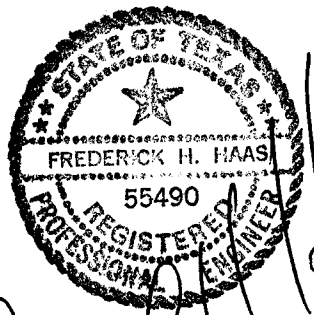
APPENDIX F

HEC-RAS MODEL FOR THE CALCULATION OF THE 500-YEAR AND PMP WATER SURFACE PROFILES



12/17/04

HEC-RAS Plan: pmp River: Ditch A Reach: 5

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Sta W.S. Lft	Sta W.S. Rgt	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)	(ft)	
5	12674	533.00	3477.00	3478.39	3478.01	1.39	3478.47	0.003073	2.31	237.18	352.67	659.59	306.92	0.43
5	12674	1768.00	3477.00	3479.22	3478.65	2.22	3479.41	0.003111	3.61	539.30	294.31	712.12	417.81	0.48
5	11337	533.00	3469.00	3470.41	3470.38	1.41	3470.80	0.014135	5.03	108.23	426.18	558.41	132.24	0.93
5	11337	1768.00	3469.00	3471.40	3471.40	2.40	3472.19	0.011380	7.37	259.90	404.87	578.73	173.86	0.94
5	10937	533.00	3464.00	3465.80	3465.61	1.80	3466.09	0.009826	4.31	123.70	472.06	602.43	130.37	0.78
5	10937	1768.00	3464.00	3466.73	3466.67	2.73	3467.39	0.011881	6.57	275.01	438.14	635.86	197.71	0.93
5	10288	533.00	3456.00	3456.93	3456.93	0.93	3457.20	0.020385	4.13	129.02	402.00	652.47	250.47	1.01
5	10288	1768.00	3456.00	3457.50	3457.50	1.50	3457.89	0.018227	5.03	351.36	346.65	813.19	466.54	1.02
5	9690	677.00	3450.00	3451.55	3451.18	1.55	3451.66	0.004712	2.64	256.54	437.56	762.72	325.16	0.52
5	9690	2568.00	3450.00	3452.40	3452.03	2.40	3452.69	0.005601	4.32	602.35	345.19	818.61	473.42	0.64
5	9006	677.00	3445.00	3446.51	3446.40	1.51	3446.75	0.012312	3.89	173.83	449.43	702.00	252.56	0.83
5	9006	2568.00	3445.00	3447.55		2.55	3447.89	0.008737	4.66	550.62	362.59	834.60	472.01	0.76
5	8130	677.00	3440.00	3441.63	3441.16	1.63	3441.71	0.003245	2.28	297.21	462.17	817.28	355.10	0.44
5	8130	2568.00	3440.00	3442.51	3441.99	2.51	3442.74	0.004151	3.85	678.70	389.53	888.33	498.79	0.55
5	7717	677.00	3437.80	3438.71	3438.71	0.91	3438.99	0.019488	4.26	158.88	329.73	614.40	284.67	1.01
5	7717	2568.00	3437.80	3439.61	3439.49	1.81	3440.03	0.011696	5.19	494.88	262.15	712.02	449.87	0.87
5	7253	770.00	3435.00	3436.41	3435.91	1.41	3436.46	0.001714	1.75	445.91	403.00	926.18	523.18	0.32
5	7253	4793.00	3435.00	3437.73	3436.95	2.73	3437.98	0.002925	4.15	1224.55	335.02	991.53	656.51	0.49
5	6343	1496.00	3430.00	3430.75	3430.75	0.75	3431.07	0.018741	4.53	330.28	772.11	1296.48	524.36	1.01
5	6343	6409.00	3430.00	3431.79	3431.79	1.79	3432.49	0.013082	6.69	974.08	677.18	1464.86	787.68	0.97
5	5363	1496.00	3425.00	3426.40	3425.83	1.40	3426.46	0.001750	1.94	788.36	703.82	1555.74	851.92	0.33
5	5363	6409.00	3425.00	3427.60	3426.70	2.60	3427.77	0.002053	3.49	2022.32	588.77	1796.04	1207.27	0.41
5	4221	1717.00	3420.00	3421.06	3421.06	1.06	3421.42	0.018111	4.81	357.22	531.16	1048.34	517.17	1.01
5	4221	6969.00	3420.00	3422.09	3422.09	2.09	3422.69	0.013866	6.36	1150.73	318.52	1328.11	1009.59	0.98
5	3489	1717.00	3416.00	3417.25	3416.73	2.25	3417.31	0.002255	2.14	874.30	-117.74	884.97	1002.71	0.38
5	3489	6969.00	3416.00	3418.33	3417.53	3.33	3418.52	0.002578	3.59	1994.93	-133.97	942.92	1076.90	0.45
5	2969	1717.00	3413.80	3414.57	3414.57	0.77	3414.89	0.018885	4.34	384.69	177.33	806.50	629.17	1.00
5	2969	6969.00	3413.80	3415.54	3415.49	1.74	3416.14	0.012585	6.56	1134.92	3.77	883.00	879.23	0.95
5	2774	1717.00	3409.00	3414.06	3412.71	5.06	3414.10	0.000321	2.27	1403.81	-406.88	643.47	1050.35	0.18
5	2774	6969.00	3409.00	3415.01	3413.39	6.01	3415.19	0.001205	4.96	2435.25	-437.14	683.38	1120.52	0.37
5	2773	Culvert												
5	2734	1717.00	3408.90	3412.71	3412.71	3.81	3412.86	0.001314	3.69	665.51	83.74	515.65	431.91	0.35
5	2734	6969.00	3408.90	3413.55	3413.55	4.65	3414.44	0.006458	9.48	1063.05	39.16	549.82	510.66	0.81
5	1688	1743.00	3408.00	3409.30	3408.79	1.30	3409.38	0.002752	2.26	770.75	186.86	1009.59	822.73	0.41
5	1688	7042.00	3408.00	3410.48	3409.72	2.48	3410.68	0.002812	3.54	2065.39	-218.68	1201.30	1419.98	0.46
5	1060	1823.00	3402.70	3404.20	3404.20	1.50	3404.61	0.017308	5.11	356.58	656.23	1102.98	444.75	1.01
5	1060	7268.00	3402.70	3405.41	3405.41	2.71	3406.07	0.014850	6.53	1112.35	480.47	1336.48	856.01	1.01

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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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
```

PROJECT DATA
Project Title: WCS
Project File : FloodPlain.prj
Run Date and Time: 12/15/04 2:53:26 PM

Project in English units

PLAN DATA

Plan Title: PMP
Plan File : D:\program files\WCS\FloodPlain.p24

Geometry Title: PMP1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g04

Flow Title : pmp
Flow File : D:\program files\WCS\FloodPlain.f22

Plan Summary Information:

Number of:	Cross Sections	= 18	Mulitple Openings	=	0
	Culverts	= 1	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 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: Mixed Flow

FLOW DATA

Flow Title: pmp
Flow File : D:\program files\WCS\FloodPlain.f22

Flow Data (cfs)

River	Reach	RS	PF 2	PF 3
Ditch A	5	12674	533	1768
Ditch A	5	9690	677	2568
Ditch A	5	7253	770	4793
Ditch A	5	6343	1496	6409
Ditch A	5	4221	1717	6969
Ditch A	5	1888	1743	7042
Ditch A	5	1060	1823	7268

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ditch A	5	PF 2	Critical	Critical

GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 12674

INPUT
Description: Sta. 12674
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
380	635	1206	1337	1433	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3478.47	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.08	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3478.39	Reach Len. (ft)	1206.00
1337.00 1433.00			
Crit W.S. (ft)	3478.01	Flow Area (sq ft)	5.33
227.05 4.80			
E.G. Slope (ft/ft)	0.003073	Area (sq ft)	5.33
227.05 4.80			
Q Total (cfs)	533.00	Flow (cfs)	4.48
524.49 4.03			
Top Width (ft)	306.92	Top Width (ft)	27.33
255.00 24.59			
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	0.84
2.31 0.84			
Max Chl Dpth (ft)	1.39	Hydr. Depth (ft)	0.20
0.89 0.20			
Conv. Total (cfs)	9615.3	Conv. (cfs)	80.8
9461.7 72.7			
Length Wtd. (ft)	1336.69	Wetted Per. (ft)	27.33
255.01 24.60			
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.04
0.17 0.04			
Alpha	1.04	Stream Power (lb/ft s)	0.03
0.39 0.03			
Frctn Loss (ft)	7.64	Cum Volume (acre-ft)	15.04
91.01 2.30			
C & E Loss (ft)	0.03	Cum SA (acres)	19.30
105.54 3.85			

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 #PF 3

E.G. Elev (ft)	3479.41	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.19	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3479.22	Reach Len. (ft)	1206.00
1337.00 1433.00			
Crit W.S. (ft)	3478.65	Flow Area (sq ft)	52.45
439.65 47.20			
E.G. Slope (ft/ft)	0.003111	Area (sq ft)	52.45
439.65 47.20			
Q Total (cfs)	1768.00	Flow (cfs)	94.95
1587.60 85.45			
Top Width (ft)	417.81	Top Width (ft)	85.69
255.00 77.12			

Vel Total (ft/s)	3.28	Avg. Vel. (ft/s)	1.81
3.61 1.81			
Max Chl Dpth (ft)	2.22	Hydr. Depth (ft)	0.61
1.72 0.61			
Conv. Total (cfs)	31697.9	Conv. (cfs)	1702.3
28463.6 1532.0			
Length Wtd. (ft)	1334.91	Wetted Per. (ft)	85.70
255.01 77.13			
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.12
0.33 0.12			
Alpha	1.12	Stream Power (lb/ft s)	0.22
1.21 0.22			
Frctn Loss (ft)	7.16	Cum Volume (acre-ft)	42.64
220.87 11.81			
C & E Loss (ft)	0.06	Cum SA (acres)	35.90
135.42 17.21			

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.
Warning: The energy loss was greater than 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: Ditch A
REACH: 5 RS: 11337

INPUT
Description: Sta. 11337
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3477	315	3474	392	3472	435	3470	499	3469
550	3470	591	3472	694	3474				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	435	.033	550	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
435	550	545	400	332	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3470.80	Element	Left OB Channel Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3470.41	Reach Len. (ft)	545.00 400.00 332.00
Crit W.S. (ft)	3470.38	Flow Area (sq ft)	1.81 104.70 1.73

E.G. Slope (ft/ft)	0.014135	Area (sq ft)	1.81
104.70	1.73		
Q Total (cfs)	533.00	Flow (cfs)	3.37
526.42	3.21		
Top Width (ft)	132.24	Top Width (ft)	8.82
115.00	8.41		
Vel Total (ft/s)	4.92	Avg. Vel. (ft/s)	1.86
5.03	1.86		
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)	0.21
0.91	0.21		
Conv. Total (cfs)	4483.2	Conv. (cfs)	28.3
4427.8	27.0		
Length Wtd. (ft)	400.25	Wetted Per. (ft)	8.83
115.02	8.42		
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.18
0.80	0.18		
Alpha	1.03	Stream Power (lb/ft s)	0.34
4.04	0.34		
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)	14.94
85.92	2.19		
C & E Loss (ft)	0.03	Cum SA (acres)	18.80
99.86	3.30		

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 #PF 3

E.G. Elev (ft)	3472.19	Element	Left OB
Channel	Right OB		
Vel Head (ft)	0.79	Wt. n-Val.	0.033
0.033	0.033		
W.S. Elev (ft)	3471.40	Reach Len. (ft)	545.00
400.00	332.00		
Crit W.S. (ft)	3471.40	Flow Area (sq ft)	21.11
218.66	20.13		
E.G. Slope (ft/ft)	0.011380	Area (sq ft)	21.11
218.66	20.13		
Q Total (cfs)	1768.00	Flow (cfs)	79.94
1611.84	76.22		
Top Width (ft)	173.86	Top Width (ft)	30.13
115.00	28.73		
Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)	3.79
7.37	3.79		
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)	0.70
1.90	0.70		
Conv. Total (cfs)	16573.1	Conv. (cfs)	749.4
15109.3	714.5		
Length Wtd. (ft)	401.34	Wetted Per. (ft)	30.16
115.02	28.76		
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.50
1.35	0.50		
Alpha	1.10	Stream Power (lb/ft s)	1.88
9.96	1.88		

```
  Frctn Loss (ft)              4.66    Cum Volume (acre-ft)        41.62
210.77      10.70
  C & E Loss (ft)              0.04    Cum SA (acres)              34.30
129.75      15.47


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

CROSS SECTION          RIVER: Ditch A
REACH: 5                  RS: 10937

INPUT
Description: Sta. 10937
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100    3470     351    3468     428    3467     465    3466     536    3464
     543    3464     609    3466     683    3468     811    3472

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .033     428    .033     609    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          428     609             729     649     445             .1       .3

CROSS SECTION OUTPUT    Profile #PF 2

  E.G. Elev (ft)           3466.09    Element                   Left OB
Channel   Right OB
  Vel Head (ft)               0.29    Wt. n-Val.
0.033
  W.S. Elev (ft)           3465.80    Reach Len. (ft)           729.00
649.00     445.00
  Crit W.S. (ft)           3465.61    Flow Area (sq ft)
123.70
  E.G. Slope (ft/ft)      0.009826    Area (sq ft)
123.70
  Q Total (cfs)             533.00    Flow (cfs)
533.00
  Top Width (ft)            130.37    Top Width (ft)
130.37
  Vel Total (ft/s)            4.31    Avg. Vel. (ft/s)
4.31
```

Max Chl Dpth (ft)	1.80	Hydr. Depth (ft)	
0.95			
Conv. Total (cfs)	5377.1	Conv. (cfs)	
5377.1			
Length Wtd. (ft)	649.00	Wetted Per. (ft)	
130.42			
Min Ch El (ft)	3464.00	Shear (lb/sq ft)	
0.58			
Alpha	1.00	Stream Power (lb/ft s)	
2.51			
Frctn Loss (ft)	8.89	Cum Volume (acre-ft)	14.93
84.87 2.18			
C & E Loss (ft)	0.01	Cum SA (acres)	18.75
98.74 3.27			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 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 #PF 3

E.G. Elev (ft)	3467.39	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.66	Wt. n-Val.	
0.033 0.033			
W.S. Elev (ft)	3466.73	Reach Len. (ft)	729.00
649.00 445.00			
Crit W.S. (ft)	3466.67	Flow Area (sq ft)	
265.27 9.75			
E.G. Slope (ft/ft)	0.011861	Area (sq ft)	
265.27 9.75			
Q Total (cfs)	1768.00	Flow (cfs)	
1743.69 24.31			
Top Width (ft)	197.71	Top Width (ft)	
170.86 26.86			
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)	
6.57 2.49			
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	
1.55 0.36			
Conv. Total (cfs)	16234.1	Conv. (cfs)	
16010.9 223.2			
Length Wtd. (ft)	647.60	Wetted Per. (ft)	
170.92 26.87			
Min Ch El (ft)	3464.00	Shear (lb/sq ft)	
1.15 0.27			
Alpha	1.03	Stream Power (lb/ft s)	
7.55 0.67			
Frctn Loss (ft)	9.41	Cum Volume (acre-ft)	41.49
208.55 10.59			
C & E Loss (ft)	0.08	Cum SA (acres)	34.11
128.43 15.25			

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: Ditch A
REACH: 5 RS: 10288

INPUT
Description: Sta. 10288
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3464	177	3462	238	3460	298	3458	493	3456
519	3456	662	3457	778	3457.1	857	3458	903	3460
947	3462	989	3464						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	298	.033	857	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
298	857	552	598	633	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3457.20	Element	Left OB Channel Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.033
W.S. Elev (ft)	3456.93	Reach Len. (ft)	552.00 598.00 633.00
Crit W.S. (ft)	3456.93	Flow Area (sq ft)	129.02
E.G. Slope (ft/ft)	0.020385	Area (sq ft)	129.02
Q Total (cfs)	533.00	Flow (cfs)	533.00
Top Width (ft)	250.47	Top Width (ft)	250.47
Vel Total (ft/s)	4.13	Avg. Vel. (ft/s)	4.13
Max Chl Dpth (ft)	0.93	Hydr. Depth (ft)	0.52
Conv. Total (cfs)	3733.1	Conv. (cfs)	3733.1
Length Wtd. (ft)	598.00	Wetted Per. (ft)	250.48
Min Ch El (ft)	3456.00	Shear (lb/sq ft)	0.66
Alpha	1.00	Stream Power (lb/ft s)	2.71
Frctn Loss (ft)	4.74	Cum Volume (acre-ft)	14.93 82.99 2.18
C & E Loss (ft)	0.05	Cum SA (acres)	18.75 95.90 3.27

Warning: The energy equation could not be balanced within the specified number of iterations. The
program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was 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 #PF 3

E.G. Elev (ft)	3457.89	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.39	Wt. n-Val.	
0.033			
W.S. Elev (ft)	3457.50	Reach Len. (ft)	552.00
598.00 633.00			
Crit W.S. (ft)	3457.50	Flow Area (sq ft)	
351.36			
E.G. Slope (ft/ft)	0.018227	Area (sq ft)	
351.36			
Q Total (cfs)	1768.00	Flow (cfs)	
1768.00			
Top Width (ft)	466.54	Top Width (ft)	
466.54			
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)	
5.03			
Max Chl Dpth (ft)	1.50	Hydr. Depth (ft)	
0.75			
Conv. Total (cfs)	13095.7	Conv. (cfs)	
13095.7			
Length Wtd. (ft)	597.95	Wetted Per. (ft)	
466.55			
Min Ch El (ft)	3456.00	Shear (lb/sq ft)	
0.86			
Alpha	1.00	Stream Power (lb/ft s)	
4.31			
Frctn Loss (ft)	5.13	Cum Volume (acre-ft)	41.49
203.95 10.54			
C & E Loss (ft)	0.03	Cum SA (acres)	34.11
123.69 15.12			

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: The energy loss was 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: Ditch A
REACH: 5                  RS: 9690

INPUT
Description: Sta. 9690
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100  3454.5     202    3454     381    3452     632    3450     638    3450
     799    3452     897    3454    1010    3458

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .033     381    .033     799    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          381     799              639     681     658             .1       .3

CROSS SECTION OUTPUT    Profile #PF 2

  E.G. Elev (ft)           3451.66    Element                  Left OB
Channel   Right OB
  Vel Head (ft)               0.11    Wt. n-Val.
0.033
  W.S. Elev (ft)           3451.55    Reach Len. (ft)          639.00
681.00     658.00
  Crit W.S. (ft)           3451.18    Flow Area (sq ft)
256.54
  E.G. Slope (ft/ft)      0.004712    Area (sq ft)
256.54
  Q Total (cfs)             677.00    Flow (cfs)
677.00
  Top Width (ft)            325.16    Top Width (ft)
325.16
  Vel Total (ft/s)            2.64    Avg. Vel. (ft/s)
2.64
  Max Chl Dpth (ft)           1.55    Hydr. Depth (ft)
0.79
  Conv. Total (cfs)         9862.4    Conv. (cfs)
9862.4
  Length Wtd. (ft)          681.00    Wetted Per. (ft)
325.18
```

Min Ch El (ft)	3450.00	Shear (lb/sq ft)	
0.23			
Alpha	1.00	Stream Power (lb/ft s)	
0.61			
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	14.93
80.34 2.18			
C & E Loss (ft)	0.01	Cum SA (acres)	18.75
91.95 3.27			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 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 #PF 3

E.G. Elev (ft)	3452.69	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.29	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3452.40	Reach Len. (ft)	639.00
681.00 658.00			
Crit W.S. (ft)	3452.03	Flow Area (sq ft)	7.17
591.26 3.92			
E.G. Slope (ft/ft)	0.005801	Area (sq ft)	7.17
591.26 3.92			
Q Total (cfs)	2568.00	Flow (cfs)	8.41
2554.99 4.60			
Top Width (ft)	473.42	Top Width (ft)	35.81
418.00 19.61			
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.17
4.32 1.17			
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)	0.20
1.41 0.20			
Conv. Total (cfs)	33717.4	Conv. (cfs)	110.4
33546.6 60.4			
Length Wtd. (ft)	680.91	Wetted Per. (ft)	35.82
418.02 19.61			
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.07
0.51 0.07			
Alpha	1.02	Stream Power (lb/ft s)	0.08
2.21 0.08			
Frctn Loss (ft)	4.80	Cum Volume (acre-ft)	41.44
197.48 10.51			
C & E Loss (ft)	0.00	Cum SA (acres)	33.89
117.61 14.97			

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: Ditch A

REACH: 5 RS: 9009

INPUT
Description: Sta. 9009
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
325	892	898	879	794	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3446.75	Element	Left OB Channel Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.033
W.S. Elev (ft)	3446.51	Reach Len. (ft)	898.00 879.00 794.00
Crit W.S. (ft)	3446.40	Flow Area (sq ft)	173.83
E.G. Slope (ft/ft)	0.012312	Area (sq ft)	173.83
Q Total (cfs)	677.00	Flow (cfs)	677.00
Top Width (ft)	252.56	Top Width (ft)	252.56
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	3.89
Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)	0.69
Conv. Total (cfs)	6101.3	Conv. (cfs)	6101.3
Length Wtd. (ft)	879.00	Wetted Per. (ft)	252.58
Min Ch El (ft)	3445.00	Shear (lb/sq ft)	0.53
Alpha	1.00	Stream Power (lb/ft s)	2.06
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	14.93
C & E Loss (ft)	0.05	Cum SA (acres)	18.75
76.98 2.18			
87.43 3.27			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 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 #PF 3

E.G. Elev (ft)	3447.89	Element	Left OB	Channel Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033
W.S. Elev (ft)	3447.55	Reach Len. (ft)	898.00	879.00 794.00
Crit W.S. (ft)		Flow Area (sq ft)		550.62
E.G. Slope (ft/ft)	0.008737	Area (sq ft)		550.62
Q Total (cfs)	2568.00	Flow (cfs)		2568.00
Top Width (ft)	472.01	Top Width (ft)		472.01
Vel Total (ft/s)	4.66	Avg. Vel. (ft/s)		4.66
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)		1.17
Conv. Total (cfs)	27473.7	Conv. (cfs)		27473.7
Length Wtd. (ft)	878.85	Wetted Per. (ft)		472.04
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.64
Alpha	1.00	Stream Power (lb/ft s)		2.97
Frctn Loss (ft)	5.11	Cum Volume (acre-ft)	41.39	188.56 10.48
C & E Loss (ft)	0.03	Cum SA (acres)	33.62	110.66 14.83

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: Ditch A
REACH: 5 RS: 8130

INPUT
Description: Sta. 8130
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
419	852	399	413	456	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3441.71	Element	Left OB Channel Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.033
W.S. Elev (ft)	3441.63	Reach Len. (ft)	399.00 413.00 456.00
Crit W.S. (ft)	3441.16	Flow Area (sq ft)	297.21
E.G. Slope (ft/ft)	0.003245	Area (sq ft)	297.21
Q Total (cfs)	677.00	Flow (cfs)	677.00
Top Width (ft)	355.10	Top Width (ft)	355.10
Vel Total (ft/s)	2.28	Avg. Vel. (ft/s)	2.28
Max Chl Dpth (ft)	1.63	Hydr. Depth (ft)	0.84
Conv. Total (cfs)	11885.3	Conv. (cfs)	11885.3
Length Wtd. (ft)	413.00	Wetted Per. (ft)	355.12
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.17
Alpha	1.00	Stream Power (lb/ft s)	0.39
Frctn Loss (ft)	2.70	Cum Volume (acre-ft)	14.93
C & E Loss (ft)	0.02	Cum SA (acres)	18.75
72.22 2.18			
81.30 3.27			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 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 #PF 3

E.G. Elev (ft)	3442.74	Element	Left OB Channel Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3442.51	Reach Len. (ft)	399.00 413.00 456.00
Crit W.S. (ft)	3441.99	Flow Area (sq ft)	7.49 661.99 9.23

E.G. Slope (ft/ft)	0.004151	Area (sq ft)	7.49	661.99	9.23
Q Total (cfs)	2568.00	Flow (cfs)	8.71	2548.55	10.74
Top Width (ft)	498.79	Top Width (ft)	29.47	433.00	36.33
Vel Total (ft/s)	3.78	Avg. Vel. (ft/s)	1.16	3.85	1.16
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)	0.25	1.53	0.25
Conv. Total (cfs)	39859.2	Conv. (cfs)	135.2	39557.4	166.7
Length Wtd. (ft)	413.07	Wetted Per. (ft)	29.47	433.02	36.33
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.07	0.40	0.07
Alpha	1.03	Stream Power (lb/ft s)	0.08	1.53	0.08
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	41.31	176.32	10.39
C & E Loss (ft)	0.02	Cum SA (acres)	33.32	101.53	14.49

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 RIVER: Ditch A
REACH: 5 RS: 7717

INPUT
Description: Sta 7717
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	233	.033	747	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
233	747	444	464	510	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3438.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.033	

W.S. Elev (ft)	3438.71	Reach Len. (ft)	444.00
464.00 510.00			
Crit W.S. (ft)	3438.71	Flow Area (sq ft)	
158.88			
E.G. Slope (ft/ft)	0.019488	Area (sq ft)	
158.88			
Q Total (cfs)	677.00	Flow (cfs)	
677.00			
Top Width (ft)	284.67	Top Width (ft)	
284.67			
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	
4.26			
Max Chl Dpth (ft)	0.91	Hydr. Depth (ft)	
0.56			
Conv. Total (cfs)	4849.5	Conv. (cfs)	
4849.5			
Length Wtd. (ft)	464.05	Wetted Per. (ft)	
284.67			
Min Ch El (ft)	3437.80	Shear (lb/sq ft)	
0.68			
Alpha	1.00	Stream Power (lb/ft s)	
2.89			
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	14.93
70.06 2.18			
C & E Loss (ft)	0.07	Cum SA (acres)	18.75
78.27 3.27			

Warning: The energy equation could not be balanced within the specified number of iterations. The
program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was 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 #PF 3

E.G. Elev (ft)	3440.03	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.42	Wt. n-Val.	
0.033			
W.S. Elev (ft)	3439.61	Reach Len. (ft)	444.00
464.00 510.00			
Crit W.S. (ft)	3439.49	Flow Area (sq ft)	
494.88			

```
  E.G. Slope (ft/ft)       0.011696    Area (sq ft)
494.88
  Q Total (cfs)             2568.00    Flow (cfs)
2568.00
  Top Width (ft)             449.87    Top Width (ft)
449.87
  Vel Total (ft/s)             5.19    Avg. Vel. (ft/s)
5.19
  Max Chl Dpth (ft)            1.81    Hydr. Depth (ft)
1.10
  Conv. Total (cfs)         23745.5    Conv. (cfs)
23745.5
  Length Wtd. (ft)           464.56    Wetted Per. (ft)
449.89
  Min Ch El (ft)            3437.80    Shear (lb/sq ft)
0.80
  Alpha                        1.00    Stream Power (lb/ft s)
4.17
  Frctn Loss (ft)              1.99    Cum Volume (acre-ft)       41.28
170.84      10.35
  C & E Loss (ft)              0.05    Cum SA (acres)             33.18
97.34       14.30


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.

CROSS SECTION          RIVER: Ditch A
REACH: 5                  RS: 7253

INPUT
Description: Sta. 7253
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100    3438     109  3438.7     321    3438     424    3436     668    3435
     906    3436    1005    3438    1200    3440    1365    3442

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .033     424    .033     906    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          424     906              756     910     980             .1       .3

CROSS SECTION OUTPUT    Profile #PF 2

  E.G. Elev (ft)           3436.46    Element                  Left OB
Channel   Right OB
  Vel Head (ft)               0.05    Wt. n-Val.                0.033
0.033      0.033
```

W.S. Elev (ft)	3436.41	Reach Len. (ft)	756.00
910.00	980.00		
Crit W.S. (ft)	3435.91	Flow Area (sq ft)	4.28
437.52	4.11		
E.G. Slope (ft/ft)	0.001714	Area (sq ft)	4.28
437.52	4.11		
Q Total (cfs)	770.00	Flow (cfs)	2.76
764.58	2.66		
Top Width (ft)	523.18	Top Width (ft)	21.00
482.00	20.18		
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)	0.65
1.75	0.65		
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)	0.20
0.91	0.20		
Conv. Total (cfs)	18599.8	Conv. (cfs)	66.8
18468.9	64.2		
Length Wtd. (ft)	909.89	Wetted Per. (ft)	21.00
482.00	20.19		
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.02
0.10	0.02		
Alpha	1.02	Stream Power (lb/ft s)	0.01
0.17	0.01		
Frctn Loss (ft)	5.36	Cum Volume (acre-ft)	14.91
66.89	2.16		
C & E Loss (ft)	0.03	Cum SA (acres)	18.64
74.19	3.15		

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.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3437.98	Element	Left OB
Channel	Right OB		
Vel Head (ft)	0.25	Wt. n-Val.	0.033
0.033	0.033		
W.S. Elev (ft)	3437.73	Reach Len. (ft)	756.00
910.00	980.00		
Crit W.S. (ft)	3436.95	Flow Area (sq ft)	76.87
1073.79	73.88		
E.G. Slope (ft/ft)	0.002925	Area (sq ft)	76.87
1073.79	73.88		
Q Total (cfs)	4793.00	Flow (cfs)	169.77
4460.06	163.17		
Top Width (ft)	656.51	Top Width (ft)	88.98
482.00	85.53		
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	2.21
4.15	2.21		
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	0.86
2.23	0.86		

Conv. Total (cfs)	88629.9	Conv. (cfs)	3139.2
82473.4	3017.3		
Length Wtd. (ft)	908.88	Wetted Per. (ft)	89.00
482.00	85.54		
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.16
0.41	0.16		
Alpha	1.07	Stream Power (lb/ft s)	0.35
1.69	0.35		
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	40.89
162.49	9.91		
C & E Loss (ft)	0.04	Cum SA (acres)	32.73
92.38	13.80		

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: Ditch A
REACH: 5 RS: 6343

INPUT
Description: Sta. 6343
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
663	1320	767	980	1051	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3431.07	Element	Left OB
Channel	Right OB		
Vel Head (ft)	0.32	Wt. n-Val.	
0.033			
W.S. Elev (ft)	3430.75	Reach Len. (ft)	767.00
980.00	1051.00		
Crit W.S. (ft)	3430.75	Flow Area (sq ft)	
330.28			
E.G. Slope (ft/ft)	0.018741	Area (sq ft)	
330.28			
Q Total (cfs)	1496.00	Flow (cfs)	
1496.00			
Top Width (ft)	524.36	Top Width (ft)	
524.36			

Vel Total (ft/s)	4.53	Avg. Vel. (ft/s)	
4.53			
Max Chl Dpth (ft)	0.75	Hydr. Depth (ft)	
0.63			
Conv. Total (cfs)	10927.8	Conv. (cfs)	
10927.8			
Length Wtd. (ft)	979.89	Wetted Per. (ft)	
524.38			
Min Ch El (ft)	3430.00	Shear (lb/sq ft)	
0.74			
Alpha	1.00	Stream Power (lb/ft s)	
3.34			
Frctn Loss (ft)	4.02	Cum Volume (acre-ft)	14.87
58.87 2.11			
C & E Loss (ft)	0.08	Cum SA (acres)	18.46
63.68 2.93			

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 #PF 3

E.G. Elev (ft)	3432.49	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.69	Wt. n-Val.	
0.033 0.033			
W.S. Elev (ft)	3431.79	Reach Len. (ft)	767.00
980.00 1051.00			
Crit W.S. (ft)	3431.79	Flow Area (sq ft)	
952.76 21.33			
E.G. Slope (ft/ft)	0.013082	Area (sq ft)	
952.76 21.33			
Q Total (cfs)	6409.00	Flow (cfs)	
6378.38 30.62			
Top Width (ft)	787.68	Top Width (ft)	
642.82 144.86			
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)	
6.69 1.44			
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)	
1.48 0.15			

Conv. Total (cfs)	56035.0	Conv. (cfs)	
55767.2	267.7		
Length Wtd. (ft)	979.09	Wetted Per. (ft)	
642.85	144.86		
Min Ch El (ft)	3430.00	Shear (lb/sq ft)	
1.21	0.12		
Alpha	1.03	Stream Power (lb/ft s)	
8.10	0.17		
Frctn Loss (ft)	4.13	Cum Volume (acre-ft)	40.22
141.32	8.84		
C & E Loss (ft)	0.16	Cum SA (acres)	31.96
80.63	11.21		

Warning: The energy equation could not be balanced within the specified number of iterations. The
program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was 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: Ditch A
REACH: 5 RS: 5363

INPUT
Description: Sta. 5363
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
742	1476	1199	1142	713	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3426.46	Element	Left OB
Channel	Right OB		

Vel Head (ft)	0.06	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3426.40	Reach Len. (ft)	1199.00
1142.00 713.00			
Crit W.S. (ft)	3425.83	Flow Area (sq ft)	7.59
764.92 15.86			
E.G. Slope (ft/ft)	0.001750	Area (sq ft)	7.59
764.92 15.86			
Q Total (cfs)	1496.00	Flow (cfs)	4.87
1480.95 10.18			
Top Width (ft)	851.92	Top Width (ft)	38.18
734.00 79.74			
Vel Total (ft/s)	1.90	Avg. Vel. (ft/s)	0.64
1.94 0.64			
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)	0.20
1.04 0.20			
Conv. Total (cfs)	35762.5	Conv. (cfs)	116.5
35402.8 243.2			
Length Wtd. (ft)	1140.73	Wetted Per. (ft)	38.18
734.00 79.74			
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.02
0.11 0.02			
Alpha	1.03	Stream Power (lb/ft s)	0.01
0.22 0.01			
Frctn Loss (ft)	5.00	Cum Volume (acre-ft)	14.81
46.55 1.92			
C & E Loss (ft)	0.03	Cum SA (acres)	18.12
49.52 1.96			

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.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3427.77	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.17	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3427.60	Reach Len. (ft)	1199.00
1142.00 713.00			
Crit W.S. (ft)	3426.70	Flow Area (sq ft)	122.30
1644.60 255.42			
E.G. Slope (ft/ft)	0.002053	Area (sq ft)	122.30
1644.60 255.42			
Q Total (cfs)	6409.00	Flow (cfs)	214.69
5745.90 448.41			
Top Width (ft)	1207.27	Top Width (ft)	153.23
734.00 320.04			
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)	1.76
3.49 1.76			

Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)	0.80
2.24	0.80		
Conv. Total (cfs)	141432.8	Conv. (cfs)	4737.8
126799.6	9895.4		
Length Wtd. (ft)	1130.35	Wetted Per. (ft)	153.24
734.00	320.04		
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.10
0.29	0.10		
Alpha	1.12	Stream Power (lb/ft s)	0.18
1.00	0.18		
Frctn Loss (ft)	5.03	Cum Volume (acre-ft)	39.14
112.10	5.50		
C & E Loss (ft)	0.04	Cum SA (acres)	30.61
65.14	5.60		

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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 4221

INPUT
Description: Sta. 4221
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421	640	3420	669	3420
753	3420.2	829	3420	837	3420	1030	3421	1320	3422
1407	3423	1497	3424						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	544	.033	1407	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
544	1407	749	732	843	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3421.42	Element	Left OB
Channel	Right OB		
Vel Head (ft)	0.36	Wt. n-Val.	0.033
0.033			
W.S. Elev (ft)	3421.06	Reach Len. (ft)	749.00
732.00	843.00		
Crit W.S. (ft)	3421.06	Flow Area (sq ft)	0.41
356.81			
E.G. Slope (ft/ft)	0.018111	Area (sq ft)	0.41
356.81			
Q Total (cfs)	1717.00	Flow (cfs)	0.25
1716.75			

Top Width (ft)	517.17	Top Width (ft)	12.84 504.34
Vel Total (ft/s)	4.81	Avg. Vel. (ft/s)	0.61 4.81
Max Chl Dpth (ft)	1.06	Hydr. Depth (ft)	0.03 0.71
Conv. Total (cfs)	12758.4	Conv. (cfs)	1.8 12756.6
Length Wtd. (ft)	736.83	Wetted Per. (ft)	12.84 504.35
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.04 0.80
Alpha	1.00	Stream Power (lb/ft s)	0.02 3.85
Frctn Loss (ft)	3.63	Cum Volume (acre-ft)	14.70 31.84 1.79
C & E Loss (ft)	0.09	Cum SA (acres)	17.42 33.29 1.31

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 #PF 3

E.G. Elev (ft)	3422.69	Element	Left OB Channel Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3422.09	Reach Len. (ft)	749.00 732.00 843.00
Crit W.S. (ft)	3422.09	Flow Area (sq ft)	121.48 1029.25
E.G. Slope (ft/ft)	0.013866	Area (sq ft)	121.48 1029.25
Q Total (cfs)	6969.00	Flow (cfs)	426.48 6542.52
Top Width (ft)	1009.59	Top Width (ft)	225.48 784.11
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	3.51 6.36

Max Chl Dpth (ft)	2.09	Hydr. Depth (ft)	0.54
1.31			
Conv. Total (cfs)	59181.7	Conv. (cfs)	3621.8
55559.9			
Length Wtd. (ft)	737.78	Wetted Per. (ft)	225.48
784.12			
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.47
1.14			
Alpha	1.05	Stream Power (lb/ft s)	1.64
7.22			
Frctn Loss (ft)	3.71	Cum Volume (acre-ft)	35.79
77.05 3.41			
C & E Loss (ft)	0.12	Cum SA (acres)	25.40
45.24 2.98			

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: Ditch A
REACH: 5 RS: 3489

INPUT
Description: Sta. 3489
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5
-76	3416	-21	3417	100	3417	258	3416.5	299	3416
309	3415	318	3416	405	3416	422	3416	539	3416.4
581	3416.2	642	3416.4	744	3416	830	3416	918	3418
1068	3420	1159	3421						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
539	918	464	500	457	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3417.31	Element	Left OB Channel Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3417.25	Reach Len. (ft)	500.00 457.00
Crit W.S. (ft)	3416.73	Flow Area (sq ft)	346.58
E.G. Slope (ft/ft)	0.002255	Area (sq ft)	346.58
Q Total (cfs)	1717.00	Flow (cfs)	741.93
Top Width (ft)	1002.71	Top Width (ft)	345.97
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	2.14
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)	1.00
Conv. Total (cfs)	36157.8	Conv. (cfs)	15624.0
Length Wtd. (ft)	481.67	Wetted Per. (ft)	345.98
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.14
Alpha	1.02	Stream Power (lb/ft s)	0.30
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)	25.93 1.79
C & E Loss (ft)	0.02	Cum SA (acres)	26.14 1.31

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 #PF 3

E.G. Elev (ft)	3418.52	Element	Left OB Channel Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3418.33	Reach Len. (ft)	500.00 457.00
Crit W.S. (ft)	3417.53	Flow Area (sq ft)	1246.14 744.64 4.14
E.G. Slope (ft/ft)	0.002578	Area (sq ft)	1246.14 744.64 4.14
Q Total (cfs)	6969.00	Flow (cfs)	4295.42 2670.72 2.86
Top Width (ft)	1076.90	Top Width (ft)	672.97 379.00 24.92

Vel Total (ft/s)	3.49	Avg. Vel. (ft/s)	3.45
3.59 0.69			
Max Chl Dpth (ft)	3.33	Hydr. Depth (ft)	1.85
1.96 0.17			
Conv. Total (cfs)	137244.0	Conv. (cfs)	84591.8
52595.9 56.3			
Length Wtd. (ft)	481.04	Wetted Per. (ft)	673.21
379.02 24.92			
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.30
0.32 0.03			
Alpha	1.00	Stream Power (lb/ft s)	1.03
1.13 0.02			
Frctn Loss (ft)	2.35	Cum Volume (acre-ft)	24.03
62.15 3.37			
C & E Loss (ft)	0.04	Cum SA (acres)	17.67
35.47 2.74			

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: Ditch A
REACH: 5 RS: 2989

INPUT
Description: Sta. 2989
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-31	.033	436	.033	841	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
436	841	317	215	172	.3 .5

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3414.89	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.31	Wt. n-Val.	0.033
0.033			
W.S. Elev (ft)	3414.57	Reach Len. (ft)	317.00
215.00 172.00			
Crit W.S. (ft)	3414.57	Flow Area (sq ft)	167.23
217.47			
E.G. Slope (ft/ft)	0.018885	Area (sq ft)	167.23
217.47			

Q Total (cfs)	1717.00	Flow (cfs)	773.66
943.34			
Top Width (ft)	629.17	Top Width (ft)	258.67
370.50			
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)	4.63
4.34			
Max Chl Dpth (ft)	0.77	Hydr. Depth (ft)	0.65
0.59			
Conv. Total (cfs)	12494.1	Conv. (cfs)	5629.7
6864.4			
Length Wtd. (ft)	253.75	Wetted Per. (ft)	258.68
370.51			
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.76
0.69			
Alpha	1.00	Stream Power (lb/ft s)	3.53
3.00			
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	6.45
22.69 1.79			
C & E Loss (ft)	0.13	Cum SA (acres)	6.79
22.03 1.31			

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

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3416.14	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.60	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3415.54	Reach Len. (ft)	317.00
215.00 172.00			
Crit W.S. (ft)	3415.49	Flow Area (sq ft)	524.33
599.53 11.05			
E.G. Slope (ft/ft)	0.012585	Area (sq ft)	524.33
599.53 11.05			
Q Total (cfs)	6969.00	Flow (cfs)	3012.55
3933.52 22.93			
Top Width (ft)	879.23	Top Width (ft)	432.23
405.00 42.00			
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	5.75
6.56 2.07			
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)	1.21
1.48 0.26			

Conv. Total (cfs)	62122.0	Conv. (cfs)	26854.0
35063.5	204.4		
Length Wtd. (ft)	262.29	Wetted Per. (ft)	432.24
405.01	42.01		
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.95
1.16	0.21		
Alpha	1.02	Stream Power (lb/ft s)	5.48
7.63	0.43		
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	14.60
54.43	3.29		
C & E Loss (ft)	0.21	Cum SA (acres)	11.79
30.97	2.39		

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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 2774

INPUT
Description: Sta. 2774 Upstream of culverts
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
437	511	40	40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3414.10	Element	Left OB
Channel	Right OB		
Vel Head (ft)	0.04	Wt. n-Val.	0.033
0.033	0.033		
W.S. Elev (ft)	3414.06	Reach Len. (ft)	40.00
40.00	40.00		
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	819.73
348.35	235.72		
E.G. Slope (ft/ft)	0.000321	Area (sq ft)	819.73
348.35	235.72		
Q Total (cfs)	1717.00	Flow (cfs)	648.66
789.16	279.18		

Top Width (ft)	1050.35	Top Width (ft)	843.88
74.00 132.47			
Vel Total (ft/s)	1.22	Avg. Vel. (ft/s)	0.79
2.27 1.18			
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)	0.97
4.71 1.78			
Conv. Total (cfs)	95823.8	Conv. (cfs)	36200.9
44042.2 15580.7			
Length Wtd. (ft)	40.00	Wetted Per. (ft)	843.96
74.04 132.54			
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02
0.09 0.04			
Alpha	1.89	Stream Power (lb/ft s)	0.02
0.21 0.04			
Frctn Loss (ft)		Cum Volume (acre-ft)	2.86
21.30 1.33			
C & E Loss (ft)		Cum SA (acres)	2.78
20.93 1.05			

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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3415.19	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.18	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3415.01	Reach Len. (ft)	40.00
40.00 40.00			
Crit W.S. (ft)	3413.39	Flow Area (sq ft)	1636.03
418.67 380.56			
E.G. Slope (ft/ft)	0.001205	Area (sq ft)	1636.03
418.67 380.56			
Q Total (cfs)	6969.00	Flow (cfs)	3883.58
2077.16 1008.27			
Top Width (ft)	1120.52	Top Width (ft)	874.14
74.00 172.38			
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	2.37
4.96 2.65			
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)	1.87
5.66 2.21			
Conv. Total (cfs)	200748.6	Conv. (cfs)	111870.0
59834.5 29044.1			
Length Wtd. (ft)	40.00	Wetted Per. (ft)	874.24
74.04 172.46			
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.14
0.43 0.17			
Alpha	1.40	Stream Power (lb/ft s)	0.33
2.11 0.44			
Frctn Loss (ft)		Cum Volume (acre-ft)	6.74
51.92 2.52			
C & E Loss (ft)		Cum SA (acres)	7.03
29.79 1.97			

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.

CULVERT RIVER: Ditch A
REACH: 5 RS: 2773

INPUT
Description:
Distance from Upstream XS = 8
Deck/Roadway Width = 24
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta: Left Right Coeff Contr. Expan.
437 511 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

Downstream Bridge Cross Section Data
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
           349     434            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
-888       F
888       F

Upstream Embankment side slope                =       3 horiz. to 1.0 vertical
Downstream Embankment side slope              =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =  3412.7
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1     Pipe Arch   1.833    2.43
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  1      39       .024                  .5                 1
Number of Barrels =  6
Upstream   Elevation =  3409
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
     469   473.4   477.8   482.2   486.6     491
Downstream Elevation =  3408.9
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
     387   391.4   395.8   400.2   404.6     409

CULVERT OUTPUT    Profile #PF 2
Culvert ID : Culvert #1

  Culv Q (cfs)             146.31    Culv Ful Lngh (ft)        39.00
  # Barrels                     6    Culv Vel US (ft/s)         5.54
  Q Barrel (cfs)           24.38    Culv Vel DS (ft/s)         5.54
  E.G. US. (ft)          3414.10    Culv Inv El Up (ft)     3409.00
  W.S. US. (ft)          3414.06    Culv Inv El Dn (ft)     3408.90
  E.G. DS (ft)           3412.86    Culv Frctn Ls (ft)         0.68
  W.S. DS (ft)           3412.71    Culv Ext Lss (ft)          0.33
  Delta EG (ft)             1.24    Culv Ent Lss (ft)          0.24
  Delta WS (ft)             1.35    Q Weir (cfs)            1582.65
  E.G. IC (ft)           3414.06    Weir Sta Lft (ft)       -408.20
  E.G. OC (ft)           3414.10    Weir Sta Rgt (ft)        611.11
  Culvert Control         Outlet    Weir Submerg               0.00
  Culv WS Inlet (ft)     3410.83    Weir Max Depth (ft)        1.40
  Culv WS Outlet (ft)    3410.73    Weir Avg Depth (ft)        0.58
  Culv Nml Depth (ft)               Wr Flw Area (sq ft)      594.10
  Culv Crt Depth (ft)       1.64    Min El Weir Flow (ft)   3412.71


CULVERT OUTPUT    Profile #PF 3
```

Culvert ID : Culvert #1

Culv Q (cfs)	132.39	Culv Ful Lngh (ft)	39.00
# Barrels	6	Culv Vel US (ft/s)	5.01
Q Barrel (cfs)	22.07	Culv Vel DS (ft/s)	5.01
E.G. US. (ft)	3415.19	Culv Inv El Up (ft)	3409.00
W.S. US. (ft)	3415.01	Culv Inv El Dn (ft)	3408.90
E.G. DS (ft)	3414.44	Culv Frctn Ls (ft)	0.55
W.S. DS (ft)	3413.55	Culv Ext Lss (ft)	
Delta EG (ft)	0.75	Culv Ent Lss (ft)	0.20
Delta WS (ft)	1.46	Q Weir (cfs)	6846.27
E.G. IC (ft)	3415.16	Weir Sta Lft (ft)	-440.00
E.G. OC (ft)	3415.19	Weir Sta Rgt (ft)	671.53
Culvert Control	Outlet	Weir Submerg	0.13
Culv WS Inlet (ft)	3410.83	Weir Max Depth (ft)	2.49
Culv WS Outlet (ft)	3410.73	Weir Avg Depth (ft)	1.58
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	1754.25
Culv Crt Depth (ft)	1.21	Min El Weir Flow (ft)	3412.71

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 2734

INPUT
Description: Sta. 2734 Downstream of culverts
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
349	434	745	846	1015	.3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3412.86	Element	Left OB Channel Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.033 0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00 846.00 1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89 288.99 100.64
E.G. Slope (ft/ft)	0.001314	Area (sq ft)	275.89 288.99 100.64

Q Total (cfs)	1717.00	Flow (cfs)	462.17
1066.10 188.73			
Top Width (ft)	431.91	Top Width (ft)	265.26
85.00 81.65			
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	1.68
3.69 1.88			
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04
3.40 1.23			
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3
29413.6 5206.9			
Length Wtd. (ft)	841.73	Wetted Per. (ft)	265.28
85.04 81.70			
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.09
0.28 0.10			
Alpha	1.44	Stream Power (lb/ft s)	0.14
1.03 0.19			
Frctn Loss (ft)	1.55	Cum Volume (acre-ft)	2.36
21.01 1.17			
C & E Loss (ft)	0.03	Cum SA (acres)	2.27
20.86 0.95			

Warning: The energy equation could not be balanced within the specified number of iterations. The
program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to
critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.
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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3414.44	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.89	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3413.55	Reach Len. (ft)	745.00
846.00 1015.00			
Crit W.S. (ft)	3413.55	Flow Area (sq ft)	518.43
360.69 183.92			
E.G. Slope (ft/ft)	0.006458	Area (sq ft)	518.43
360.69 183.92			
Q Total (cfs)	6969.00	Flow (cfs)	2643.72
3419.75 905.53			

Top Width (ft)	510.66	Top Width (ft)	309.84
85.00 115.82			
Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)	5.10
9.48 4.92			
Max Chl Dpth (ft)	4.65	Hydr. Depth (ft)	1.67
4.24 1.59			
Conv. Total (cfs)	86723.5	Conv. (cfs)	32899.0
42556.0 11268.6			
Length Wtd. (ft)		Wetted Per. (ft)	309.87
85.04 115.87			
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.67
1.71 0.64			
Alpha	1.33	Stream Power (lb/ft s)	3.44
16.21 3.15			
Frctn Loss (ft)		Cum Volume (acre-ft)	5.75
51.56 2.26			
C & E Loss (ft)		Cum SA (acres)	6.49
29.71 1.84			

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 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: Ditch A
REACH: 5 RS: 1888

INPUT
Description: Sta. 1888
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410
331	3408	532	3408	690	3408	1180	3410	1268	3412

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-775	.033	100	.033	1180	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	1180	305	828	980	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3409.38	Element	Left OB
Channel	Right OB		

Vel Head (ft)	0.08	Wt. n-Val.	
0.033			
W.S. Elev (ft)	3409.30	Reach Len. (ft)	305.00
828.00 980.00			
Crit W.S. (ft)	3408.79	Flow Area (sq ft)	
770.75			
E.G. Slope (ft/ft)	0.002752	Area (sq ft)	
770.75			
Q Total (cfs)	1743.00	Flow (cfs)	
1743.00			
Top Width (ft)	822.73	Top Width (ft)	
822.73			
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)	
2.26			
Max Chl Dpth (ft)	1.30	Hydr. Depth (ft)	
0.94			
Conv. Total (cfs)	33227.3	Conv. (cfs)	
33227.3			
Length Wtd. (ft)	828.00	Wetted Per. (ft)	
822.74			
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	
0.16			
Alpha	1.00	Stream Power (lb/ft s)	
0.36			
Frctn Loss (ft)	4.75	Cum Volume (acre-ft)	
10.71			
C & E Loss (ft)	0.03	Cum SA (acres)	
12.05			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less
than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was 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: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3410.68	Element	Left OB
Channel Right OB			
Vel Head (ft)	0.19	Wt. n-Val.	0.033
0.033 0.033			
W.S. Elev (ft)	3410.48	Reach Len. (ft)	305.00
828.00 980.00			
Crit W.S. (ft)	3409.72	Flow Area (sq ft)	109.37
1950.86 5.16			
E.G. Slope (ft/ft)	0.002812	Area (sq ft)	109.37
1950.86 5.16			
Q Total (cfs)	7042.00	Flow (cfs)	128.02
6909.20 4.78			
Top Width (ft)	1419.98	Top Width (ft)	318.68
1080.00 21.30			

Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)	1.17
3.54 0.93			
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)	0.34
1.81 0.24			
Conv. Total (cfs)	132792.6	Conv. (cfs)	2414.1
130288.3 90.2			
Length Wtd. (ft)	823.37	Wetted Per. (ft)	318.68
1080.02 21.31			
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.06
0.32 0.04			
Alpha	1.06	Stream Power (lb/ft s)	0.07
1.12 0.04			
Frctn Loss (ft)	4.55	Cum Volume (acre-ft)	0.38
29.11 0.06			
C & E Loss (ft)	0.05	Cum SA (acres)	1.12
18.40 0.24			

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.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 1060

INPUT
Description: Sta. 1060
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405
1523	3406								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1523	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
394	1523	60	60	60	.1 .3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3404.61	Element	Left OB Channel Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.033
W.S. Elev (ft)	3404.20	Reach Len. (ft)	
Crit W.S. (ft)	3404.20	Flow Area (sq ft)	356.58
E.G. Slope (ft/ft)	0.017308	Area (sq ft)	356.58

Q Total (cfs)	1823.00	Flow (cfs)	1823.00
Top Width (ft)	444.75	Top Width (ft)	444.75
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)	5.11
Max Chl Dpth (ft)	1.50	Hydr. Depth (ft)	0.80
Conv. Total (cfs)	13856.9	Conv. (cfs)	13856.9
Length Wtd. (ft)		Wetted Per. (ft)	444.76
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	0.87
Alpha	1.00	Stream Power (lb/ft s)	4.43
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3406.07	Element	Left OB Channel Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.033
W.S. Elev (ft)	3405.41	Reach Len. (ft)	
Crit W.S. (ft)	3405.41	Flow Area (sq ft)	1112.35
E.G. Slope (ft/ft)	0.014850	Area (sq ft)	1112.35
Q Total (cfs)	7268.00	Flow (cfs)	7268.00
Top Width (ft)	856.01	Top Width (ft)	856.01
Vel Total (ft/s)	6.53	Avg. Vel. (ft/s)	6.53
Max Chl Dpth (ft)	2.71	Hydr. Depth (ft)	1.30
Conv. Total (cfs)	59642.9	Conv. (cfs)	59642.9
Length Wtd. (ft)		Wetted Per. (ft)	856.03
Min Ch El (ft)	3402.70	Shear (lb/sq ft)	1.20
Alpha	1.00	Stream Power (lb/ft s)	7.87
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	
5	2734	.3	.5
5	1888	.1	.3
5	1060	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	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)	
5	12674	533.00	3477.00	3478.39	3478.01						
		237.18	306.92	0.43		3478.47	0.003073	2.31			
5	12674	1768.00	3477.00	3479.22	3478.65						
		539.30	417.81	0.48		3479.41	0.003111	3.61			
5	11337	533.00	3469.00	3470.41	3470.38						
		108.23	132.24	0.93		3470.80	0.014135	5.03			
5	11337	1768.00	3469.00	3471.40	3471.40						
		259.90	173.86	0.94		3472.19	0.011380	7.37			
5	10937	533.00	3464.00	3465.80	3465.61						
		123.70	130.37	0.78		3466.09	0.009826	4.31			
5	10937	1768.00	3464.00	3466.73	3466.67						
		275.01	197.71	0.93		3467.39	0.011861	6.57			
5	10288	533.00	3456.00	3456.93	3456.93						
		129.02	250.47	1.01		3457.20	0.020385	4.13			
5	10288	1768.00	3456.00	3457.50	3457.50						
		351.36	466.54	1.02		3457.89	0.018227	5.03			
5	9690	677.00	3450.00	3451.55	3451.18						
		256.54	325.16	0.52		3451.66	0.004712	2.64			
5	9690	2568.00	3450.00	3452.40	3452.03						
		602.35	473.42	0.64		3452.69	0.005801	4.32			

5	9009		677.00	3445.00	3446.51	3446.40
3446.75	0.012312	3.89	173.83	252.56	0.83	
5	9009		2568.00	3445.00	3447.55	
3447.89	0.008737	4.66	550.62	472.01	0.76	
5	8130		677.00	3440.00	3441.63	3441.16
3441.71	0.003245	2.28	297.21	355.10	0.44	
5	8130		2568.00	3440.00	3442.51	3441.99
3442.74	0.004151	3.85	678.70	498.79	0.55	
5	7717		677.00	3437.80	3438.71	3438.71
3438.99	0.019488	4.26	158.88	284.67	1.01	
5	7717		2568.00	3437.80	3439.61	3439.49
3440.03	0.011696	5.19	494.88	449.87	0.87	
5	7253		770.00	3435.00	3436.41	3435.91
3436.46	0.001714	1.75	445.91	523.18	0.32	
5	7253		4793.00	3435.00	3437.73	3436.95
3437.98	0.002925	4.15	1224.55	656.51	0.49	
5	6343		1496.00	3430.00	3430.75	3430.75
3431.07	0.018741	4.53	330.28	524.36	1.01	
5	6343		6409.00	3430.00	3431.79	3431.79
3432.49	0.013082	6.69	974.08	787.68	0.97	
5	5363		1496.00	3425.00	3426.40	3425.83
3426.46	0.001750	1.94	788.36	851.92	0.33	
5	5363		6409.00	3425.00	3427.60	3426.70
3427.77	0.002053	3.49	2022.32	1207.27	0.41	
5	4221		1717.00	3420.00	3421.06	3421.06
3421.42	0.018111	4.81	357.22	517.17	1.01	
5	4221		6969.00	3420.00	3422.09	3422.09
3422.69	0.013866	6.36	1150.73	1009.59	0.98	
5	3489		1717.00	3416.00	3417.25	3416.73
3417.31	0.002255	2.14	874.30	1002.71	0.38	
5	3489		6969.00	3416.00	3418.33	3417.53
3418.52	0.002578	3.59	1994.93	1076.90	0.45	
5	2989		1717.00	3413.80	3414.57	3414.57
3414.89	0.018885	4.34	384.69	629.17	1.00	
5	2989		6969.00	3413.80	3415.54	3415.49
3416.14	0.012585	6.56	1134.92	879.23	0.95	
5	2774		1717.00	3409.00	3414.06	3412.71
3414.10	0.000321	2.27	1403.81	1050.35	0.18	
5	2774		6969.00	3409.00	3415.01	3413.39
3415.19	0.001205	4.96	2435.25	1120.52	0.37	
5	2773		Culvert			
5	2734		1717.00	3408.90	3412.71	3412.71
3412.86	0.001314	3.69	665.51	431.91	0.35	
5	2734		6969.00	3408.90	3413.55	3413.55
3414.44	0.006458	9.48	1063.05	510.66	0.81	

5	1888		1743.00	3408.00	3409.30	3408.79
3409.38	0.002752	2.26	770.75	822.73	0.41	
5	1888		7042.00	3408.00	3410.48	3409.72
3410.68	0.002812	3.54	2065.39	1419.98	0.46	
5	1060		1823.00	3402.70	3404.20	3404.20
3404.61	0.017308	5.11	356.58	444.75	1.01	
5	1060		7268.00	3402.70	3405.41	3405.41
3406.07	0.014850	6.53	1112.35	856.01	1.01	

Profile Output Table - Report

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)			(ft/s)	(ft)		(sq ft)		
5	12674	533.00	3477.00	3478.39	3478.01	1.39	3478.47	0.003073	2.31	352.67	659.59	237.18	306.92	0.43
5	12674	1768.00	3477.00	3479.22	3478.65	2.22	3479.41	0.003111	3.61	294.31	712.12	539.30	417.81	0.48
5	11337	533.00	3469.00	3470.41	3470.38	1.41	3470.80	0.014135	5.03	426.18	558.41	108.23	132.24	0.93
5	11337	1768.00	3469.00	3471.40	3471.40	2.40	3472.19	0.011380	7.37	404.87	578.73	259.90	173.86	0.94
5	10937	533.00	3464.00	3465.80	3465.61	1.80	3466.09	0.009826	4.31	472.06	602.43	123.70	130.37	0.78
5	10937	1768.00	3464.00	3466.73	3466.67	2.73	3467.39	0.011861	6.57	438.14	635.86	275.01	197.71	0.93
5	10288	533.00	3456.00	3456.93	3456.93	0.93	3457.20	0.020385	4.13	402.00	652.47	129.02	250.47	1.01
5	10288	1768.00	3456.00	3457.50	3457.50	1.50	3457.89	0.018227	5.03	346.65	813.19	351.36	466.54	1.02
5	9690	677.00	3450.00	3451.55	3451.18	1.55	3451.66	0.004712	2.64	437.56	762.72	256.54	325.16	0.52
5	9690	2568.00	3450.00	3452.40	3452.03	2.40	3452.69	0.005801	4.32	345.19	818.61	602.35	473.42	0.64

5		9009	677.00	3445.00	3446.51	3446.40	
1.51	3446.75	0.012312	3.89	449.43	702.00	173.83	
252.56		0.83					
5		9009	2568.00	3445.00	3447.55		
2.55	3447.89	0.008737	4.66	362.59	834.60	550.62	
472.01		0.76					
5		8130	677.00	3440.00	3441.63	3441.16	
1.63	3441.71	0.003245	2.28	462.17	817.28	297.21	
355.10		0.44					
5		8130	2568.00	3440.00	3442.51	3441.99	
2.51	3442.74	0.004151	3.85	389.53	888.33	678.70	
498.79		0.55					
5		7717	677.00	3437.80	3438.71	3438.71	
0.91	3438.99	0.019488	4.26	329.73	614.40	158.88	
284.67		1.01					
5		7717	2568.00	3437.80	3439.61	3439.49	
1.81	3440.03	0.011696	5.19	262.15	712.02	494.88	
449.87		0.87					
5		7253	770.00	3435.00	3436.41	3435.91	
1.41	3436.46	0.001714	1.75	403.00	926.18	445.91	
523.18		0.32					
5		7253	4793.00	3435.00	3437.73	3436.95	
2.73	3437.98	0.002925	4.15	335.02	991.53	1224.55	
656.51		0.49					
5		6343	1496.00	3430.00	3430.75	3430.75	
0.75	3431.07	0.018741	4.53	772.11	1296.48	330.28	
524.36		1.01					
5		6343	6409.00	3430.00	3431.79	3431.79	
1.79	3432.49	0.013082	6.69	677.18	1464.86	974.08	
787.68		0.97					
5		5363	1496.00	3425.00	3426.40	3425.83	
1.40	3426.46	0.001750	1.94	703.82	1555.74	788.36	
851.92		0.33					
5		5363	6409.00	3425.00	3427.60	3426.70	
2.60	3427.77	0.002053	3.49	588.77	1796.04	2022.32	
1207.27		0.41					
5		4221	1717.00	3420.00	3421.06	3421.06	
1.06	3421.42	0.018111	4.81	531.16	1048.34	357.22	
517.17		1.01					
5		4221	6969.00	3420.00	3422.09	3422.09	
2.09	3422.69	0.013866	6.36	318.52	1328.11	1150.73	
1009.59		0.98					
5		3489	1717.00	3416.00	3417.25	3416.73	
2.25	3417.31	0.002255	2.14	-117.74	884.97	874.30	
1002.71		0.38					
5		3489	6969.00	3416.00	3418.33	3417.53	
3.33	3418.52	0.002578	3.59	-133.97	942.92	1994.93	
1076.90		0.45					

```
  5             2989              1717.00    3413.80    3414.57    3414.57
0.77    3414.89    0.018885       4.34        177.33      806.50     384.69
629.17          1.00
  5             2989              6969.00    3413.80    3415.54    3415.49
1.74    3416.14    0.012585       6.56          3.77      883.00    1134.92
879.23          0.95

  5             2774              1717.00    3409.00    3414.06    3412.71
5.06    3414.10    0.000321       2.27        -406.88      643.47    1403.81
1050.35          0.18
  5             2774              6969.00    3409.00    3415.01    3413.39
6.01    3415.19    0.001205       4.96        -437.14      683.38    2435.25
1120.52          0.37

  5             2773              Culvert

  5             2734              1717.00    3408.90    3412.71    3412.71
3.81    3412.86    0.001314       3.69          83.74      515.65     665.51
431.91          0.35
  5             2734              6969.00    3408.90    3413.55    3413.55
4.65    3414.44    0.006458       9.48          39.16      549.82    1063.05
510.66          0.81

  5             1888              1743.00    3408.00    3409.30    3408.79
1.30    3409.38    0.002752       2.26        186.86      1009.59     770.75
822.73          0.41
  5             1888              7042.00    3408.00    3410.48    3409.72
2.48    3410.68    0.002812       3.54        -218.68     1201.30    2065.39
1419.98          0.46

  5             1060              1823.00    3402.70    3404.20    3404.20
1.50    3404.61    0.017308       5.11        658.23      1102.98     356.58
444.75          1.01
  5             1060              7268.00    3402.70    3405.41    3405.41
2.71    3406.07    0.014850       6.53        480.47      1336.48    1112.35
856.01          1.01
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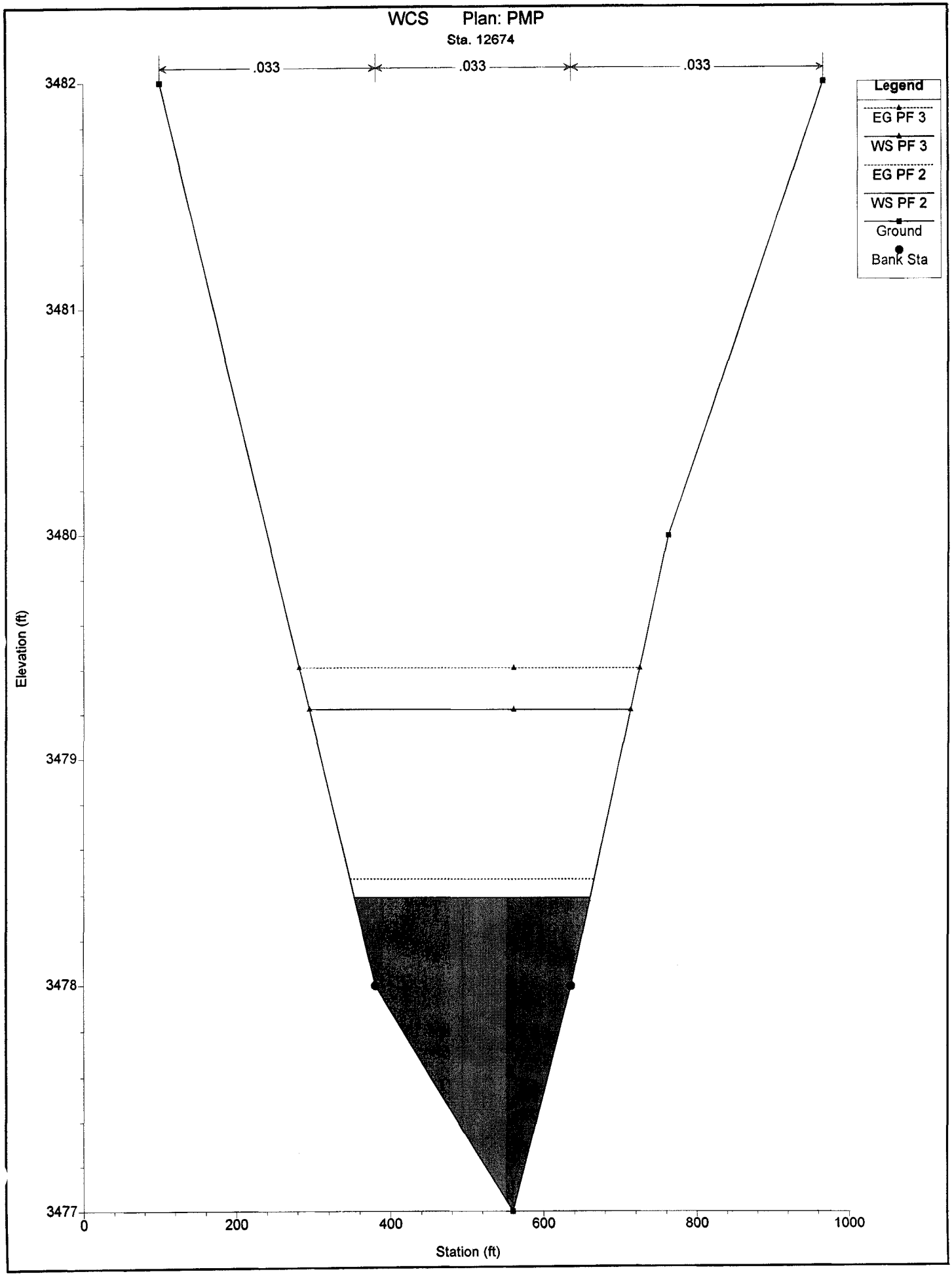
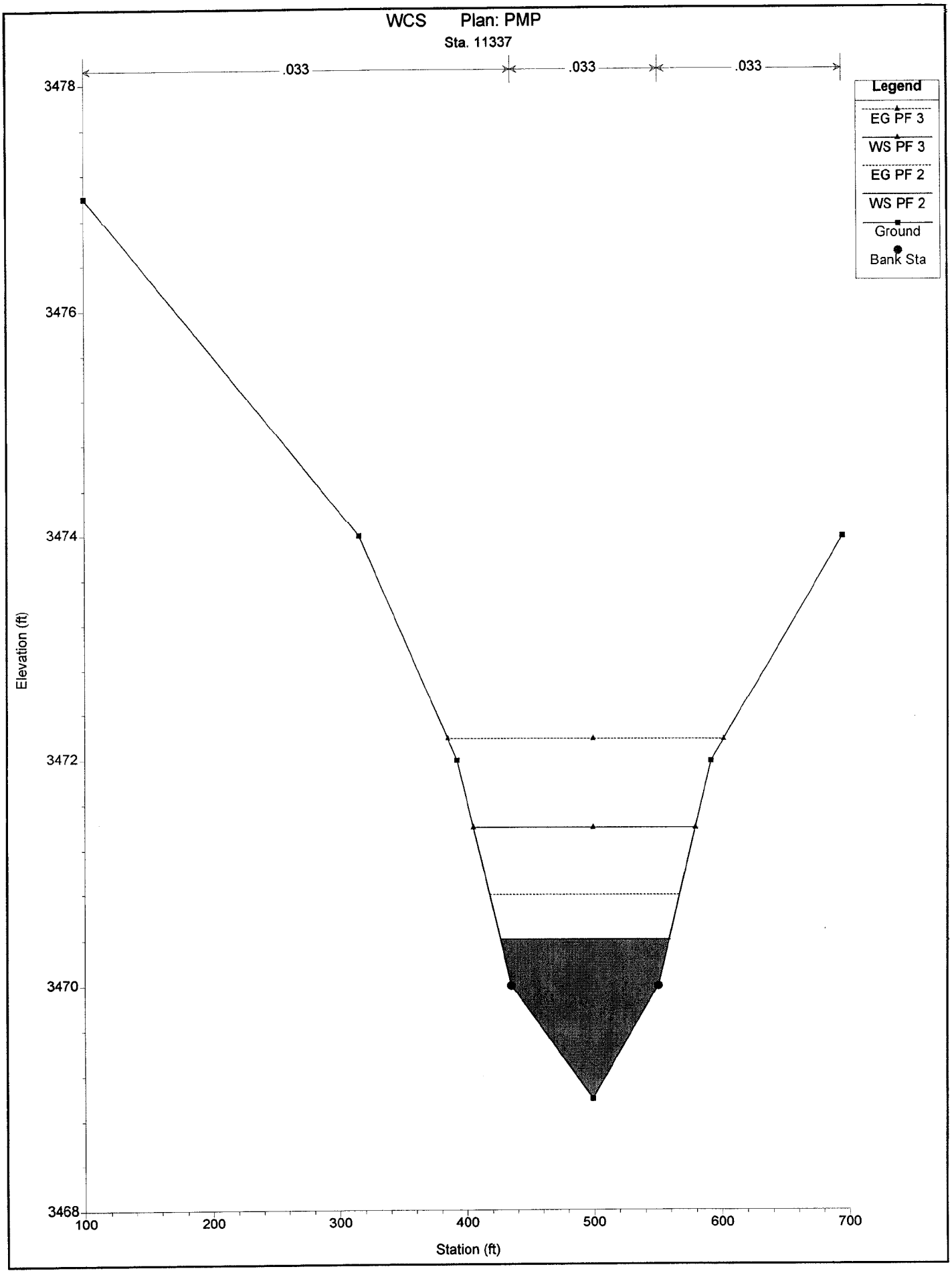
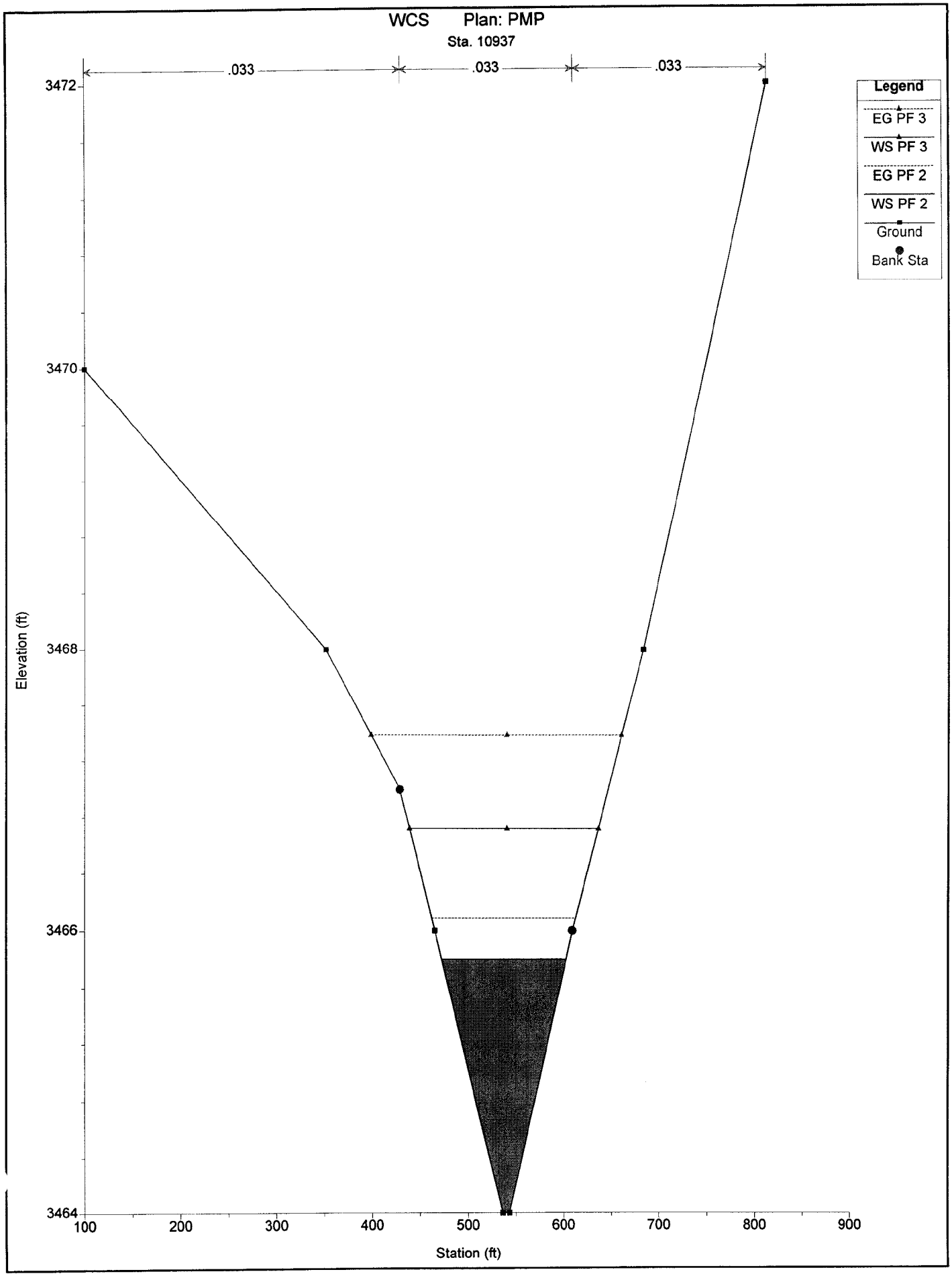
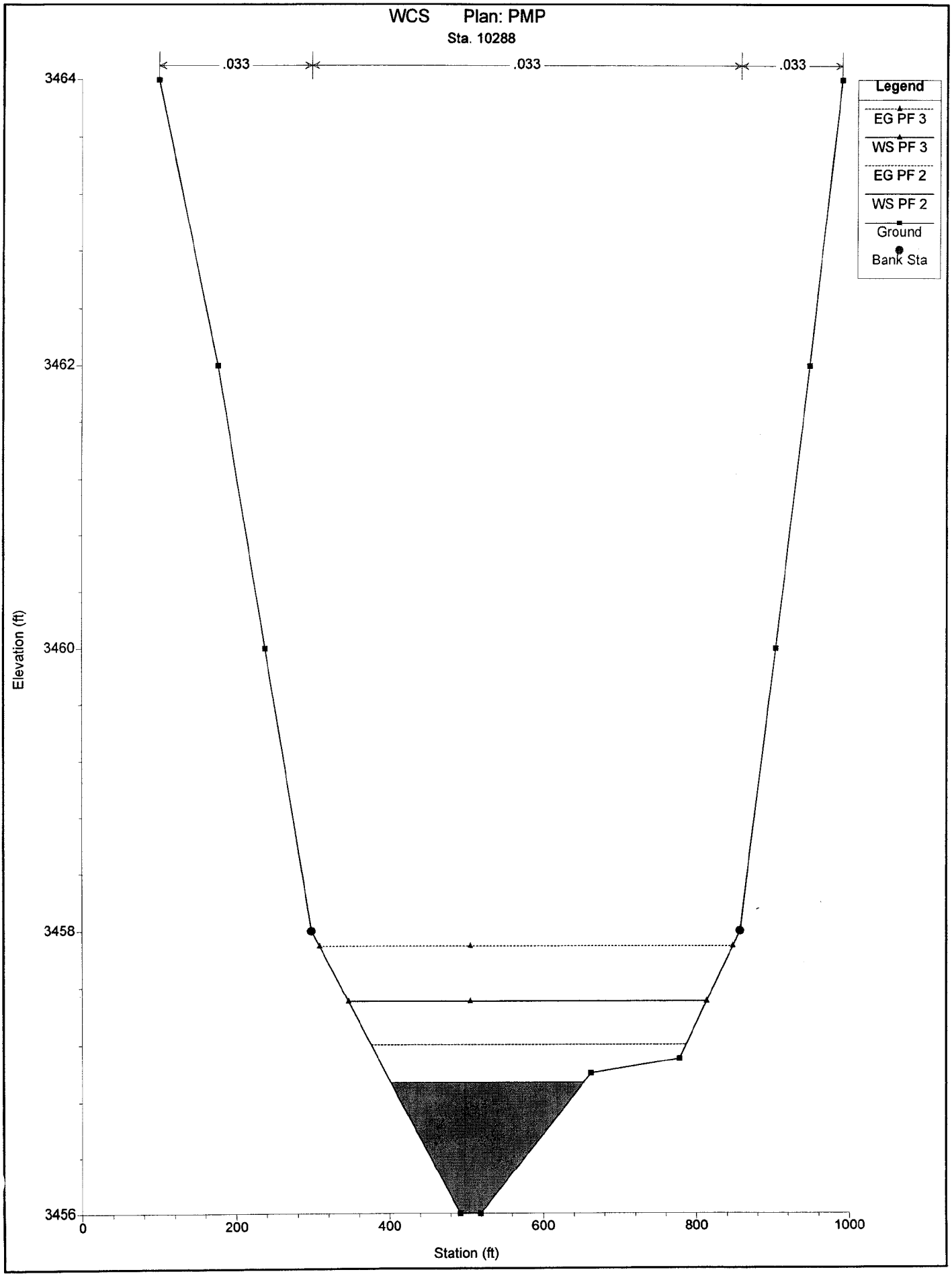
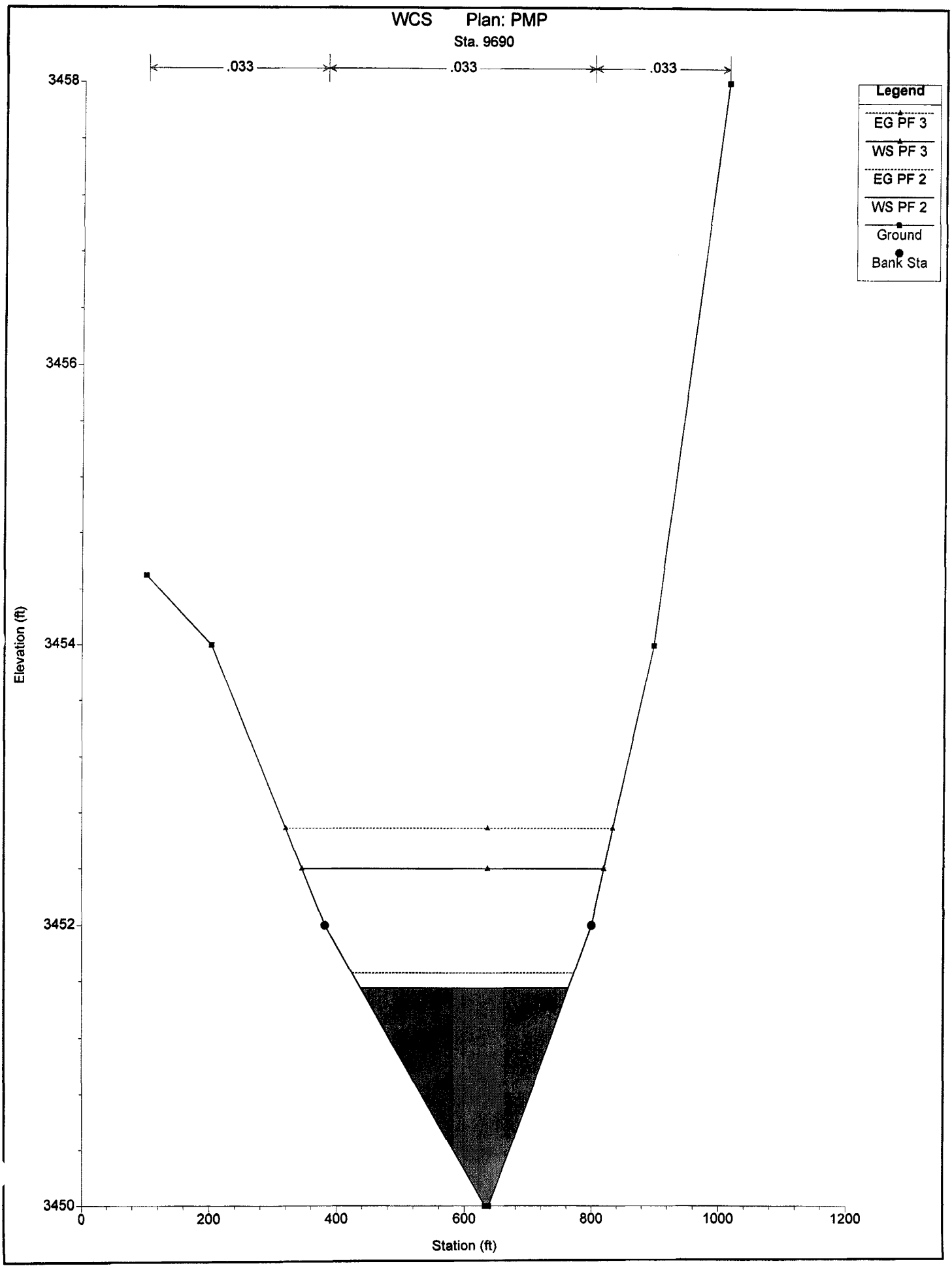
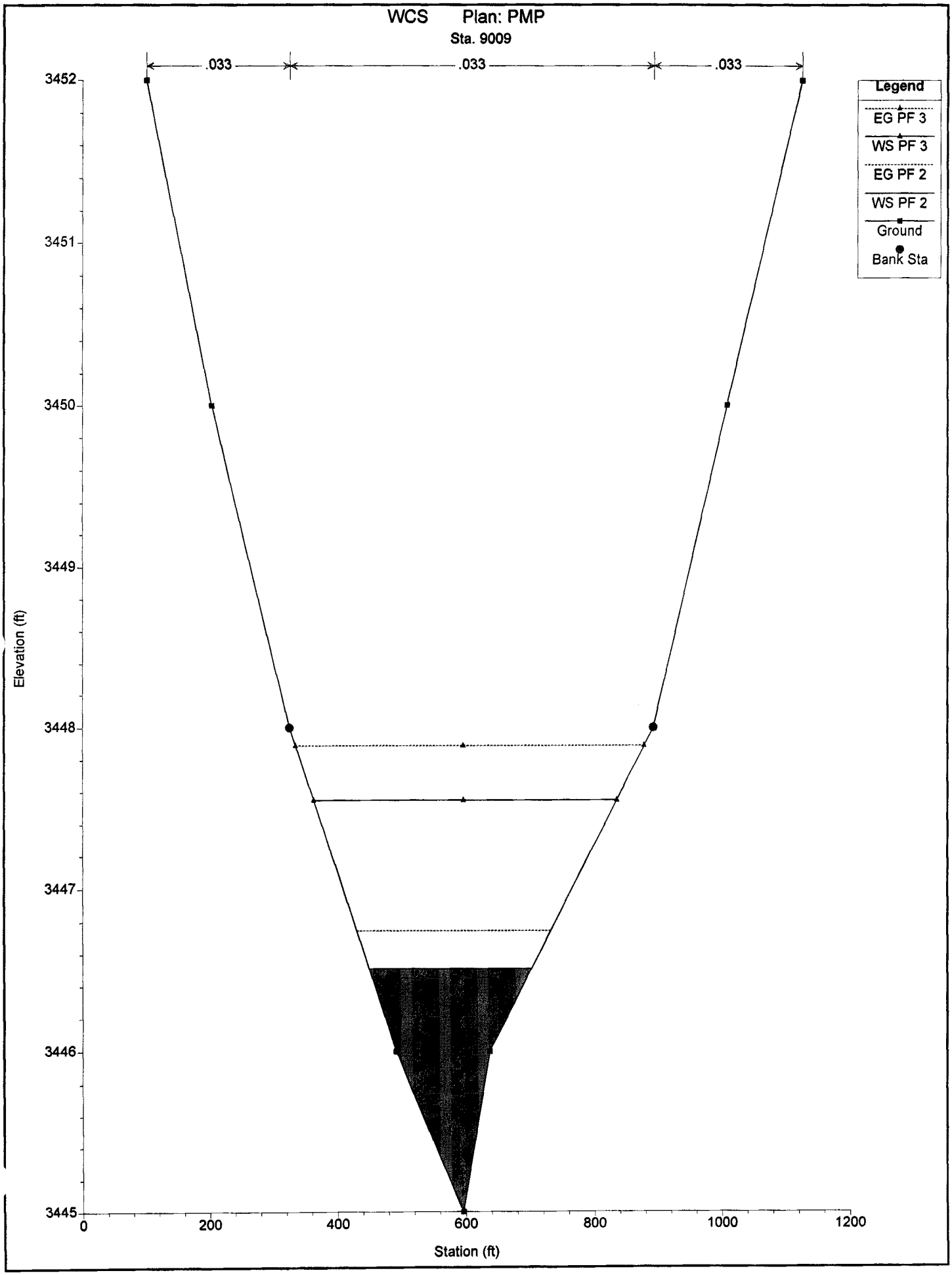

