the proper
           location.


SURCHARGE CHECK
---------------


DISCHARGE CHECK
---------------


STARTING WATER-SURFACE ELEVATION CHECK
--------------------------------------

---END---
```

HEC-RAS Report for Wash:
T4N-R3W-S10N

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: WITTMANN ZONE AE- T4N-R3W-S10N
Project File : WITTMANN_ZONE_AE_T4N_R3W_S10N.prj
Run Date and Time: 7/24/2006 4:38:02 PM

Project in English units

Project Description:
WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY, Contract FCD2004C066

Prepared by David Evans and Associates Inc.
Modeled by Frank
Brown, P.E., CFM and Nathan Logan, E.I.T.

HEC-RAS Version 3.1.3 was utilized
for floodplain and floodway delineation.
Filename : WITTMANN ZONE
AE-T4N-R3W-S10N.PRJ

Vertical datum: NAVD1988

Topography and aerial
photography provided by FCDMC, origin is the Wittmann ADMS/ADMSU (FCD 2002C029), flight dates are 04/18/02, 04/19/02 and 04/23/02 at 1:7200 ratio and 04/23/02 at 1:14400 ratio.

DTM data provided by Wittmann ADMSU
consultant from contract FCD 2002C029.

Manning's 'n' values were determined
by field reconnaissance; see the Technical Data Notebook for more detailed information.

Flow rates are from the Hydrology Computations Appendix of the
Technical Data Notebook; please refer to the Flow Rate Exhibit and the computations for the interpolated and intermediate values.

****

PLAN DATA

Plan Title: FLOODPLAIN
Plan File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.p01

Geometry Title: T4N-R3W-S10N

```
          Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.g01

          Flow Title    : FLOODPLAIN
          Flow File     : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.f02

Plan Summary Information:
Number of:  Cross Sections =   16    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

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 = True
   Left Offset      =        0
   Right Offset     =        0

River = T4N-R3W-S10N     Reach = Reach-1
RS      Profile           Method  Value1  Value2
1.492   2                      1 9887.1610078.44
1.395   2                      1 9877.4810095.63
1.292   2                      1 9904.3610125.91
1.184   2                      1 9870.2710139.98
1.093   2                      1 9804.7510054.94
0.993   2                      1 9925.7110100.66
0.901   2                      1  9857.2 10025.1
0.803   2                      1 9908.2310080.21
0.705   2                      1 9797.63 10009.6
0.590   2                      1 9827.8110065.97
0.488   2                      1 9969.7110221.05
0.384   2                      1 9941.5610112.87
0.279   2                      1 9891.6110071.11
0.184   2                      1 9845.0510139.46
0.072   2                      1 9821.5910018.08
0.000   2                      1 9691.1210137.75


*****************************************************************************

FLOW DATA

Flow Title: FLOODPLAIN
Flow File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.f02

Flow Data (cfs)
*****************************************************************************
* River           Reach           RS      *              1              2 *
* T4N-R3W-S10N    Reach-1         1.492   *            930            930 *
*****************************************************************************

Boundary Conditions
*****************************************************************************************************
*******
* River           Reach           Profile          *            Upstream
Downstream    *
*****************************************************************************************************
*******
```

```
* T4N-R3W-S10N     Reach-1          1                 *                                   Known WS =
1553.48 *
*****************************************************************************************************
*******

*************************************************************************

GEOMETRY DATA

Geometry Title: T4N-R3W-S10N
Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\WITTMANN_ZONE_AE_T4N_R3W_S10N.g01

CROSS SECTION


RIVER: T4N-R3W-S10N
REACH: Reach-1            RS: 1.492

INPUT
Description: Flow rate starting at this cross-section is 930cfs.
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************
 9411.05  1595.1 9420.01 1595.26 9422.59 1595.33 9468.86 1594.75 9497.43  1594.6
 9535.42 1594.55 9596.55 1594.03 9600.88 1594.02 9603.35    1594 9608.63 1594.02
 9616.25 1594.01 9625.64 1594.03 9645.53    1594 9648.27    1594 9733.49 1593.63
 9750.38 1593.76 9754.45  1593.1 9754.79  1593.1 9754.88 1593.08 9758.66  1592.9
 9764.02 1593.29  9768.1 1593.52 9774.99  1593.6 9842.53 1593.84 9858.33  1593.9
  9875.3 1593.65 9880.41 1593.54 9884.55  1593.5 9884.63 1593.51 9889.69 1593.48
 9896.77 1593.53 9917.68 1593.64 9924.18  1593.7 9925.86 1593.64 9927.21 1593.63
 9928.91 1593.63 9936.47  1592.3 9939.37    1592 9939.57 1592.01  9948.8 1591.94
 9957.42  1591.9 9958.65 1591.86 9959.39 1591.96 9959.59    1592 9962.97 1592.66
 9963.65  1592.7 9965.88 1592.35 9968.63 1592.54 9984.79 1592.44 9992.29 1592.33
 9993.51  1592.2 9995.11    1592 9996.79 1591.7110002.93 1590.8310004.79 1591.75
10005.55    159210006.02 1592.2210006.66 1592.4710011.89 1592.4110020.06 1592.33
 10024.9  1592.310025.64 1592.0510025.95    159210027.78 1591.52 10028.8  1591.2
10030.33  1590.910033.66 1591.4610035.33    159210036.03 1592.1410036.69 1592.28
10099.33 1592.9110099.77  1592.910099.85 1592.9110144.11 1593.7710170.88    1594
10185.35 1594.0510198.11  1594.110218.02  1594.310223.36 1594.4110258.07 1594.84
10270.67 1594.8810298.04  1594.910314.15 1595.0810339.55 1595.46 10364.3 1595.96
10366.76    159610368.99    159610383.25 1596.3310395.26 1596.3610398.55 1596.34
10403.68 1596.3210405.24  1596.310414.92 1596.46 10439.4 1596.6410477.14 1597.29
10485.26 1597.3910487.52  1597.510515.57 1597.5110553.29 1597.0210557.51 1597.04
10594.38  1597.610643.64 1596.9810654.09 1597.1610659.43 1597.0110719.12 1596.99
10723.67 1597.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9411.05    .033 9936.47     .0510036.69     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.4710036.69           455.72 510.161  510.15            .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************************
* E.G. Elev (ft)          * 1593.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.033  *   0.050  *   0.050  *
* W.S. Elev (ft)          * 1593.82  * Reach Len. (ft)         *  455.72  *  510.16  *  510.15  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   46.30  *  172.43  *   98.78  *
* E.G. Slope (ft/ft)      *0.007486  * Area (sq ft)            *   46.30  *  172.43  *   98.78  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *   65.67  *  632.71  *  231.62  *
* Top Width (ft)          *  434.50  * Top Width (ft)          *  220.85  *  100.22  *  113.43  *
* Vel Total (ft/s)        *    2.93  * Avg. Vel. (ft/s)        *    1.42  *    3.67  *    2.34  *
* Max Chl Dpth (ft)       *    2.99  * Hydr. Depth (ft)        *    0.21  *    1.72  *    0.87  *
* Conv. Total (cfs)       * 10748.6  * Conv. (cfs)             *   759.0  *  7312.6  *  2677.0  *
* Length Wtd. (ft)        *  497.91  * Wetted Per. (ft)        *  221.05  *  101.15  *  113.44  *
* Min Ch El (ft)          * 1590.83  * Shear (lb/sq ft)        *    0.10  *    0.80  *    0.41  *
* Alpha                   *    1.24  * Stream Power (lb/ft s)  *    0.14  *    2.92  *    0.95  *
* Frctn Loss (ft)         *    2.67  * Cum Volume (acre-ft)    *   30.83  *   33.06  *   17.88  *
```

```
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   48.01  *   29.60  *   32.75  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1594.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.20  * Wt. n-Val.              *   0.033  *   0.050  *   0.050  *
* W.S. Elev (ft)         * 1593.95  * Reach Len. (ft)         *  455.72  *  510.16  *  510.15  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   22.46  *  184.89  *   60.79  *
* E.G. Slope (ft/ft)     *0.007041  * Area (sq ft)            *   22.46  *  184.89  *   60.79  *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *   49.84  *  689.23  *  190.93  *
* Top Width (ft)         *  191.28  * Top Width (ft)          *   49.31  *  100.22  *   41.75  *
* Vel Total (ft/s)       *    3.47  * Avg. Vel. (ft/s)        *    2.22  *    3.73  *    3.14  *
* Max Chl Dpth (ft)      *    3.12  * Hydr. Depth (ft)        *    0.46  *    1.84  *    1.46  *
* Conv. Total (cfs)      * 11083.3  * Conv. (cfs)             *   594.0  *  8213.9  *  2275.4  *
* Length Wtd. (ft)       *  498.31  * Wetted Per. (ft)        *   49.88  *  101.15  *   43.00  *
* Min Ch El (ft)         * 1590.83  * Shear (lb/sq ft)        *    0.20  *    0.80  *    0.62  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)   *    0.44  *    3.00  *    1.95  *
* Frctn Loss (ft)        *    2.57  * Cum Volume (acre-ft)     *    9.22  *   47.54  *    4.44  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *    6.28  *   29.60  *    2.88  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9673.76   * 9936.47   *    65.67 *    46.30 *   221.05 *     7.06 *
0.21 *     1.42 *
* 2        * Chan      * 9936.47   * 10036.69  *   632.71 *   172.43 *   101.15 *    68.03 *
1.72 *     3.67 *
* 3        * ROB       * 10036.69  * 10380.18  *   231.62 *    98.78 *   113.44 *    24.91 *
0.87 *     2.34 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9673.76   * 9936.47   *    49.84 *    22.46 *    49.88 *     5.36 *
0.46 *     2.22 *
* 2        * Chan      * 9936.47   * 10036.69  *   689.23 *   184.89 *   101.15 *    74.11 *
1.84 *     3.73 *
* 3        * ROB       * 10036.69  * 10380.18  *   190.93 *    60.79 *    43.00 *    20.53 *
1.46 *     3.14 *
*****************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1 RS: 1.395

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9616.44	1592	9624.87	1591.9	9637.59	1591.82	9641.03	1591.73	9666.78	1591.9
9670.36	1591.91	9676	1591.89	9701.29	1591.86	9705.23	1591.8	9711.7	1591.8
9723.18	1591.61	9762.88	1590.74	9764.05	1590.43	9765.06	1590	9766.87	1589.49
9773.71	1589.93	9774.73	1590	9775.35	1590	9775.93	1590.08	9776.04	1590.1
9776.5	1590.16	9778.1	1590.67	9779.17	1591	9811.31	1590.75	9817.73	1590.75
9860.84	1590.7	9873.98	1590.68	9899.03	1590.6	9920.91	1590.42	9921.87	1590.43
9925.06	1590.42	9966.52	1590.04	9969.43	1590	9969.73	1590	9985.39	1589.9
9986.35	1589.75	9990.39	1589.13	9993.47	1588.56	9997.6	1589.29	9998.73	1589.4
10001.39	1589.4	10005.92	1589.45	10009.67	1589.43	10025.02	1589.5	10033.99	1589.66
10046.3	1589.72	10055.33	1589.81	10056.51	1589.54	10056.92	1589.48	10060.8	1588.9
10061.28	1589.12	10062.07	1589.56	10064.16	1589.61	10070.42	1589.86	10071.32	1589.9
10078.38	1589.75	10086.34	1589.75	10087.42	1589.51	10088.17	1589.4	10090	1589.7
10091.19	1589.81	10094.92	1589.91	10095.22	1590	10095.35	1590	10095.63	1590.1
10135.6	1590.44	10143.4	1590.41	10147.71	1590.47	10150.61	1590.51	10166.1	1590.6
10194.06	1590.9	10210.73	1590.99	10240.22	1591.28	10243.29	1591.3	10245.22	1591.28
10247.97	1591.29	10255.3	1591.22	10297.54	1591.7	10316.99	1591.66	10351.81	1591.94
10359.03	1592.03	10368.2	1592.11	10405.25	1592.06	10423.05	1591.99	10425.97	1591.99
10436.33	1592.13	10489.28	1593.11	10493.83	1593.23	10496.29	1593.25	10537.05	1593.99
10537.78	1594	10542.02	1594.11	10544.35	1594.17	10544.46	1594.12	10549.12	1594
10554.9	1593.92	10563.17	1593.91	10580.58	1593.51	10607.29	1593.54	10655.25	1593.72
10656.81	1593.72	10659.93	1593.71	10662.32	1593.76	10670.02	1593.8	10685.61	1593.84
10693.93	1593.8	10712.12	1593.91	10738.39	1593.94	10743.14	1593.94	10745.04	1593.9
10755.01	1593.98	10759.99	1594	10766.42	1594.04	10773.81	1594.07		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9616.44	.033	9985.39	.05	10095.63	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985.39	10095.63	499.8	541.066	506.27	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1591.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.050	0.050
W.S. Elev (ft)	1591.21	Reach Len. (ft)	499.80	541.07	506.27
Crit W.S. (ft)	1590.77	Flow Area (sq ft)	162.04	181.29	78.41
E.G. Slope (ft/ft)	0.004035	Area (sq ft)	162.04	181.29	78.41
Q Total (cfs)	930.00	Flow (cfs)	352.68	475.29	102.03
Top Width (ft)	490.98	Top Width (ft)	243.74	110.24	136.99
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)	2.18	2.62	1.30
Max Chl Dpth (ft)	2.65	Hydr. Depth (ft)	0.66	1.64	0.57
Conv. Total (cfs)	14640.7	Conv. (cfs)	5552.1	7482.3	1606.2
Length Wtd. (ft)	519.82	Wetted Per. (ft)	244.11	110.77	137.00
Min Ch El (ft)	1588.56	Shear (lb/sq ft)	0.17	0.41	0.14
Alpha	1.13	Stream Power (lb/ft s)	0.36	1.08	0.19
Frctn Loss (ft)	2.65	Cum Volume (acre-ft)	29.75	30.99	16.84
C & E Loss (ft)	0.00	Cum SA (acres)	45.58	28.37	31.29

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 OUTPUT Profile #2

E.G. Elev (ft)	1591.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.033	0.050	
W.S. Elev (ft)	1591.43	Reach Len. (ft)	499.80	541.07	506.27
Crit W.S. (ft)		Flow Area (sq ft)	118.58	205.73	
E.G. Slope (ft/ft)	0.003936	Area (sq ft)	118.58	205.73	
Q Total (cfs)	930.00	Flow (cfs)	355.04	574.96	
Top Width (ft)	218.15	Top Width (ft)	107.91	110.24	

```
* Vel Total (ft/s)        *    2.87  * Avg. Vel. (ft/s)        *    2.99  *    2.79  *          *
* Max Chl Dpth (ft)       *    2.87  * Hydr. Depth (ft)        *    1.10  *    1.87  *          *
* Conv. Total (cfs)       * 14824.0  * Conv. (cfs)             *  5659.2  *  9164.8  *          *
* Length Wtd. (ft)        *  523.25  * Wetted Per. (ft)        *  108.67  *  112.09  *          *
* Min Ch El (ft)          * 1588.56  * Shear (lb/sq ft)        *    0.27  *    0.45  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.80  *    1.26  *          *
* Frctn Loss (ft)         *    2.74  * Cum Volume (acre-ft)    *    8.48  *   45.25  *    4.08  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    5.45  *   28.37  *    2.64  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9616.44   * 9800.92   *    56.23 *    30.81 *    59.63 *     6.05 *
0.52 *     1.83 *
* 2         * LOB       * 9800.92   * 9985.39   *   296.45 *   131.23 *   184.48 *    31.88 *
0.71 *     2.26 *
* 3         * Chan      * 9985.39   * 10095.63  *   475.29 *   181.29 *   110.77 *    51.11 *
1.64 *     2.62 *
* 4         * ROB       * 10095.63  * 10434.72  *   102.03 *    78.41 *   137.00 *    10.97 *
0.57 *     1.30 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9800.92   * 9985.39   *   355.04 *   118.58 *   108.67 *    38.18 *
1.10 *     2.99 *
* 2         * Chan      * 9985.39   * 10095.63  *   574.96 *   205.73 *   112.09 *    61.82 *
1.87 *     2.79 *
*****************************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1            RS: 1.292

INPUT
Description: Interpolated point added at (9976.52, 1587.062) to set bank
             station.
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9515.06    1590 9527.43 1589.96 9541.13 1589.95 9554.88 1589.71 9562.95 1589.67
 9563.37  1589.7 9568.17 1589.63 9593.87 1589.68 9610.15  1589.6 9616.65 1589.58
  9617.3  1589.6 9618.15 1589.56  9652.4 1589.21  9665.9 1589.13 9729.73  1588.9
 9779.92  1588.5 9780.41 1588.49 9782.05    1588  9782.5  1587.9 9783.76 1587.25
 9789.26 1587.28 9792.42 1587.31 9794.19 1587.95 9794.35    1588 9794.56 1588.09
 9795.35 1588.36  9798.6 1588.39 9856.92  1588.3 9876.33 1588.09 9890.09    1588
 9891.69    1588 9895.04 1587.96 9908.61 1587.86 9922.92 1587.72  9942.8 1587.53
 9976.52 1587.06 9995.38  1586.8 9996.07 1586.67 9998.94  1586.110002.03 1586.59
```

```
10004.68 1587.0410055.66 1586.8810061.01 1587.0810081.13 1587.1210109.03 1587.35
10111.23  1586.910115.36 1586.3210126.78  1587.510141.48 1587.61 10146.6 1587.65
10164.14    1588 10166.1 1588.0310169.53  1588.110201.38 1588.4410207.64 1588.56
10218.52  1588.610251.93 1589.1810262.78 1589.2610305.82 1588.6410352.82 1588.42
10353.83  1588.410399.42 1589.01   10400 1589.0110443.44 1588.71 10447.6  1588.6
10450.63 1588.5510454.83 1588.6110456.81 1588.6510502.27  1589.110531.64 1589.34
10551.46 1589.2410568.66 1589.3510602.43  1589.510602.83 1589.51   10603 1589.51
10609.34  1589.310628.36 1589.2410637.84  1589.410638.71  1589.410657.29 1589.74
10674.78 1589.7410681.44  1589.710686.71 1589.7510714.47  1589.910744.05 1590.13
   10760 1590.2310799.93  1590.4 10822.9 1590.4210831.28 1590.84 10848.6    1591
10873.45 1590.7110902.83 1590.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9515.06    .035 9922.92    .06510141.48    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.5210061.01           514.03 574.601   537.1             .1       .3
Right Levee     Station=10399.42      Elevation= 1589.01

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1588.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.050  *   0.065  *   0.058  *
* W.S. Elev (ft)          * 1588.55  * Reach Len. (ft)         *  514.03  *  574.60  *  537.10  *
* Crit W.S. (ft)          * 1587.98  * Flow Area (sq ft)       *  124.90  *  138.96  *  142.69  *
* E.G. Slope (ft/ft)      *0.006667  * Area (sq ft)            *  124.90  *  138.96  *  142.69  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  249.60  *  360.99  *  319.40  *
* Top Width (ft)          *  473.88  * Top Width (ft)          *  202.99  *   84.49  *  186.40  *
* Vel Total (ft/s)        *    2.29  * Avg. Vel. (ft/s)        *    2.00  *    2.60  *    2.24  *
* Max Chl Dpth (ft)       *    2.45  * Hydr. Depth (ft)        *    0.62  *    1.64  *    0.77  *
* Conv. Total (cfs)       * 11389.6  * Conv. (cfs)             *  3056.8  *  4421.1  *  3911.7  *
* Length Wtd. (ft)        *  546.19  * Wetted Per. (ft)        *  203.42  *   84.64  *  186.56  *
* Min Ch El (ft)          * 1586.10  * Shear (lb/sq ft)        *    0.26  *    0.68  *    0.32  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    0.51  *    1.78  *    0.71  *
* Frctn Loss (ft)         *    2.92  * Cum Volume (acre-ft)    *   28.10  *   29.00  *   15.55  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   43.02  *   27.16  *   29.41  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1588.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.057  *   0.065  *   0.065  *
* W.S. Elev (ft)          * 1588.70  * Reach Len. (ft)         *  514.03  *  574.60  *  537.10  *
* Crit W.S. (ft)          * 1588.01  * Flow Area (sq ft)       *   85.56  *  151.90  *  104.78  *
* E.G. Slope (ft/ft)      *0.007310  * Area (sq ft)            *   85.56  *  151.90  *  104.78  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  213.79  *  438.44  *  277.77  *
* Top Width (ft)          *  221.55  * Top Width (ft)          *   72.16  *   84.49  *   64.90  *
* Vel Total (ft/s)        *    2.72  * Avg. Vel. (ft/s)        *    2.50  *    2.89  *    2.65  *
* Max Chl Dpth (ft)       *    2.60  * Hydr. Depth (ft)        *    1.19  *    1.80  *    1.61  *
* Conv. Total (cfs)       * 10877.1  * Conv. (cfs)             *  2500.4  *  5127.9  *  3248.7  *
* Length Wtd. (ft)        *  548.97  * Wetted Per. (ft)        *   72.98  *   84.64  *   66.34  *
* Min Ch El (ft)          * 1586.10  * Shear (lb/sq ft)        *    0.54  *    0.82  *    0.72  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    1.34  *    2.36  *    1.91  *
* Frctn Loss (ft)         *    2.80  * Cum Volume (acre-ft)    *    7.31  *   43.03  *    3.47  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    4.42  *   27.16  *    2.26  *
*****************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.
```

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

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9745.79	9976.52	249.60	124.90	203.42	26.84	0.62	2.00
* 2	Chan	9976.52	10061.01	360.99	138.96	84.64	38.82	1.64	2.60
* 3	ROB	10061.01	10399.42	319.40	142.69	186.56	34.34	0.77	2.24

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.

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9745.79	9976.52	213.79	85.56	72.98	22.99	1.19	2.50
* 2	Chan	9976.52	10061.01	438.44	151.90	84.64	47.14	1.80	2.89
* 3	ROB	10061.01	10399.42	277.77	104.78	66.34	29.87	1.61	2.65

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

CROSS SECTION

RIVER: T4N-R3W-S10N
REACH: Reach-1 RS: 1.184

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs;
flow to right of
levee is minor split flow and is not part of main floodplain
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9068.04	1587.1	9079.55	1587.19	9114.04	1586.94	9150.16	1586.55	9184.88	1586.5
9210.42	1586.36	9211.38	1586.36	9212.68	1586.35	9215.3	1586.35	9217.03	1586.3
9227.33	1586.29	9232.88	1586.32	9263.73	1586.09	9263.85	1586.09	9263.97	1586.1
9265.44	1586.1	9307.49	1586.29	9334.74	1586.29	9349.81	1586.34	9388.52	1586.1
9393.36	1586.11	9398.66	1586.11	9452.12	1586.27	9455.07	1586.26	9461.41	1586.2
9500.66	1585.96	9505.05	1585.94	9505.57	1586.02	9519.81	1586	9538.15	1586.05

```
 9558.46 1586.27 9562.87 1586.29 9565.01 1586.31  9565.1  1586.3 9565.32 1586.31
 9566.46 1586.31  9579.4 1586.36 9623.32 1586.43 9642.91  1586.5 9655.07 1586.58
 9656.19  1586.6 9658.46 1586.59 9659.65 1586.58 9670.74  1586.4 9703.03 1586.02
 9704.53    1586 9704.59    1586 9709.03 1585.95 9731.63 1585.86 9732.28 1585.88
 9732.87 1585.88 9733.16  1585.9 9737.15 1585.86 9738.46 1585.85 9740.32  1585.7
  9740.4  1585.7 9740.95 1585.67 9751.63 1585.63 9756.75 1585.56 9759.34 1585.62
 9812.63 1585.76 9821.31 1585.65 9825.49 1585.58 9870.27 1584.81 9884.74  1584.8
 9910.26 1584.67 9954.17 1584.24 9964.91 1584.42 9969.02 1584.29 9977.35    1584
 9985.36 1583.69 9992.73 1583.45 9995.38  1582.7 9997.51    1582    9999  1581.5
10000.48 1581.1410002.25 1581.8910003.28    158210003.34 1582.02 10003.6    1582
10006.29 1581.7310006.51    158210006.58 1582.0210006.63    158210006.99 1582.19
10009.62 1583.0310010.53 1583.6910011.42 1584.0310011.78    158410038.05 1584.31
10090.75 1584.7410132.54 1584.8510136.36 1584.8710139.98  1584.910140.53  1584.9
10180.64 1585.1910228.21 1585.2910234.61 1585.6210249.59 1585.5510276.44 1585.13
10315.33 1585.5810321.52 1585.6210351.36  1585.310364.66 1585.36 10373.5 1585.28
10408.25 1585.0810451.89  1585.4 10502.2 1585.2910550.96 1585.8810570.14  1585.9
10594.62 1585.8610596.32 1585.87 10597.3 1585.8610597.59 1585.8710603.26  1585.2
10604.06 1585.0910604.29 1585.1510609.22    158610610.33 1586.2910610.58  1586.4
10661.13 1586.4410693.45 1586.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9068.04    .035 9870.27    .06510090.75    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.9110038.05           601.61  478.32  318.12            .1        .3
Right Levee     Station=10550.96      Elevation= 1585.88

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1585.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.060  *   0.065  *   0.041  *
* W.S. Elev (ft)          * 1585.65  * Reach Len. (ft)         *  601.61  *  478.32  *  318.12  *
* Crit W.S. (ft)          * 1585.19  * Flow Area (sq ft)       *  122.50  *  149.88  *  232.38  *
* E.G. Slope (ft/ft)      *0.004389  * Area (sq ft)            *  122.50  *  149.88  *  232.38  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  193.50  *  362.51  *  373.99  *
* Top Width (ft)          *  730.78  * Top Width (ft)          *  164.20  *   73.14  *  493.45  *
* Vel Total (ft/s)        *    1.84  * Avg. Vel. (ft/s)        *    1.58  *    2.42  *    1.61  *
* Max Chl Dpth (ft)       *    4.50  * Hydr. Depth (ft)        *    0.75  *    2.05  *    0.47  *
* Conv. Total (cfs)       * 14038.2  * Conv. (cfs)             *  2920.8  *  5472.0  *  5645.4  *
* Length Wtd. (ft)        *  459.59  * Wetted Per. (ft)        *  164.21  *   74.27  *  493.47  *
* Min Ch El (ft)          * 1581.14  * Shear (lb/sq ft)        *    0.20  *    0.55  *    0.13  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    0.32  *    1.34  *    0.21  *
* Frctn Loss (ft)         *    2.78  * Cum Volume (acre-ft)    *   26.64  *   27.10  *   13.24  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   40.85  *   26.12  *   25.22  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1586.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.065  *   0.065  *   0.047  *
* W.S. Elev (ft)          * 1585.93  * Reach Len. (ft)         *  601.61  *  478.32  *  318.12  *
* Crit W.S. (ft)          * 1585.15  * Flow Area (sq ft)       *  128.67  *  170.72  *  129.29  *
* E.G. Slope (ft/ft)      *0.003767  * Area (sq ft)            *  128.67  *  170.72  *  129.29  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  219.82  *  417.20  *  292.98  *
* Top Width (ft)          *  269.71  * Top Width (ft)          *   94.64  *   73.14  *  101.93  *
* Vel Total (ft/s)        *    2.17  * Avg. Vel. (ft/s)        *    1.71  *    2.44  *    2.27  *
* Max Chl Dpth (ft)       *    4.79  * Hydr. Depth (ft)        *    1.36  *    2.33  *    1.27  *
* Conv. Total (cfs)       * 15153.3  * Conv. (cfs)             *  3581.7  *  6797.9  *  4773.7  *
* Length Wtd. (ft)        *  490.88  * Wetted Per. (ft)        *   95.76  *   74.27  *  102.96  *
* Min Ch El (ft)          * 1581.14  * Shear (lb/sq ft)        *    0.32  *    0.54  *    0.30  *
```

```
* Alpha                    *    1.06  * Stream Power (lb/ft s) *    0.54  *    1.32  *    0.67  *
* Frctn Loss (ft)          *    2.09  * Cum Volume (acre-ft)   *    6.05  *   40.90  *    2.03  *
* C & E Loss (ft)          *    0.00  * Cum SA (acres)         *    3.44  *   26.12  *    1.23  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9516.48   * 9964.91   *   193.50 *   122.50 *   164.21 *    20.81 *
0.75 *     1.58 *
* 2         * Chan      * 9964.91   * 10038.05  *   362.51 *   149.88 *    74.27 *    38.98 *
2.05 *     2.42 *
* 3         * ROB       * 10038.05  * 10294.50  *   282.29 *   161.64 *   256.47 *    30.35 *
0.63 *     1.75 *
* 4         * ROB       * 10294.50  * 10550.96  *    91.70 *    70.74 *   237.00 *     9.86 *
0.30 *     1.30 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9516.48   * 9964.91   *   219.82 *   128.67 *    95.76 *    23.64 *
1.36 *     1.71 *
* 2         * Chan      * 9964.91   * 10038.05  *   417.20 *   170.72 *    74.27 *    44.86 *
2.33 *     2.44 *
* 3         * ROB       * 10038.05  * 10294.50  *   292.98 *   129.29 *   102.96 *    31.50 *
1.27 *     2.27 *
*****************************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1            RS: 1.093

INPUT
Description: Levee added-Ridge not overtopped per rough BFE calcs
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
```

```
 8916.84  1584.3 8922.95 1584.25 8961.97 1584.11 8968.05 1584.07  9069.6 1583.09
 9154.02 1582.78 9165.19  1582.6 9285.55 1582.88 9294.82 1582.97 9348.76  1583.3
 9379.81 1583.33  9384.3 1583.34 9385.72 1583.34 9400.31 1583.21 9463.51  1582.9
 9469.75  1582.9 9514.18 1582.56 9517.92 1582.49 9532.21 1582.38 9536.89  1582.3
 9537.46 1582.33 9609.24 1582.19 9611.62 1582.19 9614.22  1582.2 9617.05 1582.19
  9621.9  1582.2 9674.74 1582.22 9693.55 1582.28 9713.78  1582.2 9784.45 1582.14
 9791.45 1582.17 9843.26 1582.24 9847.65 1582.25 9851.78 1582.25 9860.18 1582.29
 9908.47  1582.3 9925.17 1582.25 9932.82 1582.26 9951.47 1582.13 9959.58  1582.1
 9986.96 1581.91 9992.93 1581.89 9997.32  1581.910002.93 1581.9210054.94  1582.3
10073.49 1582.2410097.19 1582.1410098.36 1582.1410098.93  1582.110100.84 1582.15
10102.36 1582.1510103.24 1582.1610180.69  1582.510233.39  1582.810246.26 1582.87
10254.45 1582.4610309.13 1582.66 10351.5 1582.4710362.03  1582.410365.33  1582.4
10409.21  1582.310448.84  1582.610453.27 1582.6610459.79 1582.6510462.01  1582.7
   10466 1582.5910503.89 1583.0810506.38 1583.2610526.79  1583.3 10554.2 1583.07
10576.68 1583.19 10604.1 1583.51 10644.9  1583.7   10651  1583.710668.31    1584
10677.09 1584.18 10696.1 1584.4710711.16  1584.110713.37 1584.0610719.36    1584
10719.64    158410732.88    1583 10747.6 1581.85 10749.3 1581.6410750.15  1581.7
10750.56 1581.7210751.85 1581.8310752.72    158210781.78 1583.51 10792.2    1584
10798.34 1584.2510836.84 1584.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
 8916.84    .035 9517.92    .06510180.69    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9908.4710054.94           255.11 527.143  632.77            .1        .3
Left Levee      Station=  9384.3      Elevation= 1583.34
Right Levee     Station= 10696.1      Elevation= 1584.47

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1582.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.064  *   0.065  *   0.045  *
* W.S. Elev (ft)         * 1582.88  * Reach Len. (ft)         *  255.11  *  527.14  *  632.77  *
* Crit W.S. (ft)         * 1582.61  * Flow Area (sq ft)       *  259.45  *  113.43  *  173.68  *
* E.G. Slope (ft/ft)     *0.008864  * Area (sq ft)            *  259.45  *  113.43  *  173.68  *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *  413.53  *  205.87  *  310.60  *
* Top Width (ft)         * 1015.99  * Top Width (ft)          *  436.06  *  146.47  *  433.46  *
* Vel Total (ft/s)       *    1.70  * Avg. Vel. (ft/s)        *    1.59  *    1.81  *    1.79  *
* Max Chl Dpth (ft)      *    1.24  * Hydr. Depth (ft)        *    0.59  *    0.77  *    0.40  *
* Conv. Total (cfs)      *  9878.2  * Conv. (cfs)             *  4392.4  *  2186.7  *  3299.1  *
* Length Wtd. (ft)       *  403.48  * Wetted Per. (ft)        *  436.06  *  146.47  *  433.48  *
* Min Ch El (ft)         * 1581.89  * Shear (lb/sq ft)        *    0.33  *    0.43  *    0.22  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *    0.52  *    0.78  *    0.40  *
* Frctn Loss (ft)        *    2.53  * Cum Volume (acre-ft)    *   24.00  *   25.65  *   11.76  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   36.71  *   24.92  *   21.83  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1583.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.              *   0.065  *   0.065  *          *
* W.S. Elev (ft)         * 1583.84  * Reach Len. (ft)         *  255.11  *  527.14  *  632.77  *
* Crit W.S. (ft)         * 1582.92  * Flow Area (sq ft)       *  164.17  *  254.36  *          *
* E.G. Slope (ft/ft)     *0.004827  * Area (sq ft)            *  164.17  *  254.36  *          *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *  350.41  *  579.59  *          *
* Top Width (ft)         *  250.19  * Top Width (ft)          *  103.72  *  146.47  *          *
* Vel Total (ft/s)       *    2.22  * Avg. Vel. (ft/s)        *    2.13  *    2.28  *          *
* Max Chl Dpth (ft)      *    1.95  * Hydr. Depth (ft)        *    1.58  *    1.74  *          *
* Conv. Total (cfs)      * 13385.8  * Conv. (cfs)             *  5043.5  *  8342.3  *          *
* Length Wtd. (ft)       *  463.43  * Wetted Per. (ft)        *  105.37  *  148.02  *          *
* Min Ch El (ft)         * 1581.89  * Shear (lb/sq ft)        *    0.47  *    0.52  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *    1.00  *    1.18  *          *
* Frctn Loss (ft)        *    2.63  * Cum Volume (acre-ft)    *    4.02  *   38.57  *    1.56  *
```

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    2.07  *   24.92  *    0.86  *
*****************************************************************************************************

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.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9384.30   * 9908.47   *   413.53 *   259.45 *   436.06 *    44.47 *
0.59 *     1.59 *
* 2         * Chan      * 9908.47   * 10054.94  *   205.87 *   113.43 *   146.47 *    22.14 *
0.77 *     1.81 *
* 3         * ROB       * 10054.94  * 10375.52  *   217.33 *   131.22 *   320.59 *    23.37 *
0.41 *     1.66 *
* 4         * ROB       * 10375.52  * 10696.10  *    93.26 *    42.46 *   112.89 *    10.03 *
0.38 *     2.20 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9384.30   * 9908.47   *   350.41 *   164.17 *   105.37 *    37.68 *
1.58 *     2.13 *
* 2         * Chan      * 9908.47   * 10054.94  *   579.59 *   254.36 *   148.02 *    62.32 *
1.74 *     2.28 *
*****************************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1            RS: 0.993

INPUT
Description:
Station Elevation Data    num=      87
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8819.47  1582.5 8820.02 1582.52 8832.48 1582.38 8856.78 1582.19 8865.47  1582.1
 8871.05    1582 8876.96 1581.92 8883.63 1581.86 8884.64  1581.8  8886.9 1581.84
 8890.35 1581.83 8947.28 1581.76 8967.81 1581.65 8990.41  1581.4 9055.16 1581.06
 9060.96 1581.09 9066.23 1581.13 9113.98  1581.1 9164.86  1581.4 9176.17 1581.01
 9212.46 1581.13 9228.67 1580.94 9307.58  1580.9 9313.36 1580.84 9314.87 1580.83
 9356.36  1580.8 9360.77 1580.77 9371.53 1580.65 9388.89 1580.71 9406.35 1580.84
 9451.48  1580.7 9463.67 1580.56 9526.25 1580.03 9527.82    1580  9536.1    1580
```

```
 9540.66  1579.9 9543.67 1579.91 9555.89 1579.88 9566.36  1579.9  9583.3 1579.82
 9664.21 1579.68 9687.37  1579.5 9720.21  1579.6 9745.17 1579.28 9758.63 1579.44
 9790.02 1579.46 9835.77 1579.12 9839.46 1579.09 9841.84  1579.1 9842.91 1579.08
  9844.4 1579.09 9845.82 1579.09 9847.07  1579.1  9853.2  1579.1 9933.45 1579.39
 9944.26  1579.4 9990.16 1579.24 9994.88 1579.2110003.43  1579.210069.33 1579.23
10100.66 1579.4310105.17 1579.4710119.83  1579.610149.28 1579.9210160.25    1580
10160.59    158010161.51 1580.0110201.83  1580.410211.86 1580.4710213.89  1580.5
10222.61 1580.5910253.02  1580.610298.58 1580.4610338.92 1581.1110342.03  1581.2
10342.38 1581.1610342.73 1581.17 10343.6 1581.1910348.77 1581.1810355.81  1581.2
10380.94 1581.1810386.53  1581.410405.51 1581.5310444.61    158210452.63    1582
10453.24 1582.0110469.65 1582.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 8819.47    .035 9664.21    .06510119.83    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.2610100.66           487.65 486.309  458.47             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1580.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.058  *   0.065  *   0.044  *
* W.S. Elev (ft)          * 1580.36  * Reach Len. (ft)         *  487.65  *  486.31  *  458.47  *
* Crit W.S. (ft)          * 1579.86  * Flow Area (sq ft)       *  361.85  *  170.67  *   45.02  *
* E.G. Slope (ft/ft)      *0.004667  * Area (sq ft)            *  361.85  *  170.67  *   45.02  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  579.15  *  282.52  *   68.33  *
* Top Width (ft)          *  710.37  * Top Width (ft)          *  456.95  *  156.40  *   97.02  *
* Vel Total (ft/s)        *    1.61  * Avg. Vel. (ft/s)        *    1.60  *    1.66  *    1.52  *
* Max Chl Dpth (ft)       *    1.28  * Hydr. Depth (ft)        *    0.79  *    1.09  *    0.46  *
* Conv. Total (cfs)       * 13613.5  * Conv. (cfs)             *  8477.7  *  4135.6  *  1000.2  *
* Length Wtd. (ft)        *  483.32  * Wetted Per. (ft)        *  456.96  *  156.40  *   97.02  *
* Min Ch El (ft)          * 1579.20  * Shear (lb/sq ft)        *    0.23  *    0.32  *    0.14  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.37  *    0.53  *    0.21  *
* Frctn Loss (ft)         *    2.91  * Cum Volume (acre-ft)    *   22.18  *   23.93  *   10.17  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   34.09  *   23.08  *   17.98  *
*****************************************************************************************

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 OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1581.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.065  *   0.065  *          *
* W.S. Elev (ft)          * 1581.16  * Reach Len. (ft)         *  487.65  *  486.31  *  458.47  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   32.87  *  295.67  *          *
* E.G. Slope (ft/ft)      *0.006782  * Area (sq ft)            *   32.87  *  295.67  *          *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *   85.19  *  844.81  *          *
* Top Width (ft)          *  174.95  * Top Width (ft)          *   18.55  *  156.40  *          *
* Vel Total (ft/s)        *    2.83  * Avg. Vel. (ft/s)        *    2.59  *    2.86  *          *
* Max Chl Dpth (ft)       *    1.96  * Hydr. Depth (ft)        *    1.77  *    1.89  *          *
* Conv. Total (cfs)       * 11293.0  * Conv. (cfs)             *  1034.5  * 10258.4  *          *
* Length Wtd. (ft)        *  486.37  * Wetted Per. (ft)        *   20.35  *  158.13  *          *
* Min Ch El (ft)          * 1579.20  * Shear (lb/sq ft)        *    0.68  *    0.79  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    1.77  *    2.26  *          *
* Frctn Loss (ft)         *    3.11  * Cum Volume (acre-ft)    *    3.45  *   35.24  *    1.56  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    1.71  *   23.08  *    0.86  *
*****************************************************************************************

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.

  Profile #1
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
```

```
* 1          * LOB       * 9381.87   * 9944.26   *   579.15 *   361.85 *   456.96 *    62.27 *
0.79 *     1.60 *
* 2          * Chan      * 9944.26   * 10100.66  *   282.52 *   170.67 *   156.40 *    30.38 *
1.09 *     1.66 *
* 3          * ROB       * 10100.66  * 10285.16  *    68.33 *    45.02 *    97.02 *     7.35 *
0.46 *     1.52 *
*************************************************************************************************
******************

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.

