```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  22.277     .03  46.697     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        22.277  46.697              31    69.7    94.9             .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: East               RS: 10

INPUT
Description: xs-10
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 135.334   8.552 135.444  16.286 135.197  28.588 134.873  35.429  130.88
  38.853 128.012  47.261 123.213  51.232  121.39  54.238  121.49  61.824  125.37
  70.657  130.03  76.507  133.12  81.743 135.738

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  47.261     .03  61.824     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        47.261  61.824             39.1    64.3    77.1             .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: East               RS: 9

INPUT
Description: xs-9
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 125.204    8.83  124.02  24.132 122.958  35.856 120.836  43.317 119.528
  45.319  116.74   49.08  117.02  57.501  120.81  69.459  125.64  79.782  128.99
  90.292  132.59

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  43.317     .03  57.501     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        43.317  57.501             23.2    58.5    88.9             .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West               RS: 8

INPUT
Description: xs-8
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  127.83   5.026  127.04   9.216 126.405  13.138   125.2  15.873 124.089
  27.974 123.218  36.228 123.691  46.049 125.582  49.374 126.623  53.195 126.381
  56.757 126.931

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  13.138     .03  46.049     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        13.138  46.049             78.3    74.6       61             .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West               RS: 7

INPUT
Description: xs-7
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  131.64  11.337  128.26  16.067  127.96  37.535  117.43   39.42 117.517
   41.48  117.39  43.883 118.833  50.129 121.818  54.259 123.688  58.495 125.513
  63.187 128.114  66.002 130.087

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  16.067     .03  50.129     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        16.067  50.129            174.7   129.4    87.3             .2       .4

CROSS SECTION
```

```
RIVER: Natural Drainage
REACH: West                RS: 6

INPUT
Description: xs-6
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  132.12   6.343 130.144  12.465 128.232  17.515 125.596  23.803  122.91
  28.554 121.053  31.846 117.863  34.247 116.123   39.89 116.312  65.003 128.242
  87.037  136.86  93.574  136.83 106.941  140.75 119.025  144.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  28.554     .03  65.003     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        28.554  65.003              47.7    40.4    28.6             .2      .4

CROSS SECTION


RIVER: Natural Drainage
REACH: West                RS: 5

INPUT
Description: xs-5
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 130.985  12.221  129.57  17.438 128.755  29.536 122.198  34.116 120.413
  36.811  117.43   41.01   117.7  58.324  126.26  77.795 136.666  80.357  138.04
  86.796   138.1   98.46  143.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  29.536     .03  58.324     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        29.536  58.324               121   100.5    97.7             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West                RS: 4

INPUT
Description: xs-4
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  130.12   8.995  126.05  21.274  120.45  31.938  115.65  37.191  113.29
  39.969  113.17  44.261 115.156  52.004 115.801  57.112  118.08  61.654 119.807
  68.203 121.569  76.826 123.754   83.16 126.268

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  31.938     .03  44.261     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        31.938  44.261              80.3   129.2   152.3             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West                RS: 3

INPUT
Description: xs-3
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  125.55  24.309  118.95  34.758  114.17  41.515  110.98   47.33  108.28
  51.018  108.44  58.602 110.428  64.733 116.151  68.941 118.375  75.445 121.493
  84.626 125.668  89.466 128.263  93.726 130.831

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  24.309     .03  68.941     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        24.309  68.941              182.2   147.1     140             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: South               RS: 2

INPUT
Description: xs-2
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  99.456  12.181  96.635  17.897  94.226  23.962  92.571  27.247   92.06
  30.627   92.03  36.808  92.963  41.613  94.645  44.827  96.011  49.644  97.802
  55.151 100.012  59.968  102.05  62.674 103.227
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  12.181     .03  44.827     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        12.181  44.827             54.4    51.7    46.1            .2       .4

CROSS SECTION


RIVER: Natural Drainage
REACH: South              RS: 1

INPUT
Description: xs-1
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 102.161   3.784 100.488   9.662  98.653  15.977  96.037  20.721  94.146
  24.571  92.825  28.372  91.449  31.723   91.05  35.187   90.91  39.699  90.993
  43.688   92.45  47.285  93.865  50.895  95.649  53.744  96.959  58.332  100.37
  63.003 101.418

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  15.977     .03  50.895     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        15.977  50.895               0       0       0            .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: North              RS: 19

INPUT
Description: xs-19
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  89.824   3.801  89.277   8.285  88.762   13.65  88.278  16.294  88.105
  20.492  84.177  27.394  87.917  32.684  88.508  37.511  88.615  43.239  88.408
  45.479  87.981  50.005  92.349  53.923   92.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  16.294     .03  27.394     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        16.294  27.394             48.1    52.7    56.4            .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: North              RS: 18

INPUT
Description: xs-18
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  79.655   3.915  79.801   7.426   79.65   9.375  77.433  10.897  77.379
  13.781  80.302  21.023  80.793  29.076  81.292  35.507  82.392  43.372    82.5
  44.902  82.142  47.913  82.352  50.369  83.267    54.3  83.784   56.81  85.637

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04   7.426     .03  13.781     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         7.426  13.781             60.1    55.4      56            .1       .3

CROSS SECTION


RIVER: Natural Drainage
REACH: North              RS: 17

INPUT
Description: xs-17
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  77.473   3.738  77.352  13.846  75.237  27.261  75.161  30.441  74.564
  35.241  75.392  47.656  75.404  61.435  76.545  71.795  76.772   74.53  76.354
  77.194  78.945  84.126  80.247  89.497   80.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04   3.738     .03  61.435     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         3.738  61.435             77.1    84.6    93.4            .2       .4

CROSS SECTION
```