WCS Plan: PMP
Sta. 12674
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3482
3481
3480
3479
3478
3477
Elevation (ft)
0
200
400
600
800
1000
Station (ft)

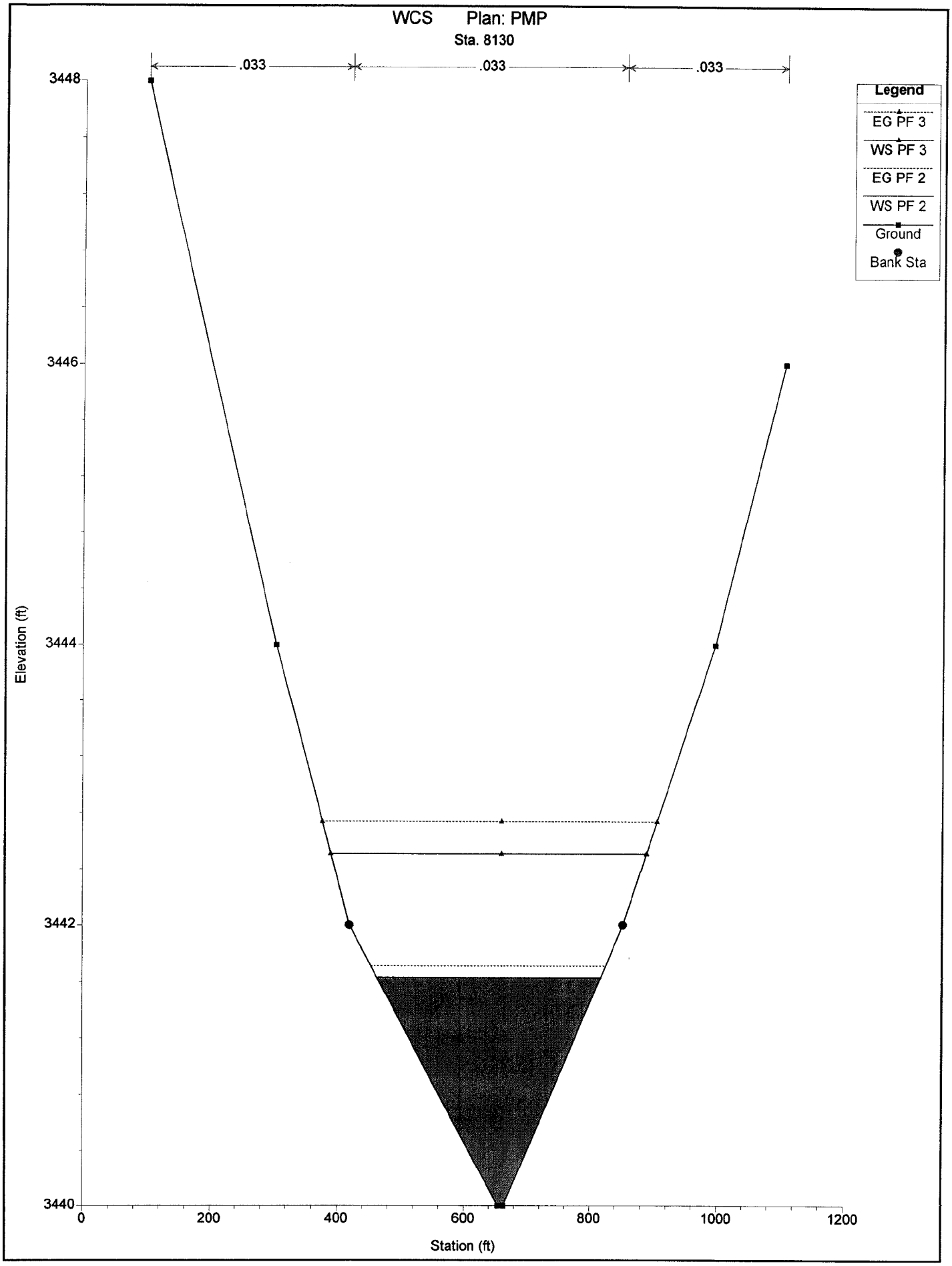

WCS Plan: PMP
Sta. 11337
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3478
3476
3474
3472
3470
3468
Elevation (ft)
100
200
300
400
500
600
700
Station (ft)

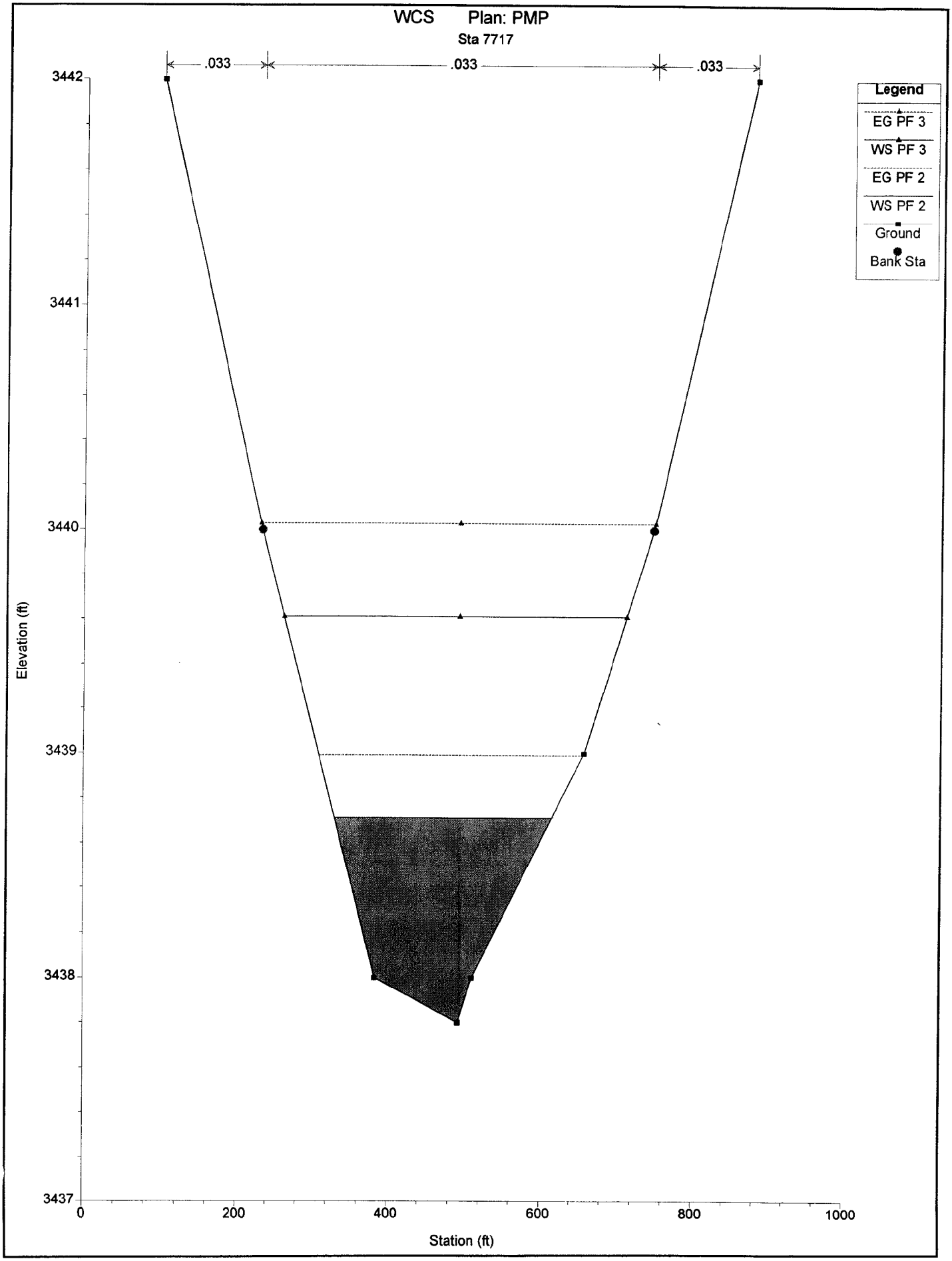

WCS Plan: PMP
Sta. 10937
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3472
3470
3468
3466
3464
Elevation (ft)
100
200
300
400
500
600
700
800
900
Station (ft)

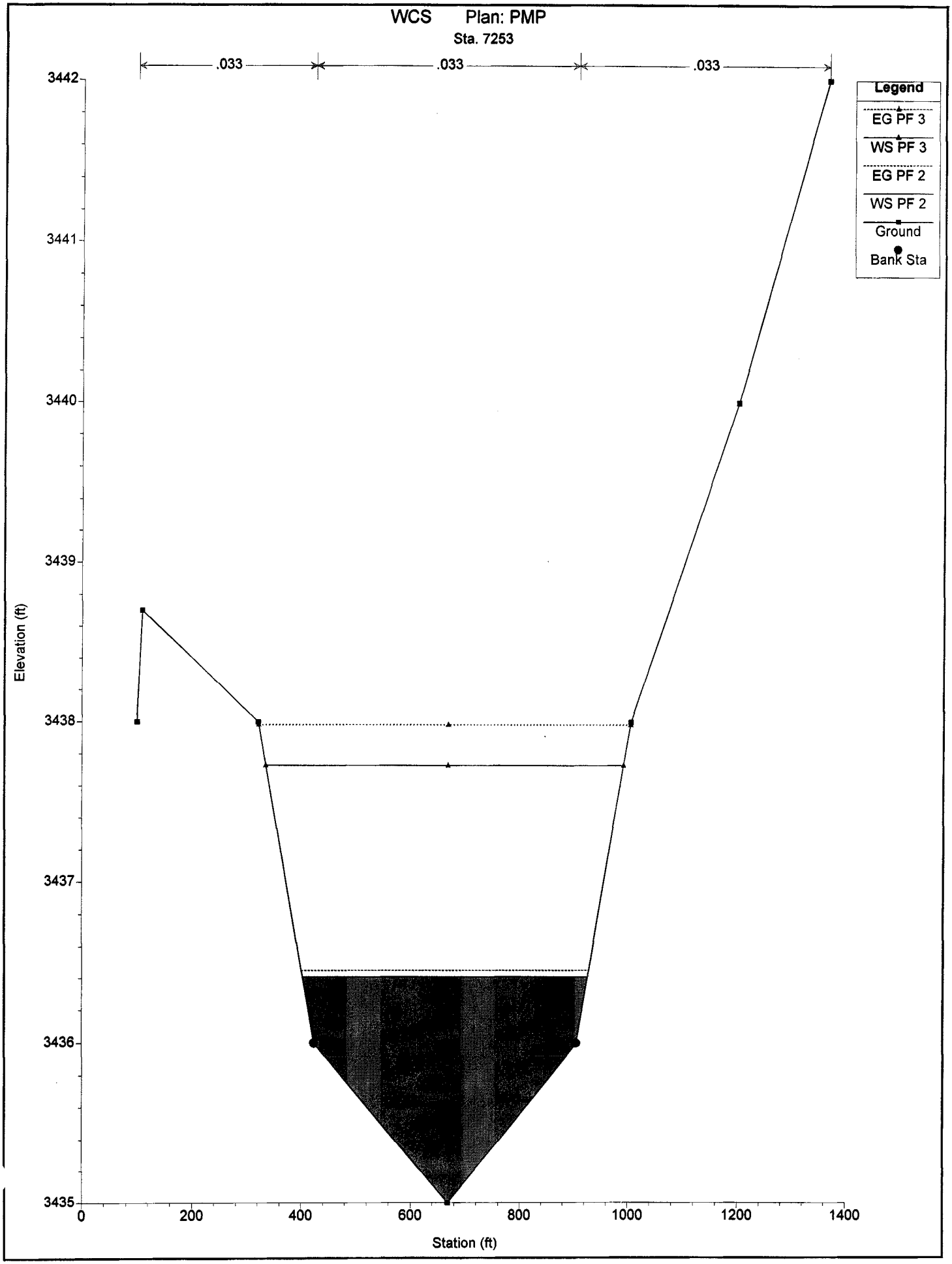

WCS Plan: PMP
Sta. 10288
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3464
3462
3460
3458
3456
Elevation (ft)
0
200
400
600
800
1000
Station (ft)

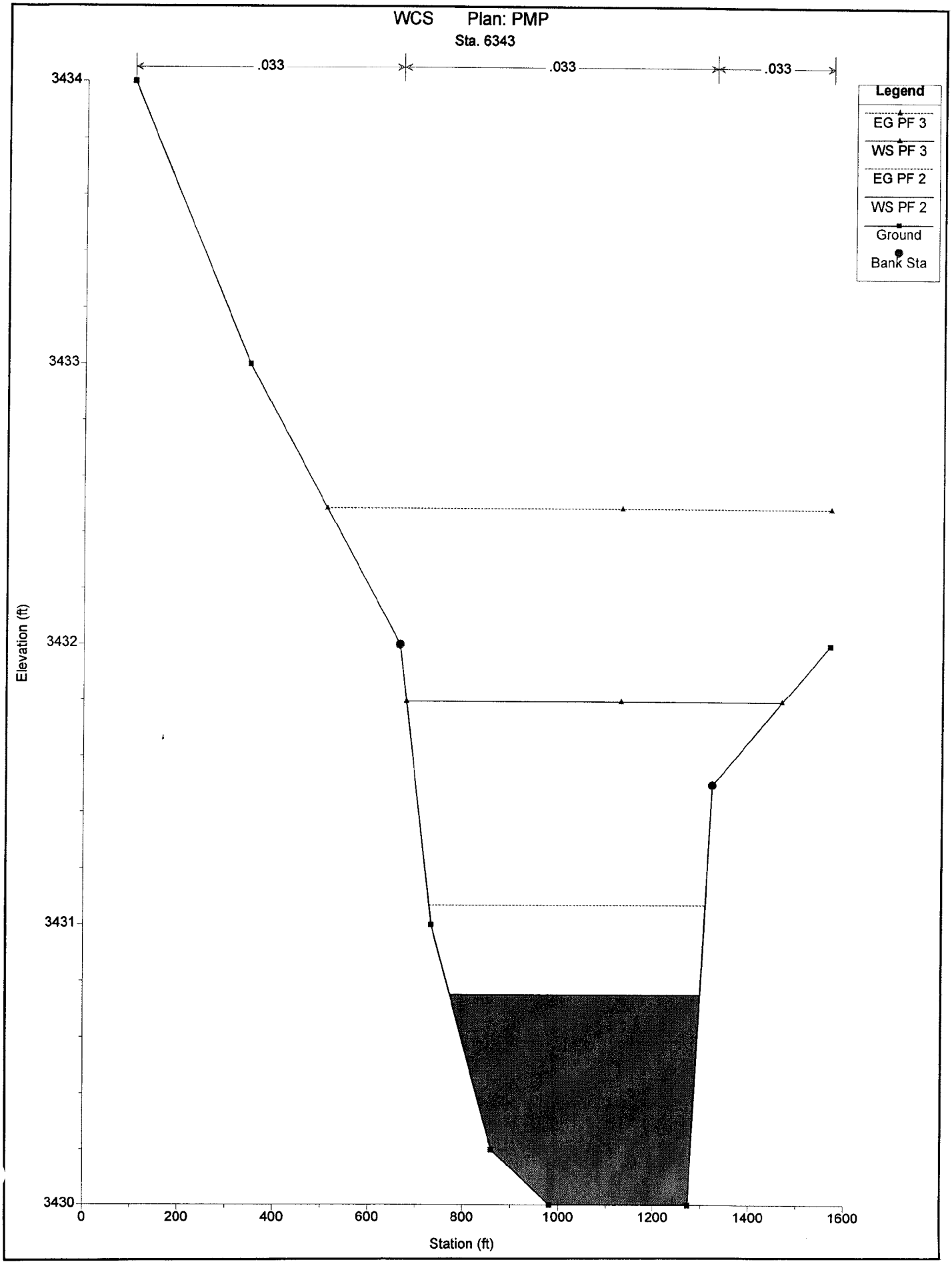

WCS Plan: PMP
Sta. 9690
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3458
3456
3454
3452
3450
Elevation (ft)
0
200
400
600
800
1000
1200
Station (ft)

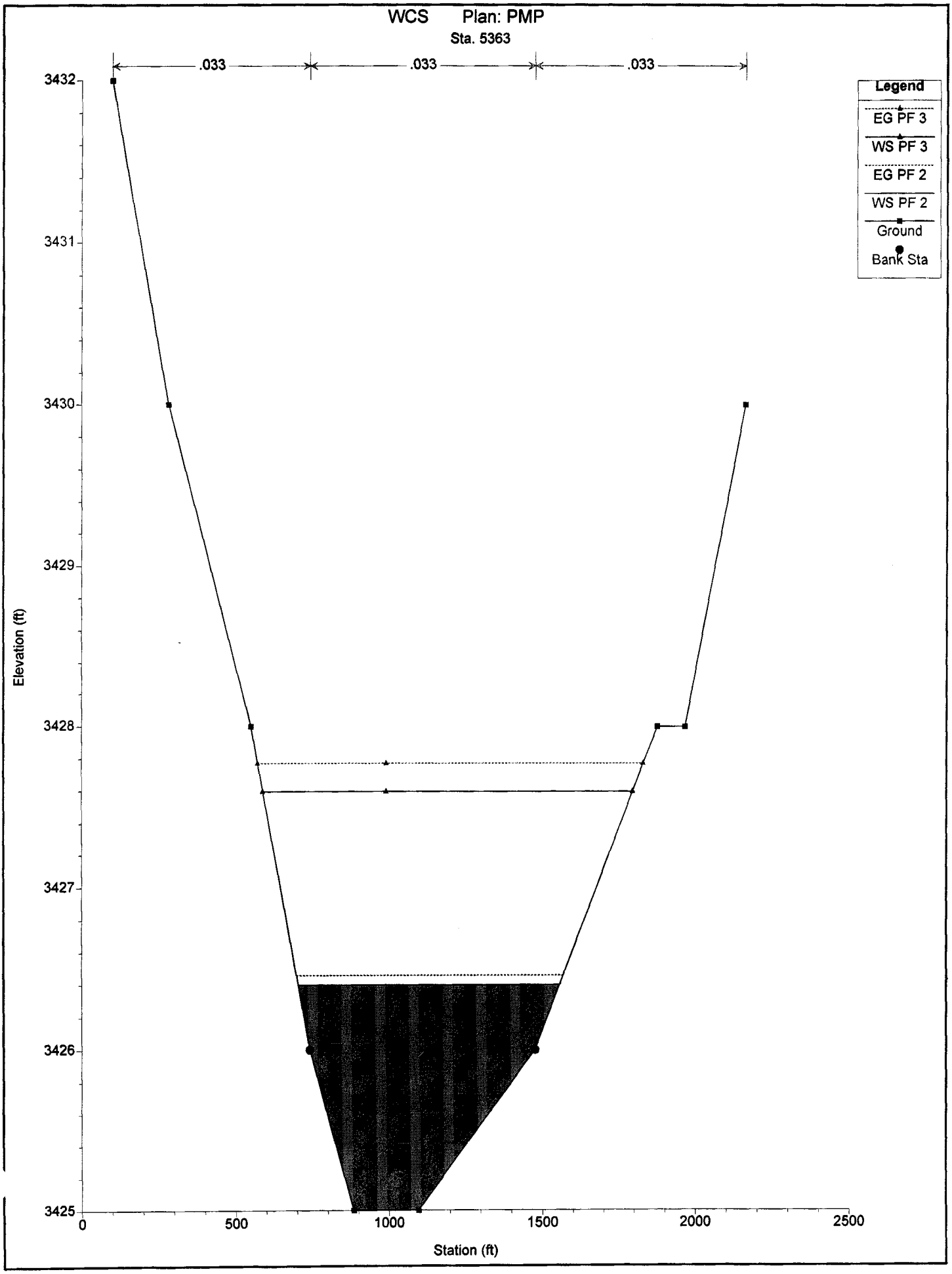

WCS Plan: PMP
Sta. 9009
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3452
3451
3450
3449
3448
3447
3446
3445
0
200
400
600
800
1000
1200
Station (ft)

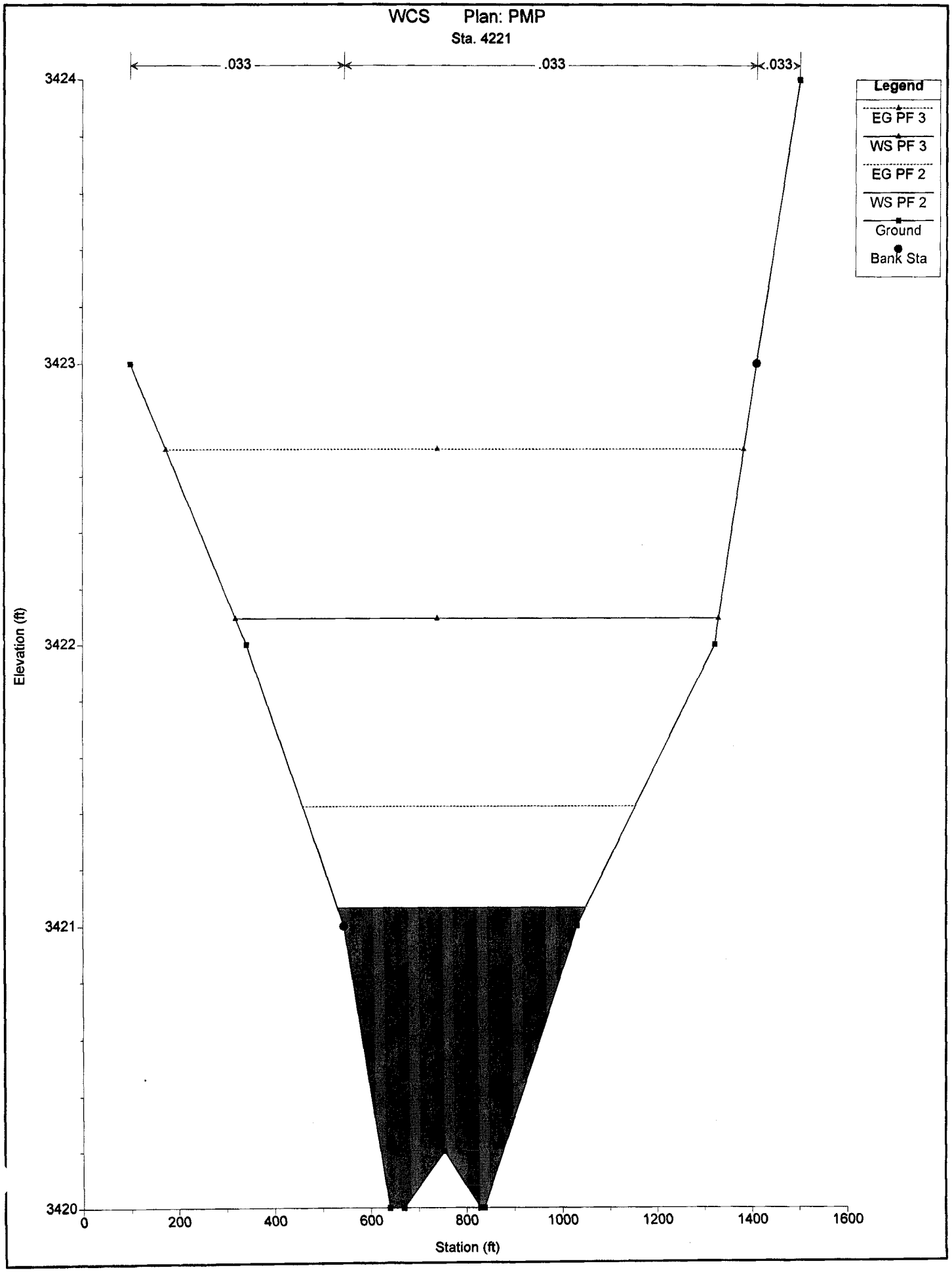

WCS Plan: PMP
Sta. 8130
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3448
3446
3444
3442
3440
Elevation (ft)
0
200
400
600
800
1000
1200
Station (ft)

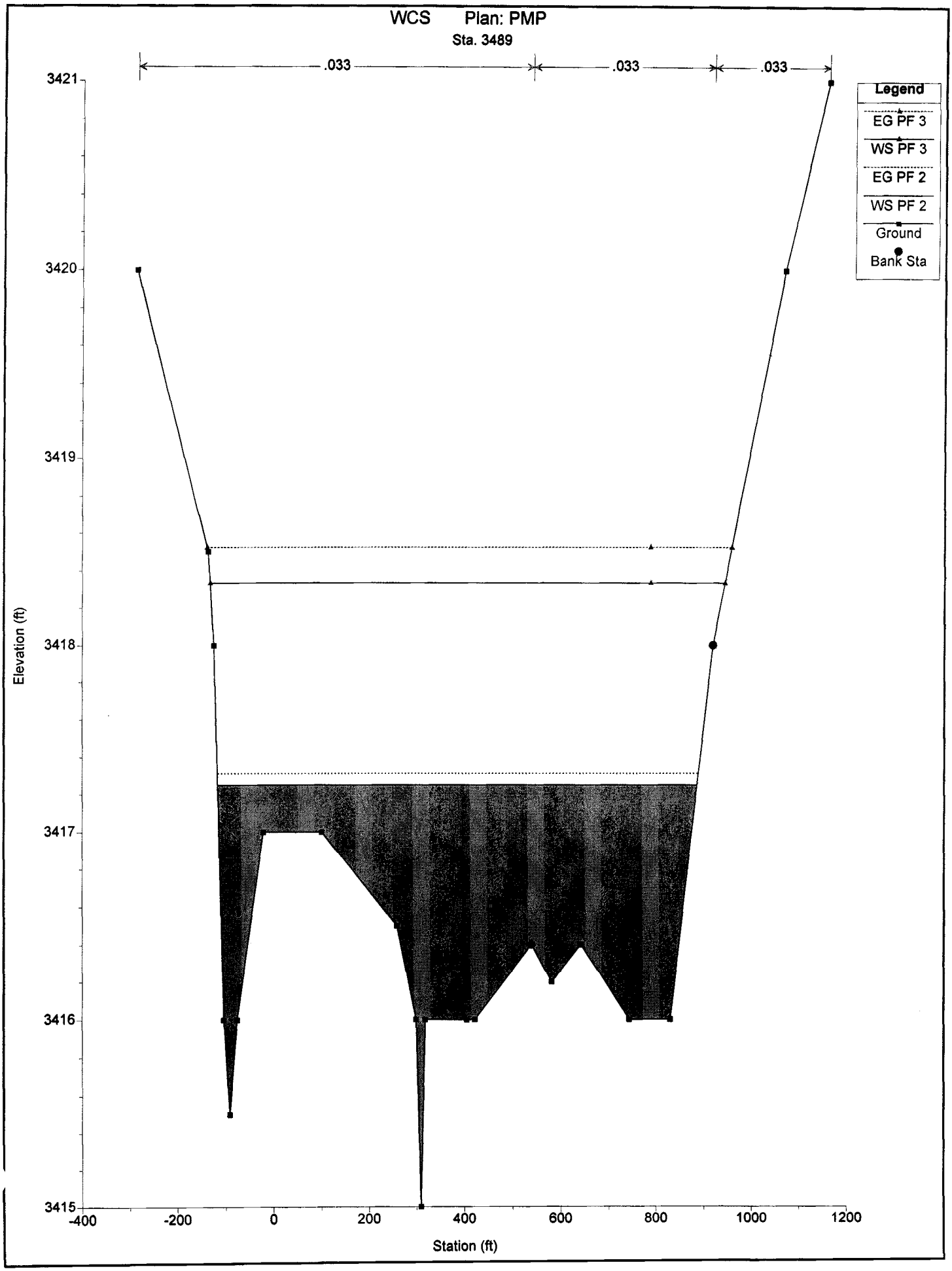

WCS Plan: PMP
Sta 7717
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3442
3441
3440
3439
3438
3437
Elevation (ft)
0
200
400
600
800
1000
Station (ft)

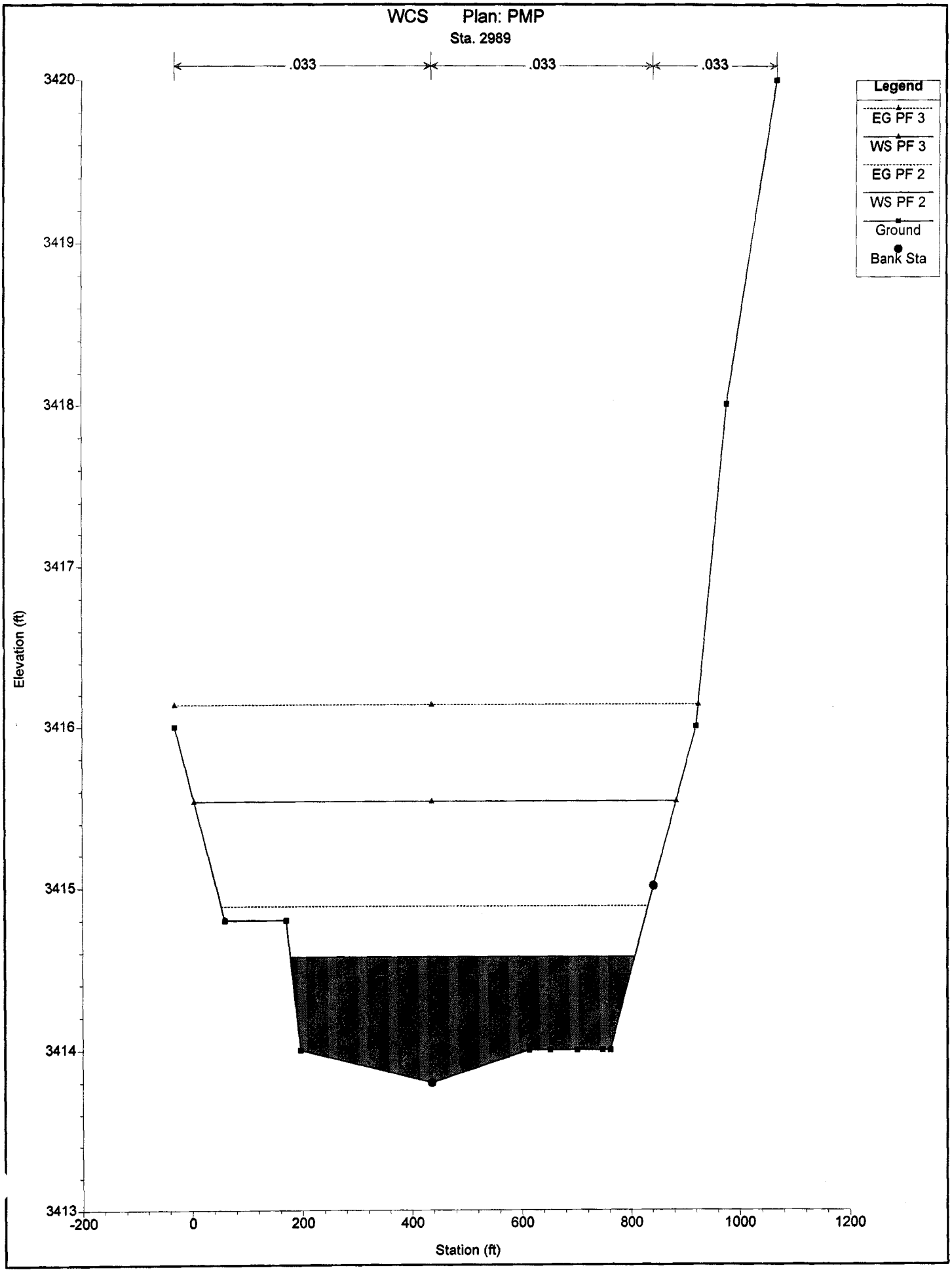

WCS Plan: PMP
Sta. 7253
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3442
3441
3440
3439
3438
3437
3436
3435
0
200
400
600
800
1000
1200
1400
Station (ft)

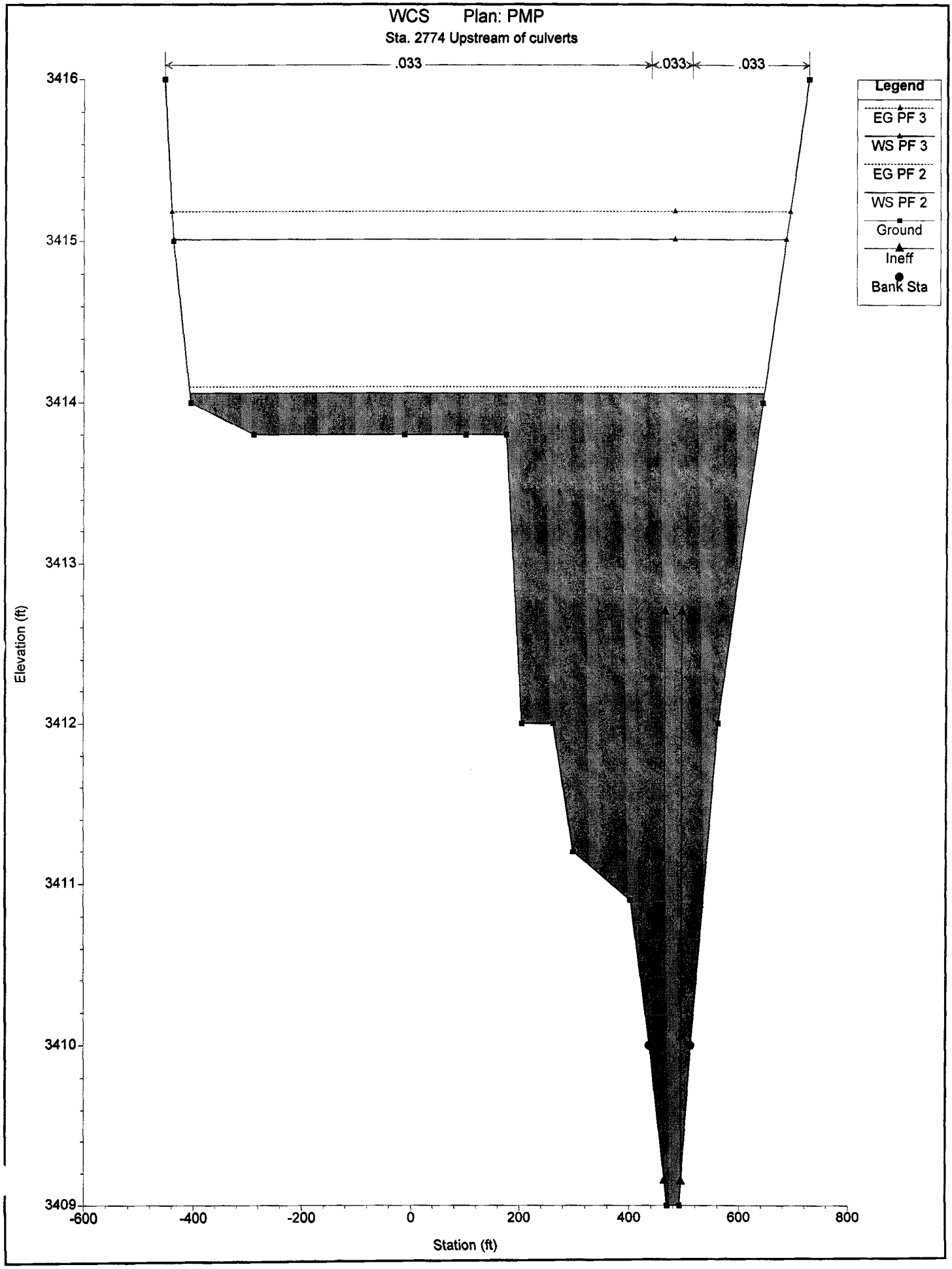

WCS Plan: PMP
Sta. 6343
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3434
3433
3432
3431
3430
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

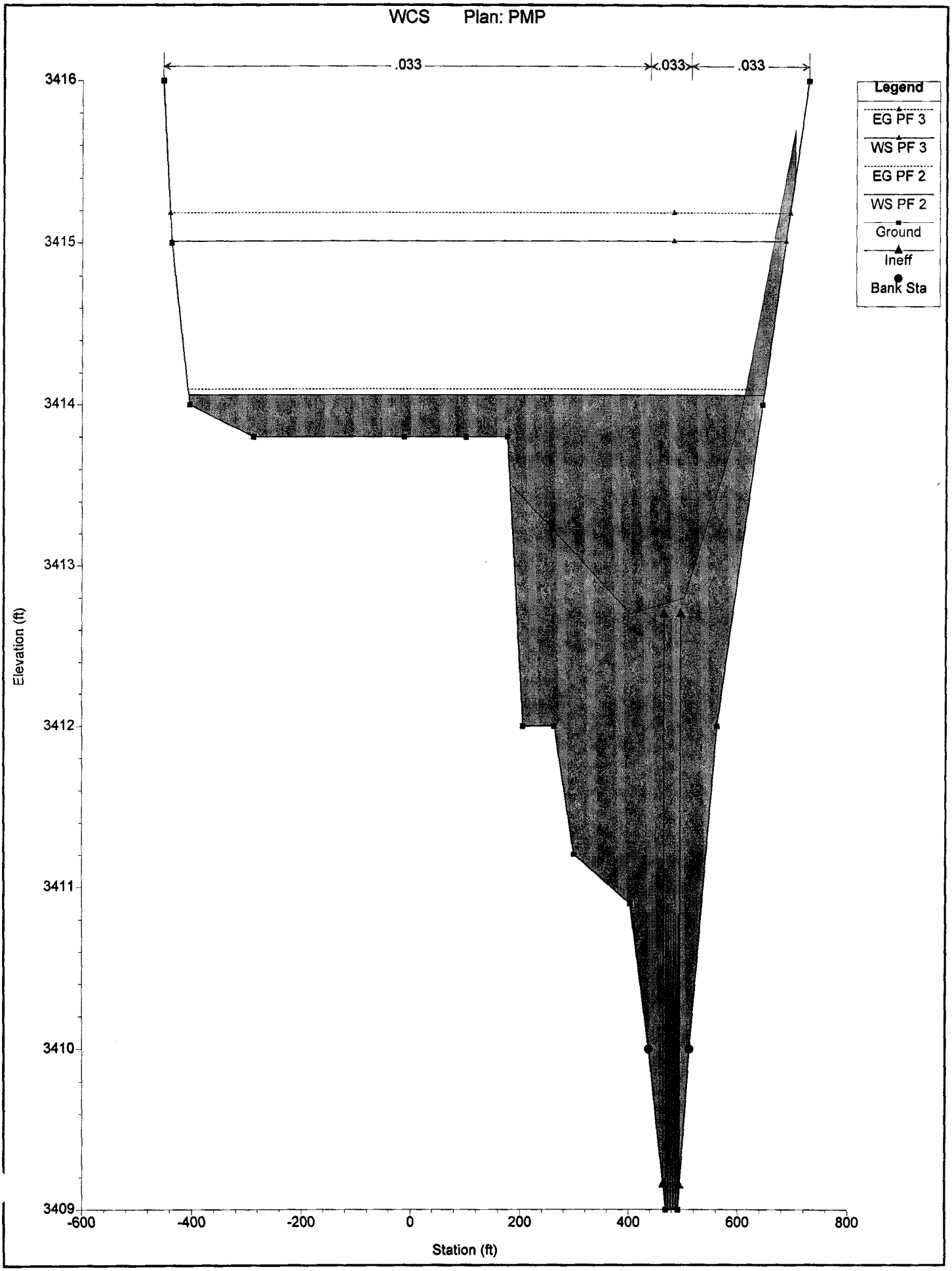

WCS Plan: PMP
Sta. 5363
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3432
3431
3430
3429
3428
3427
3426
3425
Elevation (ft)
0
500
1000
1500
2000
2500
Station (ft)

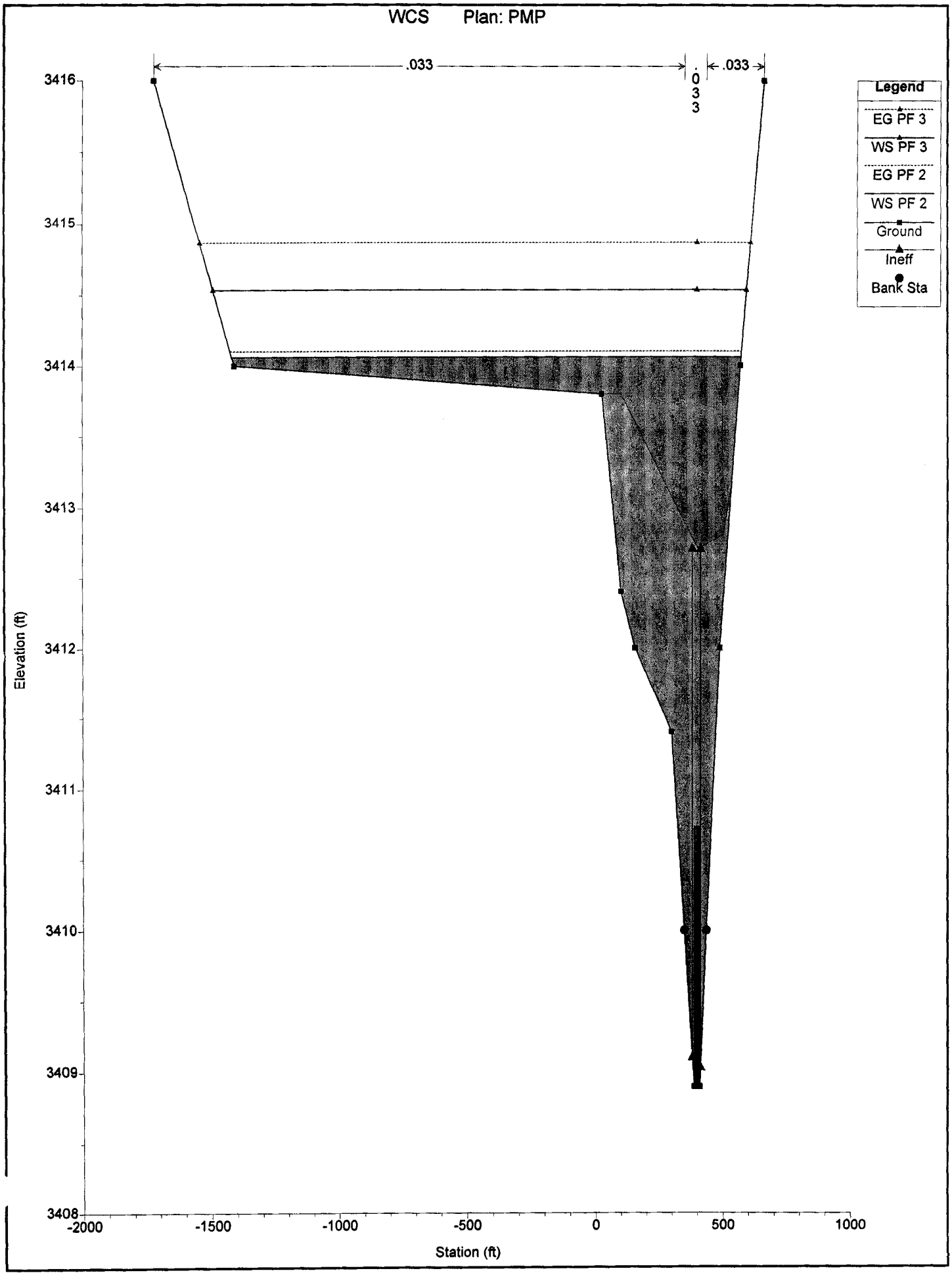

WCS Plan: PMP
Sta. 4221
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3424
3423
3422
3421
3420
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

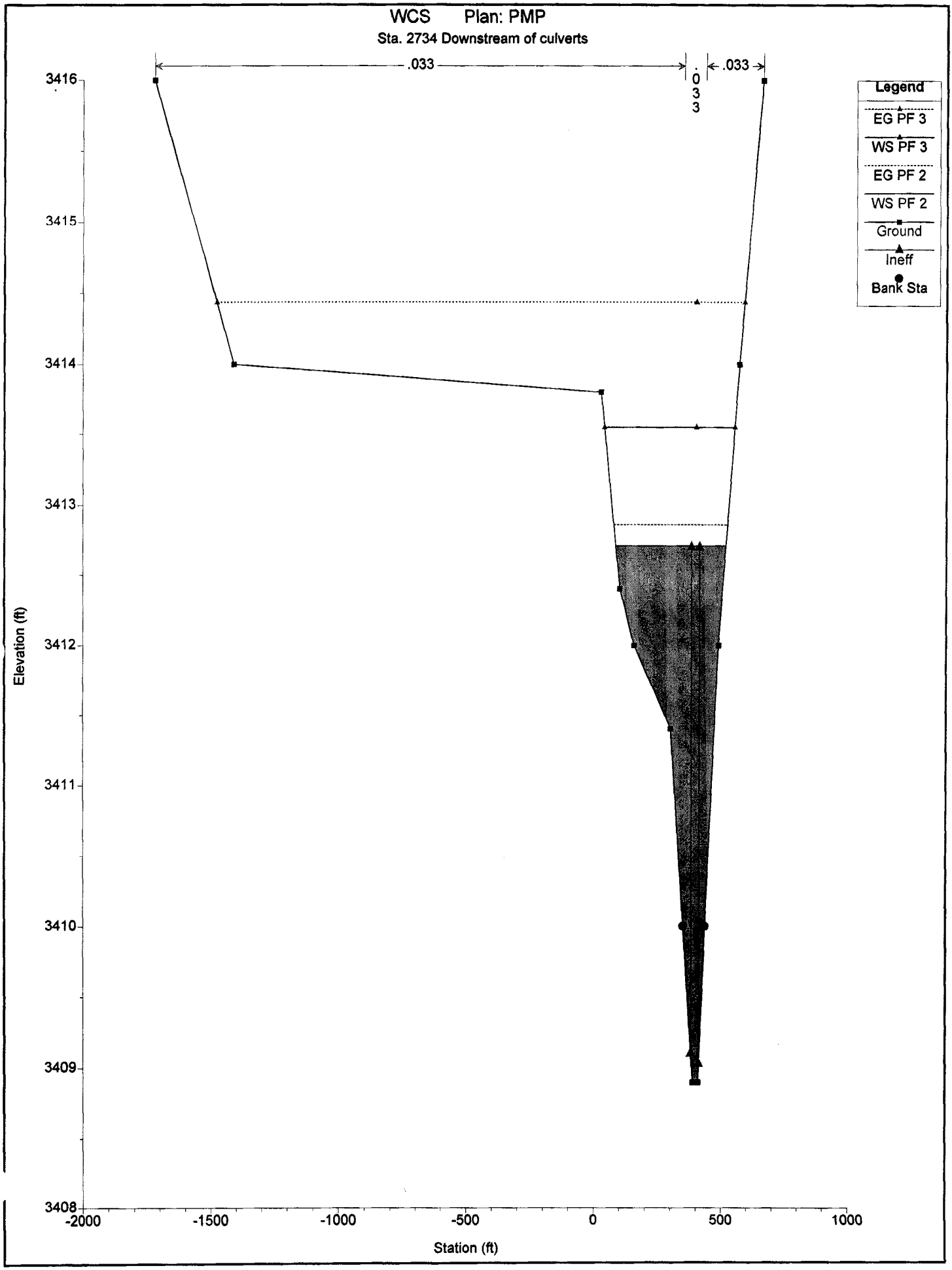

WCS Plan: PMP
Sta. 3489
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3421
3420
3419
3418
3417
3416
3415
Elevation (ft)
-400
-200
0
200
400
600
800
1000
1200
Station (ft)

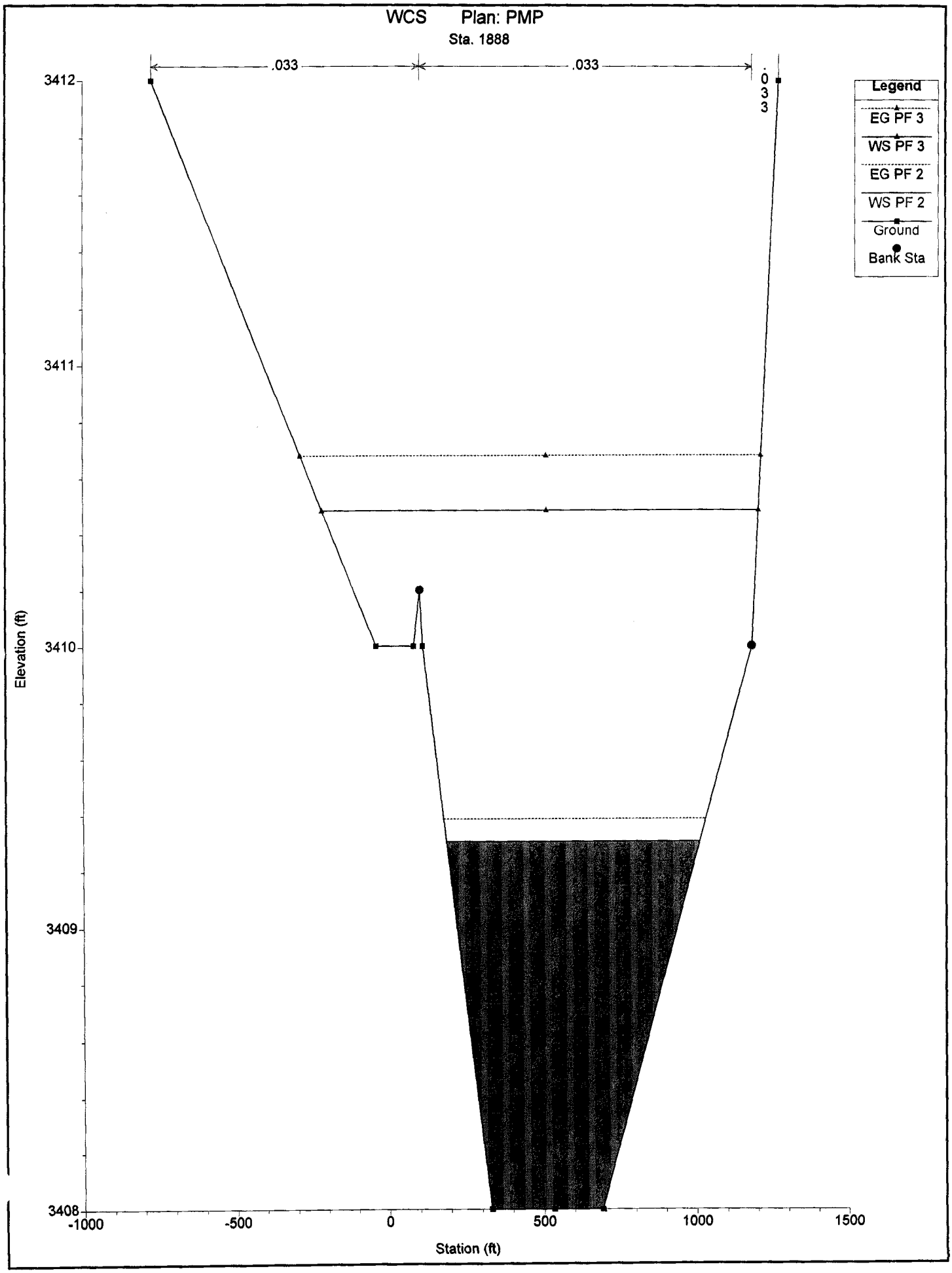

WCS Plan: PMP
Sta. 2989
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3420
3419
3418
3417
3416
3415
3414
3413
Elevation (ft)
-200
0
200
400
600
800
1000
1200
Station (ft)

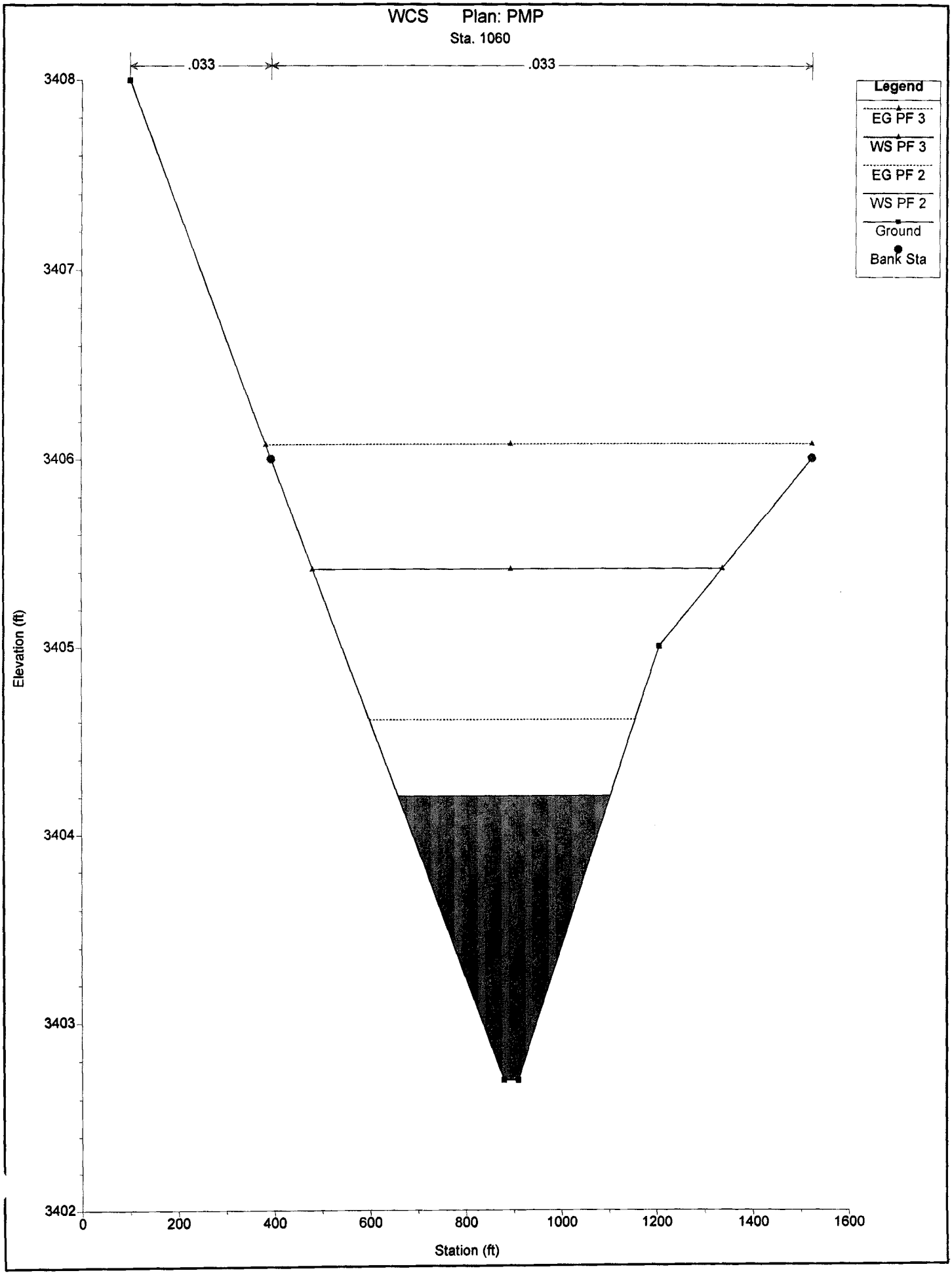

WCS Plan: PMP
Sta. 2774 Upstream of culverts
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
3416
3415
3414
3413
3412
3411
3410
3409
Elevation (ft)
-600
-400
-200
0
200
400
600
800
Station (ft)


WCS Plan: PMP
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
3416
3415
3414
3413
3412
3411
3410
3409
Elevation (ft)
-600
-400
-200
0
200
400
600
800
Station (ft)


WCS Plan: PMP
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
3416
3415
3414
3413
3412
3411
3410
3409
3408
Elevation (ft)
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


WCS Plan: PMP
Sta. 2734 Downstream of culverts
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
3416
3415
3414
3413
3412
3411
3410
3409
3408
Elevation (ft)
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


WCS Plan: PMP
Sta. 1888
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3412
3411
3410
3409
3408
Elevation (ft)
-1000
-500
0
500
1000
1500
Station (ft)


WCS Plan: PMP
Sta. 1060
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3408
3407
3406
3405
3404
3403
3402
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

HEC-RAS Plan: PMPR1 River: Ditch A Reach: 5

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(ft)	(ft)	(sq ft)	(ft)	
5	12674	592.00	3477.00	3478.45	3478.05	1.45	3478.54	0.003041	2.40	348.61	663.25	255.24	314.65	0.43
5	12674	1768.00	3477.00	3479.22	3478.65	2.22	3479.41	0.003111	3.61	294.31	712.12	539.30	417.81	0.48
5	11337	592.00	3469.00	3470.47	3470.44	1.46	3470.89	0.014287	5.25	425.01	559.52	115.46	134.51	0.94
5	11337	1768.00	3469.00	3471.40	3471.40	2.40	3472.19	0.011380	7.37	404.87	578.73	259.90	173.86	0.94
5	10937	592.00	3464.00	3465.88	3465.69	1.88	3466.18	0.009696	4.40	469.19	605.11	134.50	135.92	0.78
5	10937	1768.00	3464.00	3466.73	3466.67	2.73	3467.39	0.011861	6.57	438.14	635.86	275.01	197.71	0.93
5	10288	592.00	3456.00	3456.97	3456.97	0.97	3457.25	0.020992	4.29	398.55	657.53	138.04	258.98	1.04
5	10288	1768.00	3456.00	3457.50	3457.50	1.50	3457.89	0.018227	5.03	346.65	813.19	351.36	466.54	1.02
5	9690	751.00	3450.00	3451.61	3451.24	1.61	3451.73	0.004736	2.71	429.90	767.63	276.77	337.73	0.53
5	9690	2568.00	3450.00	3452.40	3452.03	2.40	3452.69	0.005801	4.32	345.19	818.61	602.35	473.42	0.64
5	9009	751.00	3445.00	3446.57	3446.45	1.57	3446.81	0.012198	3.97	444.50	709.53	189.12	265.03	0.83
5	9009	2568.00	3445.00	3447.55		2.55	3447.89	0.008737	4.66	362.59	834.60	550.62	472.01	0.76
5	8130	751.00	3440.00	3441.70	3441.21	1.70	3441.78	0.003259	2.34	454.54	823.41	320.72	368.87	0.44
5	8130	2568.00	3440.00	3442.51	3441.99	2.51	3442.74	0.004151	3.85	389.53	888.33	678.70	498.79	0.55
5	7717	751.00	3437.80	3438.75	3438.75	0.95	3439.05	0.019448	4.38	326.48	620.79	171.46	294.31	1.01
5	7717	2568.00	3437.80	3439.61	3439.49	1.81	3440.03	0.011696	5.19	262.15	712.02	494.88	449.87	0.87
5	7253	857.00	3435.00	3436.46	3436.95	1.46	3436.52	0.001736	1.83	400.15	928.93	475.06	528.78	0.33
5	7253	4793.00	3435.00	3437.73	3436.95	2.73	3437.98	0.002925	4.15	335.02	991.53	1224.55	656.51	0.49
5	6343	1668.00	3430.00	3430.80	3430.80	0.80	3431.14	0.018115	4.65	763.44	1298.18	358.99	534.73	1.00
5	6343	6409.00	3430.00	3431.79	3431.79	1.79	3432.49	0.013082	6.69	677.18	1464.86	974.08	787.68	0.97
5	5363	1668.00	3425.00	3426.46	3425.87	1.46	3426.52	0.001774	2.03	697.73	1568.47	843.04	870.74	0.34
5	5363	6409.00	3425.00	3427.60	3426.70	2.60	3427.77	0.002053	3.49	588.77	1796.04	2022.32	1207.27	0.41
5	4221	1914.00	3420.00	3421.13	3421.13	1.13	3421.50	0.017296	4.88	517.29	1068.16	393.73	550.87	0.99
5	4221	6969.00	3420.00	3422.09	3422.09	2.09	3422.69	0.013866	6.36	318.52	1328.11	1150.73	1009.59	0.98
5	3489	1914.00	3416.00	3417.31	3416.78	2.31	3417.37	0.002270	2.22	-118.39	887.55	933.15	1005.93	0.38
5	3489	6969.00	3416.00	3418.33	3417.53	3.33	3418.52	0.002578	3.59	-133.97	942.92	1994.93	1076.90	0.45
5	2989	1914.00	3413.80	3414.63	3414.63	0.83	3414.95	0.018186	4.47	175.68	810.52	416.79	634.84	0.99
5	2989	6969.00	3413.80	3415.54	3415.49	1.74	3416.14	0.012585	6.56	3.77	883.00	1134.92	879.23	0.95
5	2774	1914.00	3409.00	3414.10	3412.71	5.10	3414.15	0.000369	2.44	-408.24	645.26	1448.49	1053.50	0.20
5	2774	6969.00	3409.00	3415.01	3413.39	6.01	3415.19	0.001205	4.96	-437.14	683.38	2435.25	1120.52	0.37
5	2773	Culvert												
5	2734	1914.00	3408.90	3412.71	3412.71	3.81	3412.89	0.001632	4.11	83.74	515.65	665.51	431.91	0.39
5	2734	6969.00	3408.90	3413.55	3413.55	4.65	3414.44	0.006458	9.48	39.16	549.82	1063.05	510.66	0.81
5	1888	1943.00	3408.00	3409.38	3408.84	1.38	3409.47	0.002740	2.33	178.44	1028.25	834.45	849.81	0.41
5	1888	7042.00	3408.00	3410.48	3409.72	2.48	3410.68	0.002812	3.54	-218.68	1201.30	2065.39	1419.98	0.46
5	1060	2032.00	3402.70	3404.27	3404.27	1.57	3404.70	0.017302	5.25	648.43	1111.58	386.84	463.15	1.01
5	1060	7268.00	3402.70	3405.41	3405.41	2.71	3406.07	0.014850	6.53	480.47	1336.48	1112.35	856.01	1.01

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
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X     X  X        X            X  X      X    X       X
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PROJECT DATA
Project Title: WCS
Project File : FloodPlain.prj
Run Date and Time: 11/3/05 6:02:52 PM

Project in English units

PLAN DATA

Plan Title: PMPR1
Plan File : D:\program files\WCS\FloodPlain.p25

Geometry Title: PMP1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g04

Flow Title : pmp R500
Flow File : D:\program files\WCS\FloodPlain.f23

Plan Summary Information:
Number of: Cross Sections = 18 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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: Mixed Flow

FLOW DATA

Flow Title: pmp R500
Flow File : D:\program files\WCS\FloodPlain.f23

Flow Data (cfs)

River	Reach	RS	PF 2	PF 3
Ditch A	5	12674	592	1768
Ditch A	5	9690	751	2568
Ditch A	5	7253	857	4793
Ditch A	5	6343	1668	6409
Ditch A	5	4221	1914	6969
Ditch A	5	1888	1943	7042
Ditch A	5	1060	2032	7268

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ditch A	5	PF 2	Critical	Critical

GEOMETRY DATA

Geometry Title: PMP1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g04

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 12674

INPUT
Description: Sta. 12674
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
380	635	1206	1337	1433	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3478.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.45	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.05	Flow Area (sq ft)	7.04	241.86	6.34
E.G. Slope (ft/ft)	0.003041	Area (sq ft)	7.04	241.86	6.34
Q Total (cfs)	592.00	Flow (cfs)	6.45	579.74	5.81
Top Width (ft)	314.65	Top Width (ft)	31.39	255.00	28.25

Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)	0.92	2.40	0.92
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)	0.22	0.95	0.22
Conv. Total (cfs)	10735.4	Conv. (cfs)	117.0	10513.1	105.3
Length Wtd. (ft)	1336.60	Wetted Per. (ft)	31.40	255.01	28.26
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.04	0.18	0.04
Alpha	1.05	Stream Power (lb/ft s)	0.04	0.43	0.04
Frctn Loss (ft)	7.61	Cum Volume (acre-ft)	15.98	97.56	2.48
C & E Loss (ft)	0.03	Cum SA (acres)	19.90	107.86	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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3479.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3479.22	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3478.65	Flow Area (sq ft)	52.45	439.65	47.20
E.G. Slope (ft/ft)	0.003111	Area (sq ft)	52.45	439.65	47.20
Q Total (cfs)	1768.00	Flow (cfs)	94.95	1587.60	85.45
Top Width (ft)	417.81	Top Width (ft)	85.69	255.00	77.12
Vel Total (ft/s)	3.28	Avg. Vel. (ft/s)	1.81	3.61	1.81
Max Chl Dpth (ft)	2.22	Hydr. Depth (ft)	0.61	1.72	0.61
Conv. Total (cfs)	31697.9	Conv. (cfs)	1702.3	28463.6	1532.0
Length Wtd. (ft)	1334.91	Wetted Per. (ft)	85.70	255.01	77.13
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.12	0.33	0.12
Alpha	1.12	Stream Power (lb/ft s)	0.22	1.21	0.22
Frctn Loss (ft)	7.16	Cum Volume (acre-ft)	42.64	220.87	11.81
C & E Loss (ft)	0.06	Cum SA (acres)	35.90	135.42	17.21

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.
Warning: The energy loss was greater than 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: Ditch A
REACH: 5 RS: 11337

INPUT
Description: Sta. 11337
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3477	315	3474	392	3472	435	3470	499	3469
550	3470	591	3472	694	3474				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	435	.033	550	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
435	550	545	400	332	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3470.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.47	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.44	Flow Area (sq ft)	2.32	110.93	2.21
E.G. Slope (ft/ft)	0.014287	Area (sq ft)	2.32	110.93	2.21
Q Total (cfs)	592.00	Flow (cfs)	4.72	582.79	4.50
Top Width (ft)	134.51	Top Width (ft)	9.99	115.00	9.52
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)	2.03	5.25	2.03
Max Chl Dpth (ft)	1.46	Hydr. Depth (ft)	0.23	0.96	0.23
Conv. Total (cfs)	4952.9	Conv. (cfs)	39.5	4875.8	37.6
Length Wtd. (ft)	400.32	Wetted Per. (ft)	10.00	115.02	9.54
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.21	0.86	0.21
Alpha	1.04	Stream Power (lb/ft s)	0.42	4.52	0.42
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	15.85	92.15	2.34
C & E Loss (ft)	0.04	Cum SA (acres)	19.33	102.18	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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3472.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3471.40	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3471.40	Flow Area (sq ft)	21.11	218.66	20.13
E.G. Slope (ft/ft)	0.011380	Area (sq ft)	21.11	218.66	20.13
Q Total (cfs)	1768.00	Flow (cfs)	79.94	1611.84	76.22
Top Width (ft)	173.86	Top Width (ft)	30.13	115.00	28.73
Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)	3.79	7.37	3.79
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)	0.70	1.90	0.70
Conv. Total (cfs)	16573.1	Conv. (cfs)	749.4	15109.3	714.5
Length Wtd. (ft)	401.34	Wetted Per. (ft)	30.16	115.02	28.76
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.50	1.35	0.50
Alpha	1.10	Stream Power (lb/ft s)	1.88	9.96	1.88
Frctn Loss (ft)	4.66	Cum Volume (acre-ft)	41.62	210.77	10.70
C & E Loss (ft)	0.04	Cum SA (acres)	34.30	129.75	15.47

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

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

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 10937

INPUT
Description: Sta. 10937
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	428	.033	609	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
428	609	729	649	445	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3466.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.88	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.69	Flow Area (sq ft)		134.50	
E.G. Slope (ft/ft)	0.009696	Area (sq ft)		134.50	
Q Total (cfs)	592.00	Flow (cfs)		592.00	
Top Width (ft)	135.92	Top Width (ft)		135.92	
Vel Total (ft/s)	4.40	Avg. Vel. (ft/s)		4.40	
Max Chl Dpth (ft)	1.88	Hydr. Depth (ft)		0.99	
Conv. Total (cfs)	6012.0	Conv. (cfs)		6012.0	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		135.98	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)		2.64	
Frctn Loss (ft)	8.92	Cum Volume (acre-ft)	15.84	91.02	2.33
C & E Loss (ft)	0.00	Cum SA (acres)	19.27	101.03	3.58

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.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3467.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3466.73	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3466.67	Flow Area (sq ft)		265.27	9.75
E.G. Slope (ft/ft)	0.011861	Area (sq ft)		265.27	9.75
Q Total (cfs)	1768.00	Flow (cfs)		1743.69	24.31
Top Width (ft)	197.71	Top Width (ft)		170.86	26.86
Vel Total (ft/s)	6.43	Avg. Vel. (ft/s)		6.57	2.49

Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)		1.55	0.36
Conv. Total (cfs)	16234.1	Conv. (cfs)		16010.9	223.2
Length Wtd. (ft)	647.60	Wetted Per. (ft)		170.92	26.87
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		1.15	0.27
Alpha	1.03	Stream Power (lb/ft s)		7.55	0.67
Frctn Loss (ft)	9.41	Cum Volume (acre-ft)	41.49	208.55	10.59
C & E Loss (ft)	0.08	Cum SA (acres)	34.11	128.43	15.25

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

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 10288

INPUT
Description: Sta. 10288
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3464	177	3462	238	3460	298	3458	493	3456
519	3456	662	3457	778	3457.1	857	3458	903	3460
947	3462	989	3464						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	298	.033	857	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
298	857	552	598	633	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3457.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.97	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.97	Flow Area (sq ft)		138.04	
E.G. Slope (ft/ft)	0.020992	Area (sq ft)		138.04	
Q Total (cfs)	592.00	Flow (cfs)		592.00	
Top Width (ft)	258.98	Top Width (ft)		258.98	
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.29	
Max Chl Dpth (ft)	0.97	Hydr. Depth (ft)		0.53	
Conv. Total (cfs)	4086.0	Conv. (cfs)		4086.0	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		258.99	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.70	

Alpha	1.00	Stream Power (lb/ft s)		3.00	
Frctn Loss (ft)	4.79	Cum Volume (acre-ft)	15.84	88.99	2.33
C & E Loss (ft)	0.05	Cum SA (acres)	19.27	98.08	3.58

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 #PF 3

E.G. Elev (ft)	3457.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.		0.033	
W.S. Elev (ft)	3457.50	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3457.50	Flow Area (sq ft)		351.36	
E.G. Slope (ft/ft)	0.018227	Area (sq ft)		351.36	
Q Total (cfs)	1768.00	Flow (cfs)		1768.00	
Top Width (ft)	466.54	Top Width (ft)		466.54	
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)		5.03	
Max Chl Dpth (ft)	1.50	Hydr. Depth (ft)		0.75	
Conv. Total (cfs)	13095.7	Conv. (cfs)		13095.7	
Length Wtd. (ft)	597.95	Wetted Per. (ft)		466.55	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)		4.31	
Frctn Loss (ft)	5.13	Cum Volume (acre-ft)	41.49	203.95	10.54
C & E Loss (ft)	0.03	Cum SA (acres)	34.11	123.69	15.12

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: The energy loss was 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: Ditch A
REACH: 5 RS: 9690

INPUT
Description: Sta. 9690
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	381	.033	799	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
381	799	639	681	658	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3451.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.61	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3451.24	Flow Area (sq ft)		276.77	
E.G. Slope (ft/ft)	0.004736	Area (sq ft)		276.77	
Q Total (cfs)	751.00	Flow (cfs)		751.00	
Top Width (ft)	337.73	Top Width (ft)		337.73	
Vel Total (ft/s)	2.71	Avg. Vel. (ft/s)		2.71	
Max Chl Dpth (ft)	1.61	Hydr. Depth (ft)		0.82	
Conv. Total (cfs)	10912.8	Conv. (cfs)		10912.8	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		337.75	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.24	
Alpha	1.00	Stream Power (lb/ft s)		0.66	
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	15.84	86.15	2.33
C & E Loss (ft)	0.01	Cum SA (acres)	19.27	93.99	3.58

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.

CROSS SECTION OUTPUT Profile #PF 3

			Left OB	Channel	Right OB
E.G. Elev (ft)	3452.69	Element			
Vel Head (ft)	0.29	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3452.40	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3452.03	Flow Area (sq ft)	7.17	591.26	3.92
E.G. Slope (ft/ft)	0.005801	Area (sq ft)	7.17	591.26	3.92
Q Total (cfs)	2568.00	Flow (cfs)	8.41	2554.99	4.60
Top Width (ft)	473.42	Top Width (ft)	35.81	418.00	19.61
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	1.17	4.32	1.17
Max Chl Dpth (ft)	2.40	Hydr. Depth (ft)	0.20	1.41	0.20
Conv. Total (cfs)	33717.4	Conv. (cfs)	110.4	33546.6	60.4
Length Wtd. (ft)	680.91	Wetted Per. (ft)	35.82	418.02	19.61
Min Ch El (ft)	3450.00	Shear (lb/sq ft)	0.07	0.51	0.07
Alpha	1.02	Stream Power (lb/ft s)	0.08	2.21	0.08
Frctn Loss (ft)	4.80	Cum Volume (acre-ft)	41.44	197.48	10.51
C & E Loss (ft)	0.00	Cum SA (acres)	33.89	117.61	14.97

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: Ditch A
REACH: 5 RS: 9009

INPUT
Description: Sta. 9009
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
325	892	898	879	794	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	3446.81	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.57	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.45	Flow Area (sq ft)		189.12	
E.G. Slope (ft/ft)	0.012198	Area (sq ft)		189.12	
Q Total (cfs)	751.00	Flow (cfs)		751.00	
Top Width (ft)	265.03	Top Width (ft)		265.03	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)		3.97	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.71	
Conv. Total (cfs)	6799.8	Conv. (cfs)		6799.8	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		265.05	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)		2.16	
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	15.84	82.50	2.33
C & E Loss (ft)	0.05	Cum SA (acres)	19.27	89.28	3.58

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.