  Profile #2
*************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * LOB       * 9381.87   * 9944.26   *    85.19 *    32.87 *    20.35 *     9.16 *
1.77 *     2.59 *
* 2          * Chan      * 9944.26   * 10100.66  *   844.81 *   295.67 *   158.13 *    90.84 *
1.89 *     2.86 *
*************************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1            RS: 0.901

INPUT
Description: Interpolated point added at (10025.1, 1576.383) to set bank
             station.
Station Elevation Data    num=      91
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9001.47  1580.9 9003.65  1580.9 9019.52 1581.25 9050.93 1581.08  9115.4  1580.6
 9123.27 1580.49 9123.81 1580.47 9128.17  1580.4 9147.44    1580    9154 1579.88
 9176.38 1579.43  9192.8 1579.43 9237.09  1578.8    9262 1578.98 9280.42 1579.02
 9313.33 1578.43 9316.73 1578.39 9320.52  1578.4 9324.12 1578.36 9404.19 1578.02
 9414.58 1578.05 9419.77    1578 9434.17  1577.9 9444.69 1577.77 9513.86  1577.9
 9521.52  1577.9 9528.06 1577.86 9598.87 1577.33 9624.01 1577.38 9636.46  1577.3
  9653.6 1577.18 9677.82  1577.1 9720.63 1577.03 9771.03 1576.71 9786.41 1576.65
  9788.7  1576.6 9796.51 1576.61  9857.2 1576.37 9907.59  1576.3 9912.21 1576.32
 9925.58 1576.32 9934.67 1576.34 9981.12  1576.3 9985.01 1576.29    9992 1576.32
 9992.59 1576.33 9995.96 1576.36 9997.69    1576 9997.78    1576    9998 1575.96
 9999.74 1575.5610000.54 1575.2910003.13  1575.910003.52    1576 10003.6 1576.05
10004.84 1576.2310005.03 1576.2710006.91  1576.3 10025.1 1576.3810084.02 1576.65
10121.07 1576.9910138.83 1577.1610155.42  1577.310158.67 1577.34 10160.9  1577.3
10162.05 1577.3510163.53 1577.3510165.63 1577.3710172.02 1577.4210172.71  1577.4
10254.83 1577.7810256.41 1577.7810272.77  1577.810283.45 1577.7710311.79 1577.81
10336.18  1577.910346.86 1577.9910366.31 1578.0910366.45 1578.0910366.56  1578.1
10366.61 1578.0910407.27  1578.510410.09 1578.5210414.64 1578.54 10415.1 1578.55
10425.63 1578.6310458.24  1578.810502.84  1578.710518.81 1578.7310580.96 1578.68
10613.19 1578.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9001.47    .033 9720.63     .0510121.07    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9857.2 10025.1            531.31 516.239  482.52             .1       .3

CROSS SECTION OUTPUT  Profile #1
*************************************************************************************************
```

E.G. Elev (ft)	1577.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.048	0.050	0.049
W.S. Elev (ft)	1577.39	Reach Len. (ft)	531.31	516.24	482.52
Crit W.S. (ft)	1577.10	Flow Area (sq ft)	122.91	182.35	80.99
E.G. Slope (ft/ft)	0.008070	Area (sq ft)	122.91	182.35	80.99
Q Total (cfs)	930.00	Flow (cfs)	244.84	513.87	171.29
Top Width (ft)	576.35	Top Width (ft)	265.85	167.90	142.60
Vel Total (ft/s)	2.41	Avg. Vel. (ft/s)	1.99	2.82	2.11
Max Chl Dpth (ft)	2.10	Hydr. Depth (ft)	0.46	1.09	0.57
Conv. Total (cfs)	10352.6	Conv. (cfs)	2725.5	5720.3	1906.7
Length Wtd. (ft)	513.27	Wetted Per. (ft)	265.85	168.15	142.61
Min Ch El (ft)	1575.29	Shear (lb/sq ft)	0.23	0.55	0.29
Alpha	1.08	Stream Power (lb/ft s)	0.46	1.54	0.61
Frctn Loss (ft)	3.04	Cum Volume (acre-ft)	19.47	21.96	9.51
C & E Loss (ft)	0.01	Cum SA (acres)	30.05	21.27	16.72

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 OUTPUT Profile #2

E.G. Elev (ft)	1578.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.		0.050	
W.S. Elev (ft)	1578.00	Reach Len. (ft)	531.31	516.24	482.52
Crit W.S. (ft)		Flow Area (sq ft)		285.92	
E.G. Slope (ft/ft)	0.006055	Area (sq ft)		285.92	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	167.90	Top Width (ft)		167.90	
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25	
Max Chl Dpth (ft)	2.71	Hydr. Depth (ft)		1.70	
Conv. Total (cfs)	11951.3	Conv. (cfs)		11951.3	
Length Wtd. (ft)	516.24	Wetted Per. (ft)		171.40	
Min Ch El (ft)	1575.29	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		2.05	
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	3.26	31.99	1.56
C & E Loss (ft)	0.00	Cum SA (acres)	1.60	21.27	0.86

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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9429.34	9857.20	244.84	122.91	265.85	26.33	0.46	1.99
2	Chan	9857.20	10025.10	513.87	182.35	168.15	55.26	1.09	2.82
3	ROB	10025.10	10319.14	171.29	80.99	142.61	18.42	0.57	2.11

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.

Profile #2

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	Chan	9857.20	10025.10	930.00	285.92	171.40	100.00	1.70	3.25

```
*****************************************************************************************
******************

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: T4N-R3W-S10N
REACH: Reach-1            RS: 0.803

INPUT
Description: Interpolated point added at (9908.23, 1573.342) to set bank
             station.
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9260.73  1576.6 9269.67 1576.64 9276.06 1576.64 9276.18  1576.7 9279.85 1576.61
 9286.83 1576.54  9326.5    1576 9350.91 1575.76 9359.46 1575.66 9359.68 1575.67
 9361.41 1575.66 9362.95  1575.6 9364.45 1575.64 9463.54 1575.47 9501.36  1575.6
  9584.1 1574.77 9603.56 1574.62 9608.81  1574.6 9682.92  1574.2 9686.53 1574.16
 9697.29 1574.44 9700.68 1574.43 9734.25 1574.06 9740.24    1574 9743.18    1574
 9791.78 1573.62 9807.19  1573.7 9908.23 1573.34 9937.16 1573.24 9939.49  1573.2
  9943.7  1573.2 9953.47  1573.1 9963.06 1573.14 9995.43 1573.08 9996.24  1572.8
 9998.49    1572 9999.33 1571.78 9999.82 1571.6210000.07 1571.5410001.29  1571.9
10001.67    157210002.91 1572.3710005.71 1573.0310005.96 1573.0510017.03  1572.9
10020.47 1573.1610039.39 1572.9810080.21 1573.32 10154.8 1573.6910176.95  1573.8
10201.71 1573.8610220.55 1573.9410227.84    157410234.72    157410245.85  1574.1
10323.45 1574.6210328.25 1574.6610414.08  1575.810414.08 1575.7510431.88 1575.87
10438.09  1575.910447.61  1575.910472.48    1576 10473.7    157610475.75 1576.01
10488.32 1576.04 10522.8  1576.210553.61 1576.2510576.23 1576.2110616.67 1576.26
10617.33  1576.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9260.73    .033 9743.18     .05 10154.8    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9908.2310080.21            485.77  517.23  497.03             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1574.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.049  *   0.050  *   0.043  *
* W.S. Elev (ft)          * 1574.37  * Reach Len. (ft)         *  485.77  *  517.23  *  497.03  *
* Crit W.S. (ft)          * 1573.95  * Flow Area (sq ft)       *  135.83  *  219.61  *  115.13  *
* E.G. Slope (ft/ft)      *0.004528  * Area (sq ft)            *  135.83  *  219.61  *  115.13  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  215.75  *  515.94  *  198.31  *
* Top Width (ft)          *  623.37  * Top Width (ft)          *  245.40  *  171.98  *  205.99  *
* Vel Total (ft/s)        *    1.98  * Avg. Vel. (ft/s)        *    1.59  *    2.35  *    1.72  *
* Max Chl Dpth (ft)       *    2.83  * Hydr. Depth (ft)        *    0.55  *    1.28  *    0.56  *
* Conv. Total (cfs)       * 13821.5  * Conv. (cfs)             *  3206.4  *  7667.8  *  2947.3  *
* Length Wtd. (ft)        *  506.23  * Wetted Per. (ft)        *  245.41  *  172.44  *  205.99  *
* Min Ch El (ft)          * 1571.54  * Shear (lb/sq ft)        *    0.16  *    0.36  *    0.16  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)  *    0.25  *    0.85  *    0.27  *
* Frctn Loss (ft)         *    3.26  * Cum Volume (acre-ft)    *   17.89  *   19.58  *    8.42  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   26.93  *   19.26  *   14.79  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1574.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *          *   0.050  *          *
```

```
* W.S. Elev (ft)         * 1574.73  * Reach Len. (ft)        *  485.77  *  517.23  *  497.03  *
* Crit W.S. (ft)         * 1574.06  * Flow Area (sq ft)      *          *  281.05  *          *
* E.G. Slope (ft/ft)     *0.006604  * Area (sq ft)           *          *  281.05  *          *
* Q Total (cfs)          *  930.00  * Flow (cfs)             *          *  930.00  *          *
* Top Width (ft)         *  171.98  * Top Width (ft)         *          *  171.98  *          *
* Vel Total (ft/s)       *    3.31  * Avg. Vel. (ft/s)       *          *    3.31  *          *
* Max Chl Dpth (ft)      *    3.19  * Hydr. Depth (ft)       *          *    1.63  *          *
* Conv. Total (cfs)      * 11444.3  * Conv. (cfs)            *          * 11444.3  *          *
* Length Wtd. (ft)       *  517.23  * Wetted Per. (ft)       *          *  175.24  *          *
* Min Ch El (ft)         * 1571.54  * Shear (lb/sq ft)       *          *    0.66  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    2.19  *          *
* Frctn Loss (ft)        *    3.25  * Cum Volume (acre-ft)   *    3.26  *   28.63  *    1.56  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *    1.60  *   19.26  *    0.86  *
*****************************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.

  Profile #1
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9584.48   * 9908.23   *   215.75 *   135.83 *   245.41 *    23.20 *
0.55 *     1.59 *
* 2         * Chan      * 9908.23   * 10080.21  *   515.94 *   219.61 *   172.44 *    55.48 *
1.28 *     2.35 *
* 3         * ROB       * 10080.21  * 10348.77  *   198.31 *   115.13 *   205.99 *    21.32 *
0.56 *     1.72 *
*****************************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9908.23   * 10080.21  *   930.00 *   281.05 *   175.24 *   100.00 *
1.63 *     3.31 *
*****************************************************************************************************
******************

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 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: T4N-R3W-S10N
REACH: Reach-1            RS: 0.705

INPUT
Description: Levee added-Ridge not overtopped per BFE calcs
Station Elevation Data    num=     126
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*****************************************************************************
 8673.67  1573.6 8699.12 1573.75  8703.5 1573.87 8704.34 1573.87 8713.08 1573.84
 8720.16  1573.7 8730.17 1573.66 8806.92 1572.79 8816.14  1572.7 8823.18 1572.58
 8835.79 1572.45 8839.19 1572.41 8854.06 1572.34 8861.41  1572.4 8872.77 1572.35
 8928.93 1572.02 8931.52 1572.01 8932.88    1572  8933.5    1572 8957.66 1571.89
 8964.04 1571.87 9016.05 1571.85 9037.25  1571.8 9051.04 1571.71 9085.22 1571.61
 9092.37  1571.6 9149.37 1571.36 9179.43 1571.35 9183.58 1571.47 9219.62    1572
 9220.48 1572.01 9231.21  1572.1  9241.9 1572.13    9253 1572.13 9258.05  1572.1
 9264.26 1572.09 9276.37    1572 9276.67    1572 9333.95 1571.32 9335.09  1571.3
 9339.25 1571.26 9344.75 1571.22 9406.92 1570.98 9418.21  1570.9 9418.54 1570.95
 9495.75 1570.68 9497.38 1570.68 9498.35  1570.7 9499.21 1570.68 9499.75 1570.69
 9499.84 1570.68 9500.04 1570.69 9500.15  1570.7 9516.22 1571.86 9547.71 1571.36
  9605.5 1570.48  9621.5 1570.38 9623.92  1570.4 9681.93 1570.77 9684.83 1570.76
 9691.27 1570.78 9693.79 1570.78  9695.7  1570.8 9715.56 1570.46 9717.87 1570.47
 9726.97 1570.46 9797.63  1570.4 9804.06 1570.35 9831.17 1570.22 9871.17 1570.12
 9873.33 1570.18 9875.62  1570.1 9875.79 1570.13 9875.96 1570.09 9877.14 1569.88
  9879.1 1569.52 9881.79  1569.1 9885.54 1569.61 9886.62 1569.76 9886.71 1569.76
  9887.3 1569.78 9894.76 1569.98 9896.12    1570 9921.79 1570.25 9923.95  1570.3
 9924.08 1570.26 9930.25 1570.26 9946.17 1570.22 9956.01  1570.1 9960.29 1570.11
 9968.39 1570.07 9970.58 1570.07    9973 1570.09 9975.67  1570.1 9987.54 1570.27
 9989.58 1570.29 9993.71 1570.35 9996.22    1570 9998.25 1569.7610001.71 1569.33
10004.88 1569.8410005.88    157010008.58  1570.4 10009.6 1570.6110010.42 1570.62
 10040.5 1570.77 10062.6  1571.110111.65 1571.1210117.18 1571.0910147.06 1570.99
10184.09 1570.8610199.54 1571.04 10216.4  1571.210292.87 1571.8910414.75 1572.97
10437.56 1573.1110439.92 1573.1310441.89 1573.1610443.26  1573.210445.38  1573.2
10459.26  1573.310520.45 1573.5310550.02 1573.3610634.42    157410642.79  1574.1
   10648  1574.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8673.67    .033 9871.17     .0510292.87    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9797.63 10009.6           514.37  607.28  549.44            .1        .3
Left Levee      Station= 9516.22      Elevation= 1571.86

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1571.18  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.033  *   0.044  *   0.050  *
* W.S. Elev (ft)          * 1571.04  * Reach Len. (ft)        *  514.37  *  607.28  *  549.44  *
* Crit W.S. (ft)          * 1570.88  * Flow Area (sq ft)      *  108.45  *  193.16  *   18.66  *
* E.G. Slope (ft/ft)      *0.009876  * Area (sq ft)           *  108.45  *  193.16  *   18.66  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  295.17  *  615.71  *   19.12  *
* Top Width (ft)          *  554.90  * Top Width (ft)          *  228.60  *  211.97  *  114.33  *
* Vel Total (ft/s)        *    2.90  * Avg. Vel. (ft/s)        *    2.72  *    3.19  *    1.02  *
* Max Chl Dpth (ft)       *    1.94  * Hydr. Depth (ft)        *    0.47  *    0.91  *    0.16  *
* Conv. Total (cfs)       *  9358.1  * Conv. (cfs)             *  2970.1  *  6195.5  *   192.4  *
* Length Wtd. (ft)        *  557.99  * Wetted Per. (ft)        *  228.61  *  212.29  *  114.33  *
* Min Ch El (ft)          * 1569.10  * Shear (lb/sq ft)        *    0.29  *    0.56  *    0.10  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)  *    0.80  *    1.79  *    0.10  *
* Frctn Loss (ft)         *    3.03  * Cum Volume (acre-ft)    *   16.53  *   17.13  *    7.66  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   24.29  *   16.98  *   12.96  *
*****************************************************************************************

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

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1571.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          * 1571.48  * Reach Len. (ft)        *  514.37  *  607.28  *  549.44  *
* Crit W.S. (ft)          * 1570.95  * Flow Area (sq ft)      *          *  287.52  *          *
```

```
* E.G. Slope (ft/ft)     *0.005972  * Area (sq ft)           *          *  287.52  *          *
* Q Total (cfs)          *  930.00  * Flow (cfs)             *          *  930.00  *          *
* Top Width (ft)         *  211.97  * Top Width (ft)         *          *  211.97  *          *
* Vel Total (ft/s)       *    3.23  * Avg. Vel. (ft/s)       *          *    3.23  *          *
* Max Chl Dpth (ft)      *    2.38  * Hydr. Depth (ft)       *          *    1.36  *          *
* Conv. Total (cfs)      * 12034.8  * Conv. (cfs)            *          * 12034.8  *          *
* Length Wtd. (ft)       *  587.39  * Wetted Per. (ft)       *          *  214.24  *          *
* Min Ch El (ft)         * 1569.10  * Shear (lb/sq ft)       *          *    0.50  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    1.62  *          *
* Frctn Loss (ft)        *    2.88  * Cum Volume (acre-ft)   *    3.26  *   25.26  *    1.56  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *    1.60  *   16.98  *    0.86  *
*****************************************************************************************************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the
lowest, valid,
         water surface was used.

  Profile #1
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9516.22   * 9797.63   *   295.17 *   108.45 *   228.61 *    31.74 *
0.47 *     2.72 *
* 2        * Chan      * 9797.63   * 10009.60  *   615.71 *   193.16 *   212.29 *    66.21 *
0.91 *     3.19 *
* 3        * ROB       * 10009.60  * 10328.80  *    19.12 *    18.66 *   114.33 *     2.06 *
0.16 *     1.02 *
*****************************************************************************************************
******************

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

  Profile #2
*****************************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * Chan      * 9797.63   * 10009.60  *   930.00 *   287.52 *   214.24 *   100.00 *
1.36 *     3.23 *
*****************************************************************************************************
******************

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 parabolic search method failed to converge on critical depth.  The program will try
the
         cross section slice/secant method to find 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: T4N-R3W-S10N
REACH: Reach-1 RS: 0.590

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8532.55	1571.2	8563.97	1570.99	8570.45	1570.96	8603.28	1570.6	8791.77	1569.45
8794.95	1569.5	8822.09	1569.4	8963.46	1569.09	8973.71	1569.1	8986.9	1569.22
9007.16	1569.21	9046.37	1568.9	9111.7	1568.74	9115.09	1568.6	9135.86	1568.62
9168.42	1568.5	9203.91	1568.5	9225.39	1568.43	9247.91	1568.48	9290.43	1568.78
9316.46	1568.9	9346.35	1568.95	9366.72	1568.88	9380.84	1568.88	9401.88	1568.7
9418.7	1568.7	9428.35	1568.79	9454.1	1568.76	9495.22	1568.21	9510.29	1568.2
9520.76	1568.12	9524.01	1568.03	9524.09	1568.02	9529.8	1568	9546.8	1567.9
9550.32	1567.9	9553.14	1567.89	9554.13	1567.88	9560.78	1567.91	9590.45	1567.67
9624	1567.4	9643.25	1567.19	9647.66	1567.19	9660.32	1567	9680.83	1567.08
9827.81	1567.16	9893.05	1567.03	9902	1567.07	9938.28	1566.9	9956.06	1567.07
9988.84	1567.25	9991.86	1567.3	9996.74	1566.99	9999.85	1566.81	10006.87	1566.94
10014.22	1567.1	10065.97	1567.34	10092.4	1567.16	10097.47	1567.4	10101.05	1567.75
10116.3	1567.88	10132.52	1567.91	10175.03	1567.94	10176.07	1567.95	10181.55	1567.9
10187.02	1567.99	10187.45	1568	10215.57	1568.46	10239.91	1568.6	10277.37	1568.95
10337.41	1569.38	10369.65	1569.8	10371.13	1569.6	10467.9	1570.7	10529.32	1571.2
10560.41	1571.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8532.55	.033	9827.81	.05	10101.05	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9902	10014.22	399.49	542.532	520.57	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1568.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.037	0.050	0.048
W.S. Elev (ft)	1568.07	Reach Len. (ft)	399.49	542.53	520.57
Crit W.S. (ft)	1567.62	Flow Area (sq ft)	296.61	115.40	86.82
E.G. Slope (ft/ft)	0.003421	Area (sq ft)	296.61	115.40	86.82
Q Total (cfs)	930.00	Flow (cfs)	604.03	204.33	121.64
Top Width (ft)	669.38	Top Width (ft)	379.52	112.22	177.65
Vel Total (ft/s)	1.86	Avg. Vel. (ft/s)	2.04	1.77	1.40
Max Chl Dpth (ft)	1.26	Hydr. Depth (ft)	0.78	1.03	0.49
Conv. Total (cfs)	15901.0	Conv. (cfs)	10327.6	3493.6	2079.8
Length Wtd. (ft)	472.28	Wetted Per. (ft)	379.52	112.24	177.67
Min Ch El (ft)	1566.81	Shear (lb/sq ft)	0.17	0.22	0.10
Alpha	1.05	Stream Power (lb/ft s)	0.34	0.39	0.15
Frctn Loss (ft)	2.46	Cum Volume (acre-ft)	14.14	14.98	6.99
C & E Loss (ft)	0.00	Cum SA (acres)	20.69	14.72	11.12

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1568.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.050	0.050	0.050
W.S. Elev (ft)	1568.64	Reach Len. (ft)	399.49	542.53	520.57
Crit W.S. (ft)		Flow Area (sq ft)	115.20	179.37	73.61
E.G. Slope (ft/ft)	0.004092	Area (sq ft)	115.20	179.37	73.61
Q Total (cfs)	930.00	Flow (cfs)	289.81	466.12	174.07
Top Width (ft)	238.16	Top Width (ft)	74.19	112.22	51.75
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	2.52	2.60	2.36
Max Chl Dpth (ft)	1.83	Hydr. Depth (ft)	1.55	1.60	1.42
Conv. Total (cfs)	14538.2	Conv. (cfs)	4530.4	7286.6	2721.2
Length Wtd. (ft)	518.19	Wetted Per. (ft)	75.67	112.24	53.05
Min Ch El (ft)	1566.81	Shear (lb/sq ft)	0.39	0.41	0.35

```
* Alpha                    *    1.00  * Stream Power (lb/ft s) *    0.98  *    1.06  *    0.84  *
* Frctn Loss (ft)          *    2.72  * Cum Volume (acre-ft)   *    2.58  *   22.00  *    1.09  *
* C & E Loss (ft)          *    0.00  * Cum SA (acres)         *    1.17  *   14.72  *    0.54  *
*****************************************************************************************************
```

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.

Profile #1

```
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9217.28   * 9902.00   *   604.03 *   296.61 *   379.52 *    64.95 *
0.78 *     2.04 *
* 2         * Chan      * 9902.00   * 10014.22  *   204.33 *   115.40 *   112.24 *    21.97 *
1.03 *     1.77 *
* 3         * ROB       * 10014.22  * 10287.31  *   121.64 *    86.82 *   177.67 *    13.08 *
0.49 *     1.40 *
*****************************************************************************************************
******************
```

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.

Profile #2

```
*****************************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9217.28   * 9902.00   *   289.81 *   115.20 *    75.67 *    31.16 *
1.55 *     2.52 *
* 2         * Chan      * 9902.00   * 10014.22  *   466.12 *   179.37 *   112.24 *    50.12 *
1.60 *     2.60 *
* 3         * ROB       * 10014.22  * 10287.31  *   174.07 *    73.61 *    53.05 *    18.72 *
1.42 *     2.36 *
*****************************************************************************************************
******************
```

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: T4N-R3W-S10N
REACH: Reach-1 RS: 0.488

INPUT
Description: Interpolated point added at (10221.05, 1565.143) to set bank station.
Station Elevation Data num= 69

```
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*******************************************************************************
 8847.41  1567.4 8858.31 1567.36 8906.46 1566.78 8966.04 1566.52  8993.7 1566.48
 9006.61  1566.4  9026.7 1566.24 9077.24 1566.19 9096.51 1566.25 9135.85 1566.19
 9149.52  1566.1 9202.26 1566.06 9206.21 1566.09 9219.14 1566.03 9226.15 1566.08
 9238.18  1566.1 9245.35 1566.06 9288.57 1566.12 9299.93  1566.2 9308.47 1566.22
 9354.56  1566.5 9380.32  1566.6 9410.63 1566.55 9458.62 1566.28 9462.97 1566.25
 9463.35 1566.25 9463.91  1566.3 9465.13 1566.25 9477.57 1566.26 9582.75 1565.68
 9583.67 1565.68 9585.52  1565.7 9587.14 1565.66 9588.74 1565.66 9597.99 1565.61
 9637.65  1565.4 9666.08  1565.3  9683.3 1565.16 9699.14 1565.14 9743.28 1565.18
 9772.36 1565.11  9790.7    1565 9805.66 1565.01 9822.11 1565.06 9882.29 1564.93
 9893.19 1564.88 9894.52 1564.92  9917.1 1565.09  9926.8 1565.12 9969.71  1565.1
 9975.25 1565.07 9989.13 1564.8610000.13 1564.4310006.63  1564.910008.38 1565.08
```

```
10071.12  1564.510166.63 1564.4910174.78 1564.4910177.17  1564.510182.31 1564.55
10221.05 1565.1410237.23 1565.3910246.52 1565.3910268.91  1565.610320.92 1566.17
10323.33  1566.2 10392.2 1567.2210405.15 1566.6210418.33  1566.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8847.41    .033 9772.36     .0510166.63    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.7110221.05            567.7 545.941  539.58            .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)          * 1565.66  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.044  *   0.046  *   0.033  *
* W.S. Elev (ft)          * 1565.56  * Reach Len. (ft)         *  567.70  *  545.94  *  539.58  *
* Crit W.S. (ft)          * 1565.37  * Flow Area (sq ft)       *  155.13  *  222.34  *    7.94  *
* E.G. Slope (ft/ft)      *0.008878  * Area (sq ft)            *  155.13  *  222.34  *    7.94  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *  289.17  *  630.03  *   10.80  *
* Top Width (ft)          *  657.52  * Top Width (ft)          *  362.47  *  251.34  *   43.71  *
* Vel Total (ft/s)        *    2.41  * Avg. Vel. (ft/s)        *    1.86  *    2.83  *    1.36  *
* Max Chl Dpth (ft)       *    1.13  * Hydr. Depth (ft)        *    0.43  *    0.88  *    0.18  *
* Conv. Total (cfs)       *  9870.1  * Conv. (cfs)             *  3069.0  *  6686.5  *   114.6  *
* Length Wtd. (ft)        *  553.49  * Wetted Per. (ft)        *  362.48  *  251.38  *   43.71  *
* Min Ch El (ft)          * 1564.43  * Shear (lb/sq ft)        *    0.24  *    0.49  *    0.10  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)   *    0.44  *    1.39  *    0.14  *
* Frctn Loss (ft)         *    2.86  * Cum Volume (acre-ft)     *   12.07  *   12.88  *    6.43  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *   17.29  *   12.46  *    9.80  *
*****************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)          * 1566.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *          *   0.045  *          *
* W.S. Elev (ft)          * 1565.88  * Reach Len. (ft)         *  567.70  *  545.94  *  539.58  *
* Crit W.S. (ft)          * 1565.42  * Flow Area (sq ft)       *          *  302.33  *          *
* E.G. Slope (ft/ft)      *0.006965  * Area (sq ft)            *          *  302.33  *          *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *          *  930.00  *          *
* Top Width (ft)          *  251.34  * Top Width (ft)          *          *  251.34  *          *
* Vel Total (ft/s)        *    3.08  * Avg. Vel. (ft/s)        *          *    3.08  *          *
* Max Chl Dpth (ft)       *    1.45  * Hydr. Depth (ft)        *          *    1.20  *          *
* Conv. Total (cfs)       * 11143.6  * Conv. (cfs)             *          * 11143.6  *          *
* Length Wtd. (ft)        *  545.94  * Wetted Per. (ft)        *          *  252.90  *          *
* Min Ch El (ft)          * 1564.43  * Shear (lb/sq ft)        *          *    0.52  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    1.60  *          *
* Frctn Loss (ft)         *    2.32  * Cum Volume (acre-ft)     *    2.05  *   19.00  *    0.65  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.83  *   12.46  *    0.23  *
*****************************************************************************************

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.
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.

  Profile #1
*****************************************************************************************
******************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1        * LOB       * 9408.56   * 9969.71   *   289.17 *   155.13 *   362.48 *    31.09 *
0.43 *     1.86 *
* 2        * Chan      * 9969.71   * 10221.05  *   630.03 *   222.34 *   251.38 *    67.74 *
0.88 *     2.83 *
```

```
* 3          * ROB       * 10221.05  * 10319.69  *    10.80 *     7.94 *    43.71 *     1.16 *
0.18 *     1.36 *
*****************************************************************************************
******************

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.

  Profile #2
*****************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9969.71   * 10221.05  *   930.00 *   302.33 *   252.90 *   100.00 *
1.20 *     3.08 *
*****************************************************************************************
******************

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.

CROSS SECTION


RIVER: T4N-R3W-S10N
REACH: Reach-1            RS: 0.384

INPUT
Description:
Station Elevation Data    num=     105
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
    8921  1564.3 8943.33 1563.98 8944.91 1563.98 8956.97 1563.87 8994.35  1563.8
 9029.34 1563.37 9042.67 1563.37 9118.93  1563.5 9160.49  1563.5 9265.25 1563.05
 9292.63    1563 9353.15 1563.29 9361.79 1563.28 9368.11 1563.32  9371.2 1563.32
  9385.6  1563.3 9423.69 1562.81 9428.12 1562.81 9462.15 1562.85 9535.27 1562.43
 9560.87 1562.11 9603.23 1561.97 9605.44 1561.99 9660.65  1561.9 9680.67 1561.94
 9689.03 1561.97 9793.85 1562.04 9828.77 1562.11 9866.39 1562.11 9884.99  1562.2
 9888.16 1562.19 9889.73  1562.2 9890.43  1562.2 9893.88 1562.25 9894.04  1562.2
 9896.32 1562.22 9896.84 1562.22 9898.02 1562.21 9899.67  1562.2 9906.01 1562.18
 9910.43 1562.18 9941.56    1562 9958.43 1561.73 9985.26  1561.6 9990.18 1561.56
 9990.58 1561.54 9990.71  1561.5 9995.65    1560 9998.57 1559.23 9999.14 1559.04
10002.78 1559.8110003.75    156010006.46 1560.5710013.08    156210014.25 1562.25
10014.57 1562.2810016.97  1562.210023.21 1562.0110024.46 1561.9610027.88 1561.94
 10034.2 1561.7710041.68  1561.910045.59 1561.9610056.23 1561.1810058.46 1561.01
10059.09 1561.0210059.61  1561.1 10061.8 1561.6310075.88 1561.6410086.27 1561.69
10093.77 1560.7610098.37  1560.110106.32 1561.9610111.47  1561.810112.87 1561.96
10118.08 1561.9910121.92 1561.9910123.15    156210125.63 1561.9910125.99    1562
10132.29    156210138.16 1561.8910146.94  1561.810171.43 1561.9810181.57 1561.99
10185.06 1561.9410185.66    156210187.25 1561.98 10187.9    156210195.19 1562.11
10206.03 1562.3810215.91 1562.6310237.45  1563.310244.66 1563.6210261.04 1563.88
10268.93 1563.9910269.86    156410273.07    1564 10274.8 1564.0410343.04 1564.79
10356.13 1564.6210360.77  1564.610365.63 1564.6110370.79 1564.5910375.69 1564.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    8921    .033 9535.27     .0510215.91    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.5610112.87           272.08 553.653  511.93             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1562.79  * Element                *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.04	Wt. n-Val.	0.050	0.050	0.050
W.S. Elev (ft)	1562.75	Reach Len. (ft)	272.08	553.65	511.93
Crit W.S. (ft)		Flow Area (sq ft)	291.27	217.72	74.16
E.G. Slope (ft/ft)	0.003368	Area (sq ft)	291.27	217.72	74.16
Q Total (cfs)	930.00	Flow (cfs)	389.06	438.65	102.30
Top Width (ft)	739.86	Top Width (ft)	461.70	171.31	106.84
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	1.34	2.01	1.38
Max Chl Dpth (ft)	3.71	Hydr. Depth (ft)	0.63	1.27	0.69
Conv. Total (cfs)	16024.2	Conv. (cfs)	6703.6	7558.0	1762.6
Length Wtd. (ft)	445.19	Wetted Per. (ft)	461.72	172.46	106.86
Min Ch El (ft)	1559.04	Shear (lb/sq ft)	0.13	0.27	0.15
Alpha	1.13	Stream Power (lb/ft s)	0.18	0.53	0.20
Frctn Loss (ft)	2.99	Cum Volume (acre-ft)	9.16	10.12	5.92
C & E Loss (ft)	0.01	Cum SA (acres)	11.92	9.81	8.86

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1563.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.050	
W.S. Elev (ft)	1563.59	Reach Len. (ft)	272.08	553.65	511.93
Crit W.S. (ft)		Flow Area (sq ft)		361.26	
E.G. Slope (ft/ft)	0.002869	Area (sq ft)		361.26	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	171.31	Top Width (ft)		171.31	
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)		2.57	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		2.11	
Conv. Total (cfs)	17361.9	Conv. (cfs)		17361.9	
Length Wtd. (ft)	553.65	Wetted Per. (ft)		175.67	
Min Ch El (ft)	1559.04	Shear (lb/sq ft)		0.37	
Alpha	1.00	Stream Power (lb/ft s)		0.95	
Frctn Loss (ft)	3.26	Cum Volume (acre-ft)	2.05	14.84	0.65
C & E Loss (ft)	0.02	Cum SA (acres)	0.83	9.81	0.23

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.
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.

Profile #1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1	LOB	9431.28	9941.56	389.06	291.27	461.72	41.83	0.63	1.34
2	Chan	9941.56	10112.87	438.65	217.72	172.46	47.17	1.27	2.01
3	ROB	10112.87	10244.28	102.30	74.16	106.86	11.00	0.69	1.38

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.

Profile #2

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1          * Chan      * 9941.56   * 10112.87  *   930.00 *   361.26 *   175.67 *   100.00 *
2.11 *     2.57 *
*****************************************************************************************
******************
```

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.

CROSS SECTION

RIVER: T4N-R3W-S10N
REACH: Reach-1 RS: 0.279

INPUT
Description: Interpolated point added at (9774.04, 1559.3) to set bank station.
Station Elevation Data num= 74

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9089.1    1562 9090.41    1562  9092.5 1561.99 9094.96 1561.99 9112.15 1561.92
 9169.32  1561.7 9172.24 1561.68 9174.29 1561.67 9178.19 1561.66 9184.69 1561.61
 9265.95  1560.9 9290.32 1560.92 9306.23 1561.01 9347.47 1560.54 9363.95 1560.37
 9390.13  1560.6 9392.14 1560.57  9443.7 1560.37  9514.3 1560.22 9577.61 1560.04
 9581.94    1560 9584.15 1560.01 9590.46    1560 9592.18    1560  9657.5 1559.84
 9665.88  1559.8 9680.87 1559.78 9737.44 1559.51 9763.47  1559.4 9774.04  1559.3
 9811.05 1558.95 9825.13  1558.8 9860.85 1558.82 9869.18  1558.9 9891.61 1559.13
 9984.85 1558.83 9994.61  1558.8 9995.71  1558.6 9998.32    1558 9998.75 1557.89
10000.21  1557.610001.23  1557.910001.48    155810003.16 1558.6510003.87 1559.07
10026.43 1558.9810049.76  1558.910071.11 1559.1110086.35 1559.1210133.03 1559.18
10155.01 1559.22 10174.6  1559.310244.76 1559.2410253.39 1559.3310267.29 1559.35
10338.46 1559.8710347.26  1559.9   10357    156010380.62 1560.2310386.34 1560.29
10386.74 1560.2910387.44  1560.310387.81  1560.310390.68 1560.34 10392.6 1560.36
10442.63 1560.8710466.91    156110486.97 1561.3410525.45 1561.5410540.31 1561.61
 10554.9 1561.7210581.29    156210583.02 1562.0110603.29 1562.12
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9089.1    .033 9774.04     .05 10174.6    .033
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9891.6110071.11           539.49 505.967  415.07             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1559.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.049  *   0.050  *   0.042  *
* W.S. Elev (ft)         * 1559.65  * Reach Len. (ft)         *  539.49  *  505.97  *  415.07  *
* Crit W.S. (ft)         * 1559.55  * Flow Area (sq ft)       *   90.65  *  127.48  *   88.24  *
* E.G. Slope (ft/ft)     *0.019424  * Area (sq ft)            *   90.65  *  127.48  *   88.24  *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *  277.81  *  419.65  *  232.54  *
* Top Width (ft)         *  598.68  * Top Width (ft)          *  182.56  *  179.50  *  236.63  *
* Vel Total (ft/s)       *    3.04  * Avg. Vel. (ft/s)        *    3.06  *    3.29  *    2.64  *
* Max Chl Dpth (ft)      *    2.05  * Hydr. Depth (ft)        *    0.50  *    0.71  *    0.37  *
* Conv. Total (cfs)      *  6672.9  * Conv. (cfs)             *  1993.3  *  3011.1  *  1668.5  *
* Length Wtd. (ft)       *  502.64  * Wetted Per. (ft)        *  182.56  *  179.93  *  236.63  *
* Min Ch El (ft)         * 1557.60  * Shear (lb/sq ft)        *    0.60  *    0.86  *    0.45  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    1.85  *    2.83  *    1.19  *
* Frctn Loss (ft)        *    2.73  * Cum Volume (acre-ft)    *    7.96  *    7.93  *    4.96  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *    9.91  *    7.58  *    6.85  *
*****************************************************************************************
```

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1560.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.050	
W.S. Elev (ft)	1560.11	Reach Len. (ft)	539.49	505.97	415.07
Crit W.S. (ft)	1559.87	Flow Area (sq ft)		209.96	
E.G. Slope (ft/ft)	0.018347	Area (sq ft)		209.96	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	179.50	Top Width (ft)		179.50	
Vel Total (ft/s)	4.43	Avg. Vel. (ft/s)		4.43	
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)		1.17	
Conv. Total (cfs)	6865.9	Conv. (cfs)		6865.9	
Length Wtd. (ft)	505.97	Wetted Per. (ft)		181.90	
Min Ch El (ft)	1557.60	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)		5.86	
Frctn Loss (ft)	2.60	Cum Volume (acre-ft)	2.05	11.21	0.65
C & E Loss (ft)	0.07	Cum SA (acres)	0.83	7.58	0.23

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.
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 parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

Profile #1

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 LOB	9490.36	9891.61	277.81	90.65	182.56	29.87	0.50	3.06
2 Chan	9891.61	10071.11	419.65	127.48	179.93	45.12	0.71	3.29
3 ROB	10071.11	10337.20	232.54	88.24	236.63	25.00	0.37	2.64

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.
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.

Profile #2

Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
1 Chan	9891.61	10071.11	930.00	209.96	181.90	100.00	1.17	4.43

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: 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: T4N-R3W-S10N
REACH: Reach-1 RS: 0.184

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9209.79	1557.9	9230	1557.81	9279.71	1557.39	9292.79	1557.36	9324.42	1557.43
9374.24	1556.9	9394.04	1556.88	9440.97	1556.74	9450.83	1556.76	9539.88	1556.3
9546.46	1556.26	9549.31	1556.26	9551.29	1556.25	9599.91	1556.22	9640.78	1556.2
9651.24	1556.25	9701.2	1556.35	9729.64	1556.34	9738.06	1556.2	9747	1556
9747.31	1556	9765.24	1555.76	9775.5	1555.9	9779.68	1555.98	9780.59	1556
9784.46	1556.07	9791.51	1556.21	9793.33	1556.2	9794.12	1556.26	9841.08	1556.26
9845.05	1556.27	9846.83	1556.2	9851.38	1556.22	9877.29	1556.06	9884.46	1556.04
9886.06	1556.02	9887.08	1556	9887.79	1556.02	9891.03	1555.36	9892.03	1555.23
9893.62	1555.4	9898.14	1556	9899.81	1556.13	9911.92	1556	9918.88	1556.01
9919.75	1556.01	9969.92	1556.11	9973.13	1556.09	9979.12	1556.1	9989.37	1556.06
9993.59	1556.06	9996.38	1556.09	9997.12	1556.1	9997.84	1556	9998.14	1555.98
10000.62	1555.89	10001.35	1555.93	10002.2	1556	10003.59	1556.07	10004.25	1556.12
10005	1556.11	10080.95	1556.07	10084.84	1556.09	10105.81	1556.08	10108.59	1556.1
10114.28	1556.11	10127.88	1556.15	10136.38	1556.16	10136.55	1556.14	10139.46	1556.16
10140.49	1556.17	10171.96	1556.21	10211.56	1556.52	10281.92	1556.91	10329.29	1557.58
10391.08	1558	10427.38	1558.38	10430.3	1558.4	10431.21	1558.42	10434.01	1558.46
10436.79	1558.47	10461.5	1558.64	10509.98	1558.8	10588.12	1559.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9209.79	.033	9747	.051	10140.49	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9845.05	10139.46	415.2	587.698	576.86	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1557.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.038	0.050	0.033
W.S. Elev (ft)	1557.00	Reach Len. (ft)	415.20	587.70	576.86
Crit W.S. (ft)		Flow Area (sq ft)	298.14	274.92	72.23
E.G. Slope (ft/ft)	0.002504	Area (sq ft)	298.14	274.92	72.23
Q Total (cfs)	930.00	Flow (cfs)	439.51	390.45	100.04
Top Width (ft)	923.88	Top Width (ft)	480.46	294.41	149.01
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	1.47	1.42	1.38
Max Chl Dpth (ft)	1.77	Hydr. Depth (ft)	0.62	0.93	0.48
Conv. Total (cfs)	18585.6	Conv. (cfs)	8783.5	7803.0	1999.2
Length Wtd. (ft)	538.66	Wetted Per. (ft)	480.47	294.56	149.01
Min Ch El (ft)	1555.23	Shear (lb/sq ft)	0.10	0.15	0.08
Alpha	1.00	Stream Power (lb/ft s)	0.14	0.21	0.10
Frctn Loss (ft)	3.31	Cum Volume (acre-ft)	5.56	5.59	4.20
C & E Loss (ft)	0.02	Cum SA (acres)	5.80	4.83	5.01

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.

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1557.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.050	
W.S. Elev (ft)	1557.67	Reach Len. (ft)	415.20	587.70	576.86
Crit W.S. (ft)		Flow Area (sq ft)		471.65	
E.G. Slope (ft/ft)	0.002381	Area (sq ft)		471.65	
Q Total (cfs)	930.00	Flow (cfs)		930.00	
Top Width (ft)	294.41	Top Width (ft)		294.41	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)		1.97	
Max Chl Dpth (ft)	2.44	Hydr. Depth (ft)		1.60	
Conv. Total (cfs)	19058.8	Conv. (cfs)		19058.8	
Length Wtd. (ft)	587.70	Wetted Per. (ft)		297.47	

```
* Min Ch El (ft)          * 1555.23  * Shear (lb/sq ft)        *          *    0.24  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.46  *          *
* Frctn Loss (ft)         *    3.62  * Cum Volume (acre-ft)   *    2.05  *    7.26  *    0.65  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)         *    0.83  *    4.83  *    0.23  *
*********************************************************************************************

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.
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.