RIVER: Natural Drainage
REACH: North RS: 16

INPUT
Description: xs-16
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.889	12.575	70.143	26.709	68.6	29.179	68.72	53.801	69.967
71.159	70.863	94.768	70.983	98.227	70.379	104.006	72.449	109.755	73.265
119.599	73.19								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	12.575	.03	53.801	.04

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
12.575	53.801		142.8	99.3	55.8	.2	.4

CROSS SECTION

RIVER: Natural Drainage
REACH: North RS: 15

INPUT
Description: xs-15
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	82.02	3.895	82.26	28.937	70.84	37.727	70.23	45.668	69.96
57.015	69.75	71.323	69.49	86.808	65.96	91.71	66.094	95.498	65.971
101.412	65.27	105.769	63.874	108.096	62.903	111.185	62.569	112.891	64.013
119.709	66.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	101.412	.03	119.709	.04

Bank Sta: Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
101.412	119.709		0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

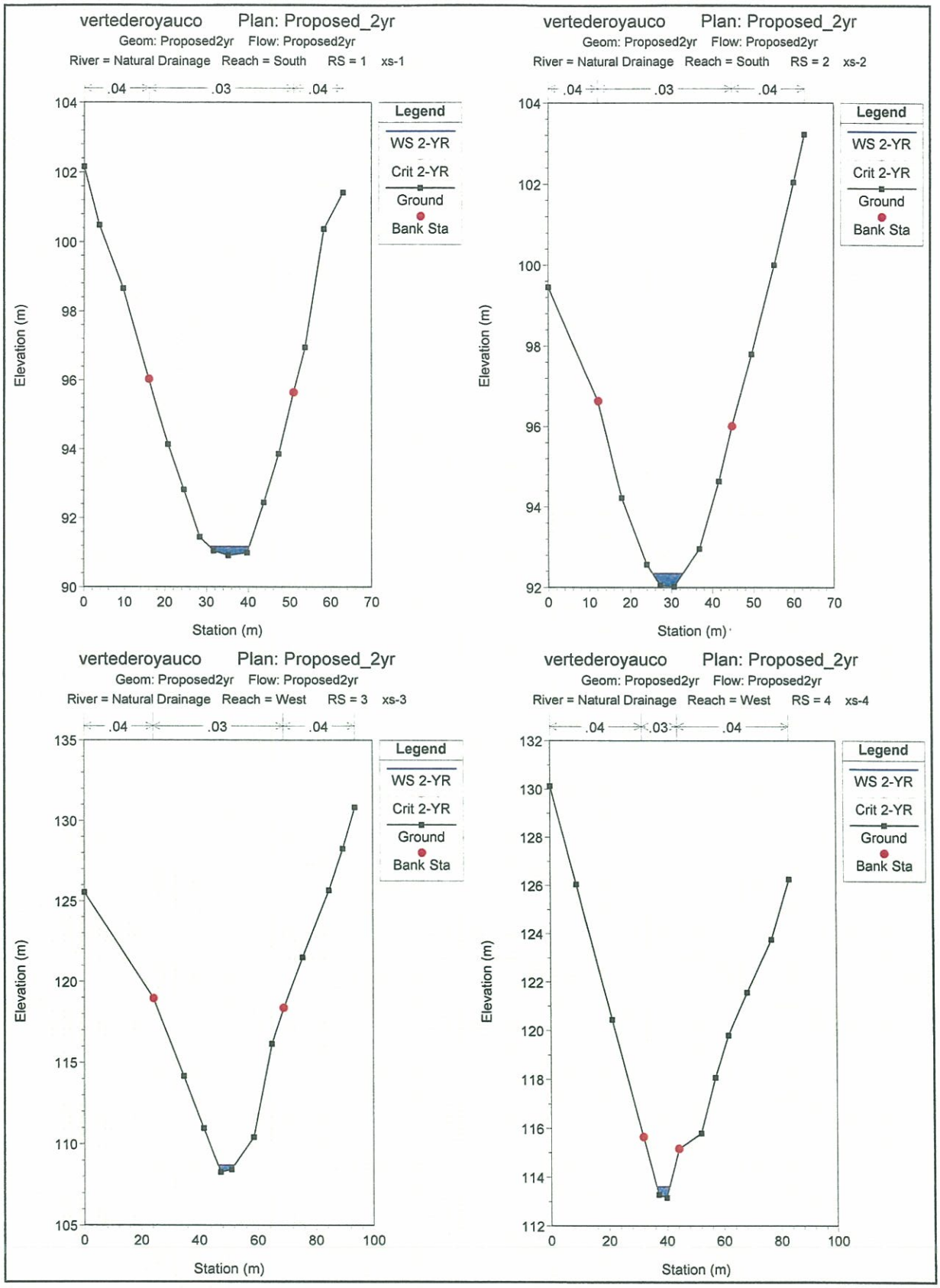
River:Natural Drainage

Reach	River Sta.	n1	n2	n3
East	14	.04	.03	.04
East	13	.04	.03	.04
East	12	.04	.03	.04
East	11	.04	.03	.04
East	10	.04	.03	.04
East	9	.04	.03	.04
West	8	.04	.03	.04
West	7	.04	.03	.04
West	6	.04	.03	.04
West	5	.04	.03	.04
West	4	.04	.03	.04
West	3	.04	.03	.04
South	2	.04	.03	.04
South	1	.04	.03	.04
North	19	.04	.03	.04
North	18	.04	.03	.04
North	17	.04	.03	.04
North	16	.04	.03	.04
North	15	.04	.03	.04