CROSS SECTION OUTPUT Profile #PF 3

			Left OB	Channel	Right OB
E.G. Elev (ft)	3447.89	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3447.55	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)		Flow Area (sq ft)		550.62	
E.G. Slope (ft/ft)	0.008737	Area (sq ft)		550.62	
Q Total (cfs)	2568.00	Flow (cfs)		2568.00	
Top Width (ft)	472.01	Top Width (ft)		472.01	
Vel Total (ft/s)	4.66	Avg. Vel. (ft/s)		4.66	

Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)		1.17	
Conv. Total (cfs)	27473.7	Conv. (cfs)		27473.7	
Length Wtd. (ft)	878.85	Wetted Per. (ft)		472.04	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.64	
Alpha	1.00	Stream Power (lb/ft s)		2.97	
Frctn Loss (ft)	5.11	Cum Volume (acre-ft)	41.39	188.56	10.48
C & E Loss (ft)	0.03	Cum SA (acres)	33.62	110.66	14.83

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: Ditch A
REACH: 5 RS: 8130

INPUT
Description: Sta. 8130
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
419	852	399	413	456	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3441.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.70	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.21	Flow Area (sq ft)		320.72	
E.G. Slope (ft/ft)	0.003259	Area (sq ft)		320.72	
Q Total (cfs)	751.00	Flow (cfs)		751.00	
Top Width (ft)	368.87	Top Width (ft)		368.87	
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)		2.34	
Max Chl Dpth (ft)	1.70	Hydr. Depth (ft)		0.87	
Conv. Total (cfs)	13155.2	Conv. (cfs)		13155.2	
Length Wtd. (ft)	413.00	Wetted Per. (ft)		368.89	

Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.41	
Frctn Loss (ft)	2.71	Cum Volume (acre-ft)	15.84	77.36	2.33
C & E Loss (ft)	0.02	Cum SA (acres)	19.27	82.88	3.58

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.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3442.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3442.51	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3441.99	Flow Area (sq ft)	7.49	661.99	9.23
E.G. Slope (ft/ft)	0.004151	Area (sq ft)	7.49	661.99	9.23
Q Total (cfs)	2568.00	Flow (cfs)	8.71	2548.55	10.74
Top Width (ft)	498.79	Top Width (ft)	29.47	433.00	36.33
Vel Total (ft/s)	3.78	Avg. Vel. (ft/s)	1.16	3.85	1.16
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)	0.25	1.53	0.25
Conv. Total (cfs)	39859.2	Conv. (cfs)	135.2	39557.4	166.7
Length Wtd. (ft)	413.07	Wetted Per. (ft)	29.47	433.02	36.33
Min Ch El (ft)	3440.00	Shear (lb/sq ft)	0.07	0.40	0.07
Alpha	1.03	Stream Power (lb/ft s)	0.08	1.53	0.08
Frctn Loss (ft)	2.69	Cum Volume (acre-ft)	41.31	176.32	10.39
C & E Loss (ft)	0.02	Cum SA (acres)	33.32	101.53	14.49

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 RIVER: Ditch A
REACH: 5 RS: 7717

INPUT
Description: Sta 7717

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	233	.033	747	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
233	747	444	464	510	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3439.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.75	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.75	Flow Area (sq ft)		171.46	
E.G. Slope (ft/ft)	0.019448	Area (sq ft)		171.46	
Q Total (cfs)	751.00	Flow (cfs)		751.00	
Top Width (ft)	294.31	Top Width (ft)		294.31	
Vel Total (ft/s)	4.38	Avg. Vel. (ft/s)		4.38	
Max Chl Dpth (ft)	0.95	Hydr. Depth (ft)		0.58	
Conv. Total (cfs)	5385.3	Conv. (cfs)		5385.3	
Length Wtd. (ft)	464.06	Wetted Per. (ft)		294.32	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.10	
Frctn Loss (ft)	1.78	Cum Volume (acre-ft)	15.84	75.03	2.33
C & E Loss (ft)	0.07	Cum SA (acres)	19.27	79.74	3.58

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 dep

th.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3440.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.033	
W.S. Elev (ft)	3439.61	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3439.49	Flow Area (sq ft)		494.88	
E.G. Slope (ft/ft)	0.011696	Area (sq ft)		494.88	
Q Total (cfs)	2568.00	Flow (cfs)		2568.00	
Top Width (ft)	449.87	Top Width (ft)		449.87	
Vel Total (ft/s)	5.19	Avg. Vel. (ft/s)		5.19	
Max Chl Dpth (ft)	1.81	Hydr. Depth (ft)		1.10	
Conv. Total (cfs)	23745.5	Conv. (cfs)		23745.5	
Length Wtd. (ft)	464.56	Wetted Per. (ft)		449.89	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.80	
Alpha	1.00	Stream Power (lb/ft s)		4.17	
Frctn Loss (ft)	1.99	Cum Volume (acre-ft)	41.28	170.84	10.35
C & E Loss (ft)	0.05	Cum SA (acres)	33.18	97.34	14.30

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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 7253

INPUT
Description: Sta. 7253
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3438	109	3438.7	321	3438	424	3436	668	3435
906	3436	1005	3438	1200	3440	1365	3442		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	424	.033	906	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
424	906	756	910	980	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3436.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.46	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.95	Flow Area (sq ft)	5.52	464.23	5.31
E.G. Slope (ft/ft)	0.001736	Area (sq ft)	5.52	464.23	5.31
Q Total (cfs)	857.00	Flow (cfs)	3.91	849.34	3.75
Top Width (ft)	528.78	Top Width (ft)	23.85	482.00	22.93
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	0.71	1.83	0.71
Max Chl Dpth (ft)	1.46	Hydr. Depth (ft)	0.23	0.96	0.23
Conv. Total (cfs)	20570.2	Conv. (cfs)	93.8	20386.3	90.1
Length Wtd. (ft)	909.87	Wetted Per. (ft)	23.86	482.00	22.93
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.03	0.10	0.03
Alpha	1.02	Stream Power (lb/ft s)	0.02	0.19	0.02
Frctn Loss (ft)	5.34	Cum Volume (acre-ft)	15.81	71.64	2.30
C & E Loss (ft)	0.03	Cum SA (acres)	19.14	75.60	3.45

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 #PF 3

E.G. Elev (ft)	3437.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3437.73	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3436.95	Flow Area (sq ft)	76.87	1073.79	73.88
E.G. Slope (ft/ft)	0.002925	Area (sq ft)	76.87	1073.79	73.88
Q Total (cfs)	4793.00	Flow (cfs)	169.77	4460.06	163.17
Top Width (ft)	656.51	Top Width (ft)	88.98	482.00	85.53
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	2.21	4.15	2.21
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	0.86	2.23	0.86
Conv. Total (cfs)	88629.9	Conv. (cfs)	3139.2	82473.4	3017.3
Length Wtd. (ft)	908.88	Wetted Per. (ft)	89.00	482.00	85.54

Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.16	0.41	0.16
Alpha	1.07	Stream Power (lb/ft s)	0.35	1.69	0.35
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	40.89	162.49	9.91
C & E Loss (ft)	0.04	Cum SA (acres)	32.73	92.38	13.80

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: Ditch A
REACH: 5 RS: 6343

INPUT
Description: Sta. 6343
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
663	1320	767	980	1051	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3431.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.80	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.80	Flow Area (sq ft)		358.99	
E.G. Slope (ft/ft)	0.018115	Area (sq ft)		358.99	
Q Total (cfs)	1668.00	Flow (cfs)		1668.00	
Top Width (ft)	534.73	Top Width (ft)		534.73	
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)		4.65	
Max Chl Dpth (ft)	0.80	Hydr. Depth (ft)		0.67	
Conv. Total (cfs)	12393.0	Conv. (cfs)		12393.0	
Length Wtd. (ft)	979.86	Wetted Per. (ft)		534.75	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		3.53	
Frctn Loss (ft)	4.03	Cum Volume (acre-ft)	15.76	63.04	2.24

C & E Loss (ft)	0.08	Cum SA (acres)	18.94	64.98	3.19

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 #PF 3

E.G. Elev (ft)	3432.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.033	0.033
W.S. Elev (ft)	3431.79	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3431.79	Flow Area (sq ft)		952.76	21.33
E.G. Slope (ft/ft)	0.013082	Area (sq ft)		952.76	21.33
Q Total (cfs)	6409.00	Flow (cfs)		6378.38	30.62
Top Width (ft)	787.68	Top Width (ft)		642.82	144.86
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		6.69	1.44
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)		1.48	0.15
Conv. Total (cfs)	56035.0	Conv. (cfs)		55767.2	267.7
Length Wtd. (ft)	979.09	Wetted Per. (ft)		642.85	144.86
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		1.21	0.12
Alpha	1.03	Stream Power (lb/ft s)		8.10	0.17
Frctn Loss (ft)	4.13	Cum Volume (acre-ft)	40.22	141.32	8.84
C & E Loss (ft)	0.16	Cum SA (acres)	31.96	80.63	11.21

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was 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: Ditch A
REACH: 5 RS: 5363

INPUT
Description: Sta. 5363
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
742	1476	1199	1142	713	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3426.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.46	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.87	Flow Area (sq ft)	10.21	811.51	21.32
E.G. Slope (ft/ft)	0.001774	Area (sq ft)	10.21	811.51	21.32
Q Total (cfs)	1668.00	Flow (cfs)	7.28	1645.51	15.21
Top Width (ft)	870.74	Top Width (ft)	44.27	734.00	92.47
Vel Total (ft/s)	1.98	Avg. Vel. (ft/s)	0.71	2.03	0.71
Max Chl Dpth (ft)	1.46	Hydr. Depth (ft)	0.23	1.11	0.23
Conv. Total (cfs)	39603.2	Conv. (cfs)	172.9	39069.3	361.0
Length Wtd. (ft)	1140.32	Wetted Per. (ft)	44.28	734.00	92.47
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.03	0.12	0.03
Alpha	1.04	Stream Power (lb/ft s)	0.02	0.25	0.02
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	15.67	49.88	1.98
C & E Loss (ft)	0.03	Cum SA (acres)	18.55	50.71	2.07

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.

CROSS SECTION OUTPUT Profile #PF 3

			Left OB	Channel	Right OB
E.G. Elev (ft)	3427.77	Element			
Vel Head (ft)	0.17	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3427.60	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3426.70	Flow Area (sq ft)	122.30	1644.60	255.42
E.G. Slope (ft/ft)	0.002053	Area (sq ft)	122.30	1644.60	255.42
Q Total (cfs)	6409.00	Flow (cfs)	214.69	5745.90	448.41
Top Width (ft)	1207.27	Top Width (ft)	153.23	734.00	320.04
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)	1.76	3.49	1.76
Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)	0.80	2.24	0.80
Conv. Total (cfs)	141432.8	Conv. (cfs)	4737.8	126799.6	9895.4
Length Wtd. (ft)	1130.35	Wetted Per. (ft)	153.24	734.00	320.04
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.10	0.29	0.10
Alpha	1.12	Stream Power (lb/ft s)	0.18	1.00	0.18
Frctn Loss (ft)	5.03	Cum Volume (acre-ft)	39.14	112.10	5.50
C & E Loss (ft)	0.04	Cum SA (acres)	30.61	65.14	5.60

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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 4221

INPUT
Description: Sta. 4221
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421	640	3420	669	3420
753	3420.2	829	3420	837	3420	1030	3421	1320	3422
1407	3423	1497	3424						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

100	.033	544	.033	1407	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
544	1407	749	732	843	.1

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3421.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3421.13	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3421.13	Flow Area (sq ft)	1.76	391.97	
E.G. Slope (ft/ft)	0.017296	Area (sq ft)	1.76	391.97	
Q Total (cfs)	1914.00	Flow (cfs)	1.70	1912.30	
Top Width (ft)	550.87	Top Width (ft)	26.71	524.16	
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	0.97	4.88	
Max Chl Dpth (ft)	1.13	Hydr. Depth (ft)	0.07	0.75	
Conv. Total (cfs)	14553.6	Conv. (cfs)	12.9	14540.7	
Length Wtd. (ft)	736.89	Wetted Per. (ft)	26.71	524.17	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.07	0.81	
Alpha	1.01	Stream Power (lb/ft s)	0.07	3.94	
Frctn Loss (ft)	3.61	Cum Volume (acre-ft)	15.51	34.10	1.81
C & E Loss (ft)	0.09	Cum SA (acres)	17.57	34.22	1.32

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 #PF 3

E.G. Elev (ft)	3422.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.033	0.033	

W.S. Elev (ft)	3422.09	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3422.09	Flow Area (sq ft)	121.48	1029.25	
E.G. Slope (ft/ft)	0.013866	Area (sq ft)	121.48	1029.25	
Q Total (cfs)	6969.00	Flow (cfs)	426.48	6542.52	
Top Width (ft)	1009.59	Top Width (ft)	225.48	784.11	
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	3.51	6.36	
Max Chl Dpth (ft)	2.09	Hydr. Depth (ft)	0.54	1.31	
Conv. Total (cfs)	59181.7	Conv. (cfs)	3621.8	55559.9	
Length Wtd. (ft)	737.78	Wetted Per. (ft)	225.48	784.12	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)	0.47	1.14	
Alpha	1.05	Stream Power (lb/ft s)	1.64	7.22	
Frctn Loss (ft)	3.71	Cum Volume (acre-ft)	35.79	77.05	3.41
C & E Loss (ft)	0.12	Cum SA (acres)	25.40	45.24	2.98

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: Ditch A
REACH: 5 RS: 3489

INPUT
Description: Sta. 3489
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-286	3420	-138	3418.5	-126	3418	-104	3416	-91	3415.5
-76	3416	-21	3417	100	3417	258	3416.5	299	3416
309	3415	318	3416	405	3416	422	3416	539	3416.4
581	3416.2	642	3416.4	744	3416	830	3416	918	3418
1068	3420	1159	3421						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-286	.033	539	.033	918	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
539	918	464	500	457	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3417.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3417.31	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.78	Flow Area (sq ft)	566.22	366.93	
E.G. Slope (ft/ft)	0.002270	Area (sq ft)	566.22	366.93	
Q Total (cfs)	1914.00	Flow (cfs)	1099.41	814.59	
Top Width (ft)	1005.93	Top Width (ft)	657.39	348.55	
Vel Total (ft/s)	2.05	Avg. Vel. (ft/s)	1.94	2.22	
Max Chl Dpth (ft)	2.31	Hydr. Depth (ft)	0.86	1.05	
Conv. Total (cfs)	40173.3	Conv. (cfs)	23075.7	17097.6	
Length Wtd. (ft)	481.59	Wetted Per. (ft)	657.58	348.56	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.12	0.15	
Alpha	1.01	Stream Power (lb/ft s)	0.24	0.33	
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	10.62	27.72	1.81
C & E Loss (ft)	0.03	Cum SA (acres)	11.69	26.89	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.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3418.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3418.33	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3417.53	Flow Area (sq ft)	1246.14	744.64	4.14
E.G. Slope (ft/ft)	0.002578	Area (sq ft)	1246.14	744.64	4.14
Q Total (cfs)	6969.00	Flow (cfs)	4295.42	2670.72	2.86
Top Width (ft)	1076.90	Top Width (ft)	672.97	379.00	24.92
Vel Total (ft/s)	3.49	Avg. Vel. (ft/s)	3.45	3.59	0.69
Max Chl Dpth (ft)	3.33	Hydr. Depth (ft)	1.85	1.96	0.17

Conv. Total (cfs)	137244.0	Conv. (cfs)	84591.8	52595.9	56.3
Length Wtd. (ft)	481.04	Wetted Per. (ft)	673.21	379.02	24.92
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.30	0.32	0.03
Alpha	1.00	Stream Power (lb/ft s)	1.03	1.13	0.02
Frctn Loss (ft)	2.35	Cum Volume (acre-ft)	24.03	62.15	3.37
C & E Loss (ft)	0.04	Cum SA (acres)	17.67	35.47	2.74

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: Ditch A
REACH: 5 RS: 2989

INPUT
Description: Sta. 2989
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-31	3416	59	3414.8	170	3414.8	196	3414	436	3413.8
613	3414	651	3414	700	3414	747	3414	761	3414
841	3415.01	920	3416	976	3418	1067	3420		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-31	.033	436	.033	841	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
436	841	317	215	172	.3	.5

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3414.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.63	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.63	Flow Area (sq ft)	180.41	236.38	
E.G. Slope (ft/ft)	0.018186	Area (sq ft)	180.41	236.38	
Q Total (cfs)	1914.00	Flow (cfs)	857.86	1056.14	
Top Width (ft)	634.84	Top Width (ft)	260.32	374.52	
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)	4.76	4.47	
Max Chl Dpth (ft)	0.83	Hydr. Depth (ft)	0.69	0.63	
Conv. Total (cfs)	14192.9	Conv. (cfs)	6361.3	7831.6	
Length Wtd. (ft)	254.28	Wetted Per. (ft)	260.33	374.53	

Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.79	0.72	
Alpha	1.00	Stream Power (lb/ft s)	3.74	3.20	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	6.65	24.26	1.81
C & E Loss (ft)	0.14	Cum SA (acres)	6.80	22.74	1.32

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

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

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3416.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.54	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3415.49	Flow Area (sq ft)	524.33	599.53	11.05
E.G. Slope (ft/ft)	0.012585	Area (sq ft)	524.33	599.53	11.05
Q Total (cfs)	6969.00	Flow (cfs)	3012.55	3933.52	22.93
Top Width (ft)	879.23	Top Width (ft)	432.23	405.00	42.00
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	5.75	6.56	2.07
Max Chl Dpth (ft)	1.74	Hydr. Depth (ft)	1.21	1.48	0.26
Conv. Total (cfs)	62122.0	Conv. (cfs)	26854.0	35063.5	204.4
Length Wtd. (ft)	262.29	Wetted Per. (ft)	432.24	405.01	42.01
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.95	1.16	0.21
Alpha	1.02	Stream Power (lb/ft s)	5.48	7.63	0.43
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	14.60	54.43	3.29
C & E Loss (ft)	0.21	Cum SA (acres)	11.79	30.97	2.39

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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 2774

INPUT
Description: Sta. 2774 Upstream of culverts
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
437	511	40	40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3414.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3414.10	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	855.61	351.50	241.39
E.G. Slope (ft/ft)	0.000369	Area (sq ft)	855.61	351.50	241.39
Q Total (cfs)	1914.00	Flow (cfs)	746.27	859.03	308.70
Top Width (ft)	1053.50	Top Width (ft)	845.24	74.00	134.26
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)	0.87	2.44	1.28
Max Chl Dpth (ft)	5.10	Hydr. Depth (ft)	1.01	4.75	1.80
Conv. Total (cfs)	99610.7	Conv. (cfs)	38838.2	44706.6	16065.9
Length Wtd. (ft)	40.00	Wetted Per. (ft)	845.32	74.04	134.32
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.02	0.11	0.04
Alpha	1.86	Stream Power (lb/ft s)	0.02	0.27	0.05
Frctn Loss (ft)		Cum Volume (acre-ft)	2.88	22.81	1.33
C & E Loss (ft)		Cum SA (acres)	2.78	21.63	1.05

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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3415.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3415.01	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3413.39	Flow Area (sq ft)	1636.03	418.67	380.56
E.G. Slope (ft/ft)	0.001205	Area (sq ft)	1636.03	418.67	380.56
Q Total (cfs)	6969.00	Flow (cfs)	3883.58	2077.16	1008.27
Top Width (ft)	1120.52	Top Width (ft)	874.14	74.00	172.38
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	2.37	4.96	2.65
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)	1.87	5.66	2.21
Conv. Total (cfs)	200748.6	Conv. (cfs)	111870.0	59834.5	29044.1
Length Wtd. (ft)	40.00	Wetted Per. (ft)	874.24	74.04	172.46
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.14	0.43	0.17
Alpha	1.40	Stream Power (lb/ft s)	0.33	2.11	0.44
Frctn Loss (ft)		Cum Volume (acre-ft)	6.74	51.92	2.52
C & E Loss (ft)		Cum SA (acres)	7.03	29.79	1.97

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.

CULVERT RIVER: Ditch A
REACH: 5 RS: 2773

INPUT
Description:
Distance from Upstream XS = 8
Deck/Roadway Width = 24
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-453	3416	-437	3415	-405	3414	-289	3413.8	-13	3413.8
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-453	.033	437	.033	511	.033

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
           437     511          .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
-888       F
888       F

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
      26  3413.8              100  3413.8              402  3412.7
     500  3412.8              600  3413.9              700  3415.7

Downstream Bridge Cross Section Data
Station Elevation Data    num=      17
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -1721     3416    -1410     3414       26   3413.8      100   3412.4      155     3412
     299   3411.4      349     3410      387   3408.9    391.4   3408.9    395.8   3408.9
   400.2   3408.9    404.6   3408.9      409   3408.9      434     3410      487     3412
     568     3414      658     3416

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -1721    .033      349    .033      434    .033

Bank Sta: Left   Right    Coeff Contr.   Expan.
           349     434          .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
-888       F
888       F

Upstream Embankment side slope                 =       3 horiz. to 1.0 vertical
Downstream Embankment side slope               =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =  3412.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Culvert #1      Pipe Arch   1.833    2.43
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length     n Value   Entrance Loss Coef   Exit Loss Coef
                  1      39        .024                   .5                1
Number of Barrels =  6
Upstream   Elevation =  3409
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
     469   473.4   477.8   482.2   486.6     491
Downstream Elevation =  3408.9
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
     387   391.4   395.8   400.2   404.6     409