  Profile #1
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9209.79   * 9527.42   *    44.94 *    48.00 *   162.83 *     4.83 *
0.29 *     0.94 *
* 2         * LOB       * 9527.42   * 9845.05   *   394.58 *   250.15 *   317.64 *    42.43 *
0.79 *     1.58 *
* 3         * Chan      * 9845.05   * 10139.46  *   390.45 *   274.92 *   294.56 *    41.98 *
0.93 *     1.42 *
* 4         * ROB       * 10139.46  * 10363.79  *   100.04 *    72.23 *   149.01 *    10.76 *
0.48 *     1.38 *
*********************************************************************************************
******************

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.

  Profile #2
*********************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9845.05   * 10139.46  *   930.00 *   471.65 *   297.47 *   100.00 *
1.60 *     1.97 *
*********************************************************************************************
******************

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.
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: T4N-R3W-S10N
REACH: Reach-1            RS: 0.072

INPUT
Description: Interpolated point added at (9821.59, 1552.906) to set bank
             station.
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9223.28  1554.5 9229.33 1554.41 9255.82 1554.37 9270.01 1554.28 9272.13 1554.27
 9275.63  1554.3  9313.9 1554.04 9320.23 1554.01 9321.01    1554 9322.72    1554
 9371.97 1553.86 9374.14 1553.87 9375.06 1553.87 9375.96  1553.9 9376.41 1553.87
 9395.89 1553.81 9398.11 1553.81 9399.41 1553.81 9445.78 1553.73 9457.36  1553.7
 9470.16  1553.7 9503.03 1553.65 9518.64 1553.68 9528.54 1553.68 9601.64 1553.51
 9626.92 1553.59 9639.32 1553.59 9717.09 1553.34 9719.26  1553.3 9719.96 1553.33
 9796.65 1553.24 9821.59 1552.91    9831 1552.78 9833.42  1552.8 9835.63 1552.75
 9836.21 1552.74 9860.36 1552.82 9872.24 1552.77 9876.04  1552.8 9916.64 1552.89
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 9933.49 1552.74 9937.97 1552.74 9944.05  1552.3 9947.26 1552.08 9949.34 1552.23
 9954.47 1552.68 9981.99 1552.81 9993.83  1552.9 9997.19  1552.5 9997.97 1552.44
10001.32 1552.0510004.64  1552.510005.19 1552.5810007.57 1552.8910018.08 1552.87
10064.43    155310121.61 1552.9710126.17    155310171.29 1553.1710186.32 1553.22
10187.41 1553.2210188.16  1553.210248.14 1553.6510295.76    155410296.26    1554
10344.97  1554.410354.68 1554.5910404.26  1555.310407.18 1555.3110454.43 1555.24
10457.12 1555.2910490.83 1555.8210491.57 1555.8310492.18  1555.810494.88 1555.84
 10513.4 1555.7710519.02  1555.910522.49    155610522.63 1555.9510525.33 1555.97
10526.07 1555.9910529.26 1555.9710530.86    155610534.98 1555.9310536.36 1555.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9223.28    .033 9796.65     .0510186.32    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9821.5910018.08           297.44 381.419   358.1             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
* E.G. Elev (ft)         * 1553.71  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.24  * Wt. n-Val.              *   0.040  *   0.050  *   0.049  *
* W.S. Elev (ft)         * 1553.47  * Reach Len. (ft)         *  297.44  *  381.42  *  358.10  *
* Crit W.S. (ft)         * 1553.47  * Flow Area (sq ft)       *   27.10  *  141.40  *   81.57  *
* E.G. Slope (ft/ft)     *0.032671  * Area (sq ft)            *   27.10  *  141.40  *   81.57  *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *   67.01  *  609.64  *  253.35  *
* Top Width (ft)         *  547.50  * Top Width (ft)          *  144.94  *  196.49  *  206.06  *
* Vel Total (ft/s)       *    3.72  * Avg. Vel. (ft/s)        *    2.47  *    4.31  *    3.11  *
* Max Chl Dpth (ft)      *    1.42  * Hydr. Depth (ft)        *    0.19  *    0.72  *    0.40  *
* Conv. Total (cfs)      *  5145.2  * Conv. (cfs)             *   370.7  *  3372.8  *  1401.6  *
* Length Wtd. (ft)       *  352.79  * Wetted Per. (ft)        *  144.94  *  196.65  *  206.07  *
* Min Ch El (ft)         * 1552.05  * Shear (lb/sq ft)        *    0.38  *    1.47  *    0.81  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)  *    0.94  *    6.32  *    2.51  *
* Frctn Loss (ft)        *    0.07  * Cum Volume (acre-ft)    *    4.01  *    2.78  *    3.18  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)          *    2.82  *    1.51  *    2.66  *
*****************************************************************************************

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 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.

CROSS SECTION OUTPUT  Profile #2
*****************************************************************************************
* E.G. Elev (ft)         * 1554.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.45  * Wt. n-Val.              *          *   0.050  *          *
* W.S. Elev (ft)         * 1553.63  * Reach Len. (ft)         *  297.44  *  381.42  *  358.10  *
* Crit W.S. (ft)         * 1553.63  * Flow Area (sq ft)       *          *  171.89  *          *
* E.G. Slope (ft/ft)     *0.040055  * Area (sq ft)            *          *  171.89  *          *
* Q Total (cfs)          *  930.00  * Flow (cfs)              *          *  930.00  *          *
* Top Width (ft)         *  196.49  * Top Width (ft)          *          *  196.49  *          *
* Vel Total (ft/s)       *    5.41  * Avg. Vel. (ft/s)        *          *    5.41  *          *
* Max Chl Dpth (ft)      *    1.58  * Hydr. Depth (ft)        *          *    0.87  *          *
* Conv. Total (cfs)      *  4646.8  * Conv. (cfs)             *          *  4646.8  *          *
* Length Wtd. (ft)       *  361.54  * Wetted Per. (ft)        *          *  198.12  *          *
* Min Ch El (ft)         * 1552.05  * Shear (lb/sq ft)        *          *    2.17  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   11.74  *          *
* Frctn Loss (ft)        *    0.20  * Cum Volume (acre-ft)    *    2.05  *    2.91  *    0.65  *
* C & E Loss (ft)        *    0.13  * Cum SA (acres)          *    0.83  *    1.51  *    0.23  *
*****************************************************************************************

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 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.

  Profile #1
*******************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * LOB       * 9522.44   * 9821.59   *    67.01 *    27.10 *   144.94 *     7.21 *
0.19 *     2.47 *
* 2         * Chan      * 9821.59   * 10018.08  *   609.64 *   141.40 *   196.65 *    65.55 *
0.72 *     4.31 *
* 3         * ROB       * 10018.08  * 10277.22  *   253.35 *    81.57 *   206.07 *    27.24 *
0.40 *     3.11 *
*******************************************************************************************
******************

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 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.

  Profile #2
*******************************************************************************************
******************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *  Percent *
Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *     Conv
*Depth(ft) *   (ft/s) *
* 1         * Chan      * 9821.59   * 10018.08  *   930.00 *   171.89 *   198.12 *   100.00 *
0.87 *     5.41 *
*******************************************************************************************
******************

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 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.

CROSS SECTION


RIVER: T4N-R3W-S10N
REACH: Reach-1            RS: 0.000
```

INPUT
Description:
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9003.48	1554.2	9030.18	1554.16	9048.84	1554.13	9060.57	1554.1	9063.93	1554.09
9091.52	1554	9092.25	1554	9099.52	1553.97	9107.44	1553.96	9112.33	1553.95
9112.58	1553.9	9113.45	1553.94	9113.92	1553.94	9128.16	1553.82	9135.22	1553.82
9173.72	1553.8	9186.41	1553.87	9188.92	1553.89	9190.39	1553.87	9192.74	1553.86
9214.25	1553.7	9216.75	1553.71	9218.52	1553.69	9224.99	1553.57	9230.33	1553.62
9231.62	1553.6	9241.87	1553.56	9304.46	1553.02	9314.45	1552.93	9318.16	1552.9
9392.12	1552.5	9417.41	1552.4	9423.61	1552.36	9431.24	1552.33	9508.01	1552.02
9511.88	1552	9512.26	1552	9512.67	1552	9533.37	1551.91	9535.73	1551.9
9561.79	1551.71	9637.94	1551.6	9650.33	1551.69	9658.14	1551.61	9680.38	1551.51
9734.32	1551.19	9761.97	1551.1	9768.93	1551.01	9805.96	1551.16	9822.99	1550.92
9840.61	1550.94	9846.21	1551	9853	1550.92	9915.26	1550.6	9920.16	1550.66
9933.26	1550.62	9939.36	1550.5	9940.24	1550.45	9940.96	1550.44	9944.75	1550.06
9945.28	1550	9949.28	1549.7	9952.8	1549.26	9955.22	1549.78	9956.33	1550
9957.15	1550.17	9957.23	1550.2	9959.63	1550.19	9978.03	1550.35	9982.06	1550.33
9993.53	1550.39	9994.3	1550.2	9994.98	1550	10001.11	1548.61	10001.66	1548.48
10004.52	1549.43	10006.12	1550	10006.2	1550.01	10006.72	1550.19	10015.65	1550.21
10017.5	1550.22	10019.08	1550.2	10019.48	1550.19	10024.86	1550.13	10025.8	1550.13
10035.98	1550.21	10082.63	1550.51	10090.44	1550.51	10097.34	1550.54	10116.08	1550.63
10136.49	1550.73	10151.31	1550.79	10153.03	1550.81	10168.38	1550.94	10227.37	1551.41
10239.69	1551.54	10280.44	1551.89	10281.55	1551.91	10284.14	1551.95	10286.81	1551.98
10287.37	1551.98	10289.39	1551.99	10309.16	1552	10311.14	1551.98	10312.01	1551.99
10323.53	1551.99	10332.62	1552	10333.75	1552	10339.85	1551.97	10340.57	1552
10342.26	1552	10379.5	1552.56	10385.64	1552.61	10389.94	1552.71	10395.01	1552.75
10401.03	1552.83	10457.3	1552.75	10463.74	1552.81	10466.91	1552.77	10486	1553.03
10514.48	1553.36	10534.1	1553.63	10543.9	1553.71	10549.39	1553.72	10586.64	1553.72
10598.84	1553.73	10599.31	1553.73	10599.89	1553.7	10600.3	1553.73	10600.36	1553.74
10600.9	1553.73	10601.36	1553.72	10613.22	1553.71	10619.92	1553.68	10626.85	1553.67
10637.16	1553.81	10646.22	1553.81	10658.66	1553.91	10662.19	1553.86		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9003.48	.033	9535.73	.05	10286.81	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.26	10082.63	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #1

E.G. Elev (ft)	1553.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.047	0.050	0.046
W.S. Elev (ft)	1553.48	Reach Len. (ft)			
Crit W.S. (ft)	1551.15	Flow Area (sq ft)	1146.48	493.67	691.99
E.G. Slope (ft/ft)	0.000058	Area (sq ft)	1146.48	493.67	691.99
Q Total (cfs)	930.00	Flow (cfs)	424.71	246.25	259.04
Top Width (ft)	1272.05	Top Width (ft)	682.11	149.37	440.57
Vel Total (ft/s)	0.40	Avg. Vel. (ft/s)	0.37	0.50	0.37
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	1.68	3.31	1.57
Conv. Total (cfs)	122571.6	Conv. (cfs)	55976.0	32455.1	34140.5
Length Wtd. (ft)		Wetted Per. (ft)	682.12	150.04	440.59
Min Ch El (ft)	1548.48	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.05	Stream Power (lb/ft s)	0.00	0.01	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #2

E.G. Elev (ft)	1553.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.050	0.050	0.050
W.S. Elev (ft)	1553.48	Reach Len. (ft)			
Crit W.S. (ft)	1551.15	Flow Area (sq ft)	601.68	493.67	158.49
E.G. Slope (ft/ft)	0.000157	Area (sq ft)	601.68	493.67	158.49
Q Total (cfs)	930.00	Flow (cfs)	408.33	406.26	115.41
Top Width (ft)	446.63	Top Width (ft)	242.14	149.37	55.12
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)	0.68	0.82	0.73

* Max Chl Dpth (ft)	*	5.00	* Hydr. Depth (ft)	*	2.48	*	3.31	*	2.88	*
* Conv. Total (cfs)	*	74296.0	* Conv. (cfs)	*	32621.0	*	32455.1	*	9219.9	*
* Length Wtd. (ft)	*		* Wetted Per. (ft)	*	244.18	*	150.04	*	57.87	*
* Min Ch El (ft)	*	1548.48	* Shear (lb/sq ft)	*	0.02	*	0.03	*	0.03	*
* Alpha	*	1.02	* Stream Power (lb/ft s)	*	0.02	*	0.03	*	0.02	*
* Frctn Loss (ft)	*		* Cum Volume (acre-ft)	*		*		*		*
* C & E Loss (ft)	*		* Cum SA (acres)	*		*		*		*

Profile #1

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9003.48	9468.37	46.01	164.10	217.22	4.95	0.76	0.28
* 2	LOB	9468.37	9933.26	378.70	982.38	464.90	40.72	2.11	0.39
* 3	Chan	9933.26	10082.63	246.25	493.67	150.04	26.48	3.31	0.50
* 4	ROB	10082.63	10372.41	238.11	602.73	289.79	25.60	2.08	0.40
* 5	ROB	10372.41	10662.19	20.93	89.26	150.80	2.25	0.59	0.23

Profile #2

*	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)
* 1	LOB	9468.37	9933.26	408.33	601.68	244.18	43.91	2.48	0.68
* 2	Chan	9933.26	10082.63	406.26	493.67	150.04	43.68	3.31	0.82
* 3	ROB	10082.63	10372.41	115.41	158.49	57.87	12.41	2.88	0.73

SUMMARY OF MANNING'S N VALUES

River:T4N-R3W-S10N

Reach	River Sta.	n1	n2	n3
*Reach-1	1.492	.033	.05	.05
*Reach-1	1.395	.033	.05	.05
*Reach-1	1.292	.035	.065	.033
*Reach-1	1.184	.035	.065	.033
*Reach-1	1.093	.035	.065	.033
*Reach-1	0.993	.035	.065	.033
*Reach-1	0.901	.033	.05	.033
*Reach-1	0.803	.033	.05	.033
*Reach-1	0.705	.033	.05	.033
*Reach-1	0.590	.033	.05	.033
*Reach-1	0.488	.033	.05	.033
*Reach-1	0.384	.033	.05	.033
*Reach-1	0.279	.033	.05	.033
*Reach-1	0.184	.033	.05	.033
*Reach-1	0.072	.033	.05	.033
*Reach-1	0.000	.033	.05	.033

SUMMARY OF REACH LENGTHS

River: T4N-R3W-S10N

Reach	River Sta.	Left	Channel	Right
Reach-1	1.492	455.72	510.161	510.15
Reach-1	1.395	499.8	541.066	506.27
Reach-1	1.292	514.03	574.601	537.1
Reach-1	1.184	601.61	478.32	318.12
Reach-1	1.093	255.11	527.143	632.77
Reach-1	0.993	487.65	486.309	458.47
Reach-1	0.901	531.31	516.239	482.52
Reach-1	0.803	485.77	517.23	497.03
Reach-1	0.705	514.37	607.28	549.44
Reach-1	0.590	399.49	542.532	520.57
Reach-1	0.488	567.7	545.941	539.58
Reach-1	0.384	272.08	553.653	511.93
Reach-1	0.279	539.49	505.967	415.07
Reach-1	0.184	415.2	587.698	576.86
Reach-1	0.072	297.44	381.419	358.1
Reach-1	0.000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: T4N-R3W-S10N

Reach	River Sta.	Contr.	Expan.
Reach-1	1.492	.1	.3
Reach-1	1.395	.1	.3
Reach-1	1.292	.1	.3
Reach-1	1.184	.1	.3
Reach-1	1.093	.1	.3
Reach-1	0.993	.1	.3
Reach-1	0.901	.1	.3
Reach-1	0.803	.1	.3
Reach-1	0.705	.1	.3
Reach-1	0.590	.1	.3
Reach-1	0.488	.1	.3
Reach-1	0.384	.1	.3
Reach-1	0.279	.1	.3
Reach-1	0.184	.1	.3
Reach-1	0.072	.1	.3
Reach-1	0.000	.1	.3

HEC-RAS Plan: FP River: T4N-R3W-S10W Reach: REACH-1 Profile: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
REACH-1	0.913	1	1200.00	1570.10	1571.41	1571.03	1571.47	0.004573	2.27	734.77	1544.95	0.38
REACH-1	0.801	1	1200.00	1566.56	1567.98		1568.07	0.008825	2.64	578.69	1207.71	0.43
REACH-1	0.708	1	1200.00	1563.70	1565.17	1564.65	1565.21	0.004352	1.89	759.42	1276.18	0.30
REACH-1	0.601	1	1200.00	1560.55	1562.18	1561.96	1562.22	0.006543	2.33	838.65	1911.84	0.38
REACH-1	0.514	1	1200.00	1558.09	1559.21	1559.00	1559.26	0.005899	1.93	678.58	1538.32	0.34
REACH-1	0.407	1	1200.00	1554.96	1555.84	1555.51	1555.87	0.005723	1.54	891.21	1861.09	0.32
REACH-1	0.287	1	1200.00	1551.37	1553.14	1552.66	1553.19	0.005410	2.49	724.90	1241.91	0.36
REACH-1	0.235	1	1200.00	1549.67	1550.87	1550.62	1551.00	0.013900	3.26	440.32	666.79	0.58
REACH-1	0.157	1	1200.00	1547.77	1549.24		1549.28	0.002077	1.65	890.56	977.39	0.25
REACH-1	0.087	1	1200.00	1545.84	1546.84	1546.84	1547.11	0.052143	4.58	296.09	666.94	0.97
REACH-1	0.000	1	1200.00	1542.66	1545.10	1543.54	1545.11	0.000275	0.72	1677.98	1190.32	0.09

HEC-RAS Plan: FP River: T4N-R3W-S10W Reach: REACH-1 Profile: 1

Reach	River Sta	Profile	Max Chl Dpth	Hyd. Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
REACH-1	0.913	1	1.31	0.48	1544.95	734.77	1.63	1571.41	1571.41	
REACH-1	0.801	1	1.42	0.48	1207.71	578.69	2.07	1567.98	1567.98	
REACH-1	0.708	1	1.47	0.60	1276.18	759.42	1.58	1565.17	1565.17	
REACH-1	0.601	1	1.63	0.44	1911.84	838.65	1.43	1562.18	1562.18	
REACH-1	0.614	1	1.12	0.44	1538.32	678.58	1.77	1559.21	1559.21	
REACH-1	0.407	1	1.20	0.48	1861.09	891.21	1.35	1555.84	1555.84	
REACH-1	0.287	1	1.77	0.58	1241.91	724.90	1.66	1553.14	1553.14	
REACH-1	0.215	1	1.19	0.66	666.79	440.32	2.73	1550.87	1550.87	
REACH-1	0.157	1	1.47	0.91	977.39	890.56	1.35	1549.24	1549.24	
REACH-1	0.087	1	1.00	0.52	566.94	296.09	4.05	1546.84	1546.84	
REACH-1	0.000	1	2.44	1.41	1190.32	1677.98	0.72	1545.10	1545.10	

HEC-RAS Plan: FLOODPLAIN River: -S10W-REACH-2 Reach: REACH-2 Profile: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
REACH-2	0.364	1	410.00	1554.64	1555.76	1555.53	1555.80	0.006810	1.77	266.63	617.73	0.36
REACH-2	0.280	1	410.00	1552.70	1553.69	1553.40	1553.72	0.004343	1.51	314.79	632.15	0.29
REACH-2	0.232	1	410.00	1550.34	1551.74	1551.57	1551.82	0.018210	2.69	189.08	460.16	0.55
REACH-2	0.165	1	410.00	1549.37	1549.85	1549.53	1549.89	0.002487	0.65	293.40	541.26	0.19
REACH-2	0.092	1	410.00	1546.91	1547.27	1547.27	1547.40	0.052174	3.05	139.78	514.80	1.00
REACH-2	0.050	1	410.00	1542.66	1545.10	1543.92	1545.11	0.000618	0.98	506.35	462.60	0.12

HEC-RAS Plan: FLOODPLAIN River: -S10W-REACH-2 Reach: REACH-2 Profile: 1

Reach	River Sta	Profile	Max Chl Dpth	Hydr Depth	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
REACH-2	0.354	1	1.12	0.43	617.73	266.63	1.54	1555.76	1555.76	
REACH-2	0.280	1	0.99	0.50	632.15	314.79	1.30	1553.69	1553.69	
REACH-2	0.232	1	1.40	0.41	460.16	189.08	2.17	1551.74	1551.74	
REACH-2	0.165	1	1.16	0.54	541.26	293.40	1.40	1549.85	1549.85	
REACH-2	0.092	1	0.49	0.27	514.80	139.78	2.93	1547.27	1547.27	
REACH-2	0.000	1	2.44	1.09	462.60	506.35	0.81	1545.10	1545.10	

CHECK-RAS Report for Washes:
T4N-R3W-S10W Reach-1
T4N-R3W-S10W Reach-2

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.prj
Plan File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.p03
Geometry File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.g02
Flow File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.f01
Report File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.nt
Selected profiles: 1
Date: 6/6/2006
Time: 3:57:46 PM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
T4N-R3W-S10W,REACH-1						
.913		0.038	0.06	-----	0.1	0.3
		0.06	0.038	-----		
.801		0.036	-----	-----	0.1	0.3
		0.059	-----	-----		
.708		0.036	0.059	-----	0.1	0.3
		0.059	0.036	-----		
.601		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.514		0.034	0.058	0.034	0.1	0.3
.407		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.287		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.235		0.034	0.034	0.058	0.1	0.3
		-----	0.058	0.034		
.157		0.034	0.034	0.058	0.1	0.3
		-----	0.058	0.034		
.087		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
0		0.034	0.034	0.058	0.1	0.3
		-----	0.058	0.034		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.034	0.06
Right Overbank n Value:	0.034	0.058
Channel n Value:	0.034	0.06
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

RS: 0.514
NT RC 01 Left overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

RS: 0.514
NT RC 01 Right overbank n value is less than 0.035
The n value for overbank is usually larger then 0.035.
The n value should be reevaluated.

```
RS:       0.514
NT RC 05 The left overbank n value of 0.034 and the right overbank n value
         of 0.034 are less than or equal to the channel n value of 0.058
         The overbank n values should be reevaluated.

RS:       0.235
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

RS:       0.157
NT RC 01 Left overbank n value is less than 0.035
         The n value for overbank is usually larger then 0.035.
         The n value should be reevaluated.

TRANSITION LOSS COEFFICIENT CHECK
---------------------------------

ROUGHNESS COEFFICIENT AT STRUCTURES
-----------------------------------

---END---
```

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.prj
Plan File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.p03
Geometry File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.g02
Flow File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.f01
Report File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-1\Wittmann Zone AE-T4N -R3W-S10W.xs
Selected profiles: 1
Date: 6/6/2006
Time: 3:58:00 PM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
T4N-R3W-S10W,REACH-1						
.913	540.32	590.93	463.42	1544.95	1200	D
.801	433.79	491.14	474.33	1207.71	1200	D
.708	641.83	565.87	419.23	1276.18	1200	D
.601	485.66	458.49	490.53	1911.84	1200	D
.514	583.37	564.17	601.57	1538.32	1200	D
.407	522.48	633.85	378.67	1861.09	1200	D
.287	282.34	277.01	247.26	1241.91	1200	D
.235	417.19	412.87	317.54	666.79	1200	D
.157	361.06	367.18	377.28	977.39	1200	
.087	478.37	459.27	508.61	566.94	1200	D,C
0	0	0	0	1190.32	1200	D,E

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

DISCHARGE CHECK

XS DC 02 Constant dicharge used for the T4N-R3W-S10W,REACH-1

LOCATION CHECK

BOUNDARY CONDITION CHECK

```
XS BC 02 The name of the stream is T4N-R3W-S10W,REACH-1
         Known WS = 1545.1 is specified as the downstream boundary
         for profile 1

XS BC 03 Maximum number of iterations is 0
         It should not be less than 20.

LATERAL WEIRS CHECK
-----------------------

---END---
```

CHECK-RAS Program: NT Check
Manning's n Value and Transition Loss Coefficient Review

Project File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.prj
Plan File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.p02
Geometry File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.g01
Flow File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.f01
Report File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.nt
Selected profiles: 1
Date: 6/6/2006
Time: 3:58:25 PM

SECNO	STRUCTURE	NLOB	NCHL	NROB	CNTR	EXP
-S10W-REACH-2,REACH-2						
.354		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.28		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.232		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.165		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		
.092		0.034	0.058	-----	0.1	0.3
		0.058	0.034	-----		
0		0.034	-----	-----	0.1	0.3
		0.058	-----	-----		

---Summary of Statistics---

	Minimum	Maximum
Left Overbank n Value:	0.034	0.058
Right Overbank n Value:	99999	-99999
Channel n Value:	0.034	0.058
Contraction Coefficient:	0.1	0.1
Expansion Coefficient:	0.3	0.3

ROUGHNESS COEFFICIENT CHECK

TRANSITION LOSS COEFFICIENT CHECK

ROUGHNESS COEFFICIENT AT STRUCTURES

---END---

CHECK-RAS Program, XS Check
Cross Section Location and Alignment Review

Project File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.prj
Plan File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.p02
Geometry File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.g01
Flow File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.f01
Report File: P:\M\MARI00000044\0800REC\0810Incoming\Primatech 5-4-06\REACH-2\Wittmann Zone AE-T4N -R3W-S10W_REACH_2.xs
Selected profiles: 1
Date: 6/6/2006
Time: 3:58:38 PM

SECNO	Len Lob	Len Chl	Len Rob	TopWdthAct	Q Total	Flow Code
-S10W-REACH-2,REACH-2						
.354	372.3537	394.0056	376.6388	617.73	410	
.28	263.0717	250.5428	245.7531	632.15	410	
.232	393.461	355.5554	332.8556	460.16	410	D
.165	366.5633	387.0758	378.2476	541.26	410	E
.092	446.3764	484.0201	501.8482	514.8	410	E,C
0	0	0	0	462.6	410	D,E

B=blocked obstruction XS SC 05
C=critial depth XS SC 03
D=divided flow XS SC 01
E=cross section extended XS SC 02
K=known water-surface XS SC 04

DISTANCE CHECK

SPACING CHECK

INEFFECTIVE FLOW CHECK

DISCHARGE CHECK

XS DC 02 Constant dicharge used for the -S10W-REACH-2,REACH-2

LOCATION CHECK

BOUNDARY CONDITION CHECK

XS BC 02 The name of the stream is -S10W-REACH-2,REACH-2
Known WS = 1545.1 is specified as the downstream boundary for profile 1

XS BC 03 Maximum number of iterations is 0

It should not be less than 20.

LATERAL WEIRS CHECK

---END---

HEC-RAS Report for Washes:
T4N-R3W-S10W Reach-1
T4N-R3W-S10W Reach-2

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: WITTMANN ZONE AE- T4N-R3W-S10W
Project File : Wittmann Zone AE-T4N -R3W-S10W.prj
Run Date and Time: 7/24/2006 4:38:50 PM

Project in English units

Project Description:
WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY, Contract FCD2004C066

Prepared by Primatech, LLC.
Modeled by George Lopez-Cepero,
P.E., Waleed Aboshanp, Ph.D., P.E., and Panduranga Kuruva, E.I.T.

HEC-RAS
Version 3.1.3 was utilized for floodplain delineation.
Filename : WITTMANN
ZONE AE-T4N-R3W-S10W.PRJ

Vertical datum: NAVD1988

Topography and aerial
photography provided by FCDMC, origin is the Wittmann ADMS/ADMSU (FCD 2002C029), flight dates are 04/18/02, 04/19/02 and 04/23/02 at 1:7200 ratio and 04/23/02 at 1:14400 ratio.

DTM data provided by Wittmann ADMSU
consultant from contract FCD 2002C029.

Manning's 'n' values were determined
by field reconnaissance; see the Technical Data Notebook for more detailed information.

Flow rates are from the Hydrology Computations Appendix of the
Technical Data Notebook; please refer to the Flow Rate Exhibit and the computations for the interpolated and intermediate values.

From review of
initial modeling with the topographic information, we determined that split flow may occur downstream of section RM 0.407. The split flow is modeled using a separate reach, named T4N-R3W-S10W-Reach 2. Reach 2 runs from RM 0.407 to the downstream end. A separate RAS model is set up for this reach to better determine the west boundary of the flood plain.

****

PLAN DATA

Plan Title: FLOODPLAIN

```
Plan File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann  Zone
AE-T4N -R3W-S10W.p03

          Geometry Title: T4N-R3W-S10W
          Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\Wittmann  Zone AE-T4N -R3W-S10W.g02

          Flow Title    : FLOODPLAIN
          Flow File     : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\Wittmann  Zone AE-T4N -R3W-S10W.f01

Plan Summary Information:
Number of:  Cross Sections =   11    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

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


*****************************************************************************

FLOW DATA

Flow Title: FLOODPLAIN
Flow File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann  Zone
AE-T4N -R3W-S10W.f01

Flow Data (cfs)
*************************************************************
* River           Reach           RS      *              1 *
* T4N-R3W-S10W    REACH-1         0.913   *           1200 *
*************************************************************

Boundary Conditions
*****************************************************************************************
***************
* River           Reach           Profile          *            Upstream
Downstream    *
*****************************************************************************************
***************
* T4N-R3W-S10W    REACH-1         1                *
Known WS = 1545.1 *
*****************************************************************************************
***************

*****************************************************************************

GEOMETRY DATA

Geometry Title: T4N-R3W-S10W
Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann
Zone AE-T4N -R3W-S10W.g02

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.913

INPUT
```

```
Description: Flow rate starting at this cross-section is 1200cfs.
Station Elevation Data     num=      167
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*******************************************************************************
 8498.31     1572 8522.58     1572 8523.73     1572 8551.73  1571.9 8578.73 1571.58
 8585.67  1571.5 8596.08  1571.8 8602.68     1572 8610.71 1572.28 8656.29 1572.12
 8684.67     1572 8738.43     1572 8816.01 1571.92 8853.68 1571.74  8903.9 1571.62
 8923.05 1571.52 8992.78 1571.24  9010.2 1571.17 9038.37 1571.03 9049.32  1571.1
 9130.34 1571.18 9277.02  1571.3 9293.05 1571.38 9337.49 1571.57 9383.59 1571.81
 9393.12 1571.86 9476.92 1572.14 9512.64  1572.3 9557.12 1572.47 9569.67  1572.5
 9596.63 1572.34 9625.62 1572.11 9651.51 1572.01 9678.13 1571.87 9695.99 1571.78
 9706.04  1571.7 9708.92  1571.7 9713.07 1571.76 9736.68  1571.9 9752.97     1572
 9761.49 1572.06 9777.46 1572.15 9895.61 1572.41 9930.18 1572.13 9939.63 1572.06
 9970.08 1571.88 9980.15 1571.81 9989.33  1571.8  9997.4 1571.7410021.75 1571.57
10071.76 1571.7910095.13  1571.910119.23 1571.9410124.73 1571.9210144.42 1571.72
 10154.1 1571.7710176.11 1571.8610191.48  1571.910196.69 1571.8710216.68 1571.84
10256.59 1571.7310261.57 1571.7110264.09  1571.710319.59 1571.3210357.76 1571.24
10366.93  1571.210375.25 1571.2610401.79  1571.110421.31 1571.0510438.68 1571.11
10474.37 1571.16 10505.8 1571.1310546.24  1571.110596.91 1571.2310647.95 1571.32
10656.47 1571.2710661.66 1571.2310687.28  1571.110789.44 1570.4610829.19 1570.43
10845.95 1570.4110853.11  1570.410855.35  1570.4 10855.6  1570.410876.73 1570.34
10933.71 1570.1710944.15 1570.1510955.83  1570.110959.161570.10910959.64 1570.11
10966.17 1570.14 11025.1  1570.311030.98 1570.3111033.44  1570.311034.24 1570.32
11034.93 1570.3211109.27 1570.4611113.22 1570.4711116.57  1570.511119.15  1570.5
 11127.1 1570.5511133.26 1570.54 11236.9 1570.83   11241  1570.811242.71 1570.84
11247.94 1570.8611313.16 1571.04 11320.4 1571.0711328.92  1571.111334.57 1571.11
11352.95 1571.2111371.72 1571.3111384.52  1571.311392.34  1571.311451.18 1571.18
 11498.7  1571.411533.15 1571.5711556.79 1571.5611578.17  1571.711595.87     1572
11605.66 1572.1611623.44 1572.45 11637.3 1572.6311643.11  1572.711657.81 1572.94
11679.67 1573.2611683.04  1573.311685.21 1573.3311690.49  1573.411722.64 1573.73
11722.78 1573.7311723.18 1573.7311765.96 1573.5111768.81  1573.511773.12 1573.47
11773.91 1573.4611774.21 1573.4611789.68 1573.36 11820.7  1573.2 11832.5 1573.18
 11833.3  1573.2 11838.6 1573.1611858.17 1573.1111863.82  1573.111883.07 1573.18
11933.95 1573.4511961.61 1573.5111972.71 1573.56 12003.5  1573.712011.42 1573.77
12021.27  1573.812060.98 1573.8912067.88 1573.9212068.57  1573.912077.72     1574
12111.09  1574.312120.97 1574.3812138.85 1574.5412158.98  1574.612163.56 1574.69
12170.61 1574.7412182.35 1574.77 12207.9  1574.812221.23  1574.812242.63 1574.85
 12270.8 1574.9612276.54     1575

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8498.31     .038 8992.78      .0610959.16     .038

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      10789.4411109.27            540.32  590.93  463.42              .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)          * 1571.47  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *     0.06  * Wt. n-Val.              *   0.060  *   0.047  *
0.038  *
* W.S. Elev (ft)          * 1571.41  * Reach Len. (ft)         *  540.32  *  590.93  *
463.42  *
* Crit W.S. (ft)          * 1571.03  * Flow Area (sq ft)       *  217.76  *  351.07  *
165.94  *
* E.G. Slope (ft/ft)      *0.004573  * Area (sq ft)            *  217.76  *  351.07  *
165.94  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  154.68  *  797.81  *
247.51  *
* Top Width (ft)          * 1544.95  * Top Width (ft)          *  833.41  *  319.83  *
391.71  *
* Vel Total (ft/s)        *     1.63  * Avg. Vel. (ft/s)        *    0.71  *    2.27  *
1.49  *
* Max Chl Dpth (ft)       *     1.31  * Hydr. Depth (ft)        *    0.26  *    1.10  *
0.42  *
* Conv. Total (cfs)       * 17744.6  * Conv. (cfs)             *  2287.2  * 11797.3  *
3660.0  *
```

```
* Length Wtd. (ft)        *  550.41  * Wetted Per. (ft)       *  833.42  *  319.83  *
391.71  *
* Min Ch El (ft)          * 1570.10  * Shear (lb/sq ft)       *    0.07  *    0.31  *
0.12  *
* Alpha                   *    1.48  * Stream Power (lb/ft s) *    0.05  *    0.71  *
0.18  *
* Frctn Loss (ft)         *    3.40  * Cum Volume (acre-ft)   *   26.32  *   30.61  *
21.82  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   73.37  *   26.34  *
39.27  *
*******************************************************************************************
******

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.