SUMMARY OF REACH LENGTHS

River: Natural Drainage

Reach	River Sta.	Left	Channel	Right
East	14	106.6	88.9	64.5
East	13	52.1	59	74.1
East	12	65.9	135.4	171.5
East	11	31	69.7	94.9
East	10	39.1	64.3	77.1
East	9	23.2	58.5	88.9
West	8	78.3	74.6	61
West	7	174.7	129.4	87.3
West	6	47.7	40.4	28.6
West	5	121	100.5	97.7
West	4	80.3	129.2	152.3
West	3	182.2	147.1	140
South	2	54.4	51.7	46.1
South	1	0	0	0
North	19	48.1	52.7	56.4
North	18	60.1	55.4	56
North	17	77.1	84.6	93.4
North	16	142.8	99.3	55.8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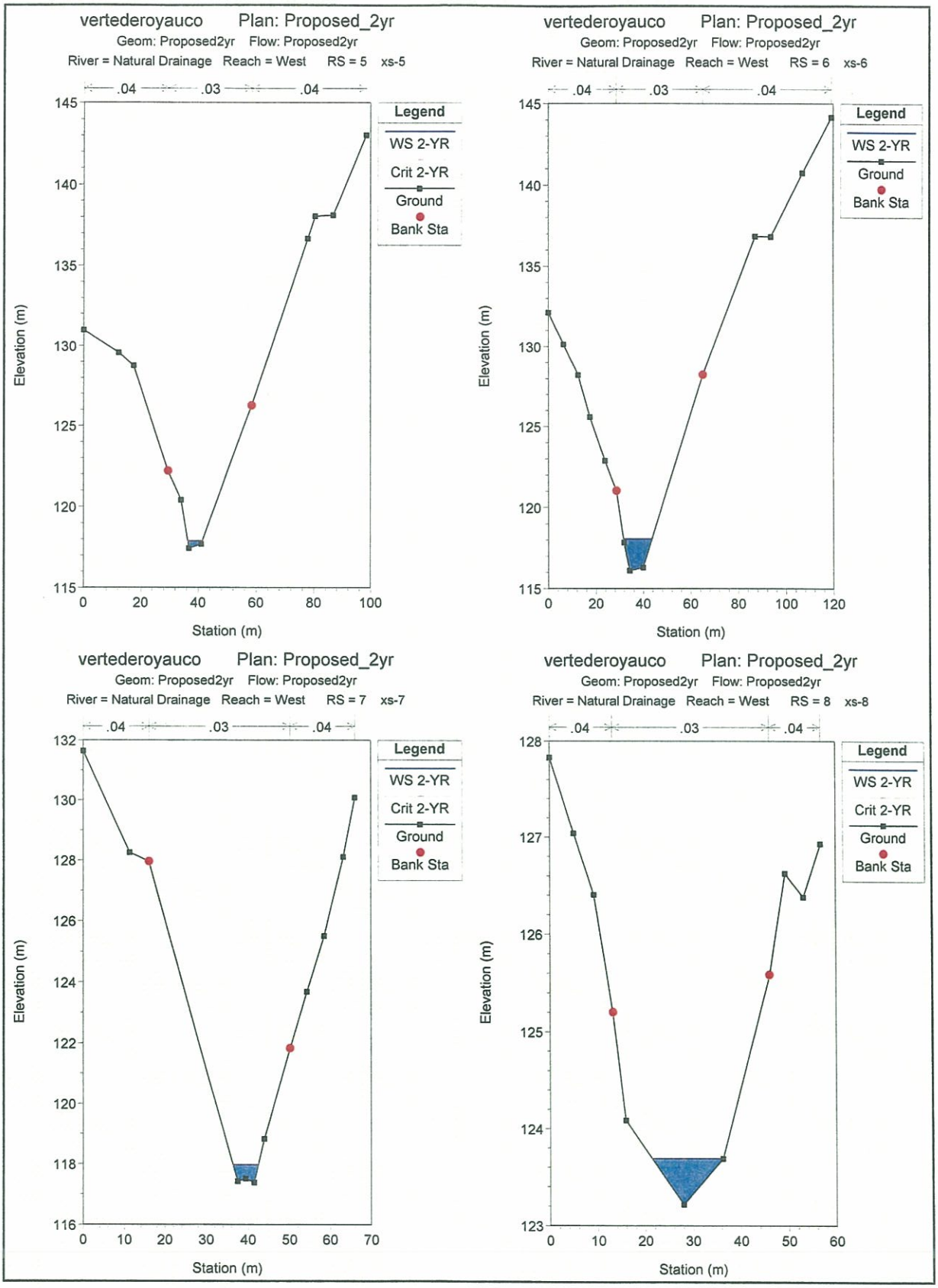
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = South RS = 1 xs-1
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = South RS = 2 xs-2