CULVERT OUTPUT    Profile #PF 2
Culvert ID : Culvert #1

  Culv Q (cfs)              149.03    Culv Ful Lngh (ft)         39.00
  # Barrels                      6    Culv Vel US (ft/s)          5.64
```

Q Barrel (cfs)	24.84	Culv Vel DS (ft/s)	5.64
E.G. US. (ft)	3414.15	Culv Inv El Up (ft)	3409.00
W.S. US. (ft)	3414.10	Culv Inv El Dn (ft)	3408.90
E.G. DS (ft)	3412.89	Culv Frctn Ls (ft)	0.70
W.S. DS (ft)	3412.71	Culv Ext Lss (ft)	0.31
Delta EG (ft)	1.26	Culv Ent Lss (ft)	0.25
Delta WS (ft)	1.39	Q Weir (cfs)	1760.21
E.G. IC (ft)	3414.12	Weir Sta Lft (ft)	-409.87
E.G. OC (ft)	3414.15	Weir Sta Rgt (ft)	614.01
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	3410.83	Weir Max Depth (ft)	1.45
Culv WS Outlet (ft)	3410.73	Weir Avg Depth (ft)	0.63
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	647.47
Culv Crt Depth (ft)	1.64	Min El Weir Flow (ft)	3412.71

CULVERT OUTPUT Profile #PF 3
Culvert ID : Culvert #1

Culv Q (cfs)	132.39	Culv Ful Lngh (ft)	39.00
# Barrels	6	Culv Vel US (ft/s)	5.01
Q Barrel (cfs)	22.07	Culv Vel DS (ft/s)	5.01
E.G. US. (ft)	3415.19	Culv Inv El Up (ft)	3409.00
W.S. US. (ft)	3415.01	Culv Inv El Dn (ft)	3408.90
E.G. DS (ft)	3414.44	Culv Frctn Ls (ft)	0.55
W.S. DS (ft)	3413.55	Culv Ext Lss (ft)	
Delta EG (ft)	0.75	Culv Ent Lss (ft)	0.20
Delta WS (ft)	1.46	Q Weir (cfs)	6846.27
E.G. IC (ft)	3415.16	Weir Sta Lft (ft)	-440.00
E.G. OC (ft)	3415.19	Weir Sta Rgt (ft)	671.53
Culvert Control	Outlet	Weir Submerg	0.13
Culv WS Inlet (ft)	3410.83	Weir Max Depth (ft)	2.49
Culv WS Outlet (ft)	3410.73	Weir Avg Depth (ft)	1.58
Culv Nml Depth (ft)		Wr Flw Area (sq ft)	1754.25
Culv Crt Depth (ft)	1.21	Min El Weir Flow (ft)	3412.71

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 2734

INPUT
Description: Sta. 2734 Downstream of culverts
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-1721	3416	-1410	3414	26	3413.8	100	3412.4	155	3412
299	3411.4	349	3410	387	3408.9	391.4	3408.9	395.8	3408.9
400.2	3408.9	404.6	3408.9	409	3408.9	434	3410	487	3412
568	3414	658	3416						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-1721	.033	349	.033	434	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
349	434	745	846	1015	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-888	F		
888	F		

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3412.89	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.71	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.71	Flow Area (sq ft)	275.89	288.99	100.64
E.G. Slope (ft/ft)	0.001632	Area (sq ft)	275.89	288.99	100.64
Q Total (cfs)	1914.00	Flow (cfs)	515.20	1188.42	210.38
Top Width (ft)	431.91	Top Width (ft)	265.26	85.00	81.65
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)	1.87	4.11	2.09
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	1.04	3.40	1.23
Conv. Total (cfs)	47371.8	Conv. (cfs)	12751.3	29413.6	5206.9
Length Wtd. (ft)	841.73	Wetted Per. (ft)	265.28	85.04	81.70
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.11	0.35	0.13
Alpha	1.44	Stream Power (lb/ft s)	0.20	1.42	0.26
Frctn Loss (ft)	1.75	Cum Volume (acre-ft)	2.36	22.52	1.17
C & E Loss (ft)	0.05	Cum SA (acres)	2.27	21.56	0.95

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.
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 OUTPUT Profile #PF 3

E.G. Elev (ft)	3414.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.55	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3413.55	Flow Area (sq ft)	518.43	360.69	183.92
E.G. Slope (ft/ft)	0.006458	Area (sq ft)	518.43	360.69	183.92
Q Total (cfs)	6969.00	Flow (cfs)	2643.72	3419.75	905.53
Top Width (ft)	510.66	Top Width (ft)	309.84	85.00	115.82

Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)	5.10	9.48	4.92
Max Chl Dpth (ft)	4.65	Hydr. Depth (ft)	1.67	4.24	1.59
Conv. Total (cfs)	86723.5	Conv. (cfs)	32899.0	42556.0	11268.6
Length Wtd. (ft)		Wetted Per. (ft)	309.87	85.04	115.87
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.67	1.71	0.64
Alpha	1.33	Stream Power (lb/ft s)	3.44	16.21	3.15
Frctn Loss (ft)		Cum Volume (acre-ft)	5.75	51.56	2.26
C & E Loss (ft)		Cum SA (acres)	6.49	29.71	1.84

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 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: Ditch A
REACH: 5 RS: 1888

INPUT
Description: Sta. 1888
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-775	3412	-41	3410	81	3410	100	3410.2	110	3410
331	3408	532	3408	690	3408	1180	3410	1268	3412

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-775	.033	100	.033	1180	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	1180	305	980	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

E.G. Elev (ft)	3409.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	3409.38	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.84	Flow Area (sq ft)		834.45	
E.G. Slope (ft/ft)	0.002740	Area (sq ft)		834.45	
Q Total (cfs)	1943.00	Flow (cfs)		1943.00	

Top Width (ft)	849.81	Top Width (ft)	849.81
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)	2.33
Max Chl Dpth (ft)	1.38	Hydr. Depth (ft)	0.98
Conv. Total (cfs)	37119.1	Conv. (cfs)	37119.1
Length Wtd. (ft)	828.00	Wetted Per. (ft)	849.82
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.17
Alpha	1.00	Stream Power (lb/ft s)	0.39
Frctn Loss (ft)	4.73	Cum Volume (acre-ft)	11.61
C & E Loss (ft)	0.03	Cum SA (acres)	12.48

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: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3410.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3410.48	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3409.72	Flow Area (sq ft)	109.37	1950.86	5.16
E.G. Slope (ft/ft)	0.002812	Area (sq ft)	109.37	1950.86	5.16
Q Total (cfs)	7042.00	Flow (cfs)	128.02	6909.20	4.78
Top Width (ft)	1419.98	Top Width (ft)	318.68	1080.00	21.30
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)	1.17	3.54	0.93
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)	0.34	1.81	0.24
Conv. Total (cfs)	132792.6	Conv. (cfs)	2414.1	130288.3	90.2
Length Wtd. (ft)	823.37	Wetted Per. (ft)	318.68	1080.02	21.31
Min Ch El (ft)	3408.00	Shear (lb/sq ft)	0.06	0.32	0.04
Alpha	1.06	Stream Power (lb/ft s)	0.07	1.12	0.04
Frctn Loss (ft)	4.55	Cum Volume (acre-ft)	0.38	29.11	0.06
C & E Loss (ft)	0.05	Cum SA (acres)	1.12	18.40	0.24

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.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 1060

INPUT
Description: Sta. 1060
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405
1523	3406								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1523	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
394	1523	60	60	60	.1	.3

CROSS SECTION OUTPUT Profile #PF 2

			Left OB	Channel	Right OB
E.G. Elev (ft)	3404.70	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.033	
W.S. Elev (ft)	3404.27	Reach Len. (ft)			
Crit W.S. (ft)	3404.27	Flow Area (sq ft)		386.84	
E.G. Slope (ft/ft)	0.017302	Area (sq ft)		386.84	
Q Total (cfs)	2032.00	Flow (cfs)		2032.00	
Top Width (ft)	463.15	Top Width (ft)		463.15	
Vel Total (ft/s)	5.25	Avg. Vel. (ft/s)		5.25	
Max Chl Dpth (ft)	1.57	Hydr. Depth (ft)		0.84	
Conv. Total (cfs)	15448.2	Conv. (cfs)		15448.2	
Length Wtd. (ft)		Wetted Per. (ft)		463.16	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		4.74	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION OUTPUT Profile #PF 3

E.G. Elev (ft)	3406.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.033	
W.S. Elev (ft)	3405.41	Reach Len. (ft)			
Crit W.S. (ft)	3405.41	Flow Area (sq ft)		1112.35	
E.G. Slope (ft/ft)	0.014850	Area (sq ft)		1112.35	
Q Total (cfs)	7268.00	Flow (cfs)		7268.00	
Top Width (ft)	856.01	Top Width (ft)		856.01	
Vel Total (ft/s)	6.53	Avg. Vel. (ft/s)		6.53	
Max Chl Dpth (ft)	2.71	Hydr. Depth (ft)		1.30	
Conv. Total (cfs)	59642.9	Conv. (cfs)		59642.9	
Length Wtd. (ft)		Wetted Per. (ft)		856.03	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		1.20	
Alpha	1.00	Stream Power (lb/ft s)		7.87	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	
5	2734	.3	.5
5	1888	.1	.3
5	1060	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl

5		12674	592.00	3477.00	3478.45	3478.05	3478.54	0.00
3041	2.40	255.24	314.65	0.43				
5		12674	1768.00	3477.00	3479.22	3478.65	3479.41	0.00
3111	3.61	539.30	417.81	0.48				
5		11337	592.00	3469.00	3470.47	3470.44	3470.89	0.01
4287	5.25	115.46	134.51	0.94				
5		11337	1768.00	3469.00	3471.40	3471.40	3472.19	0.01
1380	7.37	259.90	173.86	0.94				
5		10937	592.00	3464.00	3465.88	3465.69	3466.18	0.00
9696	4.40	134.50	135.92	0.78				
5		10937	1768.00	3464.00	3466.73	3466.67	3467.39	0.01
1861	6.57	275.01	197.71	0.93				
5		10288	592.00	3456.00	3456.97	3456.97	3457.25	0.02
0992	4.29	138.04	258.98	1.04				
5		10288	1768.00	3456.00	3457.50	3457.50	3457.89	0.01
8227	5.03	351.36	466.54	1.02				
5		9690	751.00	3450.00	3451.61	3451.24	3451.73	0.00
4736	2.71	276.77	337.73	0.53				
5		9690	2568.00	3450.00	3452.40	3452.03	3452.69	0.00
5801	4.32	602.35	473.42	0.64				
5		9009	751.00	3445.00	3446.57	3446.45	3446.81	0.01
2198	3.97	189.12	265.03	0.83				
5		9009	2568.00	3445.00	3447.55		3447.89	0.00
8737	4.66	550.62	472.01	0.76				
5		8130	751.00	3440.00	3441.70	3441.21	3441.78	0.00
3259	2.34	320.72	368.87	0.44				
5		8130	2568.00	3440.00	3442.51	3441.99	3442.74	0.00
4151	3.85	678.70	498.79	0.55				
5		7717	751.00	3437.80	3438.75	3438.75	3439.05	0.01
9448	4.38	171.46	294.31	1.01				
5		7717	2568.00	3437.80	3439.61	3439.49	3440.03	0.01
1696	5.19	494.88	449.87	0.87				
5		7253	857.00	3435.00	3436.46	3435.95	3436.52	0.00
1736	1.83	475.06	528.78	0.33				
5		7253	4793.00	3435.00	3437.73	3436.95	3437.98	0.00
2925	4.15	1224.55	656.51	0.49				
5		6343	1668.00	3430.00	3430.80	3430.80	3431.14	0.01
8115	4.65	358.99	534.73	1.00				
5		6343	6409.00	3430.00	3431.79	3431.79	3432.49	0.01
3082	6.69	974.08	787.68	0.97				
5		5363	1668.00	3425.00	3426.46	3425.87	3426.52	0.00
1774	2.03	843.04	870.74	0.34				
5		5363	6409.00	3425.00	3427.60	3426.70	3427.77	0.00
2053	3.49	2022.32	1207.27	0.41				

5		4221	1914.00	3420.00	3421.13	3421.13	3421.50	0.01
7296	4.88	393.73	550.87	0.99				
5		4221	6969.00	3420.00	3422.09	3422.09	3422.69	0.01
3866	6.36	1150.73	1009.59	0.98				
5		3489	1914.00	3416.00	3417.31	3416.78	3417.37	0.00
2270	2.22	933.15	1005.93	0.38				
5		3489	6969.00	3416.00	3418.33	3417.53	3418.52	0.00
2578	3.59	1994.93	1076.90	0.45				
5		2989	1914.00	3413.80	3414.63	3414.63	3414.95	0.01
8186	4.47	416.79	634.84	0.99				
5		2989	6969.00	3413.80	3415.54	3415.49	3416.14	0.01
2585	6.56	1134.92	879.23	0.95				
5		2774	1914.00	3409.00	3414.10	3412.71	3414.15	0.00
0369	2.44	1448.49	1053.50	0.20				
5		2774	6969.00	3409.00	3415.01	3413.39	3415.19	0.00
1205	4.96	2435.25	1120.52	0.37				
5		2773	Culvert					
5		2734	1914.00	3408.90	3412.71	3412.71	3412.89	0.00
1632	4.11	665.51	431.91	0.39				
5		2734	6969.00	3408.90	3413.55	3413.55	3414.44	0.00
6458	9.48	1063.05	510.66	0.81				
5		1888	1943.00	3408.00	3409.38	3408.84	3409.47	0.00
2740	2.33	834.45	849.81	0.41				
5		1888	7042.00	3408.00	3410.48	3409.72	3410.68	0.00
2812	3.54	2065.39	1419.98	0.46				
5		1060	2032.00	3402.70	3404.27	3404.27	3404.70	0.01
7302	5.25	386.84	463.15	1.01				
5		1060	7268.00	3402.70	3405.41	3405.41	3406.07	0.01
4850	6.53	1112.35	856.01	1.01				

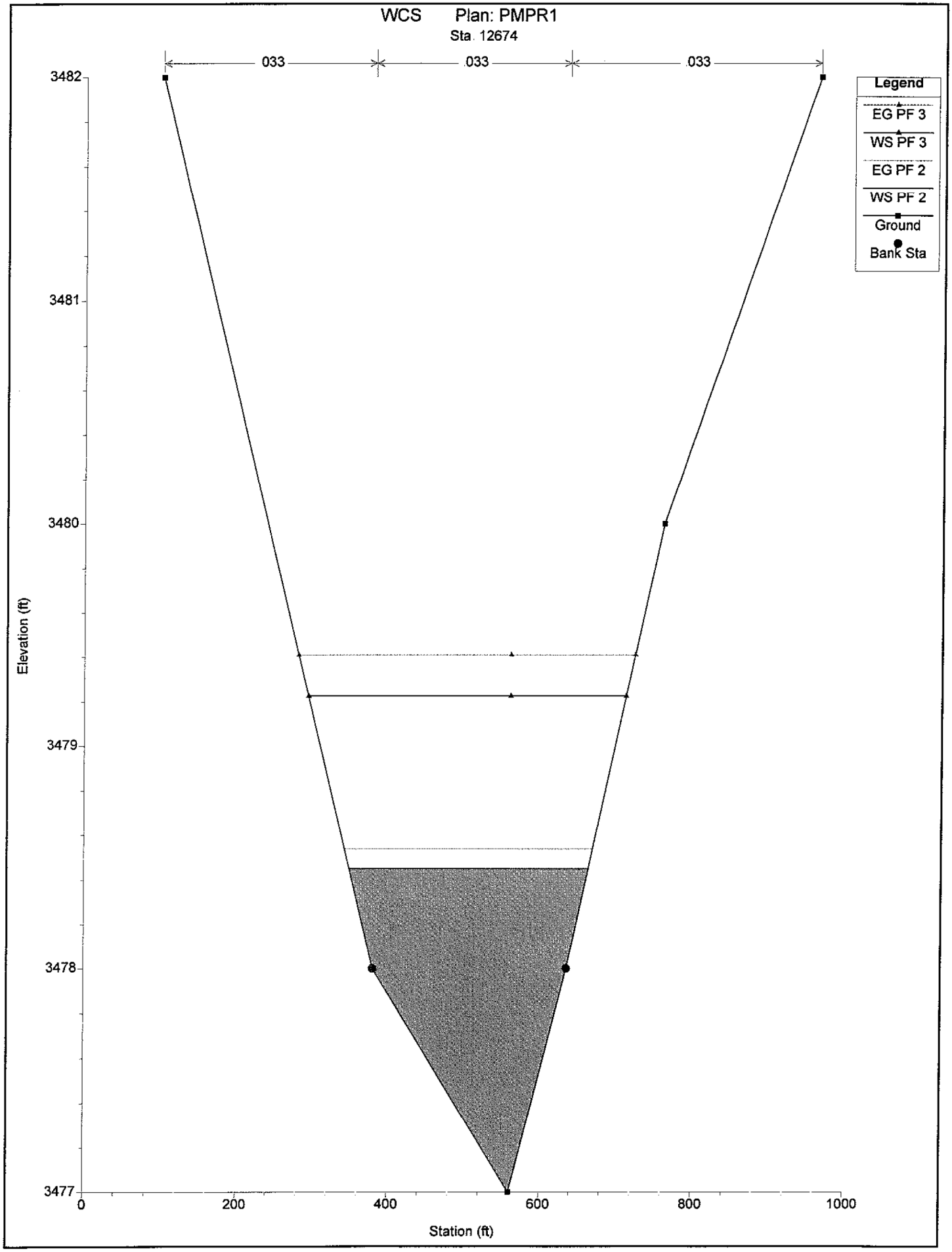
Profile Output Table - Report

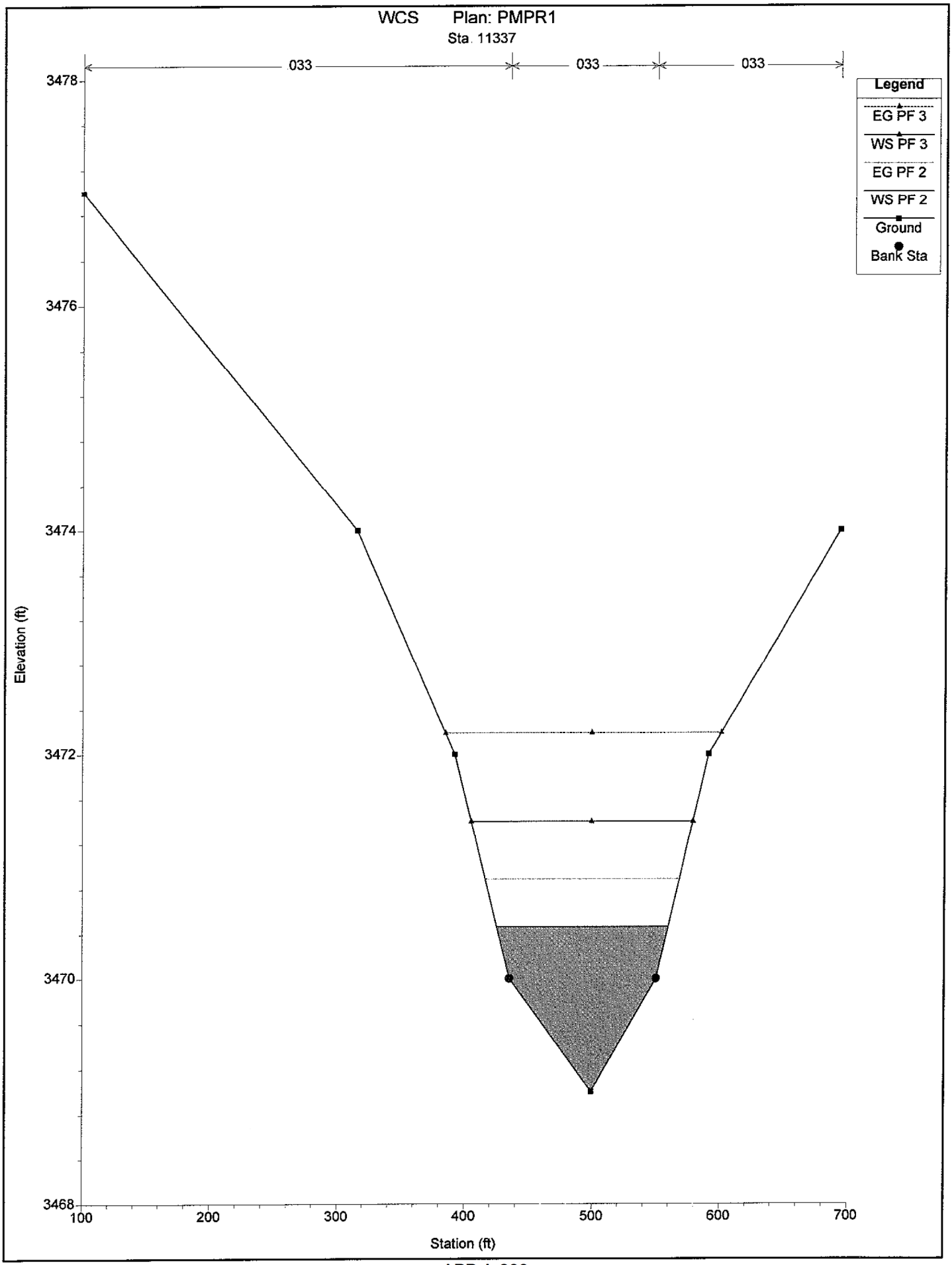
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G
E.G. Elev	Slope Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl	
		(cfs)	(ft)	(ft)	(ft)	(ft)	
(ft)	(ft/ft) (ft/s)	(ft)	(ft)	(sq ft)	(ft)		
5	12674	592.00	3477.00	3478.45	3478.05	1.45	3
478.54	0.003041 2.40	348.61	663.25	255.24	314.65	0.43	
5	12674	1768.00	3477.00	3479.22	3478.65	2.22	3

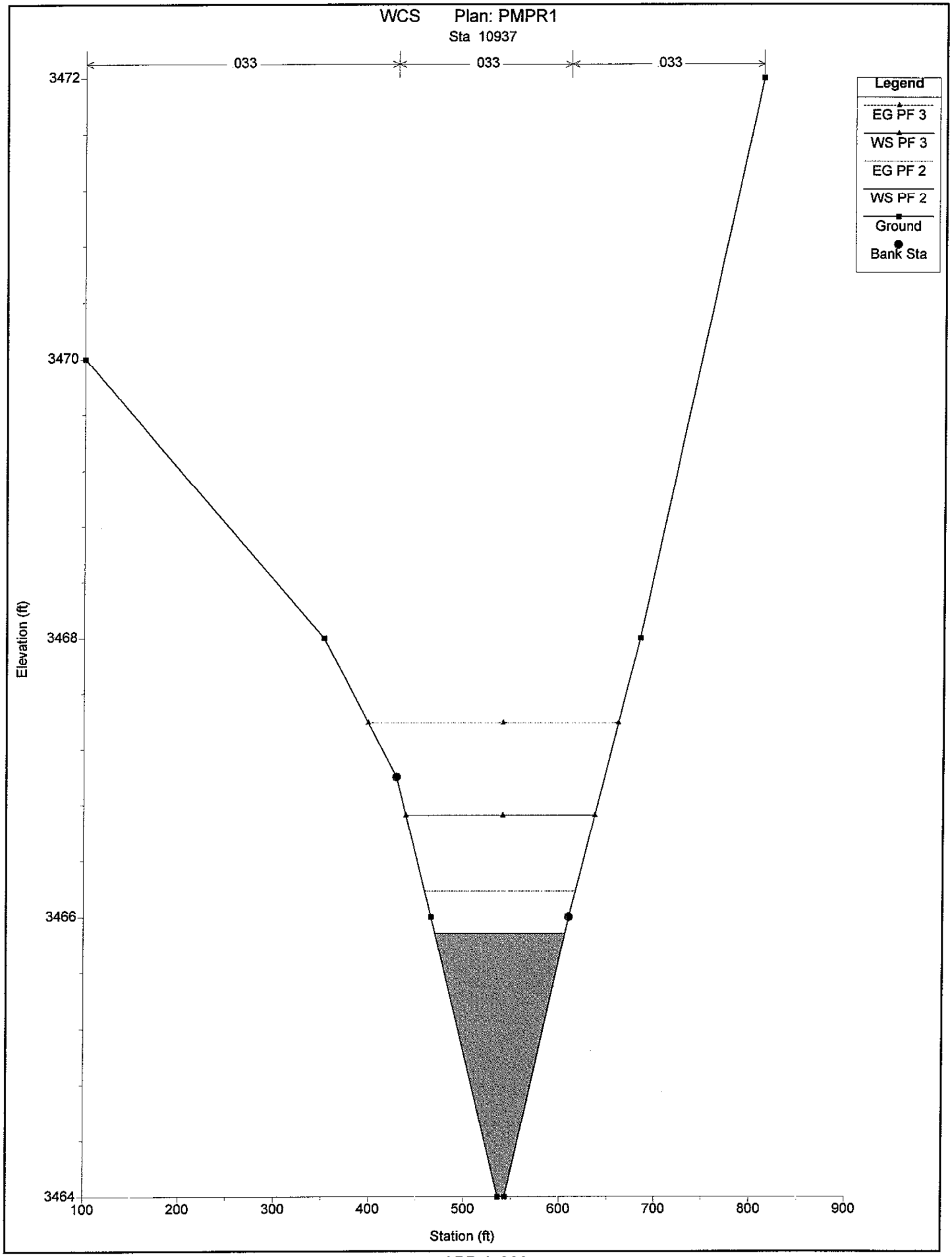
479.41	0.003111	3.61	294.31	712.12	539.30	417.81		0.48
5	11337		592.00	3469.00	3470.47	3470.44	1.46	3
470.89	0.014287	5.25	425.01	559.52	115.46	134.51		0.94
5	11337		1768.00	3469.00	3471.40	3471.40	2.40	3
472.19	0.011380	7.37	404.87	578.73	259.90	173.86		0.94
5	10937		592.00	3464.00	3465.88	3465.69	1.88	3
466.18	0.009696	4.40	469.19	605.11	134.50	135.92		0.78
5	10937		1768.00	3464.00	3466.73	3466.67	2.73	3
467.39	0.011861	6.57	438.14	635.86	275.01	197.71		0.93
5	10288		592.00	3456.00	3456.97	3456.97	0.97	3
457.25	0.020992	4.29	398.55	657.53	138.04	258.98		1.04
5	10288		1768.00	3456.00	3457.50	3457.50	1.50	3
457.89	0.018227	5.03	346.65	813.19	351.36	466.54		1.02
5	9690		751.00	3450.00	3451.61	3451.24	1.61	3
451.73	0.004736	2.71	429.90	767.63	276.77	337.73		0.53
5	9690		2568.00	3450.00	3452.40	3452.03	2.40	3
452.69	0.005801	4.32	345.19	818.61	602.35	473.42		0.64
5	9009		751.00	3445.00	3446.57	3446.45	1.57	3
446.81	0.012198	3.97	444.50	709.53	189.12	265.03		0.83
5	9009		2568.00	3445.00	3447.55		2.55	3
447.89	0.008737	4.66	362.59	834.60	550.62	472.01		0.76
5	8130		751.00	3440.00	3441.70	3441.21	1.70	3
441.78	0.003259	2.34	454.54	823.41	320.72	368.87		0.44
5	8130		2568.00	3440.00	3442.51	3441.99	2.51	3
442.74	0.004151	3.85	389.53	888.33	678.70	498.79		0.55
5	7717		751.00	3437.80	3438.75	3438.75	0.95	3
439.05	0.019448	4.38	326.48	620.79	171.46	294.31		1.01
5	7717		2568.00	3437.80	3439.61	3439.49	1.81	3
440.03	0.011696	5.19	262.15	712.02	494.88	449.87		0.87

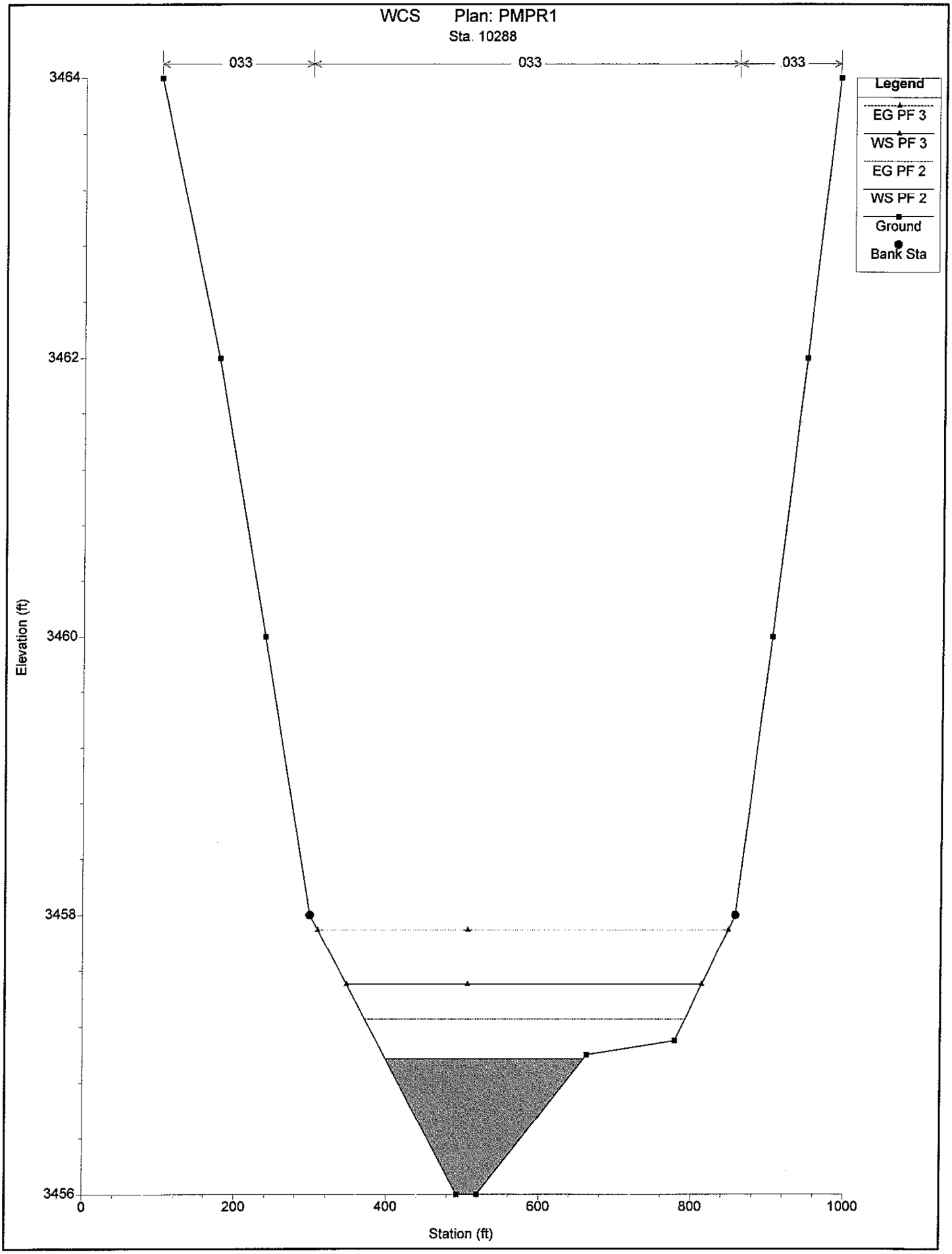
5	7253		857.00	3435.00	3436.46	3435.95	1.46	3
436.52	0.001736	1.83	400.15	928.93	475.06	528.78		0.33
5	7253		4793.00	3435.00	3437.73	3436.95	2.73	3
437.98	0.002925	4.15	335.02	991.53	1224.55	656.51		0.49
5	6343		1668.00	3430.00	3430.80	3430.80	0.80	3
431.14	0.018115	4.65	763.44	1298.18	358.99	534.73		1.00
5	6343		6409.00	3430.00	3431.79	3431.79	1.79	3
432.49	0.013082	6.69	677.18	1464.86	974.08	787.68		0.97
5	5363		1668.00	3425.00	3426.46	3425.87	1.46	3
426.52	0.001774	2.03	697.73	1568.47	843.04	870.74		0.34
5	5363		6409.00	3425.00	3427.60	3426.70	2.60	3
427.77	0.002053	3.49	588.77	1796.04	2022.32	1207.27		0.41
5	4221		1914.00	3420.00	3421.13	3421.13	1.13	3
421.50	0.017296	4.88	517.29	1068.16	393.73	550.87		0.99
5	4221		6969.00	3420.00	3422.09	3422.09	2.09	3
422.69	0.013866	6.36	318.52	1328.11	1150.73	1009.59		0.98
5	3489		1914.00	3416.00	3417.31	3416.78	2.31	3
417.37	0.002270	2.22	-118.39	887.55	933.15	1005.93		0.38
5	3489		6969.00	3416.00	3418.33	3417.53	3.33	3
418.52	0.002578	3.59	-133.97	942.92	1994.93	1076.90		0.45
5	2989		1914.00	3413.80	3414.63	3414.63	0.83	3
414.95	0.018186	4.47	175.68	810.52	416.79	634.84		0.99
5	2989		6969.00	3413.80	3415.54	3415.49	1.74	3
416.14	0.012585	6.56	3.77	883.00	1134.92	879.23		0.95
5	2774		1914.00	3409.00	3414.10	3412.71	5.10	3
414.15	0.000369	2.44	-408.24	645.26	1448.49	1053.50		0.20
5	2774		6969.00	3409.00	3415.01	3413.39	6.01	3
415.19	0.001205	4.96	-437.14	683.38	2435.25	1120.52		0.37

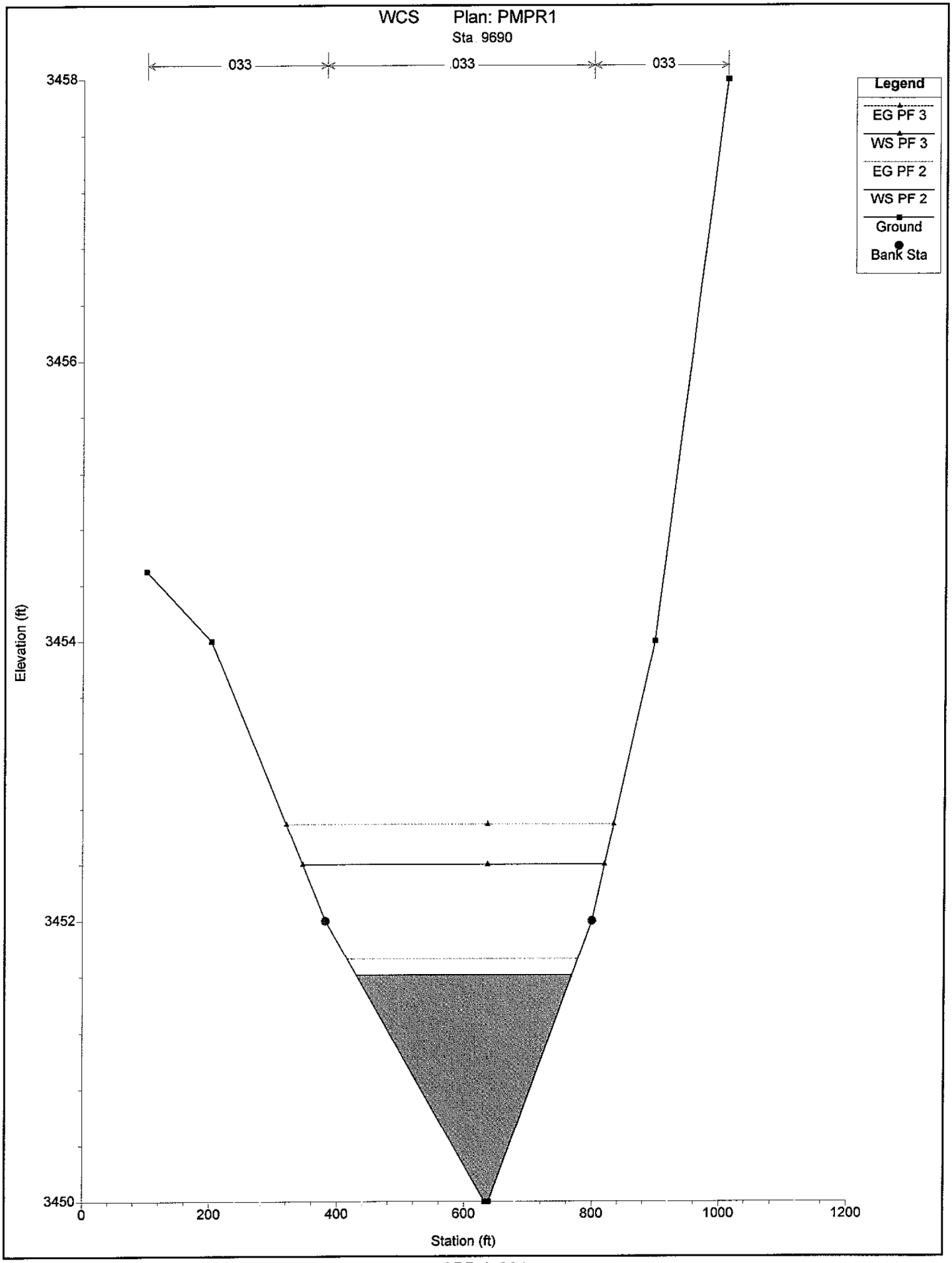
5	2773		Culvert					
5	2734		1914.00	3408.90	3412.71	3412.71	3.81	3
412.89	0.001632	4.11	83.74	515.65	665.51	431.91		0.39
5	2734		6969.00	3408.90	3413.55	3413.55	4.65	3
414.44	0.006458	9.48	39.16	549.82	1063.05	510.66		0.81
5	1888		1943.00	3408.00	3409.38	3408.84	1.38	3
409.47	0.002740	2.33	178.44	1028.25	834.45	849.81		0.41
5	1888		7042.00	3408.00	3410.48	3409.72	2.48	3
410.68	0.002812	3.54	-218.68	1201.30	2065.39	1419.98		0.46
5	1060		2032.00	3402.70	3404.27	3404.27	1.57	3
404.70	0.017302	5.25	648.43	1111.58	386.84	463.15		1.01
5	1060		7268.00	3402.70	3405.41	3405.41	2.71	3
406.07	0.014850	6.53	480.47	1336.48	1112.35	856.01		1.01

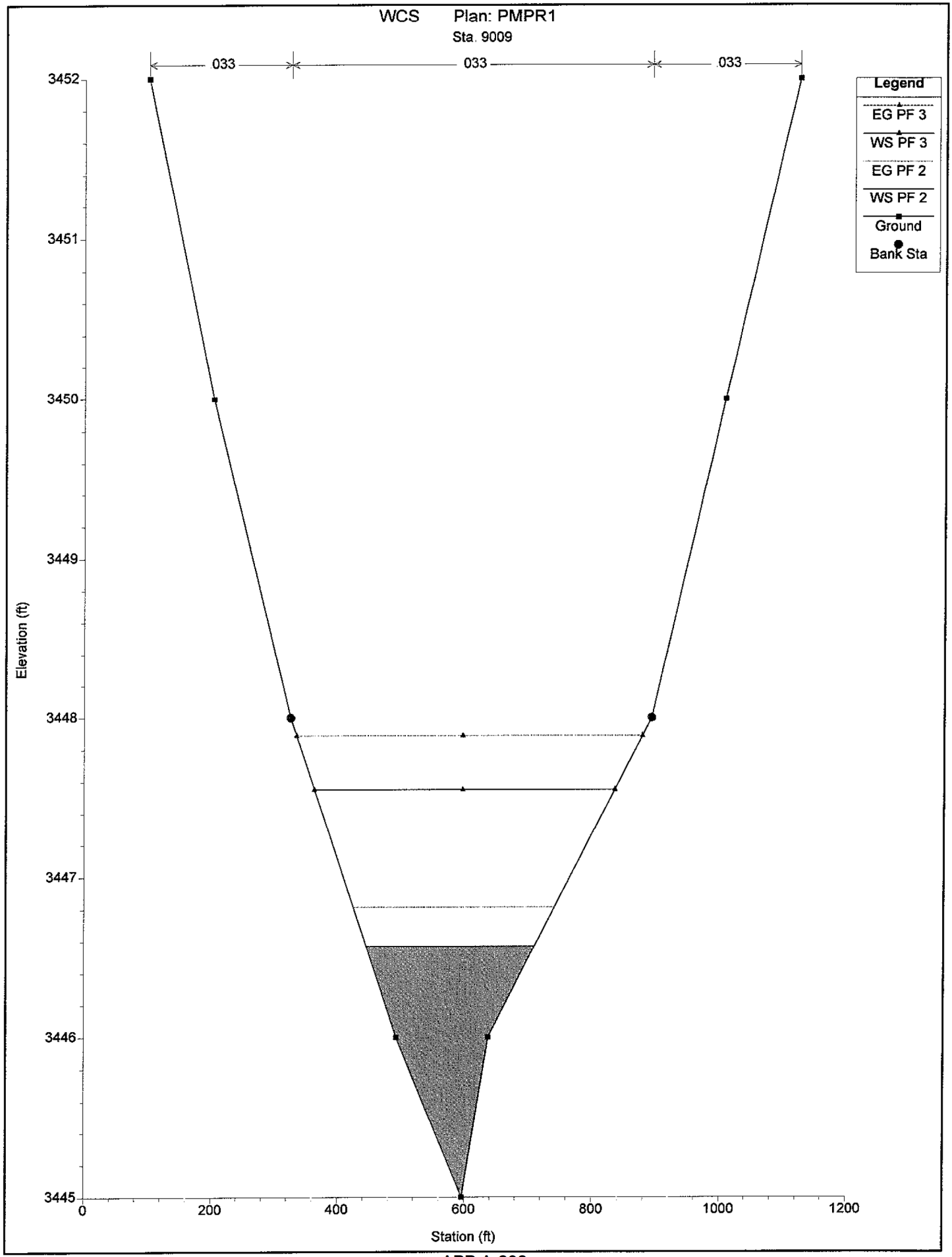

WCS Plan: PMPR1
Sta 12674
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3482
3481
3480
3479
3478
3477
Elevation (ft)
0
200
400
600
800
1000
Station (ft)

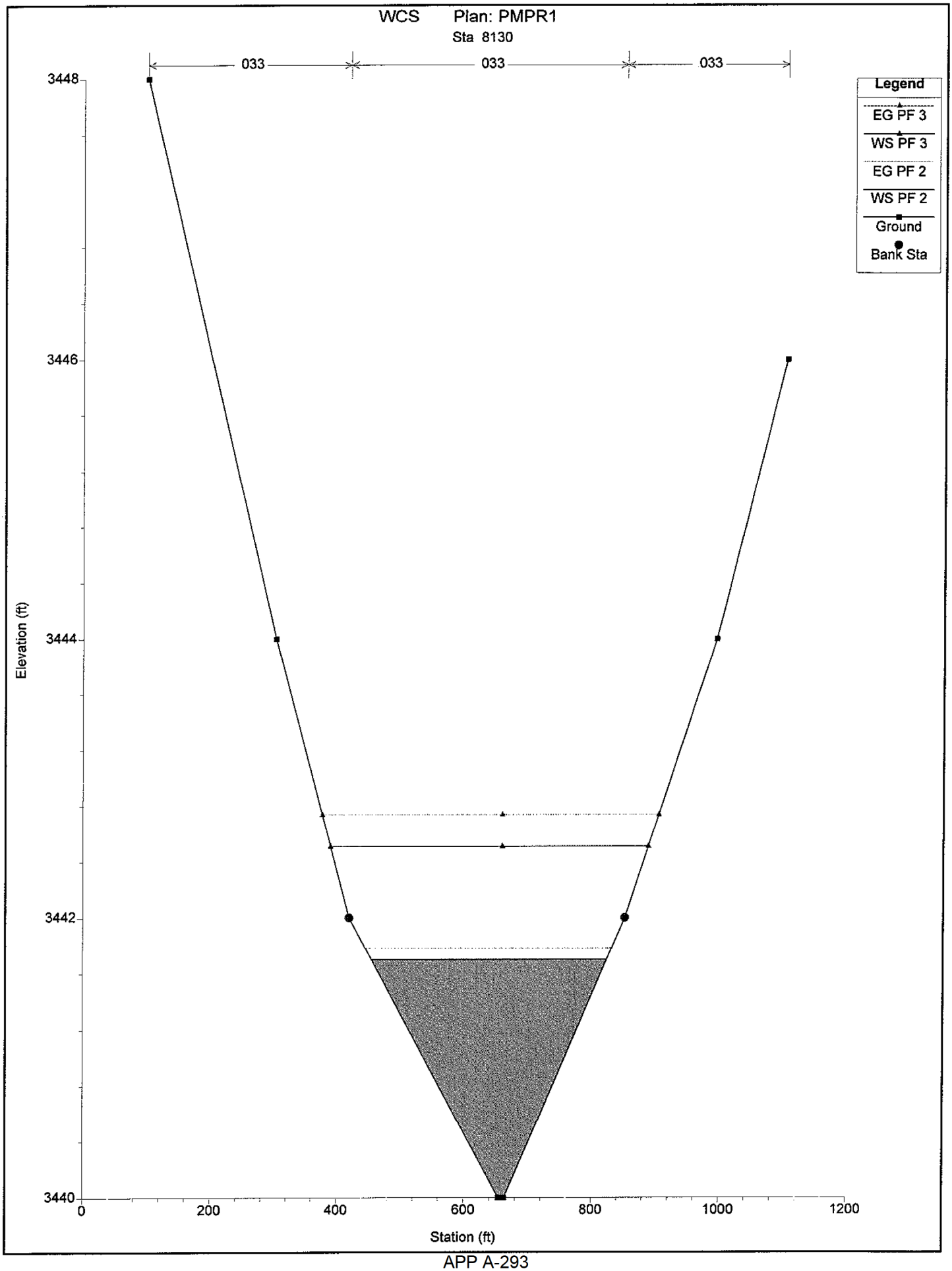

WCS Plan: PMPR1
Sta. 11337
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3478
3476
3474
3472
3470
3468
Elevation (ft)
100
200
300
400
500
600
700
Station (ft)

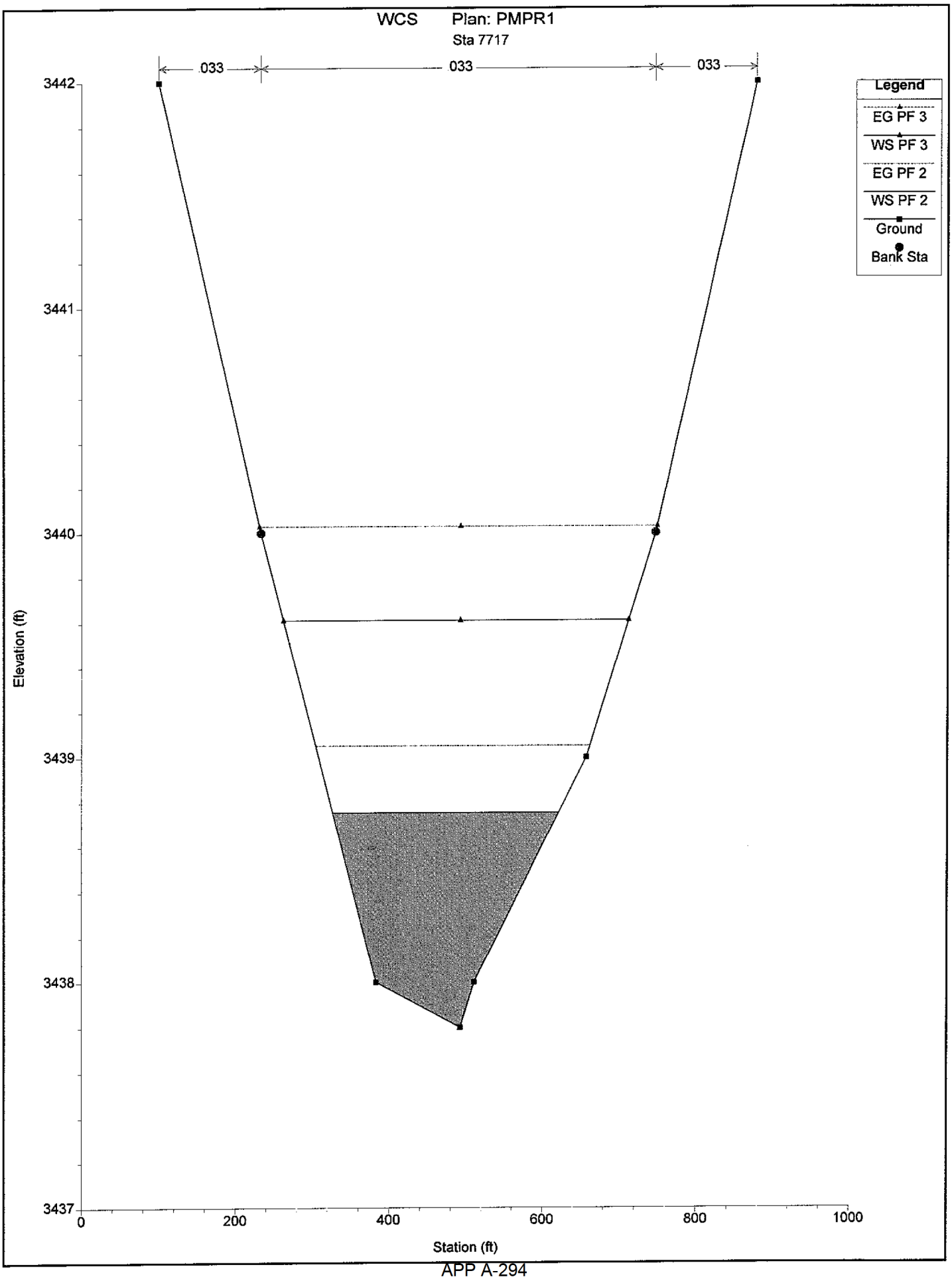

WCS Plan: PMPR1
Sta 10937
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3472
3470
3468
3466
3464
Elevation (ft)
100
200
300
400
500
600
700
800
900
Station (ft)

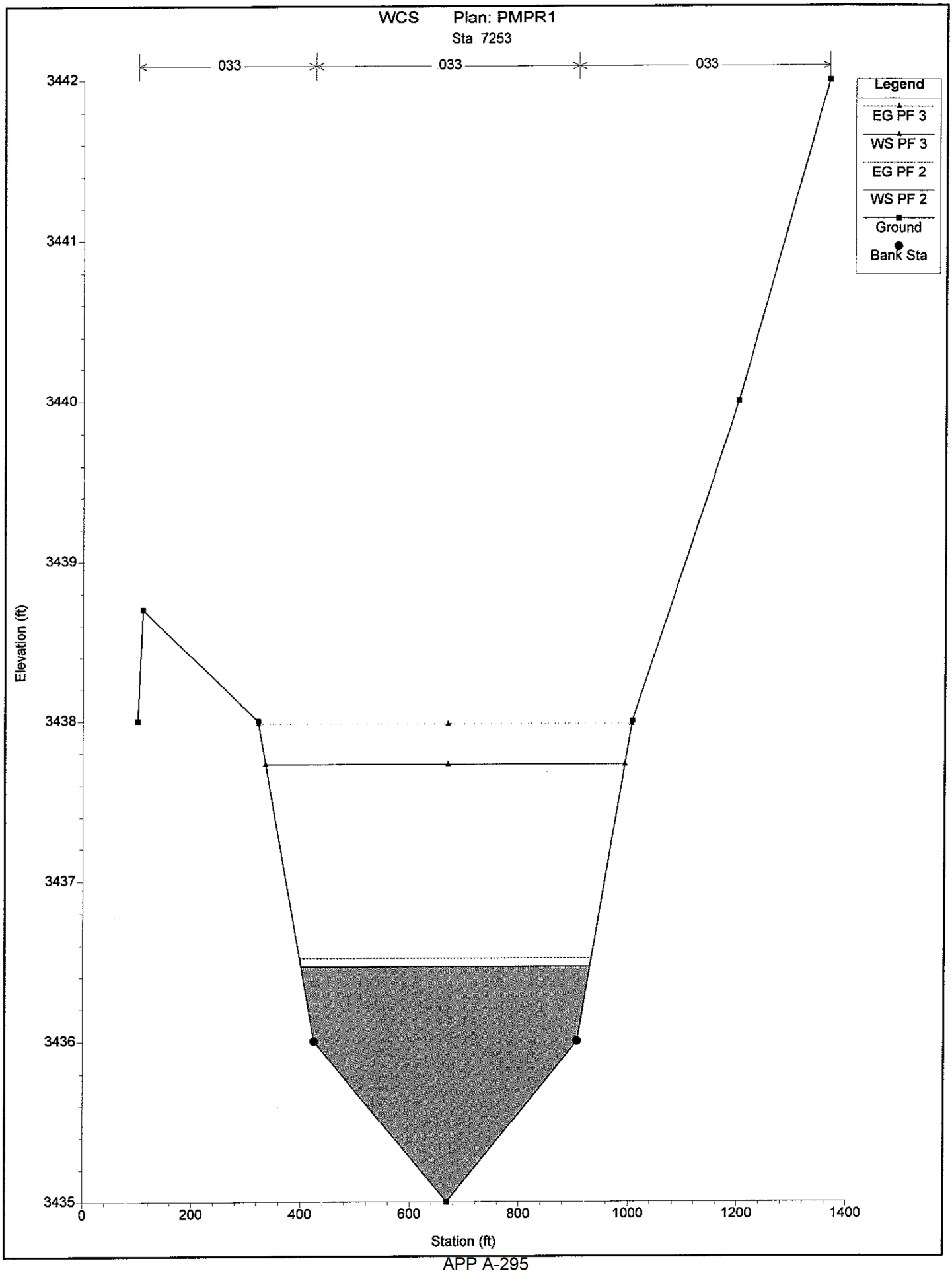

WCS Plan: PMPR1
Sta. 10288
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3464
3462
3460
3458
3456
0
200
400
600
800
1000
Station (ft)

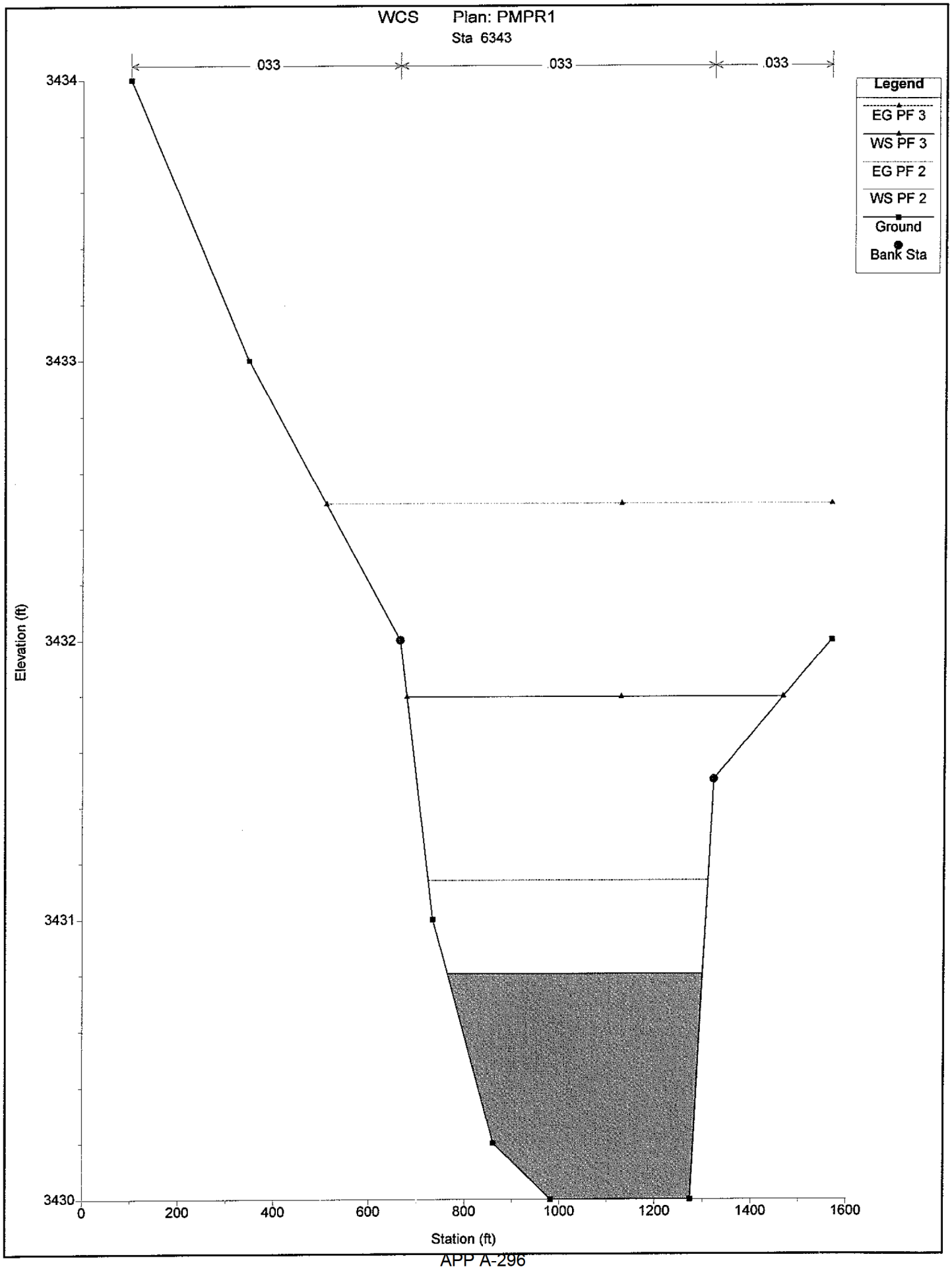

WCS Plan: PMPR1
Sta 9690
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3458
3456
3454
3452
3450
0
200
400
600
800
1000
1200
Station (ft)

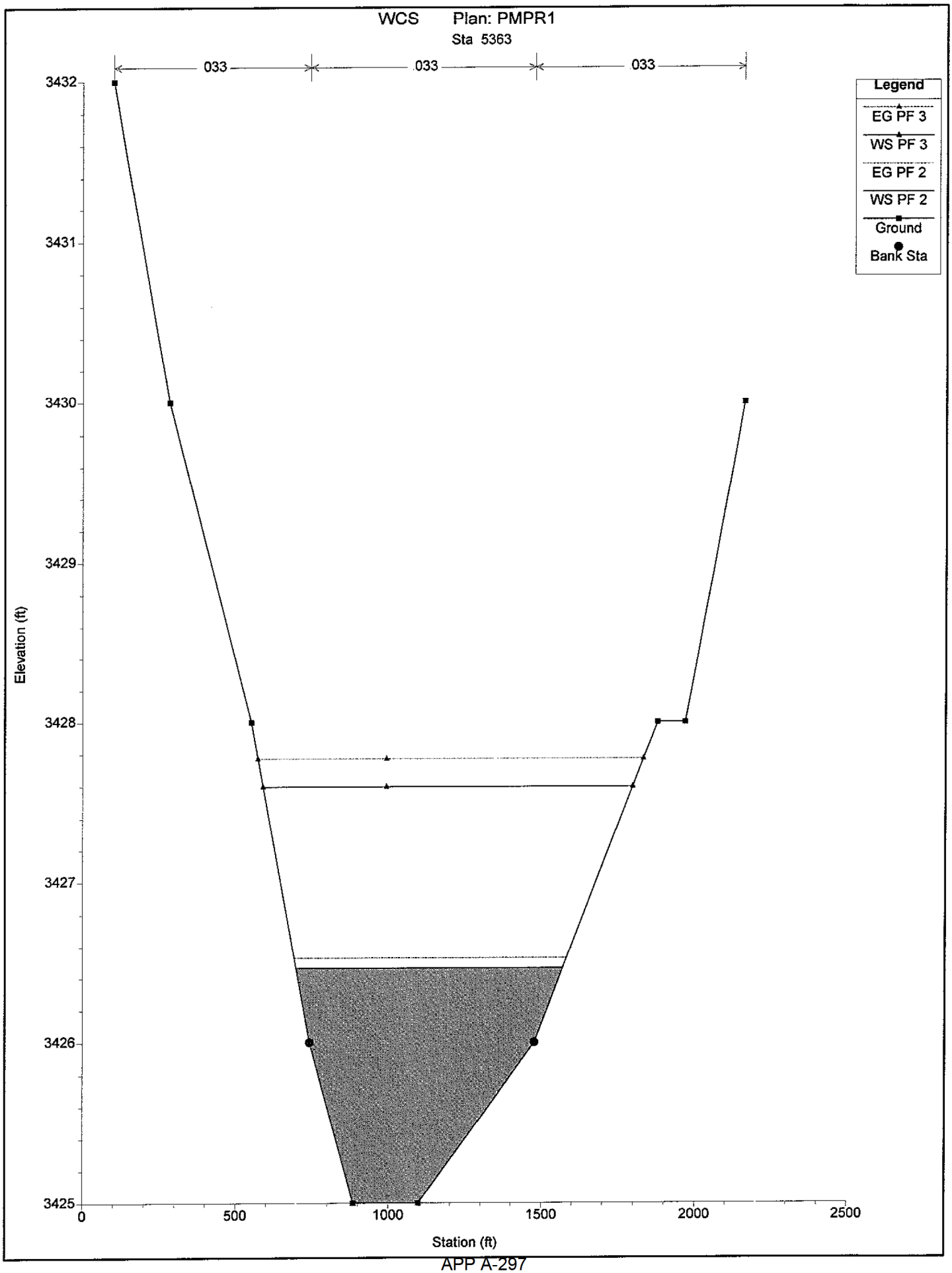

WCS Plan: PMPR1
Sta. 9009
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3452
3451
3450
3449
3448
3447
3446
3445
0
200
400
600
800
1000
1200
Station (ft)

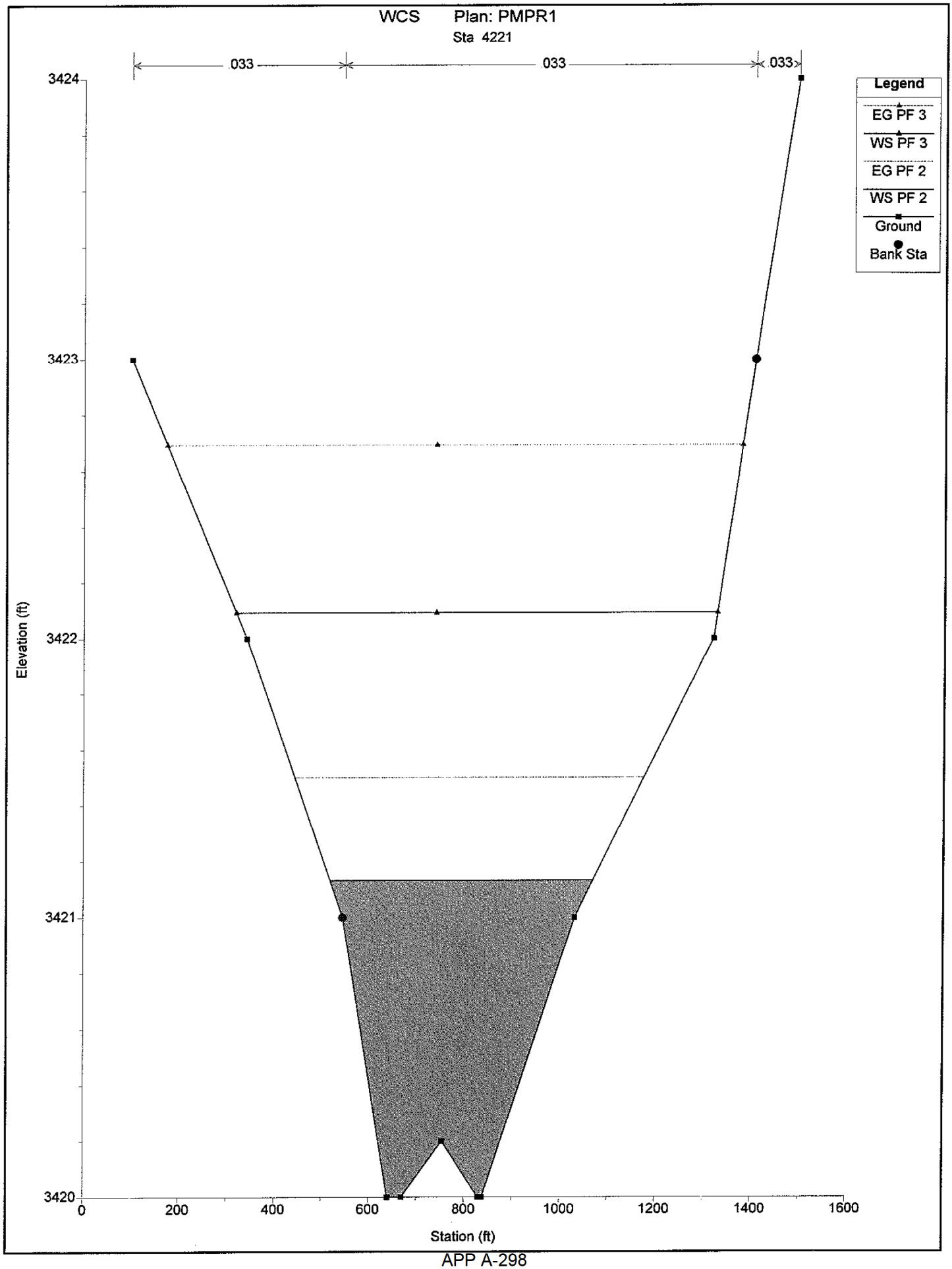

WCS Plan: PMPR1
Sta 8130
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3448
3446
3444
3442
3440
Elevation (ft)
0
200
400
600
800
1000
1200
Station (ft)

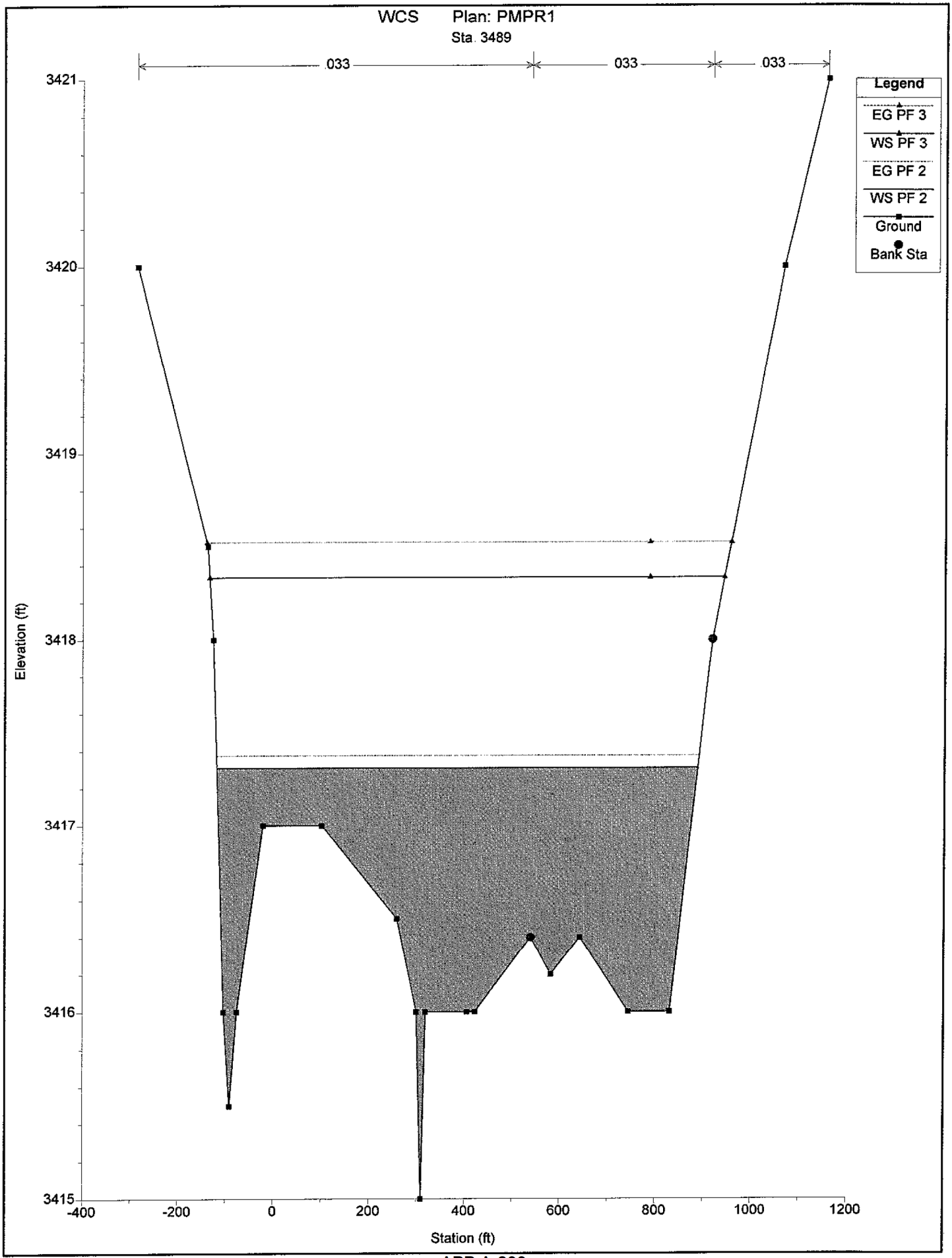

WCS Plan: PMPR1
Sta 7717
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3442
3441
3440
3439
3438
3437
Elevation (ft)
0
200
400
600
800
1000
Station (ft)

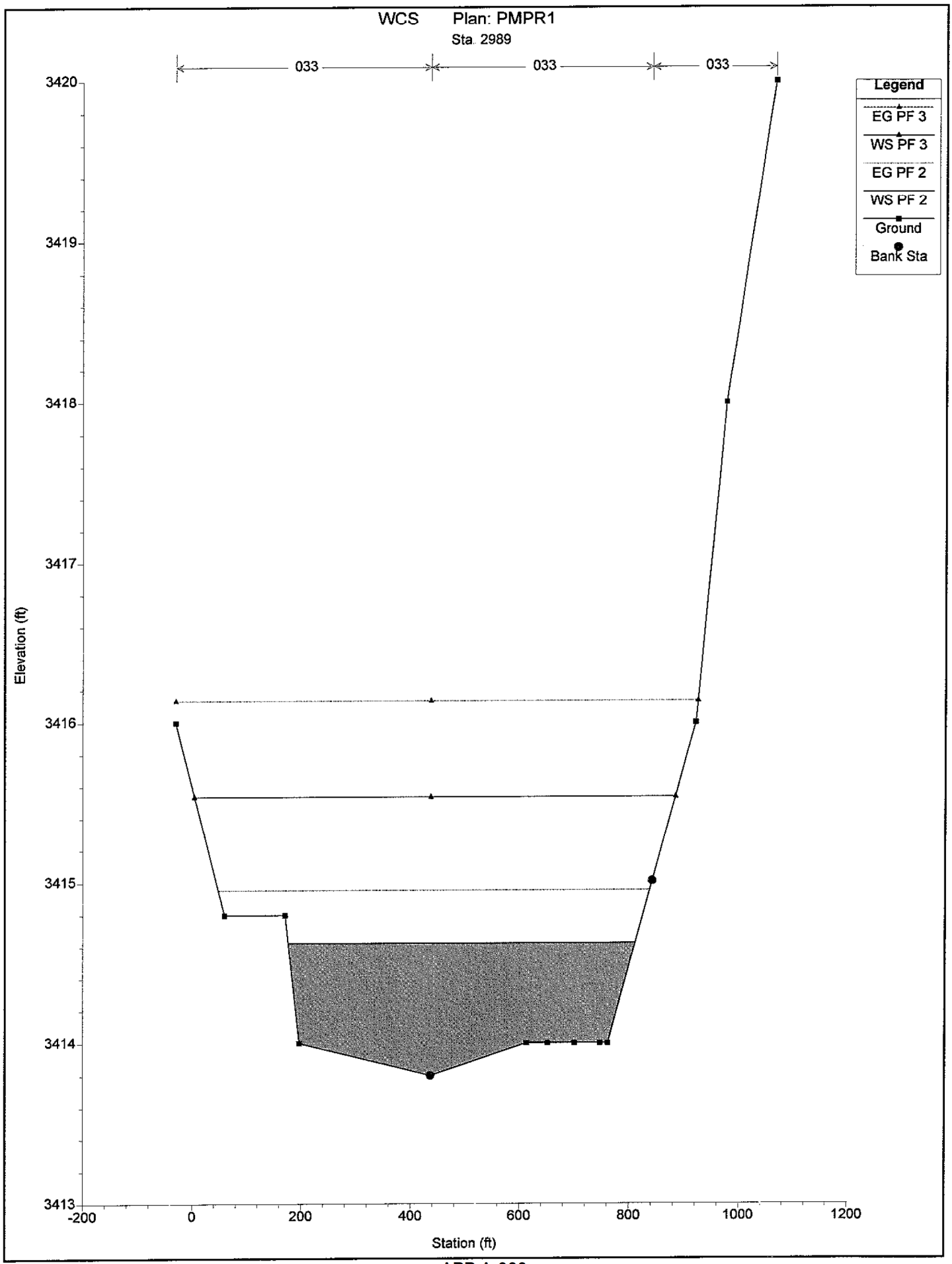

WCS Plan: PMPR1
Sta. 7253
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3442
3441
3440
3439
3438
3437
3436
3435
0
200
400
600
800
1000
1200
1400
Station (ft)

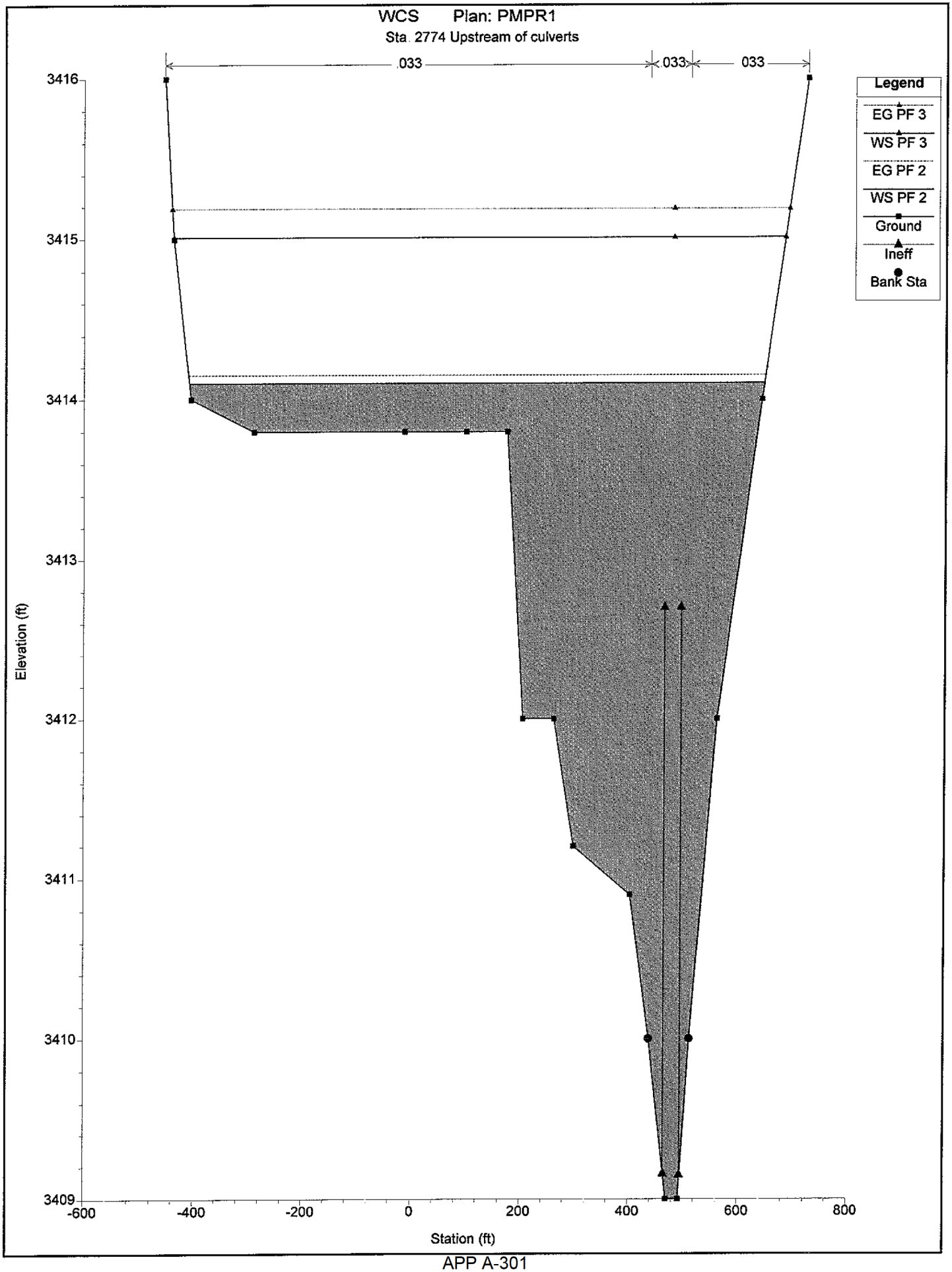

WCS Plan: PMPR1
Sta 6343
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3434
3433
3432
3431
3430
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

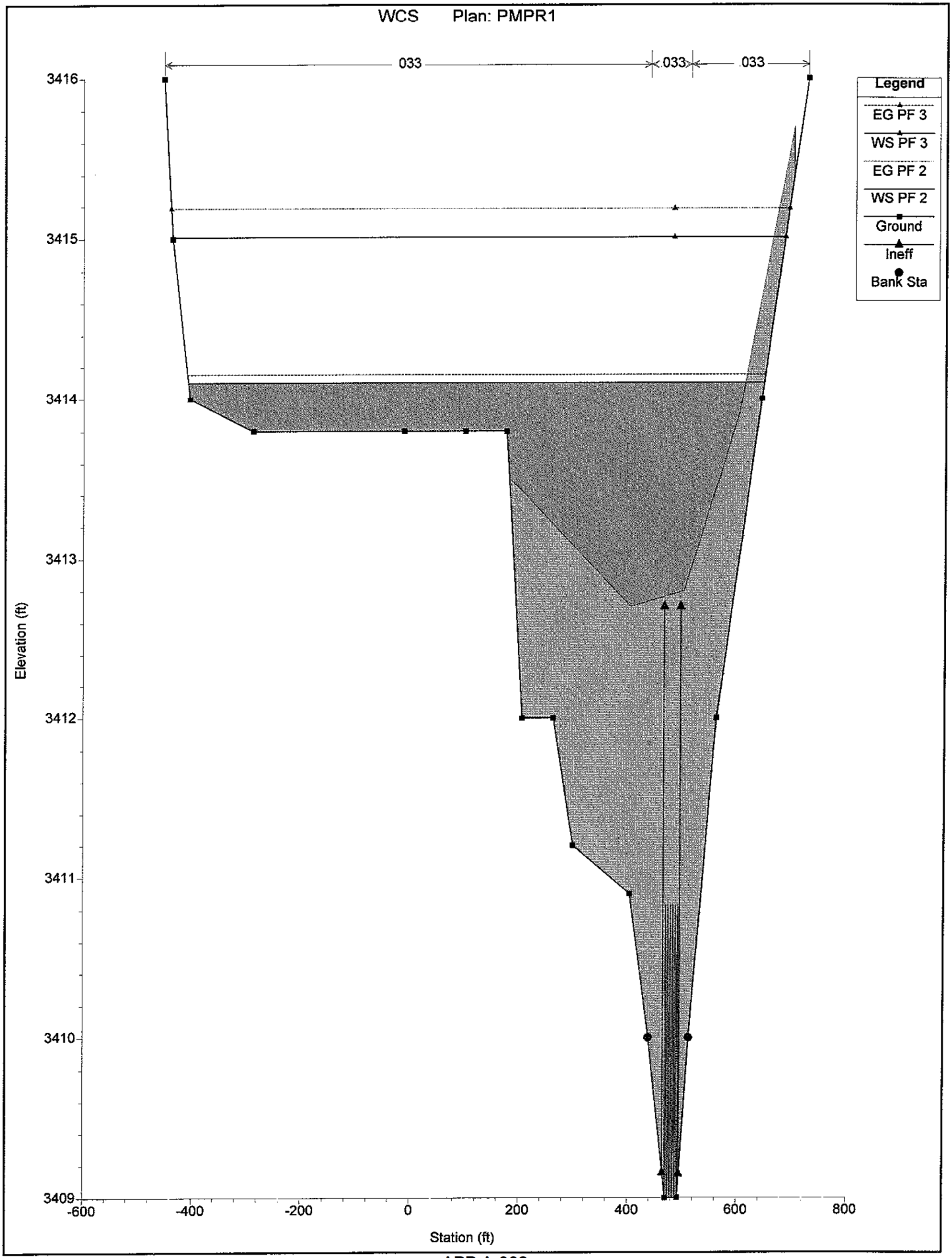

WCS Plan: PMPR1
Sta 5363
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3432
3431
3430
3429
3428
3427
3426
3425
0
500
1000
1500
2000
2500
Station (ft)

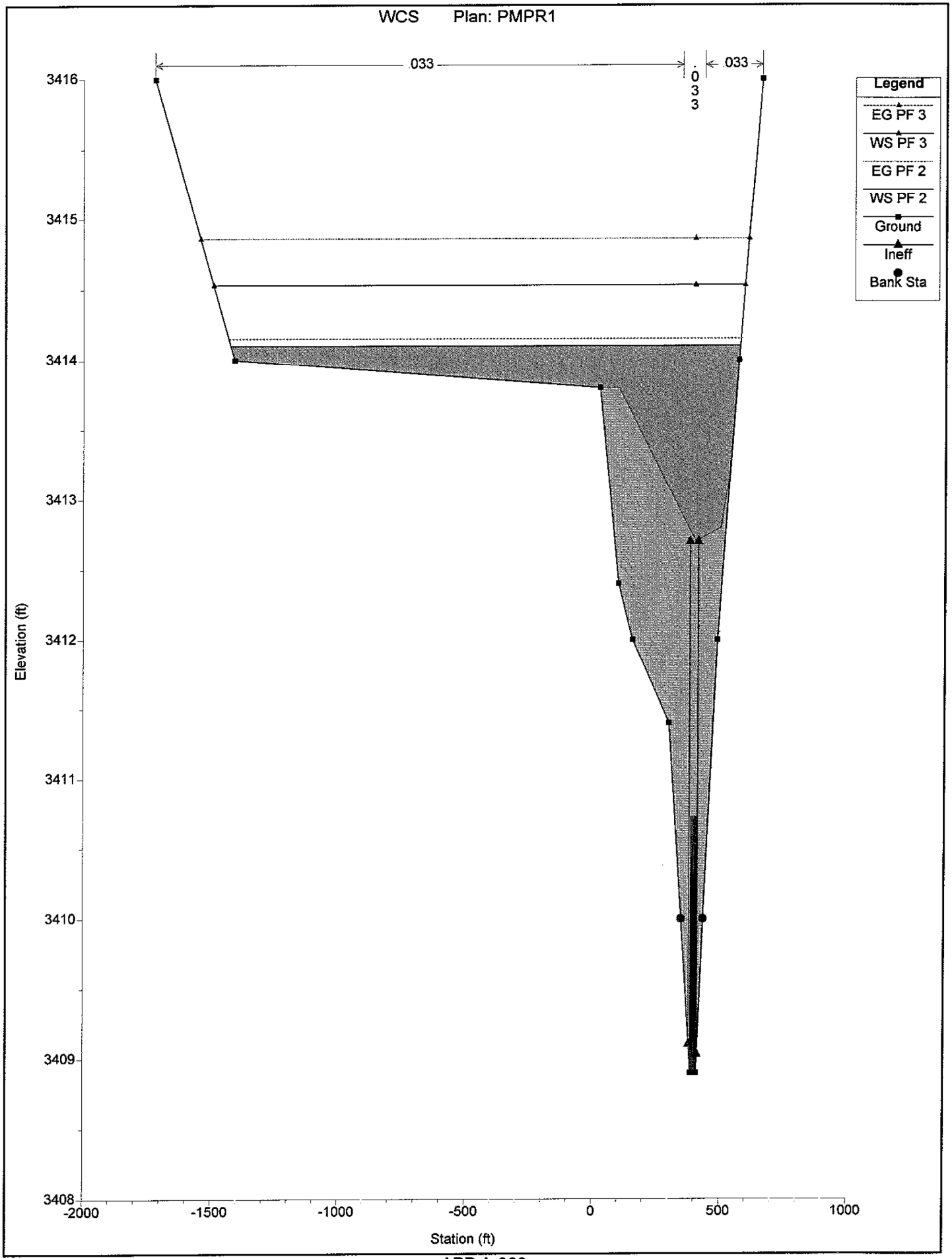

WCS Plan: PMPR1
Sta 4221
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3424
3423
3422
3421
3420
Elevation (ft)
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

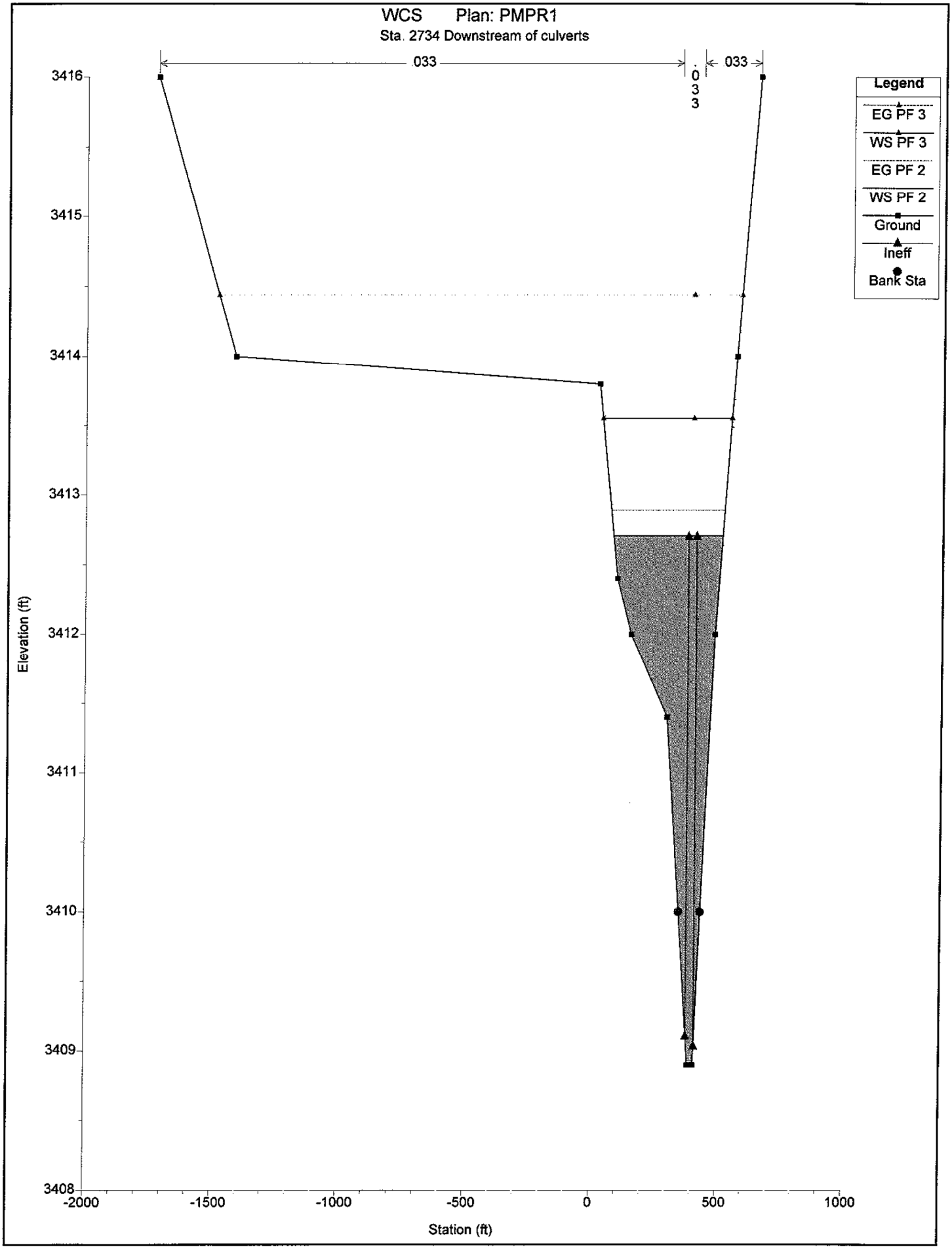

WCS Plan: PMPR1
Sta. 3489
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3421
3420
3419
3418
3417
3416
3415
-400
-200
0
200
400
600
800
1000
1200
Station (ft)

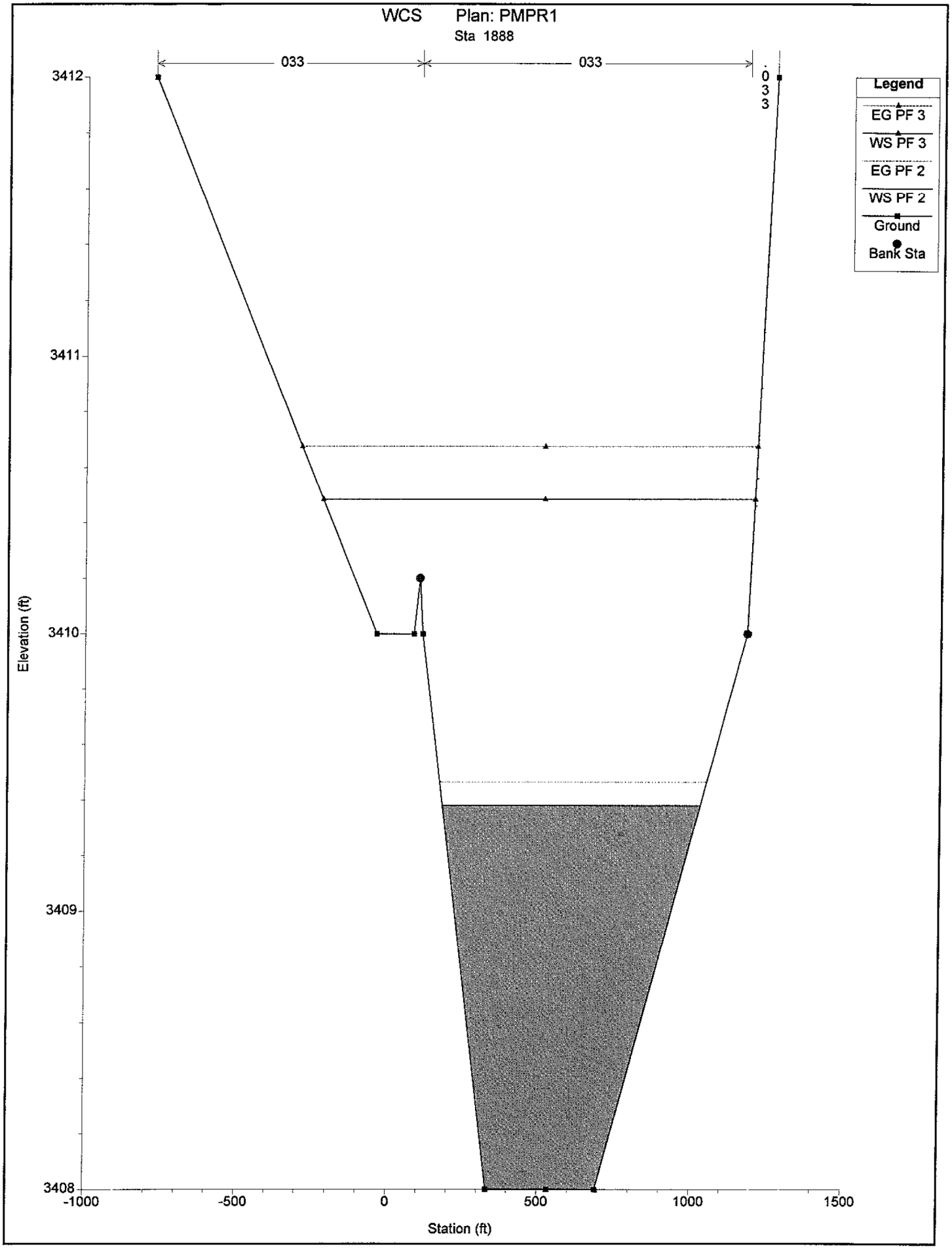

WCS Plan: PMPR1
Sta. 2989
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3420
3419
3418
3417
3416
3415
3414
3413
-200
0
200
400
600
800
1000
1200
Station (ft)

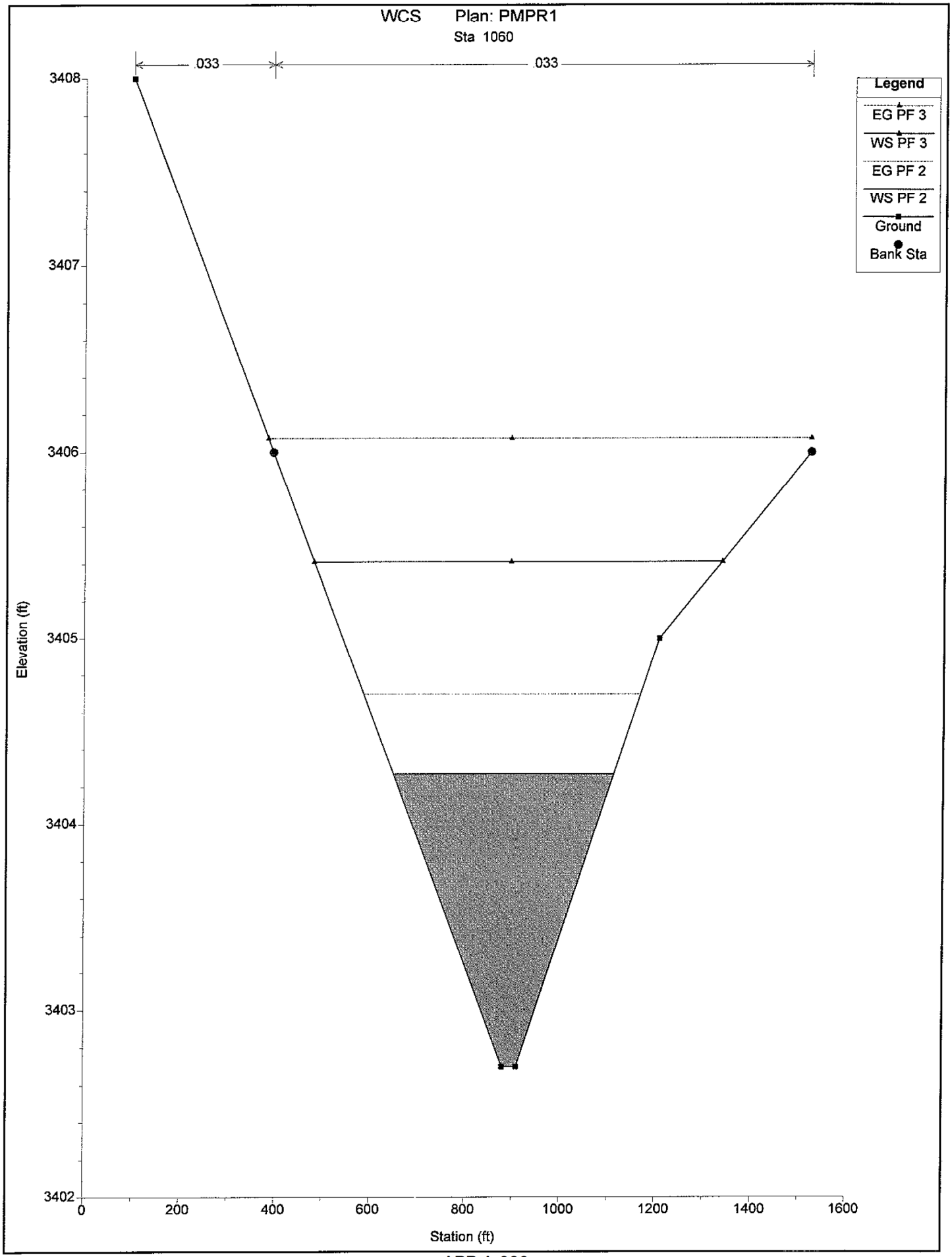

WCS Plan: PMPR1
Sta. 2774 Upstream of culverts
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
3416
3415
3414
3413
3412
3411
3410
3409
Elevation (ft)
-600
-400
-200
0
200
400
600
800
Station (ft)


WCS Plan: PMPR1
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
Elevation (ft)
3416
3415
3414
3413
3412
3411
3410
3409
-600
-400
-200
0
200
400
600
800
Station (ft)


WCS Plan: PMPR1
.033
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
Elevation (ft)
3416
3415
3414
3413
3412
3411
3410
3409
3408
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


WCS Plan: PMPR1
Sta. 2734 Downstream of culverts
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Ineff
Bank Sta
Elevation (ft)
3416
3415
3414
3413
3412
3411
3410
3409
3408
-2000
-1500
-1000
-500
0
500
1000
Station (ft)


WCS Plan: PMPR1
Sta 1888
033
033
033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
3412
3411
3410
3409
3408
Elevation (ft)
-1000
-500
0
500
1000
1500
Station (ft)


WCS Plan: PMPR1
Sta 1060
.033
.033
Legend
EG PF 3
WS PF 3
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
3408
3407
3406
3405
3404
3403
3402
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

APPENDIX G

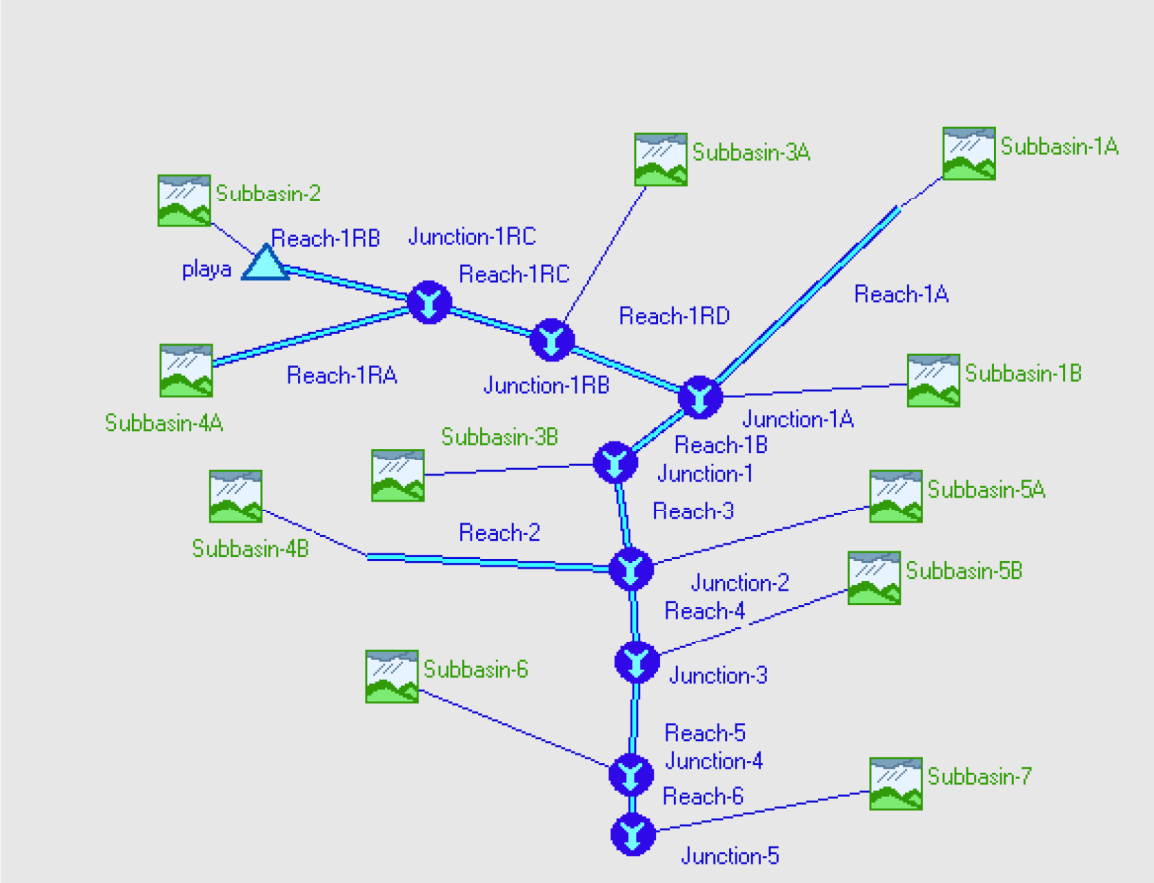
HEC-HMS MODEL FOR THE CALCULATION OF THE DEVELOPED LOW LEVEL & BYPRODUCT FACILTY 100-YEAR PEAK DISCHARGES

HMS * Summary of Results

Project : WCS Run Name : 100YrNOD3/11/06

Start of Run : 01Dec00 0000 Basin Model : 100YrAM3/11/06NOD
End of Run : 02Dec00 0000 Met. Model : Met100 Year
Execution Time : 20Mar06 1832 Control Specs : Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4B	239.00	01 Dec 00 1240	42.425	0.423
Reach-2	239.00	01 Dec 00 1255	42.172	0.423
Subbasin-4A	43.152	01 Dec 00 1232	6.7441	0.067
Reach-1RA	43.152	01 Dec 00 1235	6.7361	0.067
Subbasin-2	440.24	01 Dec 00 1305	105.39	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1RB	0.0	30 Nov 00 2400	0.0	1.063
Junction-1RC	43.152	01 Dec 00 1235	6.7361	1.130
Reach-1RC	43.152	01 Dec 00 1240	6.7228	1.130
Subbasin-3A	55.732	01 Dec 00 1229	8.3632	0.083
Junction-1RB	96.283	01 Dec 00 1234	15.086	1.213
Reach-1RD	96.283	01 Dec 00 1250	14.990	1.213
Subbasin-1A	256.61	01 Dec 00 1328	73.808	0.691
Reach-1A	256.61	01 Dec 00 1344	73.328	0.691
Subbasin-1B	174.42	01 Dec 00 1241	31.477	0.314
Junction-1A	384.76	01 Dec 00 1302	119.80	2.218
Reach-1B	384.76	01 Dec 00 1305	119.65	2.218
Subbasin-3B	57.918	01 Dec 00 1223	7.5802	0.075
Junction-1	405.72	01 Dec 00 1302	127.23	2.293
Reach-3	405.72	01 Dec 00 1319	126.34	2.293
Subbasin-5A	118.86	01 Dec 00 1234	19.306	0.192
Junction-2	678.91	01 Dec 00 1303	187.82	2.908
Reach-4	678.91	01 Dec 00 1324	186.20	2.908
Subbasin-5B	128.06	01 Dec 00 1251	26.440	0.265
Junction-3	770.36	01 Dec 00 1320	212.64	3.173
Reach-5	770.36	01 Dec 00 1334	211.39	3.173
Subbasin-6	54.403	01 Dec 00 1225	7.4715	0.074
Junction-4	782.50	01 Dec 00 1333	218.86	3.247
Reach-6	782.50	01 Dec 00 1333	218.86	3.247
Subbasin-7	43.582	01 Dec 00 1304	10.316	0.104
Junction-5	817.50	01 Dec 00 1332	229.18	3.351

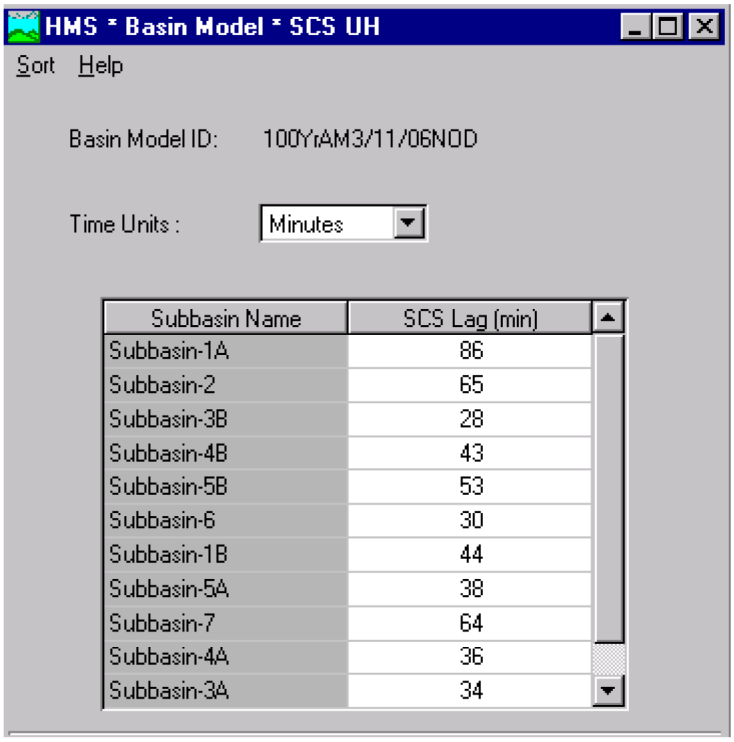


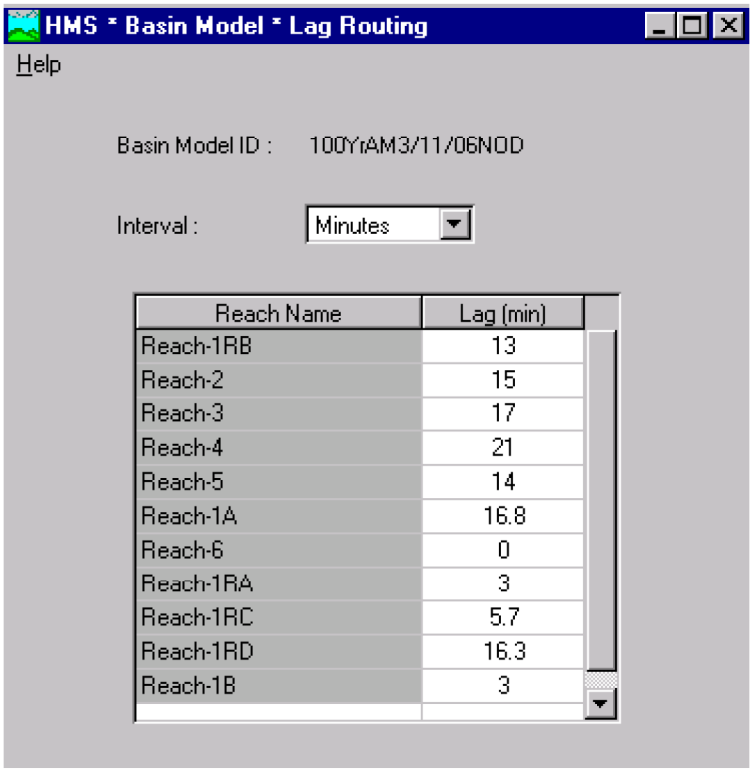
HMS * Basin Model * SCS Curve Number

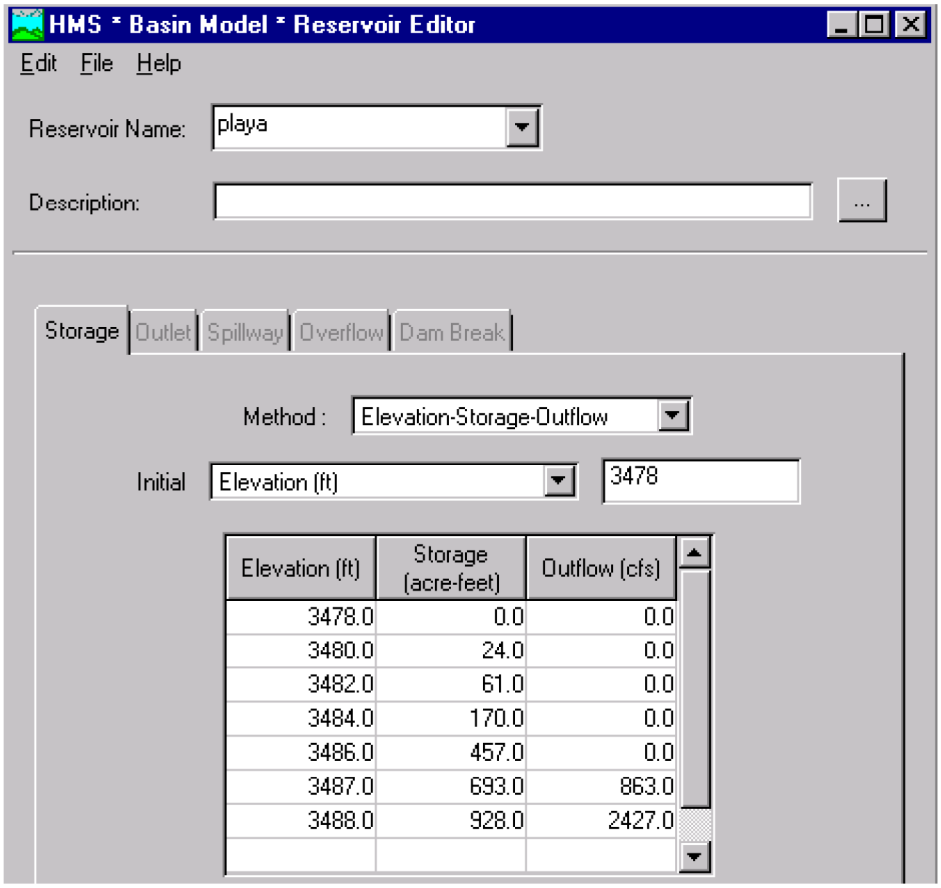
Sort Help

Basin Model ID: 100YrAM3/11/06NOD

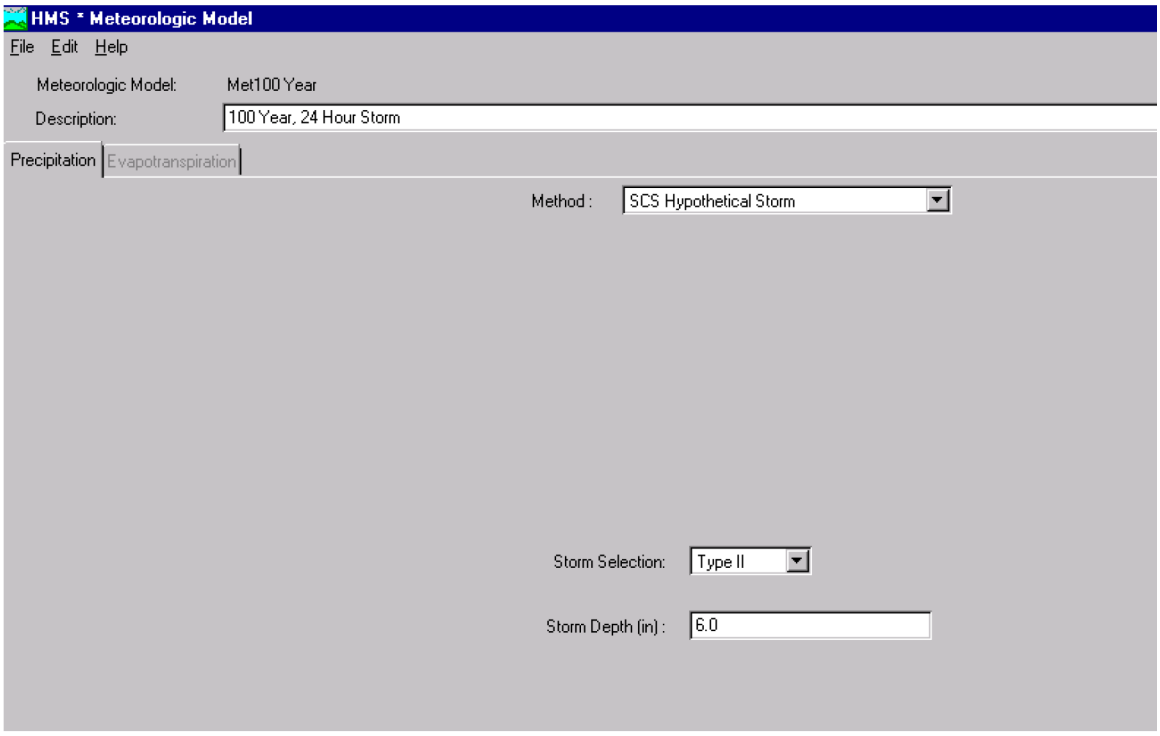
Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	62		0.0
Subbasin-2	60		0.0
Subbasin-3B	60		0.0
Subbasin-4B	60		0.0
Subbasin-5B	60		0.0
Subbasin-6	60		0.0
Subbasin-1B	60		0.0
Subbasin-5A	60		0.0
Subbasin-7	60		0.0
Subbasin-4A	60		0.0
Subbasin-3A	60		0.0


HMS * Basin Model * SCS UH
Sort Help
Basin Model ID: 100YrAM3/11/06NOD
Time Units : Minutes
Subbasin Name | SCS Lag (min)
Subbasin-1A | 86
Subbasin-2 | 65
Subbasin-3B | 28
Subbasin-4B | 43
Subbasin-5B | 53
Subbasin-6 | 30
Subbasin-1B | 44
Subbasin-5A | 38
Subbasin-7 | 64
Subbasin-4A | 36
Subbasin-3A | 34

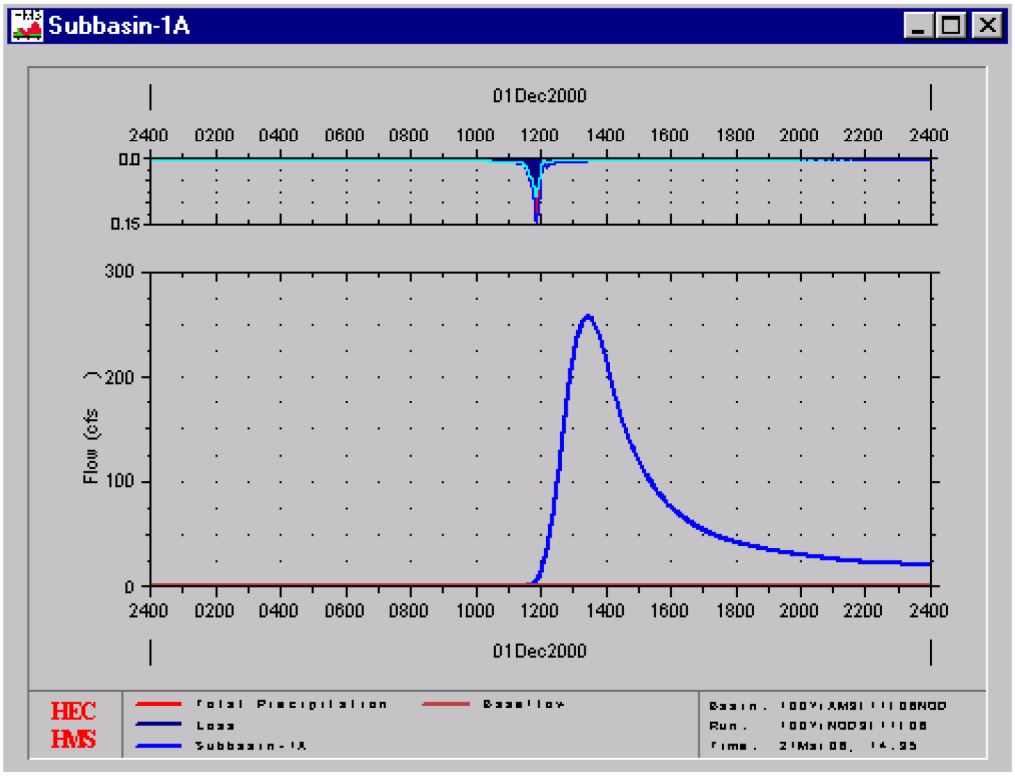

HMS * Basin Model * Lag Routing
Help
Basin Model ID : 100YrAM3/11/06NOD
Interval : Minutes
Reach Name | Lag (min)
Reach-1RB | 13
Reach-2 | 15
Reach-3 | 17
Reach-4 | 21
Reach-5 | 14
Reach-1A | 16.8
Reach-6 | 0
Reach-1RA | 3
Reach-1RC | 5.7
Reach-1RD | 16.3
Reach-1B | 3

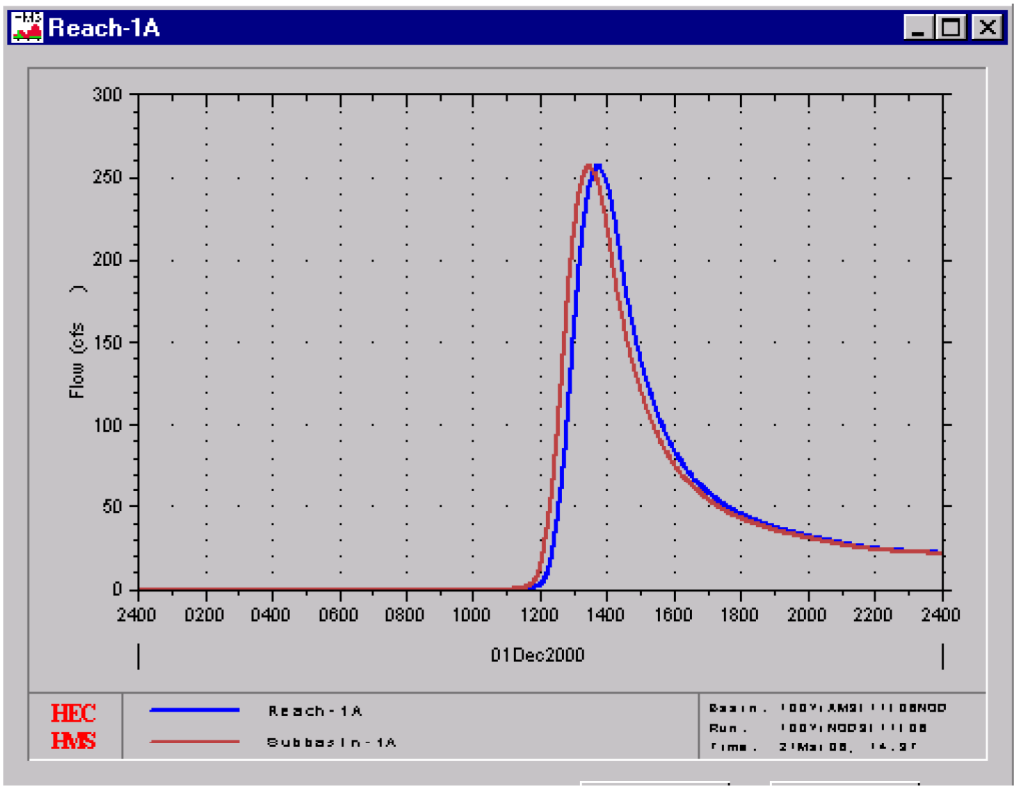

HMS * Basin Model * Reservoir Editor
Edit File Help
Reservoir Name: playa
Description:
...
Storage Outlet Spillway Overflow Dam Break
Method : Elevation-Storage-Outflow
Initial Elevation (ft) 3478
Elevation (ft) Storage (acre-feet) Outflow (cfs)
3478.0 0.0 0.0
3480.0 24.0 0.0
3482.0 61.0 0.0
3484.0 170.0 0.0
3486.0 457.0 0.0
3487.0 693.0 863.0
3488.0 928.0 2427.0

Meteorologic Model Input



WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS





WCS FACILITY
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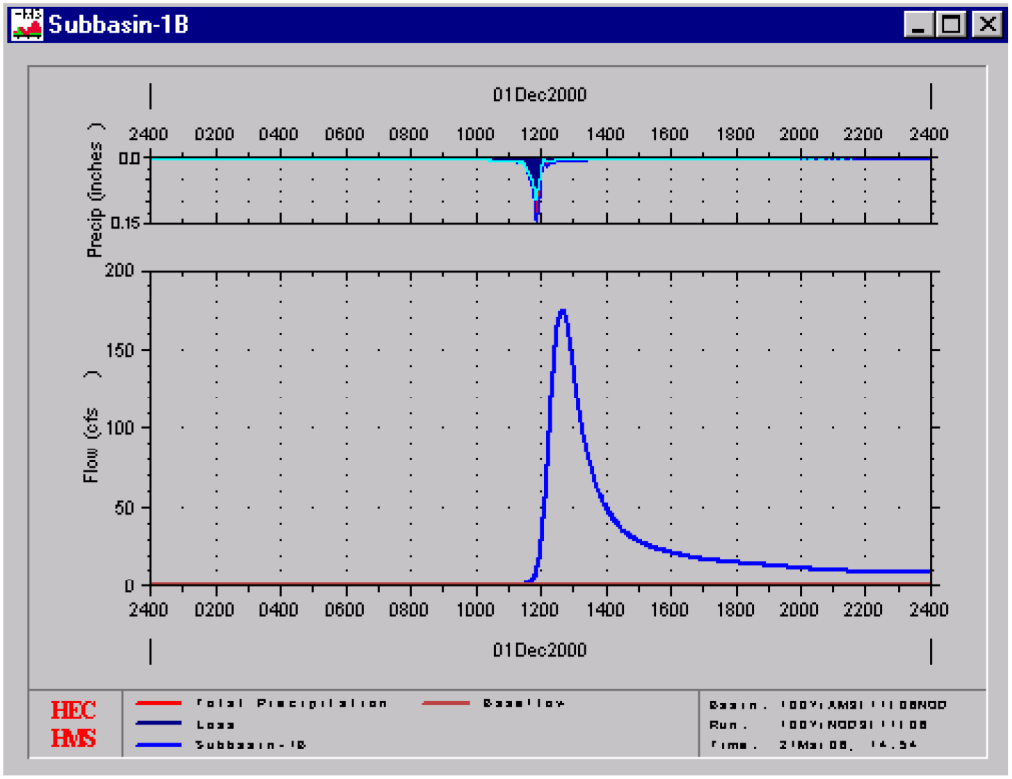

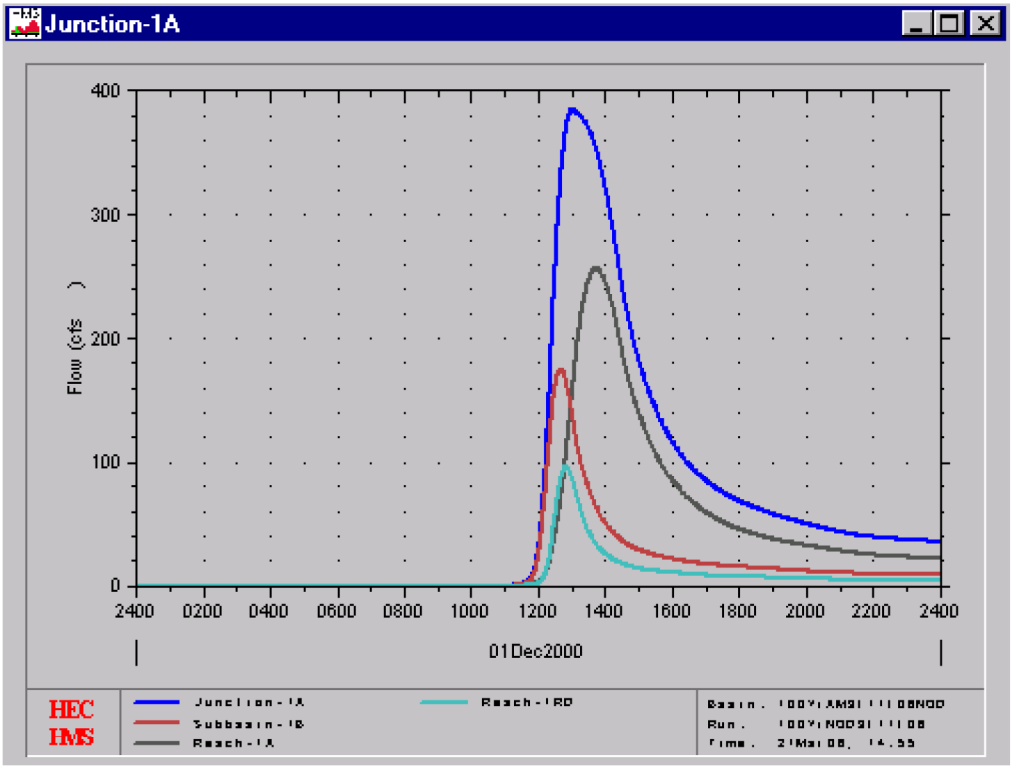

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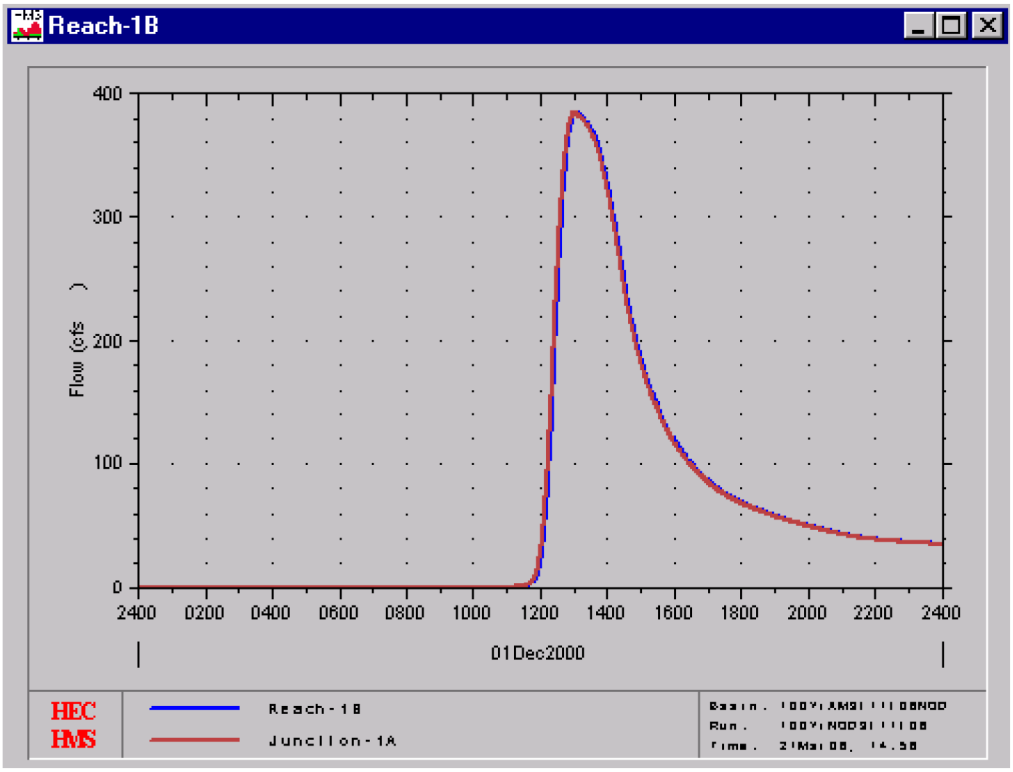

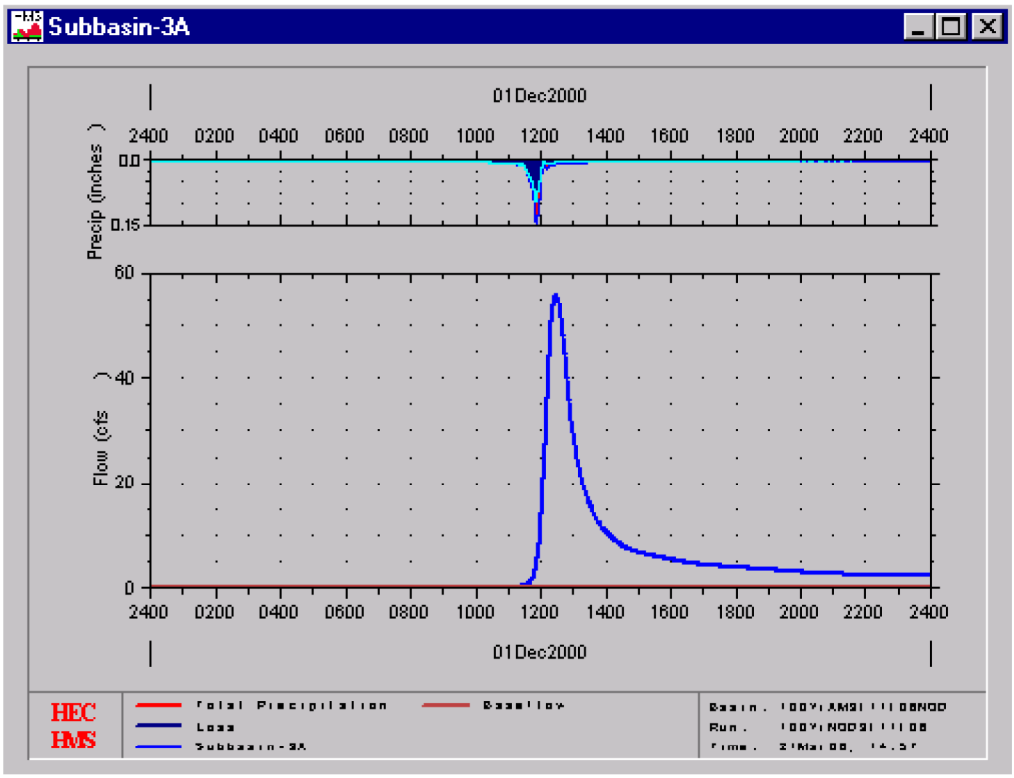

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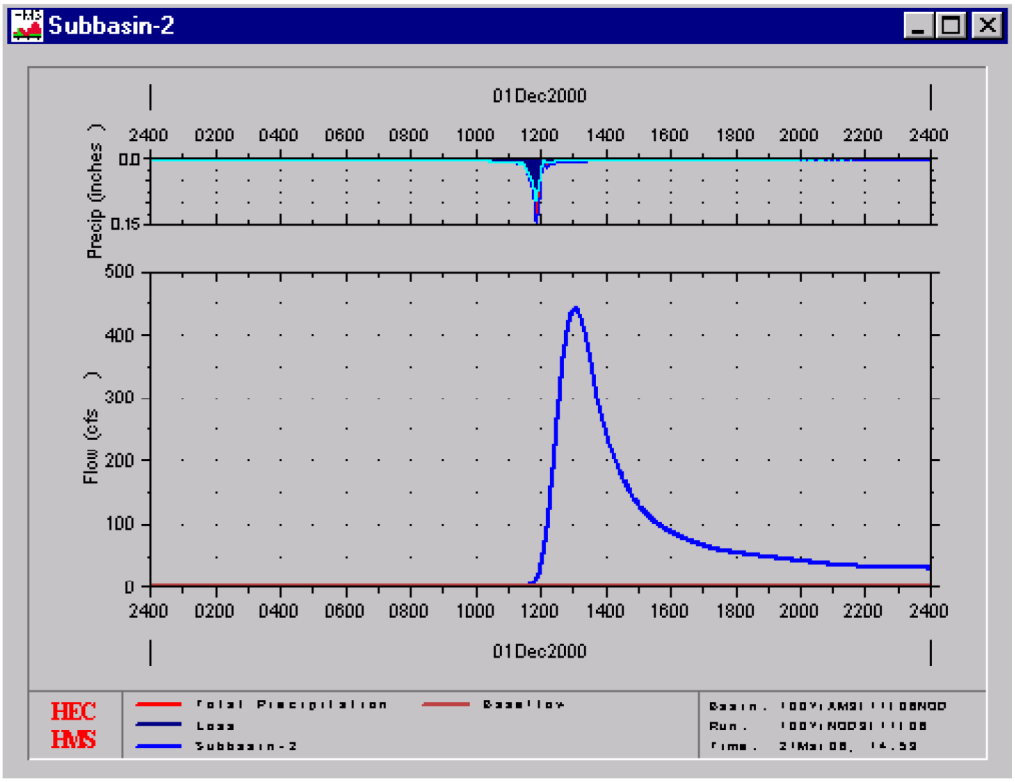

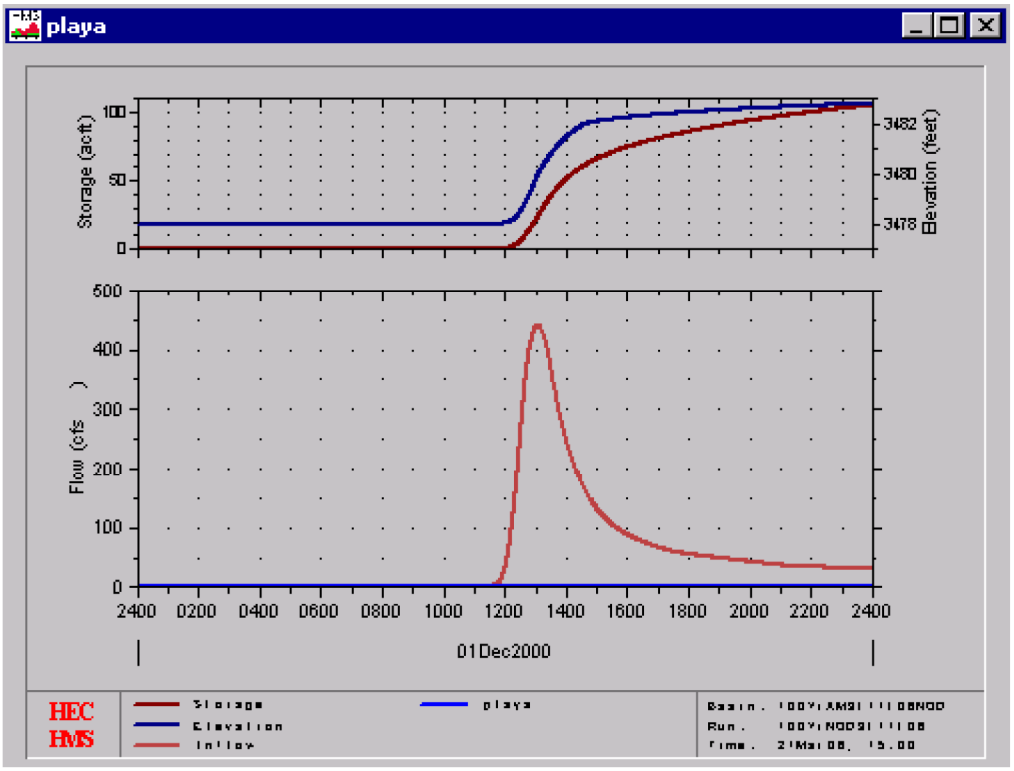

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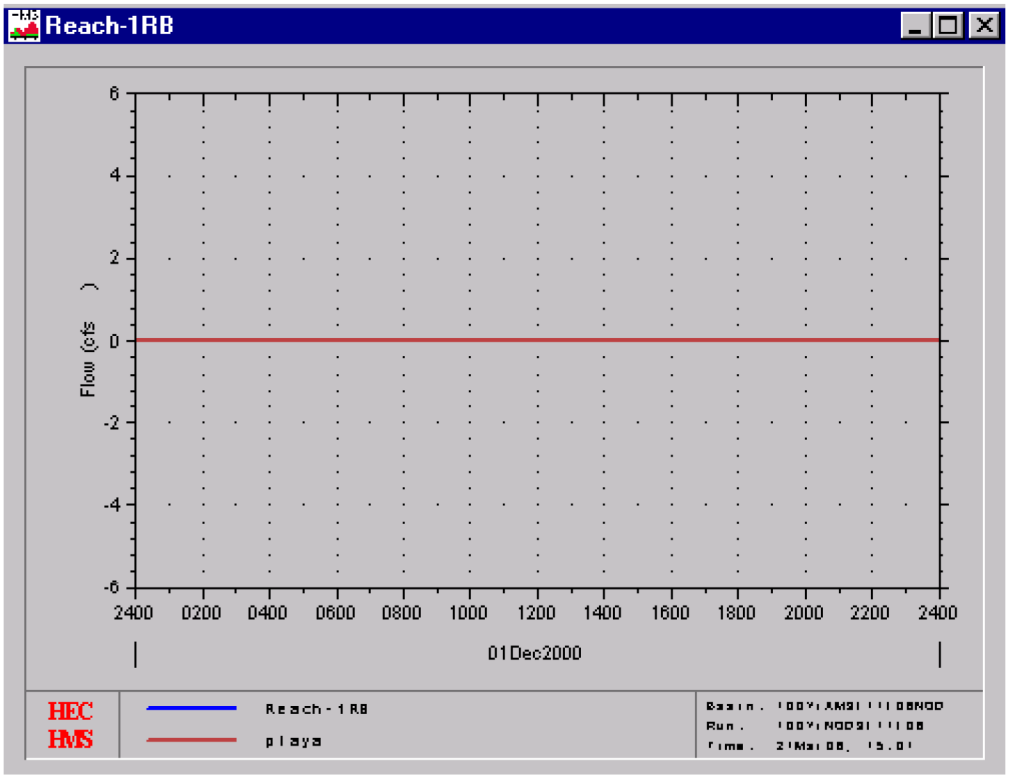

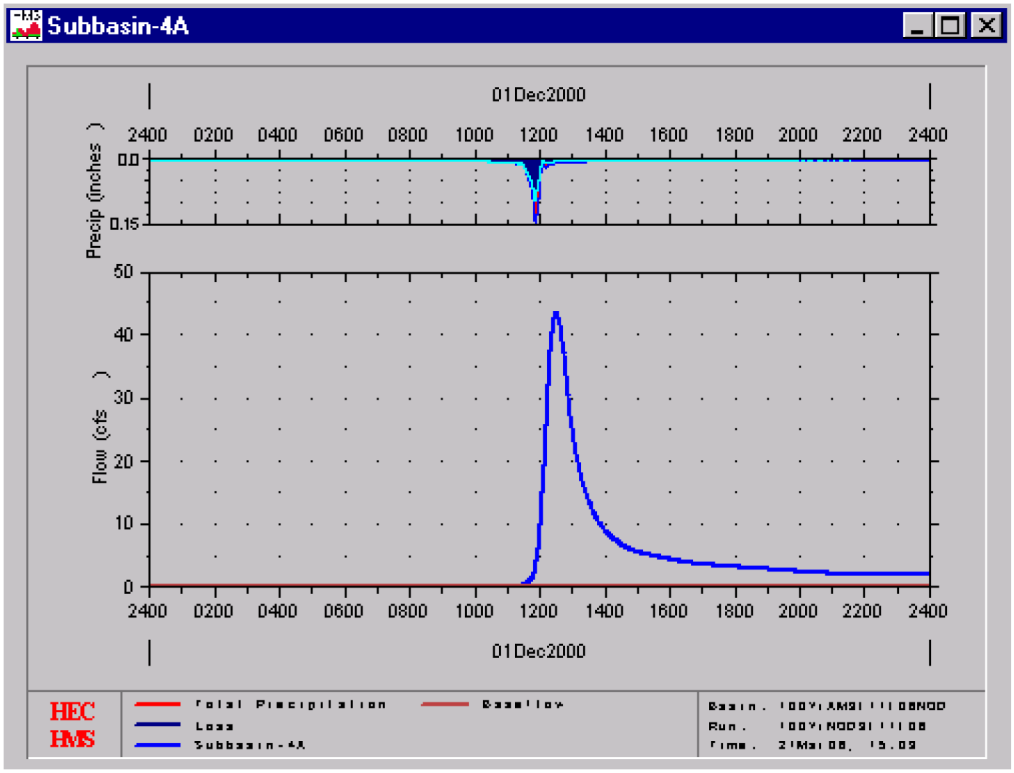

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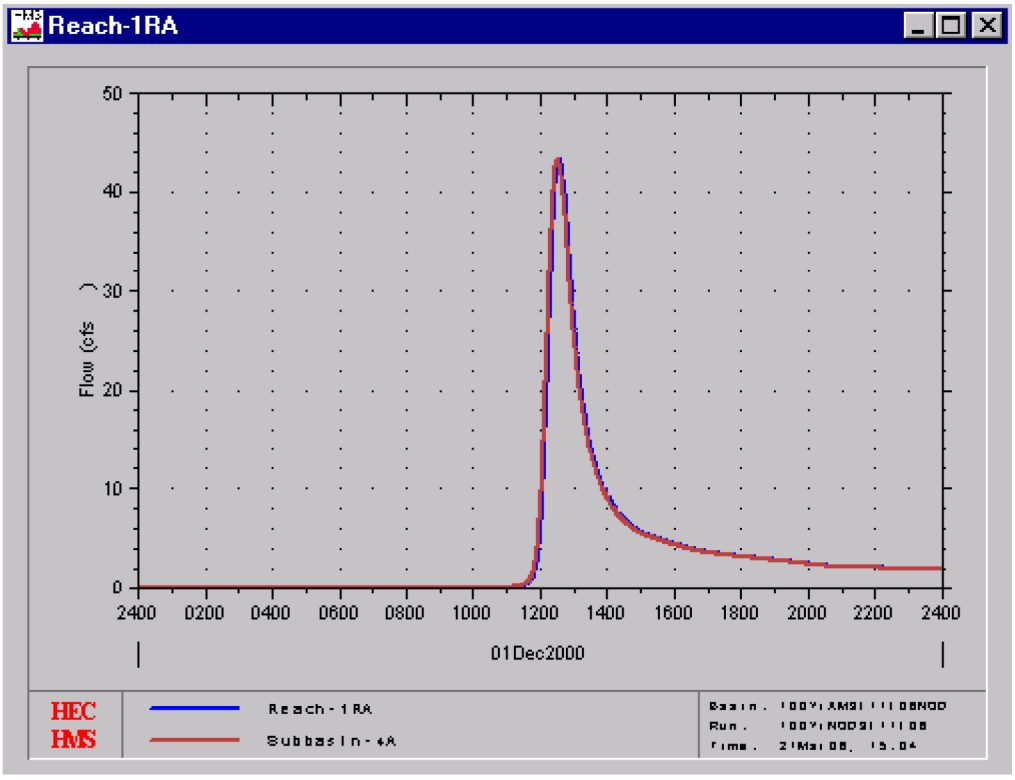

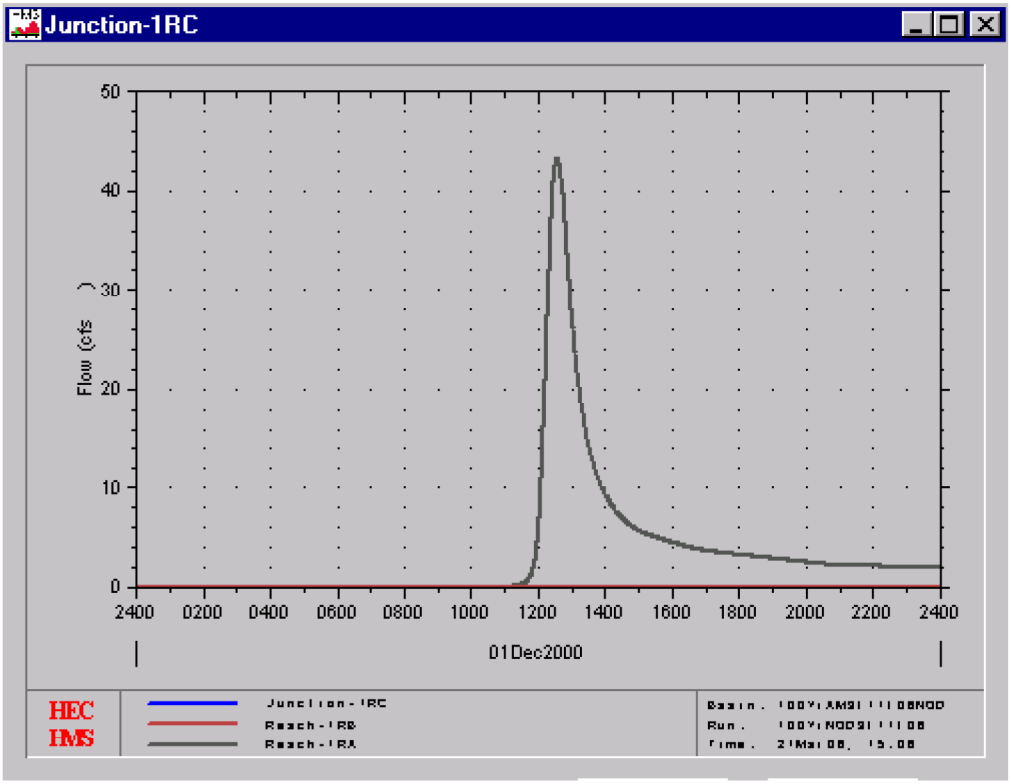

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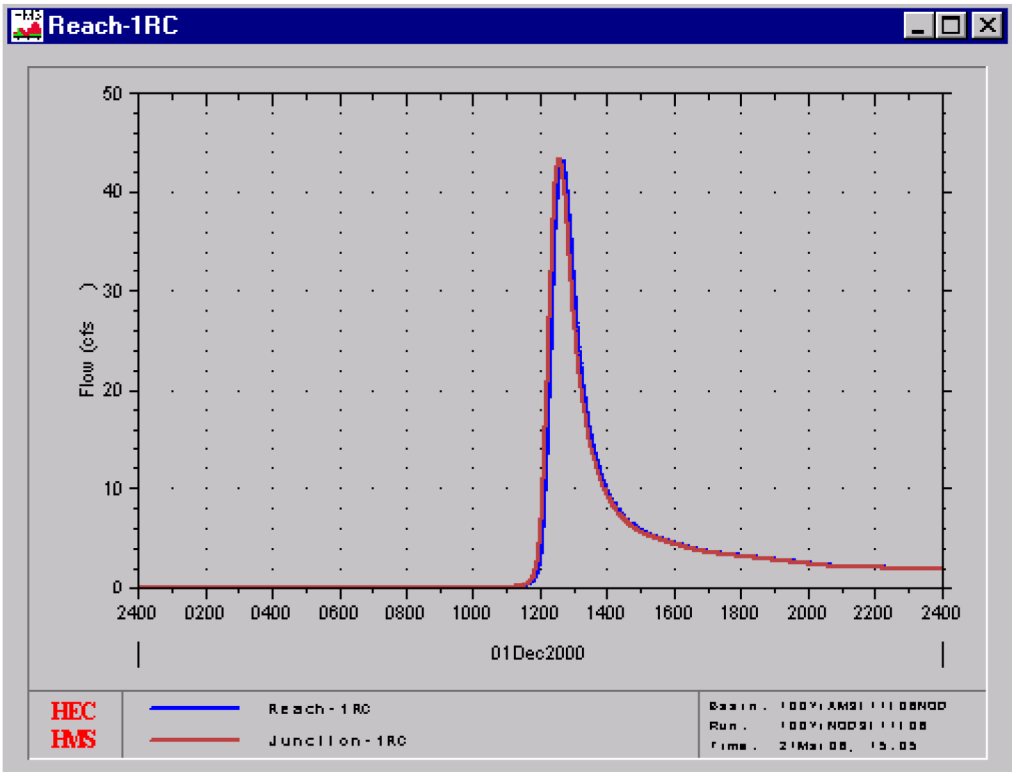

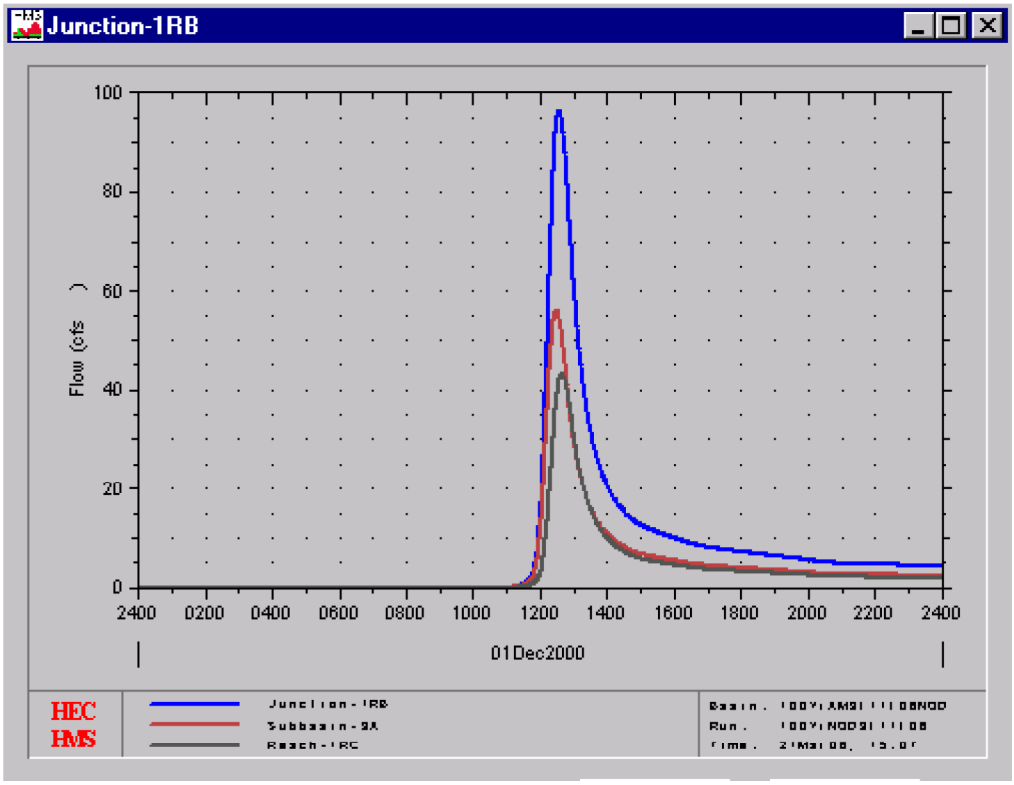

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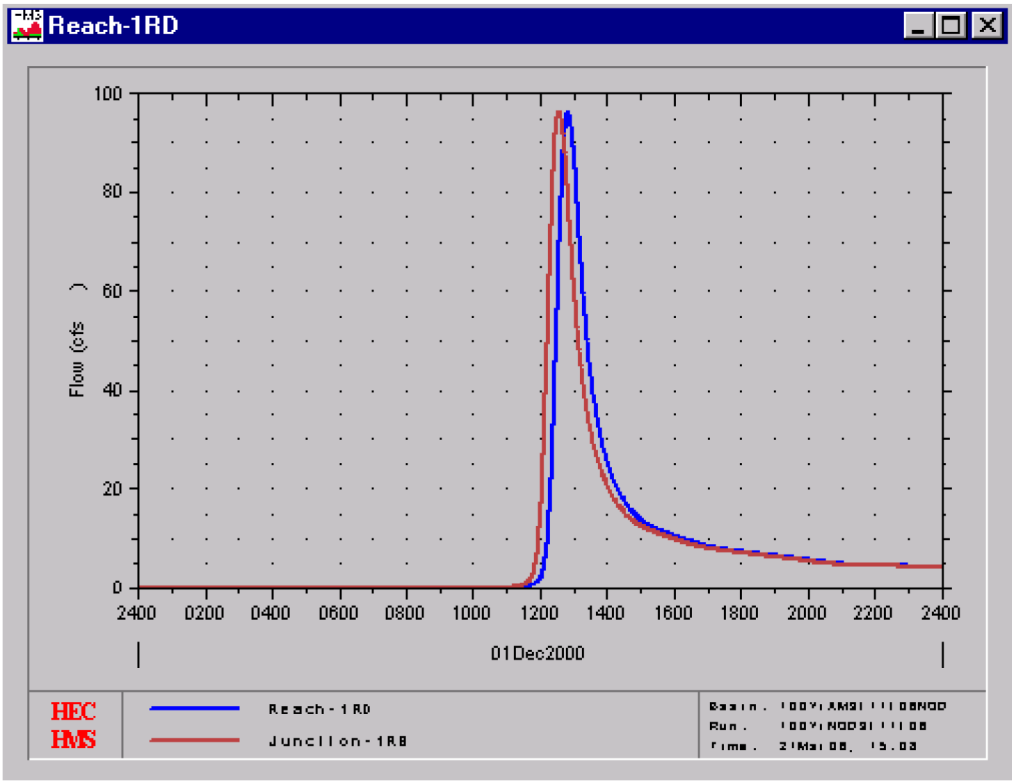

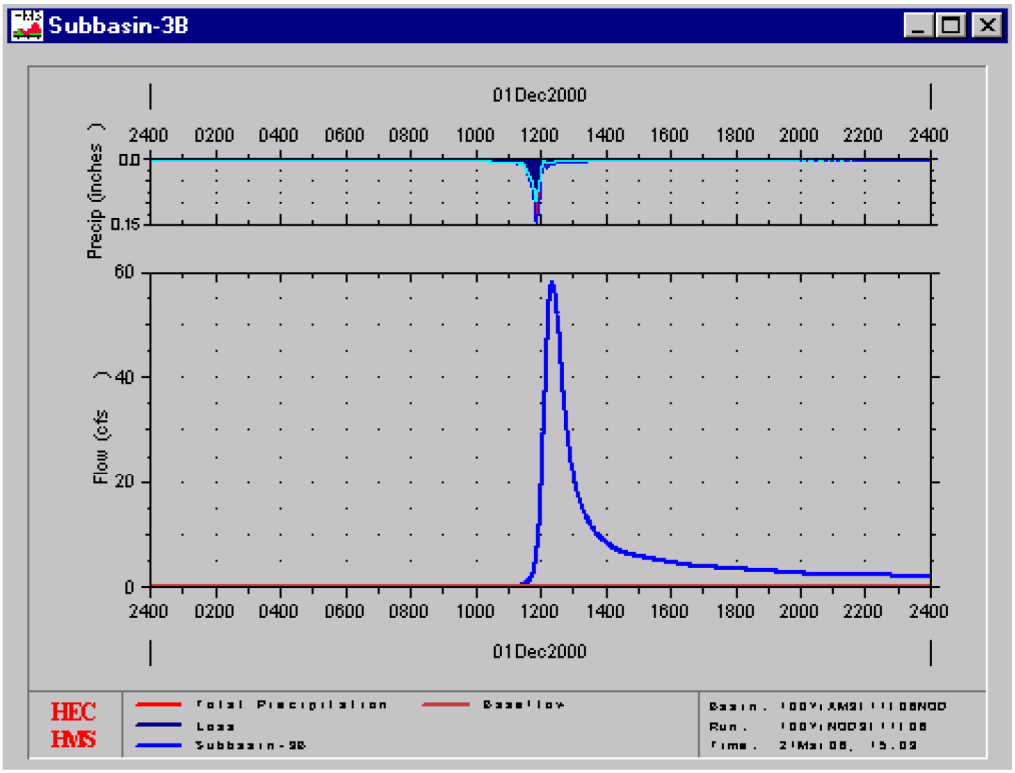

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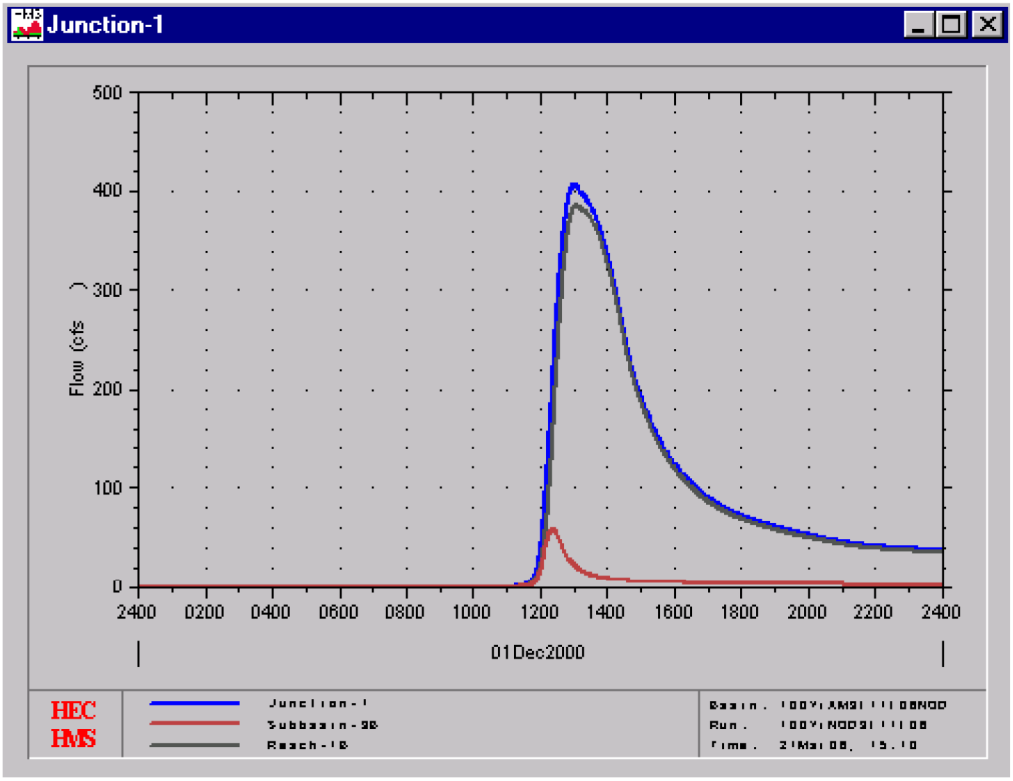

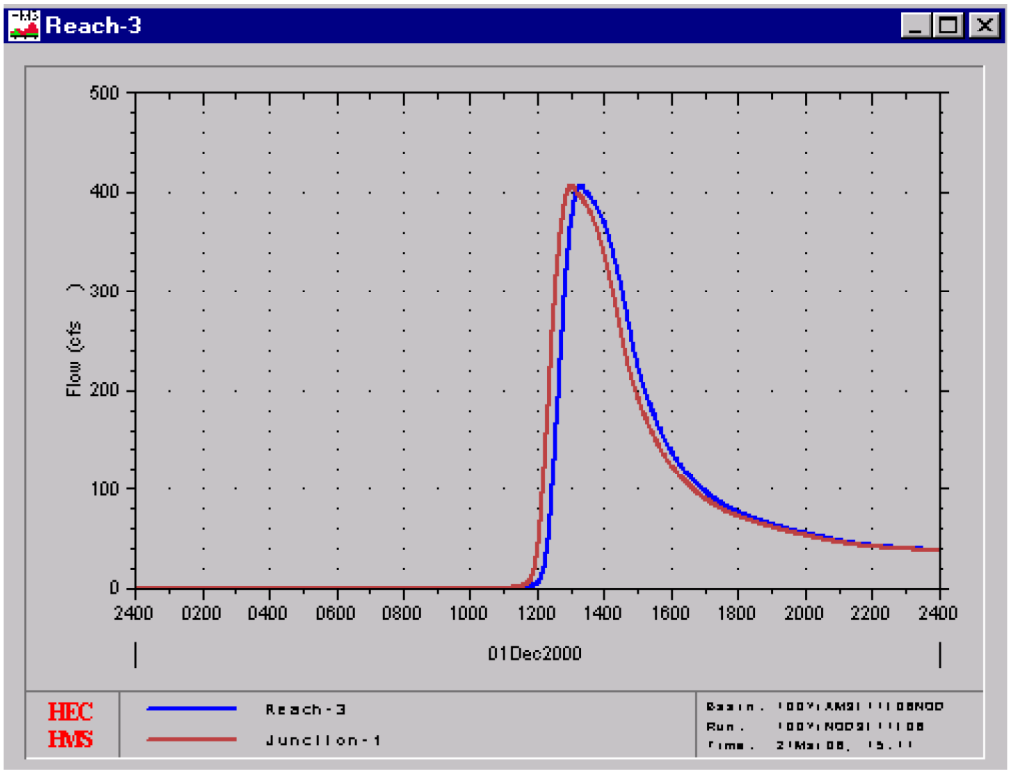

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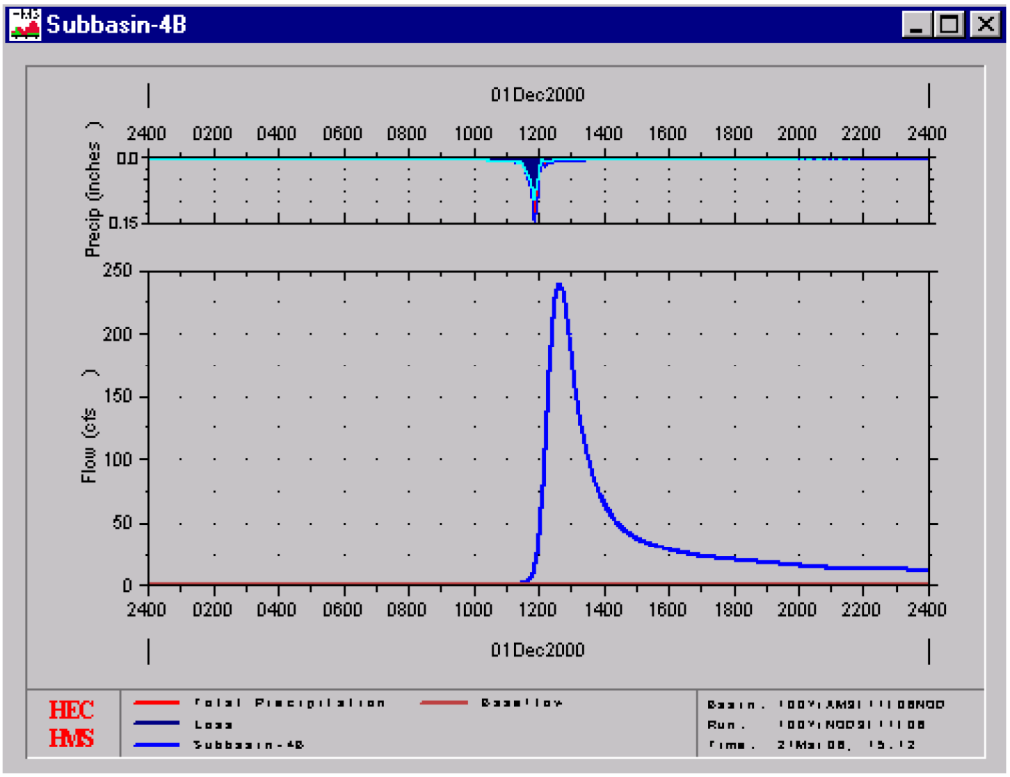

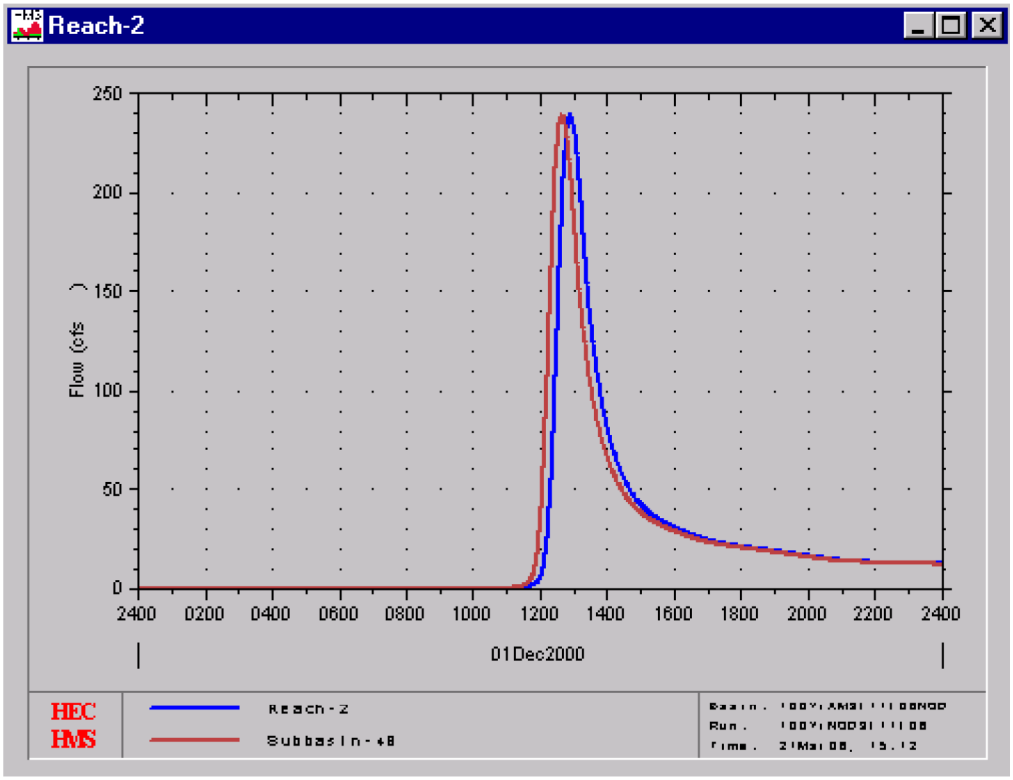

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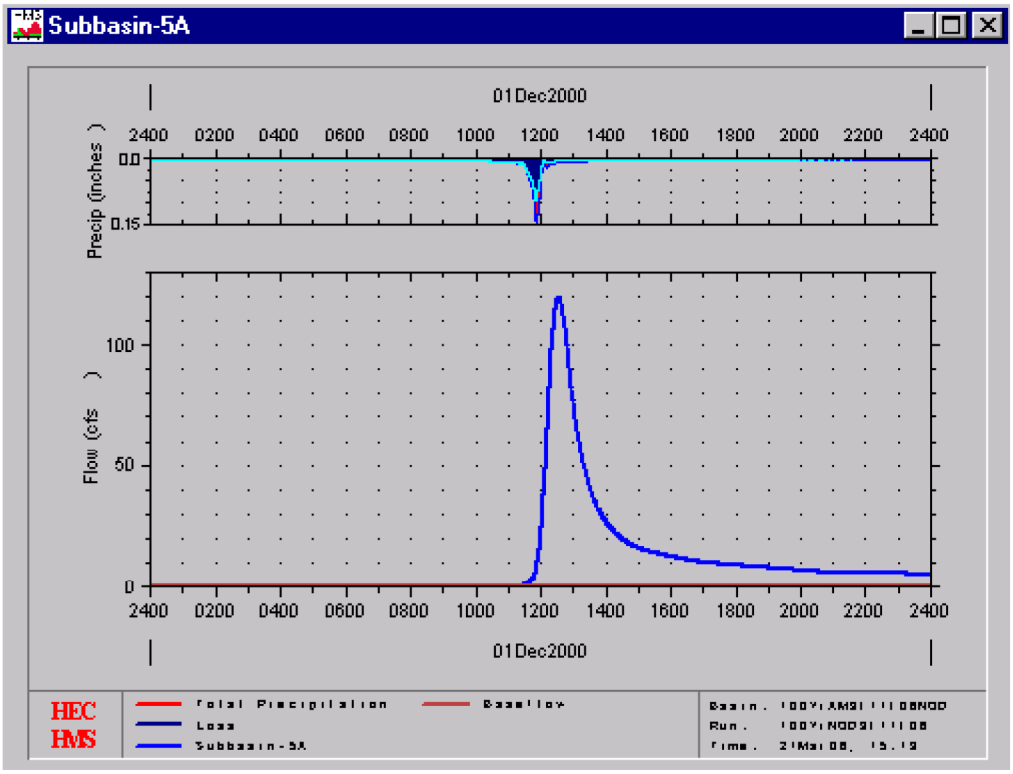

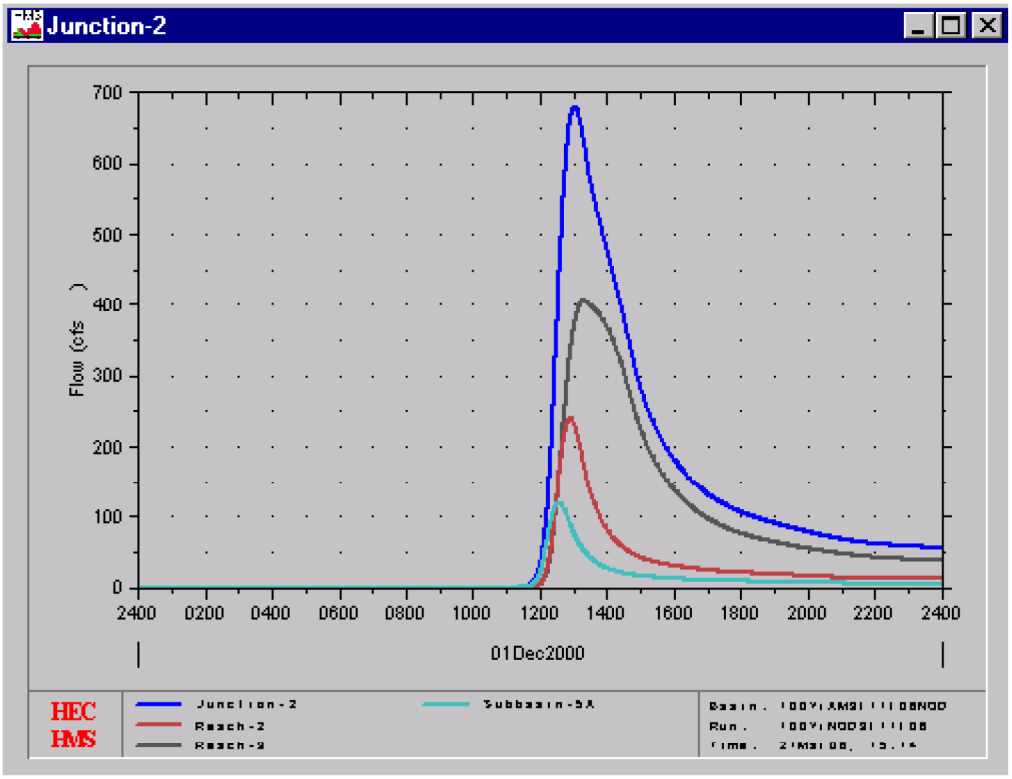

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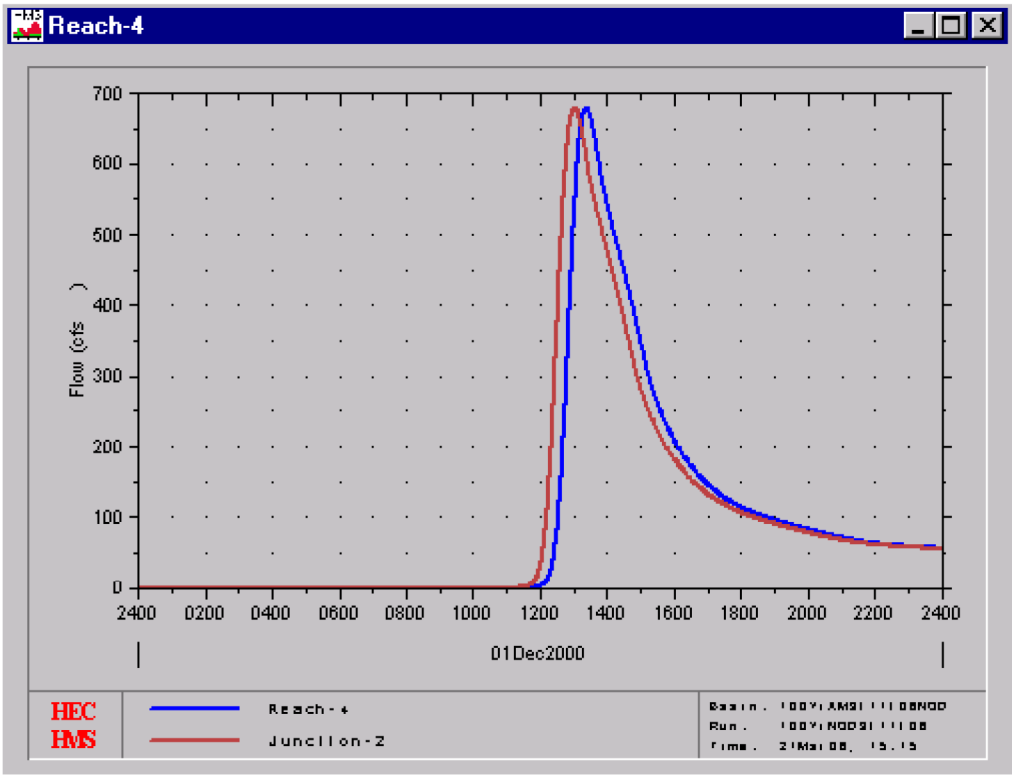

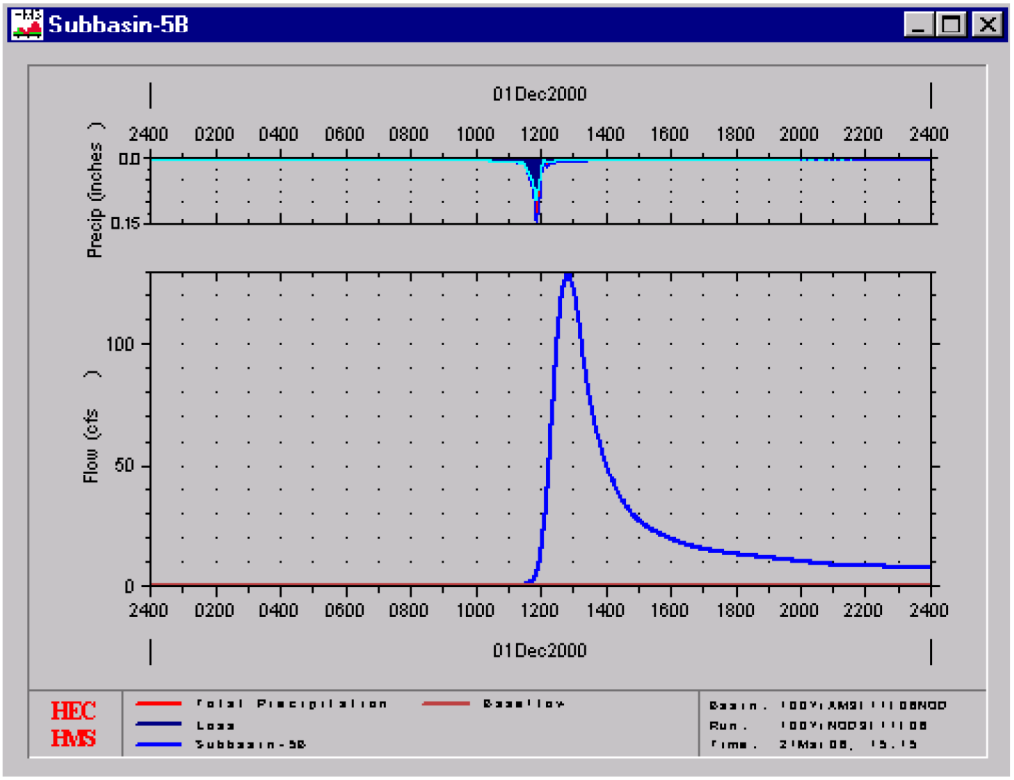

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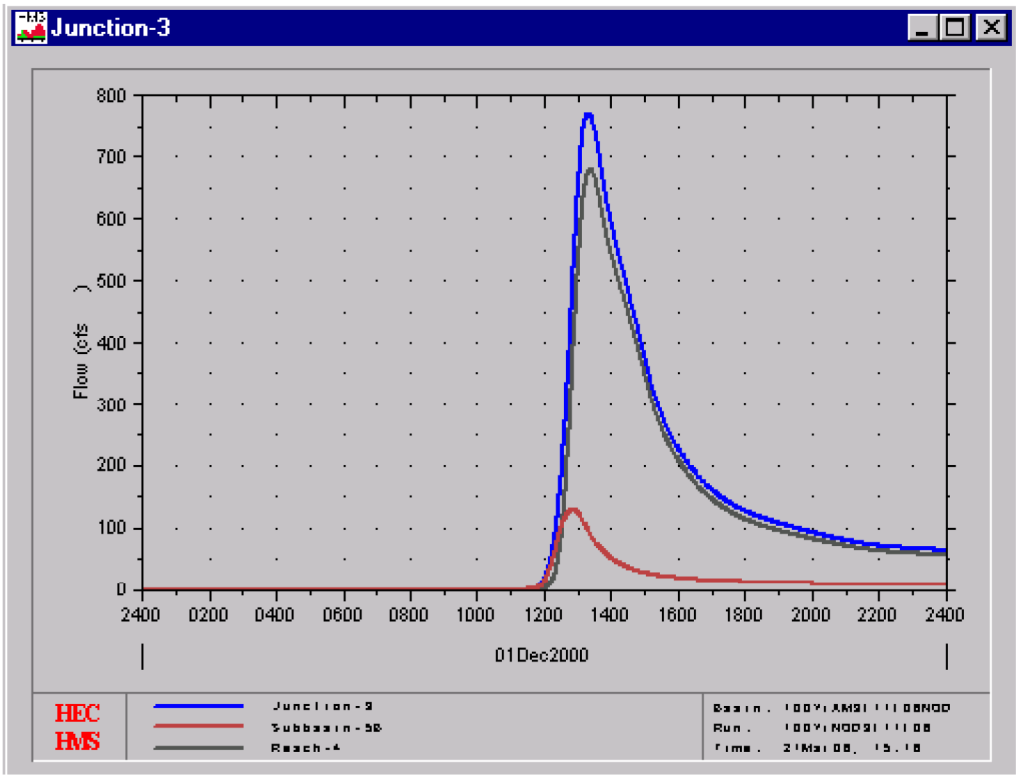

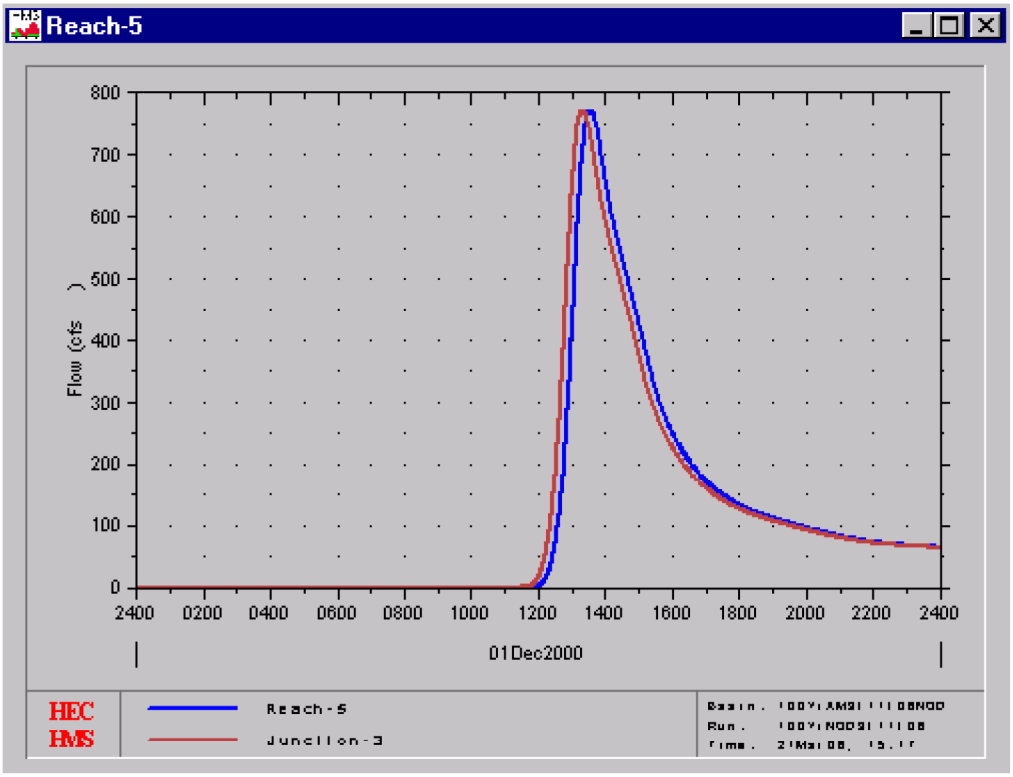

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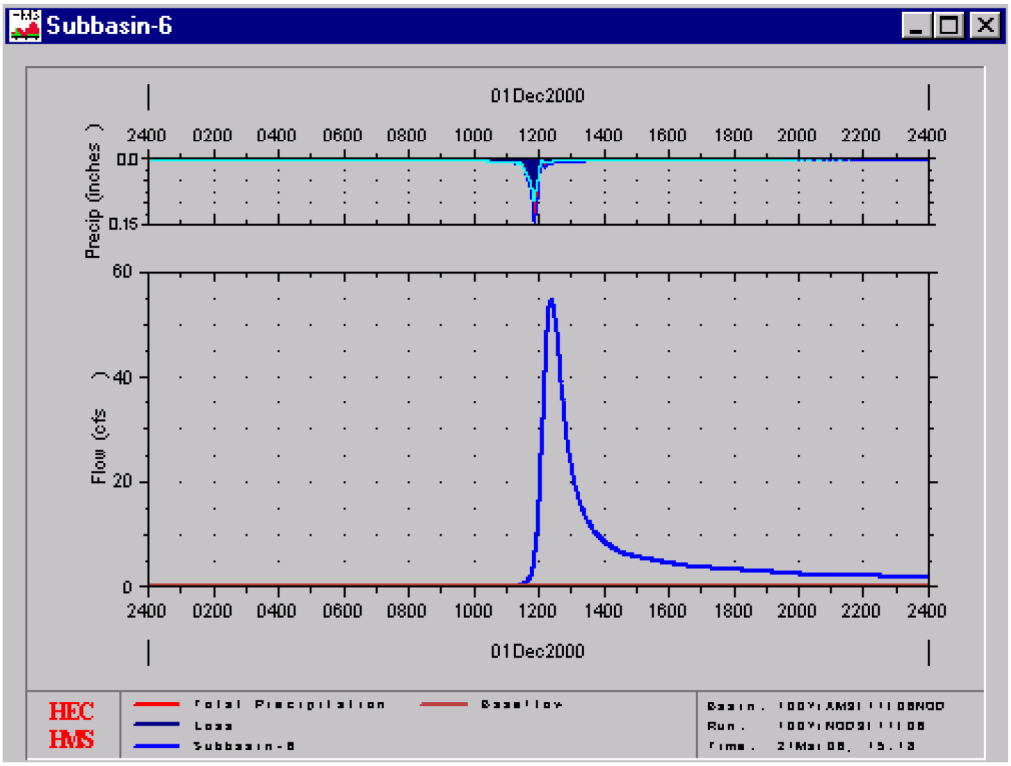

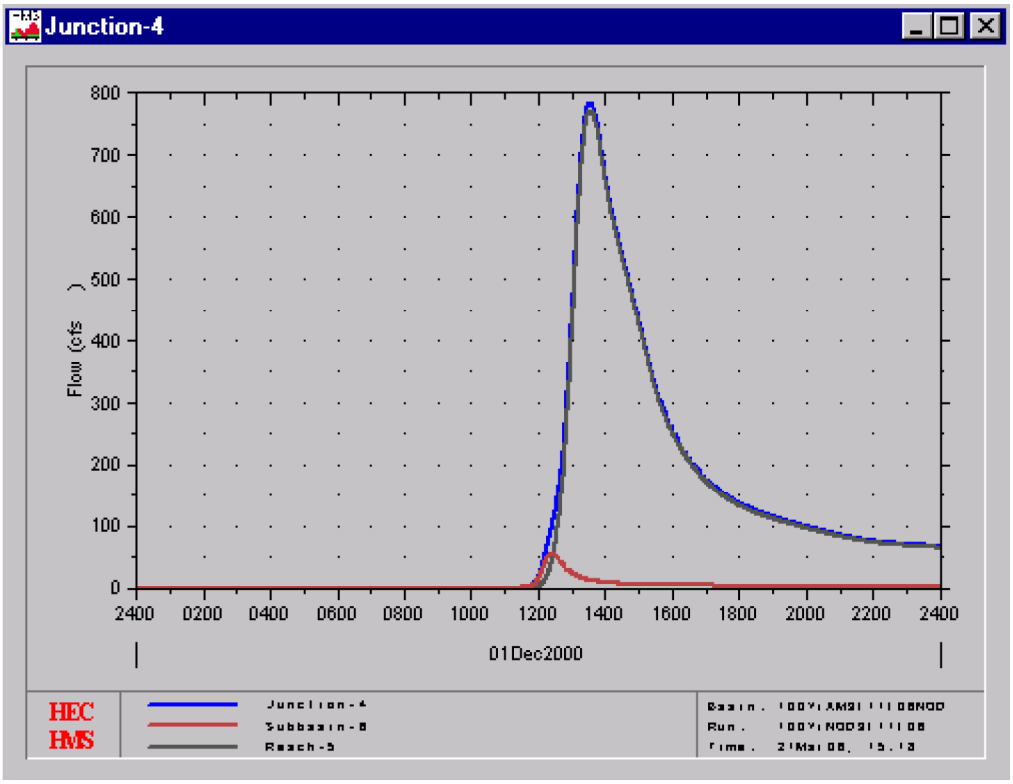

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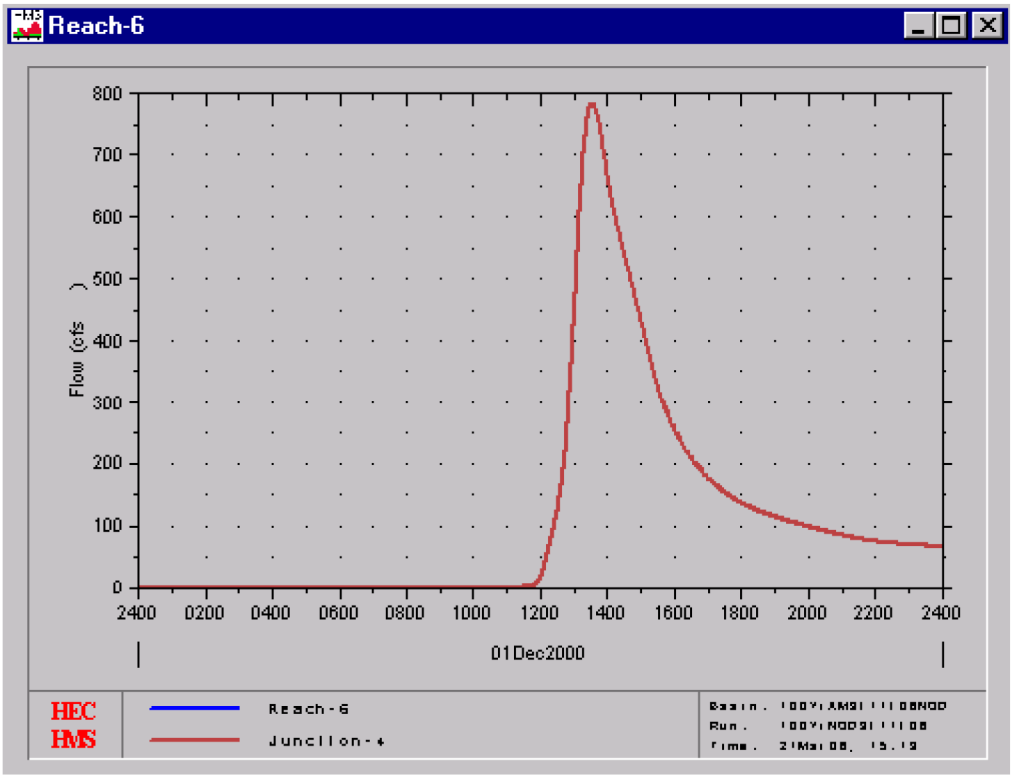
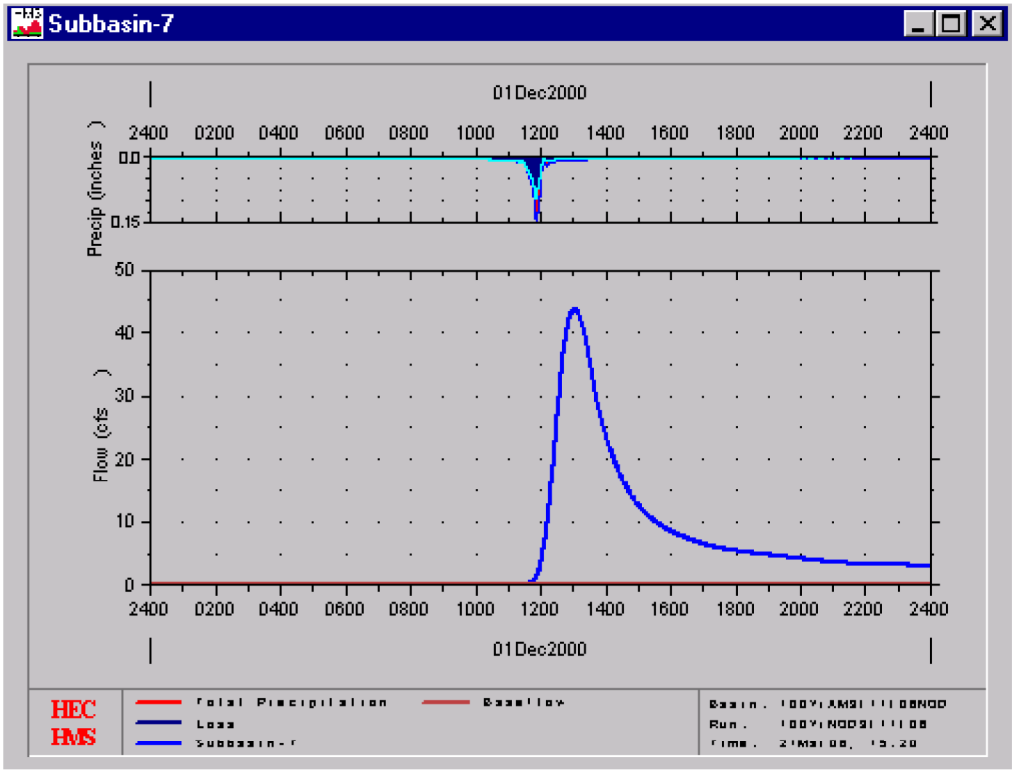
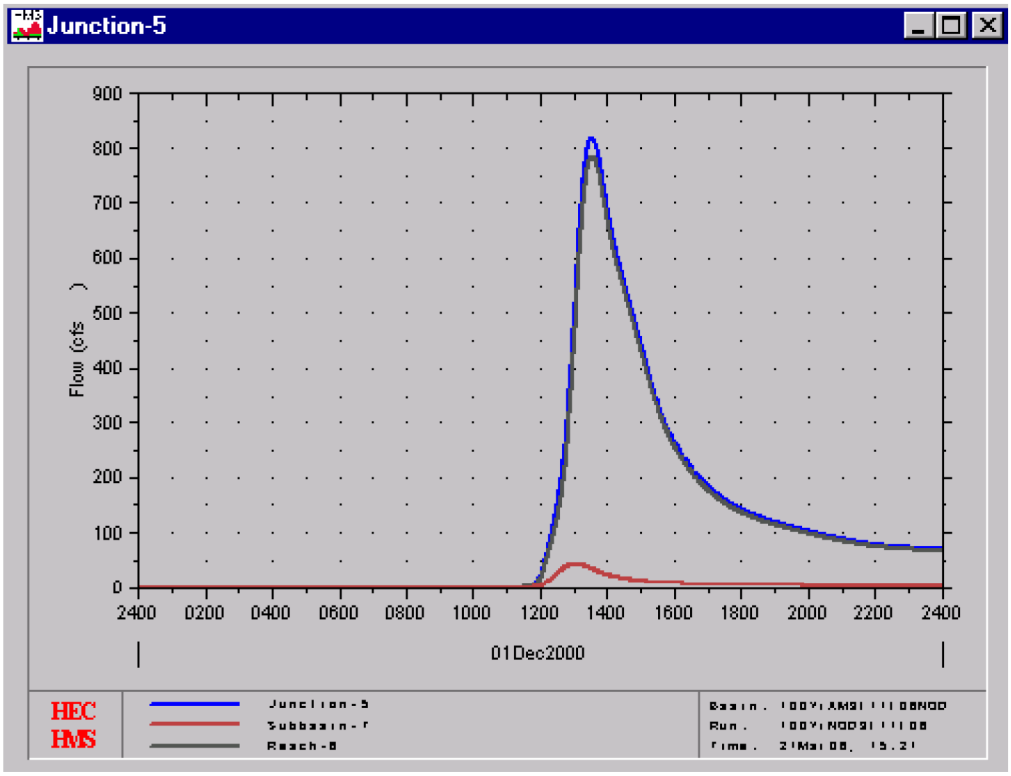




WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS



APPENDIX H

HEC-RAS MODEL FOR THE CALCULATION OF THE DEVELOPED LOW LEVEL & BYPRODUCT FACILITY 100-YEAR WATER SURFACE PROFILES

HEC-RAS Plan: 3-21-06 River: Ditch A Reach: 5

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(ft)	(ft)	(sq ft)	(ft)	
5	12674	257.00	3477.00	3478.09	3477.76	1.09	3478.13	0.002960	1.72	373.93	640.46	150.10	266.53	0.40
5	12674	257.00	3477.00	3478.09	3477.76	1.09	3478.13	0.002960	1.72	373.93	640.46	150.10	266.53	0.40
5	12674	257.00	3477.00	3478.09	3477.76	1.09	3478.13	0.002960	1.72	373.93	640.46	150.10	266.53	0.40
5	12674	257.00	3477.00	3478.09	3477.76	1.09	3478.13	0.002960	1.72	373.93	640.46	150.10	266.53	0.40
5	11337	257.00	3469.00	3470.07	3470.03	1.07	3470.31	0.016404	3.95	433.58	551.36	65.20	117.78	0.92
5	11337	257.00	3469.00	3470.07	3470.03	1.07	3470.31	0.016404	3.95	433.58	551.36	65.20	117.78	0.92
5	11337	257.00	3469.00	3470.07	3470.03	1.07	3470.31	0.016404	3.95	433.58	551.36	65.20	117.78	0.92
5	11337	257.00	3469.00	3470.07	3470.03	1.07	3470.31	0.016404	3.95	433.58	551.36	65.20	117.78	0.92
5	10937	257.00	3464.00	3465.37	3465.18	1.37	3465.56	0.008905	3.46	487.21	588.35	74.30	101.14	0.71
5	10937	257.00	3464.00	3465.37	3465.18	1.37	3465.56	0.008905	3.46	487.21	588.35	74.30	101.14	0.71
5	10937	257.00	3464.00	3465.37	3465.18	1.37	3465.56	0.008905	3.46	487.21	588.35	74.30	101.14	0.71
5	10937	257.00	3464.00	3465.37	3465.18	1.37	3465.56	0.008905	3.46	487.21	588.35	74.30	101.14	0.71
5	10288	257.00	3456.00	3456.67	3456.67	0.67	3456.87	0.022405	3.56	427.25	615.43	72.21	188.17	1.01
5	10288	257.00	3456.00	3456.67	3456.67	0.67	3456.87	0.022405	3.56	427.25	615.43	72.21	188.17	1.01
5	10288	257.00	3456.00	3456.67	3456.67	0.67	3456.87	0.022405	3.56	427.25	615.43	72.21	188.17	1.01
5	10288	257.00	3456.00	3456.67	3456.67	0.67	3456.87	0.022405	3.56	427.25	615.43	72.21	188.17	1.01
5	9690	385.00	3450.00	3451.27	3450.94	1.27	3451.34	0.004386	2.23	473.16	739.88	172.58	266.72	0.49
5	9690	385.00	3450.00	3451.27	3450.94	1.27	3451.34	0.004386	2.23	473.16	739.88	172.58	266.72	0.49
5	9690	385.00	3450.00	3451.27	3450.94	1.27	3451.34	0.004386	2.23	473.16	739.88	172.58	266.72	0.49
5	9690	385.00	3450.00	3451.27	3450.94	1.27	3451.34	0.004386	2.23	473.16	739.88	172.58	266.72	0.49
5	9009	385.00	3445.00	3446.20	3446.12	1.20	3446.41	0.014078	3.65	475.39	662.37	105.53	186.98	0.86
5	9009	385.00	3445.00	3446.20	3446.12	1.20	3446.41	0.014078	3.65	475.39	662.37	105.53	186.98	0.86
5	9009	385.00	3445.00	3446.20	3446.12	1.20	3446.41	0.014078	3.65	475.39	662.37	105.53	186.98	0.86
5	9009	385.00	3445.00	3446.20	3446.12	1.20	3446.41	0.014078	3.65	475.39	662.37	105.53	186.98	0.86
5	8130	385.00	3440.00	3441.33	3440.91	1.33	3441.39	0.003030	1.93	497.63	788.76	199.71	291.13	0.41
5	8130	385.00	3440.00	3441.33	3440.91	1.33	3441.39	0.003030	1.93	497.63	788.76	199.71	291.13	0.41
5	8130	385.00	3440.00	3441.33	3440.91	1.33	3441.39	0.003030	1.93	497.63	788.76	199.71	291.13	0.41
5	8130	385.00	3440.00	3441.33	3440.91	1.33	3441.39	0.003030	1.93	497.63	788.76	199.71	291.13	0.41
5	7717	385.00	3437.80	3438.49	3438.49	0.69	3438.71	0.021709	3.79	346.21	582.10	101.69	235.89	1.02
5	7717	385.00	3437.80	3438.49	3438.49	0.69	3438.71	0.021709	3.79	346.21	582.10	101.69	235.89	1.02
5	7717	385.00	3437.80	3438.49	3438.49	0.69	3438.71	0.021709	3.79	346.21	582.10	101.69	235.89	1.02
5	7717	385.00	3437.80	3438.49	3438.49	0.69	3438.71	0.021709	3.79	346.21	582.10	101.69	235.89	1.02
5	7253	406.00	3435.00	3436.11	3435.70	1.10	3436.14	0.001870	1.39	418.61	911.18	292.04	492.58	0.32
5	7253	406.00	3435.00	3436.11	3435.70	1.10	3436.14	0.001870	1.39	418.61	911.18	292.04	492.58	0.32
5	7253	406.00	3435.00	3436.11	3435.70	1.10	3436.14	0.001870	1.39	418.61	911.18	292.04	492.58	0.32
5	7253	406.00	3435.00	3436.11	3435.70	1.10	3436.14	0.001870	1.39	418.61	911.18	292.04	492.58	0.32
5	6343	679.00	3430.00	3430.47	3430.47	0.46	3430.67	0.021530	3.60	817.66	1287.56	188.77	469.90	1.00
5	6343	679.00	3430.00	3430.47	3430.47	0.46	3430.67	0.021530	3.60	817.66	1287.56	188.77	469.90	1.00
5	6343	679.00	3430.00	3430.47	3430.47	0.46	3430.67	0.021530	3.60	817.66	1287.56	188.77	469.90	1.00
5	6343	679.00	3430.00	3430.47	3430.47	0.46	3430.67	0.021530	3.60	817.66	1287.56	188.77	469.90	1.00
5	5363	679.00	3425.00	3426.01	3425.54	1.01	3426.04	0.001717	1.41	740.85	1478.40	481.80	737.55	0.31
5	5363	679.00	3425.00	3426.01	3425.54	1.01	3426.04	0.001717	1.41	740.85	1478.40	481.80	737.55	0.31
5	5363	679.00	3425.00	3426.01	3425.54	1.01	3426.04	0.001717	1.41	740.85	1478.40	481.80	737.55	0.31
5	5363	679.00	3425.00	3426.01	3425.54	1.01	3426.04	0.001717	1.41	740.85	1478.40	481.80	737.55	0.31
5	4221	770.00	3420.00	3420.70	3420.70	0.70	3420.95	0.020777	3.99	572.78	972.14	192.79	399.36	1.01
5	4221	770.00	3420.00	3420.70	3420.70	0.70	3420.95	0.020777	3.99	572.78	972.14	192.79	399.36	1.01
5	4221	770.00	3420.00	3420.70	3420.70	0.70	3420.95	0.020777	3.99	572.78	972.14	192.79	399.36	1.01
5	4221	770.00	3420.00	3420.70	3420.70	0.70	3420.95	0.020777	3.99	572.78	972.14	192.79	399.36	1.01
5	3489	770.00	3416.00	3416.90	3416.51	1.90	3416.94	0.002166	1.64	130.24	869.79	485.64	739.55	0.35
5	3489	770.00	3416.00	3416.90	3416.51	1.90	3416.94	0.002166	1.64	130.24	869.79	485.64	739.55	0.35
5	3489	770.00	3416.00	3416.90	3416.51	1.90	3416.94	0.002166	1.64	130.24	869.79	485.64	739.55	0.35
5	3489	770.00	3416.00	3416.90	3416.51	1.90	3416.94	0.002166	1.64	130.24	869.79	485.64	739.55	0.35
5	2989	770.00	3413.80	3414.31	3414.31	0.51	3414.50	0.022178	3.33	185.93	785.54	222.10	599.61	0.99
5	2989	770.00	3413.80	3414.31	3414.31	0.51	3414.50	0.022178	3.33	185.93	785.54	222.10	599.61	0.99
5	2989	770.00	3413.80	3414.31	3414.31	0.51	3414.50	0.022178	3.33	185.93	785.54	222.10	599.61	0.99
5	2989	770.00	3413.80	3414.31	3414.31	0.51	3414.50	0.022178	3.33	185.93	785.54	222.10	599.61	0.99
5	2774	770.00	3409.00	3413.72	3412.70	4.72	3413.73	0.000063	0.96	176.34	629.53	1107.47	453.19	0.08
5	2774	770.00	3409.00	3413.72	3412.70	4.72	3413.73	0.000063	0.96	176.34	629.53	1107.47	453.19	0.08
5	2774	770.00	3409.00	3413.72	3412.70	4.72	3413.73	0.000063	0.96	176.34	629.53	1107.47	453.19	0.08
5	2774	770.00	3409.00	3413.72	3412.70	4.72	3413.73	0.000063	0.96	176.34	629.53	1107.47	453.19	0.08
5	2773	Culvert												
5	2734	770.00	3408.90	3412.70	3412.70	3.80	3412.73	0.000267	1.66	84.13	515.36	662.35	431.23	0.16
5	2734	770.00	3408.90	3412.70	3412.70	3.80	3412.73	0.000267	1.66	84.13	515.36	662.35	431.23	0.16
5	2734	770.00	3408.90	3412.70	3412.70	3.80	3412.73	0.000267	1.66	84.13	515.36	662.35	431.23	0.16
5	2734	770.00	3408.90	3412.70	3412.70	3.80	3412.73	0.000267	1.66	84.13	515.36	662.35	431.23	0.16
5	1888	783.00	3408.00	3408.48	3408.48	0.48	3408.69	0.021962	3.65	277.69	808.19	214.56	530.50	1.01
5	1888	783.00	3408.00	3408.48	3408.48	0.48	3408.69	0.021962	3.65	277.69	808.19	214.56	530.50	1.01

HEC-RAS Plan: 3-21-06 River: Ditch A Reach: 5 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G. Elev	E.G. Slope	Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(ft)	(ft)	(sq ft)	(ft)	
5	1888	783.00	3408.00	3408.48	3408.48	0.48	3408.69	0.021962	3.65	277.69	808.19	214.56	530.50	1.01
5	1868	783.00	3408.00	3408.48	3408.48	0.48	3408.69	0.021962	3.65	277.69	808.19	214.56	530.50	1.01
5	1060	818.00	3402.70	3404.50	3403.76	1.80	3404.54	0.001656	1.50	614.45	1554.00	511.24	626.40	0.31
5	1060	818.00	3402.70	3405.00	3403.76	2.30	3405.01	0.000442	0.89	540.97	1554.00	921.10	1013.03	0.16
5	1060	818.00	3402.70	3406.00	3403.76	3.30	3406.00	0.000039	0.41	394.00	1554.00	2007.61	1160.00	0.05
5	1060	818.00	3402.70	3407.00	3403.76	4.30	3407.00	0.000009	0.26	247.00	1554.00	3241.11	1307.00	0.03

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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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
```