  Profile #1
*******************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 8498.31   * 9643.88   *    40.00 *    68.15 *   350.23 *
3.33 *     0.19 *     0.59 *
* 2         * LOB       * 9643.88   * 10789.44  *   114.68 *   149.61 *   483.19 *
9.56 *     0.31 *     0.77 *
* 3         * Chan      * 10789.44  * 11109.27  *   797.81 *   351.07 *   319.83 *
66.48 *     1.10 *     2.27 *
* 4         * ROB       * 11109.27  * 11692.90  *   247.51 *   165.94 *   391.71 *
20.63 *     0.42 *     1.49 *
*******************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.801

INPUT
Description:
Station Elevation Data    num=     155
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8626.68  1570.1 8629.62  1570.1 8640.36 1570.12 8645.39 1570.27 8656.02 1570.18
 8674.58    1570 8705.86  1569.6 8734.34 1569.35 8753.68 1569.21 8800.24 1568.78
 8805.88  1568.7 8812.16  1568.8 8875.99 1568.97 8914.85 1568.81 8926.37  1568.7
 8933.02  1568.6 8977.69 1568.48 9035.87  1568.3 9048.75 1568.17 9070.08 1568.12
 9093.61    1568 9096.68    1568 9105.73 1567.92 9116.18  1567.9 9188.551567.881
  9193.5 1567.88 9270.05  1567.7 9272.24  1567.7 9289.45 1567.54 9291.89 1567.53
 9384.86 1567.41 9436.64  1567.9 9457.65 1567.81 9471.72 1567.45 9516.71  1567.9
 9534.21 1567.99 9554.42 1568.11 9583.56  1568.4 9611.98 1568.46 9635.97 1568.51
 9654.33  1568.7 9701.04 1569.01 9716.36 1568.68 9759.53  1568.6 9854.14 1568.39
 9919.43 1568.42 9958.41 1568.32 9994.47 1568.0710065.24 1568.5810130.31 1568.12
10130.38 1568.12 10141.9 1568.7710187.83  1569.210201.78 1569.0610214.66 1568.89
10253.94  1568.410261.21  1568.310285.85 1568.4410306.55 1568.6110335.24 1568.55
10345.27 1568.4710360.23  1568.410409.38 1568.6310410.42 1568.6310451.89  1568.1
10457.54 1568.0210459.21 1568.0210460.47 1567.9810465.12 1567.9810467.09    1568
10475.04 1567.9410502.44 1567.8410534.37 1567.9310540.26 1567.9110544.88  1567.9
10552.45 1567.9210569.93 1567.9710666.59 1567.6210668.83 1567.61 10671.9  1567.6
10675.69  1567.610771.73 1567.4910778.43 1567.3710826.54 1566.93 10850.8  1566.7
10856.75  1566.710913.93 1566.6610966.09 1566.5610980.13 1567.1311004.831567.172
11021.56  1567.211074.39 1567.1111091.05 1567.2111096.61 1567.2411175.61 1567.65
```

```
11179.34  1567.711180.68 1567.6811188.84 1567.7111198.09 1567.7511214.13 1567.84
11241.55    156811243.81 1568.0111262.56 1568.1111271.49 1568.1811320.34 1568.35
11342.49  1568.411368.99 1568.3611373.37  1568.411378.16 1568.3511410.53 1568.37
 11414.2  1568.411416.93 1568.3711418.84 1568.3811423.08 1568.3911467.61 1568.67
11538.26  1569.1 11571.1 1569.37 11582.2 1569.4511603.45 1569.5811620.63 1569.61
11664.95  1569.811682.04 1569.8611717.44 1569.8411722.06 1569.8511728.11 1569.87
11728.96  1569.911742.51 1569.9111751.99 1569.9511761.24 1569.9811762.87 1569.99
11765.33    157011781.37 1570.0611782.46 1570.0711807.05 1570.2211812.26 1570.25
11821.39  1570.311838.74 1570.46 11860.4 1570.6111890.83 1571.0711935.38 1571.58
11948.17  1571.411950.03 1571.38 11953.2 1571.3711983.86 1571.3511996.36 1571.34
 12002.6  1571.412005.13 1571.3712016.85 1571.4212074.54 1571.7512084.21 1571.79
12089.15  1571.8 12097.6 1571.7812105.99 1571.7512130.77 1571.67 12134.1 1571.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8626.68    .036 9188.55    .05911004.83    .036

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10778.4310980.13           433.79  491.14  474.33             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)          * 1568.07  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.058  *   0.059  *
0.039  *
* W.S. Elev (ft)          * 1567.98  * Reach Len. (ft)         *  433.79  *  491.14  *
474.33  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  192.04  *  237.90  *
148.75  *
* E.G. Slope (ft/ft)      *0.008825  * Area (sq ft)            *  192.04  *  237.90  *
148.75  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  195.45  *  628.31  *
376.24  *
* Top Width (ft)          * 1207.71  * Top Width (ft)          *  747.70  *  201.70  *
258.30  *
* Vel Total (ft/s)        *    2.07  * Avg. Vel. (ft/s)        *    1.02  *    2.64  *
2.53  *
* Max Chl Dpth (ft)       *    1.42  * Hydr. Depth (ft)        *    0.26  *    1.18  *
0.58  *
* Conv. Total (cfs)       * 12773.8  * Conv. (cfs)             *  2080.5  *  6688.2  *
4005.0  *
* Length Wtd. (ft)        *  474.16  * Wetted Per. (ft)        *  747.71  *  201.72  *
258.31  *
* Min Ch El (ft)          * 1566.56  * Shear (lb/sq ft)        *    0.14  *    0.65  *
0.32  *
* Alpha                   *    1.36  * Stream Power (lb/ft s)  *    0.14  *    1.72  *
0.80  *
* Frctn Loss (ft)         *    2.85  * Cum Volume (acre-ft)    *   23.78  *   26.61  *
20.15  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   63.56  *   22.80  *
35.81  *
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *    (ft/s) *
* 1         * LOB       * 8626.68   * 9702.56   *   127.21 *   117.26 *   433.89 *
10.60 *     0.27 *     1.08 *
```

```
* 2          * LOB       * 9702.56   * 10778.43  *    68.24 *    74.77 *   313.82 *
5.69 *     0.24 *     0.91 *
* 3          * Chan      * 10778.43  * 10980.13  *   628.31 *   237.90 *   201.72 *
52.36 *     1.18 *     2.64 *
* 4          * ROB       * 10980.13  * 11557.12  *   376.24 *   148.75 *   258.31 *
31.35 *     0.58 *     2.53 *
*******************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.708

INPUT
Description:
Station Elevation Data    num=     141
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8517.97  1567.4 8552.16 1567.76 8562.37 1567.55 8582.57 1567.46 8590.22  1567.3
 8617.12 1566.59 8656.35 1566.89 8732.14 1566.72 8756.23 1566.49 8759.46  1566.6
  8814.9 1566.83 8815.89 1566.83 8938.98  1566.2 8942.96 1566.15 8959.26    1566
  8983.5  1565.8 9012.99 1565.49 9081.49 1565.38 9098.45 1565.29 9135.92  1564.9
 9192.32 1565.05 9211.89 1564.98  9214.1 1564.96 9214.91 1564.96  9226.21564.925
 9294.81 1564.71 9313.45  1564.8 9397.19 1564.92 9418.38 1565.02  9515.5 1565.18
 9534.58  1565.4 9632.29 1565.51 9677.41  1565.7 9738.45  1565.7 9797.81 1565.89
 9826.13 1565.66 9888.22  1565.6  9888.8 1565.63 9996.12 1565.3910118.29 1565.43
10221.59 1565.7210226.72 1565.6310247.51  1565.710251.88 1565.7610306.72  1565.9
10338.34 1565.9510345.38  1565.910355.07 1565.8410367.72 1565.7210367.72  1565.7
10405.96 1565.3210435.94 1564.9710444.09 1564.8810475.31 1564.8510479.66  1564.8
10530.79 1564.63 10536.6 1564.5610541.09 1564.5210545.47  1564.510545.47 1564.49
10546.36 1564.4810553.38 1564.3510563.86 1564.3510583.06 1564.2210589.76  1564.2
 10601.1 1564.09 10607.4 1564.0810614.19 1564.0810616.92 1564.0910642.21  1564.1
10646.16 1564.1210682.01  1564.310705.41 1564.3310709.08 1564.3210712.46  1564.3
10715.43 1564.2610720.78 1564.2310729.98 1564.1810747.01 1564.1110757.56    1564
10775.62    156410779.49 1563.9910800.02 1563.91 10817.6 1563.8410838.72  1563.8
10853.32 1563.7510855.19  1563.710866.43 1563.77 10882.5 1563.8410915.58    1564
10921.87 1564.0310929.54 1564.0610934.86 1564.0710935.25 1564.0810945.02  1564.1
10951.67 1564.0910962.721564.12410968.13 1564.14 10996.4  1564.1 11038.6 1564.16
11063.52  1564.511094.25 1564.7911217.44 1564.8911221.35 1564.8911225.56 1564.96
11241.29  1565.211253.94 1565.18 11285.4 1564.96 11311.4 1565.1411325.36 1565.24
11334.54  1565.311338.44 1565.3911375.12 1565.83 11386.3 1565.9611389.52    1566
11400.99  1566.111402.16 1566.1511402.44 1566.1511403.03 1566.1611415.97 1566.16
11444.45  1566.111558.52 1566.5111594.12  1566.711603.99 1566.74 11622.4 1566.74
11658.62  1566.811678.29 1567.0311706.92 1567.2611709.09 1567.2611766.17 1567.41
11777.34  1567.611801.59 1567.7511815.24 1567.85 11832.7 1567.9911833.48    1568
 11839.8  1568.111856.68 1568.2511870.17 1568.4311897.07 1568.8411941.08 1568.68
11960.56  1568.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 8517.97    .036  9226.2    .05910962.72    .036

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10705.4110968.13            641.83  565.87  419.23              .1       .3

CROSS SECTION OUTPUT  Profile #1
*******************************************************************************************
******
* E.G. Elev (ft)          * 1565.21  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.058  *   0.058  *
0.036  *
```

```
* W.S. Elev (ft)          * 1565.17  * Reach Len. (ft)        *  641.83  *  565.87  *
419.23  *
* Crit W.S. (ft)          * 1564.65  * Flow Area (sq ft)      *  286.86  *  312.53  *
160.04  *
* E.G. Slope (ft/ft)      *0.004352  * Area (sq ft)           *  286.86  *  312.53  *
160.04  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)             *  319.70  *  589.18  *
291.12  *
* Top Width (ft)          * 1276.18  * Top Width (ft)         *  683.26  *  262.72  *
330.19  *
* Vel Total (ft/s)        *    1.58  * Avg. Vel. (ft/s)       *    1.11  *    1.89  *
1.82  *
* Max Chl Dpth (ft)       *    1.47  * Hydr. Depth (ft)       *    0.42  *    1.19  *
0.48  *
* Conv. Total (cfs)       * 18189.2  * Conv. (cfs)            *  4846.0  *  8930.5  *
4412.7  *
* Length Wtd. (ft)        *  568.07  * Wetted Per. (ft)       *  683.28  *  262.72  *
330.20  *
* Min Ch El (ft)          * 1563.70  * Shear (lb/sq ft)       *    0.11  *    0.32  *
0.13  *
* Alpha                   *    1.15  * Stream Power (lb/ft s) *    0.13  *    0.61  *
0.24  *
* Frctn Loss (ft)         *    3.00  * Cum Volume (acre-ft)   *   21.40  *   23.51  *
18.47  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)         *   56.44  *   20.19  *
32.61  *
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 8517.97   * 9611.69   *    61.13 *    88.26 *   396.96 *
5.09 *     0.22 *     0.69 *
* 2         * LOB       * 9611.69   * 10705.41  *   258.57 *   198.60 *   286.32 *
21.55 *     0.69 *     1.30 *
* 3         * Chan      * 10705.41  * 10968.13  *   589.18 *   312.53 *   262.72 *
49.10 *     1.19 *     1.89 *
* 4         * ROB       * 10968.13  * 11464.34  *   291.12 *   160.04 *   330.20 *
24.26 *     0.48 *     1.82 *
*****************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.601

INPUT
Description:
Station Elevation Data    num=     138
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8383.77    1565  8429.7 1564.51 8474.84  1564.2 8492.66 1564.12 8516.64    1564
 8553.29 1563.82 8569.37 1563.74 8608.25 1563.63 8615.02 1563.73  8631.9 1563.79
 8683.95 1563.58 8750.26 1562.93 8819.64 1562.17 8836.02  1562.1 8874.26 1562.08
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 8897.72 1562.03 8924.62 1561.81 8940.19  1561.7 8948.99  1561.7 8969.25  1561.7
 8977.66 1561.77 9012.55 1561.94  9026.6 1561.94 9071.41 1561.83 9091.03 1561.82
 9119.19  1561.9 9185.881561.822  9204.7  1561.8 9298.65  1561.7 9329.05 1561.54
 9361.09 1561.96 9417.03 1561.53  9444.3 1561.67 9502.36 1561.77 9539.63 1561.81
 9599.87 1561.91 9600.26 1561.91 9605.46    1562 9612.81 1562.09 9615.76 1562.14
  9619.9 1562.23  9635.4  1562.2 9677.17 1562.19 9688.21  1562.5 9755.78 1562.29
 9773.89 1562.29 9795.09  1562.2 9839.27 1562.13 9880.53    1562 9929.18 1561.59
 9955.15 1561.3810067.39 1561.5610070.72 1561.5610103.61 1561.7210134.65 1561.95
10173.55 1562.0210282.11 1562.1610290.86  1562.210318.49 1562.1910339.79 1562.11
10373.59    1562 10461.9 1561.6110473.59  1561.610487.25  1561.610497.02 1561.63
10510.43 1561.6610524.57 1561.68 10535.1  1561.710556.55 1561.55 10578.5 1561.49
10605.55 1561.5210614.12 1561.6210631.92  1561.210652.42 1561.2210692.83 1560.92
10695.63 1560.9210702.83  1560.710705.48 1560.6510708.83 1560.5510715.31 1560.89
10715.62 1560.9310730.32  1561.210732.79 1561.3110800.93 1561.42 10837.8 1561.53
10843.691561.54510878.15 1561.6310889.19  1561.710892.81 1561.7210907.85 1561.83
10929.31    156210931.47 1562.0110935.86    156210970.97 1562.3111007.56 1562.59
11053.51 1562.6111074.36 1562.6611085.67  1562.811103.69 1562.9911147.39    1563
11174.07 1562.9711182.53 1563.2511184.19  1563.3   11185 1563.25 11190.2 1563.19
 11221.1 1562.8211230.88  1562.811327.13  1563.511348.15 1563.61 11350.5 1563.63
11376.54 1563.7811412.49    156411414.89    156411415.92 1564.0211416.18 1564.02
11424.66    156411425.13    156411426.51    156411433.89    156411434.87 1563.99
11446.06 1563.9911452.11    156411457.62    1564 11460.1 1563.9611464.77 1564.03
11473.28 1564.0611483.33 1564.1111500.89  1564.411543.33 1564.9411554.14 1565.12
 11561.2 1565.2111575.08 1565.3711602.35  1565.711626.07 1565.9311631.22    1566
 11649.8 1566.25 11652.2 1566.2711656.43  1566.3

Manning's n Values :       num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8383.77    .034 9185.88    .05810843.69    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10652.4210732.79            485.66  458.49  490.53             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)          * 1562.22  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.053  *   0.058  *
0.050  *
* W.S. Elev (ft)          * 1562.18  * Reach Len. (ft)         *  485.66  *  458.49  *
490.53  *
* Crit W.S. (ft)          * 1561.96  * Flow Area (sq ft)       *  614.92  *   96.00  *
127.72  *
* E.G. Slope (ft/ft)      *0.006543  * Area (sq ft)            *  614.92  *   96.00  *
127.72  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  749.39  *  223.93  *
226.68  *
* Top Width (ft)          * 1911.84  * Top Width (ft)          * 1608.09  *   80.37  *
223.38  *
* Vel Total (ft/s)        *    1.43  * Avg. Vel. (ft/s)        *    1.22  *    2.33  *
1.77  *
* Max Chl Dpth (ft)       *    1.63  * Hydr. Depth (ft)        *    0.38  *    1.19  *
0.57  *
* Conv. Total (cfs)       * 14835.4  * Conv. (cfs)             *  9264.7  *  2768.4  *
2802.4  *
* Length Wtd. (ft)        *  477.73  * Wetted Per. (ft)        * 1608.12  *   80.39  *
223.38  *
* Min Ch El (ft)          * 1560.55  * Shear (lb/sq ft)        *    0.16  *    0.49  *
0.23  *
* Alpha                   *    1.24  * Stream Power (lb/ft s) *    0.19  *    1.14  *
0.41  *
* Frctn Loss (ft)         *    2.97  * Cum Volume (acre-ft)    *   14.75  *   20.86  *
17.08  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   39.56  *   17.96  *
29.94  *
*****************************************************************************************
******

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.

  Profile #1
*********************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 8383.77   * 9518.10   *   343.96 *   254.45 *   699.31 *
28.66 *     0.36 *     1.35 *
* 2         * LOB       * 9518.10   * 10652.42  *   405.44 *   360.48 *   908.81 *
33.79 *     0.40 *     1.12 *
* 3         * Chan      * 10652.42  * 10732.79  *   223.93 *    96.00 *    80.39 *
18.66 *     1.19 *     2.33 *
* 4         * ROB       * 10732.79  * 11194.61  *   226.68 *   127.72 *   223.38 *
18.89 *     0.57 *     1.77 *
*********************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.514

INPUT
Description:
Station Elevation Data    num=     117
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8422.27  1560.8 8443.18 1561.15 8453.31 1561.31 8484.96 1561.15 8518.35 1560.39
 8522.49 1560.32 8522.71 1560.32 8528.61  1560.2 8591.23 1560.37    8606  1560.3
 8635.05  1560.5 8650.86 1560.62 8652.78 1560.53 8659.88  1560.4 8701.34 1560.13
 8720.33    1560  8734.7 1559.93 8744.93 1559.87 8828.78 1559.34 8839.31 1559.27
 8859.76 1559.15 8888.53 1559.27 8954.08  1559.1 8958.36 1558.85 9035.74 1558.85
 9111.36  1558.7 9115.92 1558.59 9183.151558.809  9192.8 1558.84 9285.77    1559
 9343.83 1559.07 9353.19 1559.07  9383.6 1558.83 9516.86 1558.94 9623.98 1558.96
 9662.13 1559.24 9673.03 1559.37 9673.04 1559.37 9683.13 1559.38 9721.23 1559.45
 9795.21 1559.39 9893.28 1559.18  9911.4 1558.94 9939.48    1559 9951.75 1559.06
10060.31 1559.4210061.17 1559.4210196.72 1559.28 10218.6 1559.39 10232.7 1559.41
10264.77 1559.4510304.05 1559.4710345.62 1559.44 10348.9 1559.4110405.12 1558.79
10406.62  1558.810410.65 1558.7610505.38 1558.4810515.18 1558.4210521.05 1558.52
   10524  1558.510527.42 1558.5310532.53 1558.5210540.77  1558.510552.04 1558.46
10564.37  1558.410573.54 1558.3810576.13 1558.3810578.74 1558.3410586.19 1558.28
10592.02  1558.210599.43  1558.210620.19 1558.1510625.67 1558.1210633.09  1558.1
10640.11  1558.110642.36 1558.0910653.56 1558.0910667.58  1558.1   10686 1558.11
10707.83  1558.1 10734.5 1558.1710760.02 1558.21 10779.2 1558.2510789.78 1558.27
 10791.6  1558.310817.07 1558.6210820.61 1558.6710838.371558.74410899.55    1559
10907.13 1558.97 10909.8    155910923.75 1558.8810945.84 1558.8110998.02 1558.66
11015.68 1559.1111016.94  1559.111022.39 1559.2111078.56 1559.9611079.61 1559.97
11080.24 1559.98   11084    156011084.03    156011090.31 1560.0511109.86  1560.2
11138.65  1560.411178.24  1560.511179.93 1560.5111182.03 1560.5211184.55 1560.54
 11200.8 1560.61 11220.4  1560.811277.38 1561.2111314.76 1561.5211357.19 1561.55
 11367.4 1561.5811370.75  1561.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 8422.27    .03410527.42    .05810817.07    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10527.4210817.07           583.37  564.17  601.57             .1       .3
```

```
CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
******
* E.G. Elev (ft)          * 1559.26  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.034  *   0.058  *
0.034  *
* W.S. Elev (ft)          * 1559.21  * Reach Len. (ft)         *  583.37  *  564.17  *
601.57  *
* Crit W.S. (ft)          * 1559.00  * Flow Area (sq ft)       *  321.74  *  280.78  *
76.07  *
* E.G. Slope (ft/ft)      *0.005899  * Area (sq ft)            *  321.74  *  280.78  *
76.07  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  527.11  *  541.13  *
131.76  *
* Top Width (ft)          * 1538.32  * Top Width (ft)          * 1043.50  *  289.65  *
205.17  *
* Vel Total (ft/s)        *    1.77  * Avg. Vel. (ft/s)        *    1.64  *    1.93  *
1.73  *
* Max Chl Dpth (ft)       *    1.12  * Hydr. Depth (ft)        *    0.31  *    0.97  *
0.37  *
* Conv. Total (cfs)       * 15624.3  * Conv. (cfs)             *  6863.0  *  7045.6  *
1715.6  *
* Length Wtd. (ft)        *  581.72  * Wetted Per. (ft)        * 1043.52  *  289.65  *
205.18  *
* Min Ch El (ft)          * 1558.09  * Shear (lb/sq ft)        *    0.11  *    0.36  *
0.14  *
* Alpha                   *    1.02  * Stream Power (lb/ft s) *    0.19  *    0.69  *
0.24  *
* Frctn Loss (ft)         *    3.38  * Cum Volume (acre-ft)    *    9.53  *   18.88  *
15.93  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   24.78  *   16.01  *
27.53  *
*********************************************************************************************
******

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.

  Profile #1
*********************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 8422.27   * 9474.85   *   297.73 *   181.23 *   585.33 *
24.81 *     0.31 *     1.64 *
* 2         * LOB       * 9474.85   * 10527.42  *   229.38 *   140.51 *   458.18 *
19.11 *     0.31 *     1.63 *
* 3         * Chan      * 10527.42  * 10817.07  *   541.13 *   280.78 *   289.65 *
45.09 *     0.97 *     1.93 *
* 4         * ROB       * 10817.07  * 11093.91  *   131.76 *    76.07 *   205.18 *
10.98 *     0.37 *     1.73 *
*********************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.407

INPUT
```

```
Description: Use results at sec 0.354 of -10W-Reach2  for right FP
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8717.72  1557.1 8732.81 1557.12 8754.85 1556.79 8792.46    1557 8839.53 1556.49
 8852.32 1556.35 8864.34 1556.09 8871.74    1556 8873.15    1556 8919.36 1555.54
 8949.35 1555.23 8966.93 1555.35 9048.08    1556    9060    1556 9081.42 1556.11
 9099.56  1556.2 9113.01 1556.26 9121.05 1556.26 9131.42 1556.11 9153.93    1556
 9183.58 1555.92 9213.94  1555.8 9232.33  1555.9 9289.28 1555.76 9299.52 1555.76
 9366.71 1555.48 9389.96  1555.4 9443.961555.695 9444.91  1555.7 9502.16 1555.37
 9591.45 1555.09  9654.1 1554.94 9666.44    1555  9742.1 1555.12 9805.59 1555.16
 9869.65 1555.37 9871.81    1555 9904.69 1555.28 9954.95  1555.6 9989.77  1555.8
10020.81  1555.110024.06  1555.110025.81 1555.0410041.97    155510089.26 1554.96
 10131.3 1555.0310145.04 1555.1310179.37 1555.4310186.08  1555.210212.42 1555.41
10306.17 1555.8410336.76 1555.8210346.15 1555.8810353.74 1555.9110367.59 1555.93
10381.63 1555.9410390.65  1555.910402.95 1555.8910407.66 1555.8810417.25 1555.86
10455.31 1555.5310461.48  1555.510466.05 1555.47 10472.7 1555.4310475.49  1555.4
10476.76 1555.3910478.01  1555.410478.78 1555.3710497.47 1555.3810519.37 1555.54
 10530.7 1555.5210533.04  1555.510535.23 1555.5310536.79 1555.54 10560.8 1555.47
10565.59 1555.4810660.99  1555.7 10663.5 1555.7410666.48 1555.7310683.63 1555.58
10783.44 1554.6410821.51  1554.810862.01    155510876.02 1555.0110878.53 1555.04
10893.09 1555.2910894.28  1555.310936.24 1555.34 10948.71555.38910953.89 1555.41
11029.75  1555.511049.17 1555.81 11064.9    155611066.85 1556.0311084.76 1556.29
11101.05 1556.43 11171.9 1557.2811176.08  1557.311229.13    155811233.43 1558.05
11250.95 1558.2811259.45 1558.3911283.73  1558.711287.98  1558.711317.07 1558.39
11317.27 1558.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8717.72    .034 9443.96    .058 10948.7    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.7710179.37           522.48  633.85  378.67             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)          * 1555.87  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.053  *   0.058  *
0.055  *
* W.S. Elev (ft)          * 1555.84  * Reach Len. (ft)         *  522.48  *  633.85  *
378.67  *
* Crit W.S. (ft)          * 1555.51  * Flow Area (sq ft)       *  406.41  *  134.34  *
350.47  *
* E.G. Slope (ft/ft)      *0.005723  * Area (sq ft)            *  406.41  *  134.34  *
350.47  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  553.82  *  206.92  *
439.26  *
* Top Width (ft)          * 1861.09  * Top Width (ft)          *  885.80  *  189.60  *
785.68  *
* Vel Total (ft/s)        *    1.35  * Avg. Vel. (ft/s)        *    1.36  *    1.54  *
1.25  *
* Max Chl Dpth (ft)       *    1.20  * Hydr. Depth (ft)        *    0.46  *    0.71  *
0.45  *
* Conv. Total (cfs)       * 15862.3  * Conv. (cfs)             *  7320.7  *  2735.2  *
5806.4  *
* Length Wtd. (ft)        *  479.21  * Wetted Per. (ft)        *  885.85  *  189.61  *
785.71  *
* Min Ch El (ft)          * 1554.96  * Shear (lb/sq ft)        *    0.16  *    0.25  *
0.16  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    0.22  *    0.39  *
0.20  *
* Frctn Loss (ft)         *    2.67  * Cum Volume (acre-ft)    *    4.66  *   16.19  *
12.99  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   11.86  *   12.91  *
20.69  *
*****************************************************************************************
******
```

```
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.

  Profile #1
*******************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 8717.72   * 9353.74   *    66.45 *    54.92 *   249.78 *
5.54 *     0.22 *     1.21 *
* 2         * LOB       * 9353.74   * 9989.77   *   487.37 *   351.49 *   636.06 *
40.61 *     0.55 *     1.39 *
* 3         * Chan      * 9989.77   * 10179.37  *   206.92 *   134.34 *   189.61 *
17.24 *     0.71 *     1.54 *
* 4         * ROB       * 10179.37  * 10748.32  *   119.54 *   147.36 *   482.64 *
9.96 *     0.31 *     0.81 *
* 5         * ROB       * 10748.32  * 11317.27  *   319.72 *   203.12 *   303.06 *
26.64 *     0.67 *     1.57 *
*******************************************************************************************
**************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.287

INPUT
Description: Use results at sec 0.280 of -10W-Reach2  for right FP
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9027.49  1554.9 9057.44 1554.65 9127.17 1554.23 9152.79  1554.1 9163.71    1554
 9179.55 1553.86 9186.46 1553.79 9190.01    1554 9191.96    1554 9194.55 1554.25
 9200.78 1554.42 9204.42    1554  9208.5  1553.9 9217.15 1553.96 9236.41 1553.89
 9276.14 1553.29 9318.29 1553.18 9349.02    1553 9402.64 1553.21 9433.82 1553.51
 9434.46 1553.23  9544.8 1552.77 9567.22  1552.7 9798.99  1553.3 9820.561553.146
  9838.1 1553.02 9858.95  1552.7 9869.83 1552.61 9889.69 1552.41 9905.29  1552.2
 9916.11 1552.08 9922.42    1552 9927.49 1551.93 9970.24 1551.37 9994.31  1551.6
10017.24 1551.8410087.94 1551.9210135.39    155210183.02 1552.1110184.23 1552.11
10195.18 1552.1210316.88 1552.3210355.32  1552.410431.37 1552.77   10469 1553.04
10529.18 1553.1610548.35 1553.2410555.41  1553.310591.08 1553.5910612.82 1553.77
10618.62 1553.8310620.21 1553.8310725.01 1553.27 10768.3 1553.3810807.37 1553.29
10853.32 1553.1710865.15  1553.110909.56 1552.9410919.85  1552.711031.28  1552.8
11054.79 1553.13 11106.5 1553.1911133.391553.23411168.21 1553.29 11178.4 1553.35
11262.29  1553.611272.71  1553.611284.18 1553.7911291.35 1553.8711301.06    1554
11326.97 1554.3311344.91  1554.6 11354.1 1554.7111367.24 1554.8711421.85 1554.57
11436.78  1554.511438.61  1554.511448.24 1554.58 11457.4 1554.6411496.37 1554.91
11530.71 1554.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9027.49    .034 9820.56    .05811133.39    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9927.4910017.24           282.34  277.01  247.26             .1       .3

CROSS SECTION OUTPUT  Profile #1
*******************************************************************************************
******
```

```
* E.G. Elev (ft)          * 1553.19  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.046  *   0.058  *
0.058  *
* W.S. Elev (ft)          * 1553.14  * Reach Len. (ft)         *  282.34  *  277.01  *
247.26  *
* Crit W.S. (ft)          * 1552.66  * Flow Area (sq ft)       *  128.18  *  136.04  *
460.68  *
* E.G. Slope (ft/ft)      *0.005410  * Area (sq ft)            *  128.18  *  136.04  *
460.68  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  156.69  *  338.26  *
705.05  *
* Top Width (ft)          * 1241.91  * Top Width (ft)          *  446.16  *   89.75  *
706.00  *
* Vel Total (ft/s)        *    1.66  * Avg. Vel. (ft/s)        *    1.22  *    2.49  *
1.53  *
* Max Chl Dpth (ft)       *    1.77  * Hydr. Depth (ft)        *    0.29  *    1.52  *
0.65  *
* Conv. Total (cfs)       * 16314.3  * Conv. (cfs)             *  2130.3  *  4598.7  *
9585.3  *
* Length Wtd. (ft)        *  265.32  * Wetted Per. (ft)        *  446.17  *   89.76  *
706.01  *
* Min Ch El (ft)          * 1551.37  * Shear (lb/sq ft)        *    0.10  *    0.51  *
0.22  *
* Alpha                   *    1.21  * Stream Power (lb/ft s) *    0.12  *    1.27  *
0.34  *
* Frctn Loss (ft)         *    2.18  * Cum Volume (acre-ft)    *    1.45  *   14.22  *
9.46  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    3.87  *   10.87  *
14.21  *
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
*************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9027.49   * 9477.49   *     2.55 *     5.09 *    80.70 *
0.21 *     0.06 *     0.50 *
* 2         * LOB       * 9477.49   * 9927.49   *   154.14 *   123.09 *   365.48 *
12.84 *     0.34 *     1.25 *
* 3         * Chan      * 9927.49   * 10017.24  *   338.26 *   136.04 *    89.76 *
28.19 *     1.52 *     2.49 *
* 4         * ROB       * 10017.24  * 10773.97  *   660.20 *   404.43 *   501.60 *
55.02 *     0.81 *     1.63 *
* 5         * ROB       * 10773.97  * 11530.71  *    44.85 *    56.25 *   204.41 *
3.74 *     0.28 *     0.80 *
*****************************************************************************************
*************************

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.
```

CROSS SECTION

RIVER: T4N-R3W-S10W
REACH: REACH-1 RS: 0.235

INPUT
Description: Use results at sec 0.232 of -10W-Reach2 for right FP
Station Elevation Data num= 84

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9056.77  1553.3 9067.11 1553.61 9079.26 1553.23 9096.13 1553.31 9176.91 1553.42
 9227.46 1553.26 9253.32  1553.1 9263.32 1552.95 9337.85 1552.69 9348.26  1552.6
 9350.41  1552.6 9400.37    1552 9417.48 1551.79 9421.83  1551.7 9433.16 1551.72
 9446.36    1552 9455.14    1552 9474.36  1552.3 9497.67 1552.13 9504.85    1552
 9513.23    1552 9530.48 1551.62 9558.37 1551.49 9590.83 1551.28 9610.42 1551.16
 9700.14 1550.92 9705.02 1550.92 9754.52 1551.27 9774.65    1551 9805.05 1550.35
  9822.1 1550.05    9825 1550.05 9863.06    1550 9871.211549.975 9909.04 1549.86
 9931.06  1549.8 9938.03 1549.73 9945.35 1549.67 9996.53  1549.810031.33 1549.95
10098.01    155010145.84 1550.1110168.08 1550.1810229.61  1550.310301.92  1550.5
10327.12 1550.6110411.18 1550.7210423.12  1550.8 10467.2 1551.0810513.29 1551.57
 10577.1 1551.6510578.54  1551.610579.08 1551.6510580.38 1551.6510612.98  1551.8
10692.32 1551.5610726.75  1551.410763.92  1551.710786.14 1551.83 10822.7 1551.62
10842.76 1551.5410860.38 1551.2910899.77  1551.110923.06 1550.9710940.35 1550.76
10942.57 1550.3410945.61 1550.7710946.43 1550.8910947.66 1550.9611000.33 1551.04
 11078.41551.282 11093.7 1551.3311148.53    155211149.09    155211158.34 1552.12
11164.14 1552.1911164.39 1552.1911182.15 1552.2911228.17 1552.16 11256.3 1552.85
11279.66 1553.0611363.27  1552.811410.11 1552.6211489.45 1552.95
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9056.77    .034 9871.21    .058 11078.4    .034
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9822.110098.01            417.19  412.87  317.54             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
******
* E.G. Elev (ft)          * 1551.00  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.034  *   0.053  *
0.058  *
* W.S. Elev (ft)          * 1550.87  * Reach Len. (ft)         *  417.19  *  412.87  *
317.54  *
* Crit W.S. (ft)          * 1550.62  * Flow Area (sq ft)       *   17.52  *  267.81  *
154.99  *
* E.G. Slope (ft/ft)      *0.013900  * Area (sq ft)            *   17.52  *  267.81  *
154.99  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *   51.11  *  873.57  *
275.32  *
* Top Width (ft)          *  666.79  * Top Width (ft)          *   41.11  *  275.91  *
349.77  *
* Vel Total (ft/s)        *    2.73  * Avg. Vel. (ft/s)        *    2.92  *    3.26  *
1.78  *
* Max Chl Dpth (ft)       *    1.19  * Hydr. Depth (ft)        *    0.43  *    0.97  *
0.44  *
* Conv. Total (cfs)       * 10178.4  * Conv. (cfs)             *   433.5  *  7409.6  *
2335.3  *
* Length Wtd. (ft)        *  390.39  * Wetted Per. (ft)        *   41.12  *  275.91  *
349.85  *
* Min Ch El (ft)          * 1549.67  * Shear (lb/sq ft)        *    0.37  *    0.84  *
0.38  *
* Alpha                   *    1.19  * Stream Power (lb/ft s) *    1.08  *    2.75  *
0.68  *
* Frctn Loss (ft)         *    1.69  * Cum Volume (acre-ft)    *    0.98  *   12.94  *
7.72  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    2.29  *    9.71  *
11.21  *
```

```
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
***************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9439.44   * 9822.10   *    51.11 *    17.52 *    41.12 *
4.26 *     0.43 *     2.92 *
* 2         * Chan      * 9822.10   * 10098.01  *   873.57 *   267.81 *   275.91 *
72.80 *     0.97 *     3.26 *
* 3         * ROB       * 10098.01  * 10793.73  *   273.55 *   152.88 *   335.26 *
22.80 *     0.46 *     1.79 *
* 4         * ROB       * 10793.73  * 11489.45  *     1.77 *     2.12 *    14.59 *
0.15 *     0.15 *     0.83 *
*****************************************************************************************
***************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.157

INPUT
Description: Use results at sec 0.165 of -10W-Reach2  for right FP
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9036.94  1550.1 9099.34 1550.24 9122.58 1550.11 9132.52    1550 9146.59 1550.07
 9227.17 1550.11 9231.65 1550.11 9260.39    1550 9295.91  1549.9    9315 1549.85
 9373.61 1549.67 9447.59 1549.84 9463.33 1549.77 9514.15 1549.77 9539.13 1549.85
 9606.25 1549.64 9637.77 1549.45 9684.86 1549.32 9717.46  1548.9 9734.58 1548.64
 9772.43 1548.36  9782.7 1548.28    98181548.005 9818.61    1548 9818.76    1548
 9849.07 1547.77 9849.96 1547.77  9878.61547.787 9900.66  1547.810044.07 1547.85
10057.19  1547.910104.87    154810163.04 1548.1910206.49 1548.3610326.19 1548.01
10327.24    154810365.35  1548.410469.82 1548.68 10523.3 1548.9110538.89 1548.97
10550.88 1549.0310651.53  1549.110660.17 1549.2210786.98  1549.610896.27 1549.37
10896.53 1549.3710926.921549.45310981.17  1549.610995.73  1549.711004.43 1549.77
11032.52    155011099.09 1550.5211103.74  1550.611110.83  1550.611114.69 1550.62
11170.73 1550.4111241.94  1550.811256.92 1550.8711366.25 1551.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9036.94    .034  9878.6    .05810926.92    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9782.710163.04           361.06  367.18  377.28             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
******
* E.G. Elev (ft)          * 1549.28  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.034  *   0.050  *
0.058  *
* W.S. Elev (ft)          * 1549.24  * Reach Len. (ft)         *  361.06  *  367.18  *
377.28  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   50.35  *  506.25  *
333.96  *
* E.G. Slope (ft/ft)      *0.002077  * Area (sq ft)            *   50.35  *  506.25  *
333.96  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *   67.11  *  837.00  *
295.89  *
* Top Width (ft)          *  977.39  * Top Width (ft)          *   91.94  *  380.34  *
505.11  *
* Vel Total (ft/s)        *    1.35  * Avg. Vel. (ft/s)        *    1.33  *    1.65  *
0.89  *
* Max Chl Dpth (ft)       *    1.47  * Hydr. Depth (ft)        *    0.55  *    1.33  *
0.66  *
* Conv. Total (cfs)       * 26333.8  * Conv. (cfs)             *  1472.8  * 18367.8  *
6493.2  *
* Length Wtd. (ft)        *  370.05  * Wetted Per. (ft)        *   91.94  *  380.34  *
505.12  *
* Min Ch El (ft)          * 1547.77  * Shear (lb/sq ft)        *    0.07  *    0.17  *
0.09  *
* Alpha                   *    1.21  * Stream Power (lb/ft s)  *    0.09  *    0.29  *
0.08  *
* Frctn Loss (ft)         *    2.14  * Cum Volume (acre-ft)    *    0.65  *    9.27  *
5.93  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    1.65  *    6.60  *
8.09  *
*****************************************************************************************
******
```

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.
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.

Profile #1

```
*****************************************************************************************
**************************
*          * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*          *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1        * LOB       * 9409.82   * 9782.70   *    67.11 *    50.35 *    91.94 *
5.59 *     0.55 *     1.33 *
* 2        * Chan      * 9782.70   * 10163.04  *   837.00 *   506.25 *   380.34 *
69.75 *     1.33 *     1.65 *
* 3        * ROB       * 10163.04  * 10764.64  *   295.89 *   333.96 *   505.12 *
24.66 *     0.66 *     0.89 *
*****************************************************************************************
**************************
```

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.