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 3 xs-3
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 4 xs-4
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)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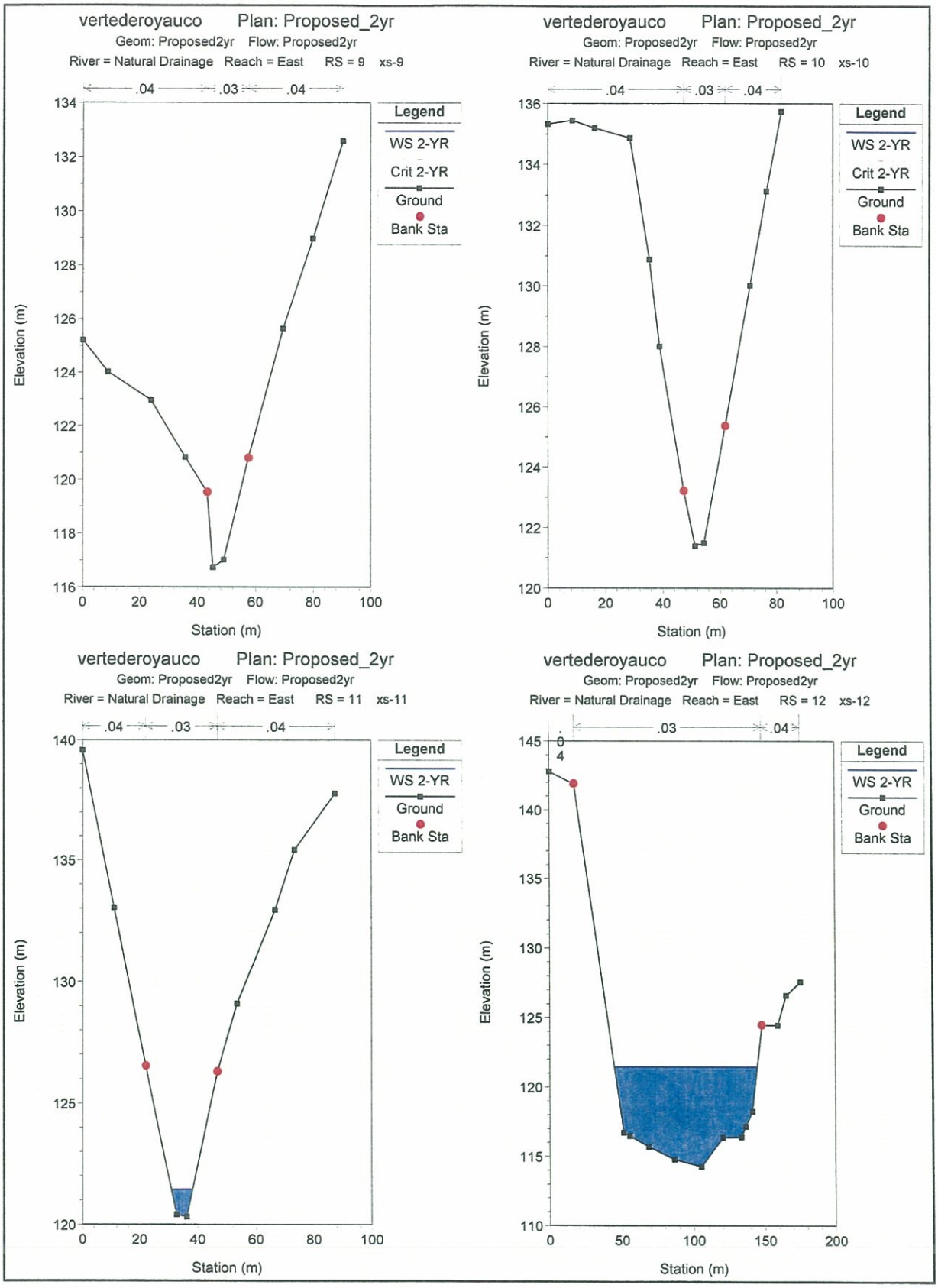
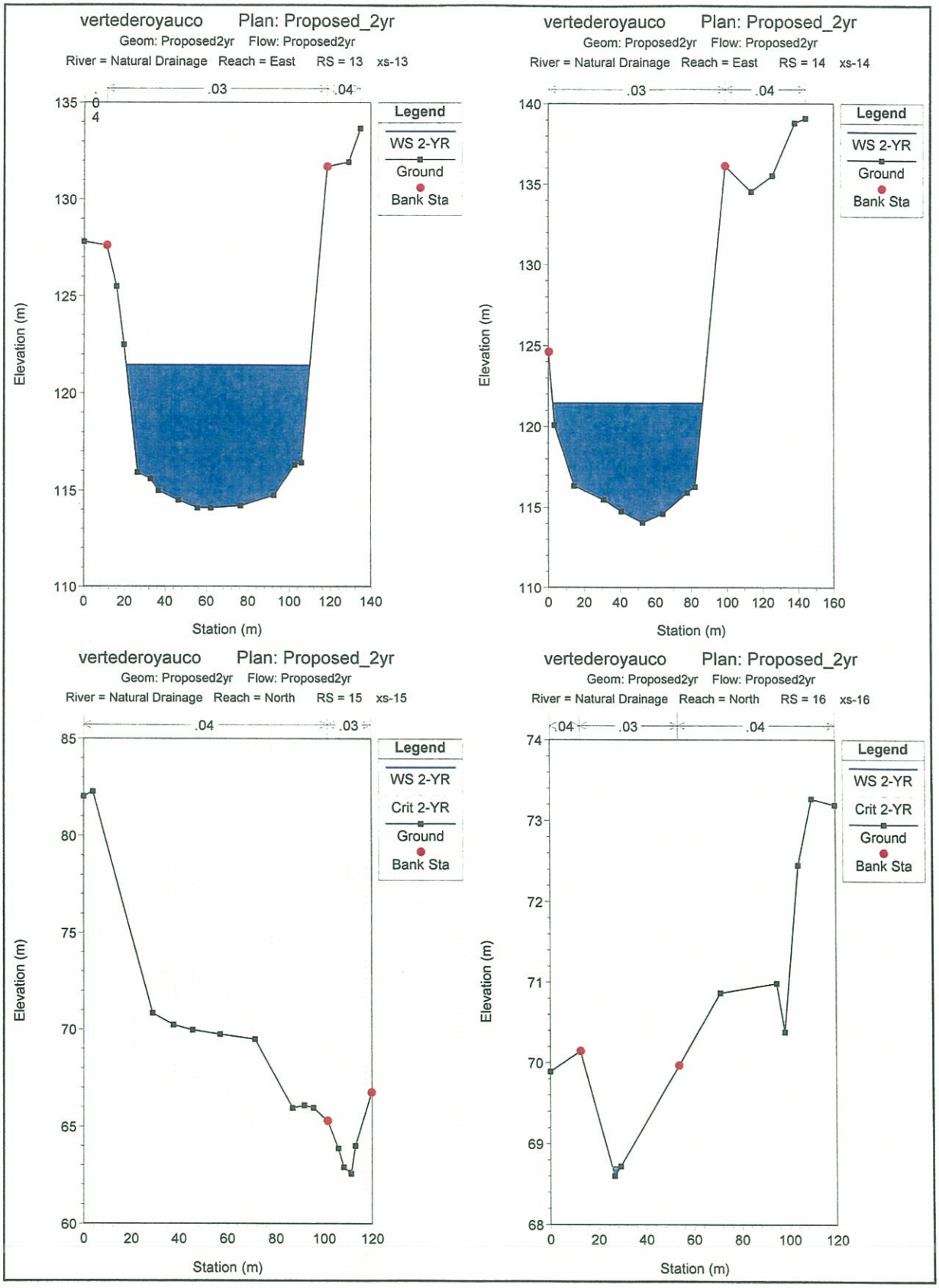
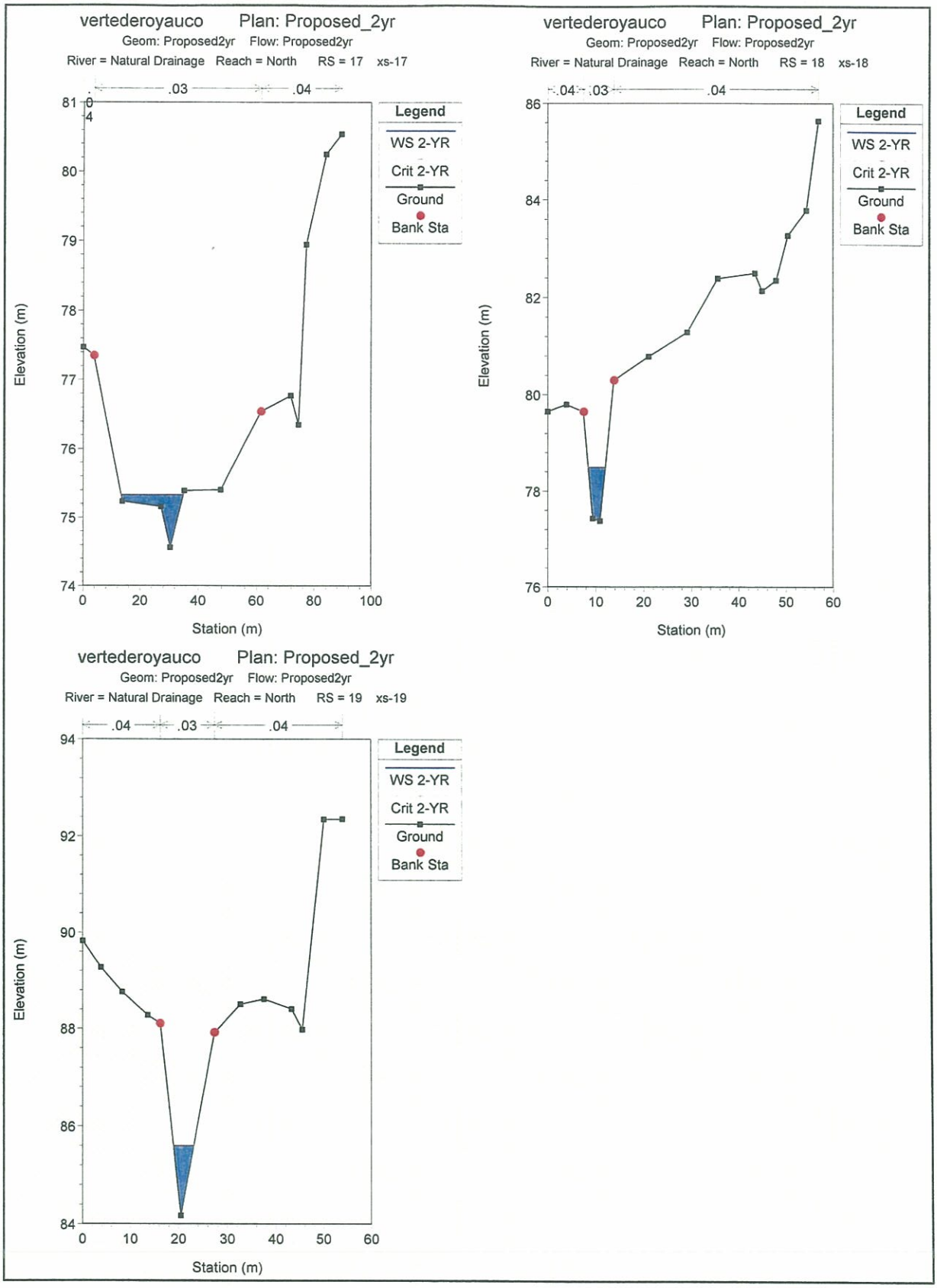
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 5 xs-5
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 6 xs-6
.04 .03 .04
Legend
WS 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 7 xs-7
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = West RS = 8 xs-8
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)


vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 9 xs-9
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 10 xs-10
.04 .03 .04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 11 xs-11
.04 .03 .04
Legend
WS 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 12 xs-12
.03 .04
Legend
WS 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)


vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 13 xs-13
.03
.04
Legend
WS 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = East RS = 14 xs-14
.03
.04
Legend
WS 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = North RS = 15 xs-15
.04
.03
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = North RS = 16 xs-16
.04
.03
.04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)


vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = North RS = 17 xs-17
.03
.04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = North RS = 18 xs-18
.04
.03
.04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)
vertederoyauco Plan: Proposed_2yr
Geom: Proposed2yr Flow: Proposed2yr
River = Natural Drainage Reach = North RS = 19 xs-19
.04
.03
.04
Legend
WS 2-YR
Crit 2-YR
Ground
Bank Sta
Elevation (m)
Station (m)

HEC-RAS Plan: Proposed2yr Profile: 2-YR

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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
South	1	2-YR	2.42	90.91	91.17	91.17	91.27	0.015758	1.36342	1.77	9.50	1.01
South	2	2-YR	2.42	92.03	92.35	92.35	92.46	0.014970	1.48748	1.63	7.34	1.01
North	15	2-YR	0.14	62.57	62.74	62.74	62.78	0.021773	0.92687	0.15	1.77	1.01
North	16	2-YR	0.14	68.60	68.71	68.71	68.74	0.022923	0.74041	0.19	3.36	1.00
North	17	2-YR	7.77	74.56	75.33	75.33	75.45	0.014870	1.53954	5.05	21.52	1.01
North	18	2-YR	7.77	77.38	78.50	78.50	78.90	0.013339	2.78884	2.79	3.57	1.01
North	19	2-YR	7.77	84.18	85.60	85.60	85.95	0.013017	2.64663	2.94	4.14	1.00
West	3	2-YR	2.44	108.28	108.68	108.68	108.82	0.014346	1.64455	1.48	5.49	1.01
West	4	2-YR	2.44	113.17	113.61	113.61	113.77	0.013887	1.76089	1.39	4.45	1.01
West	5	2-YR	2.44	117.43	117.88	117.88	118.02	0.014610	1.70358	1.43	4.96	1.01
West	6	2-YR	2.44	116.12	118.06		118.06	0.000015	0.15117	16.14	11.91	0.04
West	7	2-YR	5.47	117.39	117.98	117.98	118.20	0.012582	2.07969	2.63	6.04	1.01
West	8	2-YR	5.47	123.22	123.69	123.69	123.82	0.014813	1.55272	3.52	14.85	1.02
East	9	2-YR	0.02	116.74	116.81	116.81	116.83	0.032588	0.61463	0.03	0.96	1.07
East	10	2-YR	0.02	121.39	121.44	121.44	121.45	0.030317	0.49442	0.04	1.62	1.00
East	11	2-YR	0.02	120.32	121.45		121.45	0.000000	0.00345	5.79	7.22	0.00
East	12	2-YR	0.02	114.27	121.45		121.45	0.000000	0.00004	543.94	99.91	0.00
East	13	2-YR	10.01	114.09	121.45		121.45	0.000000	0.01791	558.90	89.32	0.00
East	14	2-YR	10.01	114.06	121.45		121.45	0.000000	0.02108	474.80	84.14	0.00

GEOMETRY: PROPOSED 100-YR

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: vertederoyauco
Project File : vertederoyauco.prj
Run Date and Time: 10/23/2008 3:16:48 PM

Project in SI units

PLAN DATA

Plan Title: Proposed_100yr
Plan File : C:\PROJ\Yauco\RAS3\vertederoyauco.p01

Geometry Title: Proposed100yr
Geometry File : C:\PROJ\Yauco\RAS3\vertederoyauco.g01

Flow Title : Proposed100yr
Flow File : C:\PROJ\Yauco\RAS3\vertederoyauco.f02

Plan Summary Information:
Number of: Cross Sections = 19 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
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: Proposed100yr
Flow File : C:\PROJ\Yauco\RAS3\vertederoyauco.f02

Flow Data (m3/s)

River	Reach	RS	100-YR
Natural	DrainageEast	14	20.05
Natural	DrainageEast	12	7.95
Natural	DrainageWest	8	11.19
Natural	DrainageWest	6	8.95
Natural	DrainageSouth	2	16.15
Natural	DrainageSouth	1	16.15
Natural	DrainageNorth	19	15.9
Natural	DrainageNorth	16	11.96

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Natural	DrainageSouth	100-YR		Critical
Natural	DrainageNorth	100-YR		Critical

GEOMETRY DATA

Geometry Title: Proposed100yr
Geometry File : C:\PROJ\Yauco\RAS3\vertederoyauco.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Natural Drainage	East		River
Natural Drainage	West		River
Natural Drainage	South	River	
Natural Drainage	North		

JUNCTION INFORMATION

Name: River
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Natural Drainage	West	to Natural Drainage	South	147.1	
Natural Drainage	East	to Natural Drainage	South	58.5	

CROSS SECTION

RIVER: Natural Drainage
REACH: East RS: 14

INPUT
Description: xs-14
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	124.603	3.284	120.092	14.232	116.34	30.84	115.49	40.636	114.75
52.564	114.06	64.041	114.61	77.738	115.94	82.015	116.29	99.006	136.146
113.679	134.545	125.48	135.537	138.016	138.809	144.155	139.089		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	14.232	.03	82.015	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
14.232	82.015	106.6	88.9	64.5	.1	.3

CROSS SECTION

RIVER: Natural Drainage
REACH: East RS: 13

INPUT
Description: xs-13
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	127.806	11.073	127.616	15.986	125.5	19.674	122.491	26.348	115.93
32.779	115.6	36.735	114.99	46.39	114.5	55.568	114.09	62.087	114.09
76.449	114.21	92.567	114.75	102.593	116.32	105.951	116.44	118.442	131.72
128.964	131.955	134.676	133.692						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	26.348	.03	105.951	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
26.348	105.951	52.1	59	74.1	.2	.4