PROJECT DATA
Project Title: WCS
Project File : FloodPlain.prj
Run Date and Time: 3/21/06 9:23:32 AM

Project in English units

PLAN DATA

Plan Title: Plan 33
Plan File : D:\program files\WCS\FloodPlain.p33

Geometry Title: 1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g03

Flow Title : 100YrAM3-11-06ManyNOD
Flow File : D:\program files\WCS\FloodPlain.f24

Plan Summary Information:
Number of: Cross Sections = 18 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 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: Mixed Flow

FLOW DATA

Flow Title: 100YrAM3-11-06ManyNOD
Flow File : D:\program files\WCS\FloodPlain.f24

Flow Data (cfs)

River	Reach	RS	100 Yr.-WS3404.5	100 Yr.-WS3405	100 Yr.-WS3406	100 Yr.-WS3407
Ditch A	5	12674	257	257	257	257
Ditch A	5	9690	385	385	385	385
Ditch A	5	7253	406	406	406	406
Ditch A	5	6343	679	679	679	679
Ditch A	5	4221	770	770	770	770
Ditch A	5	1888	783	783	783	783
Ditch A	5	1060	818	818	818	818

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Ditch A	5	100 Yr.-WS3404.5	Critical	Known WS = 3404.5
Ditch A	5	100 Yr.-WS3405	Critical	Known WS = 3405
Ditch A	5	100 Yr.-WS3406	Critical	Known WS = 3406
Ditch A	5	100 Yr.-WS3407	Critical	Known WS = 3407

GEOMETRY DATA

Geometry Title: 1-20-04SecRemoved
Geometry File : D:\program files\WCS\FloodPlain.g03

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 12674

INPUT
Description: Sta. 12674
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3482	380	3478	560	3477	635	3478	761	3480
964	3482								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	380	.033	635	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
380	635	1206	1337	1433	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

			Left OB	Channel	Right OB
E.G. Elev (ft)	3478.13	Element			
Vel Head (ft)	0.05	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3478.09	Reach Len. (ft)	1206.00	1337.00	1433.00
Crit W.S. (ft)	3477.76	Flow Area (sq ft)	0.26	149.60	0.24
E.G. Slope (ft/ft)	0.002960	Area (sq ft)	0.26	149.60	0.24
Q Total (cfs)	257.00	Flow (cfs)	0.08	256.85	0.07
Top Width (ft)	266.53	Top Width (ft)	6.07	255.00	5.46
Vel Total (ft/s)	1.71	Avg. Vel. (ft/s)	0.30	1.72	0.30
Max Chl Dpth (ft)	1.09	Hydr. Depth (ft)	0.04	0.59	0.04
Conv. Total (cfs)	4723.4	Conv. (cfs)	1.5	4720.6	1.3
Length Wtd. (ft)	1336.99	Wetted Per. (ft)	6.07	255.01	5.46
Min Ch El (ft)	3477.00	Shear (lb/sq ft)	0.01	0.11	0.01
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.19	0.00
Frctn Loss (ft)	7.80	Cum Volume (acre-ft)	9.36	59.51	1.69
C & E Loss (ft)	0.02	Cum SA (acres)	11.60	96.79	1.53

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

Warning: The energy loss was greater than 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: Ditch A
REACH: 5 RS: 11337

INPUT
Description: Sta. 11337
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3477	315	3474	392	3472	435	3470	499	3469
550	3470	591	3472	694	3474				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	435	.033	550	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
435	550	545	400	332	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

			Left OB	Channel	Right OB
E.G. Elev (ft)	3470.31	Element			

Vel Head (ft)	0.24	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3470.07	Reach Len. (ft)	545.00	400.00	332.00
Crit W.S. (ft)	3470.03	Flow Area (sq ft)	0.05	65.11	0.04
E.G. Slope (ft/ft)	0.016404	Area (sq ft)	0.05	65.11	0.04
Q Total (cfs)	257.00	Flow (cfs)	0.03	256.95	0.03
Top Width (ft)	117.78	Top Width (ft)	1.42	115.00	1.36
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)	0.59	3.95	0.59
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)	0.03	0.57	0.03
Conv. Total (cfs)	2006.6	Conv. (cfs)	0.2	2006.2	0.2
Length Wtd. (ft)	400.00	Wetted Per. (ft)	1.42	115.02	1.36
Min Ch El (ft)	3469.00	Shear (lb/sq ft)	0.03	0.58	0.03
Alpha	1.00	Stream Power (lb/ft s)	0.02	2.29	0.02
Frctn Loss (ft)	4.72	Cum Volume (acre-ft)	9.35	56.22	1.69
C & E Loss (ft)	0.02	Cum SA (acres)	11.50	91.11	1.42

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: Ditch A
REACH: 5 RS: 10937

INPUT
Description: Sta. 10937
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3470	351	3468	428	3467	465	3466	536	3464
543	3464	609	3466	683	3468	811	3472		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	428	.033	609	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
428	609	729	649	445	.1 .3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3465.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.033	
W.S. Elev (ft)	3465.37	Reach Len. (ft)	729.00	649.00	445.00
Crit W.S. (ft)	3465.18	Flow Area (sq ft)		74.30	
E.G. Slope (ft/ft)	0.008905	Area (sq ft)		74.30	

Q Total (cfs)	257.00	Flow (cfs)		257.00	
Top Width (ft)	101.14	Top Width (ft)		101.14	
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)		3.46	
Max Chl Dpth (ft)	1.37	Hydr. Depth (ft)		0.73	
Conv. Total (cfs)	2723.5	Conv. (cfs)		2723.5	
Length Wtd. (ft)	649.00	Wetted Per. (ft)		101.18	
Min Ch El (ft)	3464.00	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		1.41	
Frctn Loss (ft)	8.70	Cum Volume (acre-ft)	9.35	55.58	1.69
C & E Loss (ft)	0.00	Cum SA (acres)	11.49	90.12	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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 10288

INPUT
Description: Sta. 10288
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3464	177	3462	238	3460	298	3458	493	3456
519	3456	662	3457	778	3457.1	857	3458	903	3460
947	3462	989	3464						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	298	.033	857	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
298	857	552	598	633	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3456.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.033	
W.S. Elev (ft)	3456.67	Reach Len. (ft)	552.00	598.00	633.00
Crit W.S. (ft)	3456.67	Flow Area (sq ft)		72.21	
E.G. Slope (ft/ft)	0.022405	Area (sq ft)		72.21	
Q Total (cfs)	257.00	Flow (cfs)		257.00	
Top Width (ft)	188.17	Top Width (ft)		188.17	

Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)		3.56	
Max Chl Dpth (ft)	0.67	Hydr. Depth (ft)		0.38	
Conv. Total (cfs)	1717.0	Conv. (cfs)		1717.0	
Length Wtd. (ft)	598.00	Wetted Per. (ft)		188.18	
Min Ch El (ft)	3456.00	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)		1.91	
Frctn Loss (ft)	4.35	Cum Volume (acre-ft)	9.35	54.49	1.69
C & E Loss (ft)	0.04	Cum SA (acres)	11.49	87.96	1.41

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: Ditch A
REACH: 5 RS: 9690

INPUT
Description: Sta. 9690
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3454.5	202	3454	381	3452	632	3450	638	3450
799	3452	897	3454	1010	3458				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	381	.033	799	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
381	799	639	681	658	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3451.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.033	
W.S. Elev (ft)	3451.27	Reach Len. (ft)	639.00	681.00	658.00
Crit W.S. (ft)	3450.94	Flow Area (sq ft)		172.58	
E.G. Slope (ft/ft)	0.004386	Area (sq ft)		172.58	

Q Total (cfs)	385.00	Flow (cfs)		385.00	
Top Width (ft)	266.72	Top Width (ft)		266.72	
Vel Total (ft/s)	2.23	Avg. Vel. (ft/s)		2.23	
Max Chl Dpth (ft)	1.27	Hydr. Depth (ft)		0.65	
Conv. Total (cfs)	5813.2	Conv. (cfs)		5813.2	
Length Wtd. (ft)	681.00	Wetted Per. (ft)		266.73	
Min Ch El (ft)	3450.00	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.40	
Frctn Loss (ft)	4.92	Cum Volume (acre-ft)	9.35	52.81	1.69
C & E Loss (ft)	0.01	Cum SA (acres)	11.49	84.84	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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 9009

INPUT
Description: Sta. 9009
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3452	203	3450	325	3448	492	3446	596	3445
637	3446	892	3448	1007	3450	1124	3452		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	325	.033	892	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
325	892	898	879	794	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3446.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.033	
W.S. Elev (ft)	3446.20	Reach Len. (ft)	898.00	879.00	794.00
Crit W.S. (ft)	3446.12	Flow Area (sq ft)		105.53	
E.G. Slope (ft/ft)	0.014078	Area (sq ft)		105.53	
Q Total (cfs)	385.00	Flow (cfs)		385.00	
Top Width (ft)	186.98	Top Width (ft)		186.98	

Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)		3.65	
Max Chl Dpth (ft)	1.20	Hydr. Depth (ft)		0.56	
Conv. Total (cfs)	3244.9	Conv. (cfs)		3244.9	
Length Wtd. (ft)	879.00	Wetted Per. (ft)		187.00	
Min Ch El (ft)	3445.00	Shear (lb/sq ft)		0.50	
Alpha	1.00	Stream Power (lb/ft s)		1.81	
Frctn Loss (ft)	4.97	Cum Volume (acre-ft)	9.35	50.63	1.69
C & E Loss (ft)	0.04	Cum SA (acres)	11.49	81.29	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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 8130

INPUT
Description: Sta. 8130
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3448	303	3444	419	3442	654	3440	663	3440
852	3442	995	3444	1104	3446				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	419	.033	852	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
419	852	399	413	456	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3441.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.033	
W.S. Elev (ft)	3441.33	Reach Len. (ft)	399.00	413.00	456.00
Crit W.S. (ft)	3440.91	Flow Area (sq ft)		199.71	
E.G. Slope (ft/ft)	0.003030	Area (sq ft)		199.71	
Q Total (cfs)	385.00	Flow (cfs)		385.00	
Top Width (ft)	291.13	Top Width (ft)		291.13	
Vel Total (ft/s)	1.93	Avg. Vel. (ft/s)		1.93	
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)		0.69	
Conv. Total (cfs)	6994.2	Conv. (cfs)		6994.2	

Length Wtd. (ft)	413.00	Wetted Per. (ft)		291.14	
Min Ch El (ft)	3440.00	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	2.65	Cum Volume (acre-ft)	9.35	47.55	1.69
C & E Loss (ft)	0.02	Cum SA (acres)	11.49	76.47	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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 7717

INPUT
Description: Sta 7717
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3442	233	3440	383	3438	492	3437.8	510	3438
657	3439	747	3440	879	3442				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	233	.033	747	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
233	747	444	464	510	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3438.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.033	
W.S. Elev (ft)	3438.49	Reach Len. (ft)	444.00	464.00	510.00
Crit W.S. (ft)	3438.49	Flow Area (sq ft)		101.69	
E.G. Slope (ft/ft)	0.021709	Area (sq ft)		101.69	
Q Total (cfs)	385.00	Flow (cfs)		385.00	
Top Width (ft)	235.89	Top Width (ft)		235.89	
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)		3.79	
Max Chl Dpth (ft)	0.69	Hydr. Depth (ft)		0.43	
Conv. Total (cfs)	2613.0	Conv. (cfs)		2613.0	
Length Wtd. (ft)	464.00	Wetted Per. (ft)		235.89	
Min Ch El (ft)	3437.80	Shear (lb/sq ft)		0.58	

Alpha	1.00	Stream Power (lb/ft s)		2.21	
Frctn Loss (ft)	2.02	Cum Volume (acre-ft)	9.35	46.12	1.69
C & E Loss (ft)	0.06	Cum SA (acres)	11.49	73.97	1.41

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: Ditch A
REACH: 5 RS: 7253

INPUT
Description: Sta. 7253
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3438	109	3438.7	321	3438	424	3436	668	3435
906	3436	1005	3438	1200	3440	1365	3442		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	424	.033	906	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
424	906	756	910	980	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3436.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3436.11	Reach Len. (ft)	756.00	910.00	980.00
Crit W.S. (ft)	3435.70	Flow Area (sq ft)	0.28	291.48	0.27
E.G. Slope (ft/ft)	0.001870	Area (sq ft)	0.28	291.48	0.27
Q Total (cfs)	406.00	Flow (cfs)	0.08	405.85	0.07
Top Width (ft)	492.58	Top Width (ft)	5.39	482.00	5.18
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)	0.27	1.39	0.27
Max Chl Dpth (ft)	1.10	Hydr. Depth (ft)	0.05	0.60	0.05
Conv. Total (cfs)	9389.2	Conv. (cfs)	1.8	9385.8	1.7

Length Wtd. (ft)	909.99	Wetted Per. (ft)	5.39	482.00	5.19
Min Ch El (ft)	3435.00	Shear (lb/sq ft)	0.01	0.07	0.01
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.10	0.00
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	9.35	44.03	1.68
C & E Loss (ft)	0.02	Cum SA (acres)	11.46	70.15	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.