CROSS SECTION

```
RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.087

INPUT
Description: Use results at sec 0.092 of -10W-Reach2  for right FP
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8922.12  1548.6  8940.4 1548.54 8998.18 1548.22 9004.71 1548.19 9006.84 1548.19
 9066.93 1548.27 9131.56 1548.13 9144.28 1548.12 9212.86 1548.03 9260.06 1547.98
 9333.41  1547.7 9368.19 1547.74 9420.87    1548 9423.44    1548 9447.15 1548.13
  9476.7 1548.25 9552.55 1548.17 9566.49  1548.1 9577.28    1548 9597.35 1547.83
 9618.33 1547.72 9674.95 1547.79 9716.84 1547.69 9760.22 1547.16 9791.35    1547
 9794.17 1547.09 9826.16 1546.84 9841.461546.716 9879.26 1546.41 9930.57    1546
 9931.15    1546 9938.93 1545.94 9950.49 1545.8410003.61 1545.9910006.78    1546
10054.94 1546.2810075.79  1546.410108.39 1546.55 10200.5 1546.32 10240.5 1546.07
10256.44    154610257.33    154610261.21    154610266.38  1546.110305.77 1546.34
10364.42 1546.78 10399.2 1546.9910417.41 1547.0810431.75  1547.210670.25 1546.86
10679.52  1546.810697.45 1546.8610760.43 1546.9810793.37 1546.9110843.931547.036
10861.34 1547.0810873.67  1547.210882.19  1547.310889.34 1547.3710926.11 1547.74
10937.89 1547.8510955.48    154810955.67    154810984.73 1548.2910995.21 1548.38
11085.74 1548.5911098.74 1548.6511114.97  1548.811148.51 1549.0111187.14 1549.25
11241.24  1549.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8922.12    .034 9841.46    .05810843.93    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9879.2610108.39           478.37  459.27  508.61          .1        .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)         * 1547.11  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.27  * Wt. n-Val.              *   0.057  *   0.058  *
0.058  *
* W.S. Elev (ft)         * 1546.84  * Reach Len. (ft)         *  478.37  *  459.27  *
508.61  *
* Crit W.S. (ft)         * 1546.84  * Flow Area (sq ft)       *   11.46  *  158.86  *
125.77  *
* E.G. Slope (ft/ft)     *0.052143  * Area (sq ft)            *   11.46  *  158.86  *
125.77  *
* Q Total (cfs)          * 1200.00  * Flow (cfs)              *   27.67  *  727.97  *
444.36  *
* Top Width (ft)         *  566.94  * Top Width (ft)          *   53.21  *  229.13  *
284.60  *
* Vel Total (ft/s)       *    4.05  * Avg. Vel. (ft/s)        *    2.41  *    4.58  *
3.53  *
* Max Chl Dpth (ft)      *    1.00  * Hydr. Depth (ft)        *    0.22  *    0.69  *
0.44  *
* Conv. Total (cfs)      *  5255.1  * Conv. (cfs)             *   121.2  *  3188.0  *
1946.0  *
* Length Wtd. (ft)       *  477.24  * Wetted Per. (ft)        *   53.21  *  229.13  *
284.61  *
* Min Ch El (ft)         * 1545.84  * Shear (lb/sq ft)        *    0.70  *    2.26  *
1.44  *
* Alpha                  *    1.07  * Stream Power (lb/ft s) *    1.69  *   10.34  *
5.08  *
* Frctn Loss (ft)        *    0.46  * Cum Volume (acre-ft)    *    0.40  *    6.46  *
3.94  *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)          *    1.05  *    4.03  *
4.67  *
*****************************************************************************************
******

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.

  Profile #1
*******************************************************************************************
***************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9400.69   * 9879.26   *    27.67 *    11.46 *    53.21 *
2.31 *     0.22 *     2.41 *
* 2         * Chan      * 9879.26   * 10108.39  *   727.97 *   158.86 *   229.13 *
60.66 *     0.69 *     4.58 *
* 3         * ROB       * 10108.39  * 10674.81  *   444.19 *   125.40 *   267.71 *
37.02 *     0.47 *     3.54 *
* 4         * ROB       * 10674.81  * 11241.24  *     0.17 *     0.37 *    16.90 *
0.01 *     0.02 *     0.46 *
*******************************************************************************************
***************************

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.

CROSS SECTION


RIVER: T4N-R3W-S10W
REACH: REACH-1            RS: 0.000

INPUT
Description: Section at ponding area of known WS elev. at 1545.10
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9607.75  1545.2 9647.25  1544.9 9668.99 1544.78 9682.01 1544.72 9723.29 1544.57
 9759.39    1544 9762.98    1544 9795.47 1543.53 9812.23 1543.29 9826.06 1543.11
 9831.091543.051 9858.45 1542.73 9870.81 1542.82 9879.52 1542.87 9958.99  1542.8
10054.51 1542.7110100.43 1542.6610111.08  1542.810115.31 1542.8810119.05 1543.12
10130.16 1543.0510159.65 1543.3110233.82  1543.510251.53  1543.610258.74 1543.69
10262.73  1543.710295.26    154410304.89 1544.0910348.64  1544.610369.38 1544.83
10374.76 1545.2710420.38 1544.5610453.37  1544.110457.07 1544.0410460.07 1543.96
 10476.5    154410548.47 1543.5610573.77 1543.3110574.49 1543.3110576.29 1543.21
```

```
 10582.9  1543.410584.18  1543.4 10602.8 1543.3710608.33 1543.0210611.96 1542.66
10616.38    154310623.14 1542.9810638.66 1542.9310694.54 1543.7710703.661543.899
10710.83    154410715.38 1544.0710733.29  1544.310742.14 1544.4210781.15 1544.83
10781.31 1544.8310818.46  1544.910824.24 1544.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9607.75    .034 9831.09    .05810374.76    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9759.3910295.26                0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)         * 1545.11  * Element                *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.01  * Wt. n-Val.             *   0.034  *   0.055  *
0.035  *
* W.S. Elev (ft)         * 1545.10  * Reach Len. (ft)        *          *          *
*
* Crit W.S. (ft)         * 1543.54  * Flow Area (sq ft)      *   61.05  * 1067.37  *
549.56  *
* E.G. Slope (ft/ft)     *0.000275  * Area (sq ft)           *   61.05  * 1067.37  *
549.56  *
* Q Total (cfs)          * 1200.00  * Flow (cfs)             *   25.60  *  765.38  *
409.01  *
* Top Width (ft)         * 1190.32  * Top Width (ft)         *  138.47  *  535.87  *
515.97  *
* Vel Total (ft/s)       *    0.72  * Avg. Vel. (ft/s)       *    0.42  *    0.72  *
0.74  *
* Max Chl Dpth (ft)      *    2.44  * Hydr. Depth (ft)       *    0.44  *    1.99  *
1.07  *
* Conv. Total (cfs)      * 72425.8  * Conv. (cfs)            *  1545.3  * 46194.7  *
24685.9  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)       *  138.48  *  535.89  *
516.20  *
* Min Ch El (ft)         * 1542.66  * Shear (lb/sq ft)       *    0.01  *    0.03  *
0.02  *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *    0.00  *    0.02  *
0.01  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)   *          *          *
*
* C & E Loss (ft)        *          * Cum SA (acres)         *          *          *
*
*****************************************************************************************
******

Warning: Divided flow computed for this cross-section.

  Profile #1
*****************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9607.75   * 9683.57   *     3.10 *    13.44 *    62.65 *
0.26 *     0.21 *     0.23 *
* 2         * LOB       * 9683.57   * 9759.39   *    22.50 *    47.61 *    75.82 *
1.87 *     0.63 *     0.47 *
* 3         * Chan      * 9759.39   * 10295.26  *   765.38 *  1067.37 *   535.89 *
63.78 *     1.99 *     0.72 *
* 4         * ROB       * 10295.26  * 10559.75  *   141.06 *   224.90 *   251.51 *
11.75 *     0.89 *     0.63 *
* 5         * ROB       * 10559.75  * 10824.24  *   267.96 *   324.66 *   264.69 *
22.33 *     1.23 *     0.83 *
*****************************************************************************************
**************************
```

Warning: Divided flow computed for this cross-section.

****

SUMMARY OF MANNING'S N VALUES

River:T4N-R3W-S10W

Reach	River Sta.	n1	n2	n3
REACH-1	0.913	.038	.06	.038
REACH-1	0.801	.036	.059	.036
REACH-1	0.708	.036	.059	.036
REACH-1	0.601	.034	.058	.034
REACH-1	0.514	.034	.058	.034
REACH-1	0.407	.034	.058	.034
REACH-1	0.287	.034	.058	.034
REACH-1	0.235	.034	.058	.034
REACH-1	0.157	.034	.058	.034
REACH-1	0.087	.034	.058	.034
REACH-1	0.000	.034	.058	.034

****

SUMMARY OF REACH LENGTHS

River: T4N-R3W-S10W

Reach	River Sta.	Left	Channel	Right
REACH-1	0.913	540.32	590.93	463.42
REACH-1	0.801	433.79	491.14	474.33
REACH-1	0.708	641.83	565.87	419.23
REACH-1	0.601	485.66	458.49	490.53
REACH-1	0.514	583.37	564.17	601.57
REACH-1	0.407	522.48	633.85	378.67
REACH-1	0.287	282.34	277.01	247.26
REACH-1	0.235	417.19	412.87	317.54
REACH-1	0.157	361.06	367.18	377.28
REACH-1	0.087	478.37	459.27	508.61
REACH-1	0.000	0	0	0

****

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: T4N-R3W-S10W

Reach	River Sta.	Contr.	Expan.
REACH-1	0.913	.1	.3
REACH-1	0.801	.1	.3
REACH-1	0.708	.1	.3
REACH-1	0.601	.1	.3
REACH-1	0.514	.1	.3
REACH-1	0.407	.1	.3
REACH-1	0.287	.1	.3
REACH-1	0.235	.1	.3
REACH-1	0.157	.1	.3
REACH-1	0.087	.1	.3
REACH-1	0.000	.1	.3

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

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: WITTMANN ZONE AE- T4N-R3W-S10W_REACH_2
Project File : Wittmann Zone AE-T4N -R3W-S10W_REACH_2.prj
Run Date and Time: 7/27/2006 12:00:57 PM

Project in English units

Project Description:
WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY, Contract FCD2004C066

Prepared by Primatech, LLC.
Modeled by George Lopez-Cepero,
P.E., Waleed Aboshanp, Ph.D., P.E., and Panduranga Kuruva, E.I.T.

HEC-RAS
Version 3.1.3 was utilized for floodplain delineation.
Filename : WITTMANN
ZONE AE-T4N-R3W-S10W_REACH_2.PRJ

Vertical datum: NAVD1988

Topography and
aerial photography provided by FCDMC, origin is the Wittmann ADMS/ADMSU (FCD 2002C029), flight dates are 04/18/02, 04/19/02 and 04/23/02 at 1:7200 ratio and 04/23/02 at 1:14400 ratio.

DTM data provided by Wittmann ADMSU
consultant from contract FCD 2002C029.

Manning's 'n' values were determined
by field reconnaissance; see the Technical Data Notebook for more detailed information.

Flow rates are from the Hydrology Computations Appendix of the Technical Data Notebook; please refer to the Flow Rate Exhibit and the computations for the interpolated and intermediate values.

From review of
initial modeling of T4N-R3W-S10W with the topographic information, we determined that split flow may occur downstream of section RM 0.407 in T4N-R3W-S10W model. This model is for the split flow reach that is named T4N-R3W-S10W-Reach 2. Reach 2 runs from RM 0.407 in the T4N-R3W-S10W to the downstream end. This model is used to better determine the west boundary of the flood plain.

****

PLAN DATA

```
Plan Title: FLOODPLAIN
Plan File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann  Zone
AE-T4N -R3W-S10W_REACH_2.p02

           Geometry Title: -R2
           Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\Wittmann  Zone AE-T4N -R3W-S10W_REACH_2.g01

           Flow Title    : FLOODPLAIN
           Flow File     : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-
RAS\Wittmann  Zone AE-T4N -R3W-S10W_REACH_2.f01

Plan Summary Information:
Number of:  Cross Sections =    6    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

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


*****************************************************************************

FLOW DATA

Flow Title: FLOODPLAIN
Flow File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann  Zone
AE-T4N -R3W-S10W_REACH_2.f01

Flow Data (cfs)
*************************************************************
* River           Reach           RS      *              1 *
* -S10W-REACH-2   REACH-2         0.354   *            410 *
*************************************************************

Boundary Conditions
*****************************************************************************************
***************
* River           Reach           Profile          *            Upstream
Downstream    *
*****************************************************************************************
***************
* -S10W-REACH-2   REACH-2         1                *
Known WS = 1545.1 *
*****************************************************************************************
***************

*****************************************************************************

GEOMETRY DATA

Geometry Title: -R2
Geometry File : P:\M\MARI00000044\0600INFO\EP\WR\605WR Hydraulic Calcs\HEC-RAS\Wittmann
Zone AE-T4N -R3W-S10W_REACH_2.g01

CROSS SECTION


RIVER: -S10W-REACH-2
REACH: REACH-2            RS: 0.354
```

```
INPUT
Description: Flow rate starting at this cross-section is 410 cfs.
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9546.43 1555.93 9546.87 1555.93 9560.91 1555.94 9569.93  1555.9 9582.23 1555.89
 9586.94 1555.88 9596.53 1555.86 9634.59 1555.53 9640.76  1555.5 9645.33 1555.47
 9651.98 1555.43 9654.77  1555.4 9656.04 1555.39 9657.29  1555.4 9658.06 1555.37
 9676.75 1555.38 9698.65 1555.54 9709.98 1555.52 9712.32  1555.5 9714.51 1555.53
 9716.07 1555.549734.0381555.488 9740.08 1555.47 9744.87 1555.48 9840.27  1555.7
 9842.78 1555.74 9845.76 1555.73 9862.91 1555.58 9962.72 1554.64   10000  1554.8
10000.79  1554.810041.29    1555 10055.3 1555.0110057.81 1555.0410072.37 1555.29
10073.56  1555.310115.52 1555.3410127.981555.38910133.17 1555.4110163.681555.446
10209.03  1555.510228.45 1555.8110244.18    155610246.13 1556.0310264.04 1556.29
10280.33 1556.4310351.18 1557.2810355.36  1557.310408.41    155810412.71 1558.05
10430.23 1558.2810438.73 1558.3910463.01  1558.710467.26  1558.710496.35 1558.39
10496.55 1558.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9546.43    .0349734.038    .05810163.68    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9862.9110072.37         372.3537394.0056376.6388             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)         * 1555.80  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.039  *   0.058  *
0.050  *
* W.S. Elev (ft)         * 1555.76  * Reach Len. (ft)         *  372.35  *  394.01  *
376.64  *
* Crit W.S. (ft)         * 1555.53  * Flow Area (sq ft)       *   54.26  *  160.88  *
51.49  *
* E.G. Slope (ft/ft)     *0.006810  * Area (sq ft)            *   54.26  *  160.88  *
51.49  *
* Q Total (cfs)          *  410.00  * Flow (cfs)              *   61.69  *  285.28  *
63.03  *
* Top Width (ft)         *  617.73  * Top Width (ft)          *  255.16  *  209.46  *
153.11  *
* Vel Total (ft/s)       *    1.54  * Avg. Vel. (ft/s)        *    1.14  *    1.77  *
1.22  *
* Max Chl Dpth (ft)      *    1.12  * Hydr. Depth (ft)        *    0.21  *    0.77  *
0.34  *
* Conv. Total (cfs)      *  4968.2  * Conv. (cfs)             *   747.5  *  3456.9  *
763.8  *
* Length Wtd. (ft)       *  387.11  * Wetted Per. (ft)        *  255.16  *  209.47  *
153.12  *
* Min Ch El (ft)         * 1554.64  * Shear (lb/sq ft)        *    0.09  *    0.33  *
0.14  *
* Alpha                  *    1.10  * Stream Power (lb/ft s) *    0.10  *    0.58  *
0.18  *
* Frctn Loss (ft)        *    2.08  * Cum Volume (acre-ft)    *    5.41  *    4.47  *
1.53  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *   12.11  *    6.44  *
4.09  *
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
***************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
```

```
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9546.43   * 9704.67   *    37.59 *    25.43 *    96.92 *
9.17 *     0.26 *     1.48 *
* 2         * LOB       * 9704.67   * 9862.91   *    24.10 *    28.83 *   158.24 *
5.88 *     0.18 *     0.84 *
* 3         * Chan      * 9862.91   * 10072.37  *   285.28 *   160.88 *   209.47 *
69.58 *     0.77 *     1.77 *
* 4         * ROB       * 10072.37  * 10284.46  *    63.03 *    51.49 *   153.12 *
15.37 *     0.34 *     1.22 *
*****************************************************************************************
*************************

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: -S10W-REACH-2
REACH: REACH-2            RS: 0.280

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9537.13 1553.83  9554.5 1553.74 9641.93 1553.27 9685.22 1553.389691.1031553.366
 9724.29 1553.29 9770.24 1553.17 9782.07  1553.1 9826.48 1552.94 9836.77  1552.7
  9948.2  1552.8 9971.71 1553.13   10000 1553.1610023.42 1553.1910050.311553.234
10070.941553.26710085.13 1553.2910095.32 1553.3510179.21  1553.610189.63  1553.6
 10201.1 1553.7910208.27 1553.8710217.98    155410243.89 1554.3310261.83  1554.6
10271.02 1554.7110284.16 1554.8710338.77 1554.57 10353.7  1554.510355.53  1554.5
10365.16 1554.5810374.32 1554.6410413.29 1554.9110447.63 1554.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9537.13    .0349691.103    .05810070.94    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9782.07 9971.71         263.0717250.5428245.7531             .1       .3

CROSS SECTION OUTPUT  Profile #1
*****************************************************************************************
******
* E.G. Elev (ft)          * 1553.72  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.046  *   0.058  *
0.049  *
* W.S. Elev (ft)          * 1553.69  * Reach Len. (ft)         *  263.07  *  250.54  *
245.75  *
* Crit W.S. (ft)          * 1553.40  * Flow Area (sq ft)       *   74.57  *  161.18  *
79.04  *
* E.G. Slope (ft/ft)      *0.004343  * Area (sq ft)            *   74.57  *  161.18  *
79.04  *
* Q Total (cfs)           *  410.00  * Flow (cfs)              *   80.65  *  244.17  *
85.18  *
* Top Width (ft)          *  632.15  * Top Width (ft)          *  218.94  *  189.64  *
223.57  *
* Vel Total (ft/s)        *    1.30  * Avg. Vel. (ft/s)        *    1.08  *    1.51  *
1.08  *
* Max Chl Dpth (ft)       *    0.99  * Hydr. Depth (ft)        *    0.34  *    0.85  *
0.35  *
* Conv. Total (cfs)       *  6221.4  * Conv. (cfs)             *  1223.8  *  3705.1  *
1292.5  *
* Length Wtd. (ft)        *  252.07  * Wetted Per. (ft)        *  218.94  *  189.65  *
223.57  *
* Min Ch El (ft)          * 1552.70  * Shear (lb/sq ft)        *    0.09  *    0.23  *
0.10  *
```

```
* Alpha                    *    1.08  * Stream Power (lb/ft s) *    0.10  *    0.35  *
0.10  *
* Frctn Loss (ft)          *    1.90  * Cum Volume (acre-ft)   *    4.86  *    3.01  *
0.97  *
* C & E Loss (ft)          *    0.01  * Cum SA (acres)         *   10.09  *    4.63  *
2.46  *
*******************************************************************************************
******

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.

  Profile #1
*******************************************************************************************
***************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9537.13   * 9659.60   *    26.75 *    23.78 *    96.47 *
6.52 *     0.25 *     1.12 *
* 2         * LOB       * 9659.60   * 9782.07   *    53.90 *    50.80 *   122.47 *
13.15 *     0.41 *     1.06 *
* 3         * Chan      * 9782.07   * 9971.71   *   244.17 *   161.18 *   189.65 *
59.55 *     0.85 *     1.51 *
* 4         * ROB       * 9971.71   * 10209.67  *    85.18 *    79.04 *   223.57 *
20.78 *     0.35 *     1.08 *
*******************************************************************************************
***************************

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.

CROSS SECTION


RIVER: -S10W-REACH-2
REACH: REACH-2            RS: 0.232

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9710.48 1551.76 9775.25 1551.56 9809.68  1551.49812.6041551.424 9846.85  1551.7
 9869.07 1551.83 9905.63 1551.62 9925.69 1551.54 9943.31 1551.29  9982.7  1551.1
   10000    155110005.99 1550.9710023.28 1550.76 10025.5 1550.3410028.54 1550.77
10029.36 1550.8910030.59 1550.9610083.26 1551.0410114.181551.13610161.331551.282
10176.63 1551.3310231.46    155210232.02    155210241.27 1552.1210247.07 1552.19
10247.32 1552.1910265.08 1552.29 10311.1 1552.1610339.23 1552.8510362.59 1553.06
 10446.2  1552.810493.04 1552.6210572.38 1552.95

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
*********************************
 9710.48    .0349812.604    .058

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9982.710114.18          393.461355.5554332.8556             .1       .3

CROSS SECTION OUTPUT  Profile #1
```

```
*****************************************************************************************
******
* E.G. Elev (ft)          * 1551.82  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.051  *   0.058  *
0.058  *
* W.S. Elev (ft)          * 1551.74  * Reach Len. (ft)         *  393.46  *  355.56  *
332.86  *
* Crit W.S. (ft)          * 1551.57  * Flow Area (sq ft)       *   52.41  *   98.36  *
38.30  *
* E.G. Slope (ft/ft)      *0.016210  * Area (sq ft)            *   52.41  *   98.36  *
38.30  *
* Q Total (cfs)           *  410.00  * Flow (cfs)              *   77.90  *  264.29  *
67.80  *
* Top Width (ft)          *  460.16  * Top Width (ft)          *  232.90  *  131.48  *
95.78  *
* Vel Total (ft/s)        *    2.17  * Avg. Vel. (ft/s)        *    1.49  *    2.69  *
1.77  *
* Max Chl Dpth (ft)       *    1.40  * Hydr. Depth (ft)        *    0.23  *    0.75  *
0.40  *
* Conv. Total (cfs)       *  3220.3  * Conv. (cfs)             *   611.9  *  2075.8  *
532.5  *
* Length Wtd. (ft)        *  373.99  * Wetted Per. (ft)        *  232.90  *  131.56  *
95.79  *
* Min Ch El (ft)          * 1550.34  * Shear (lb/sq ft)        *    0.23  *    0.76  *
0.40  *
* Alpha                   *    1.19  * Stream Power (lb/ft s) *    0.34  *    2.03  *
0.72  *
* Frctn Loss (ft)         *    1.92  * Cum Volume (acre-ft)    *    4.47  *    2.26  *
0.64  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    8.72  *    3.71  *
1.56  *
*****************************************************************************************
******

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.

  Profile #1
*****************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9710.48   * 9846.59   *    30.79 *    20.89 *   128.76 *
7.51 *     0.16 *     1.47 *
* 2         * LOB       * 9846.59   * 9982.70   *    47.11 *    31.52 *   104.14 *
11.49 *     0.30 *     1.49 *
* 3         * Chan      * 9982.70   * 10114.18  *   264.29 *    98.36 *   131.56 *
64.46 *     0.75 *     2.69 *
* 4         * ROB       * 10114.18  * 10343.28  *    67.80 *    38.30 *    95.79 *
16.54 *     0.40 *     1.77 *
*****************************************************************************************
**************************

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.
```

CROSS SECTION

RIVER: -S10W-REACH-2
REACH: REACH-2 RS: 0.165

INPUT
Description:
Station Elevation Data num= 26

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
9698.442 1548.699748.813 1548.919764.403 1548.979776.394 1549.039877.044  1549.1
9885.684 1549.229887.7941549.226   10000 1549.5610012.49  1549.610121.78 1549.37
10122.04 1549.3710134.261549.40310152.431549.45310206.68  1549.610221.24  1549.7
10229.94 1549.7710258.03    1550 10324.6 1550.5210329.25  1550.610336.34  1550.6
 10340.2 1550.6210396.24 1550.4110467.45  1550.810482.43 1550.8710591.76 1551.63
 10603.8 1551.71
```

Manning's n Values num= 2

```
     Sta   n Val     Sta   n Val
*********************************
9698.442    .0349887.794    .058
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10012.4910206.68         366.5633387.0758378.2476             .1       .3
```

CROSS SECTION OUTPUT Profile #1

```
*****************************************************************************************
******
* E.G. Elev (ft)          * 1549.89  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.037  *   0.058  *
0.058  *
* W.S. Elev (ft)          * 1549.85  * Reach Len. (ft)         *  366.56  *  387.08  *
378.25  *
* Crit W.S. (ft)          * 1549.53  * Flow Area (sq ft)       *  218.21  *   70.90  *
4.30  *
* E.G. Slope (ft/ft)      *0.002487  * Area (sq ft)            *  218.21  *   70.90  *
4.30  *
* Q Total (cfs)           *  410.00  * Flow (cfs)              *  362.32  *   46.27  *
1.41  *
* Top Width (ft)          *  541.26  * Top Width (ft)          *  314.05  *  194.19  *
33.03  *
* Vel Total (ft/s)        *    1.40  * Avg. Vel. (ft/s)        *    1.66  *    0.65  *
0.33  *
* Max Chl Dpth (ft)       *    1.16  * Hydr. Depth (ft)        *    0.69  *    0.37  *
0.13  *
* Conv. Total (cfs)       *  8220.8  * Conv. (cfs)             *  7264.6  *   927.8  *
28.3  *
* Length Wtd. (ft)        *  370.00  * Wetted Per. (ft)        *  315.21  *  194.19  *
33.03  *
* Min Ch El (ft)          * 1549.37  * Shear (lb/sq ft)        *    0.11  *    0.06  *
0.02  *
* Alpha                   *    1.27  * Stream Power (lb/ft s) *    0.18  *    0.04  *
0.01  *
* Frctn Loss (ft)         *    2.48  * Cum Volume (acre-ft)    *    3.25  *    1.57  *
0.47  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    6.25  *    2.38  *
1.07  *
*****************************************************************************************
******
```

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.
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.

```
  Profile #1
*******************************************************************************************
*************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9698.44   * 9855.47   *   280.42 *   139.93 *   158.19 *
68.40 *     0.89 *     2.00 *
* 2         * LOB       * 9855.47   * 10012.49  *    81.89 *    78.28 *   157.02 *
19.97 *     0.50 *     1.05 *
* 3         * Chan      * 10012.49  * 10206.68  *    46.27 *    70.90 *   194.19 *
11.29 *     0.37 *     0.65 *
* 4         * ROB       * 10206.68  * 10405.24  *     1.41 *     4.30 *    33.03 *
0.34 *     0.13 *     0.33 *
*******************************************************************************************
*************************

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.
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: -S10W-REACH-2
REACH: REACH-2            RS: 0.092

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
9633.853 1546.789668.595 1546.999686.805 1547.089701.145  1547.29781.3971547.086
9939.645 1546.869948.915  1546.89966.845 1546.86   10000 1546.9210029.83 1546.98
10062.76 1546.9110093.181546.98610113.331547.03610130.73 1547.0810143.06  1547.2
10151.58  1547.310158.73 1547.37 10195.5 1547.7410207.29 1547.8510224.88    1548
10225.06    154810254.13 1548.29 10264.6 1548.3810355.13 1548.5910368.13 1548.65
10384.37  1548.810417.91 1549.0110456.54 1549.2510510.63  1549.610512.76  1549.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
9633.853    .0349781.397    .05810093.18    .034

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      10029.8310130.73         446.3764484.0201501.8482             .1       .3

CROSS SECTION OUTPUT  Profile #1
*******************************************************************************************
******
* E.G. Elev (ft)          * 1547.40  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.051  *   0.049  *
0.034  *
* W.S. Elev (ft)          * 1547.27  * Reach Len. (ft)         *  446.38  *  484.02  *
501.85  *
* Crit W.S. (ft)          * 1547.27  * Flow Area (sq ft)       *  109.09  *   28.96  *
1.73  *
* E.G. Slope (ft/ft)      *0.052174  * Area (sq ft)            *  109.09  *   28.96  *
1.73  *
* Q Total (cfs)           *  410.00  * Flow (cfs)              *  318.05  *   88.30  *
3.64  *
```

```
* Top Width (ft)          *  514.80  * Top Width (ft)          *  395.98  *  100.90  *
17.92  *
* Vel Total (ft/s)        *    2.93  * Avg. Vel. (ft/s)        *    2.92  *    3.05  *
2.10  *
* Max Chl Dpth (ft)       *    0.49  * Hydr. Depth (ft)        *    0.28  *    0.29  *
0.10  *
* Conv. Total (cfs)       *  1795.0  * Conv. (cfs)             *  1392.4  *   386.6  *
16.0  *
* Length Wtd. (ft)        *  460.76  * Wetted Per. (ft)        *  396.47  *  100.90  *
17.92  *
* Min Ch El (ft)          * 1546.91  * Shear (lb/sq ft)        *    0.90  *    0.93  *
0.31  *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *    2.61  *    2.85  *
0.66  *
* Frctn Loss (ft)         *    0.93  * Cum Volume (acre-ft)    *    1.87  *    1.13  *
0.45  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    3.26  *    1.07  *
0.85  *
*******************************************************************************************
******

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 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.
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.

  Profile #1
*******************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
* 1         * LOB       * 9633.85   * 9831.84   *   119.58 *    39.94 *   198.48 *
29.17 *     0.20 *     2.99 *
* 2         * LOB       * 9831.84   * 10029.83  *   198.47 *    69.14 *   197.99 *
48.41 *     0.35 *     2.87 *
* 3         * Chan      * 10029.83  * 10130.73  *    88.30 *    28.96 *   100.90 *
21.54 *     0.29 *     3.05 *
* 4         * ROB       * 10130.73  * 10321.75  *     3.64 *     1.73 *    17.92 *
0.89 *     0.10 *     2.10 *
*******************************************************************************************
**************************

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 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.
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: -S10W-REACH-2
REACH: REACH-2            RS: 0.000

INPUT
Description: Section at ponding area of known WS elev. at 1545.10
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
9740.706  1544.69761.446 1544.839766.826 1545.279812.446 1544.569845.436  1544.1
9849.136 1544.049852.136 1543.969860.204 1543.989868.566    15449940.536 1543.56
9965.836 1543.319966.556 1543.319968.356 1543.219974.966  1543.49976.246  1543.4
9994.866 1543.37   10000 1543.05 10000.4 1543.0210004.03 1542.6610008.45    1543
10015.21 1542.9810030.73 1542.9310038.611543.04910086.61 1543.7710095.731543.899
 10102.9    154410107.45 1544.0710125.36  1544.310134.21 1544.4210173.22 1544.83
10173.38 1544.8310210.53  1544.910216.31 1544.96

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
*******************************
9740.706    .0349860.204    .058

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9994.86610086.61                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #1
*********************************************************************************************
******
* E.G. Elev (ft)          * 1545.11  * Element                 *  Left OB *  Channel *
Right OB *
* Vel Head (ft)           *    0.01  * Wt. n-Val.              *   0.053  *   0.058  *
0.058  *
* W.S. Elev (ft)          * 1545.10  * Reach Len. (ft)         *          *          *
*
* Crit W.S. (ft)          * 1543.92  * Flow Area (sq ft)       *  256.40  *  174.09  *
75.85  *
* E.G. Slope (ft/ft)      *0.000618  * Area (sq ft)            *  256.40  *  174.09  *
75.85  *
* Q Total (cfs)           *  410.00  * Flow (cfs)              *  206.35  *  169.89  *
33.76  *
* Top Width (ft)          *  462.60  * Top Width (ft)          *  241.15  *   91.74  *
129.70  *
* Vel Total (ft/s)        *    0.81  * Avg. Vel. (ft/s)        *    0.80  *    0.98  *
0.45  *
* Max Chl Dpth (ft)       *    2.44  * Hydr. Depth (ft)        *    1.06  *    1.90  *
0.58  *
* Conv. Total (cfs)       * 16492.6  * Conv. (cfs)             *  8300.7  *  6833.9  *
1358.1  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *  241.68  *   91.79  *
129.85  *
* Min Ch El (ft)          * 1542.66  * Shear (lb/sq ft)        *    0.04  *    0.07  *
0.02  *
* Alpha                   *    1.12  * Stream Power (lb/ft s) *    0.03  *    0.07  *
0.01  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *          *          *
*
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *
*
*********************************************************************************************
******

Warning: Divided flow computed for this cross-section.
```

```
  Profile #1
*****************************************************************************************
**************************
*           * Pos       * Left Sta  * Right Sta *     Flow *     Area *     W.P. *
Percent *     Hydr * Velocity *
*           *           * (ft)      * (ft)      *    (cfs) *  (sq ft) *     (ft) *
Conv *Depth(ft) *   (ft/s) *
*           *           *           *           *          *          *          *
*          *          *
*****************************************************************************************
**************************

Warning: Divided flow computed for this cross-section.

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:-S10W-REACH-2
*****************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*REACH-2         *    0.354       *     .034*     .058*     .034*
*REACH-2         *    0.280       *     .034*     .058*     .034*
*REACH-2         *    0.232       *     .034*     .058*         *
*REACH-2         *    0.165       *     .034*     .058*         *
*REACH-2         *    0.092       *     .034*     .058*     .034*
*REACH-2         *    0.000       *     .034*     .058*         *
*****************************************************************

*****************************************************************************

SUMMARY OF REACH LENGTHS

River: -S10W-REACH-2
*****************************************************************
*     Reach      *   River Sta.   *  Left   * Channel *  Right  *
*****************************************************************
*REACH-2         *    0.354       * 372.3537* 394.0056* 376.6388*
*REACH-2         *    0.280       * 263.0717* 250.5428* 245.7531*
*REACH-2         *    0.232       *  393.461* 355.5554* 332.8556*
*REACH-2         *    0.165       * 366.5633* 387.0758* 378.2476*
*REACH-2         *    0.092       * 446.3764* 484.0201* 501.8482*
*REACH-2         *    0.000       *        0*        0*        0*
*****************************************************************

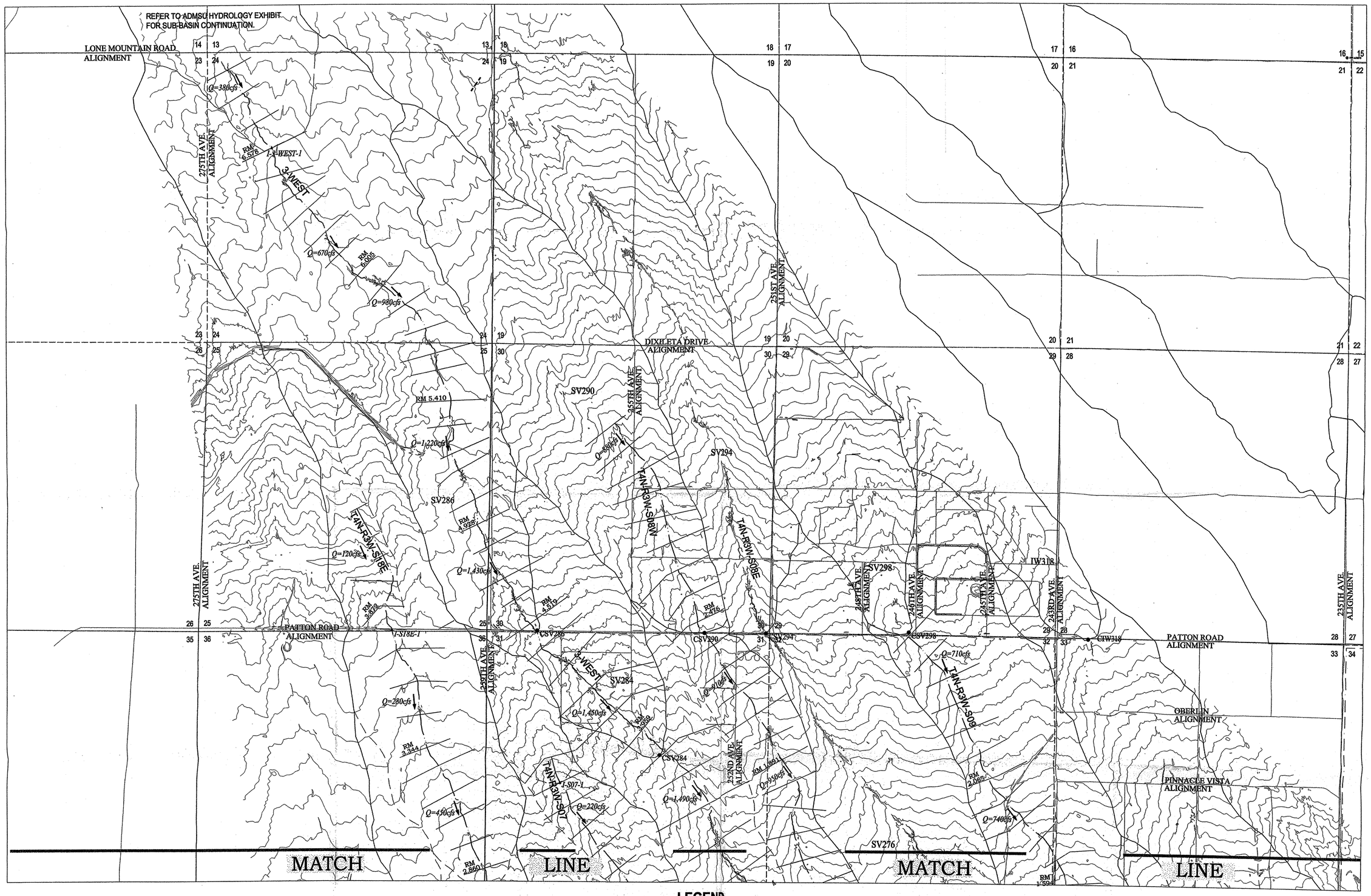
*****************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: -S10W-REACH-2