CROSS SECTION

RIVER: Natural Drainage
REACH: East RS: 12

INPUT
Description: xs-12
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	142.79	17.058	141.89	51.145	116.72	55.471	116.49	68.639	115.7
86.442	114.78	105.279	114.27	120.297	116.36	133.271	116.39	136.323	117.16
141.191	118.26	147.886	124.46	159.152	124.453	165.052	126.589	175.122	127.566

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	51.145	.03	120.297	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51.145	120.297	65.9	135.4	171.5	.2	.4

CROSS SECTION

RIVER: Natural Drainage
REACH: East RS: 11

INPUT
Description: xs-11
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	139.585	11.117	133.04	22.277	126.54	32.813	120.42	36.279	120.32
46.697	126.311	53.548	129.115	66.615	132.952	73.291	135.427	87.403	137.786

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  22.277     .03  46.697     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        22.277  46.697               31    69.7    94.9             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: East               RS: 10

INPUT
Description: xs-10
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 135.334   8.552 135.444  16.286 135.197  28.588 134.873  35.429  130.88
  38.853 128.012  47.261 123.213  51.232  121.39  54.238  121.49  61.824  125.37
  70.657  130.03  76.507  133.12  81.743 135.738

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  47.261     .03  61.824     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        47.261  61.824              39.1    64.3    77.1             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: East               RS: 9

INPUT
Description: xs-9
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 125.204    8.83  124.02  24.132 122.958  35.856 120.836  43.317 119.528
  45.319  116.74   49.08  117.02  57.501  120.81  69.459  125.64  79.782  128.99
  90.292  132.59

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  43.317     .03  57.501     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        43.317  57.501              23.2    58.5    88.9             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West               RS: 8

INPUT
Description: xs-8
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  127.83   5.026  127.04   9.216 126.405  13.138   125.2  15.873 124.089
  27.974 123.218  36.228 123.691  46.049 125.582  49.374 126.623  53.195 126.381
  56.757 126.931

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  13.138     .03  46.049     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        13.138  46.049              78.3    74.6       61             .1      .3

CROSS SECTION


RIVER: Natural Drainage
REACH: West               RS: 7

INPUT
Description: xs-7
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  131.64  11.337  128.26  16.067  127.96  37.535  117.43   39.42 117.517
   41.48  117.39  43.883 118.833  50.129 121.818  54.259 123.688  58.495 125.513
  63.187 128.114  66.002 130.087

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .04  16.067     .03  50.129     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        16.067  50.129             174.7   129.4    87.3             .2      .4

CROSS SECTION
```

RIVER: Natural Drainage
REACH: West RS: 6

INPUT
Description: xs-6
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	132.12	6.343	130.144	12.465	128.232	17.515	125.596	23.803	122.91
28.554	121.053	31.846	117.863	34.247	116.123	39.89	116.312	65.003	128.242
87.037	137.33	93.574	139.65	106.941	143.5	119.025	144.85		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	28.554	.03	65.003	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28.554	65.003	47.7	40.4	28.6	.2	.4

CROSS SECTION

RIVER: Natural Drainage
REACH: West RS: 5

INPUT
Description: xs-5
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	130.985	12.221	129.57	17.438	128.755	29.536	122.198	34.116	120.413
36.811	117.43	41.01	117.7	58.324	126.26	77.795	136.666	80.357	138.04
86.796	140	98.46	145						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	29.536	.03	58.324	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.536	58.324	121	100.5	97.7	.1	.3

CROSS SECTION

RIVER: Natural Drainage
REACH: West RS: 4

INPUT
Description: xs-4
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	130.12	8.995	126.05	21.274	120.45	31.938	115.65	37.191	113.29
39.969	113.17	44.261	115.156	52.004	115.801	57.112	118.08	61.654	119.807
68.203	121.569	76.826	125.62	83.16	130.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	31.938	.03	44.261	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31.938	44.261	80.3	129.2	152.3	.1	.3

CROSS SECTION

RIVER: Natural Drainage
REACH: West RS: 3

INPUT
Description: xs-3
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	125.55	24.309	118.95	34.758	114.17	41.515	110.98	47.33	108.28
51.018	108.44	58.602	110.428	64.733	116.151	68.941	118.375	75.445	121.493
84.626	125.668	89.466	128.263	93.726	130.831				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.04	24.309	.03	68.941	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
24.309	68.941	182.2	147.1	140	.1	.3

CROSS SECTION

RIVER: Natural Drainage
REACH: South RS: 2

INPUT
Description: xs-2
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	99.456	12.181	96.635	17.897	94.226	23.962	92.571	27.247	92.06
30.627	92.03	36.808	92.963	41.613	94.645	44.827	96.011	49.644	97.802
55.151	100.012	59.968	102.05	62.674	103.227				