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 6343

INPUT
Description: Sta. 6343
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3434	346	3433	663	3432	732	3431	860	3430.2
981	3430	1273	3430	1320	3431.5	1566	3432		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	663	.033	1320	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
663	1320	767	980	1051	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3430.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.033	
W.S. Elev (ft)	3430.47	Reach Len. (ft)	767.00	980.00	1051.00
Crit W.S. (ft)	3430.47	Flow Area (sq ft)		188.77	
E.G. Slope (ft/ft)	0.021530	Area (sq ft)		188.77	
Q Total (cfs)	679.00	Flow (cfs)		679.00	
Top Width (ft)	469.90	Top Width (ft)		469.90	
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)		3.60	
Max Chl Dpth (ft)	0.46	Hydr. Depth (ft)		0.40	
Conv. Total (cfs)	4627.5	Conv. (cfs)		4627.5	
Length Wtd. (ft)	980.00	Wetted Per. (ft)		469.91	
Min Ch El (ft)	3430.00	Shear (lb/sq ft)		0.54	

Alpha	1.00	Stream Power (lb/ft s)		1.94	
Frctn Loss (ft)	4.09	Cum Volume (acre-ft)	9.35	39.01	1.68
C & E Loss (ft)	0.05	Cum SA (acres)	11.41	60.20	1.32

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: Ditch A
REACH: 5 RS: 5363

INPUT
Description: Sta. 5363
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3432	282	3430	550	3428	742	3426	885	3425
1097	3425	1476	3426	1877	3428	1966	3428	2160	3430

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	742	.033	1476	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
742	1476	1199	1142	713	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3426.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3426.01	Reach Len. (ft)	1199.00	1142.00	713.00
Crit W.S. (ft)	3425.54	Flow Area (sq ft)	0.01	481.78	0.01
E.G. Slope (ft/ft)	0.001717	Area (sq ft)	0.01	481.78	0.01
Q Total (cfs)	679.00	Flow (cfs)	0.00	679.00	0.00
Top Width (ft)	737.55	Top Width (ft)	1.15	734.00	2.40
Vel Total (ft/s)	1.41	Avg. Vel. (ft/s)	0.06	1.41	0.06
Max Chl Dpth (ft)	1.01	Hydr. Depth (ft)	0.01	0.66	0.01
Conv. Total (cfs)	16384.5	Conv. (cfs)	0.0	16384.4	0.0

Length Wtd. (ft)	1142.00	Wetted Per. (ft)	1.15	734.00	2.40
Min Ch El (ft)	3425.00	Shear (lb/sq ft)	0.00	0.07	0.00
Alpha	1.00	Stream Power (lb/ft s)	0.00	0.10	0.00
Frctn Loss (ft)	5.08	Cum Volume (acre-ft)	9.35	31.47	1.68
C & E Loss (ft)	0.02	Cum SA (acres)	11.40	46.66	1.29

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

Warning: The energy loss was greater than 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: Ditch A
REACH: 5 RS: 4221

INPUT
Description: Sta. 4221
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3423	341	3422	544	3421	640	3420	669	3420
753	3420.2	829	3420	837	3420	1030	3421	1320	3422
1407	3423	1497	3424						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	544	.033	1407	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
544	1407	749	732	843	.1

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3420.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.033	
W.S. Elev (ft)	3420.70	Reach Len. (ft)	749.00	732.00	843.00
Crit W.S. (ft)	3420.70	Flow Area (sq ft)		192.79	
E.G. Slope (ft/ft)	0.020777	Area (sq ft)		192.79	
Q Total (cfs)	770.00	Flow (cfs)		770.00	
Top Width (ft)	399.36	Top Width (ft)		399.36	
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)		3.99	
Max Chl Dpth (ft)	0.70	Hydr. Depth (ft)		0.48	
Conv. Total (cfs)	5341.9	Conv. (cfs)		5341.9	
Length Wtd. (ft)	736.33	Wetted Per. (ft)		399.36	
Min Ch El (ft)	3420.00	Shear (lb/sq ft)		0.63	

Alpha	1.00	Stream Power (lb/ft s)		2.50	
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	9.35	22.63	1.68
C & E Loss (ft)	0.06	Cum SA (acres)	11.39	31.80	1.27

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: The energy loss was 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: Ditch A
REACH: 5 RS: 3489

INPUT
Description: Sta. 3489
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3417	258	3416.5	299	3416	309	3415	318	3416
405	3416	422	3416	539	3416.4	581	3416.2	642	3416.4
744	3416	830	3416	918	3418	1068	3420	1159	3421

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	539	.033	918	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
539	918	464	500	457	.1 .3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3416.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3416.90	Reach Len. (ft)	464.00	500.00	457.00
Crit W.S. (ft)	3416.51	Flow Area (sq ft)	255.79	229.85	
E.G. Slope (ft/ft)	0.002166	Area (sq ft)	255.79	229.85	
Q Total (cfs)	770.00	Flow (cfs)	392.11	377.89	
Top Width (ft)	739.55	Top Width (ft)	408.76	330.79	
Vel Total (ft/s)	1.59	Avg. Vel. (ft/s)	1.53	1.64	

Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)	0.63	0.69	
Conv. Total (cfs)	16544.2	Conv. (cfs)	8424.9	8119.4	
Length Wtd. (ft)	482.34	Wetted Per. (ft)	408.87	330.80	
Min Ch El (ft)	3416.00	Shear (lb/sq ft)	0.08	0.09	
Alpha	1.00	Stream Power (lb/ft s)	0.13	0.15	
Frctn Loss (ft)	2.43	Cum Volume (acre-ft)	7.15	19.08	1.68
C & E Loss (ft)	0.01	Cum SA (acres)	7.87	25.67	1.27

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

Warning: The energy loss was greater than 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: Ditch A
REACH: 5 RS: 2989

INPUT
Description: Sta. 2989
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
170	3414.8	196	3414	436	3413.8	613	3414	651	3414
700	3414	747	3414	761	3414	841	3415.01	920	3416
976	3418	1067	3420						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
170	.033	436	.033	841	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
436	841	317	215	172	.3	.5

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3414.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.033	0.033	
W.S. Elev (ft)	3414.31	Reach Len. (ft)	317.00	215.00	172.00
Crit W.S. (ft)	3414.31	Flow Area (sq ft)	99.91	122.19	
E.G. Slope (ft/ft)	0.022178	Area (sq ft)	99.91	122.19	
Q Total (cfs)	770.00	Flow (cfs)	363.42	406.58	
Top Width (ft)	599.61	Top Width (ft)	250.07	349.54	
Vel Total (ft/s)	3.47	Avg. Vel. (ft/s)	3.64	3.33	
Max Chl Dpth (ft)	0.51	Hydr. Depth (ft)	0.40	0.35	
Conv. Total (cfs)	5170.5	Conv. (cfs)	2440.3	2730.2	

Length Wtd. (ft)	260.63	Wetted Per. (ft)	250.07	349.54	
Min Ch El (ft)	3413.80	Shear (lb/sq ft)	0.55	0.48	
Alpha	1.01	Stream Power (lb/ft s)	2.01	1.61	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	5.26	17.06	1.68
C & E Loss (ft)	0.09	Cum SA (acres)	4.36	21.77	1.27

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

Warning: The conveyance ratio (upstream conveyance 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: Ditch A
REACH: 5 RS: 2774

INPUT
Description: Sta. 2774 Upstream of culverts
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	437	.033	511	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
437	511	40	40	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

E.G. Elev (ft)	3413.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3413.72	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	3412.70	Flow Area (sq ft)	591.62	323.04	192.81
E.G. Slope (ft/ft)	0.000063	Area (sq ft)	591.62	323.04	192.81
Q Total (cfs)	770.00	Flow (cfs)	365.74	308.81	95.44
Top Width (ft)	453.19	Top Width (ft)	260.66	74.00	118.53

Vel Total (ft/s)	0.70	Avg. Vel. (ft/s)	0.62	0.96	0.50
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)	2.27	4.37	1.63
Conv. Total (cfs)	96842.1	Conv. (cfs)	45999.3	38839.0	12003.8
Length Wtd. (ft)	40.00	Wetted Per. (ft)	260.73	74.04	118.59
Min Ch El (ft)	3409.00	Shear (lb/sq ft)	0.01	0.02	0.01
Alpha	1.20	Stream Power (lb/ft s)	0.01	0.02	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.74	15.96	1.30
C & E Loss (ft)		Cum SA (acres)	2.51	20.72	1.04

CULVERT RIVER: Ditch A
REACH: 5 RS: 2773

INPUT
Description:
Distance from Upstream XS = 8
Deck/Roadway Width = 24
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3413.8	175	3413.8	204	3412	261	3412	298	3411.2
402	3410.9	437	3410	469	3409	491	3409	511	3410
560	3412	641	3414	725	3416				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	437	.033	511	.033

Bank Sta: Left	Right	Coeff Contr.	Expan.
437	511	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
888	F		
888	F		

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
26	3413.8		100	3413.8		402	3412.7	
500	3412.8		600	3413.9		700	3415.7	

Downstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	3413.8	100	3412.4	155	3412	299	3411.4	349	3410
387	3408.9	391.4	3408.9	395.8	3408.9	400.2	3408.9	404.6	3408.9
409	3408.9	434	3410	487	3412	568	3414	658	3416

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      26    .033      349    .033      434    .033

Bank Sta: Left   Right    Coeff Contr.    Expan.
           349     434             .3        .5
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

Upstream Embankment side slope                =       3 horiz. to 1.0 vertical
Downstream Embankment side slope              =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins           =  3412.7
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Culvert #1      Pipe Arch   1.833    2.43
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  1      39       .024                   .5                1
Number of Barrels =  6
Upstream   Elevation =  3409
Centerline Stations
    Sta.     Sta.     Sta.     Sta.     Sta.     Sta.
     469    473.4    477.8    482.2    486.6      491
Downstream Elevation =  3408.9
Centerline Stations
    Sta.     Sta.     Sta.     Sta.     Sta.     Sta.
     387    391.4    395.8    400.2    404.6      409

CROSS SECTION          RIVER: Ditch A
REACH: 5                  RS: 2734

INPUT
Description: Sta. 2734 Downstream of culverts
Station Elevation Data    num=       15
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
      26  3413.8      100  3412.4      155    3412       299  3411.4      349    3410
     387  3408.9   391.4   3408.9   395.8   3408.9    400.2   3408.9    404.6  3408.9
     409  3408.9      434    3410      487    3412       568    3414      658    3416

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      26    .033      349    .033      434    .033

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           349     434                 745     846    1015              .3        .5
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
888        F
888        F