*****************************************************
*     Reach      *   River Sta.   * Contr.  * Expan.  *
*****************************************************
*REACH-2         *    0.354   *       .1*       .3*
*REACH-2         *    0.280   *       .1*       .3*
*REACH-2         *    0.232   *       .1*       .3*
*REACH-2         *    0.165   *       .1*       .3*
*REACH-2         *    0.092   *       .1*       .3*
*REACH-2         *    0.000   *       .1*       .3*
*****************************************************
```

Appendix F Erosion and Sediment Transport Analysis

No erosion and sediment transport was required for this study.



LEGEND

Wittmann ADMSU Basin	Section Line
Sub-Basin Boundary	Cross-Section
Matchline	Thalweg
4 Section Number	*I-S07-1 Intermediate Concentration Point (CP)
	•CSV284 Wittmann ADMSU CP
	SV272 Wittmann ADMSU Basin Label (Refer to FCD2002C029 for background hydrology data)

0 400' 800' 1,600'

DATE	REVISION	BY

DRAWN BY: NBL
CHECKED BY: FEB
DATE: 05/06

DAVID EVANS AND ASSOCIATES INC.
21141 East Highland Avenue, Suite 200
Phoenix, Arizona 85016
Phone: 602.678.5151

WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY
FCD2004C066
FLOW RATE EXHIBIT

SCALE: 1"=800'
SECTION: VARIES
TWNSHP: T4N, T5N
RANGE: R3W, R4W
SHEET 1 OF 2
JOB NO.: MARI0044

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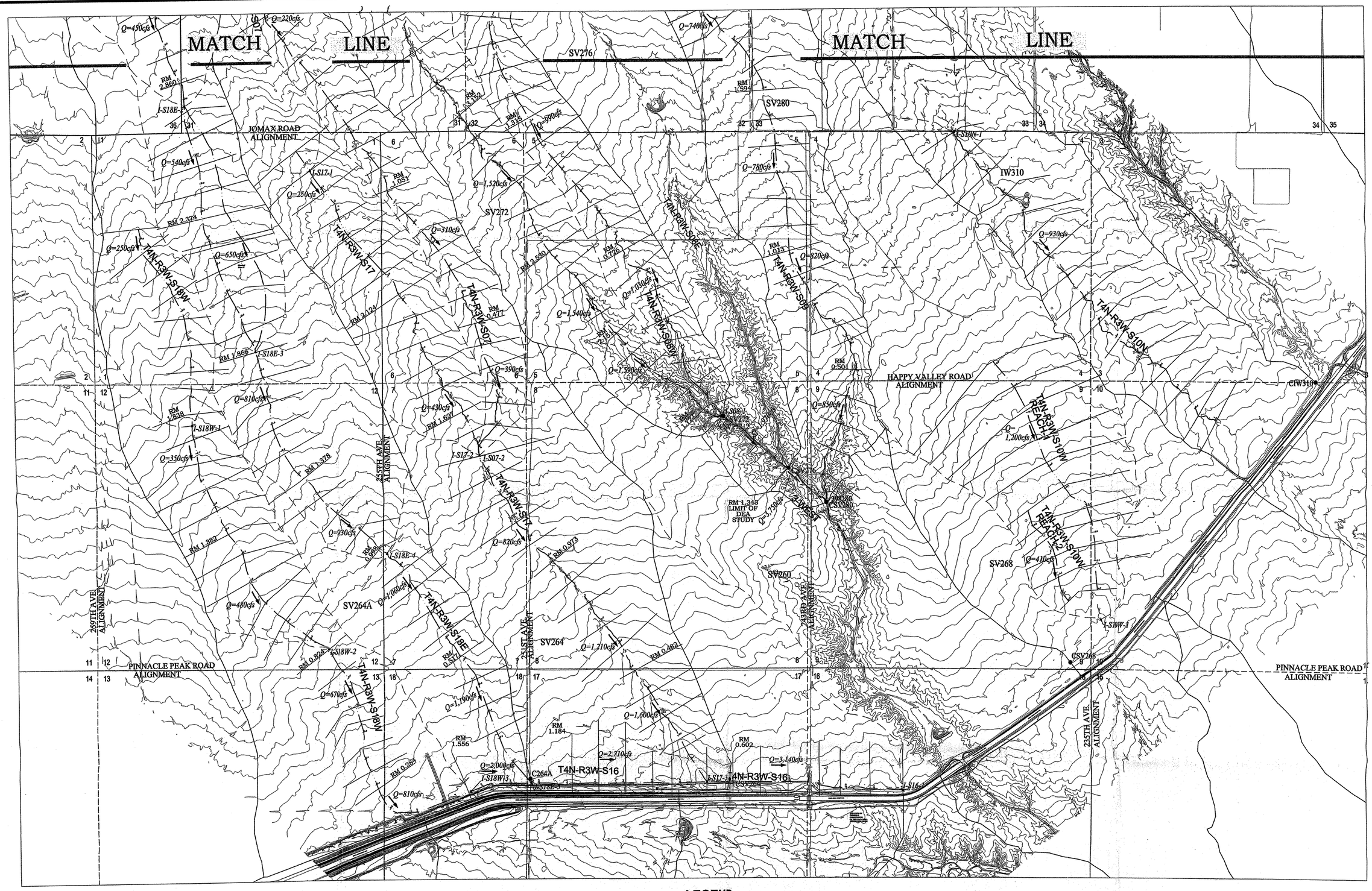


LEGEND

- Wittmann ADMSU Basin
- Sub-Basin Boundary
- Matchline
- 4 Section Number
- Section Line
- Cross-Section
- Thalweg
- I-S07-1 Intermediate Concentration Point (CP)
- CSV284 Wittmann ADMSU CP
- SV272 Wittmann ADMSU Basin Label (Refer to FCD2002C029 for background hydrology data)

DRAWN BY:	NBL	REVISION	BY
CHECKED BY:	FEB		
DATE:	05/06	DATE	

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

WITTMANN AREA ZONE AE FLOODPLAIN DELINEATION STUDY FCD2004C066 FLOW RATE EXHIBIT

SCALE: 1"=800'

SECTION: VARIES
TWNSHP: T4N, T5N
RANGE: R3W, R4W

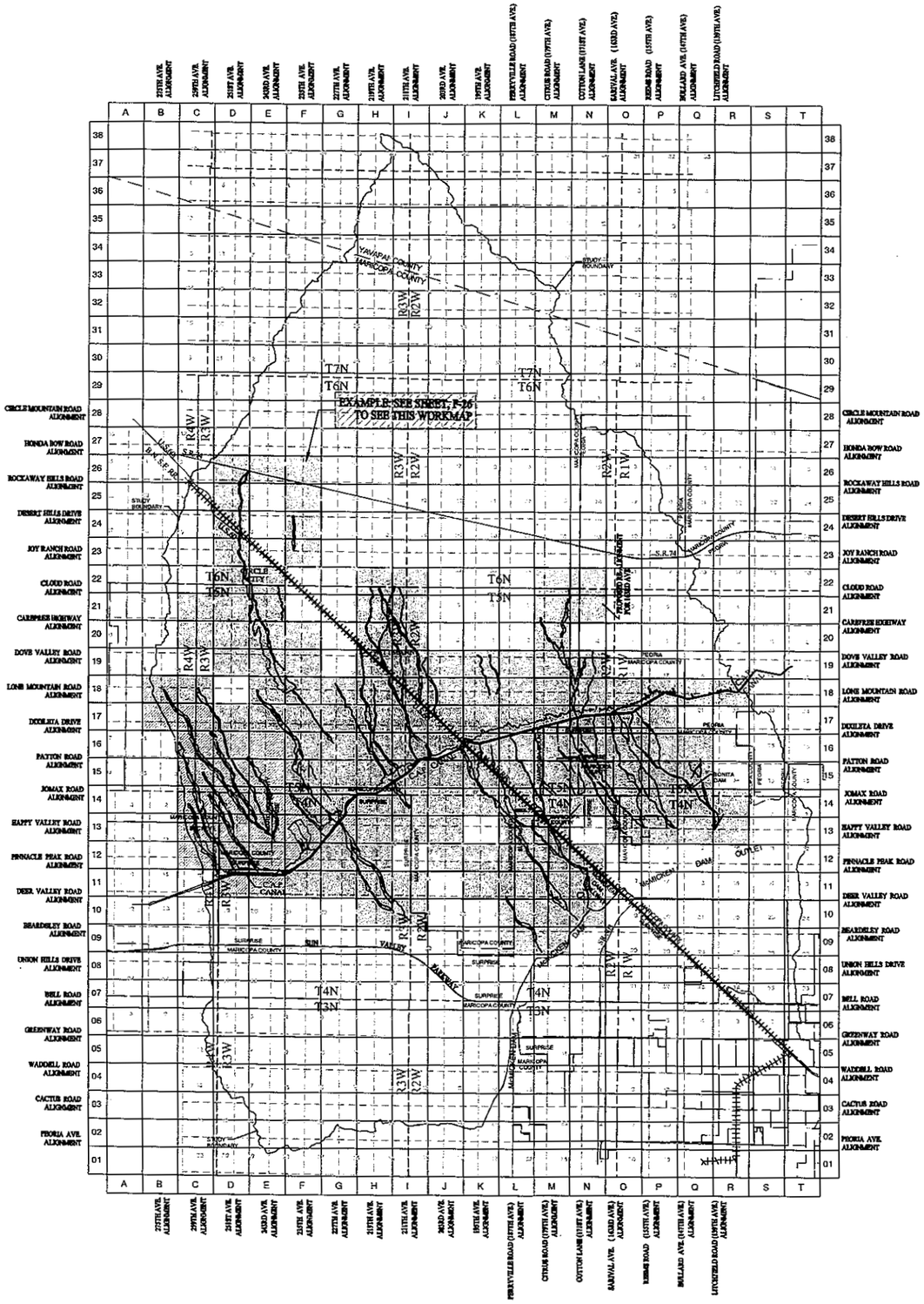
SHEET 2 OF 2

JOB NO.: MARI0044

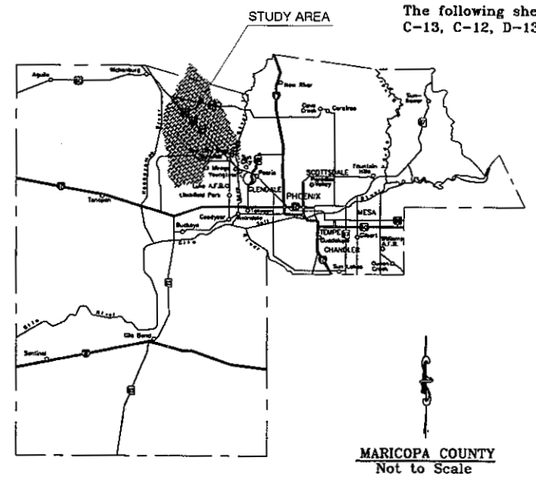
P:\M\MARI0000044\0400CAD\DWG\EP\SHEETS\WEmhMARI0044-H02.dwg Nbl May 19, 2006 9:01:01am

Exhibit B: Hydraulics Work Study Maps

These maps are reduced size (11x17) not to scale, the full-size maps (Scale:1"=200') are bound separately.



1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES



LOCATION MAP

Contract FCD2002C029

Contract FCD2004C066/FCD2002C029

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

WITTMANN AREA DRAINAGE MASTER STUDY UPDATE

CONTRACT F.C.D. 2002C029

and

WITTMANN PHASE 2 ZONE AE FLOODPLAIN DELINEATION STUDY

CONTRACT F.C.D. 2004C066

The following sheets are part of both the ADMSU (FCD2002C029) and the Wittmann Phase 2 (FCD2004C066): C-17, D-16, D-15, D-14, E-16, E-15, E-14, E-13, E-12, E-11, F-12, F-13, F-14, and G-13.

The following sheets are only part of the Wittmann Phase 2 (FCD2004C066): B-18, B-17, C-16, C-15, C-14, C-13, C-12, D-13, D-12, D-11. All other sheets are part of the ADMSU (FCD2002C029).

AERIAL MAPPING

NOT A PART OF THIS CONTRACT.
SUPPLIED BY THE FLOOD CONTROL DISTRICT.

HYDROLOGY

Contract FCD2002C029

Entellus, Inc.
2255 North 44th Street, Suite 125
Phoenix, Az. 85008-3279
602.242.2566 Telephone

FLOODPLAIN DELINEATION

Contract FCD2002C029

Entellus, Inc.
2255 North 44th Street, Suite 125
Phoenix, Az. 85008-3279
602.242.2566 Telephone

Contract FCD2004C066

David Evans and Associates, Inc.
2141 East Highland Ave, Suite 200
Phoenix, Az. 85016
602.678.5151 Telephone

Portions of F-12 and F-13 only
Primatech, LLC
1295 W. Washington Street, Suite 115
Tempe, Az. 85281
602.685.9009 Telephone

Registered Professional Engineer (Civil) CERTIFICATE NO. 23960 FRANK EDWARD BROWN ARIZONA, U.S.A.

Registered Professional Engineer (Civil) CERTIFICATE NO. 11963 C.A. LOPEZ-CEPERO ARIZONA, U.S.A.

Entellus

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone 602 678 5151

	ADMSU		PHASE 2	
DESIGN	AMG/RAS	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMG/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET 1 OF 158

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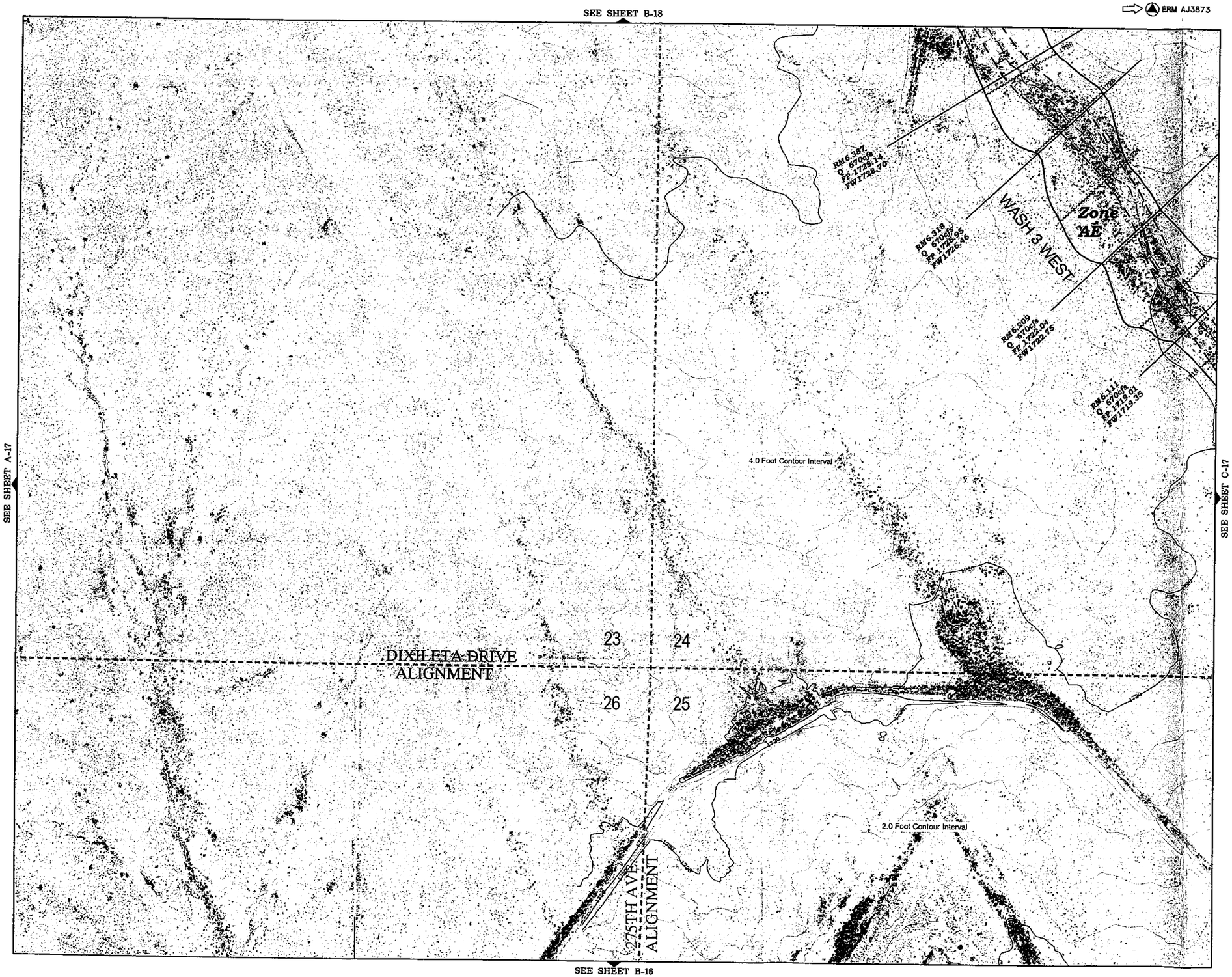


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH ID. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A
- EFFECTIVE ZONE AE
- EFFECTIVE ZONE AH
- EFFECTIVE FLOODWAY
- ZONE A
- ZONE AH
- ZONE AE
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION: 2.199 FP=1400.55; Q=1270 FW=1400.56

RM 1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 23999 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

1. NGVD 29 + 1.98 FEET = NAVD 88.
2. Wash 3-West surveyed cross-sections RM 6.912 to RM 4.709 take precedence over the 4.00-foot contour mapping for floodplain delineation.

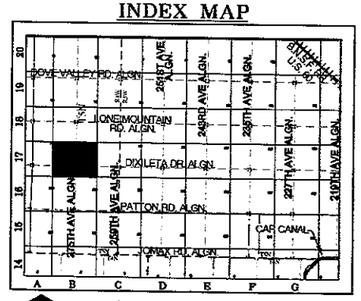
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



N

200' 0' 200' 400'

SCALE: 1"= 200'

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN			FGB/MBL	07/06
DESIGN CHK.			FEB	07/06
PLANS			MBL	07/06
PLANS CHK.			FGB/MBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET B-17 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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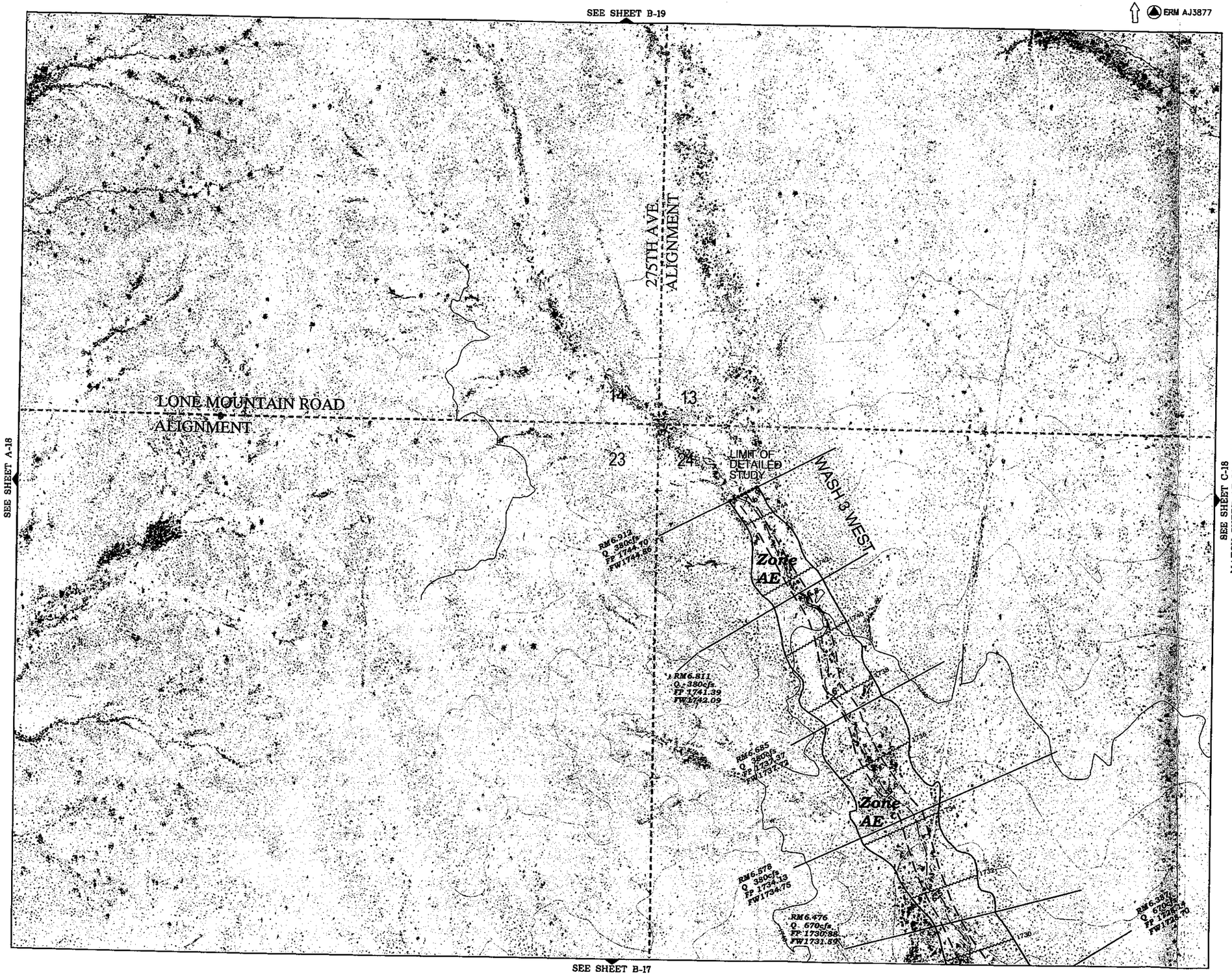

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2.199 / Q=1270 / FP=1400.55 / FW=1400.56

RM 1.406
Q 1,970cfs
FP 1566.90
FW 1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (CIVIL) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:
1. NGVD 29 + 1.99 FEET = NAVD 88.
2. Wash 3-West surveyed cross-sections RM 6.912 to RM 4.709 take precedence over the 4.00-foot contour mapping for floodplain delineation.

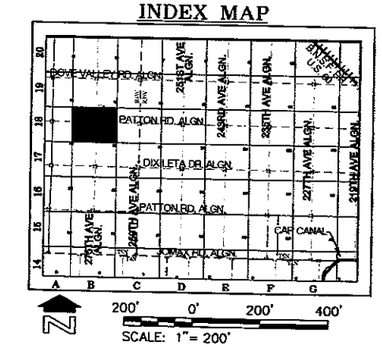
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3877		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



SCALE: 1" = 200'

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN			FEB/NBL	07/06
DESIGN CHK.			FEB	07/06
PLANS			NBL	07/06
PLANS CHK.			FEB/NBL	07/06
SUBMITTED BY:				
DATE:				

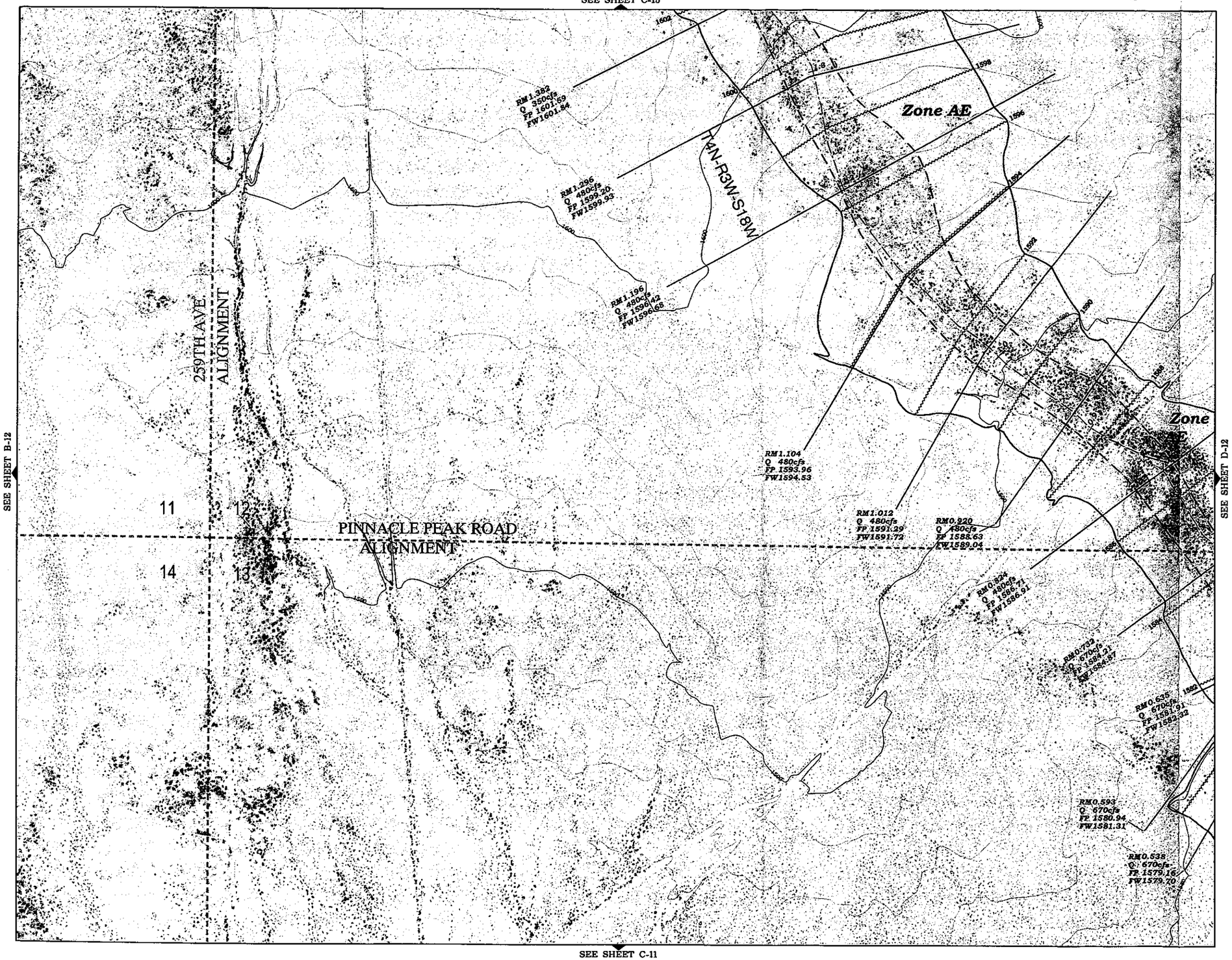
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET B-18 OF FLOODPLAIN DELINEATION



1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A
- EFFECTIVE ZONE AE
- EFFECTIVE ZONE AH
- EFFECTIVE FLOODWAY
- ZONE A
- ZONE AH
- ZONE AE
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION 2.199 Q=1270 FP=1400.55 FW=1400.56

RM1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

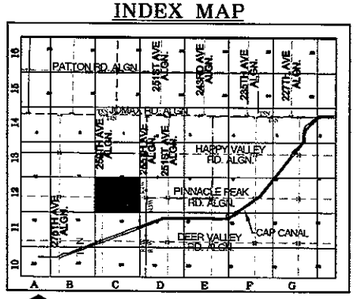
NOTE:
1. NGVD 29 + 1.93 FEET = NAVD 88

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



200' 0' 200' 400'

SCALE: 1"= 200'

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU	PHASE 2		
DESIGN			FER/NBL	07/06
DESIGN CHK.			FER	07/06
PLANS			NBL	07/06
PLANS CHK.			FER/NBL	07/06

SUBMITTED BY: DATE:

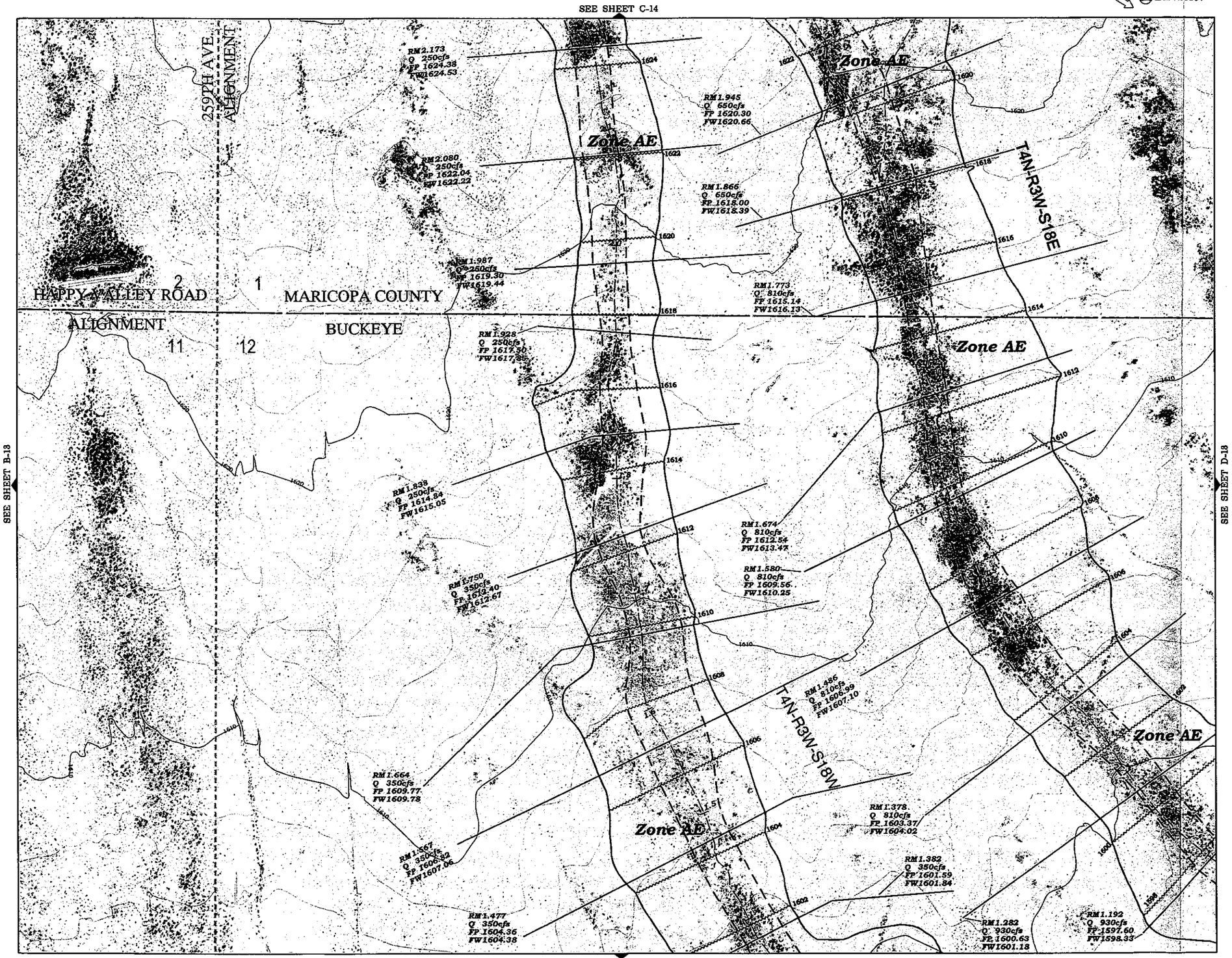
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-12 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2.199 (Qsm=1270) FP=1400.55 FW=1400.56

RM1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (CIVIL) CERTIFICATE NO. 22063 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:
1. NGVD 29 + 1.94 FEET = NAVD 88.

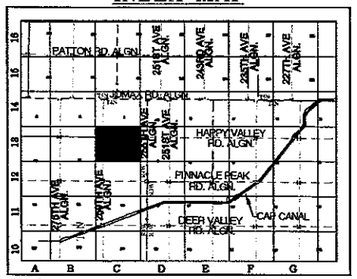
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



N

200' 0' 200' 400'
SCALE: 1" = 200'

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN			FEB/NBL	07/06
DESIGN CHK.			FEB	07/06
PLANS			NBL	07/06
PLANS CHK.			FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-13 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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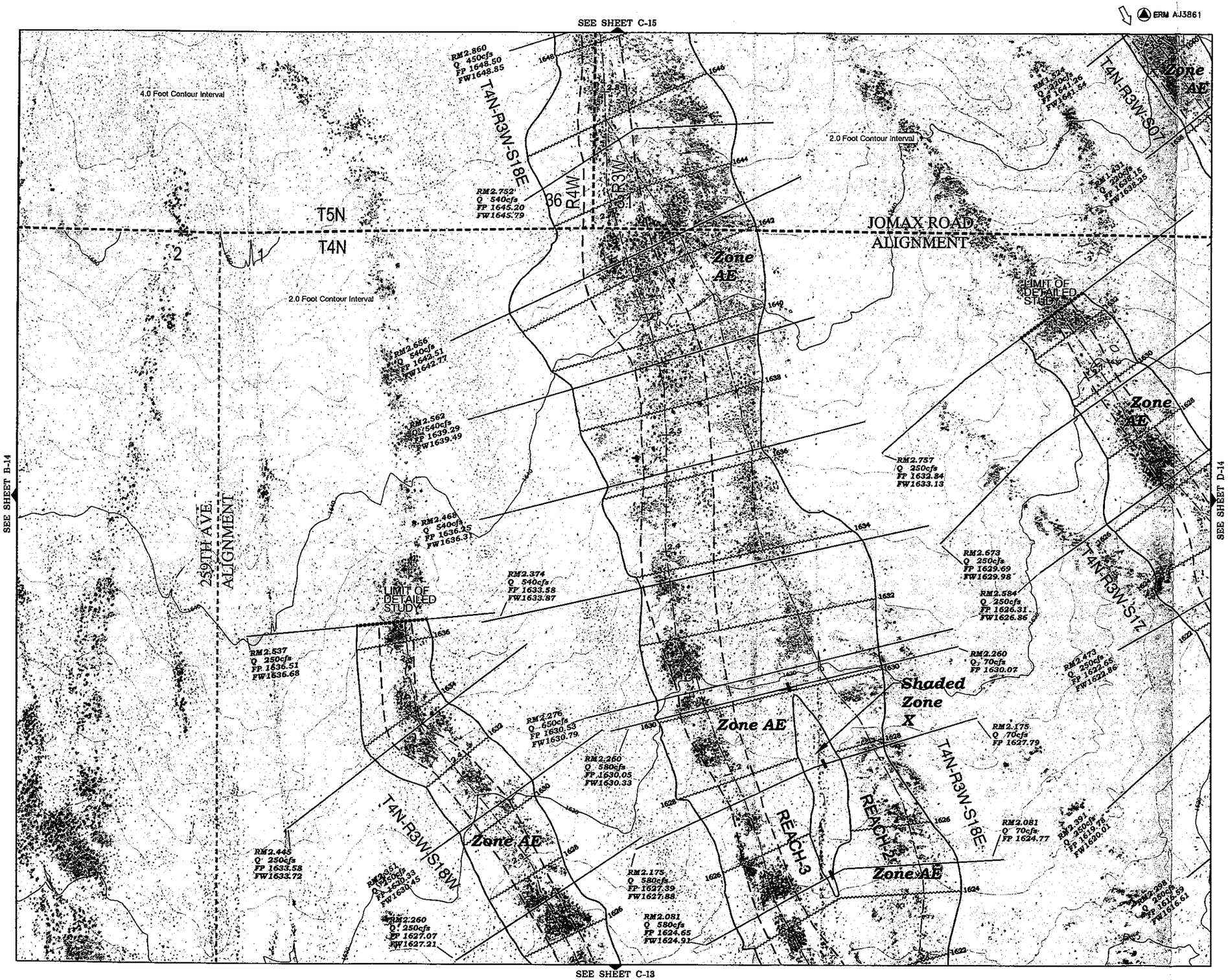


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A
- ZONE A
- EFFECTIVE ZONE AE
- ZONE AH
- EFFECTIVE ZONE AH
- ZONE AE
- EFFECTIVE FLOODWAY
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION: 2.199 (Qmax=1270) FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 23966 FRANK EDWARD BROWN ARIZONA, U.S.A.

NOTE:

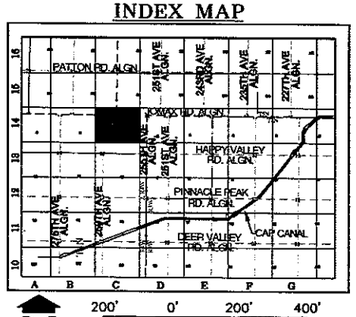
1. NGVD 29 + 1.95 FEET = NAVD 88
2. Wash T4N-R3W-S18E surveyed cross-sections RM3.787 to RM 2.752 take precedence over the 4.00-foot contour mapping for floodplain delineation.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU	PHASE 2	
DESIGN		FEB/NBL	07/06
DESIGN CHK.		FEB	07/06
PLANS		NBL	07/06
PLANS CHK.		FEB/NBL	07/06
SUBMITTED BY:		DATE:	

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-14 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART CEO TECHNOLOGIES

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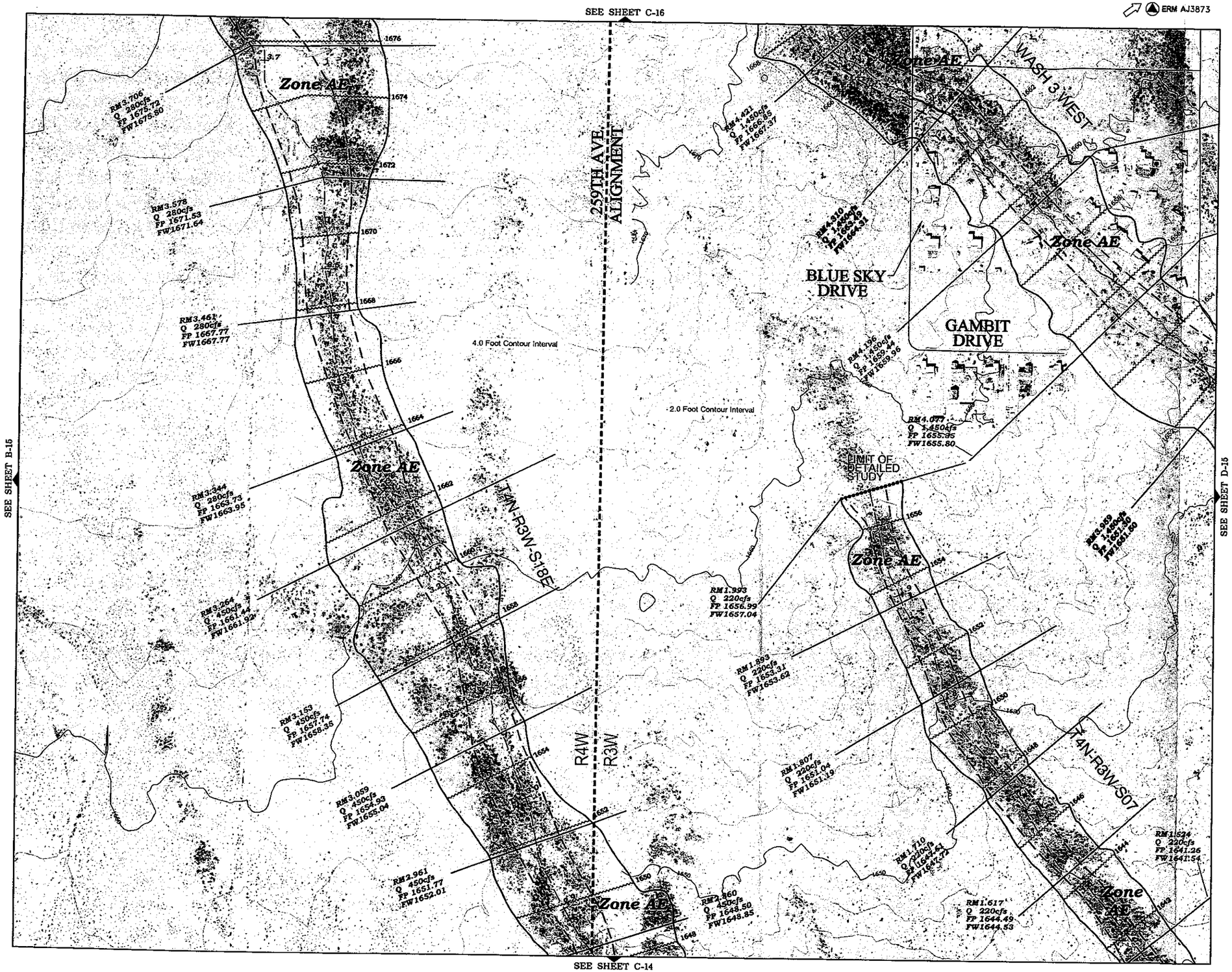


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE — RM 1.406 Q 1,970cfs FP 1566.90 FW1567.62

CROSS SECTION — 2,199 Q100=1270 FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE 23959 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

1. NGVD 29 +1.96 FEET = NAVD 88.
2. Wash T4N-R3W-S18E surveyed cross-sections RM3.787 to RM 2.752 take precedence over the 4.00-foot contour mapping for floodplain delineation.

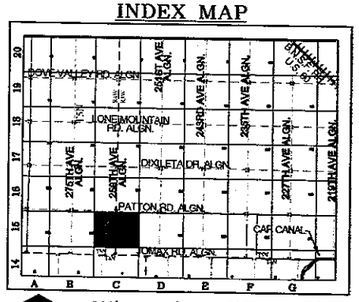
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV

INDEX MAP



DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU	PHASE 2		
DESIGN			FEB/NBL	07/06
DESIGN CHK.			FEB	07/06
PLANS			NBL	07/06
PLANS CHK.			FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-15 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

P:\WA\WAR100000004\AO\DWG\FP\SHEETS\FP-WORKMAPS\C-15.dwg Nbl Oct 03, 2006 3:49:26pm

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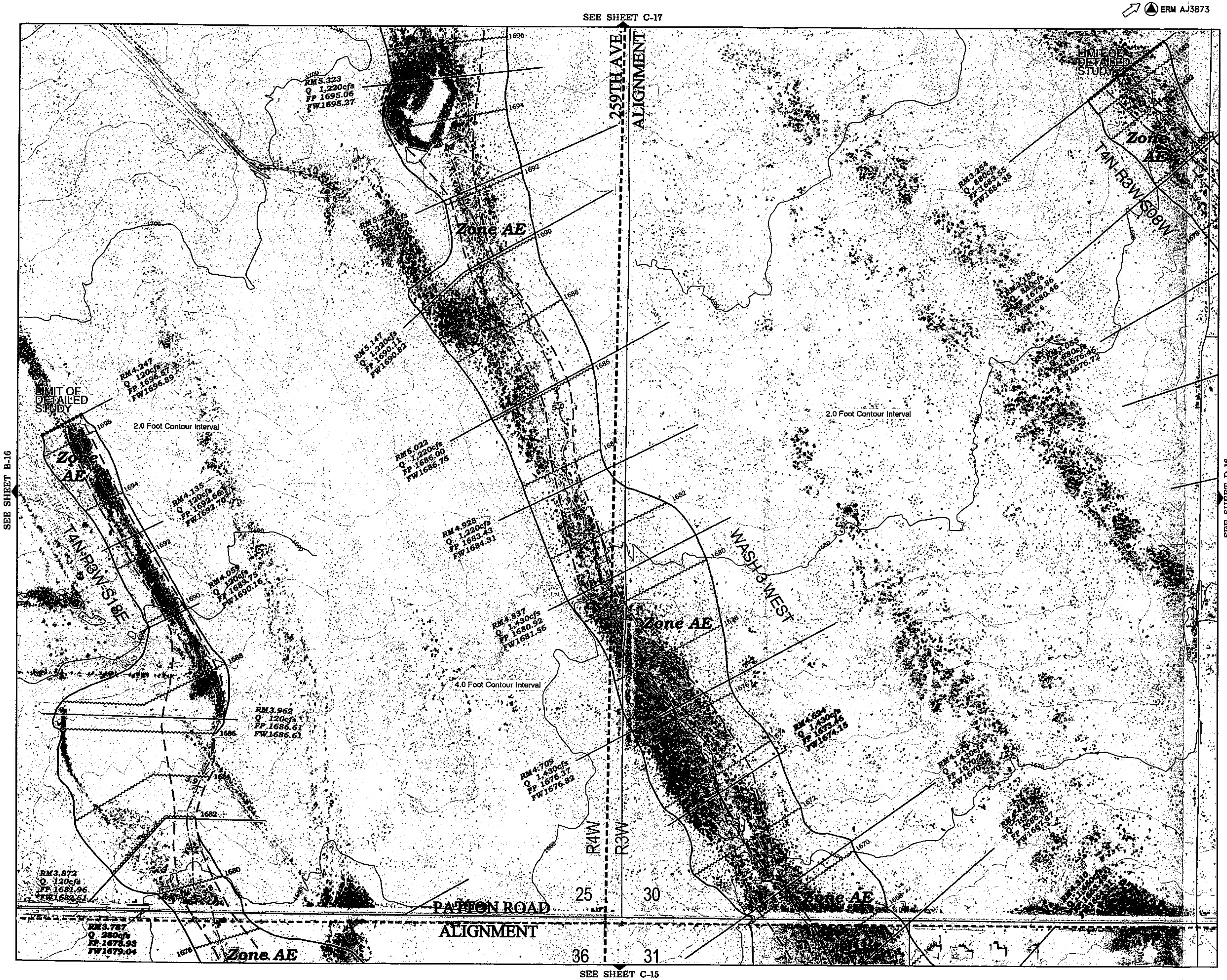


1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029		WITTMANN PHASE 2-FCD2004C066
EFFECTIVE ZONE A	ZONE A	ZONE AE FLOODPLAIN (FP)
EFFECTIVE ZONE AE	ZONE AH	ZONE AE FLOODWAY (FW)
EFFECTIVE ZONE AH	ZONE AE	
EFFECTIVE FLOODWAY	FLOODWAY (FW)	
	ZONE AO	

HYDRAULIC BASE LINE

CROSS SECTION 2.199 / Q_{100}=1270 FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029 — NOT APPLICABLE FOR THIS SHEET

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) Certificate No. 23969 FRANK EDWARD BROWN Date Signed ... ARIZONA, U.S.A.

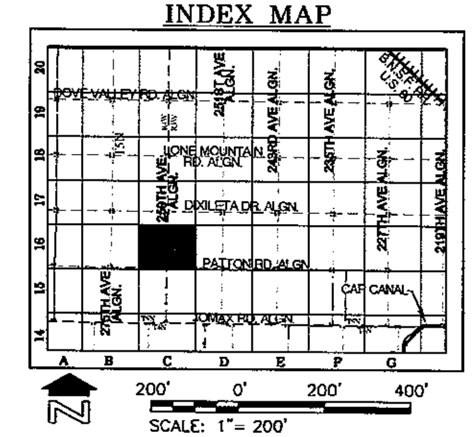