CROSS SECTION OUTPUT    Profile #100 Yr.-WS3405

  E.G. Elev (ft)           3412.73     Element                 Left OB    Channel   Right OB
```

Vel Head (ft)	0.03	Wt. n-Val.	0.033	0.033	0.033
W.S. Elev (ft)	3412.70	Reach Len. (ft)	745.00	846.00	1015.00
Crit W.S. (ft)	3412.70	Flow Area (sq ft)	273.94	288.37	100.04
E.G. Slope (ft/ft)	0.000267	Area (sq ft)	273.94	288.37	100.04
Q Total (cfs)	770.00	Flow (cfs)	206.26	479.23	84.51
Top Width (ft)	431.23	Top Width (ft)	264.87	85.00	81.36
Vel Total (ft/s)	1.16	Avg. Vel. (ft/s)	0.75	1.66	0.84
Max Chl Dpth (ft)	3.80	Hydr. Depth (ft)	1.03	3.39	1.23
Conv. Total (cfs)	47090.5	Conv. (cfs)	12614.4	29308.0	5168.1
Length Wtd. (ft)	841.78	Wetted Per. (ft)	264.90	85.04	81.40
Min Ch El (ft)	3408.90	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	1.44	Stream Power (lb/ft s)	0.01	0.09	0.02
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	2.34	15.68	1.17
C & E Loss (ft)	0.05	Cum SA (acres)	2.27	20.65	0.95

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

CROSS SECTION RIVER: Ditch A
REACH: 5 RS: 1888

INPUT
Description: Sta. 1888
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3410.2	110	3410	331	3408	532	3408	690	3408
1180	3410								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	100	.033	1180	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	1180	305	828	980	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

			Left OB	Channel	Right OB
E.G. Elev (ft)	3408.69	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.033	
W.S. Elev (ft)	3408.48	Reach Len. (ft)	305.00	828.00	980.00
Crit W.S. (ft)	3408.48	Flow Area (sq ft)		214.56	
E.G. Slope (ft/ft)	0.021962	Area (sq ft)		214.56	
Q Total (cfs)	783.00	Flow (cfs)		783.00	
Top Width (ft)	530.50	Top Width (ft)		530.50	
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)		3.65	
Max Chl Dpth (ft)	0.48	Hydr. Depth (ft)		0.40	
Conv. Total (cfs)	5283.6	Conv. (cfs)		5283.6	
Length Wtd. (ft)	828.00	Wetted Per. (ft)		530.50	
Min Ch El (ft)	3408.00	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.02	
Frctn Loss (ft)	1.09	Cum Volume (acre-ft)		10.79	
C & E Loss (ft)	0.06	Cum SA (acres)		14.67	

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

Warning: The energy loss was 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: Ditch A
REACH: 5 RS: 1060

INPUT
Description: Sta. 1060
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	3408	394	3406	879	3402.7	909	3402.7	1206	3405
1554	3404.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.033	394	.033	1554	.033

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
394	1554	60	60	.1	.3

CROSS SECTION OUTPUT Profile #100 Yr.-WS3405

			Left OB	Channel	Right OB
E.G. Elev (ft)	3405.01	Element			
Vel Head (ft)	0.01	Wt. n-Val.		0.033	
W.S. Elev (ft)	3405.00	Reach Len. (ft)			
Crit W.S. (ft)	3403.76	Flow Area (sq ft)		921.10	
E.G. Slope (ft/ft)	0.000442	Area (sq ft)		921.10	
Q Total (cfs)	818.00	Flow (cfs)		818.00	
Top Width (ft)	1013.03	Top Width (ft)		1013.03	
Vel Total (ft/s)	0.89	Avg. Vel. (ft/s)		0.89	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		0.91	
Conv. Total (cfs)	38907.7	Conv. (cfs)		38907.7	
Length Wtd. (ft)		Wetted Per. (ft)		1013.75	
Min Ch El (ft)	3402.70	Shear (lb/sq ft)		0.03	
Alpha	1.00	Stream Power (lb/ft s)		0.02	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

SUMMARY OF MANNING'S N VALUES

River:Ditch A

Reach	River Sta.	n1	n2	n3
5	12674	.033	.033	.033
5	11337	.033	.033	.033
5	10937	.033	.033	.033
5	10288	.033	.033	.033
5	9690	.033	.033	.033
5	9009	.033	.033	.033
5	8130	.033	.033	.033
5	7717	.033	.033	.033
5	7253	.033	.033	.033

		FloodPlain	rep	
5	6343	.033	.033	.033
5	5363	.033	.033	.033
5	4221	.033	.033	.033
5	3489	.033	.033	.033
5	2989	.033	.033	.033
5	2774	.033	.033	.033
5	2773	Culvert		
5	2734	.033	.033	.033
5	1888	.033	.033	.033
5	1060	.033	.033	.033

SUMMARY OF REACH LENGTHS

River: Ditch A

Reach	River Sta.	Left	Channel	Right
5	12674	1206	1337	1433
5	11337	545	400	332
5	10937	729	649	445
5	10288	552	598	633
5	9690	639	681	658
5	9009	898	879	794
5	8130	399	413	456
5	7717	444	464	510
5	7253	756	910	980
5	6343	767	980	1051
5	5363	1199	1142	713
5	4221	749	732	843
5	3489	464	500	457
5	2989	317	215	172
5	2774	40	40	40
5	2773	Culvert		
5	2734	745	846	1015
5	1888	305	828	980
5	1060	60	60	60

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Ditch A

Reach	River Sta.	Contr.	Expan.
5	12674	.1	.3
5	11337	.1	.3
5	10937	.1	.3
5	10288	.1	.3
5	9690	.1	.3
5	9009	.1	.3
5	8130	.1	.3
5	7717	.1	.3
5	7253	.1	.3
5	6343	.1	.3
5	5363	.1	.3
5	4221	.1	.3
5	3489	.1	.3
5	2989	.3	.5
5	2774	.3	.5
5	2773	Culvert	

FloodPlain.rep

5	2734	.3	.5
5	1888	.1	.3
5	1060	.1	.3

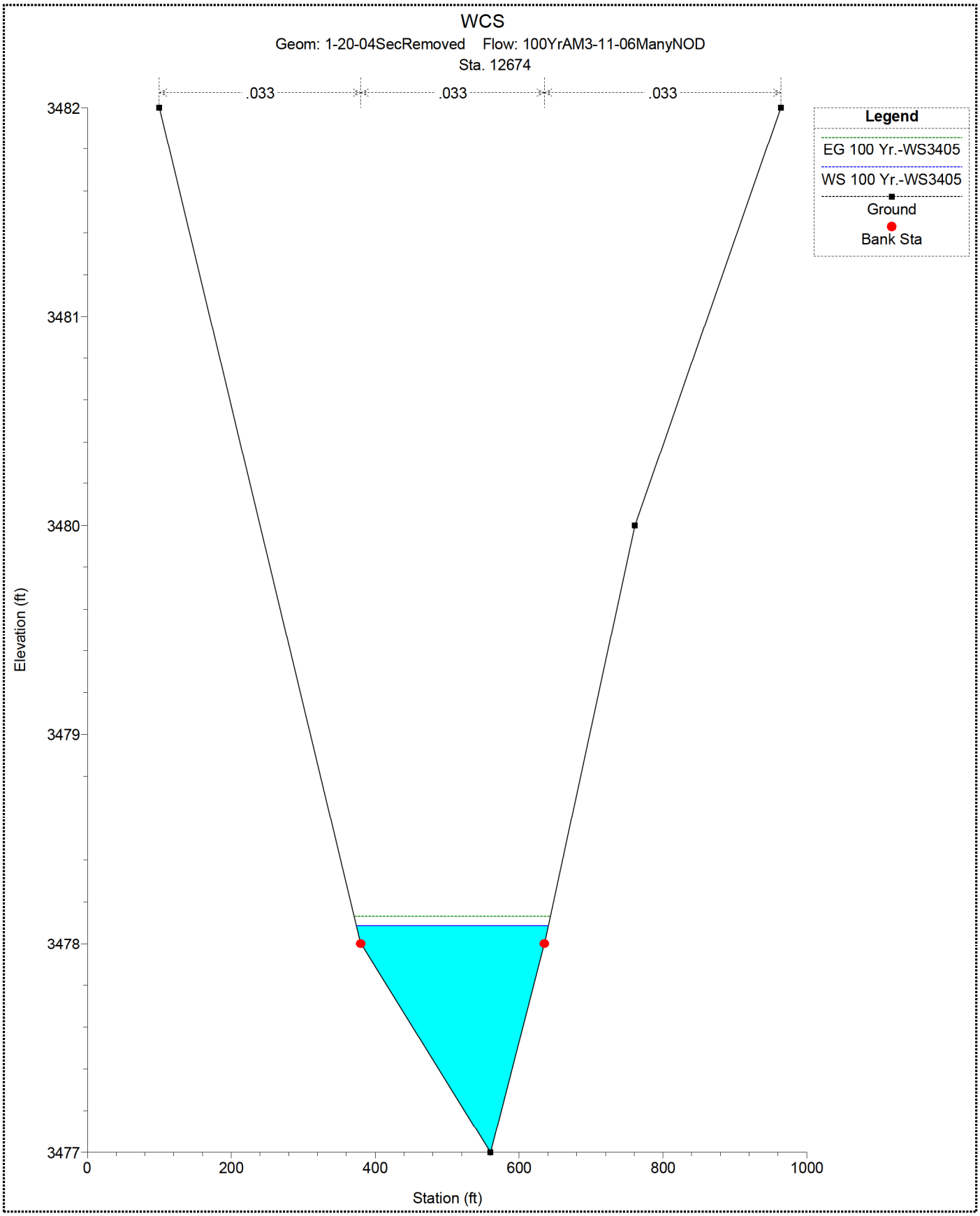
Profile Output Table - Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. S
	Flow Area	Top Width	Froude # Chl				
		(cfs)	(ft)	(ft)	(ft)	(ft)	
lope	Vel Chnl						
/ft)	(ft/s)	(sq ft)	(ft)				(ft
5	12674	257.00	3477.00	3478.09	3477.76	3478.13	0.00
2960	1.72	150.10	266.53	0.40			
5	11337	257.00	3469.00	3470.07	3470.03	3470.31	0.01
6404	3.95	65.20	117.78	0.92			
5	10937	257.00	3464.00	3465.37	3465.18	3465.56	0.00
8905	3.46	74.30	101.14	0.71			
5	10288	257.00	3456.00	3456.67	3456.67	3456.87	0.02
2405	3.56	72.21	188.17	1.01			
5	9690	385.00	3450.00	3451.27	3450.94	3451.34	0.00
4386	2.23	172.58	266.72	0.49			
5	9009	385.00	3445.00	3446.20	3446.12	3446.41	0.01
4078	3.65	105.53	186.98	0.86			
5	8130	385.00	3440.00	3441.33	3440.91	3441.39	0.00
3030	1.93	199.71	291.13	0.41			
5	7717	385.00	3437.80	3438.49	3438.49	3438.71	0.02
1709	3.79	101.69	235.89	1.02			
5	7253	406.00	3435.00	3436.11	3435.70	3436.14	0.00
1870	1.39	292.04	492.58	0.32			
5	6343	679.00	3430.00	3430.47	3430.47	3430.67	0.02
1530	3.60	188.77	469.90	1.00			
5	5363	679.00	3425.00	3426.01	3425.54	3426.04	0.00
1717	1.41	481.80	737.55	0.31			
5	4221	770.00	3420.00	3420.70	3420.70	3420.95	0.02
0777	3.99	192.79	399.36	1.01			
5	3489	770.00	3416.00	3416.90	3416.51	3416.94	0.00
2166	1.64	485.64	739.55	0.35			
5	2989	770.00	3413.80	3414.31	3414.31	3414.50	0.02
2178	3.33	222.10	599.61	0.99			
5	2774	770.00	3409.00	3413.72	3412.70	3413.73	0.00
0063	0.96	1107.47	453.19	0.08			
5	2773	Culvert					
5	2734	770.00	3408.90	3412.70	3412.70	3412.73	0.00
0267	1.66	662.35	431.23	0.16			
5	1888	783.00	3408.00	3408.48	3408.48	3408.69	0.02
1962	3.65	214.56	530.50	1.01			
5	1060	818.00	3402.70	3405.00	3403.76	3405.01	0.00
0442	0.89	921.10	1013.03	0.16			

Profile Output Table - Report Standard Table 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	Max Chl Dpth	E.G
. Elev	E.G. Slope Vel Chnl	Sta W.S. Lft	Sta W.S. Rgt	Flow Area	Top Width	Froude # Chl	
		(cfs)	(ft)	(ft)	(ft)	(ft)	
(ft)	(ft/ft) (ft/s)	(ft)	(ft)	(sq ft)	(ft)		

5	12674		257.00	3477.00	3478.09	3477.76	1.09	3
478.13	0.002960	1.72	373.93	640.46	150.10	266.53		0.40
5	11337		257.00	3469.00	3470.07	3470.03	1.07	3
470.31	0.016404	3.95	433.58	551.36	65.20	117.78		0.92
5	10937		257.00	3464.00	3465.37	3465.18	1.37	3
465.56	0.008905	3.46	487.21	588.35	74.30	101.14		0.71
5	10288		257.00	3456.00	3456.67	3456.67	0.67	3
456.87	0.022405	3.56	427.25	615.43	72.21	188.17		1.01
5	9690		385.00	3450.00	3451.27	3450.94	1.27	3
451.34	0.004386	2.23	473.16	739.88	172.58	266.72		0.49
5	9009		385.00	3445.00	3446.20	3446.12	1.20	3
446.41	0.014078	3.65	475.39	662.37	105.53	186.98		0.86
5	8130		385.00	3440.00	3441.33	3440.91	1.33	3
441.39	0.003030	1.93	497.63	788.76	199.71	291.13		0.41
5	7717		385.00	3437.80	3438.49	3438.49	0.69	3
438.71	0.021709	3.79	346.21	582.10	101.69	235.89		1.02
5	7253		406.00	3435.00	3436.11	3435.70	1.10	3
436.14	0.001870	1.39	418.61	911.18	292.04	492.58		0.32
5	6343		679.00	3430.00	3430.47	3430.47	0.46	3
430.67	0.021530	3.60	817.66	1287.56	188.77	469.90		1.00
5	5363		679.00	3425.00	3426.01	3425.54	1.01	3
426.04	0.001717	1.41	740.85	1478.40	481.80	737.55		0.31
5	4221		770.00	3420.00	3420.70	3420.70	0.70	3
420.95	0.020777	3.99	572.78	972.14	192.79	399.36		1.01
5	3489		770.00	3416.00	3416.90	3416.51	1.90	3
416.94	0.002166	1.64	130.24	869.79	485.64	739.55		0.35
5	2989		770.00	3413.80	3414.31	3414.31	0.51	3
414.50	0.022178	3.33	185.93	785.54	222.10	599.61		0.99
5	2774		770.00	3409.00	3413.72	3412.70	4.72	3
413.73	0.000063	0.96	176.34	629.53	1107.47	453.19		0.08
5	2773		Culvert					
5	2734		770.00	3408.90	3412.70	3412.70	3.80	3
412.73	0.000267	1.66	84.13	515.36	662.35	431.23		0.16
5	1888		783.00	3408.00	3408.48	3408.48	0.48	3
408.69	0.021962	3.65	277.69	808.19	214.56	530.50		1.01
5	1060		818.00	3402.70	3405.00	3403.76	2.30	3
405.01	0.000442	0.89	540.97	1554.00	921.10	1013.03		0.16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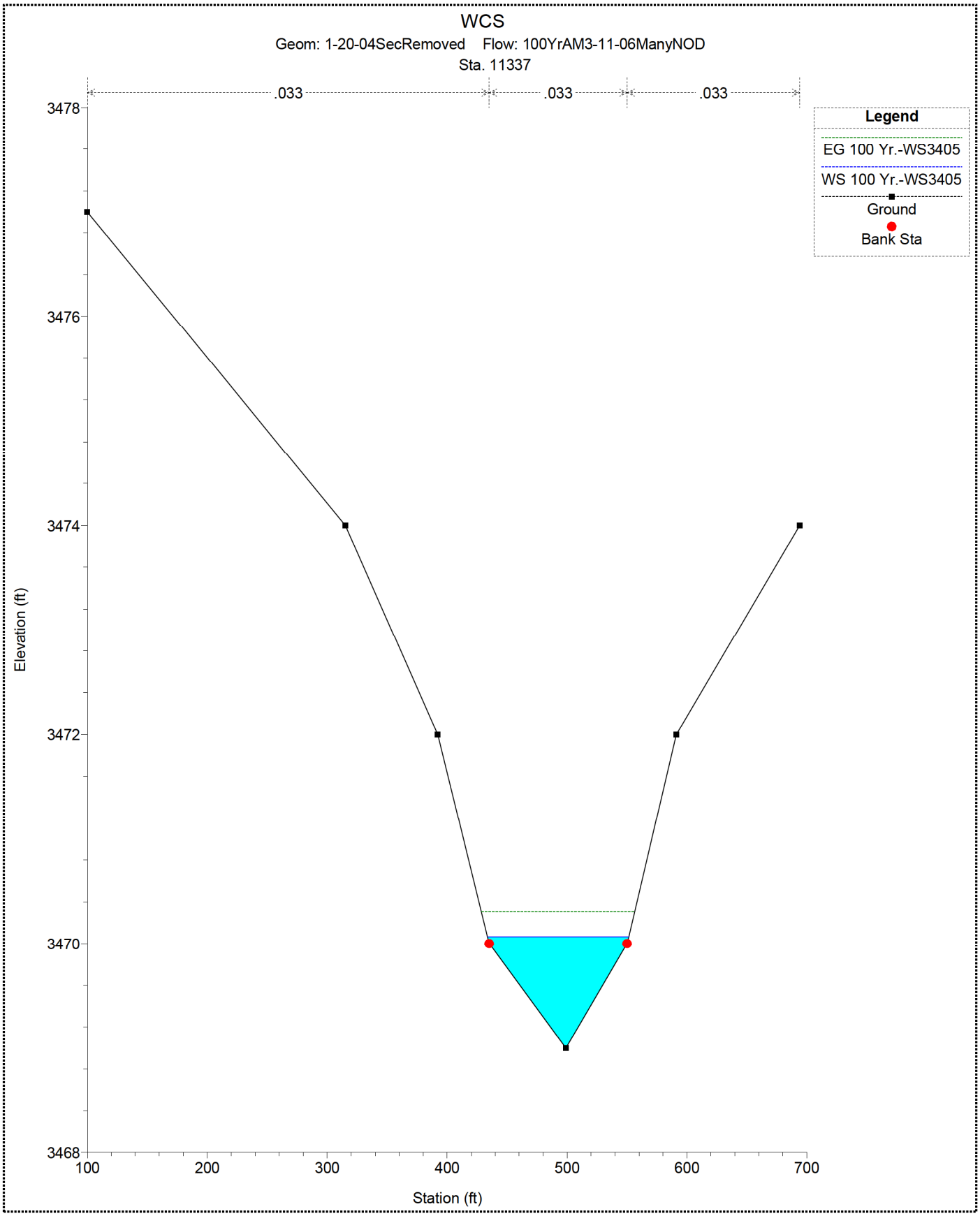
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3482
3481
3480
3479
3478
3477
0
200
400
600
800
1000
Station (ft)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.033
.033
Legend
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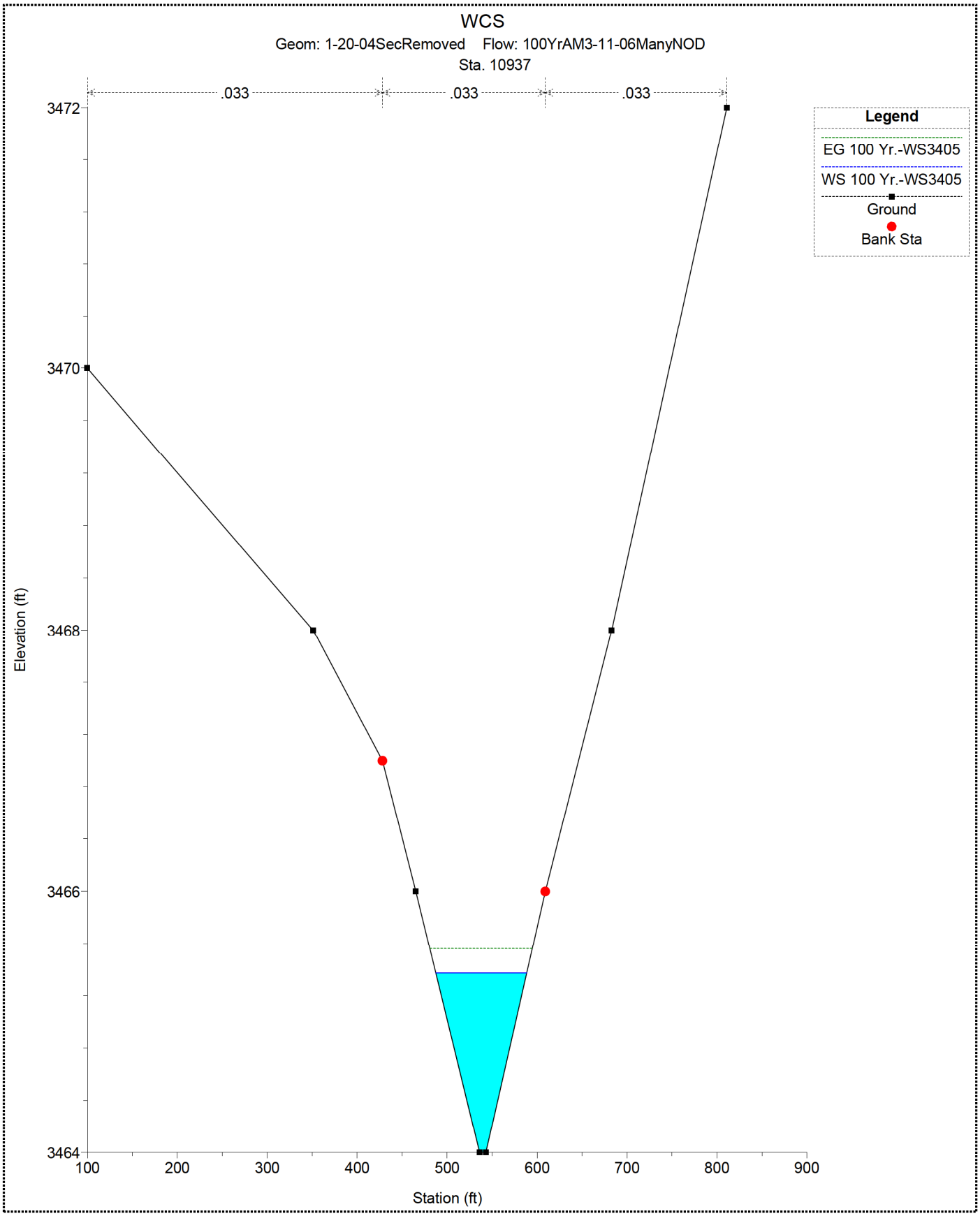
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3478
3476
3474
3472
3470
3468
100
200
300
400
500
600
700
Station (ft)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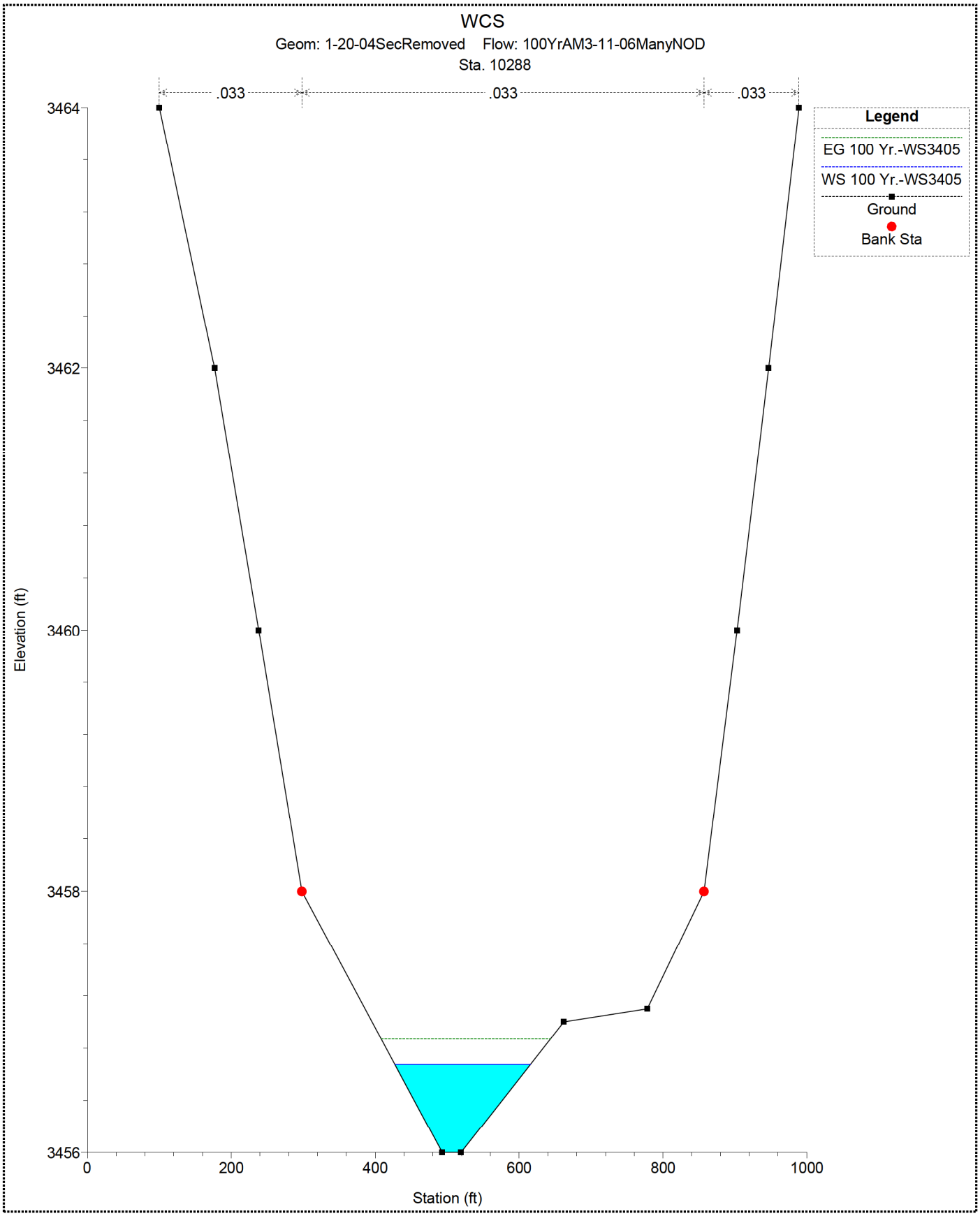
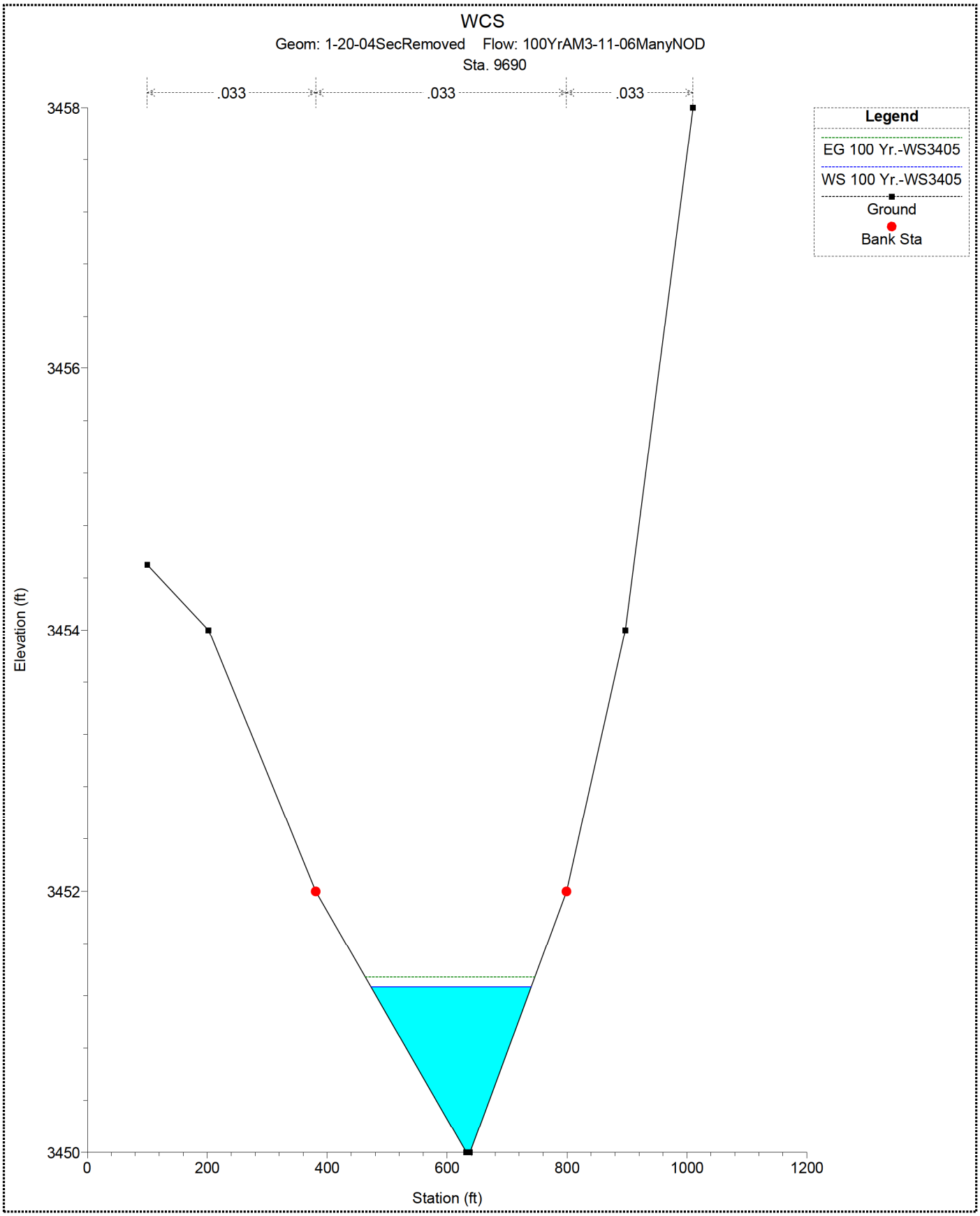
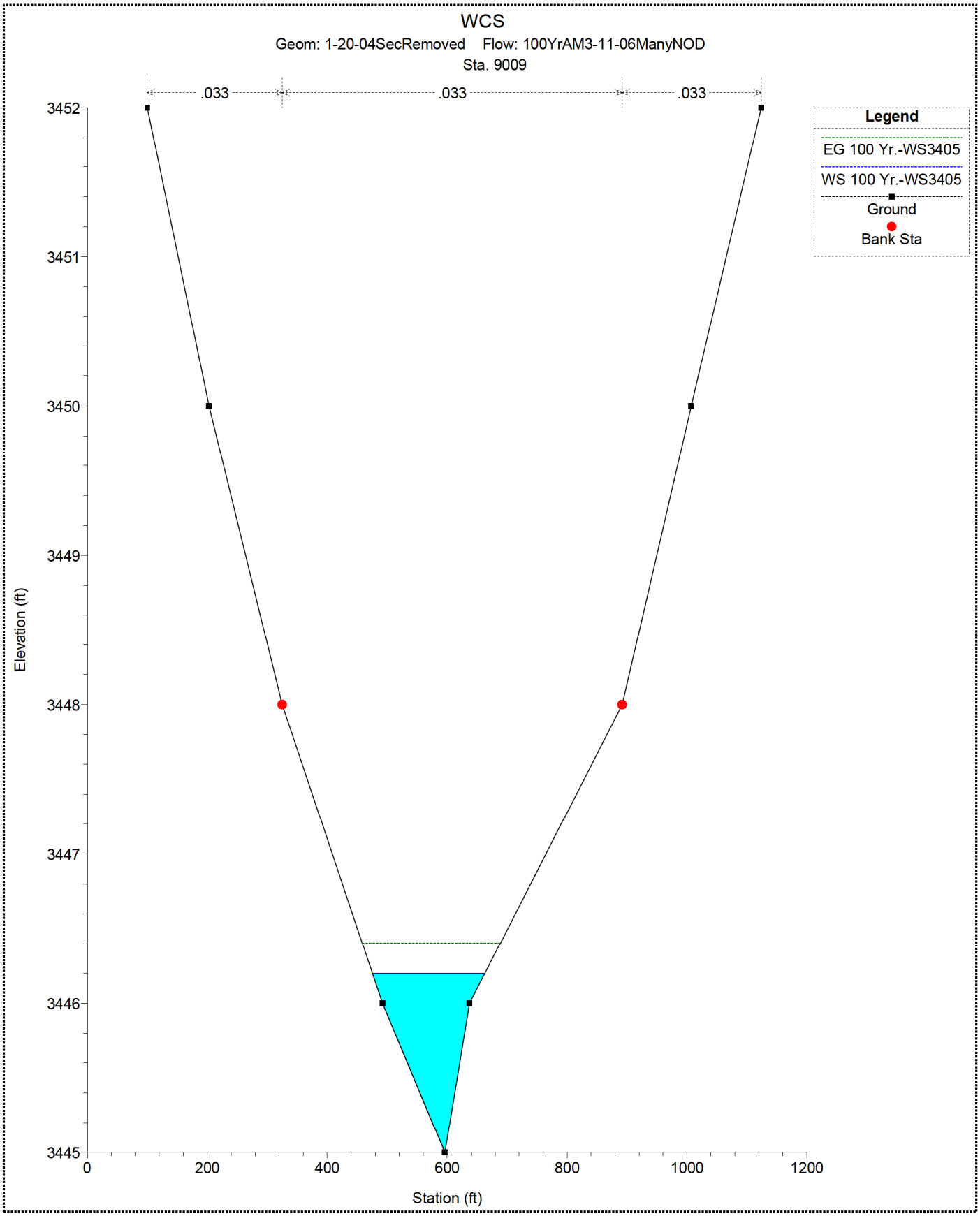
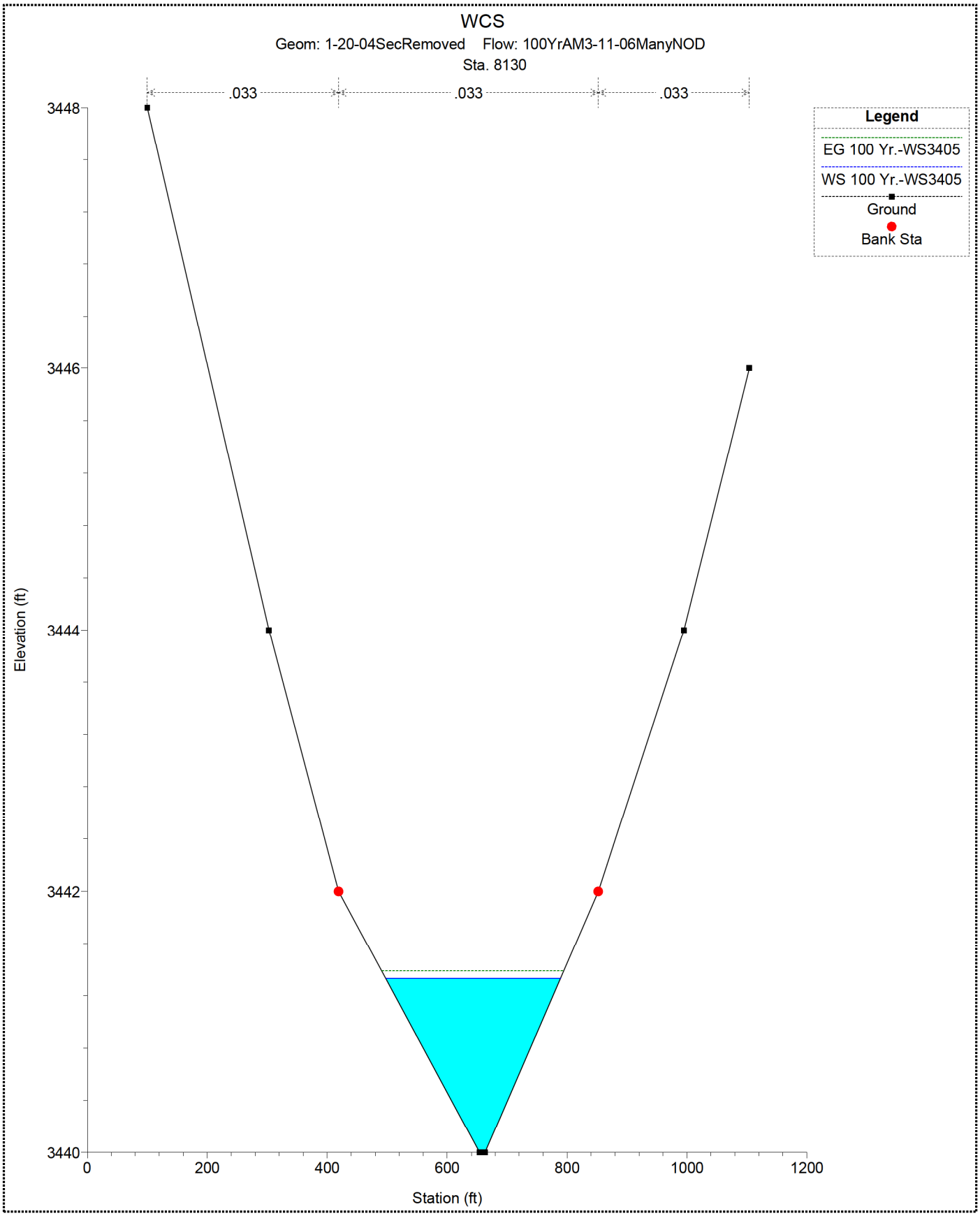
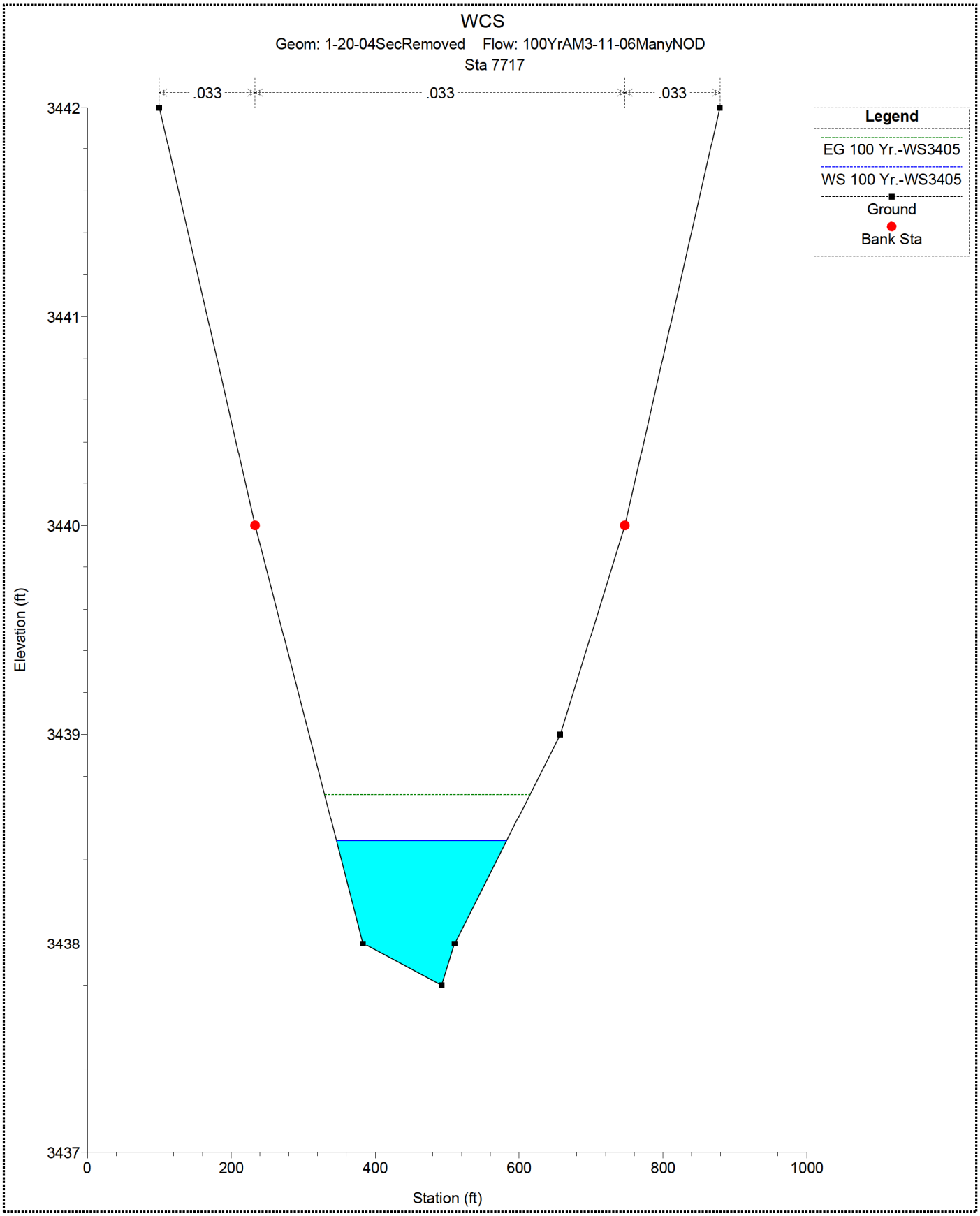
Sta. 10937
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3472
3470
3468
3466
3464
100
200
300
400
500
600
700
800
900
Station (ft)

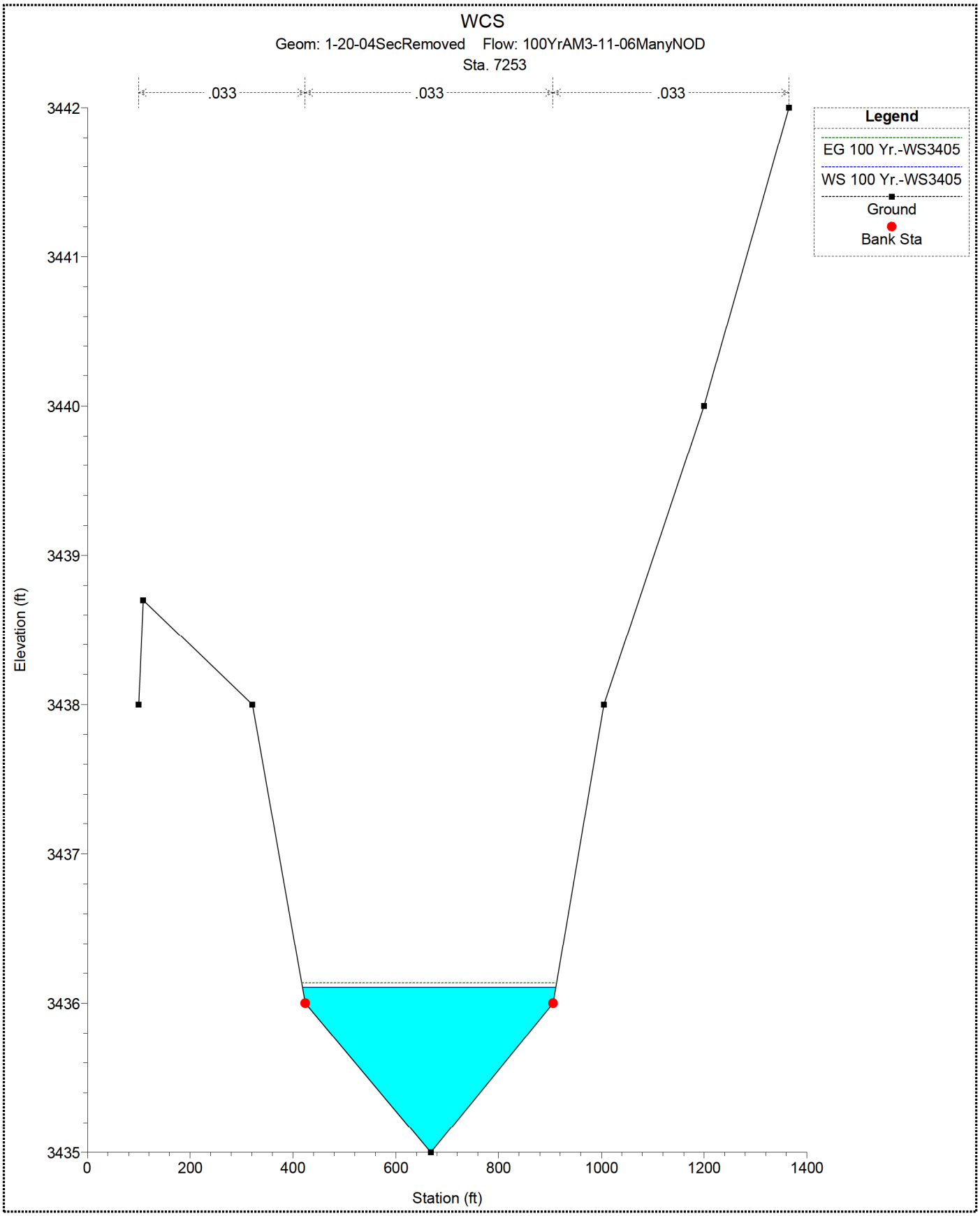

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 10288
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3464
3462
3460
3458
3456
0
200
400
600
800
1000
Station (ft)

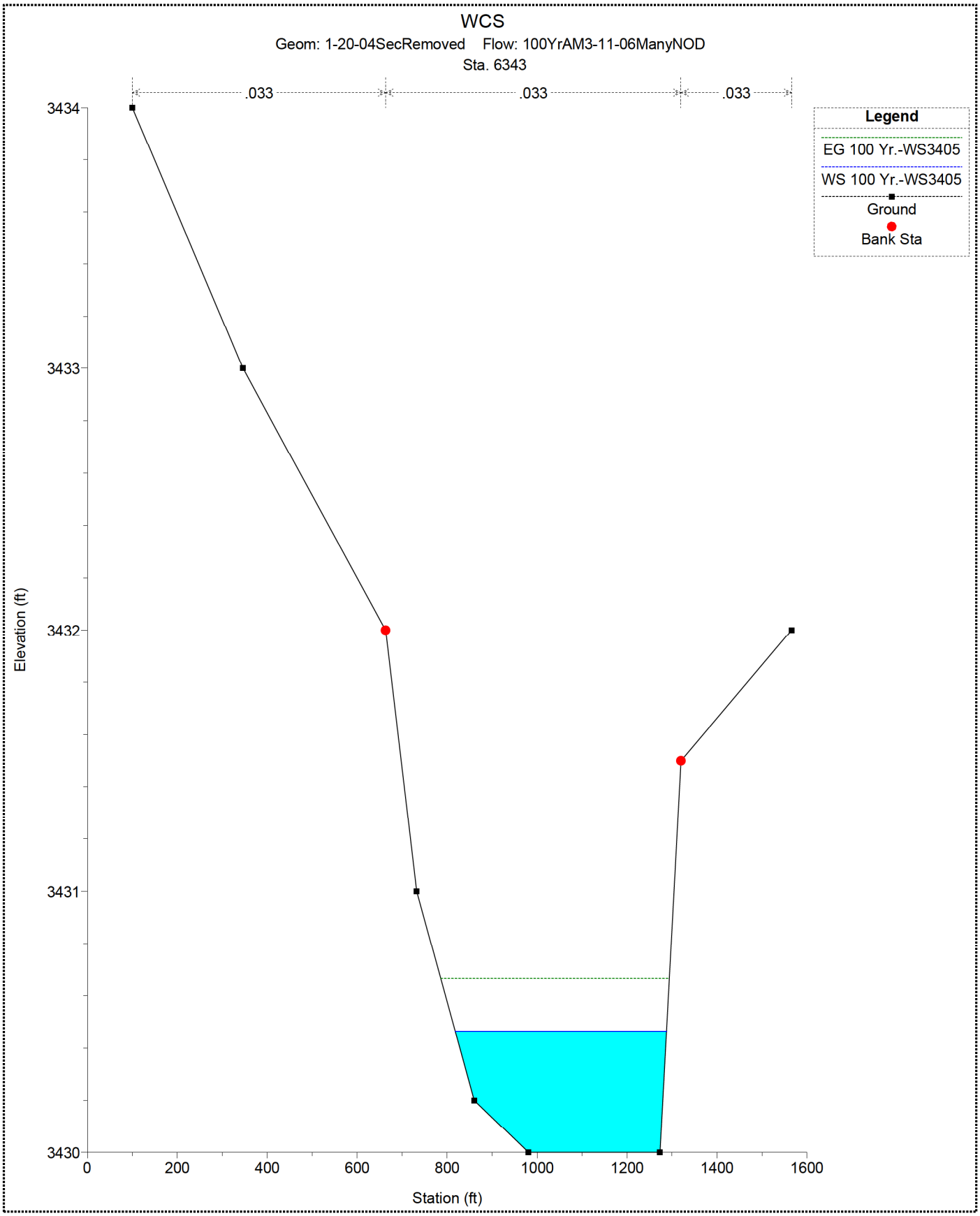

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 9690
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3458
3456
3454
3452
3450
0
200
400
600
800
1000
1200
Station (ft)

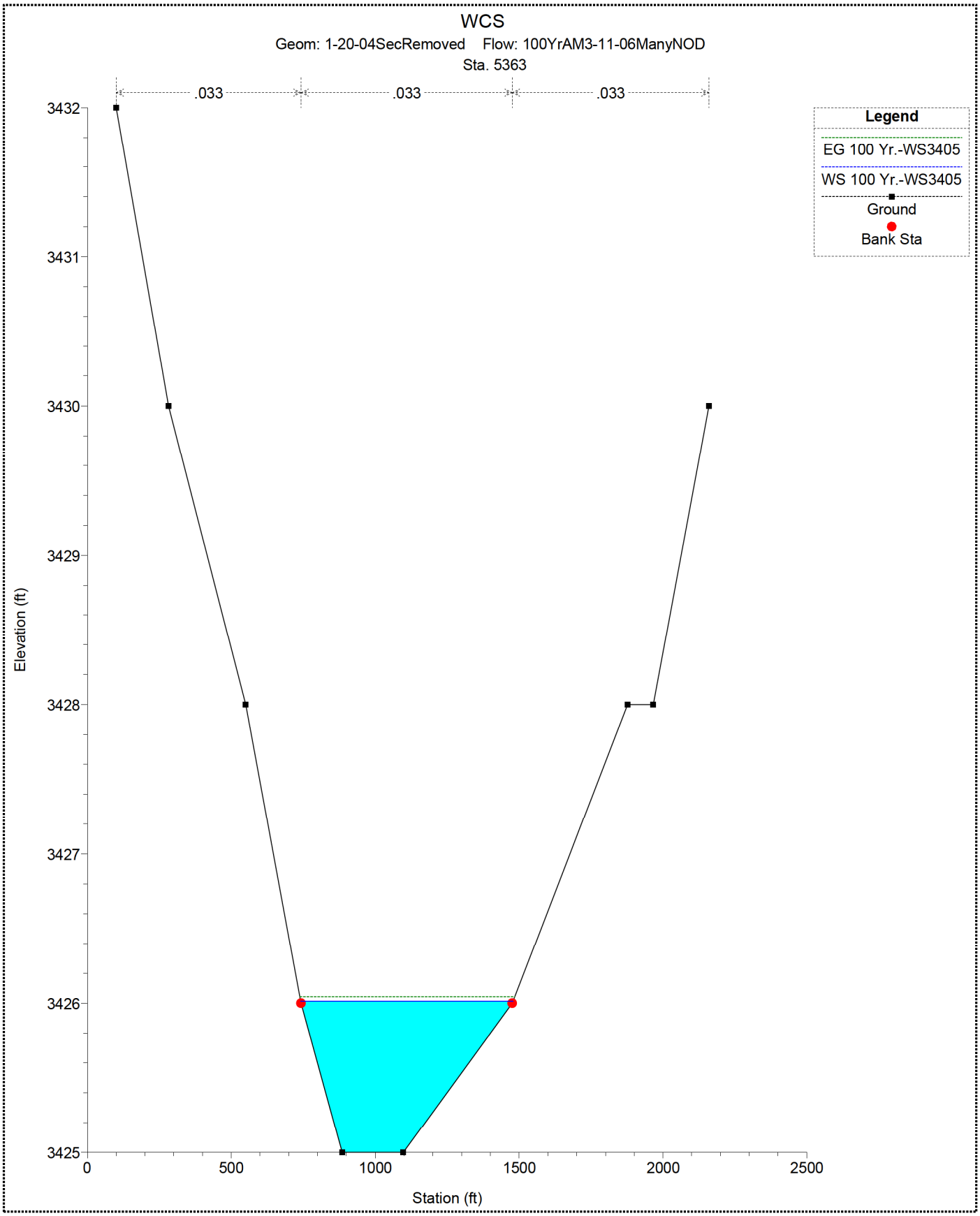

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 9009
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
Station (ft)
3452
3451
3450
3449
3448
3447
3446
3445
0
200
400
600
800
1000
1200

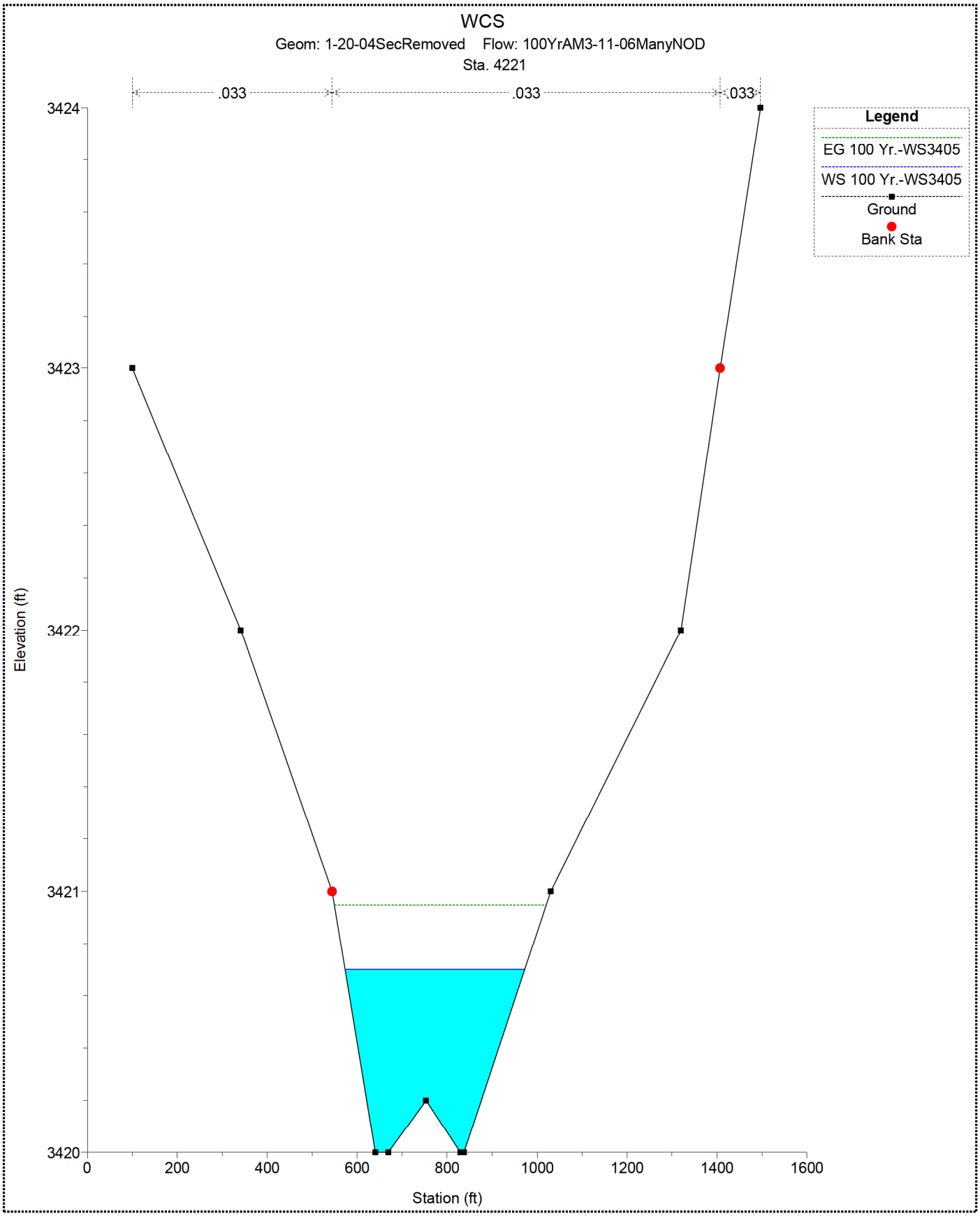

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 8130
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3448
3446
3444
3442
3440
0
200
400
600
800
1000
1200
Station (ft)

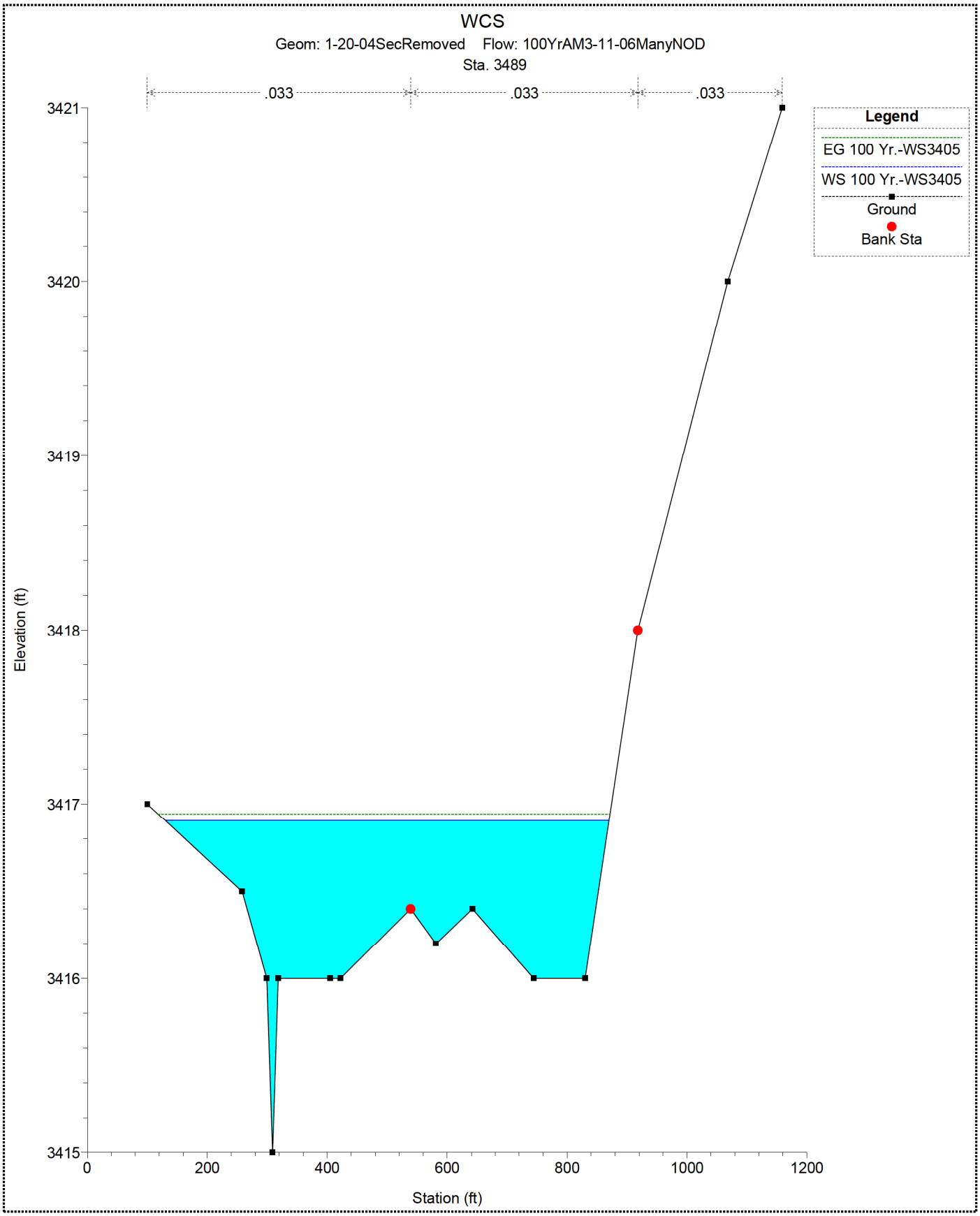

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta 7717
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3442
3441
3440
3439
3438
3437
0
200
400
600
800
1000
Station (ft)

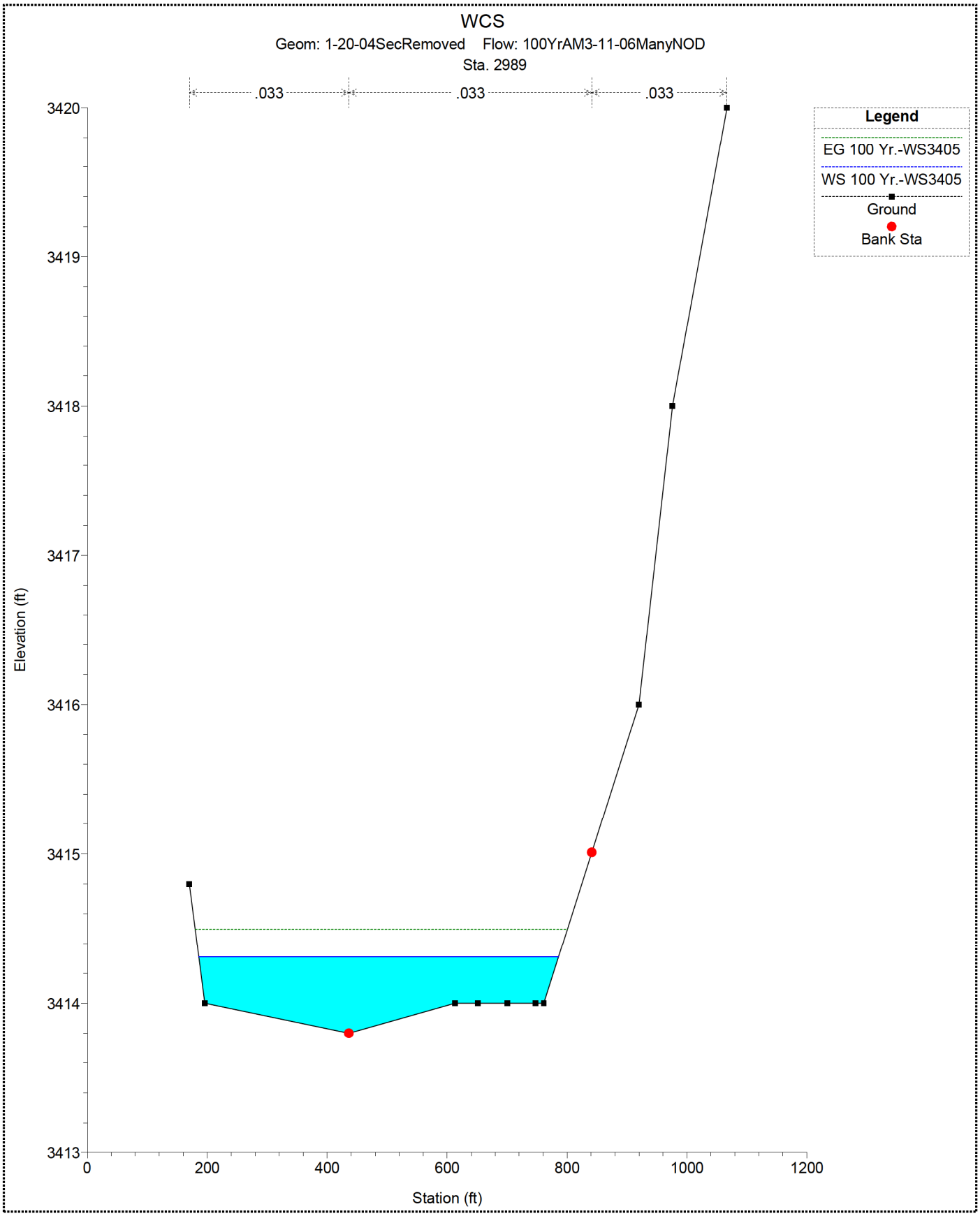

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 7253
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
Station (ft)
3442
3441
3440
3439
3438
3437
3436
3435
0
200
400
600
800
1000
1200
1400

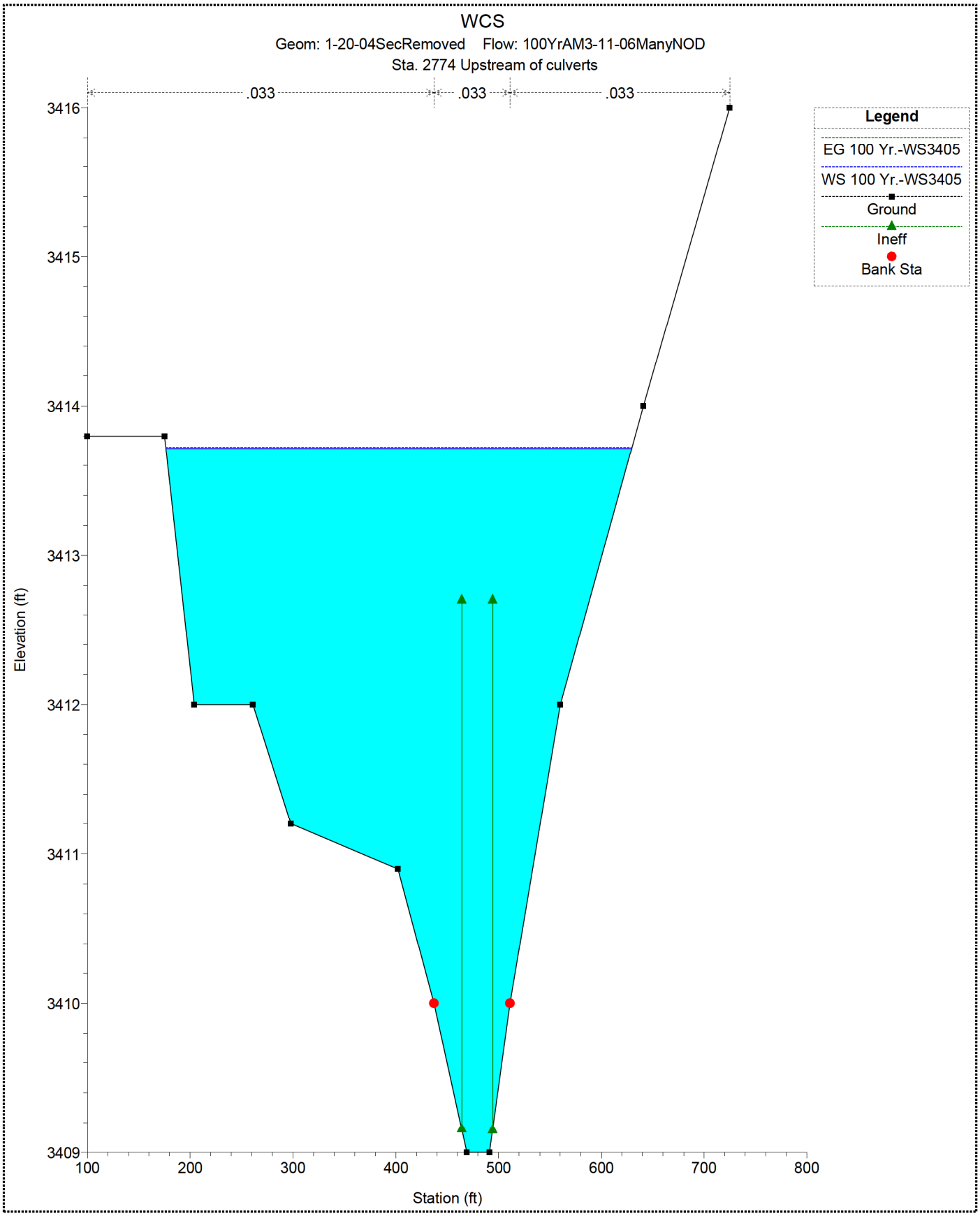

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 6343
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3434
3433
3432
3431
3430
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

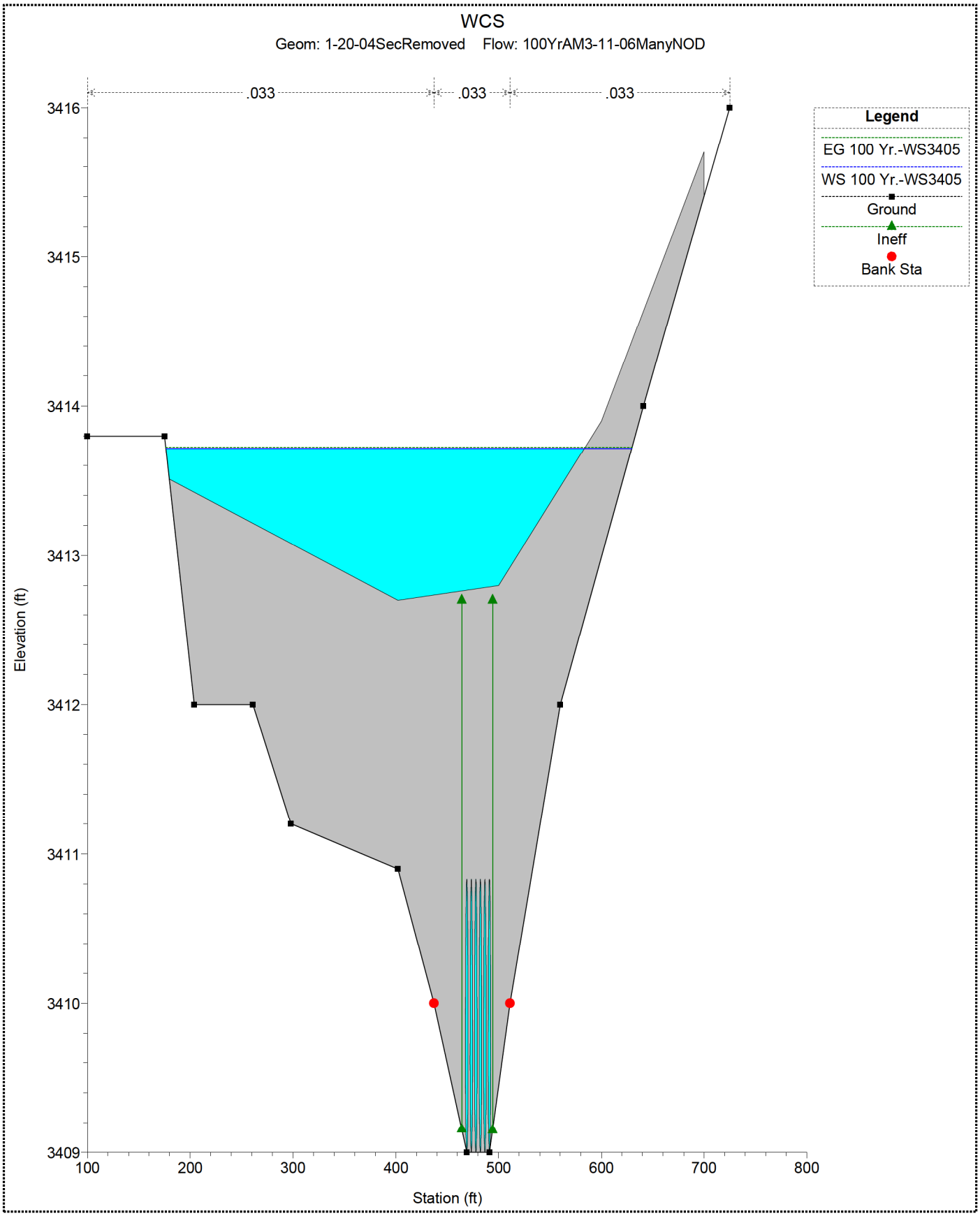

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 5363
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3432
3431
3430
3429
3428
3427
3426
3425
0
500
1000
1500
2000
2500
Station (ft)

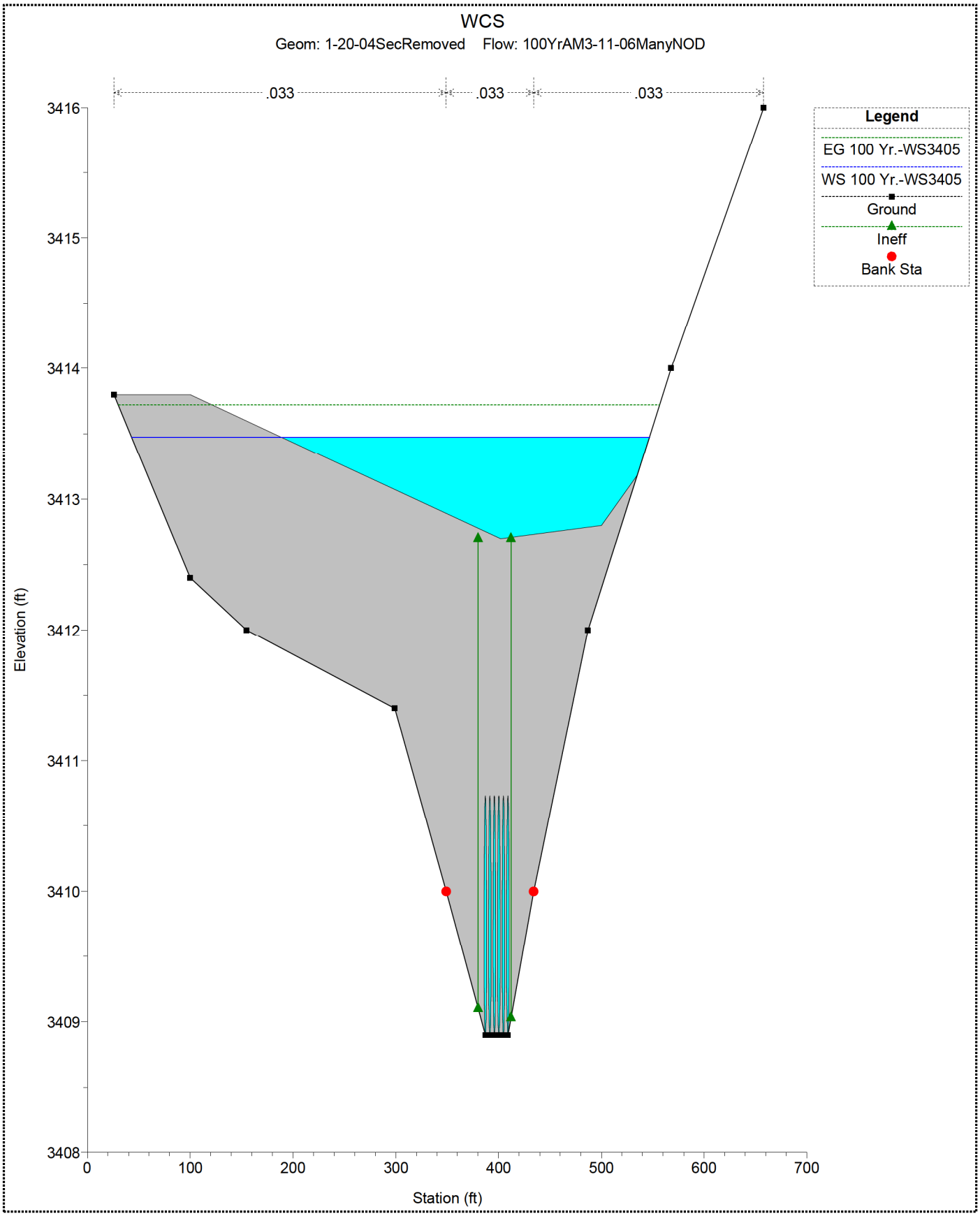

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 4221
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3424
3423
3422
3421
3420
0
200
400
600
800
1000
1200
1400
1600
Station (ft)

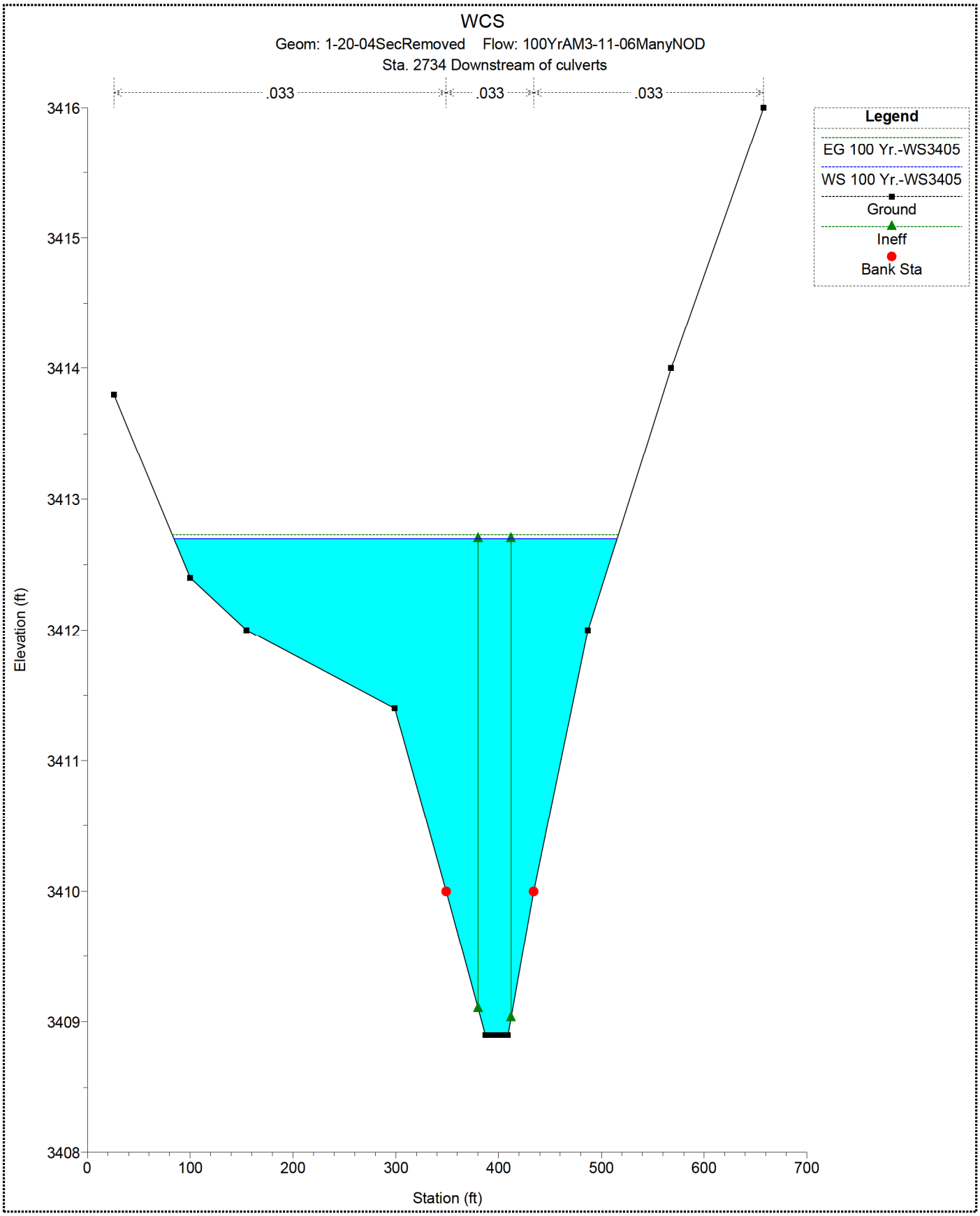

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 3489
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3421
3420
3419
3418
3417
3416
3415
0
200
400
600
800
1000
1200