NOTE:
1. NGVD 29 + 1.97 FEET = NAVD 88.
2. Surveyed cross-sections Wash T4N-R3W-S18E RM 3.787 to RM 2.752 and Wash 3-West RM 6.912 to RM 4.709 take precedence over the 4.00-foot contour mapping for floodplain delineation.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



200' 0' 200' 400'
SCALE: 1"= 200'

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN			FEB/NBL	07/06
DESIGN CHK.			FEB	07/06
PLANS			NBL	07/06
PLANS CHK.			FEB/NBL	07/06

SUBMITTED BY: DATE:

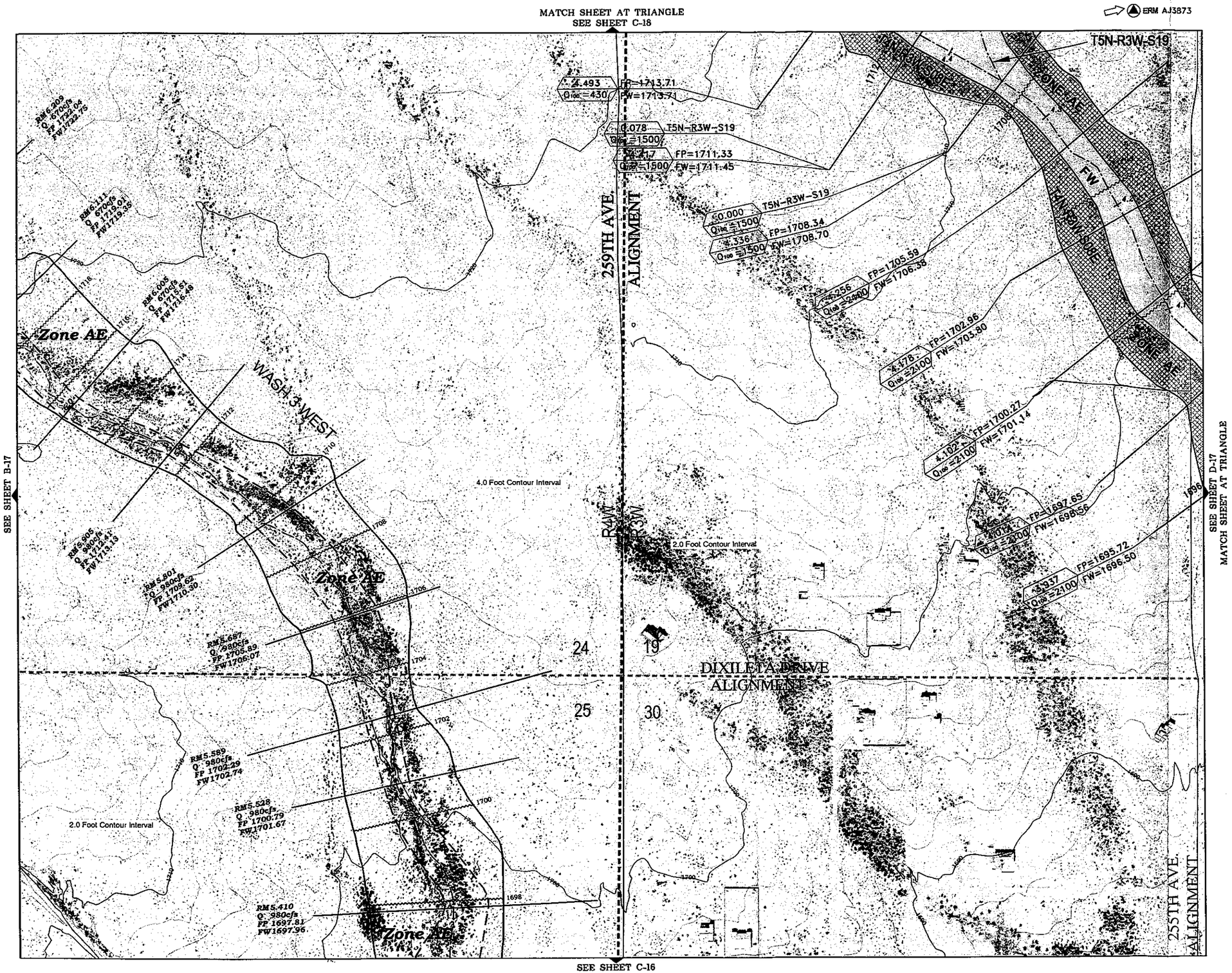
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-16 of FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029

and

WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029		WITTMANN PHASE 2-FCD2004C066	
EFFECTIVE ZONE A		ZONE A	ZONE AE FLOODPLAIN (FP)
EFFECTIVE ZONE AE		ZONE AH	ZONE AE FLOODWAY (FW)
EFFECTIVE ZONE AH		ZONE AE	
EFFECTIVE FLOODWAY		FLOODWAY (FW)	
		ZONE AO	

HYDRAULIC BASE LINE — RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN ARIZONA, U.S.A.

NOTE:

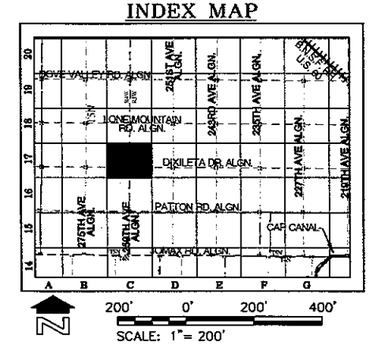
1. NGVD 29 + 1.97 FEET = NAVD 88.
2. Wash 3-West surveyed cross-sections RM 6.912 to RM 4.709 take precedence over the 4.00-foot contour mapping for floodplain delineation.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



Entellus — 3800 N. 44th Street, Suite 130, Phoenix, AZ 85018, TEL 602.343.2600, FAX 602.343.2607, TTY 711, www.entellusinc.com

DAVID EVANS AND ASSOCIATES INC. — 2141 East Highland Avenue, Suite 200, Phoenix Arizona 85016, Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/KAS	07/05	FEB/NBL	07/06
DESIGN CHK.	MAA	07/05	FEB	07/06
PLANS	KAS	07/05	NBL	07/06
PLANS CHK.	AMC/MAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET C-17 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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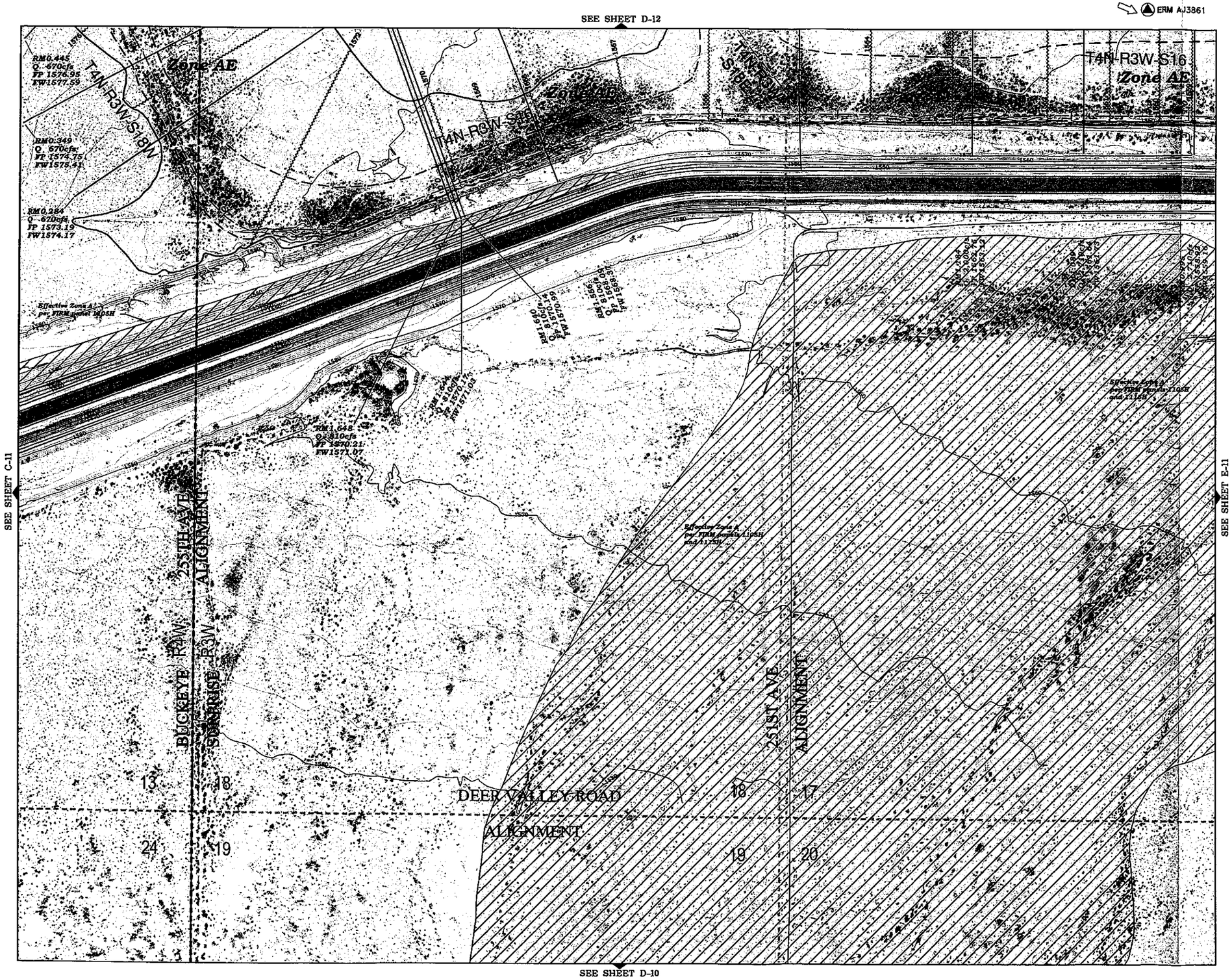


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029

and

WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTING ZONE A
- EFFECTING ZONE AE
- EFFECTING ZONE AH
- EFFECTING FLOODWAY
- ZONE A
- ZONE AH
- ZONE AE
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE — 13.1 — 17.4

CROSS SECTION — 2,199 (Dist=1270) FP=1400.55 FW=1400.56

RM1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) — CERTIFICATE NO. 23969 — FRANK EDWARD BROWN — Date Signed — ARIZONA, U.S.A.

NOTE:

1. NGVD 29 + 1.92 FEET = NAVD 88.

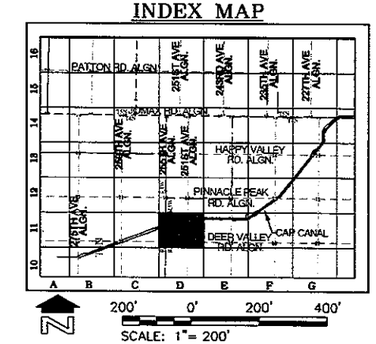
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix, Arizona 85016
Phone: 602.678.5151

	ADMSU	PHASE 2	
DESIGN		FEB/NBL	07/06
DESIGN CHK.		FEB	07/06
PLANS		NBL	07/06
PLANS CHK.		FEB/NBL	07/06
SUBMITTED BY:		DATE:	

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-11 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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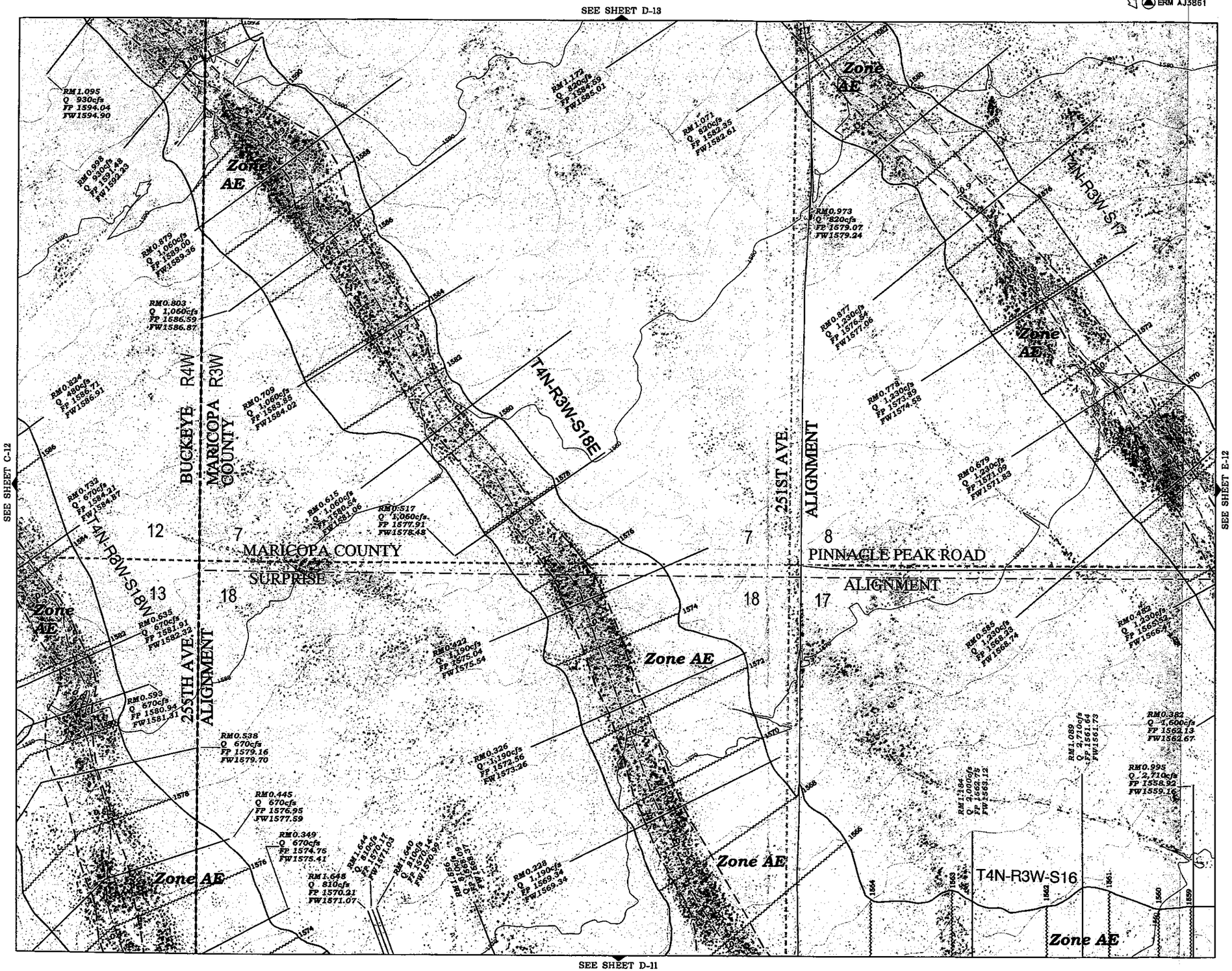


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A
- EFFECTIVE ZONE AE
- EFFECTIVE ZONE AH
- EFFECTIVE FLOODWAY
- ZONE A
- ZONE AH (EL 1234.56)
- ZONE AE
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE: 251 — 1-4

CROSS SECTION: 2.199 (Qtot=1270) FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 22969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:
1. NGVD 29 + 1.92 FEET = NAVD 88.

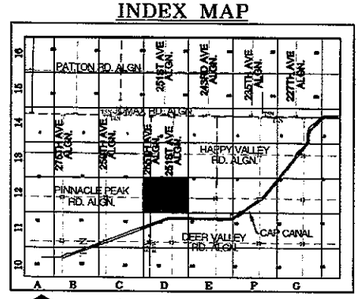
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



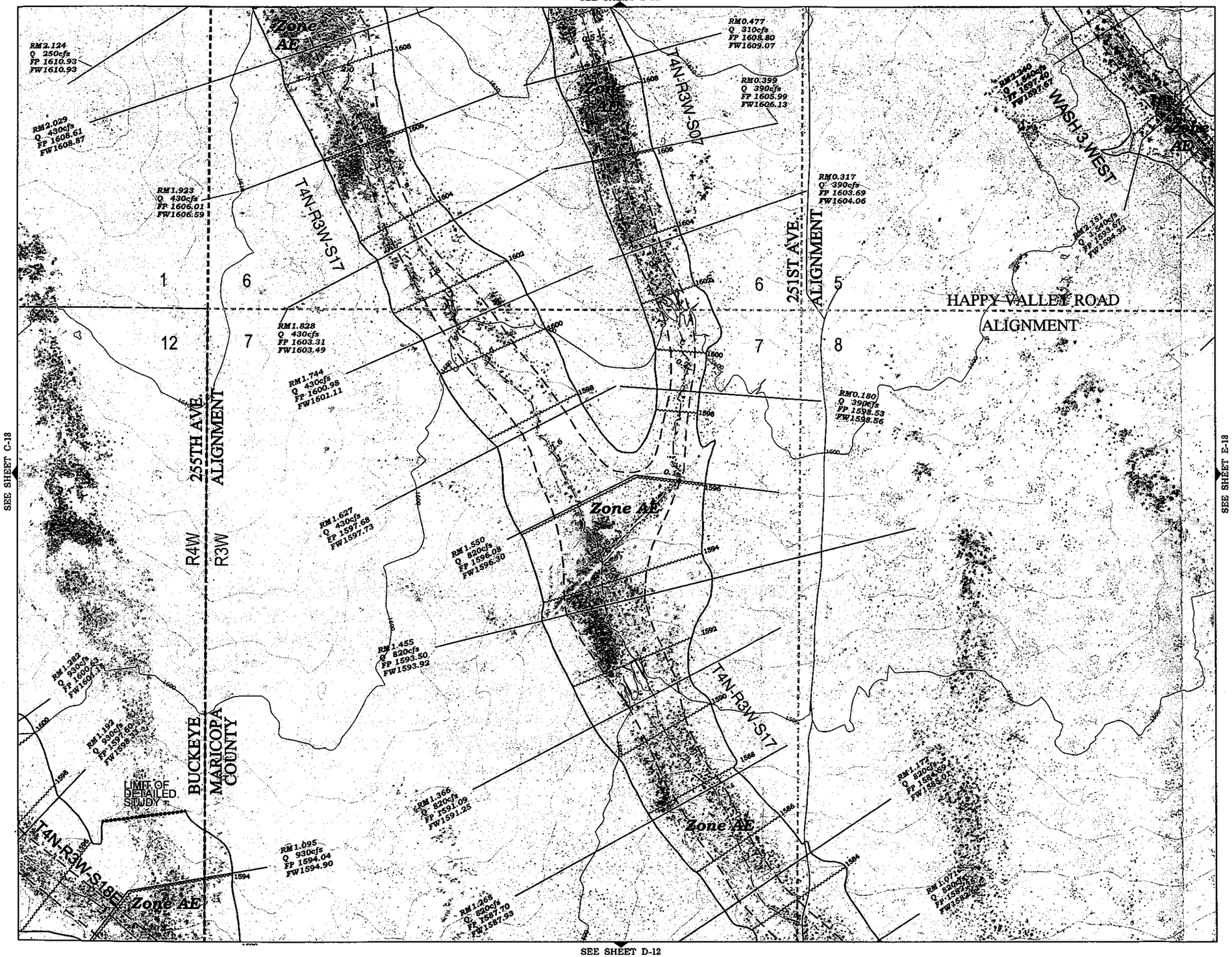
DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2		FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DESIGN	AMC/HAA	07/05	FEB/MBL	07/06	
DESIGN CHK.	HAA	07/05	FEB	07/06	
PLANS	KAB	07/05	MBL	07/06	RECOMMENDED BY: DATE
PLANS CHK.	AMC/HAA	07/05	FEB/MBL	07/06	APPROVED BY: DATE
SUBMITTED BY: DATE:					CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-12 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

P:\4\MAR00000044\DWG\FP\SHEETS\FP-WORKMAPS\D-12.dwg Nov Oct 04, 2006 7:01:58am



1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029		WITTMANN PHASE 2-FCD2004C066
EFFECTIVE ZONE A	ZONE A	ZONE AE FLOODPLAIN (FP)
EFFECTIVE ZONE AE	ZONE AH	ZONE AE FLOODWAY (FW)
EFFECTIVE ZONE AH	ZONE AE	
EFFECTIVE FLOODWAY	FLOODWAY (FW)	
	ZONE AO	
HYDRAULIC BASE LINE		
CROSS SECTION	2,199 / Qmax=1270 / FP=1400.55 / FW=1400.56	RM1.406 Q 1,970cfs FP 1566.90 FW1567.62
ENTELLUS-FCD2002C029		DAVID EVANS and ASSOCIATES INC.-FCD2004C066

NOT APPLICABLE FOR THIS SHEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

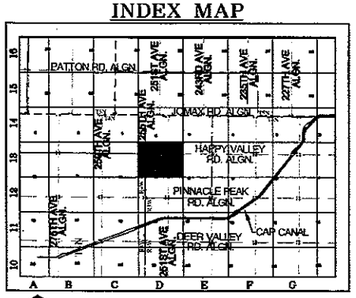
NOTE:
1. NGVD 29 + 1.93 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV

INDEX MAP



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Phone: 602.678.5151

	ADMSU	PHASE 2	
DESIGN		FEB/NBL	07/06
DESIGN CHK.		FEB	07/06
PLANS		NBL	07/06
PLANS CHK.		FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-13 OF FLOODPLAIN DELINEATION

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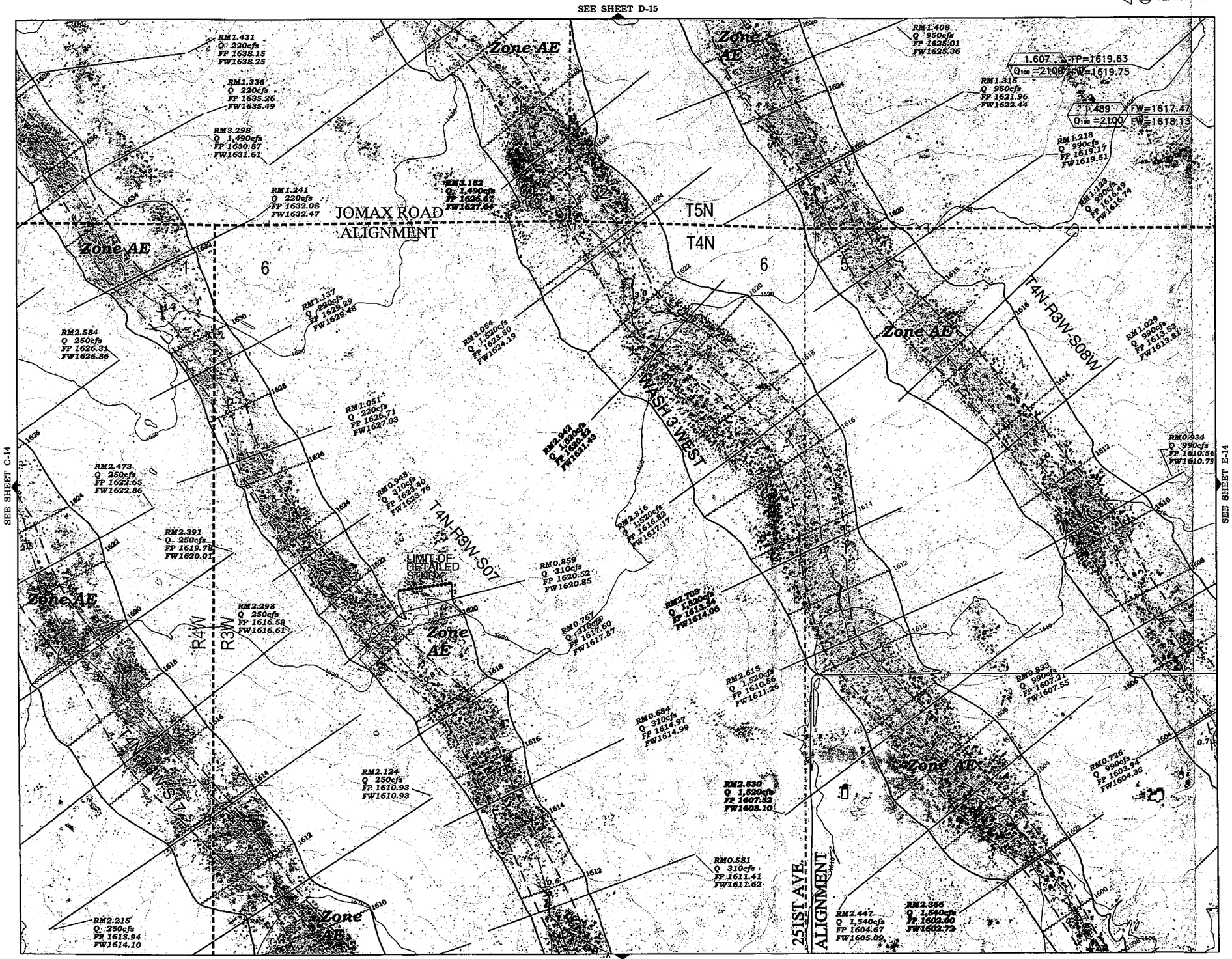


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A — ZONE A
- EFFECTIVE ZONE AE — ZONE AH
- EFFECTIVE ZONE AH — ZONE AE
- EFFECTIVE FLOODWAY — FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2.199 FP=1400.55 Q100=1270 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE 23963 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

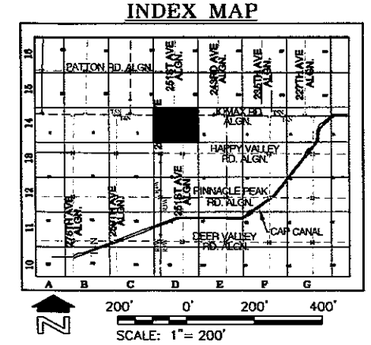
1. NGVD 29 + 1.94 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



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2555 N. 44th Street, Suite 100
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602.381.3047
FAX 602.381.3047
www.entellus.com

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2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAG	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	03/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-14 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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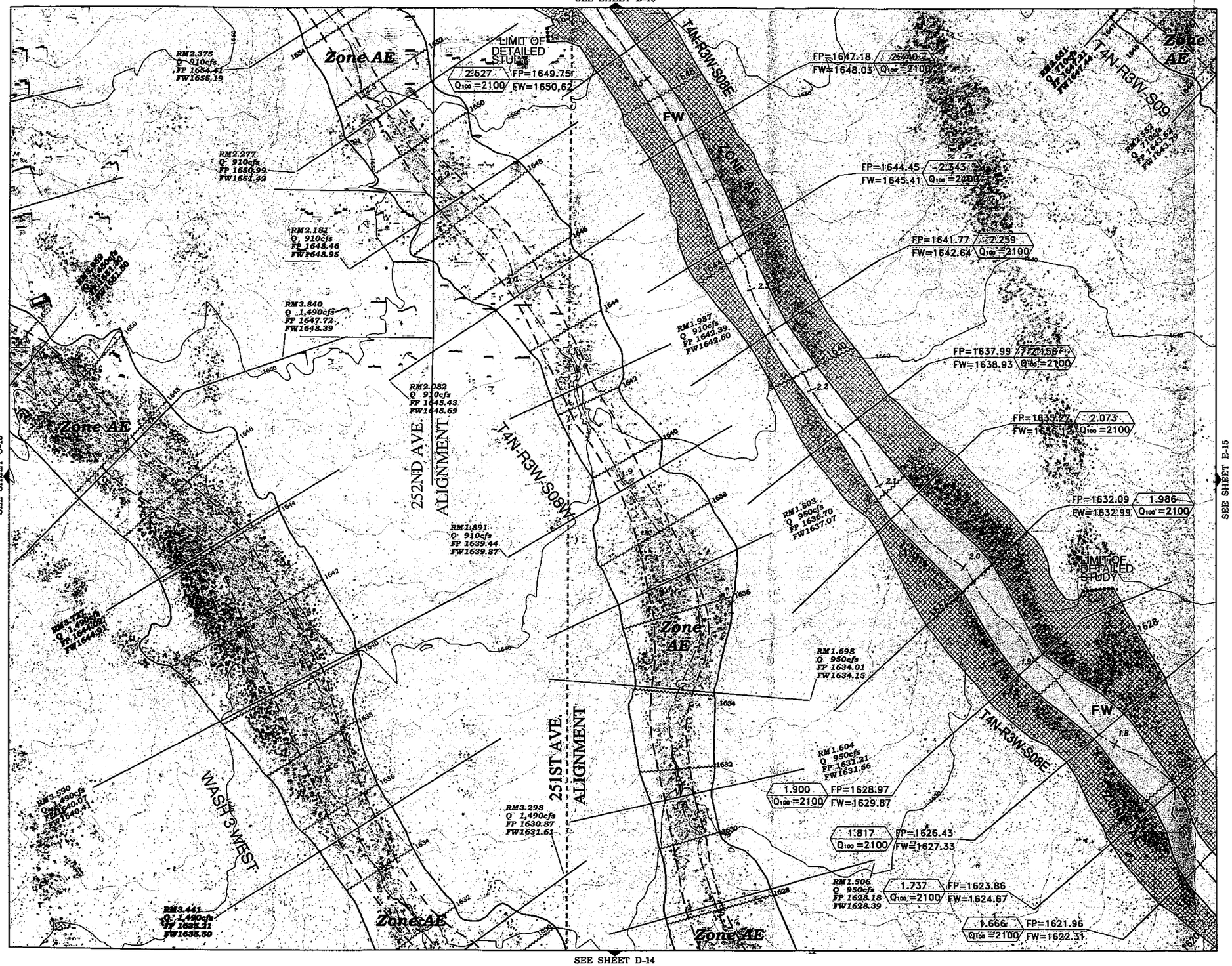


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A — ZONE A
- EFFECTIVE ZONE AE — ZONE AH
- EFFECTIVE ZONE AH — ZONE AE
- EFFECTIVE FLOODWAY — FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 27969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

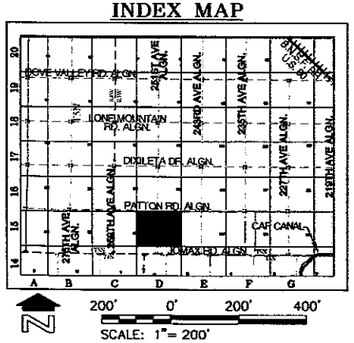
NOTE:
1. NGVD 29 + 1.95 = NAVD 88

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



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	ADMSU		MHASE 2	
DESIGN	AMC/RAS	07/05	FEB/MBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

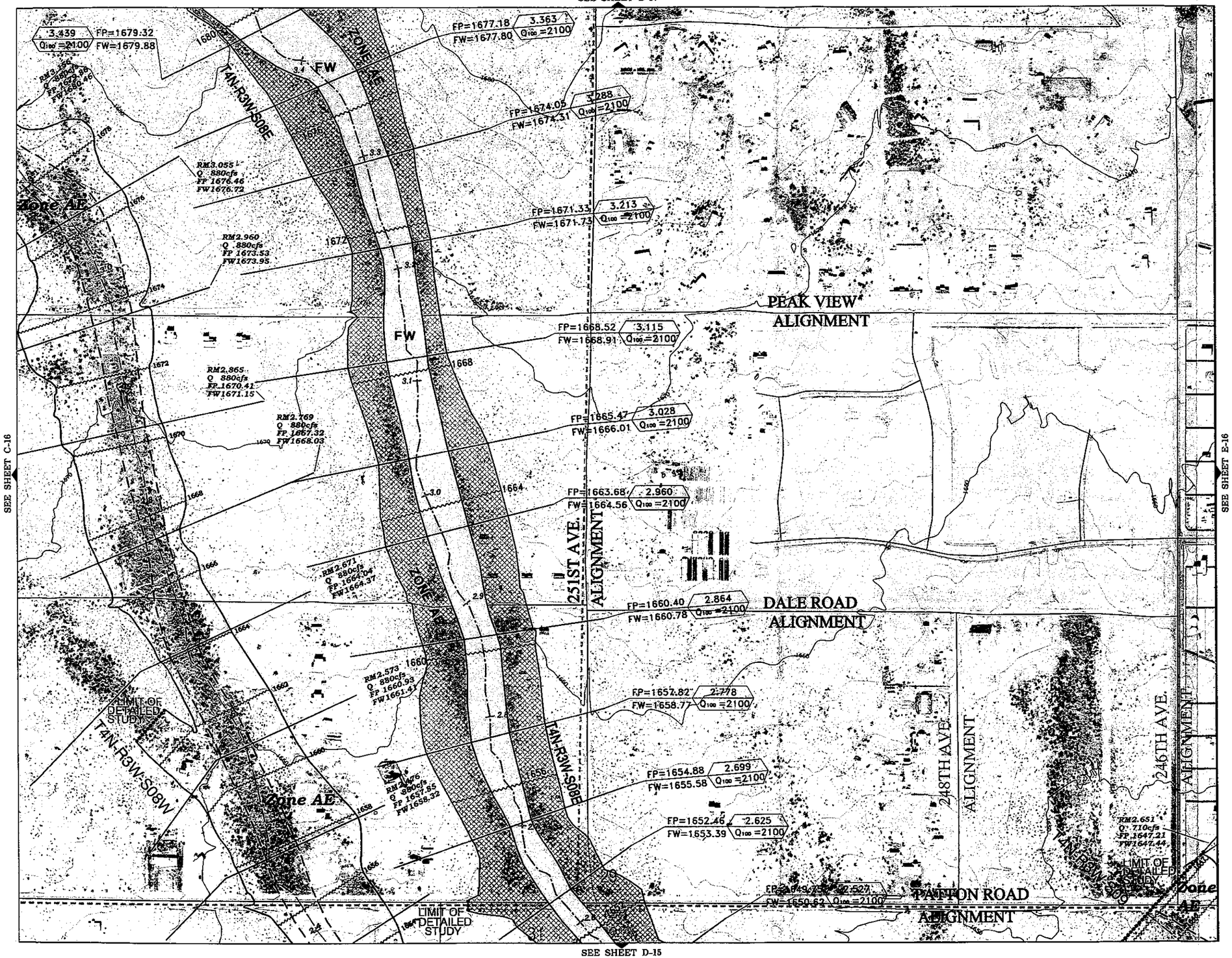
SHEET D-15 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

P:\M\MARI0000004\D\DWG\EP\SHEETS\FP-WORKMAPS\D-15.dwg Nbl Oct 04, 2006 7:15:03am

MATCH SHEET AT TRIANGLE
SEE SHEET D-17

ERM AJ3873



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029 — WITTMANN PHASE 2-FCD2004C066

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO
ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE — 17.1 — 17.4

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029 — DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

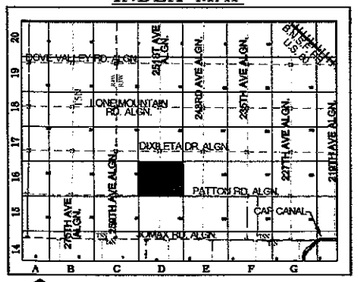
1. NGVD 79 + 1.96 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



N

200' 0' 200' 400'
SCALE: 1" = 200'

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2141 East Highland Avenue, Suite 200
Phoenix, Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAS	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET D-16 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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SEE SHEET E-12

ERM AJ3861

Zone AE

T4N-R3W-S-16

Zone AE

Zone AE

ZONE AH
EL.1545.10

Floodplain Mapped per Engineering Judgement

LIMIT OF DETAILED STUDY

RM 0.899
Q 2,710cfs
FP 1567.72
FW 1567.32

RM 0.802
Q 2,710cfs
FP 1566.90
FW 1566.50

RM 0.707
Q 2,710cfs
FP 1565.15
FW 1565.50

RM 0.602
Q 3,140cfs
FP 1564.90
FW 1564.50

RM 0.506
Q 3,140cfs
FP 1563.72
FW 1563.72

RM 0.406
Q 3,140cfs
FP 1562.91
FW 1562.93

RM 0.297
Q 3,140cfs
FP 1555.15
FW 1555.46

RM 0.223
Q 3,140cfs
FP 1554.21
FW 1554.69

RM 0.102
Q 3,140cfs
FP 1547.88
FW 1548.49

RM 0.000
Q 3,140cfs
FP 1547.23
FW 1547.76

Location of Possible Overtopping of CAP Canal

Floodplain Mapped per Engineering Judgement

243RD AVE. ALIGNMENT

Effective Zone AE per FIRM panel 2105L dated 11/15/

DEER VALLEY ROAD ALIGNMENT

17

16

20

21

SEE SHEET D-11

SEE SHEET F-11
MATCH SHEET AT TRIANGLE

SEE SHEET E-10

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029

and

WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EFFECTIVE ZONE A — ZONE A
- EFFECTIVE ZONE AE — ZONE AH
- EFFECTIVE ZONE AH — ZONE AE
- EFFECTIVE FLOODWAY — FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE — 13-1 / 11-4

CROSS SECTION — 2.199 / Qm=1270 / FP=1400.55 / FW=1400.56

RM1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

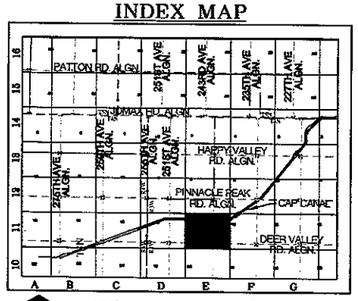
1. NGVD 29 + 1.92 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



200' 0' 200' 400'

SCALE: 1" = 200'

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Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAC	07/05	FEB/MBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	MBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/MBL	07/06

SUBMITTED BY: DATE:

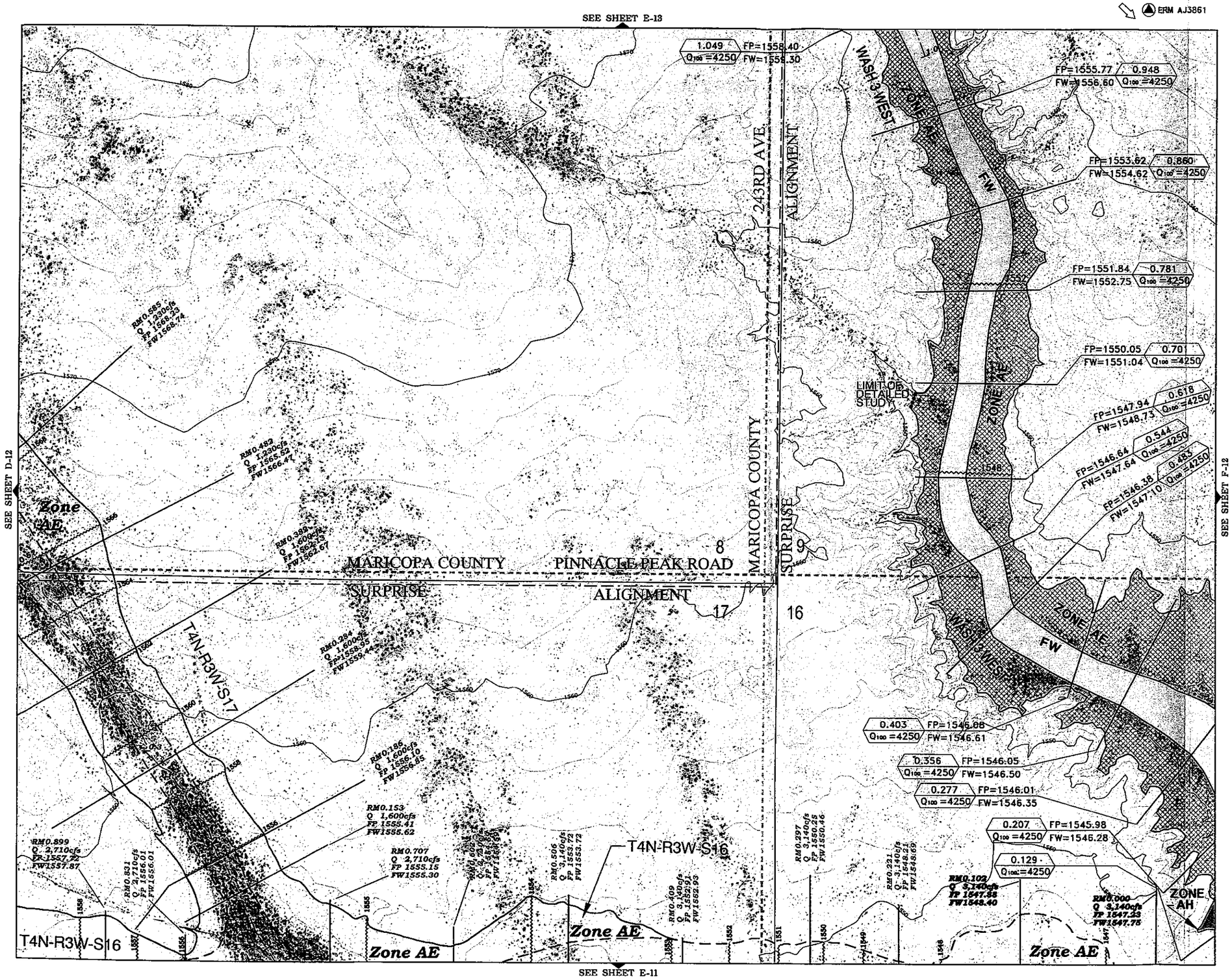
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-11 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

RM 1.406
Q 1,970cfs
FP 1566.90
FW 1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 22960 FRANK EDWARD BROWN ARIZONA, U.S.A.

NOTE:
1. NGVD 29 + 1.91 FEET = NAVD 88.

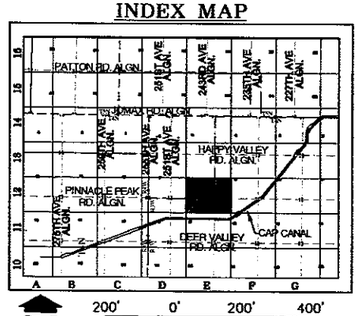
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



Entellus

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Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAS	07/05	FEB/MBL	07/05
DESIGN CHK.	MAR	07/05	FEB	07/05
PLANS	KAR	07/05	MBL	07/05
PLANS CHK.	AMC/MAR	07/05	FEB/MBL	07/05

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-12 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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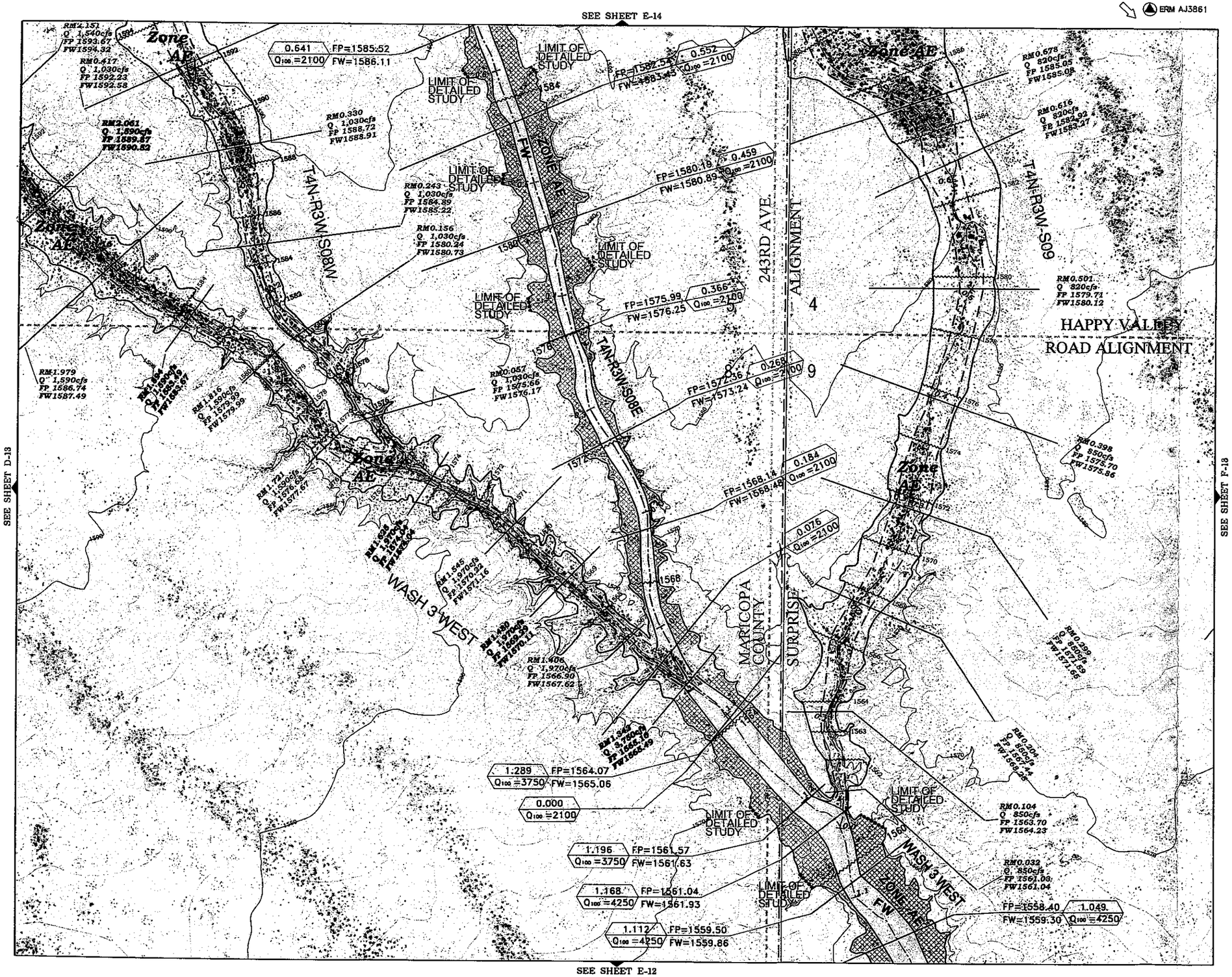


FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029: EFFECTIVE ZONE A; EFFECTIVE ZONE AE; EFFECTIVE ZONE AH; EFFECTIVE FLOODWAY; ZONE A; ZONE AH; ZONE AE; FLOODWAY (FW); ZONE AO

WITTMANN PHASE 2-FCD2004C066: ZONE AE FLOODPLAIN (FP); ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION: 2,199 Q100 =1270 FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE 23968 FRANKLEDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

1. NGVD 29 + 1.92 FEET = NAVD 88.

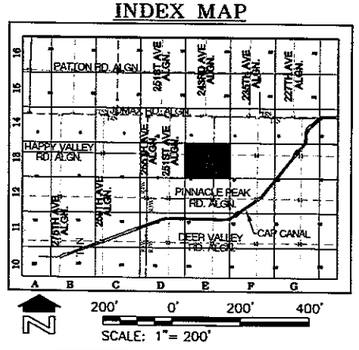
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV

INDEX MAP



Entellus
2355 E. 44th Street, Suite 100 Tucson, AZ 85713 Phone: 520.294.2000 Fax: 520.294.0037 WEB: www.entellus.com

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAS	07/05	FDB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-13 OF FLOODPLAIN DELINEATION

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029 and WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029 — WITTMANN PHASE 2-FCD2004C066

EFFECTIVE ZONE A — ZONE A — ZONE AE FLOODPLAIN (FP)
EFFECTIVE ZONE AH — ZONE AH — ZONE AE FLOODWAY (FW)
EFFECTIVE ZONE AE — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW) — ZONE AO

HIGHWATER MARK LINE

CROSS SECTION 2.199 Q100=1270 FP=1400.55 FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029 — DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE 23966 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

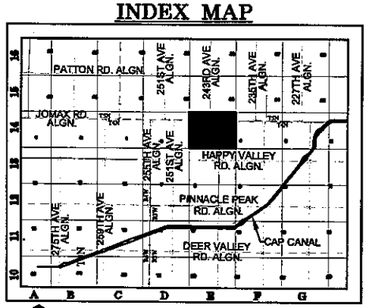
NOTE:
1. NGVD 29 + 1.93 FEET = NAVD 88.
2. FLOODWAY REVISED 04/07-SEE ADDENDUM LOCATED IN TDN

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



Entellus

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

		ADMSU		PHASE 2	
DESIGN		AMG/ BAA	07/05	FEB/ BRL	07/06
DESIGN CHK.		HAA	07/05	FEB	07/06
PLANS		KAB	07/05	BRL	07/06
PLANS CHK.		AMG/ HAA	07/05	FEB/ BRL	07/06

SUBMITTED BY: DATE:

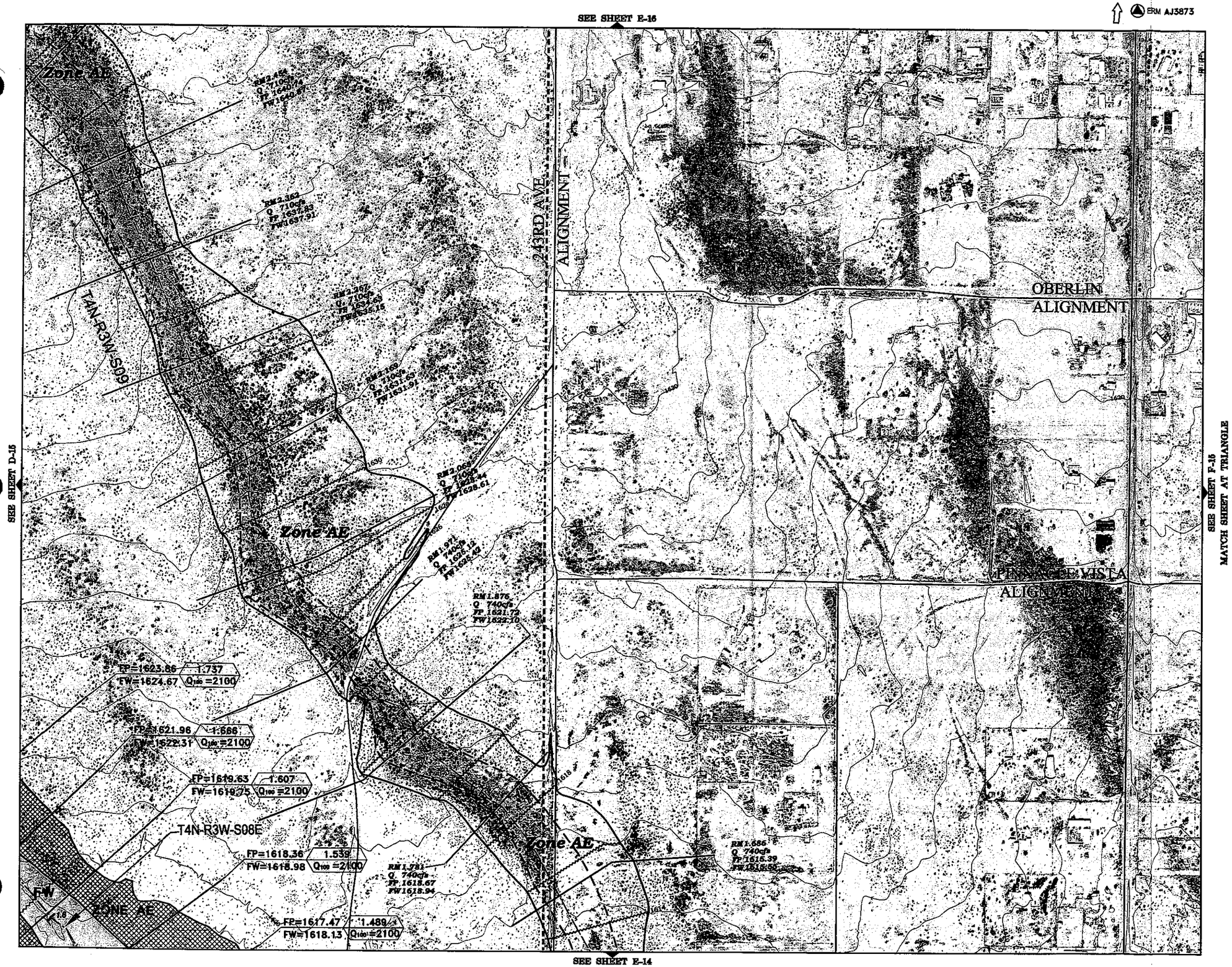
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-14 OF FLOODPLAIN DELINEATION



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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029

and

WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

- EXISTING ZONE A
- EXISTING ZONE AE
- EXISTING ZONE AH
- EXISTING FLOODWAY
- ZONE A
- ZONE AH
- ZONE AE
- FLOODWAY (FW)
- ZONE AO

WITTMANN PHASE 2-FCD2004C066

- ZONE AE FLOODPLAIN (FP)
- ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION 2.199 FP=1400.56 Q100=1270 FW=1400.56

RM 1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23989 FRANK EDWARD BROWN ARIZONA, U.S.A.

NOTE:

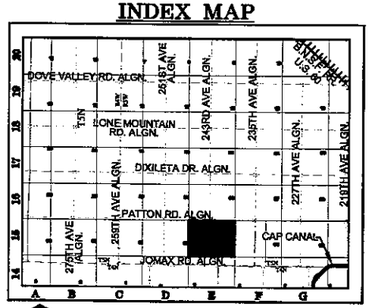
1. NGVD 29 + 1.94 FEET = NAVD 88.
2. FLOODWAY REVISED 04/07-SEE ADDENDUM LOCATED IN TDN

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV

INDEX MAP



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Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMB/ EJM	07/06	FEB/	07/06
DESIGN CHK.	HAA	07/06	FEB	07/06
PLANS	KAB	07/06	NBL	07/06
PLANS CHK.	AMB/ HAA	07/06	FEB/ NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

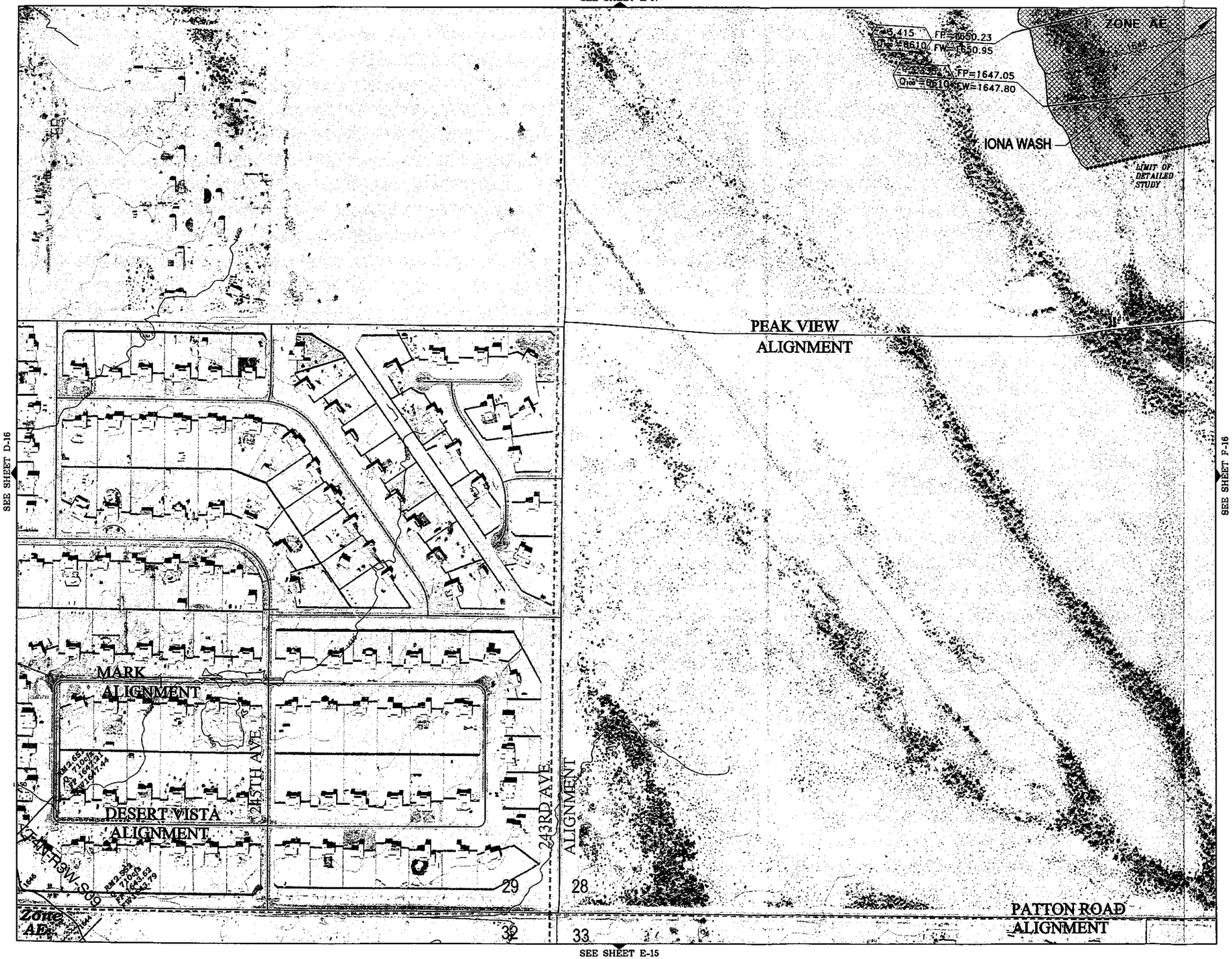
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-15 OF FLOODPLAIN DELINEATION

MATCH SHEET AT TRIANGLE
SEE SHEET E-17

ERM AJ3873



SEE SHEET D-16

SEE SHEET F-16
MATCH SHEET AT TRIANGLE

SEE SHEET E-15

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION — 2,199 / Q100=1270 — FP=1400.55 / FW=1400.56

RM1.406
Q 1,970cfs
FP 1566.90
FW1567.62

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23869 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

NOTE:

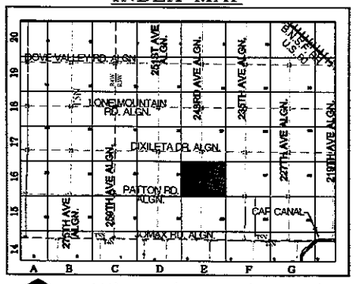
1. NGVD 29 + 1.95 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3873		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



N

200' 0' 200' 400'
SCALE: 1"= 200'

Entellus — 2828 N. 44th Street, Suite 130, Phoenix, AZ 85008-3279, Tel: 602.361.1001, Fax: 602.361.1007, www.entellus.com

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Phoenix, Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAC	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET E-16 OF FLOODPLAIN DELINEATION

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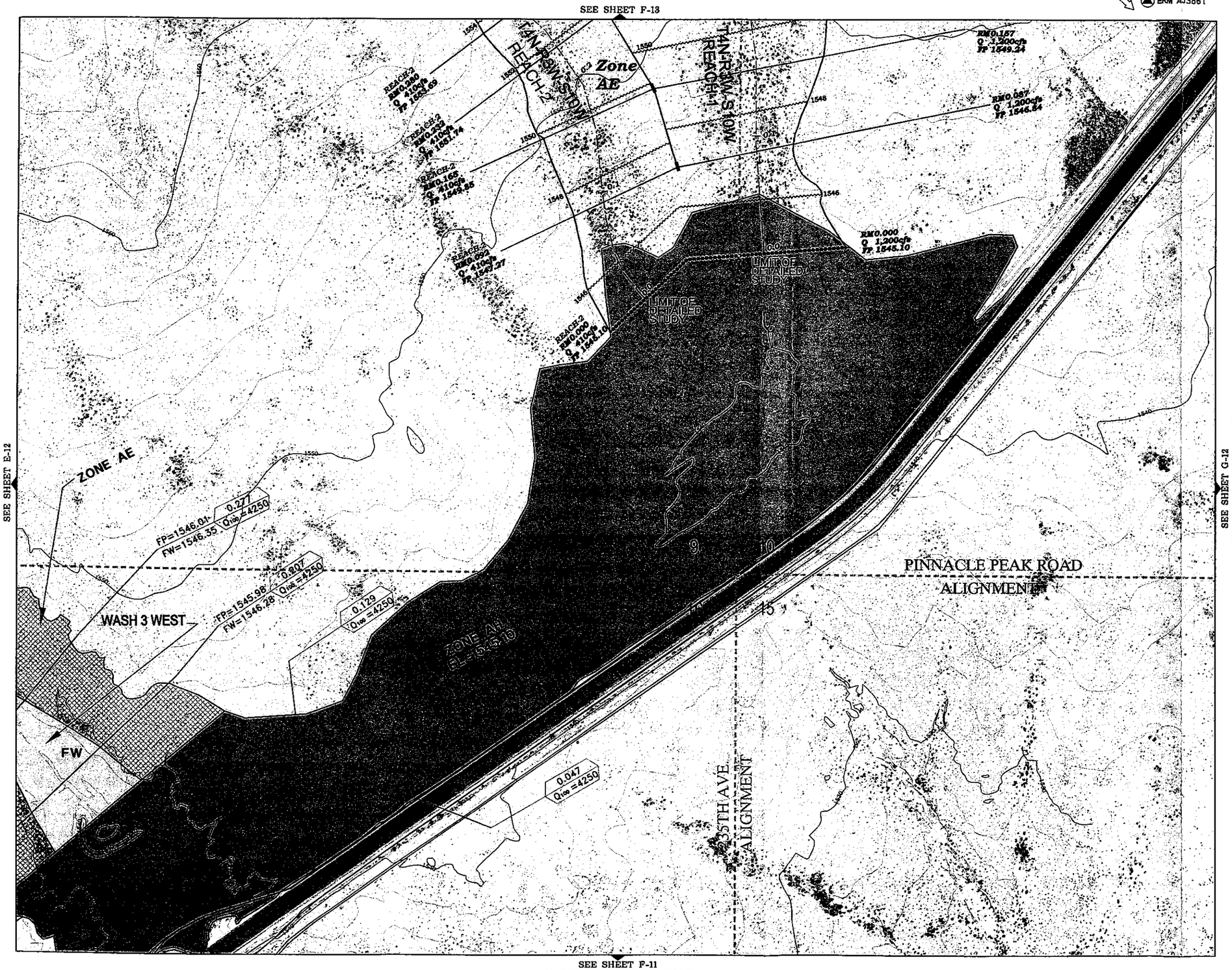

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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029

and

WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029 — WITTMANN PHASE 2-FCD2004C066

EFFECTIVE ZONE A — ZONE A — ZONE AE FLOODPLAIN (FP)

EFFECTIVE ZONE AE — ZONE AH — ZONE AE FLOODWAY (FW)

EFFECTIVE ZONE AH — ZONE AE

EFFECTIVE FLOODWAY — FLOODWAY (FW)

ZONE AO

HYDRAULIC BASE LINE — RM1.406 Q 1,970cfs FP 1566.90 FW 1567.62

CROSS SECTION — 2,199 / Q100=1270 — FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029 — DAVID EVANS and ASSOCIATES INC.-FCD2004C066

PRIMATECH-FCD2004C066

NOTE:

1. NGVD 29 + 1.90 FEET = NAVD 88.

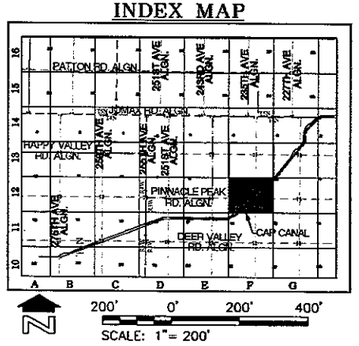
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



Entellus
DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAK	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

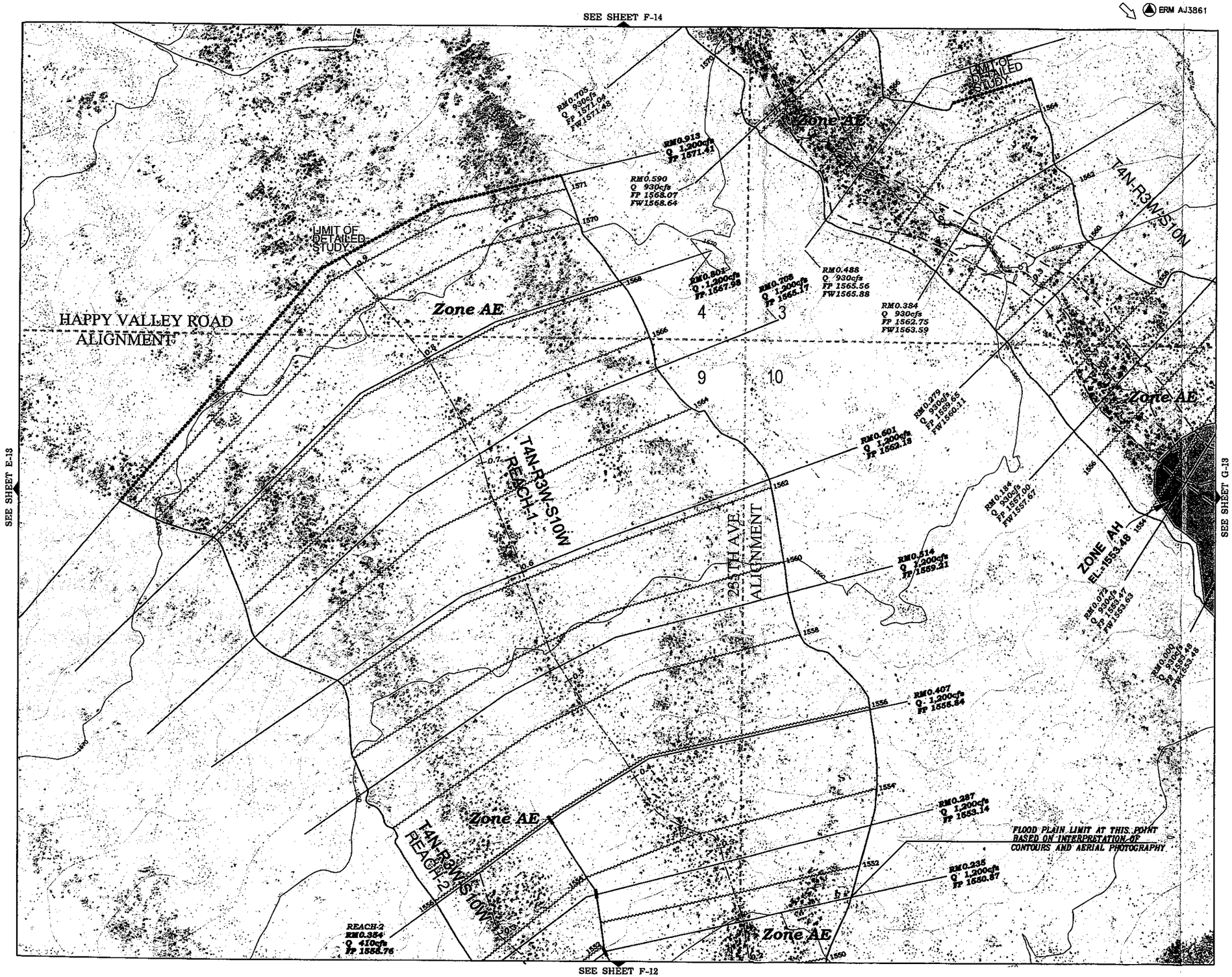
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-12 OF FLOODPLAIN DELINEATION



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029 — WITTMANN PHASE 2-FCD2004C066

EFFECTIVE ZONE A — ZONE A — ZONE AE FLOODPLAIN (FP)
EFFECTIVE ZONE AE — ZONE AH — ZONE AE FLOODWAY (FW)
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

HYDRAULIC BASE LINE — 13.1 — 14.4

CROSS SECTION — 2,199 / Qmax=1270 / FP=1400.55 / FW=1400.56

RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

ENTELLUS-FCD2002C029 — DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN ARIZONA, U.S.A.

PRIMATECH-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 11963 G.A. LOPEZ-CEVERO ARIZONA, U.S.A.

NOTE:
1. NGVD 29 + 1.92 FEET = NAVD 88.

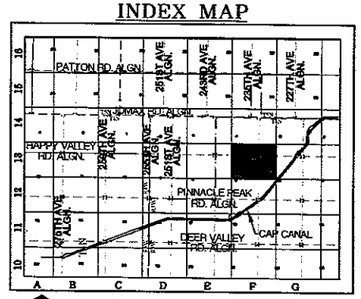
ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3861		

NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



Entellus — 2999 N. 44th Street, Suite 250, Phoenix, AZ 85018-2329, Tel 602.381.8580, Fax 602.381.8587, www.entellusinc.com

DAVID EVANS AND ASSOCIATES INC. — 2141 East Highland Avenue, Suite 200, Phoenix Arizona 85016, Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/RAG	07/05	FEB/NBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	NBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/NBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

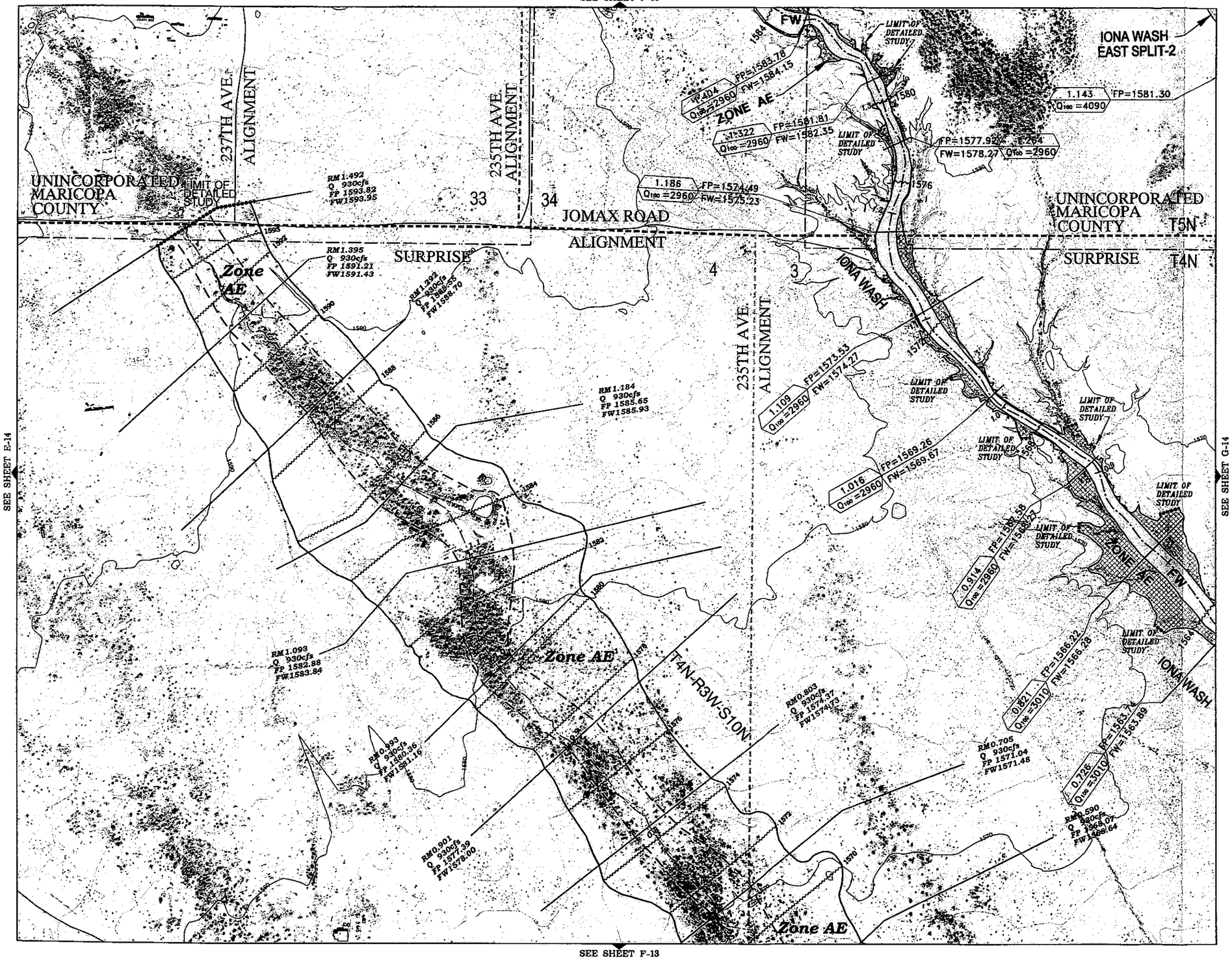
RECOMMENDED BY: DATE
APPROVED BY: DATE
CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-13 OF FLOODPLAIN DELINEATION

P:\K\MAR00000044\...\DMCV\FP\SHEETS\FP-WORKMAPS\F-13.dwg Nbl Oct 04, 2006 7:53:37am

MATCH SHEET AT TRIANGLE
SEE SHEET F-15

ERM AJ3866



SEE SHEET E-14

SEE SHEET G-14
MATCH SHEET AT TRIANGLE

SEE SHEET F-13

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

P:\M\MARI0000044\...\LOWC\EP\SHEETS\FP-WORKMAPS\F-14.dwg Nbi Oct 04, 2006 7:57:18am

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029: EFFECTIVE ZONE A; EFFECTIVE ZONE AE; EFFECTIVE ZONE AH; EFFECTIVE FLOODWAY; ZONE A; ZONE AH; ZONE AE; FLOODWAY (FW); ZONE AO

WITTMANN PHASE 2-FCD2004C066: ZONE AE FLOODPLAIN (FP); ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE

CROSS SECTION 2.199 Q100=1270 FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE NO. 23060 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

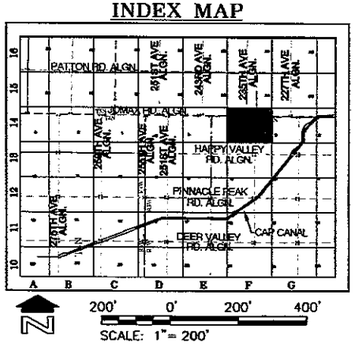
NOTE:
1. NGVD 29 + 1.91 FEET = NAVD 88

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE. WWW.NGS.NOAA.GOV

INDEX MAP



Entellus

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2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMC/HAA	07/05	FEB/MBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	MBL	07/06
PLANS CHK.	AMC/HAA	07/05	FEB/MBL	07/06

SUBMITTED BY: DATE:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

RECOMMENDED BY: DATE

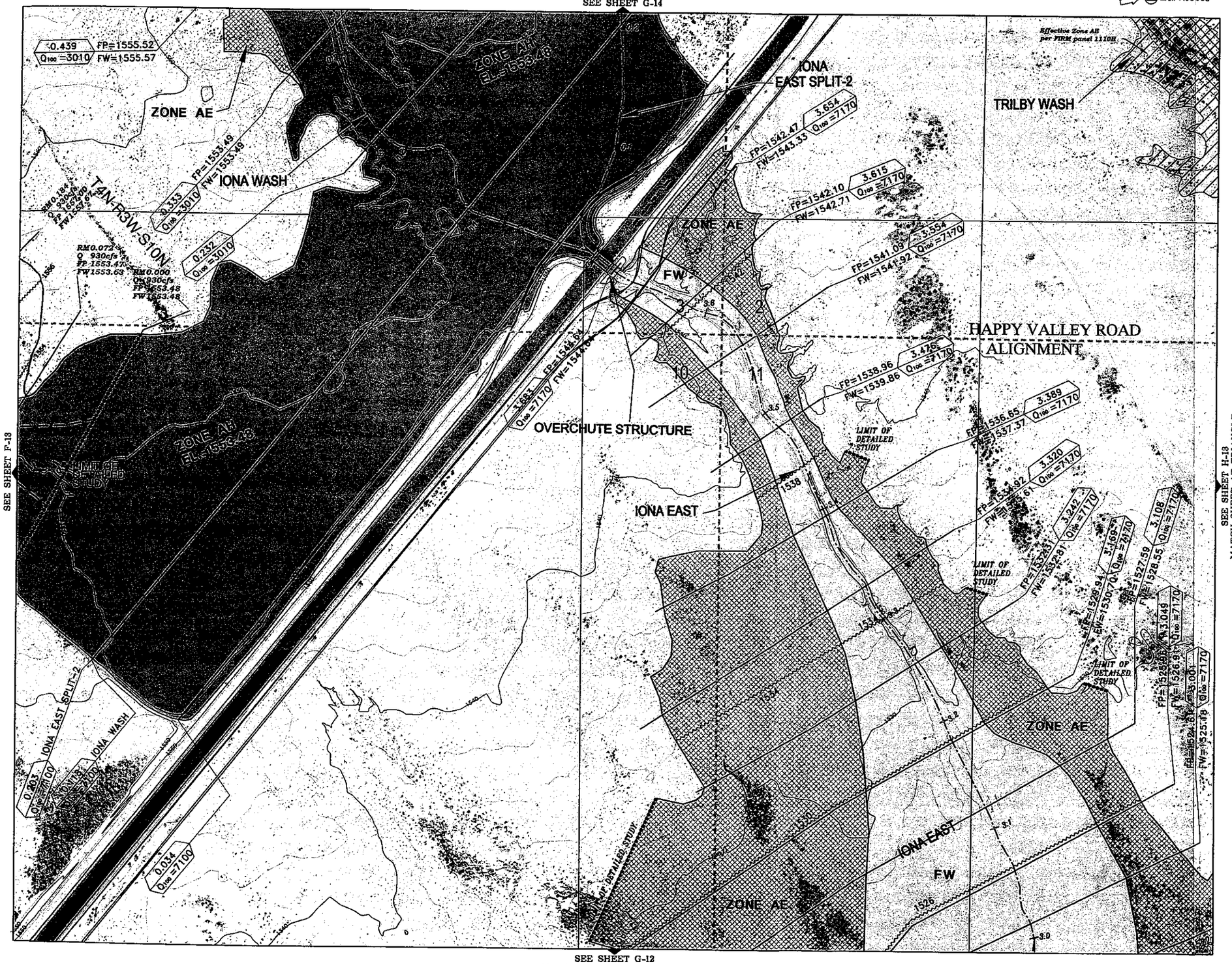
APPROVED BY: DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET F-14 OF FLOODPLAIN DELINEATION

MATCH SHEET AT TRIANGLE
SEE SHEET G-14

ERM AJ3866



SEE SHEET F-13

SEE SHEET H-13
MATCH SHEET AT TRIANGLE

SEE SHEET G-12
MATCH SHEET AT TRIANGLE

1" = 600' (1:7200) FLIGHT DATES: (04/18/02), (04/19/02), (04/23/02), 1"=1200' (1:14400) (04/23/02) BY: STEWART GEO TECHNOLOGIES

P:\M\MARI0000004\J\DWG\EP\SHEETS\FP-WORKMAPS\G-13.dwg hbl Oct 04, 2005 8:02:29am

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ADMSU-FCD2002C029
and
WITTMANN PHASE 2-FCD2004C066

LEGEND

ZONE DESIGNATION	ZONE A
WASH I.D. LABEL	WASH 9 EAST
ELEVATION REFERENCE MARK	ERM AJ3866
BASE FLOOD ELEVATION	1320
DIKE / LEVEE	DIKE
COUNTY BOUNDARY	
CORPORATE LIMIT	
LIMIT OF STUDY	
LIMIT OF DETAILED STUDY	
TOWNSHIP/RANGE LINE	
SECTION LINE	
SECTION NUMBER	29

ADMSU-FCD2002C029

EFFECTIVE ZONE A — ZONE A
EFFECTIVE ZONE AE — ZONE AH
EFFECTIVE ZONE AH — ZONE AE
EFFECTIVE FLOODWAY — FLOODWAY (FW)
ZONE AO

WITTMANN PHASE 2-FCD2004C066

ZONE AE FLOODPLAIN (FP)
ZONE AE FLOODWAY (FW)

HYDRAULIC BASE LINE — RM1.406 Q 1,970cfs FP 1566.90 FW1567.62

CROSS SECTION — 2.199 Q100=1270 FP=1400.55 FW=1400.56

ENTELLUS-FCD2002C029

DAVID EVANS and ASSOCIATES INC.-FCD2004C066

Registered Professional Engineer (Civil) CERTIFICATE 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

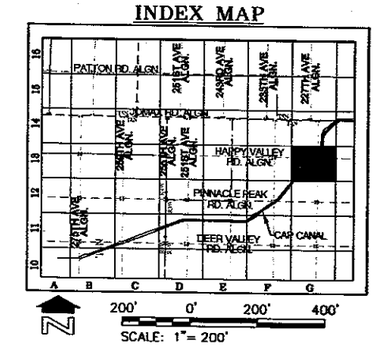
NOTE:
1. NGVD 29 + 1.89 FEET = NAVD 88.

ELEVATION REFERENCE MARKS

NOTE: ALL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

I.D. NUMBER	ELEV. (FT)	DESCRIPTION/LOCATION
AJ3866		NOTE: FOR ERM DESCRIPTION AND ELEVATIONS GO TO THE NATIONAL GEODETIC SURVEY WEB SITE, WWW.NGS.NOAA.GOV

INDEX MAP



200' 0' 200' 400'
SCALE: 1" = 200'

Entellus
1000 N. 44th Street, Suite 100
Phoenix, AZ 85008-6379
Tel 602.244.0065
Fax 602.244.0067
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DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

	ADMSU		PHASE 2	
DESIGN	AMG/RAS	07/05	FEB/MBL	07/06
DESIGN CHK.	HAA	07/05	FEB	07/06
PLANS	KAB	07/05	MBL	07/06
PLANS CHK.	AMG/HAA	07/05	FEB/MBL	07/06

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SHEET G-13 OF FLOODPLAIN DELINEATION