Station (ft)

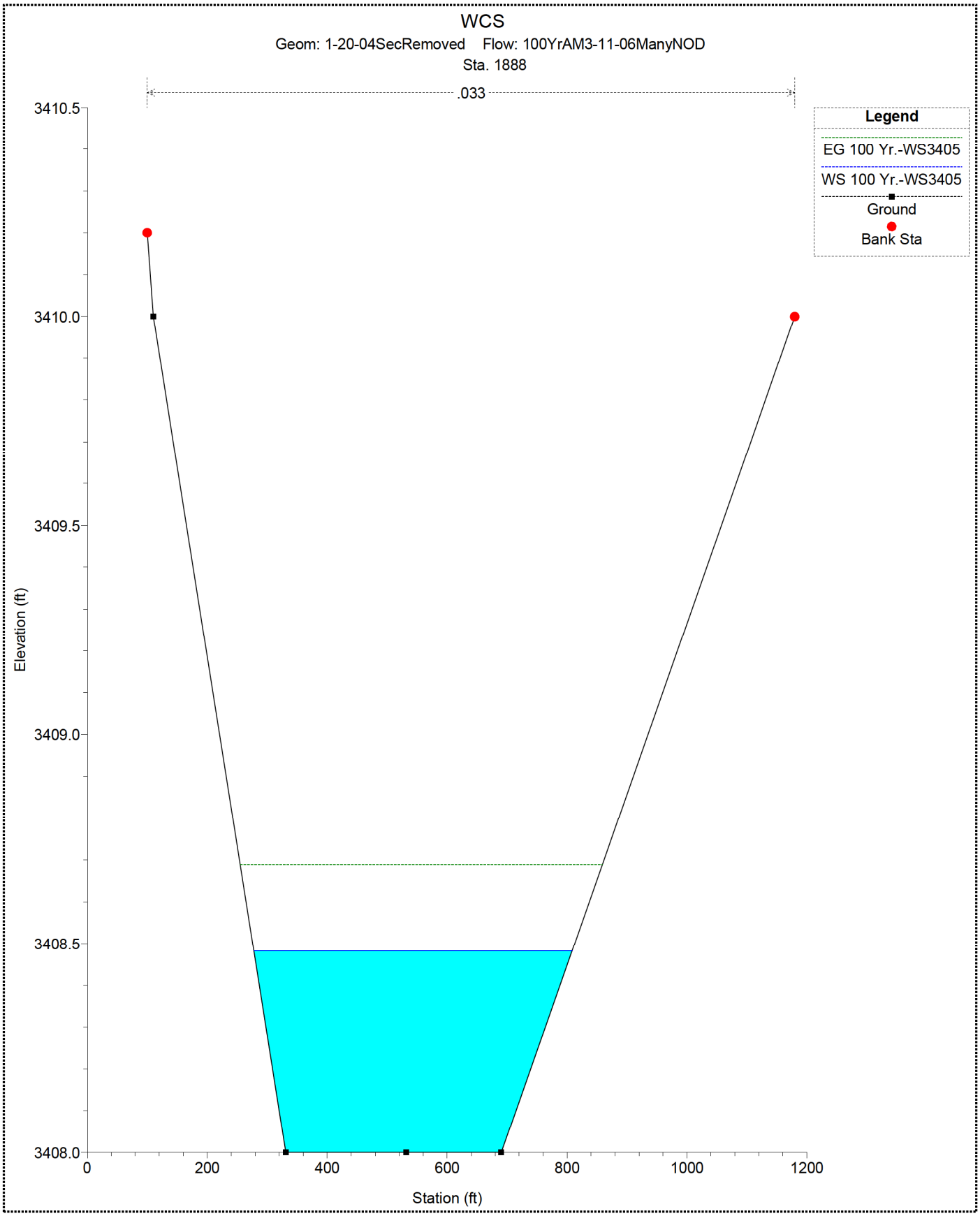

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 2989
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
3420
3419
3418
3417
3416
3415
3414
3413
0
200
400
600
800
1000
1200
Station (ft)

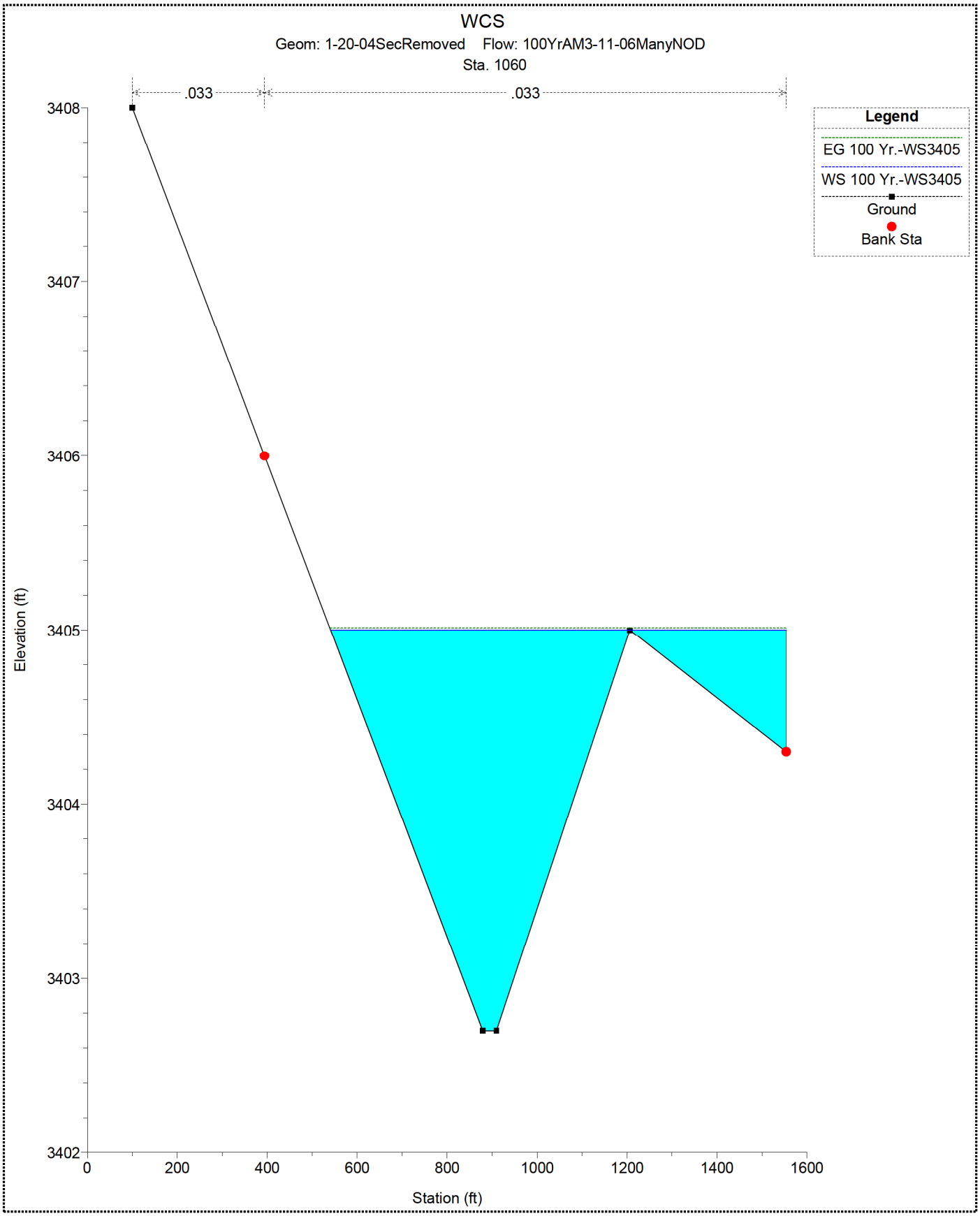

WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 2774 Upstream of culverts
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Ineff
Bank Sta
Elevation (ft)
3416
3415
3414
3413
3412
3411
3410
3409
100
200
300
400
500
600
700
800
Station (ft)


WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Ineff
Bank Sta
Elevation (ft)
3416
3415
3414
3413
3412
3411
3410
3409
100
200
300
400
500
600
700
800
Station (ft)


WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
3416
3415
3414
3413
3412
3411
3410
3409
3408
0
100
200
300
400
500
600
700


WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 2734 Downstream of culverts
.033
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
3416
3415
3414
3413
3412
3411
3410
3409
3408
0
100
200
300
400
500
600
700


WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 1888
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
3410.5
3410.0
3409.5
3409.0
3408.5
3408.0
Elevation (ft)
0
200
400
600
800
1000
1200
Station (ft)


WCS
Geom: 1-20-04SecRemoved Flow: 100YrAM3-11-06ManyNOD
Sta. 1060
.033
.033
Legend
EG 100 Yr.-WS3405
WS 100 Yr.-WS3405
Ground
Bank Sta
Elevation (ft)
Station (ft)
3408
3407
3406
3405
3404
3403
3402
0
200
400
600
800
1000
1200
1400
1600

APPENDIX I

HEC-HMS MODEL FOR THE CALCULATION OF THE DEVELOPED LOW LEVEL & BYPRODUCT FACILITY 500-YEAR PEAK DISCHARGES

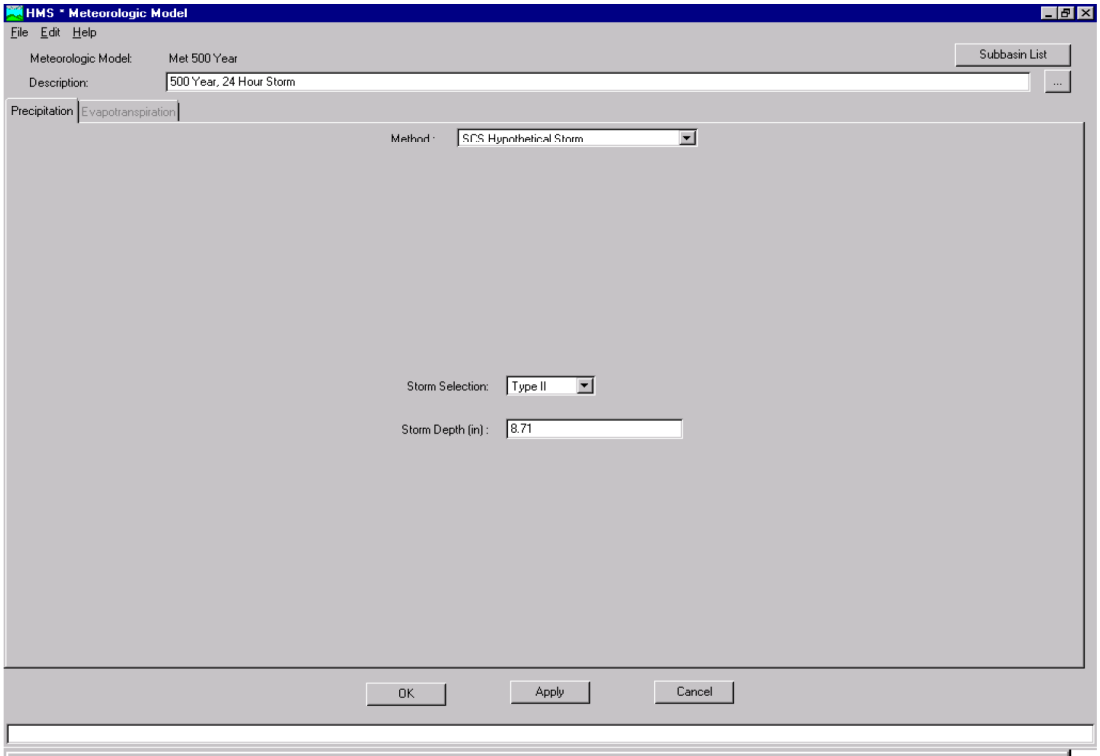
HMS * Summary of Results

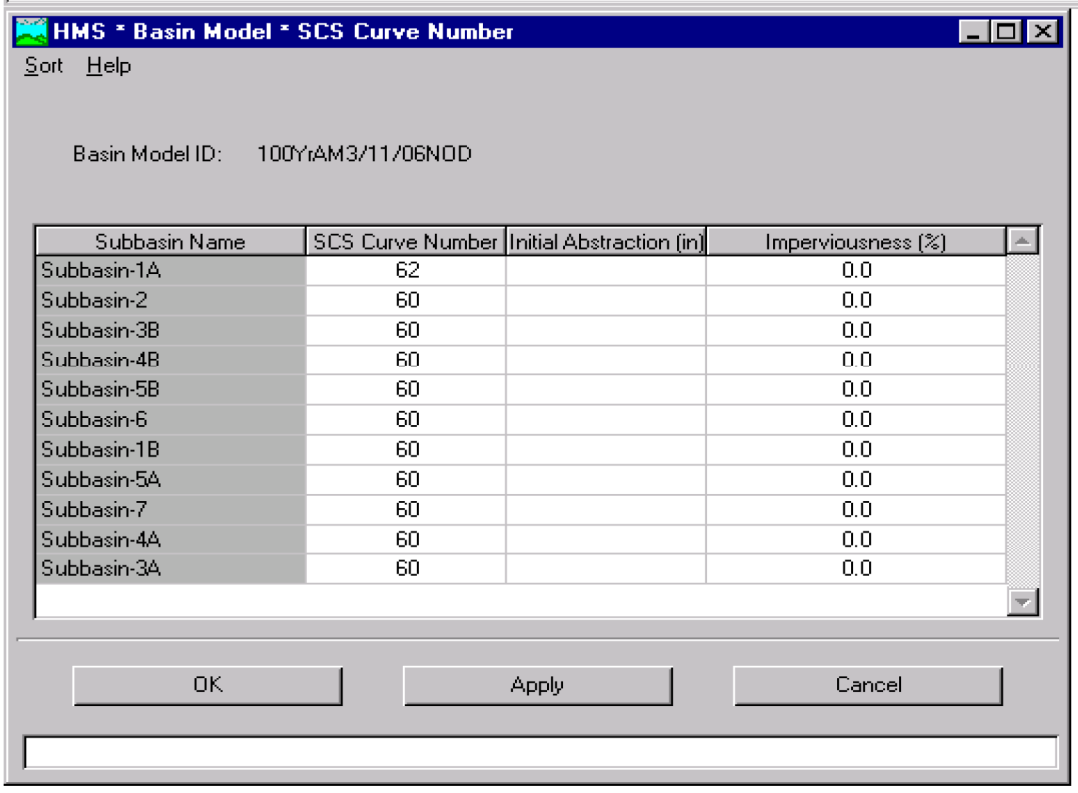
Project : WCS Run Name : 500 Year Storm NOD

Start of Run : 01Dec00 0000 Basin Model : 100YrAM3/11/06NOD
End of Run : 02Dec00 0000 Met. Model : Met 500 Year
Execution Time : 20Mar06 1840 Control Specs : Control 1

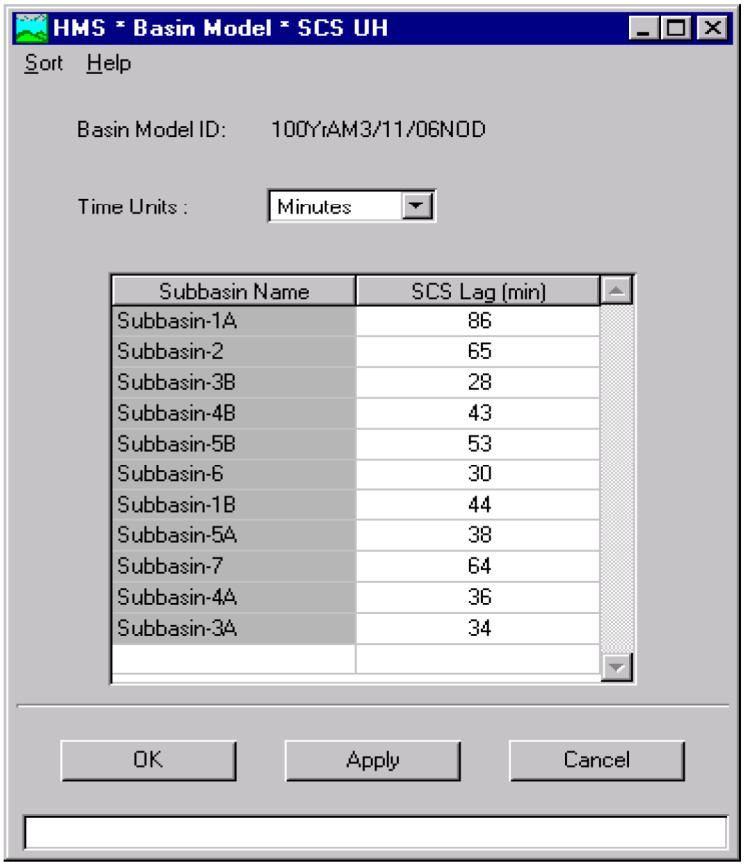
Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4B	515.23	01 Dec 00 1238	85.822	0.423
Reach-2	515.23	01 Dec 00 1253	85.385	0.423
Subbasin-4A	92.952	01 Dec 00 1230	13.635	0.067
Reach-1RA	92.952	01 Dec 00 1233	13.622	0.067
Subbasin-2	949.25	01 Dec 00 1302	213.56	1.063
playa	0.0	30 Nov 00 2400	0.0	1.063
Reach-1RB	0.0	30 Nov 00 2400	0.0	1.063
Junction-1RC	92.952	01 Dec 00 1233	13.622	1.130
Reach-1RC	92.952	01 Dec 00 1238	13.599	1.130
Subbasin-3A	120.01	01 Dec 00 1228	16.906	0.083
Junction-1RB	207.24	01 Dec 00 1233	30.505	1.213
Reach-1RD	207.24	01 Dec 00 1249	30.340	1.213
Subbasin-1A	533.30	01 Dec 00 1325	146.15	0.691
Reach-1A	533.30	01 Dec 00 1341	145.34	0.691
Subbasin-1B	376.03	01 Dec 00 1239	63.679	0.314
Junction-1A	827.56	01 Dec 00 1258	239.36	2.218
Reach-1B	827.56	01 Dec 00 1301	239.11	2.218
Subbasin-3B	124.49	01 Dec 00 1221	15.317	0.075
Junction-1	872.40	01 Dec 00 1258	254.42	2.293
Reach-3	872.40	01 Dec 00 1315	252.91	2.293
Subbasin-5A	256.07	01 Dec 00 1232	39.040	0.192
Junction-2	1470.0	01 Dec 00 1300	377.34	2.908
Reach-4	1470.0	01 Dec 00 1321	374.55	2.908
Subbasin-5B	276.18	01 Dec 00 1249	53.528	0.265
Junction-3	1668.1	01 Dec 00 1317	428.07	3.173
Reach-5	1668.1	01 Dec 00 1331	425.94	3.173
Subbasin-6	116.97	01 Dec 00 1223	15.099	0.074
Junction-4	1692.0	01 Dec 00 1330	441.03	3.247
Reach-6	1692.0	01 Dec 00 1330	441.03	3.247
Subbasin-7	93.976	01 Dec 00 1301	20.903	0.104
Junction-5	1767.1	01 Dec 00 1330	461.94	3.351

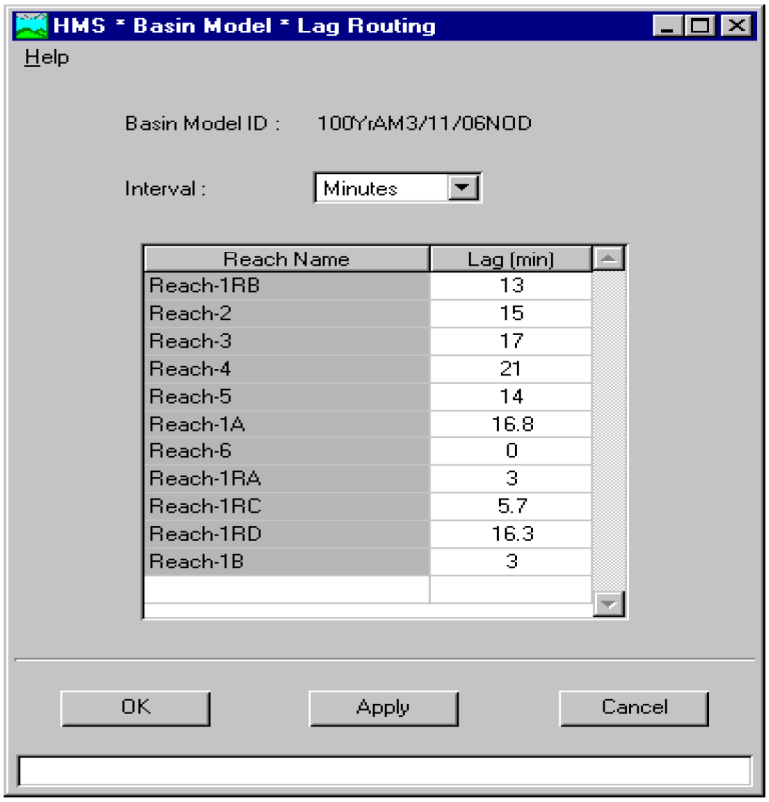
Meteorologic Model Input

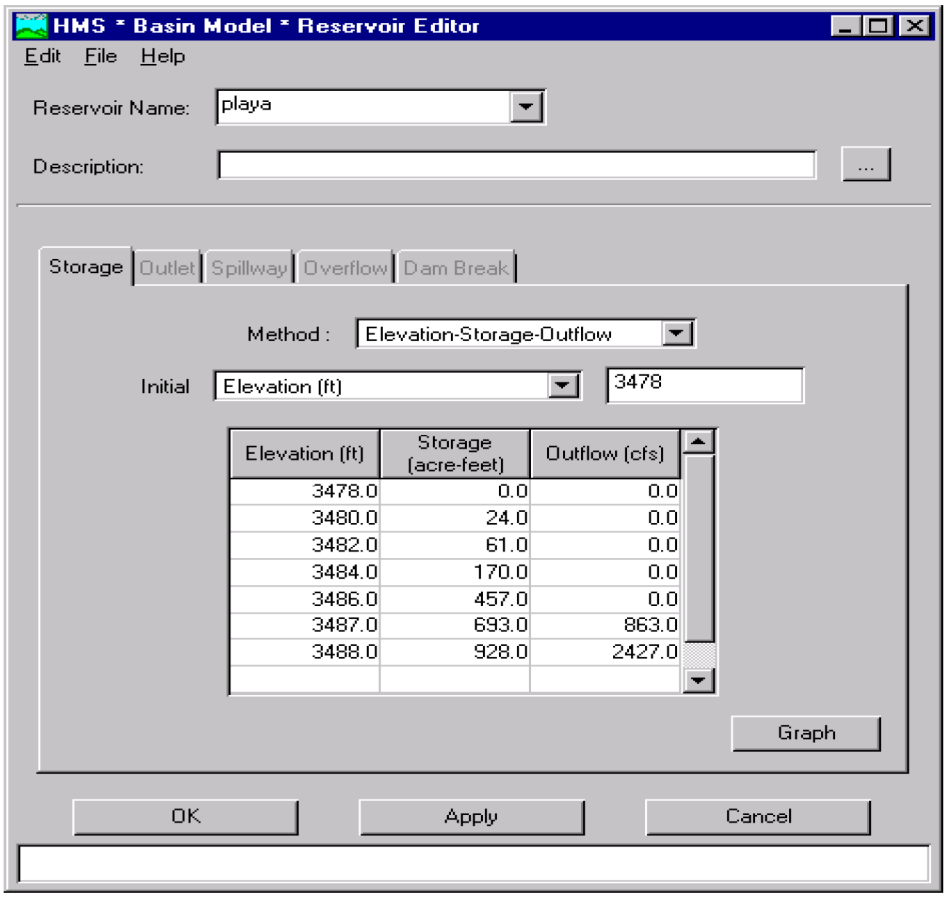




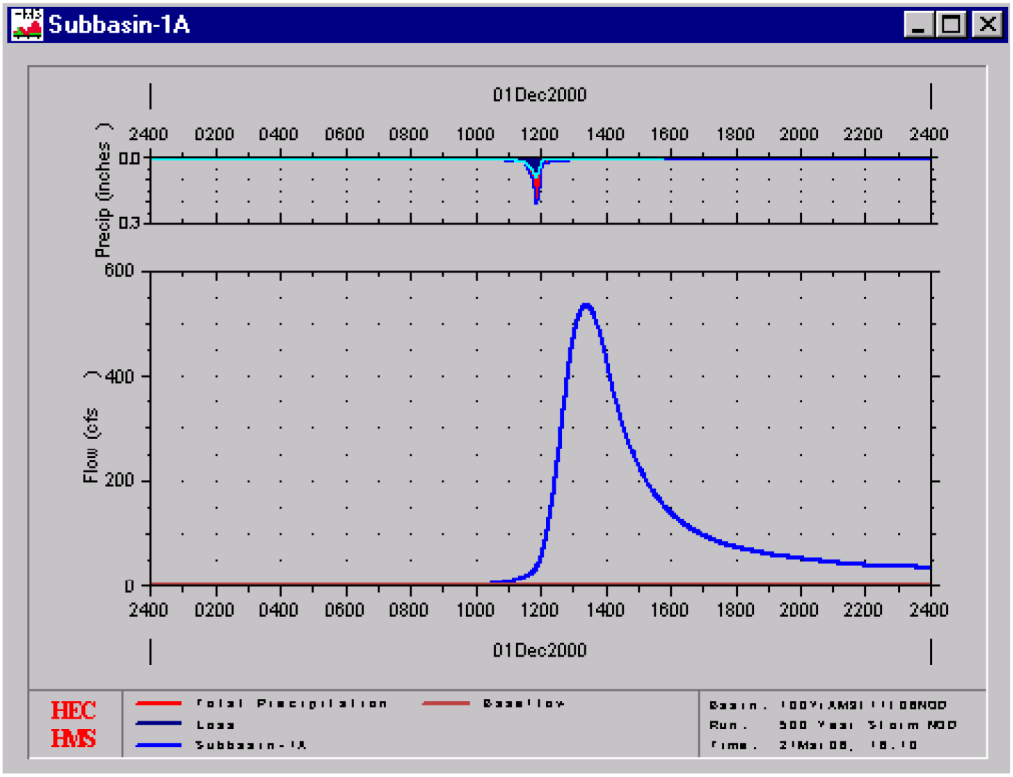
Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	62		0.0
Subbasin-2	60		0.0
Subbasin-3B	60		0.0
Subbasin-4B	60		0.0
Subbasin-5B	60		0.0
Subbasin-6	60		0.0
Subbasin-1B	60		0.0
Subbasin-5A	60		0.0
Subbasin-7	60		0.0
Subbasin-4A	60		0.0
Subbasin-3A	60		0.0

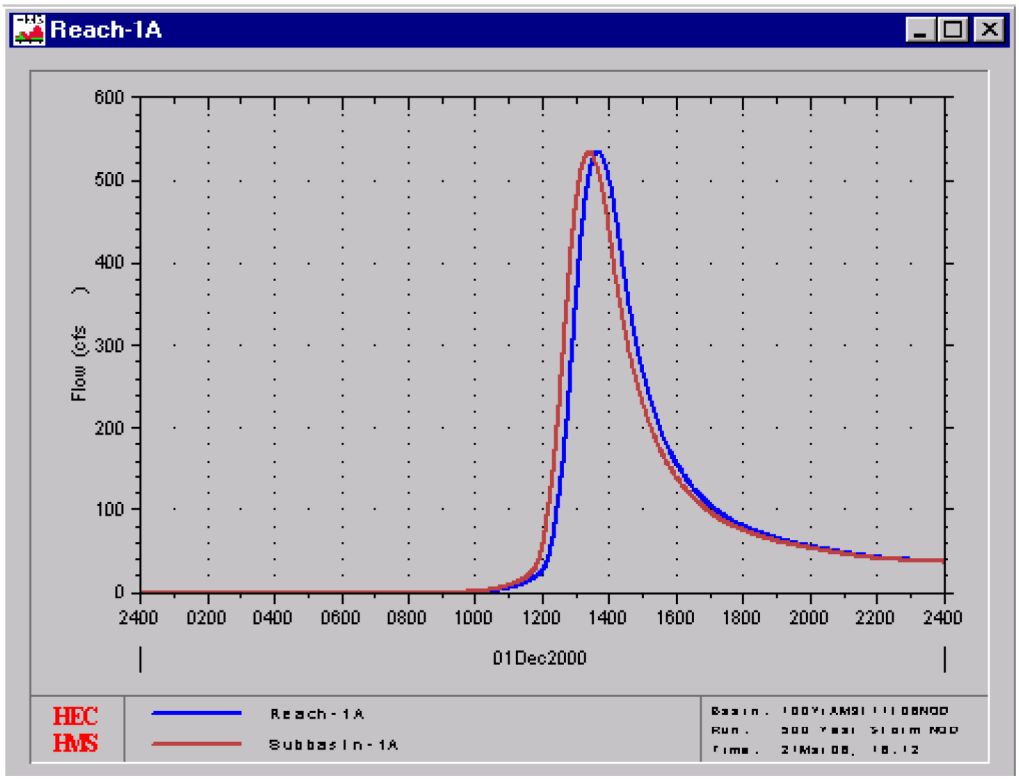

HMS * Basin Model * SCS UH
Sort Help
Basin Model ID: 100YrAM3/11/06NOD
Time Units : Minutes
Subbasin Name | SCS Lag (min)
Subbasin-1A | 86
Subbasin-2 | 65
Subbasin-3B | 28
Subbasin-4B | 43
Subbasin-5B | 53
Subbasin-6 | 30
Subbasin-1B | 44
Subbasin-5A | 38
Subbasin-7 | 64
Subbasin-4A | 36
Subbasin-3A | 34
OK
Apply
Cancel


HMS * Basin Model * Lag Routing
Help
Basin Model ID : 100YrAM3/11/06NOD
Interval : Minutes
Reach Name | Lag (min)
Reach-1RB | 13
Reach-2 | 15
Reach-3 | 17
Reach-4 | 21
Reach-5 | 14
Reach-1A | 16.8
Reach-6 | 0
Reach-1RA | 3
Reach-1RC | 5.7
Reach-1RD | 16.3
Reach-1B | 3
OK
Apply
Cancel

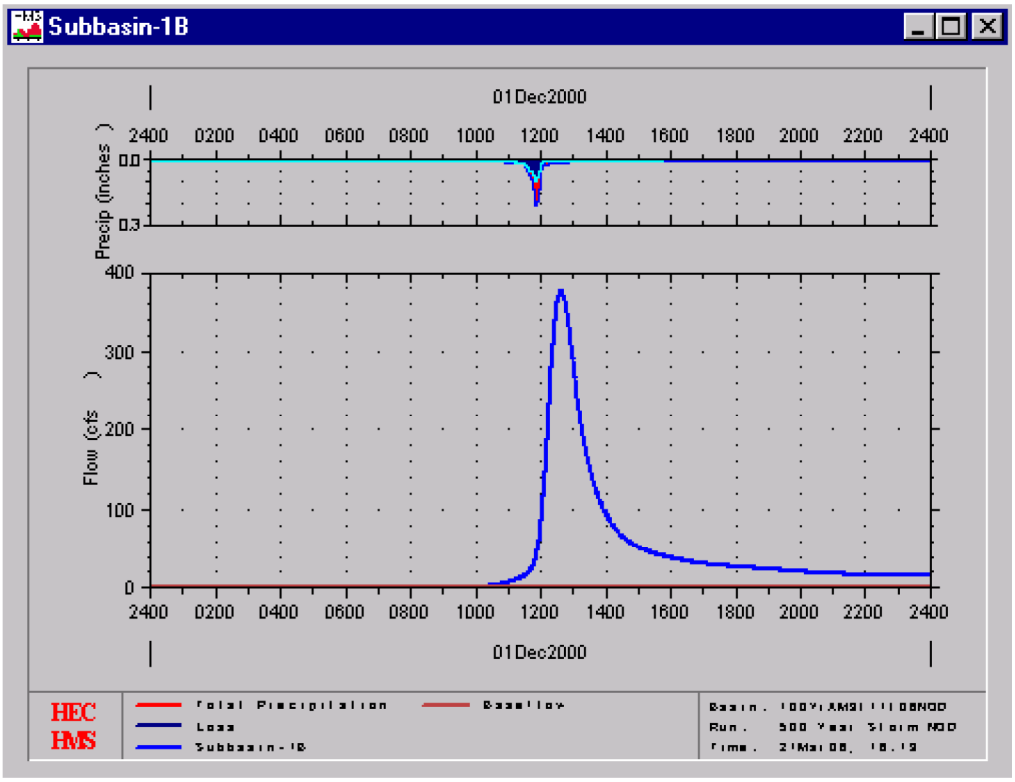

HMS * Basin Model * Reservoir Editor
Edit File Help
Reservoir Name: playa
Description:
...
Storage Outlet Spillway Overflow Dam Break
Method : Elevation-Storage-Outflow
Initial Elevation (ft) 3478
Elevation (ft) Storage (acre-feet) Outflow (cfs)
3478.0 0.0 0.0
3480.0 24.0 0.0
3482.0 61.0 0.0
3484.0 170.0 0.0
3486.0 457.0 0.0
3487.0 693.0 863.0
3488.0 928.0 2427.0
Graph
OK
Apply
Cancel

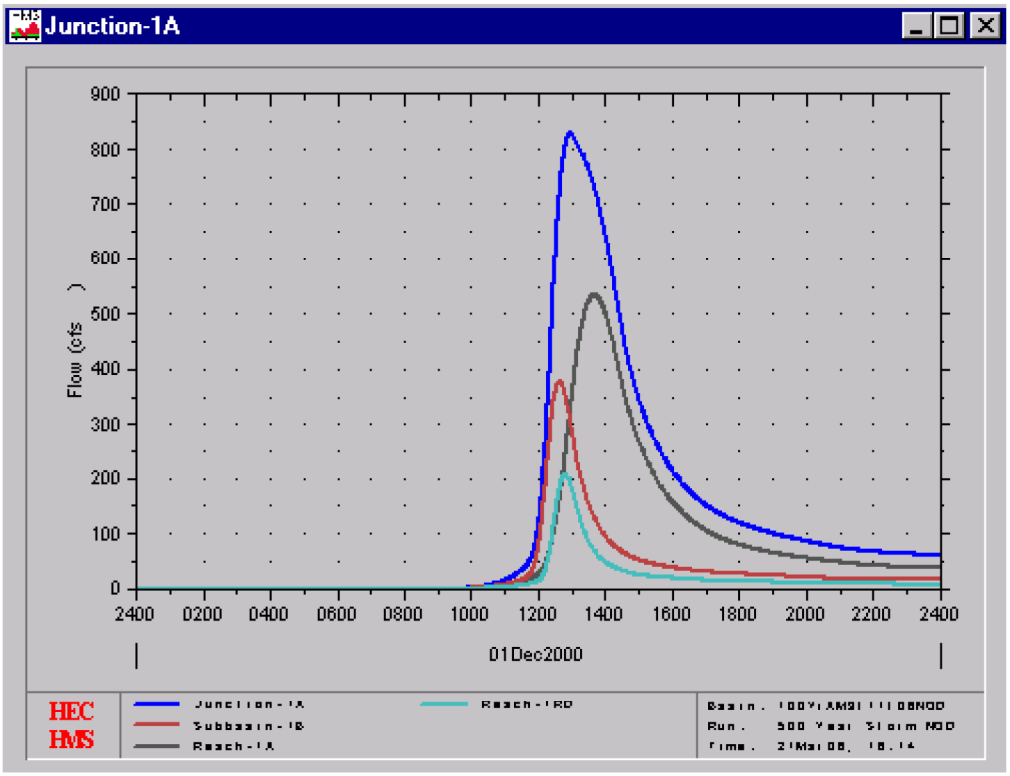
WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS



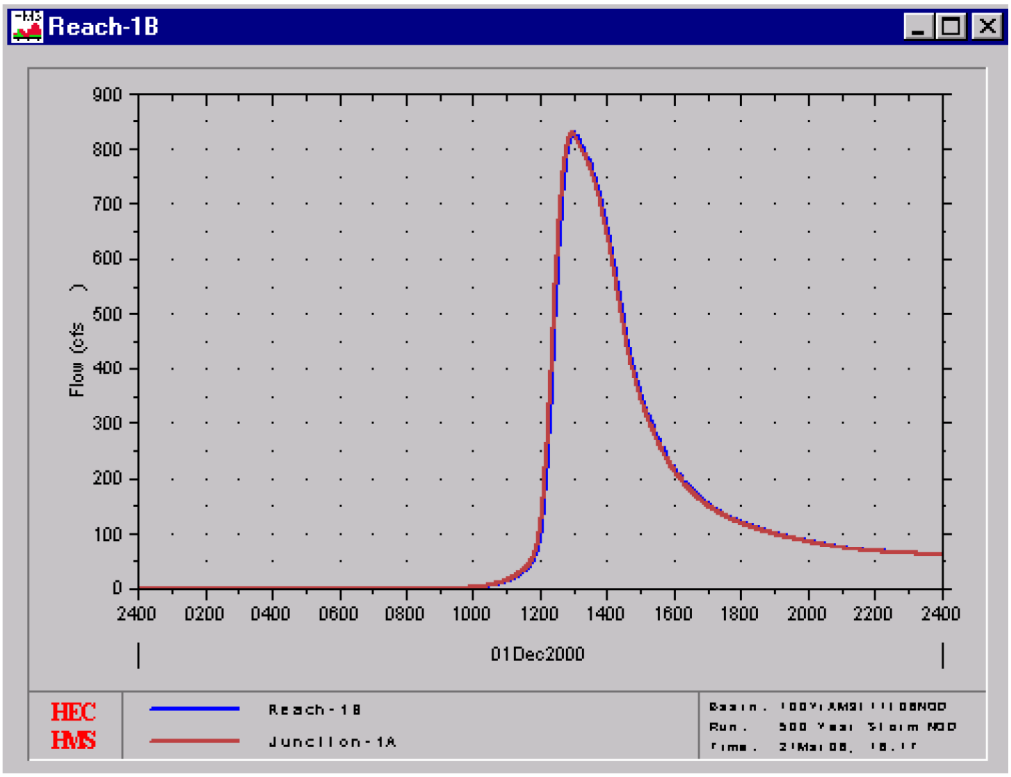


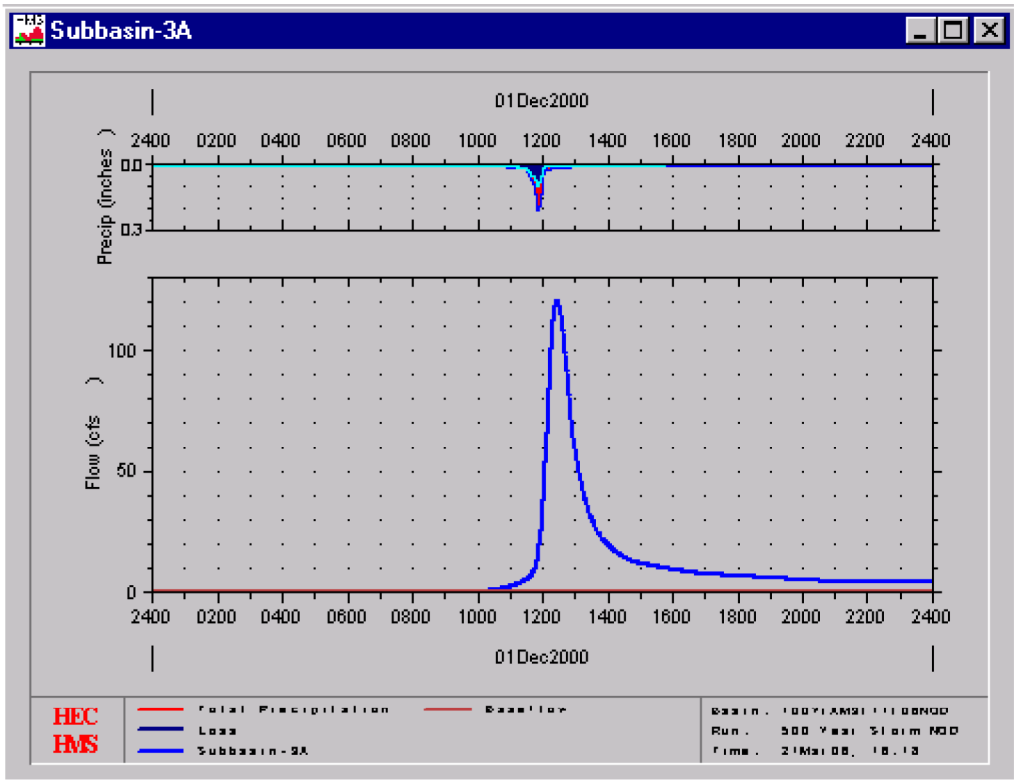
WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS



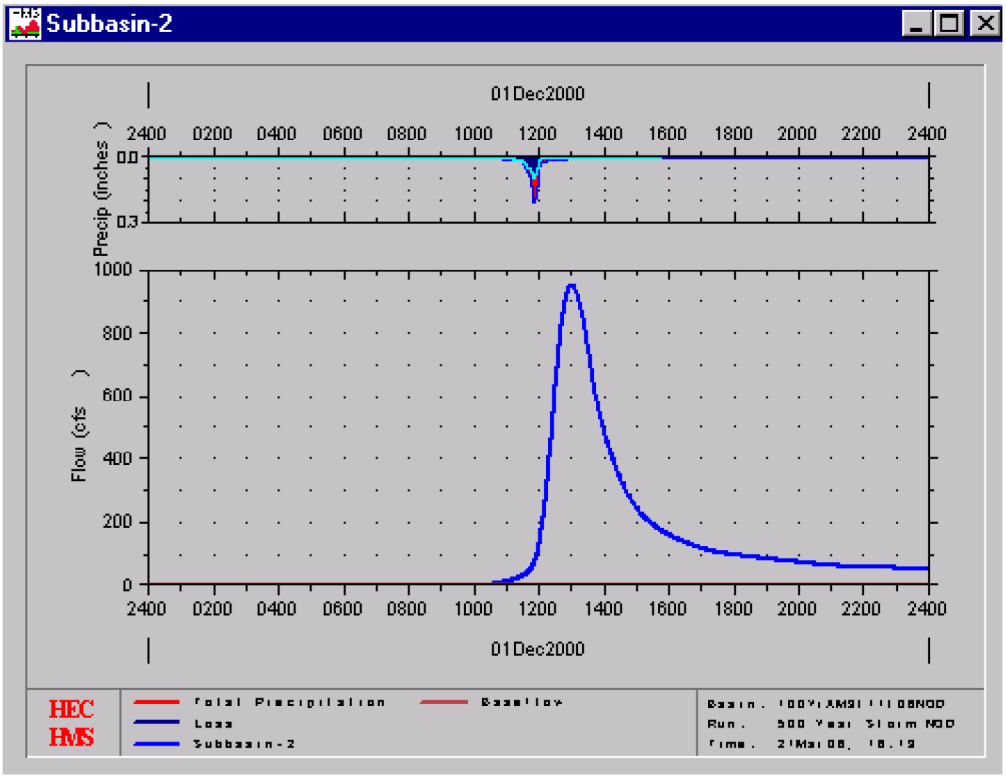


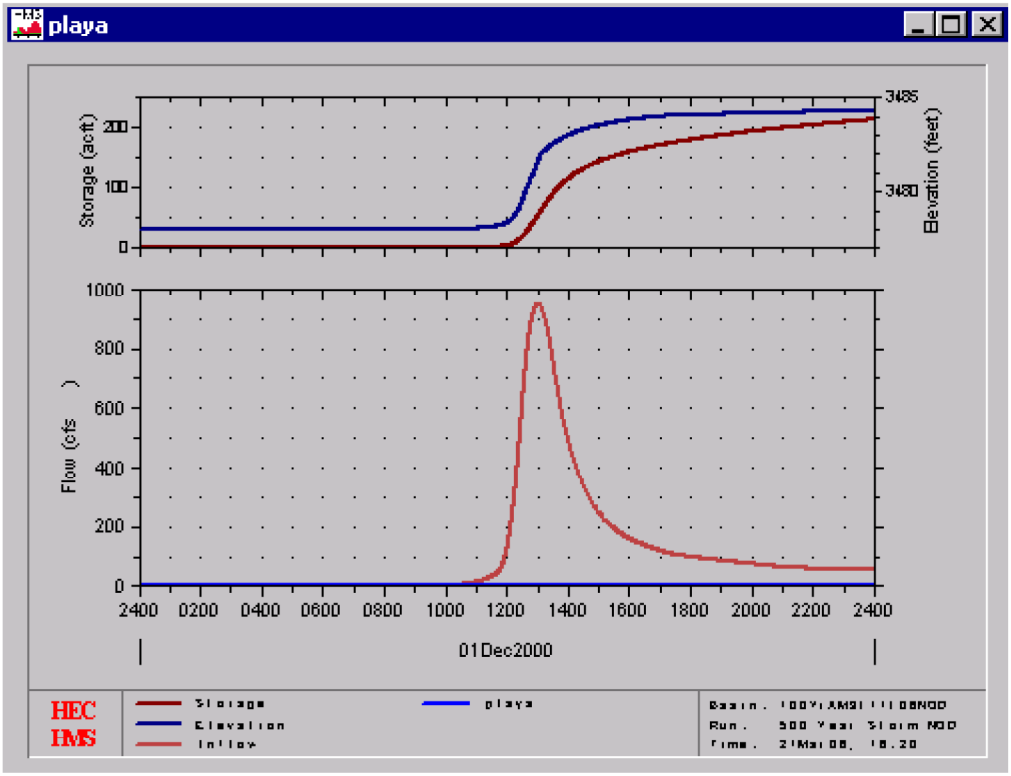
WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS





WCS FACILITY
FLOOD PLAIN STUDY HYDROGRAPHS





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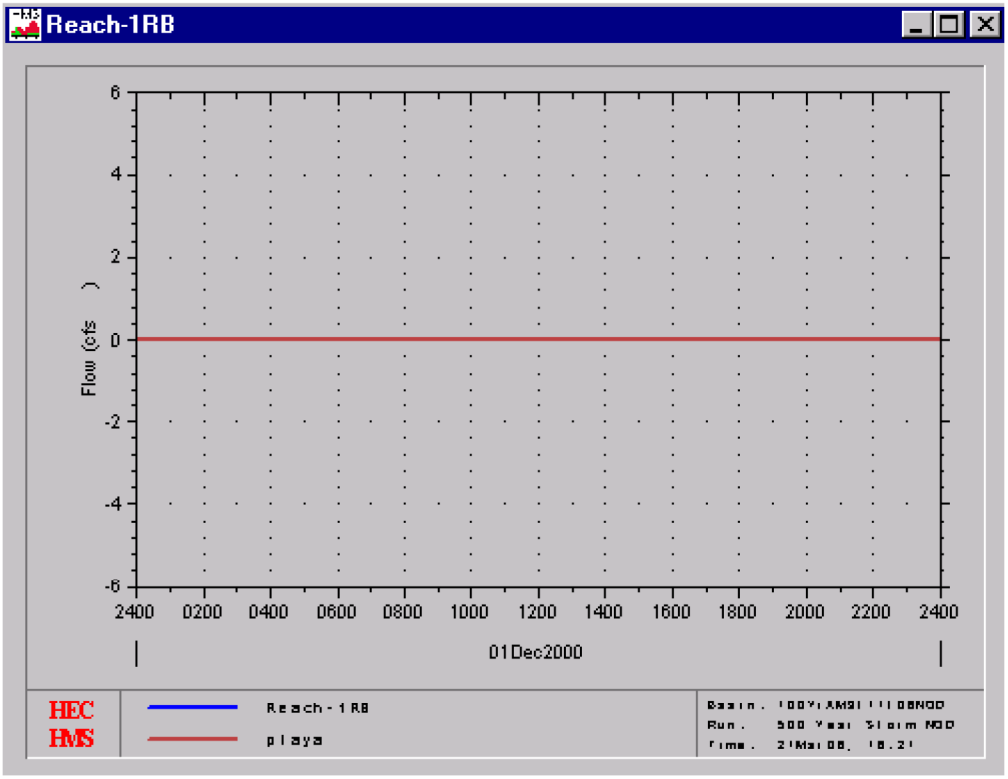

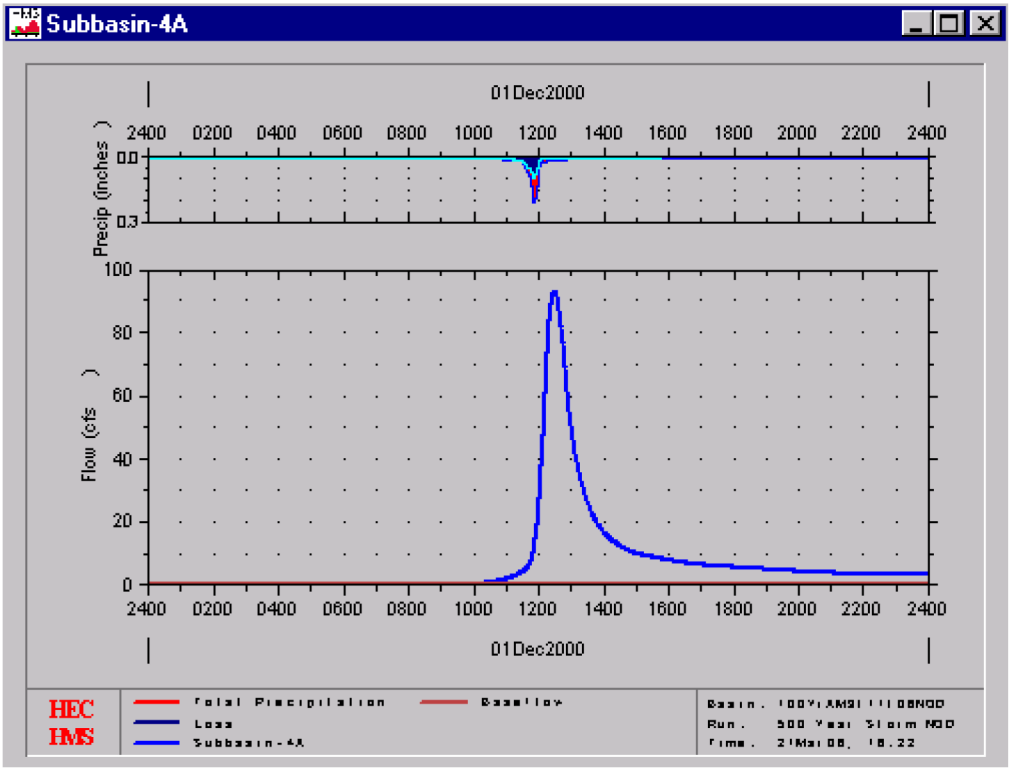

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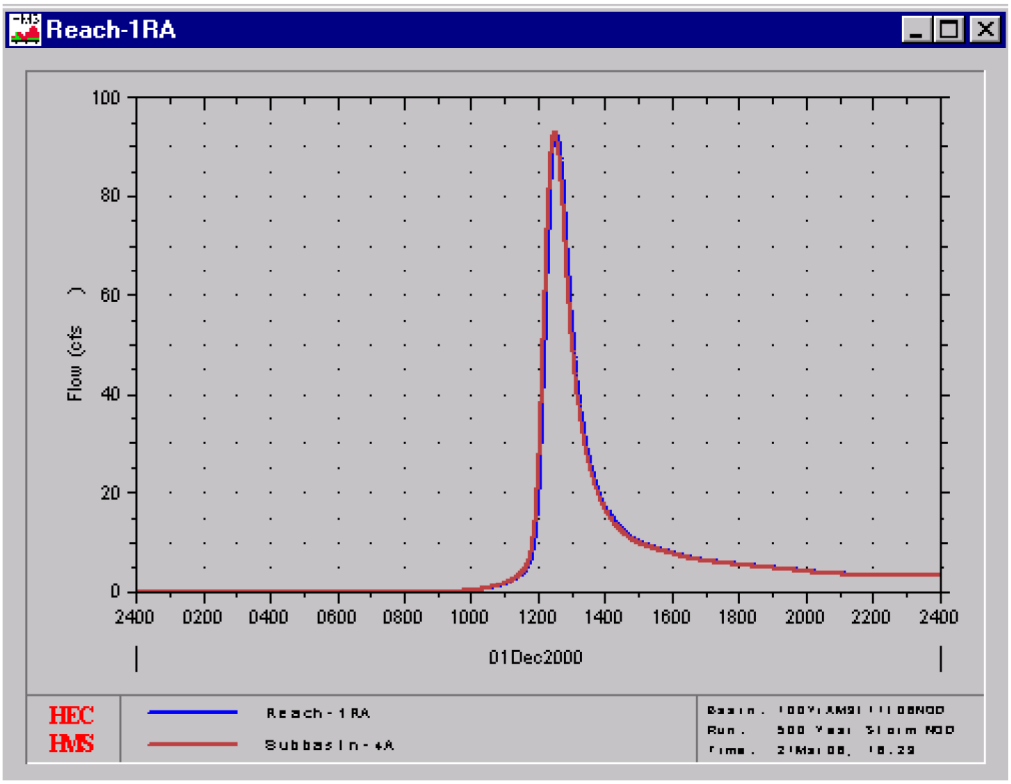

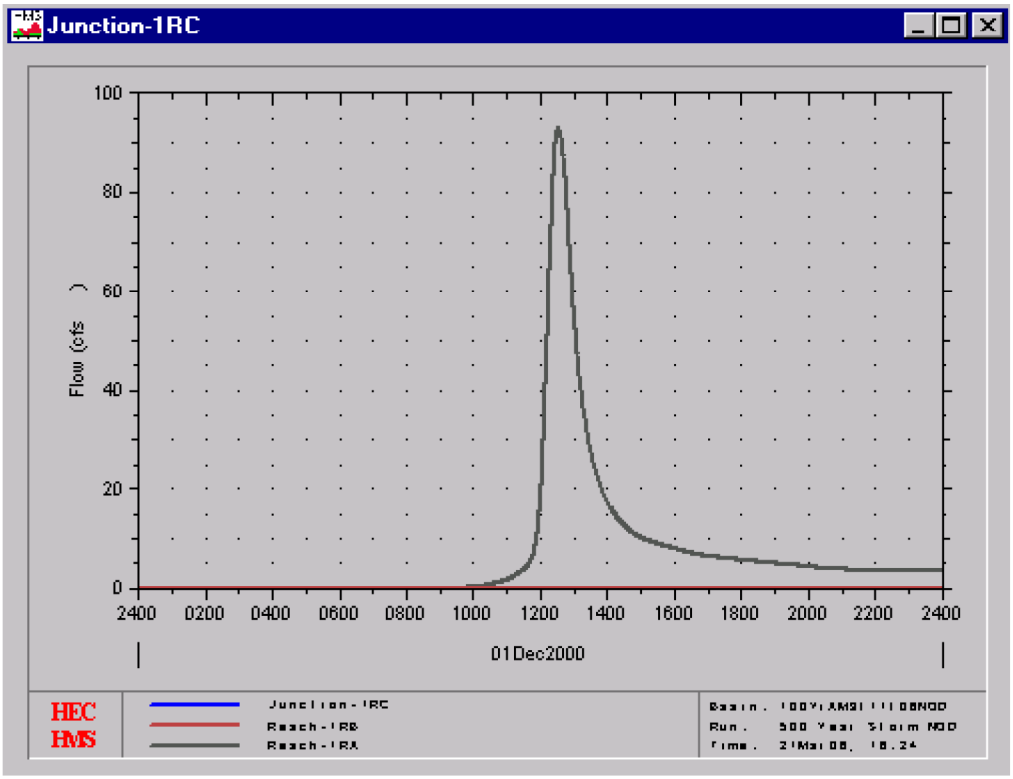

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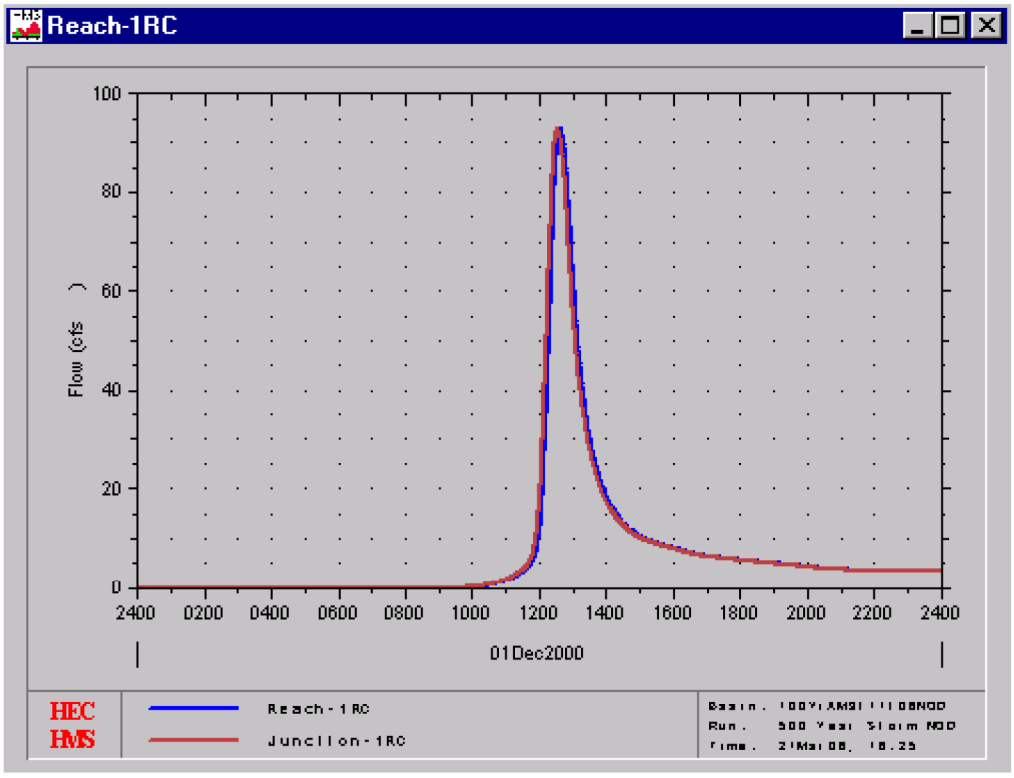

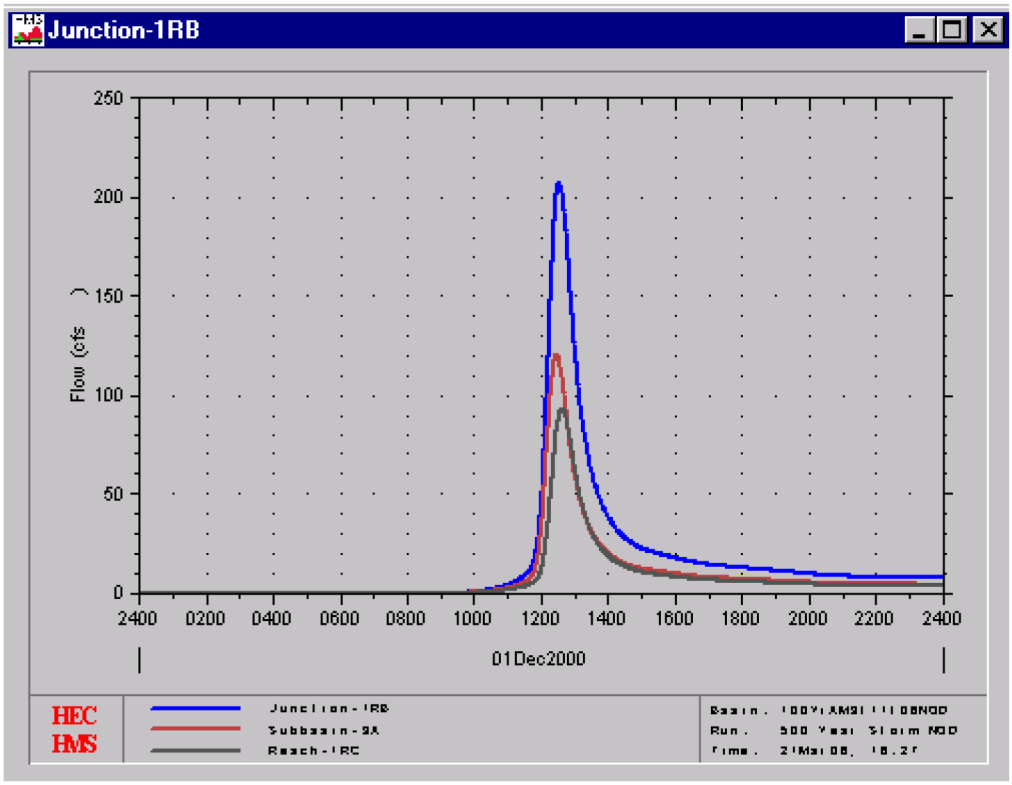

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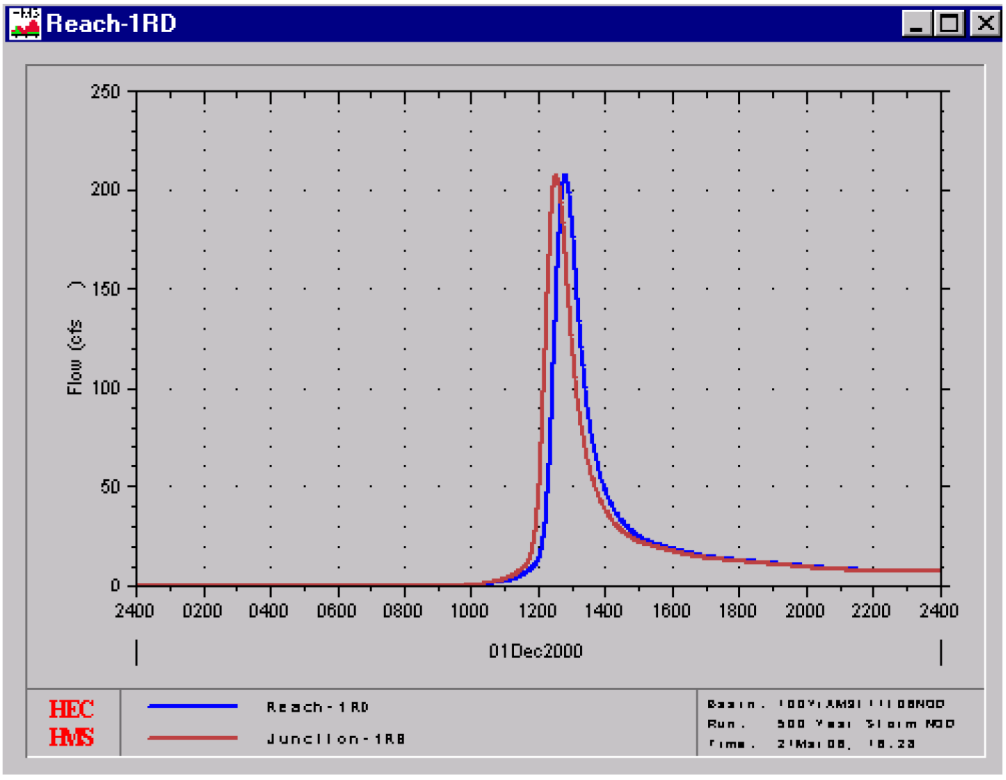

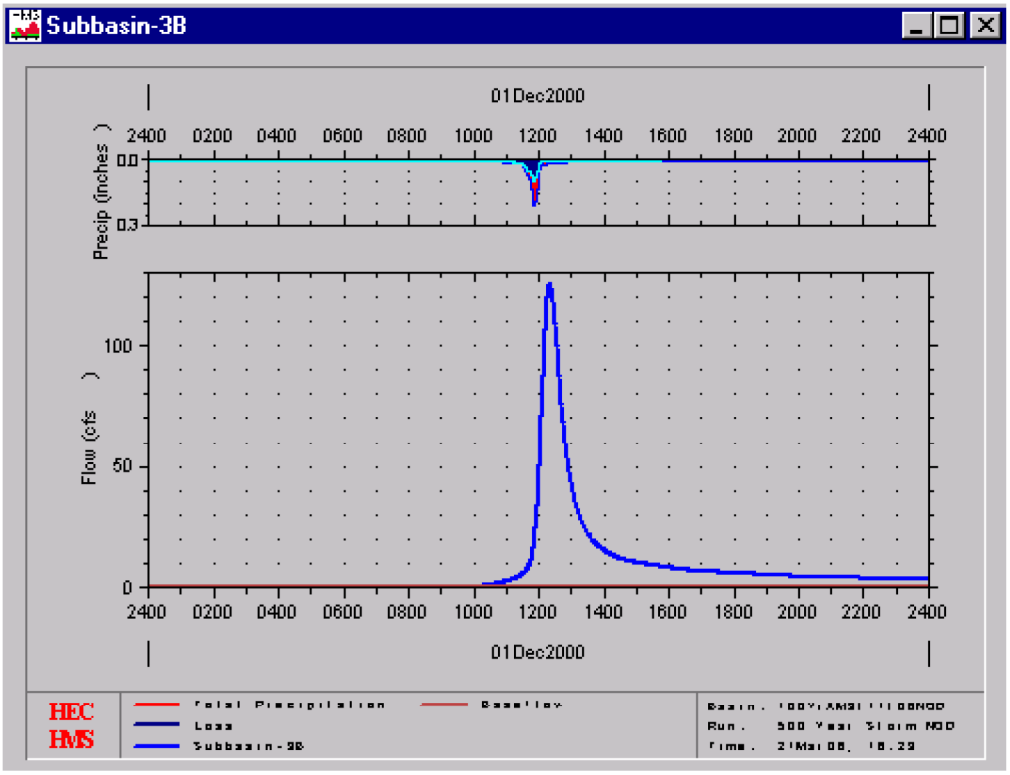

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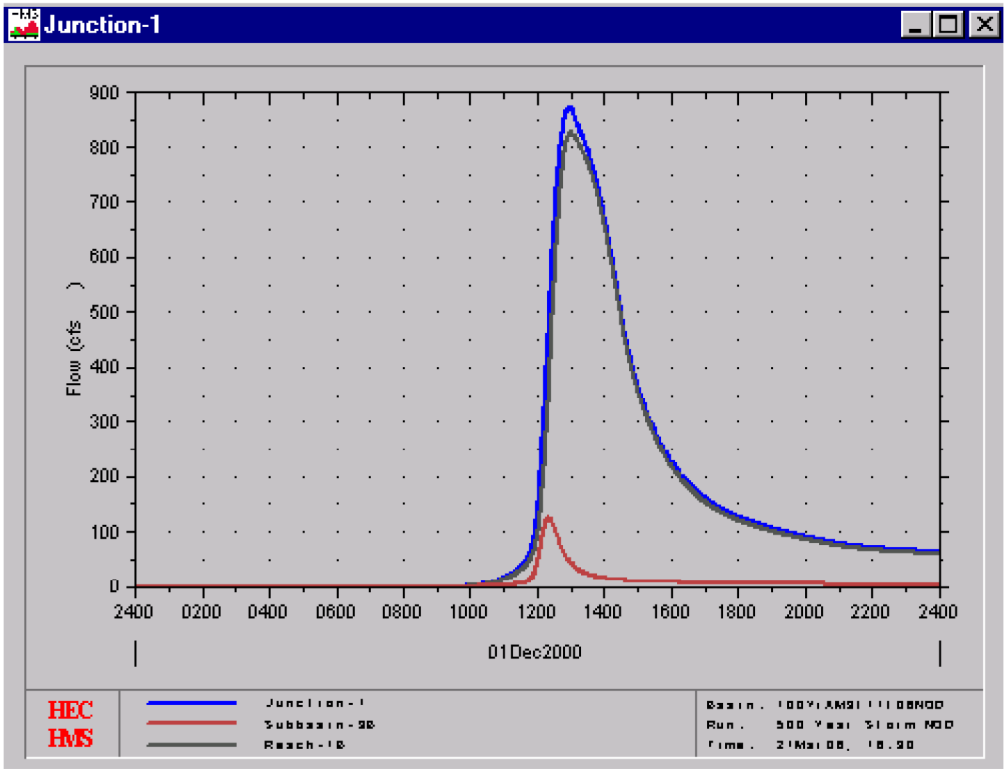

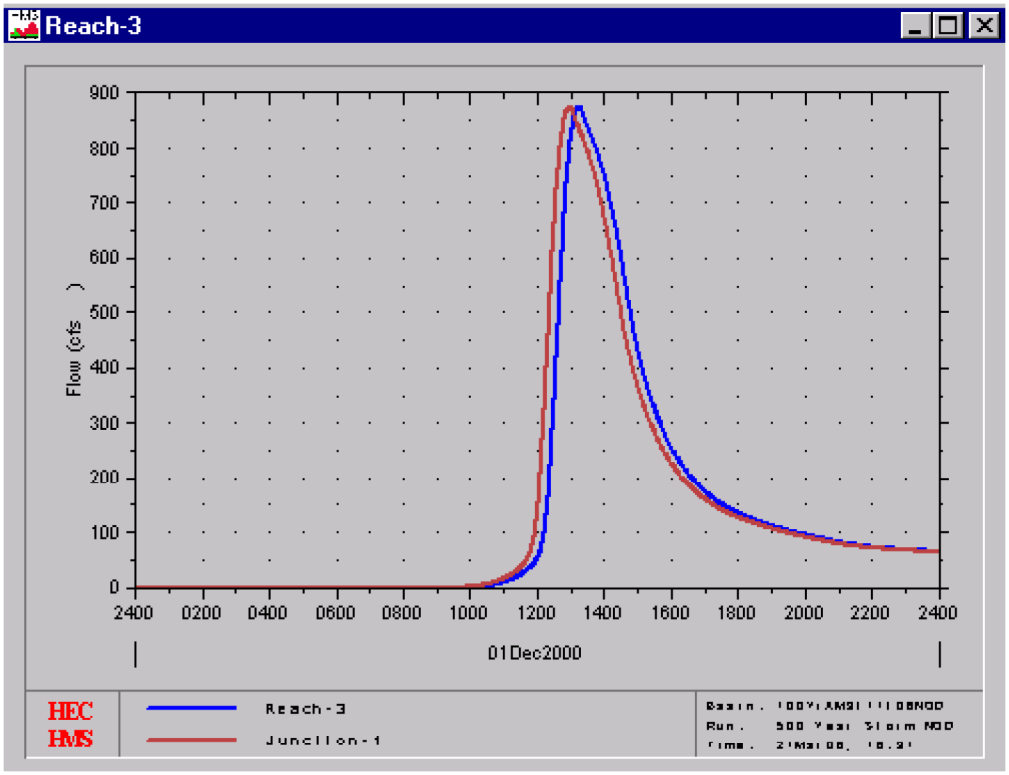

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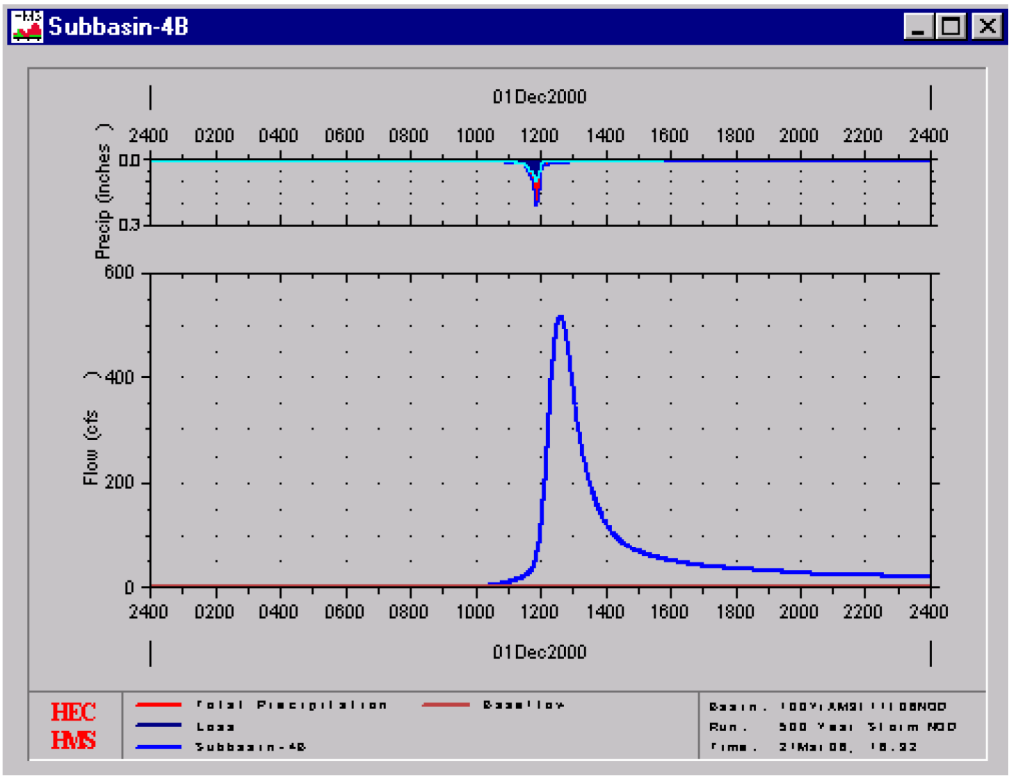

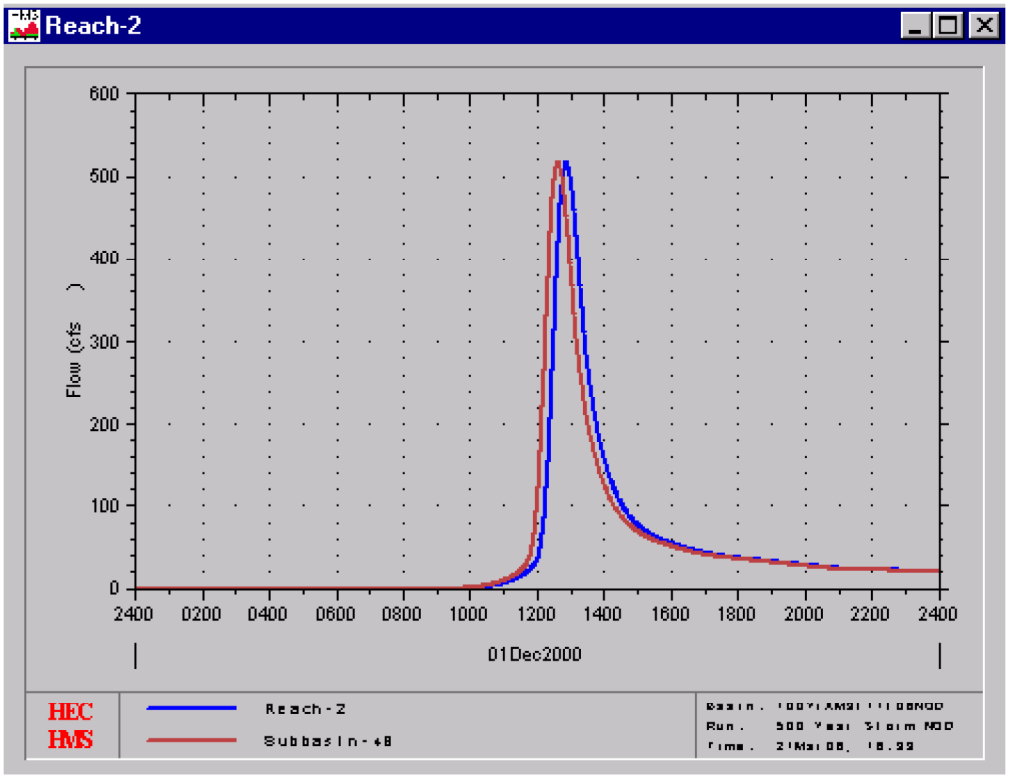

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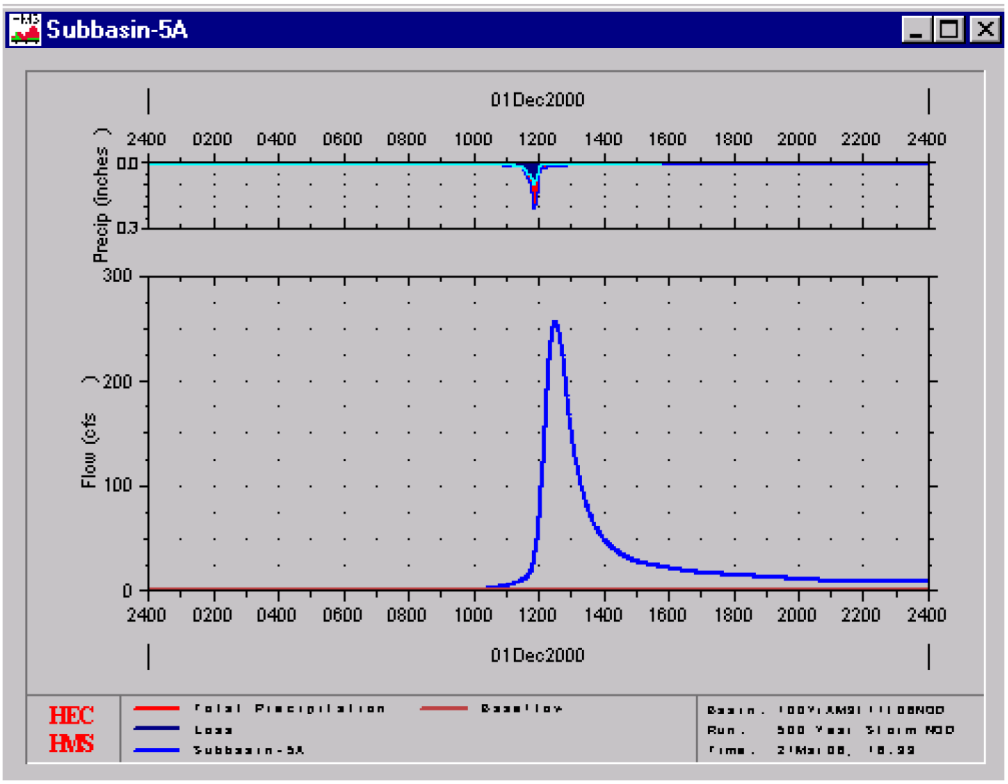

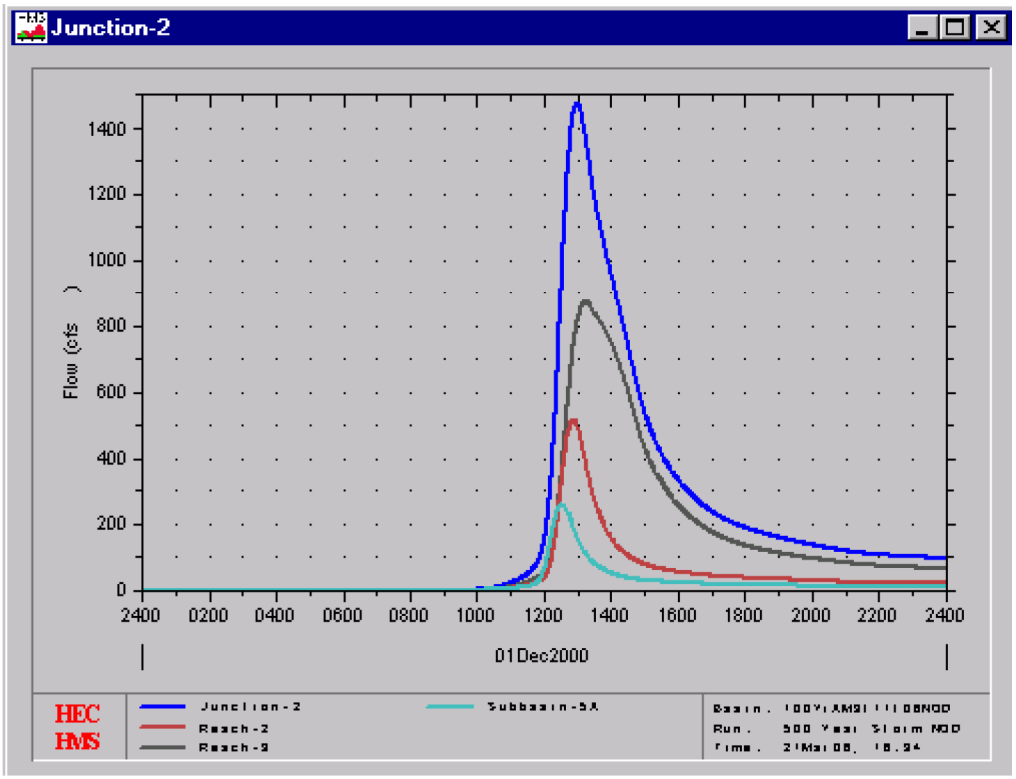

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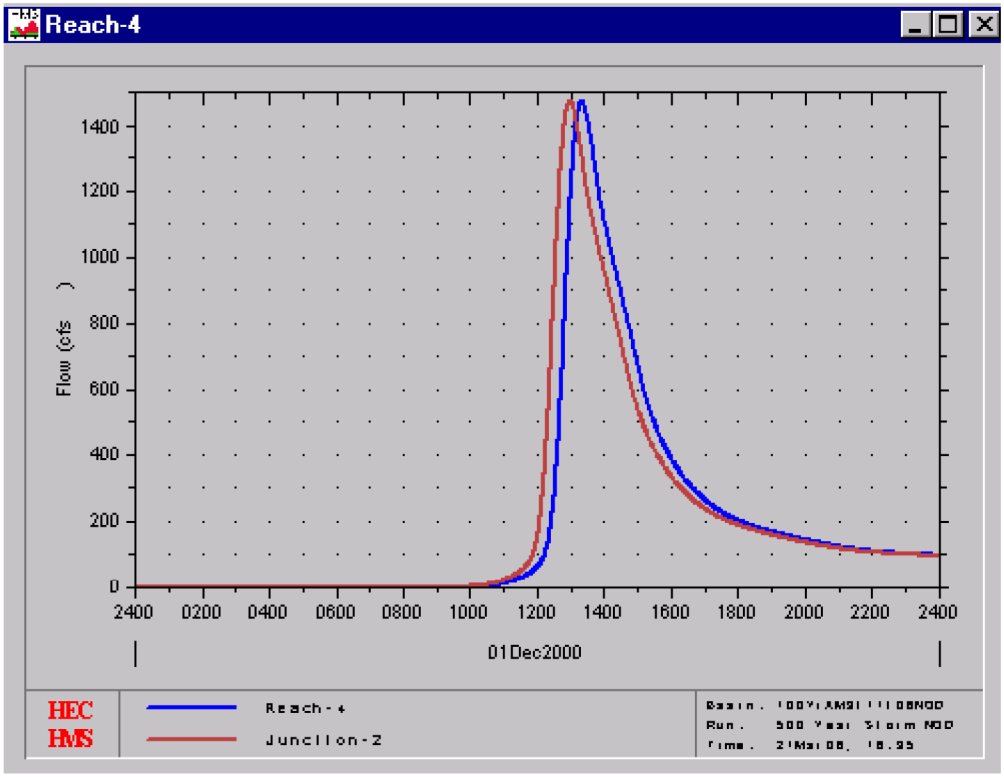

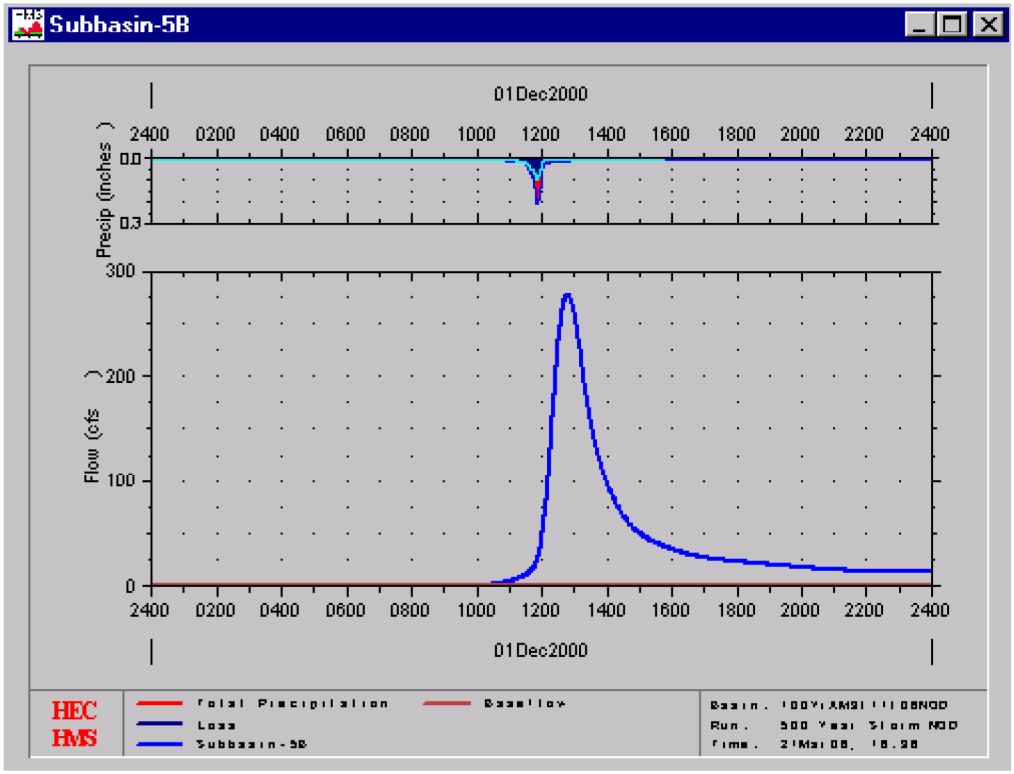

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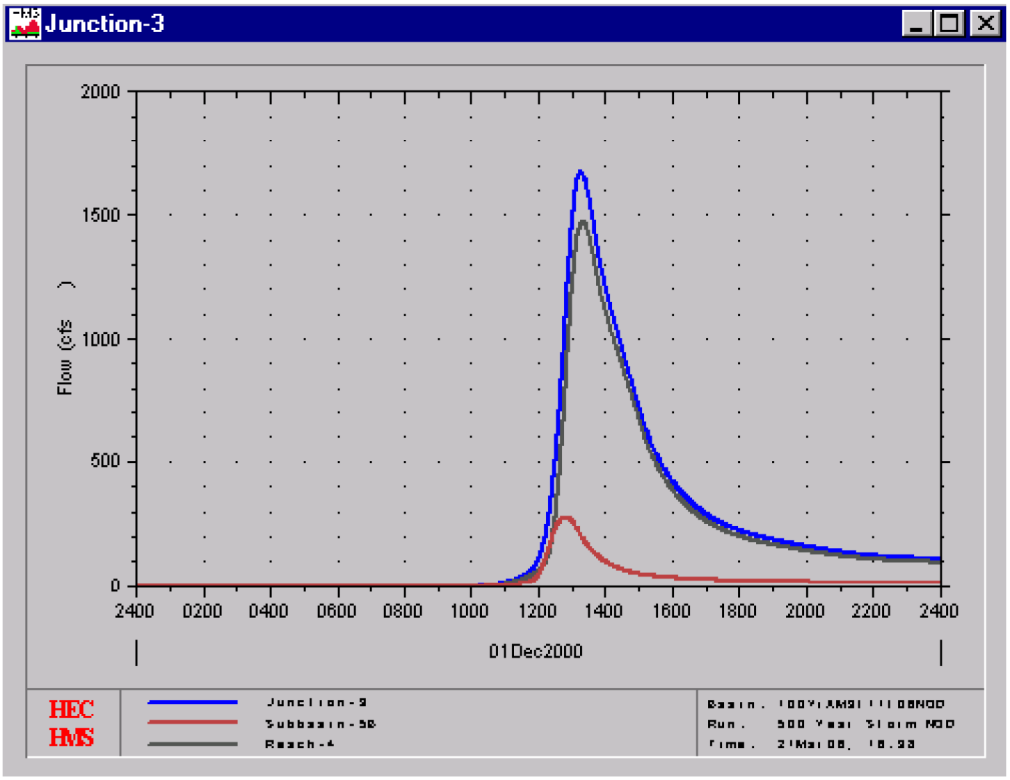

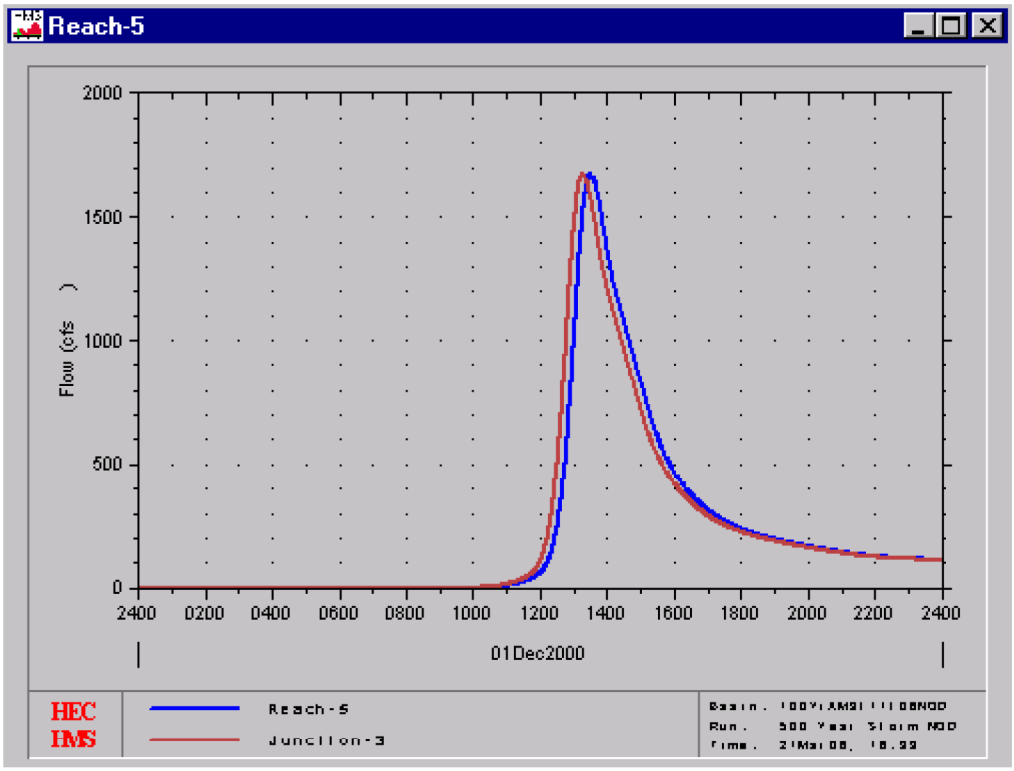

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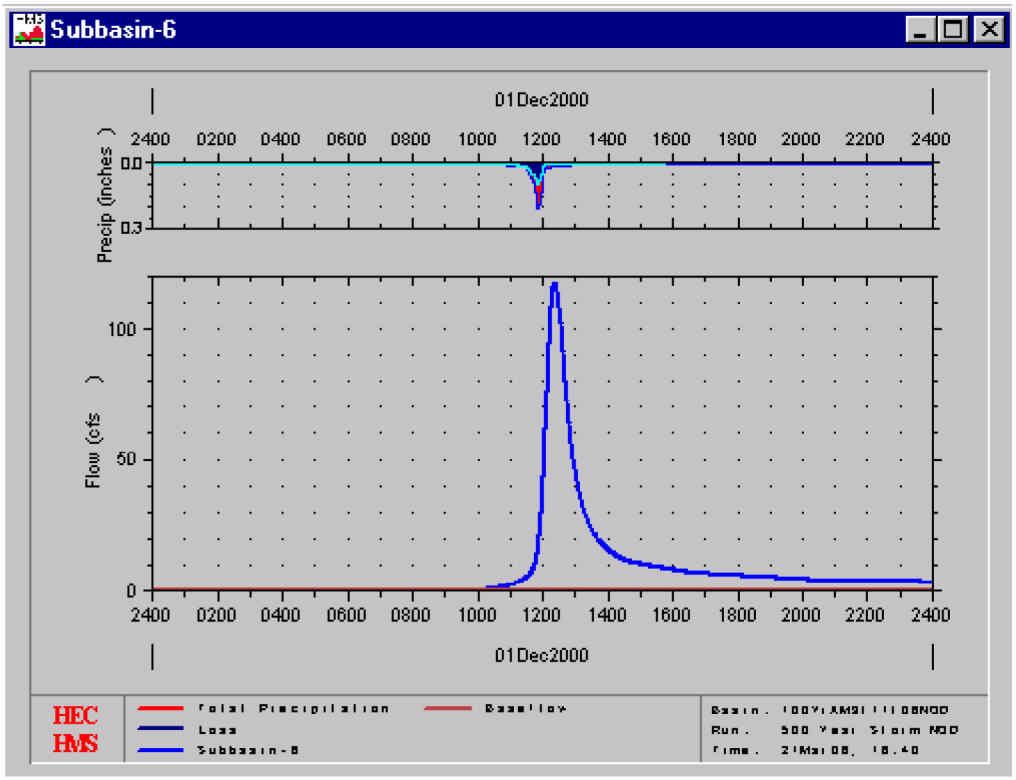

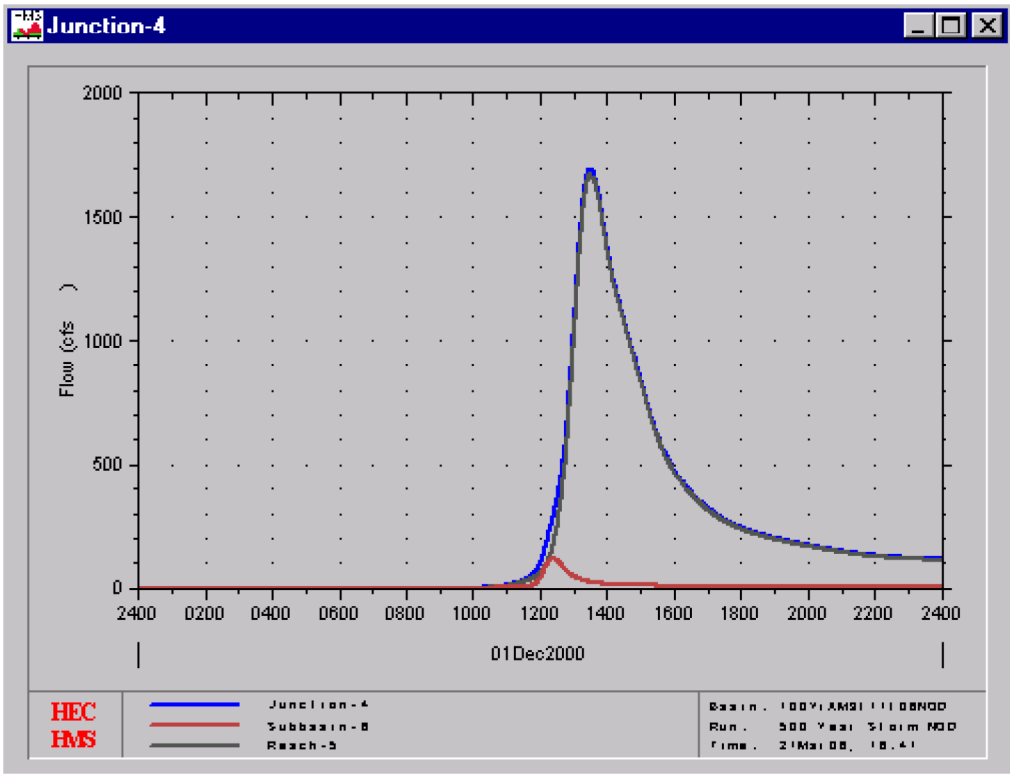

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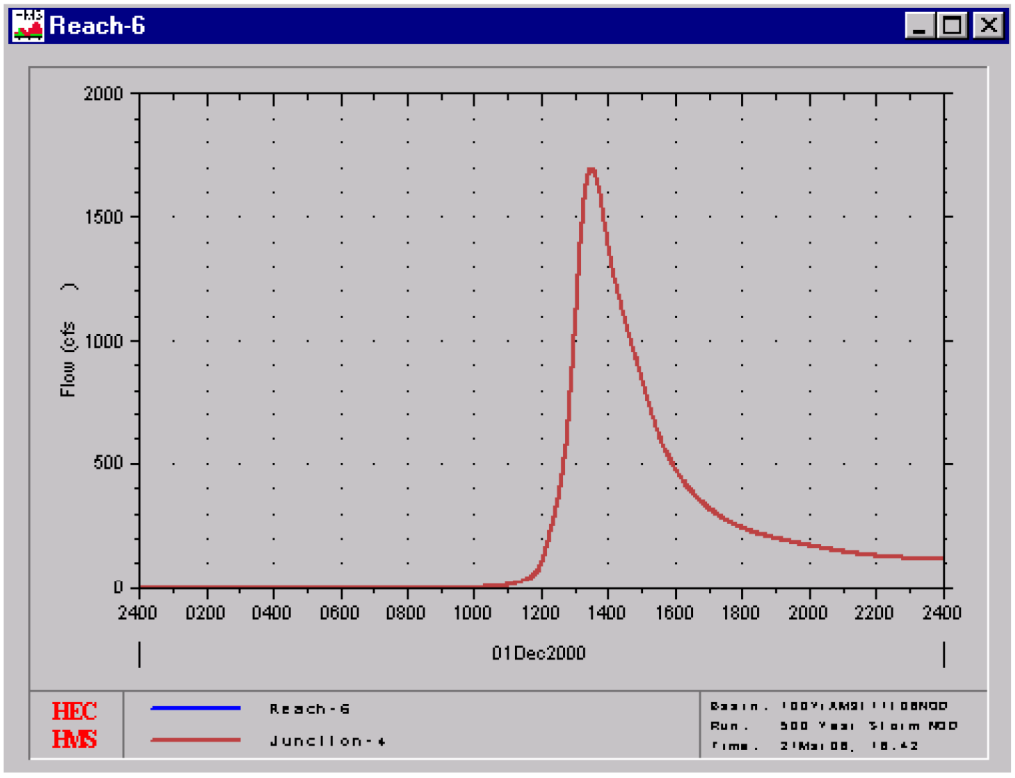

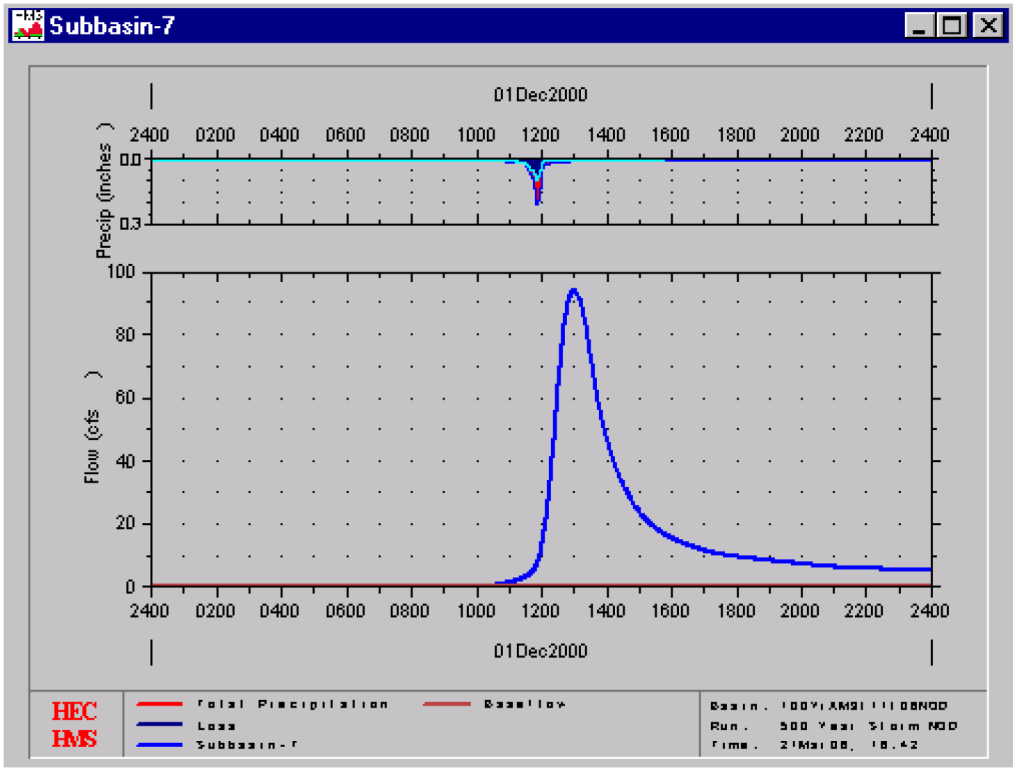

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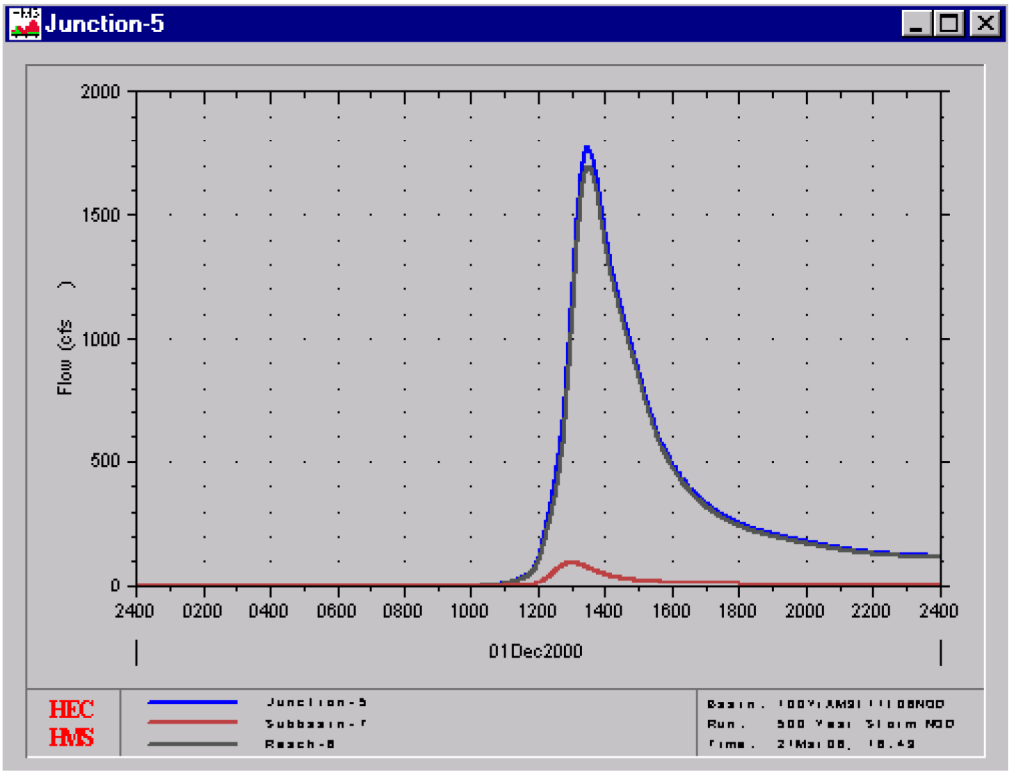


APPENDIX J

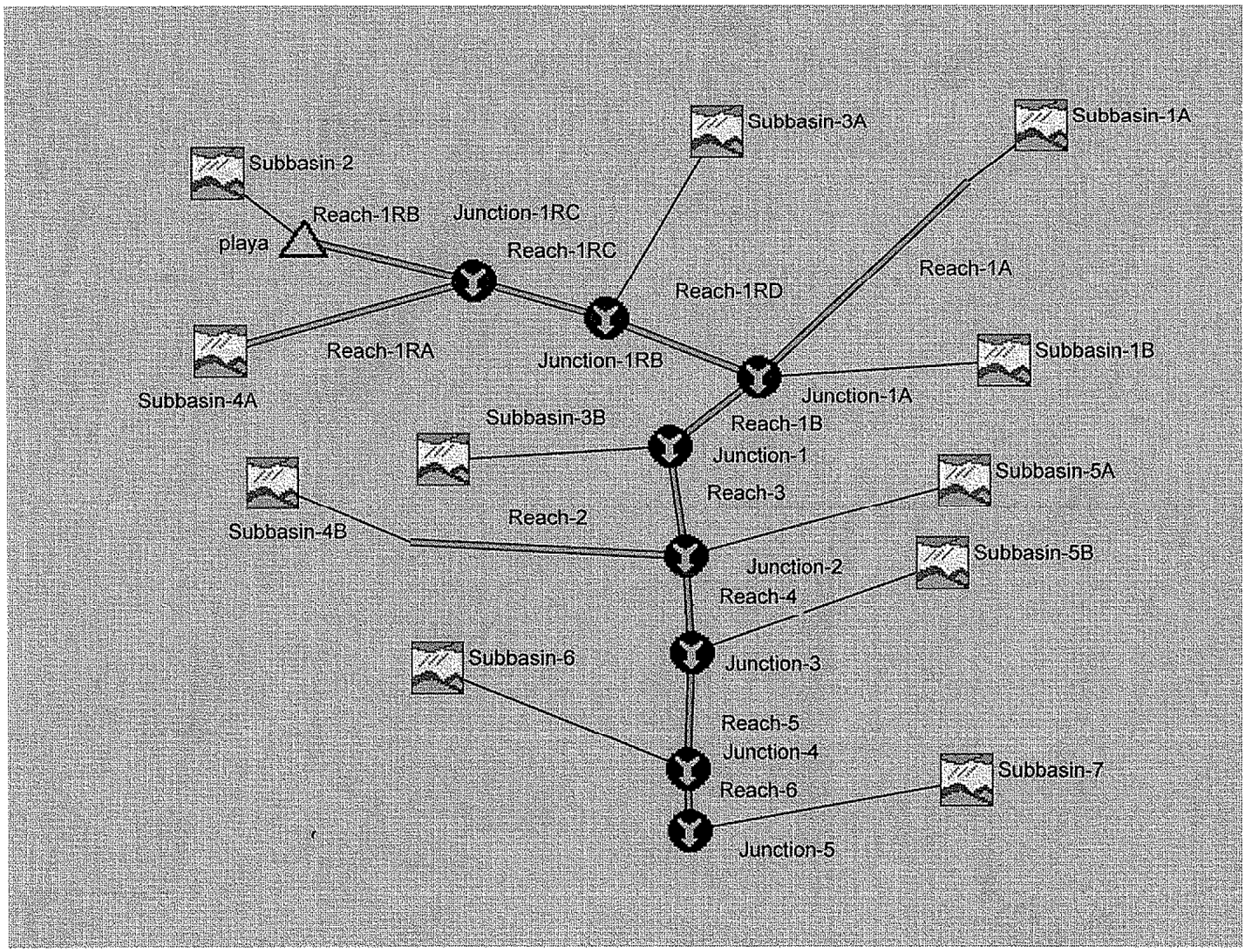
HEC-HMS MODEL FOR THE CALCULATION OF THE DEVELOPED LOW LEVEL & BYPRODUCT FACILITY PMP PEAK DISCHARGES

HMS * Summary of Results

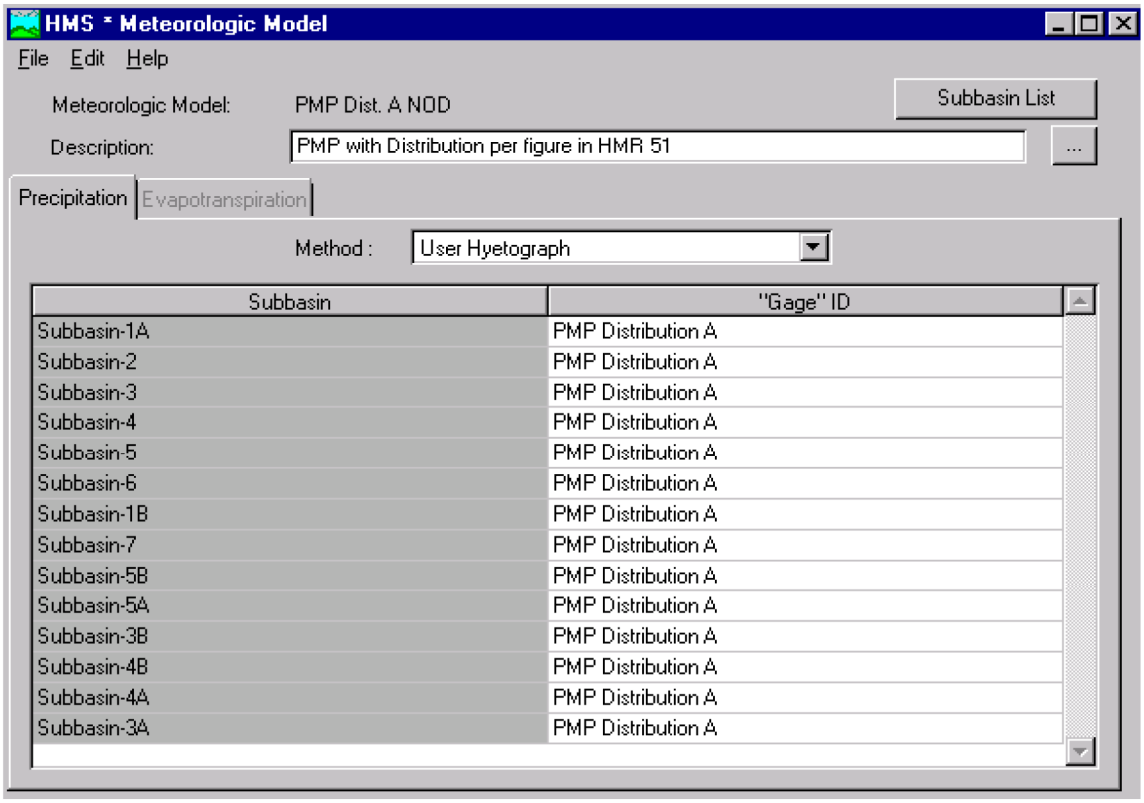
Project : WCS Run Name : PMP Dist. A NOD

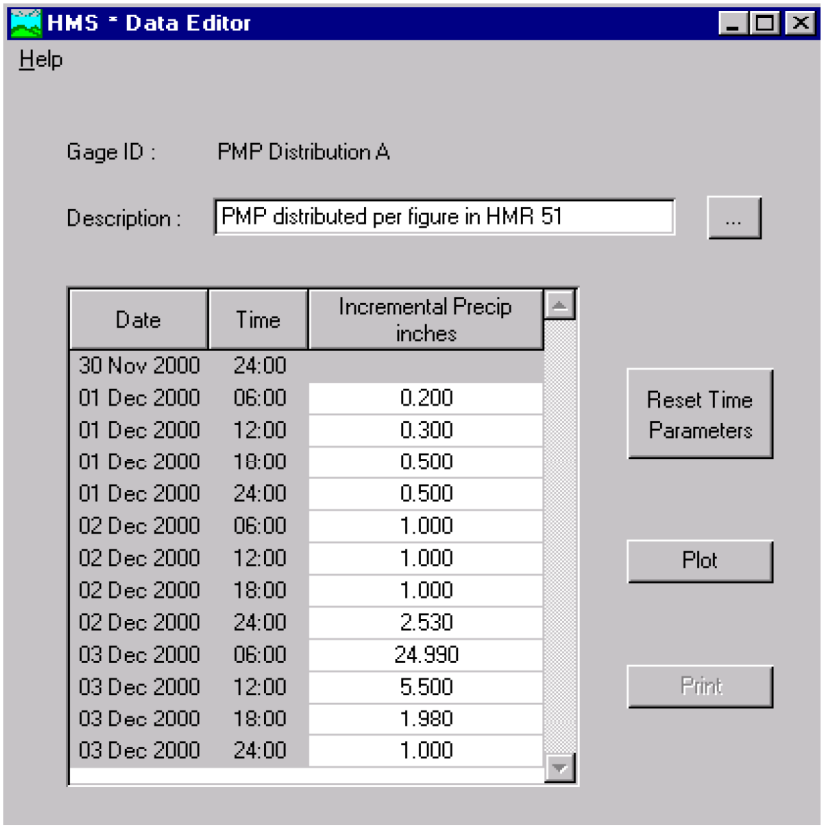
Start of Run : 01Dec00 0000 Basin Model : 100YrAM3/11/06NOD
End of Run : 05Dec00 0000 Met. Model : PMP Dist. A NOD
Execution Time : 20Mar06 1842 Control Specs : Control PMP

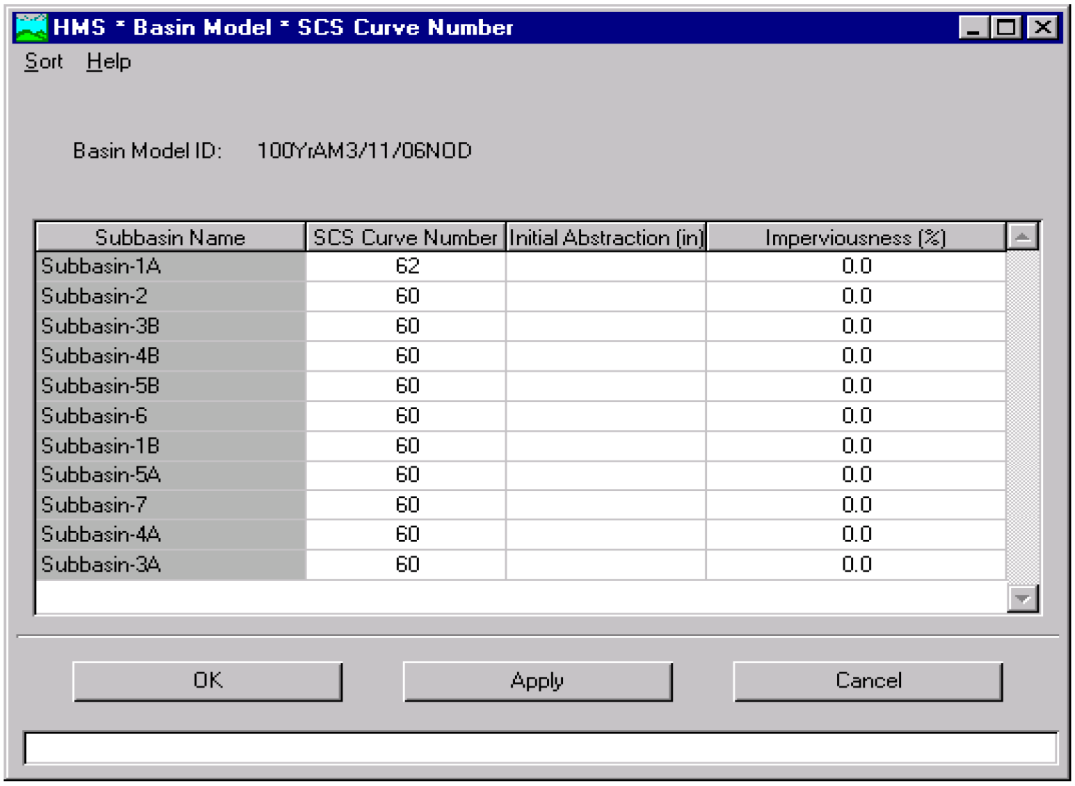
Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Volume (ac ft)	Drainage Area (sq mi)
Subbasin-4B	1091.4	03 Dec 00 0601	755.08	0.423
Reach-2	1091.4	03 Dec 00 0616	755.08	0.423
Subbasin-4A	173.16	03 Dec 00 0601	119.60	0.067
Reach-1RA	173.16	03 Dec 00 0604	119.60	0.067
Subbasin-2	2726.0	03 Dec 00 0605	1897.5	1.063
playa	2194.2	03 Dec 00 0655	1440.5	1.063
Reach-1RB	2194.2	03 Dec 00 0708	1440.5	1.063
Junction-1RC	2261.6	03 Dec 00 0700	1560.1	1.130
Reach-1RC	2261.6	03 Dec 00 0705	1560.1	1.130
Subbasin-3A	214.60	03 Dec 00 0601	148.16	0.083
Junction-1RB	2362.0	03 Dec 00 0634	1708.2	1.213
Reach-1RD	2362.0	03 Dec 00 0650	1708.2	1.213
Subbasin-1A	1767.9	03 Dec 00 0610	1252.0	0.691
Reach-1A	1767.9	03 Dec 00 0626	1252.0	0.691
Subbasin-1B	809.97	03 Dec 00 0601	560.51	0.314
Junction-1A	4796.4	03 Dec 00 0626	3520.7	2.218
Reach-1B	4796.4	03 Dec 00 0629	3520.7	2.218
Subbasin-3B	194.17	03 Dec 00 0600	133.88	0.075
Junction-1	4941.7	03 Dec 00 0623	3654.6	2.293
Reach-3	4941.7	03 Dec 00 0640	3654.6	2.293
Subbasin-5A	495.98	03 Dec 00 0601	342.73	0.192
Junction-2	6399.2	03 Dec 00 0626	4752.4	2.908
Reach-4	6399.2	03 Dec 00 0647	4752.4	2.908
Subbasin-5B	681.99	03 Dec 00 0603	473.04	0.265
Junction-3	6955.3	03 Dec 00 0640	5225.4	3.173
Reach-5	6955.3	03 Dec 00 0654	5225.4	3.173
Subbasin-6	191.50	03 Dec 00 0600	132.09	0.074
Junction-4	7027.3	03 Dec 00 0651	5357.5	3.247
Reach-6	7027.3	03 Dec 00 0651	5357.5	3.247
Subbasin-7	266.78	03 Dec 00 0604	185.65	0.104
Junction-5	7252.1	03 Dec 00 0647	5543.2	3.351


Subbasin-3A
Subbasin-1A
Subbasin-2
Reach-1RB
Junction-1RC
playa
Reach-1RC
Reach-1A
Reach-1RD
Reach-1RA
Junction-1RB
Subbasin-1B
Subbasin-4A
Junction-1A
Subbasin-3B
Reach-1B
Junction-1
Subbasin-5A
Reach-3
Subbasin-4B
Reach-2
Junction-2
Subbasin-5B
Reach-4
Subbasin-6
Junction-3
Reach-5
Junction-4
Subbasin-7
Reach-6
Junction-5

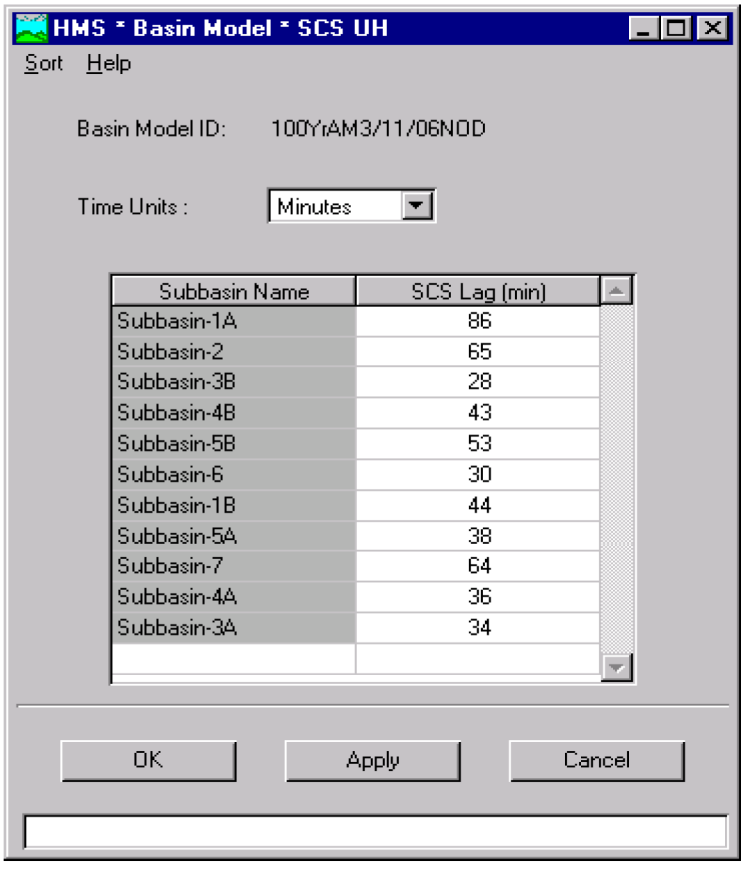
Meteorologic Model Input



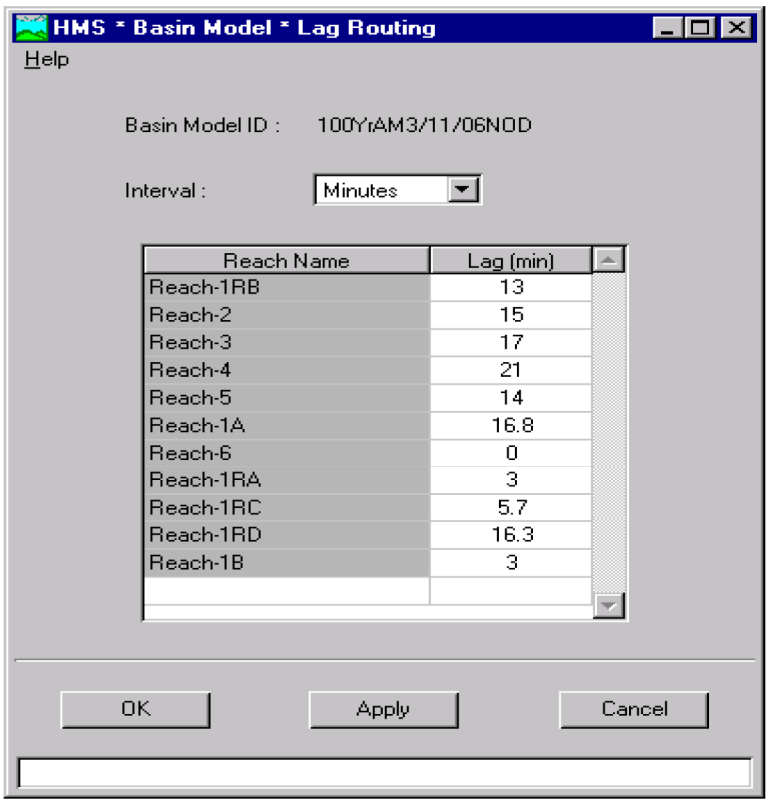


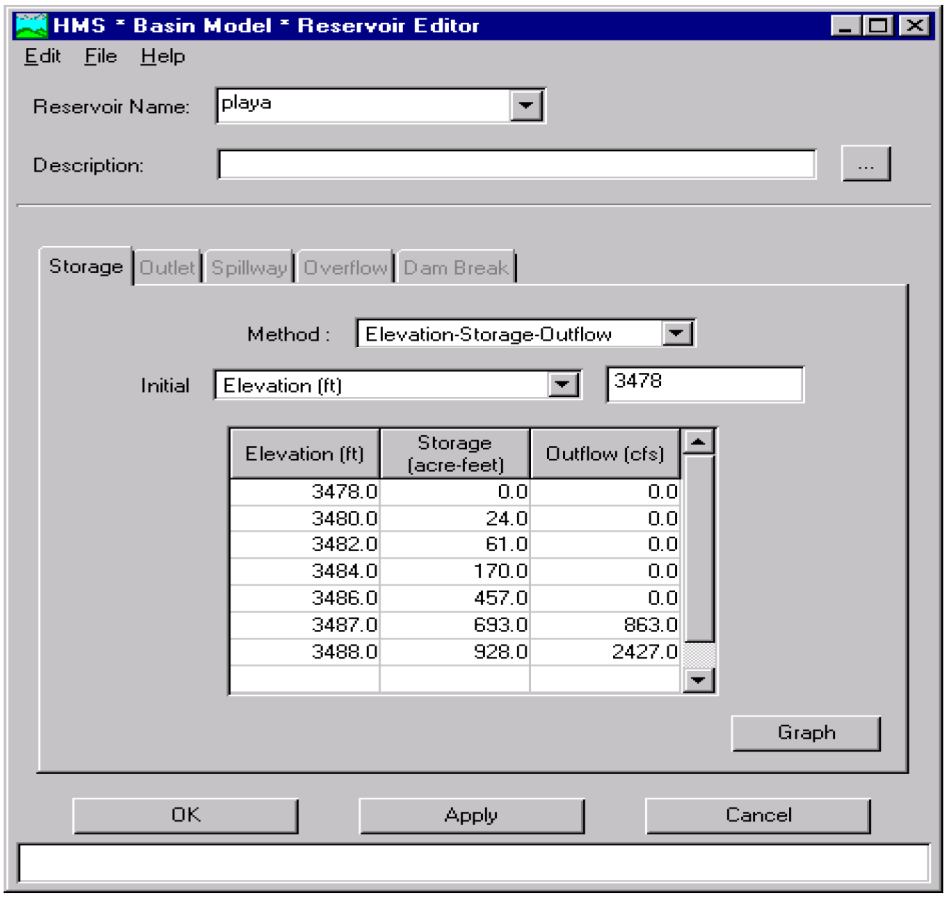


Subbasin Name	SCS Curve Number	Initial Abstraction (in)	Imperviousness (%)
Subbasin-1A	62		0.0
Subbasin-2	60		0.0
Subbasin-3B	60		0.0
Subbasin-4B	60		0.0
Subbasin-5B	60		0.0
Subbasin-6	60		0.0
Subbasin-1B	60		0.0
Subbasin-5A	60		0.0
Subbasin-7	60		0.0
Subbasin-4A	60		0.0
Subbasin-3A	60		0.0



Subbasin Name	SCS Lag (min)
Subbasin-1A	86
Subbasin-2	65
Subbasin-3B	28
Subbasin-4B	43
Subbasin-5B	53
Subbasin-6	30
Subbasin-1B	44
Subbasin-5A	38
Subbasin-7	64
Subbasin-4A	36
Subbasin-3A	34


HMS * Basin Model * Lag Routing
Help
Basin Model ID : 100YrAM3/11/06NOD
Interval : Minutes
Reach Name | Lag (min)
Reach-1RB | 13
Reach-2 | 15
Reach-3 | 17
Reach-4 | 21
Reach-5 | 14
Reach-1A | 16.8
Reach-6 | 0
Reach-1RA | 3
Reach-1RC | 5.7
Reach-1RD | 16.3
Reach-1B | 3
OK
Apply
Cancel


HMS * Basin Model * Reservoir Editor
Edit File Help
Reservoir Name: playa
Description:
Storage Outlet Spillway Overflow Dam Break
Method : Elevation-Storage-Outflow
Initial Elevation (ft) 3478
Elevation (ft) | Storage (acre-feet) | Outflow (cfs)
3478.0 | 0.0 | 0.0
3480.0 | 24.0 | 0.0
3482.0 | 61.0 | 0.0
3484.0 | 170.0 | 0.0
3486.0 | 457.0 | 0.0
3487.0 | 693.0 | 863.0
3488.0 | 928.0 | 2427.0
Graph
OK
Apply
Cancel

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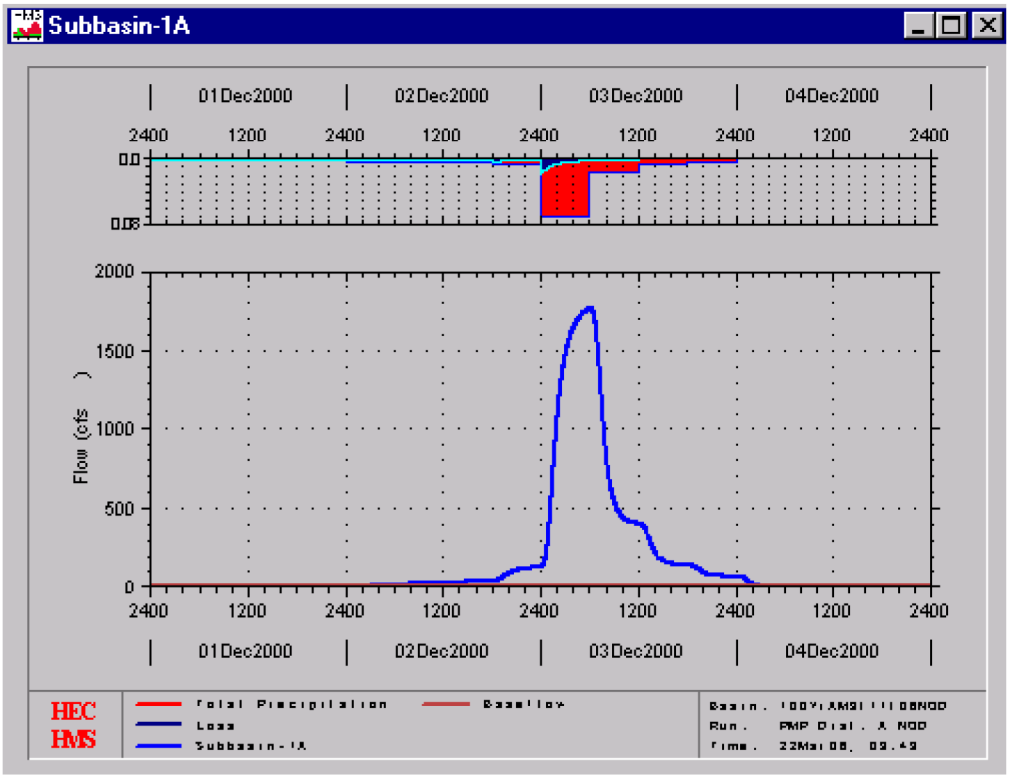

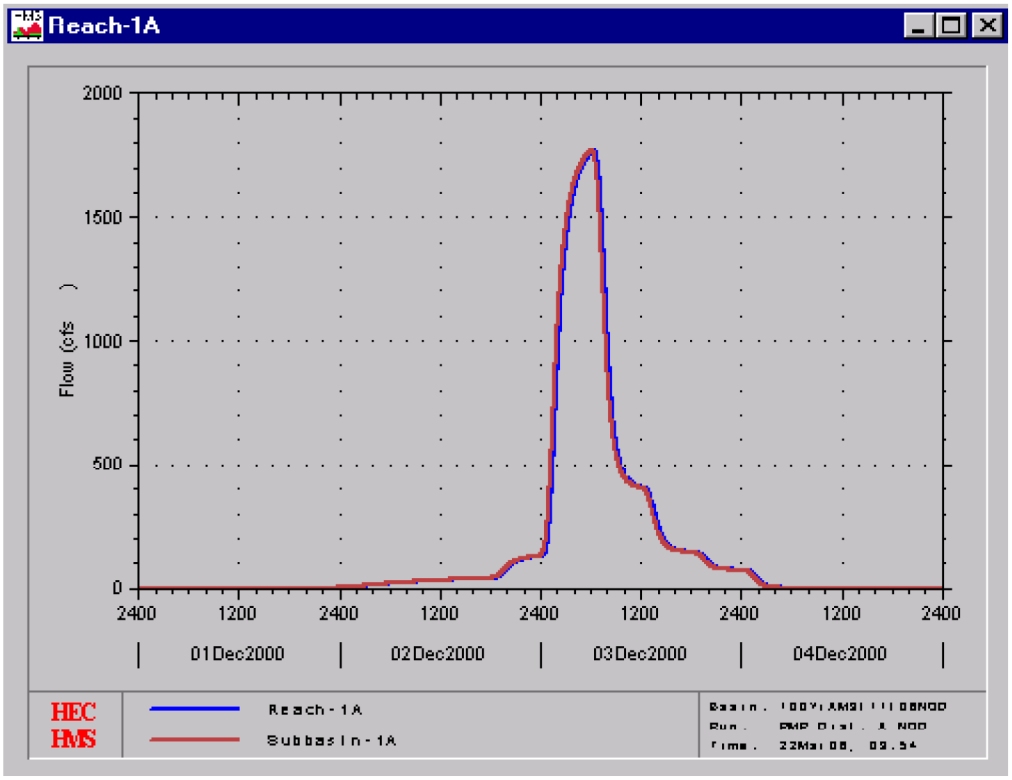

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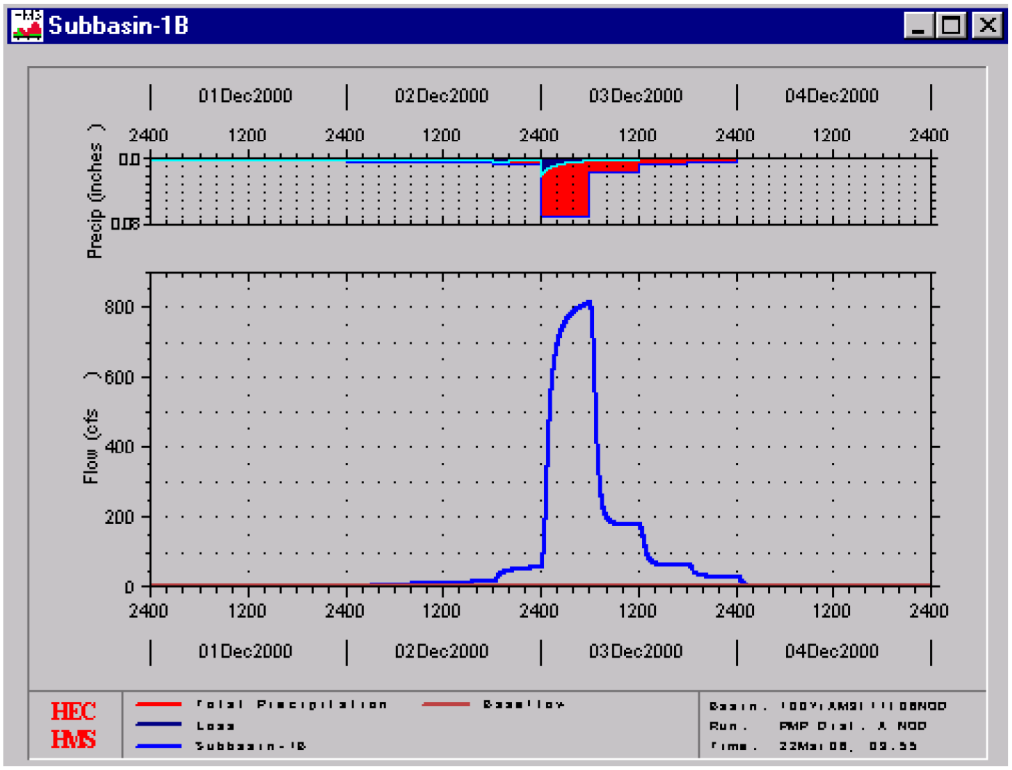

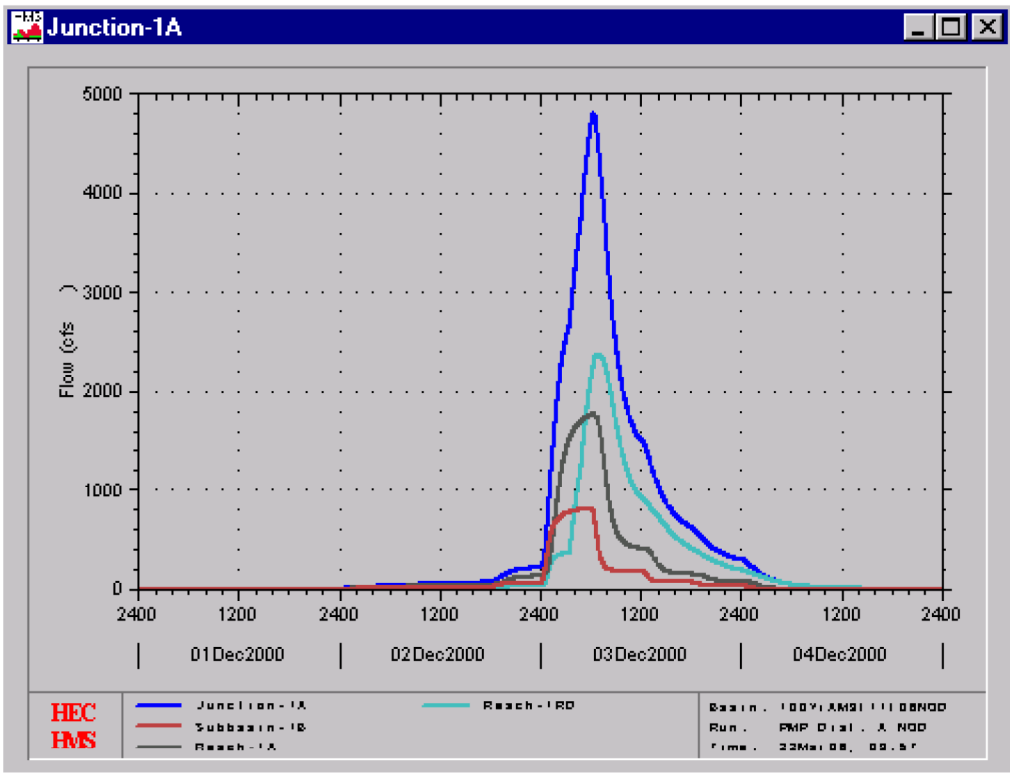

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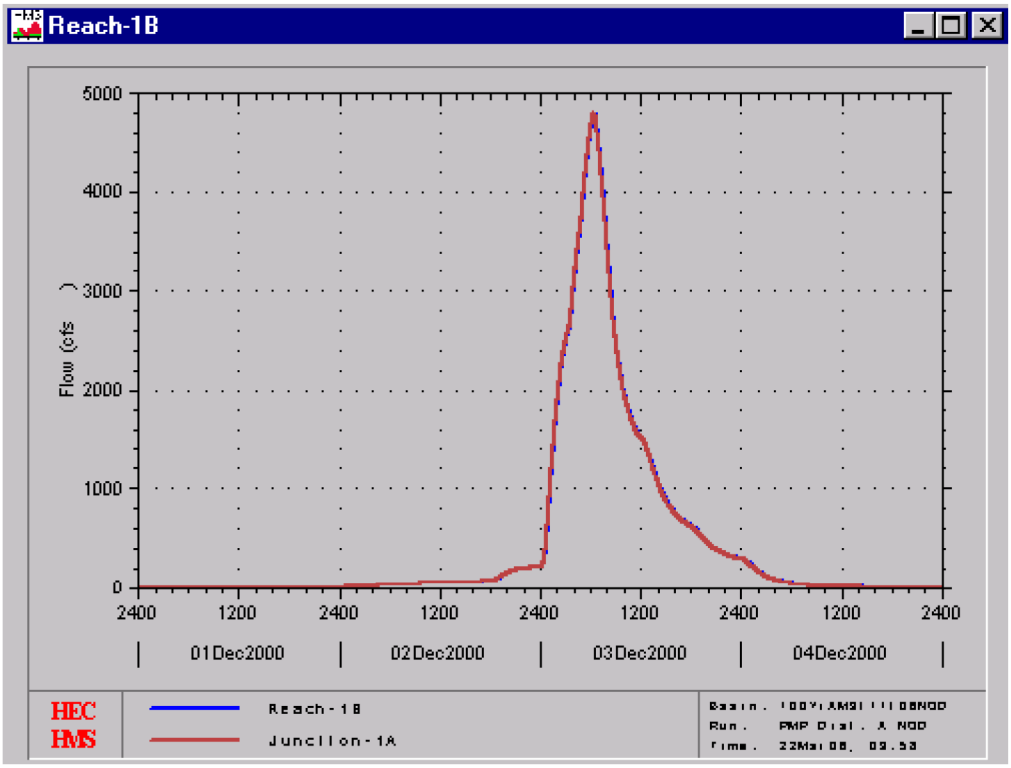

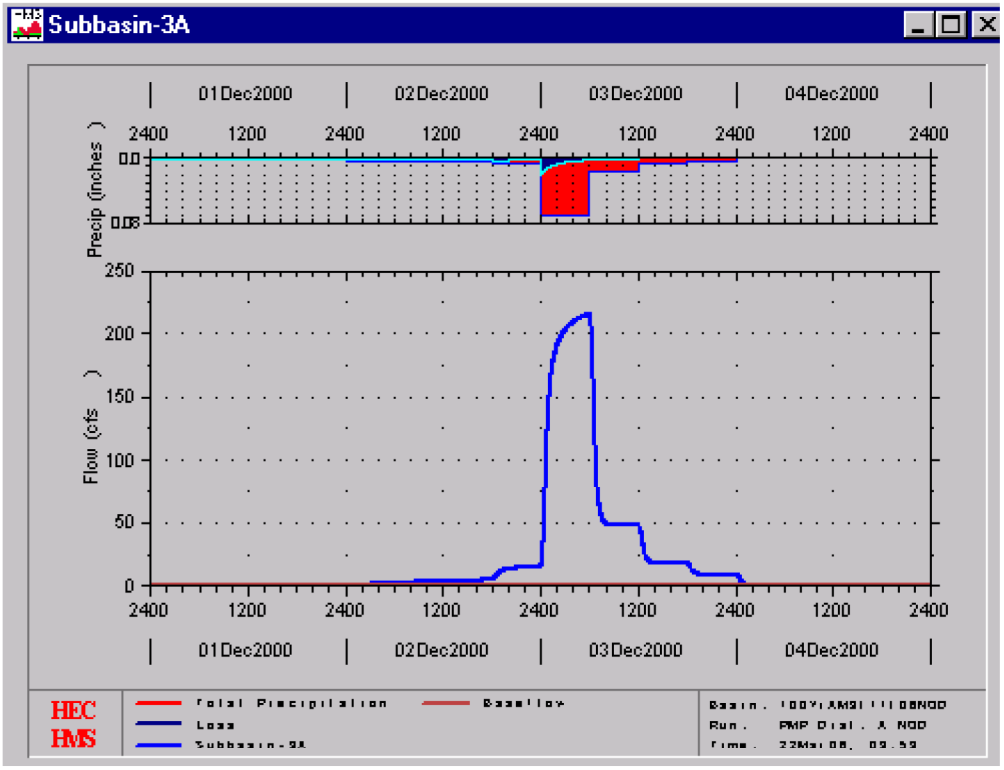

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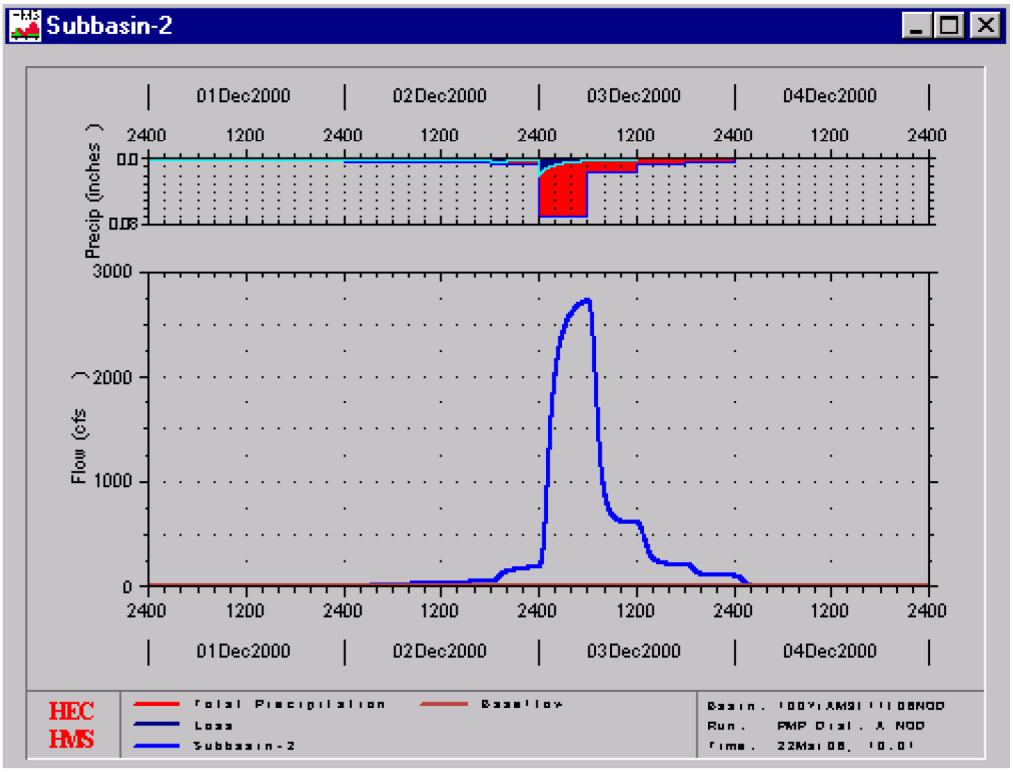

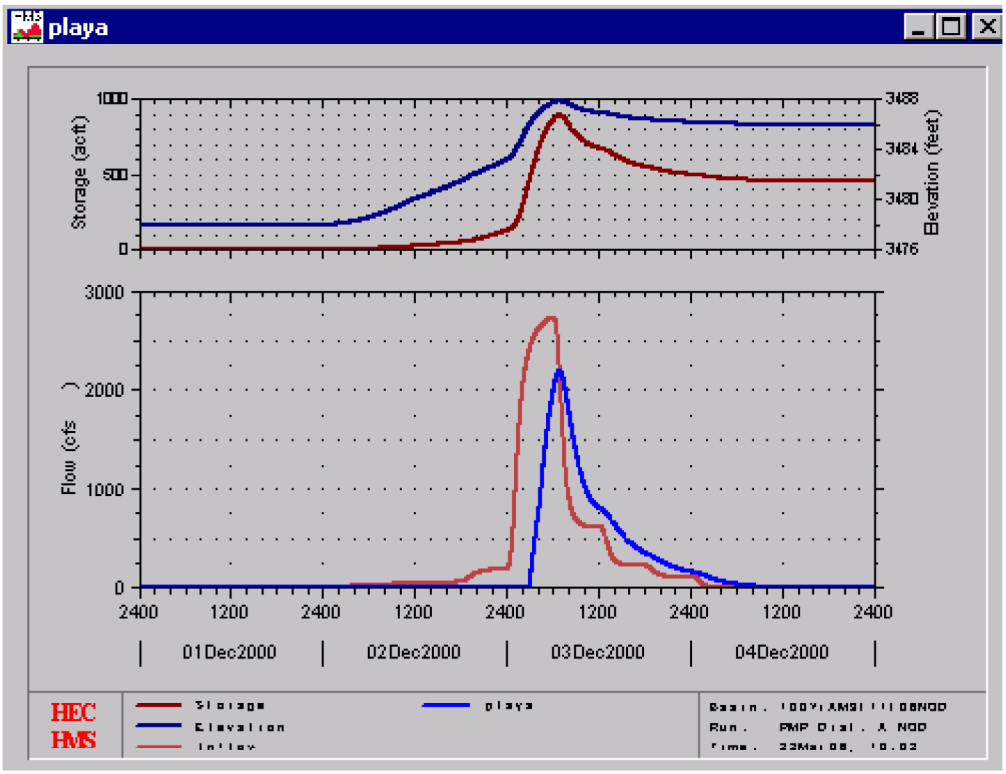

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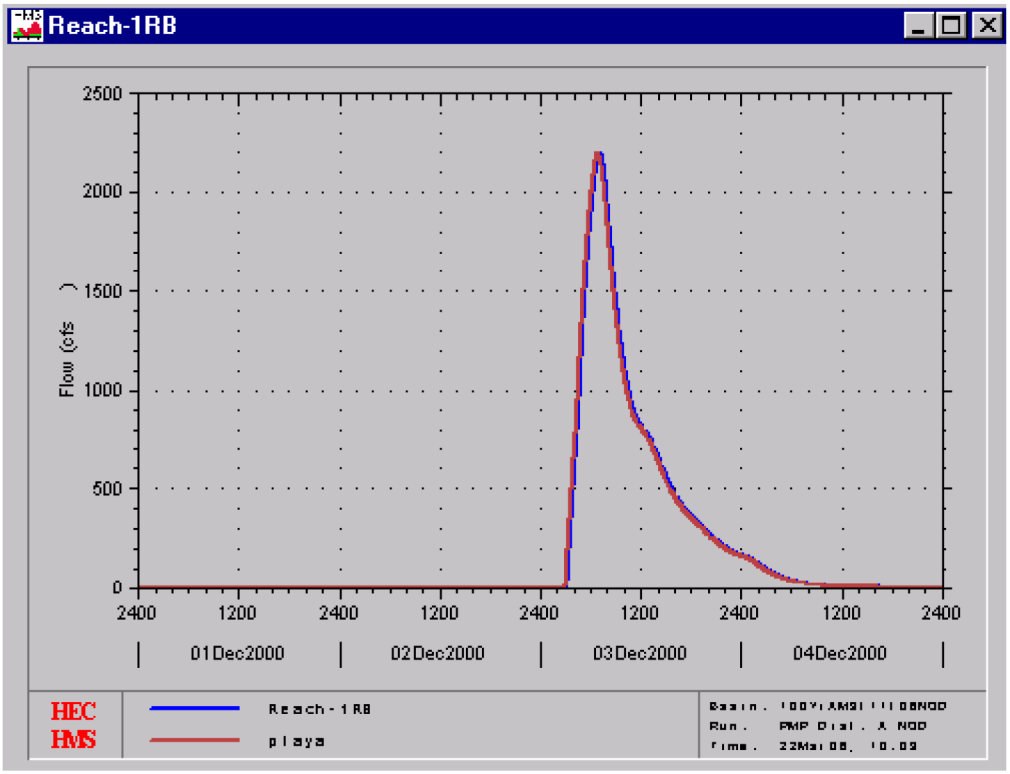

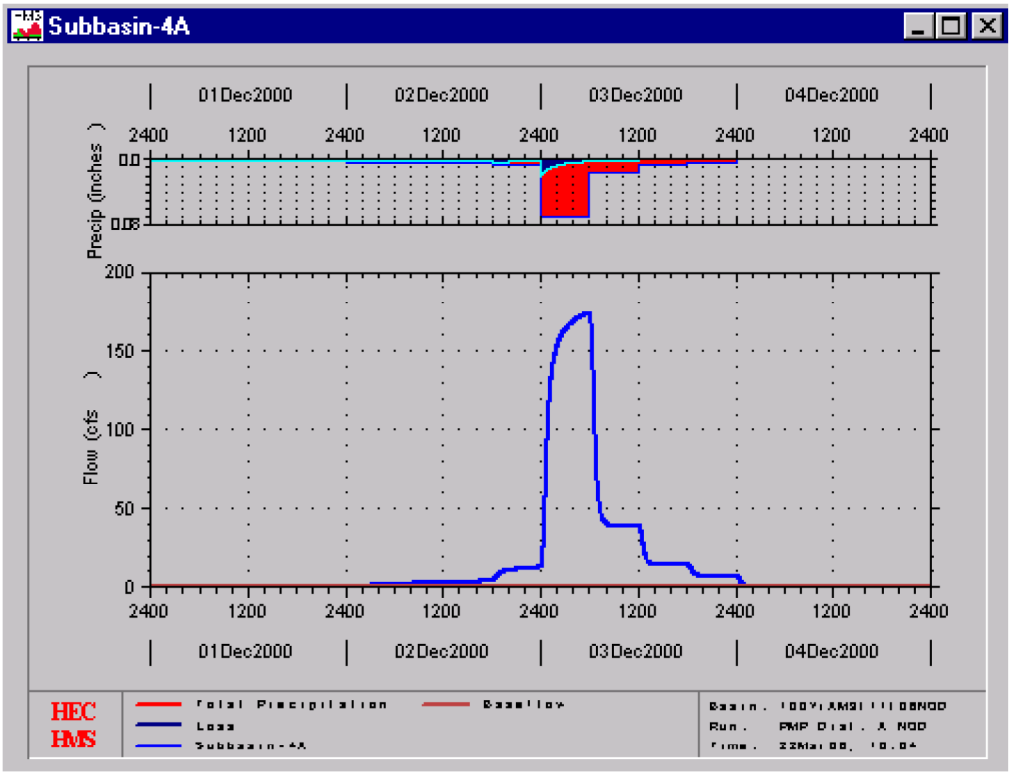

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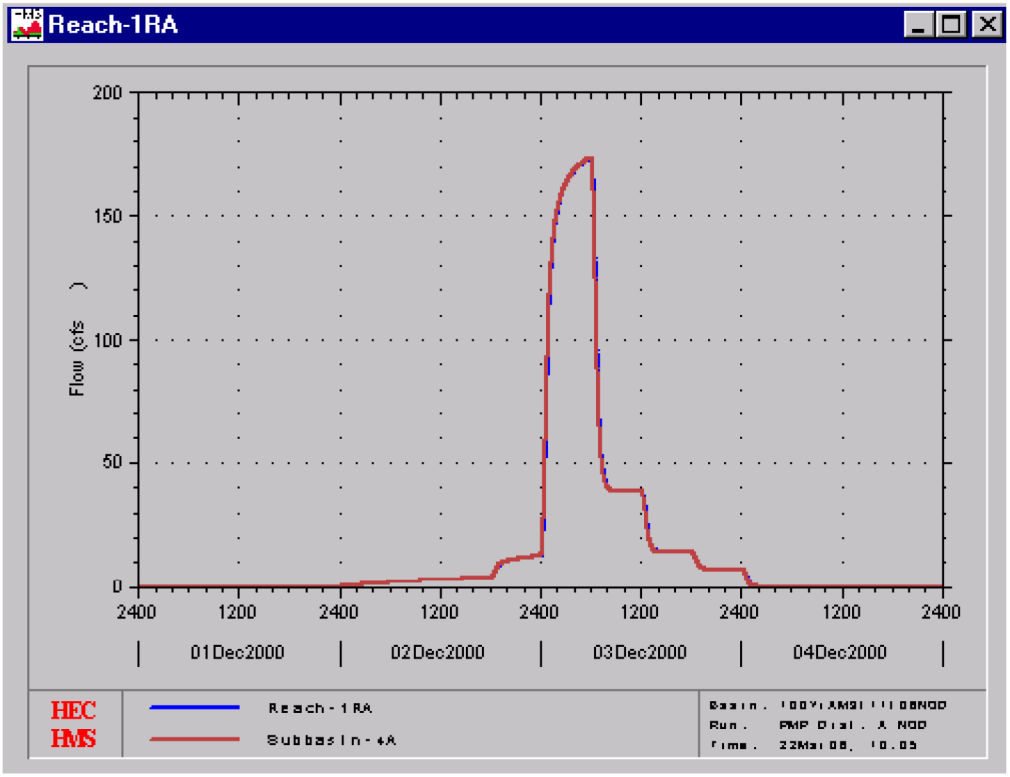

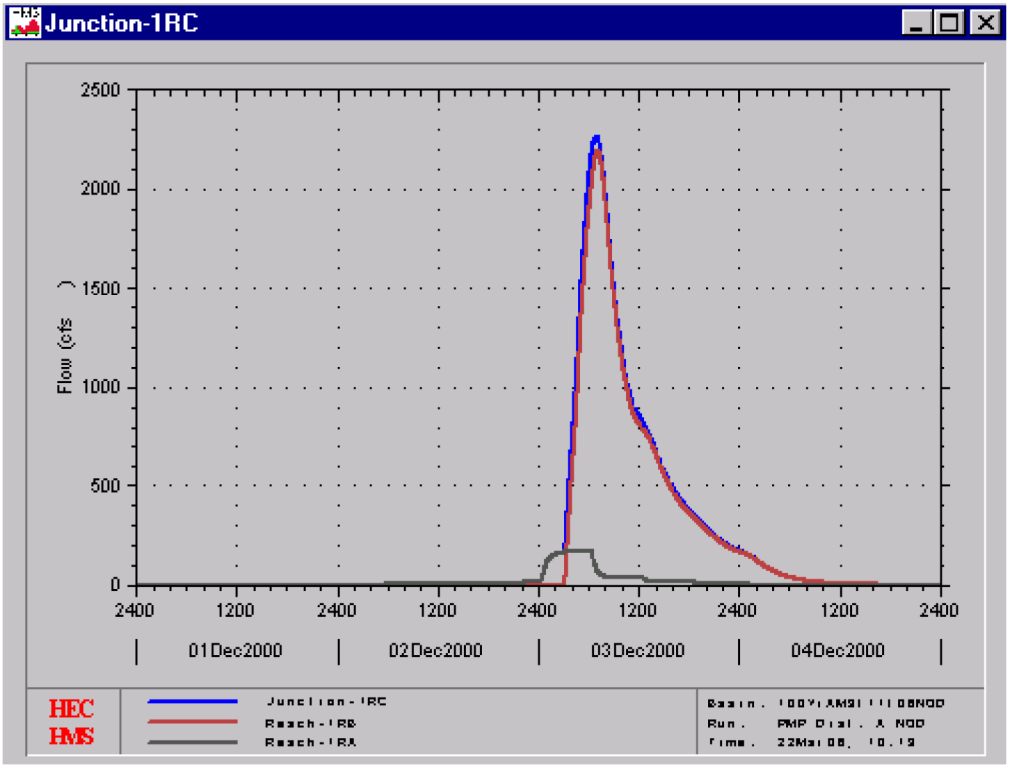

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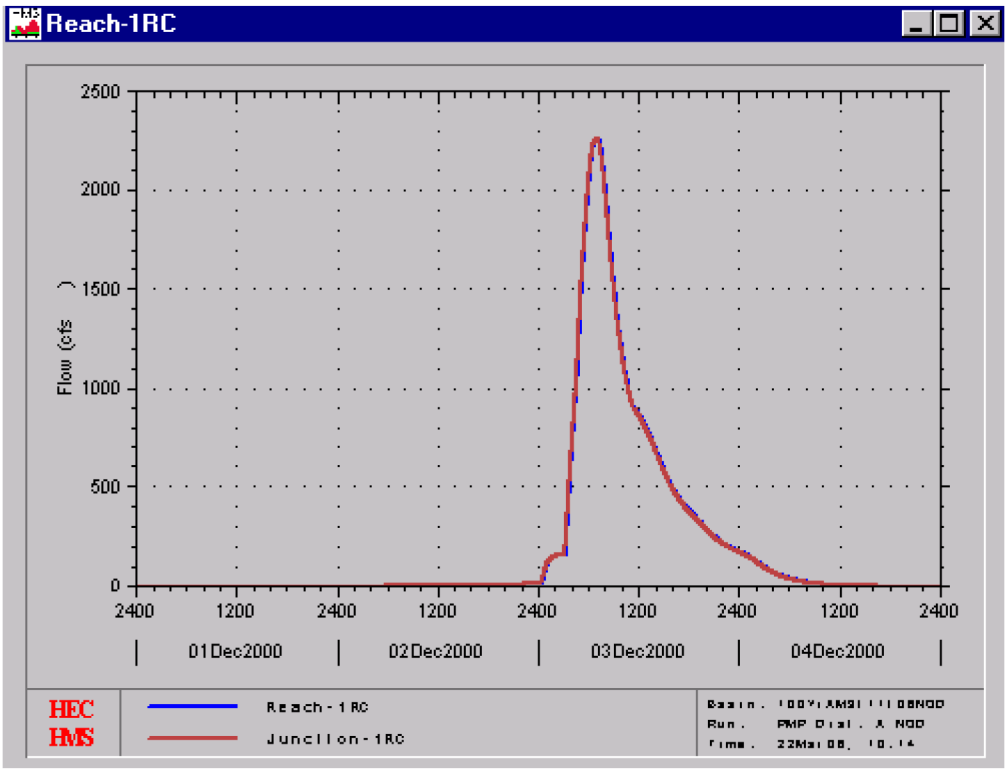

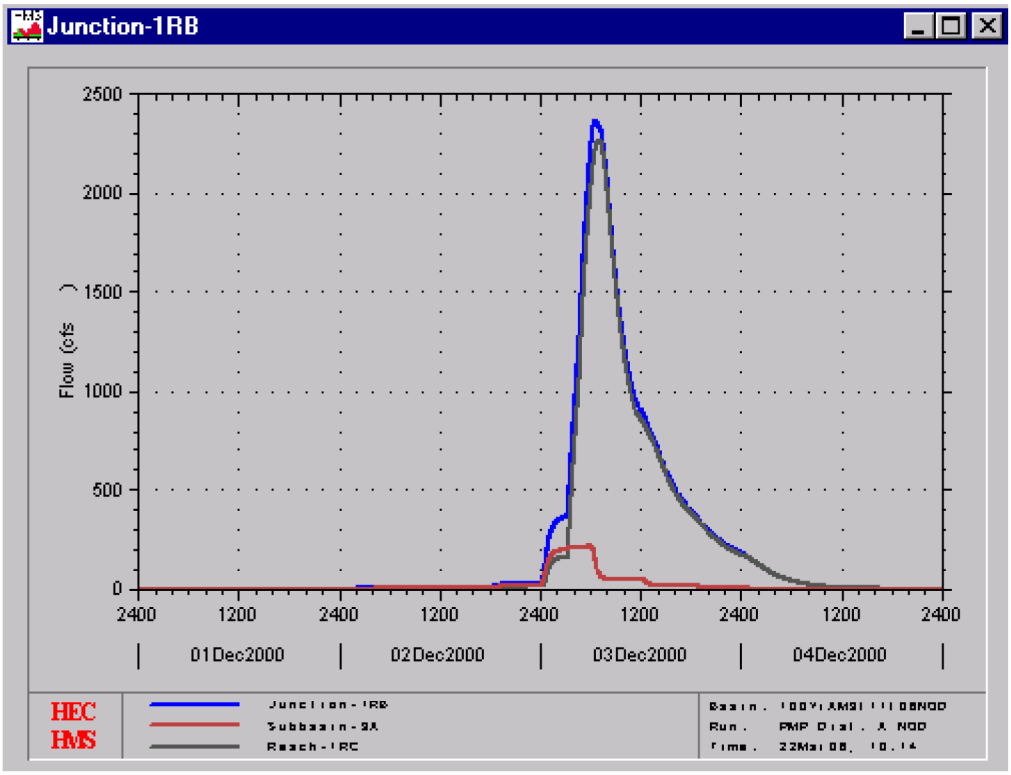

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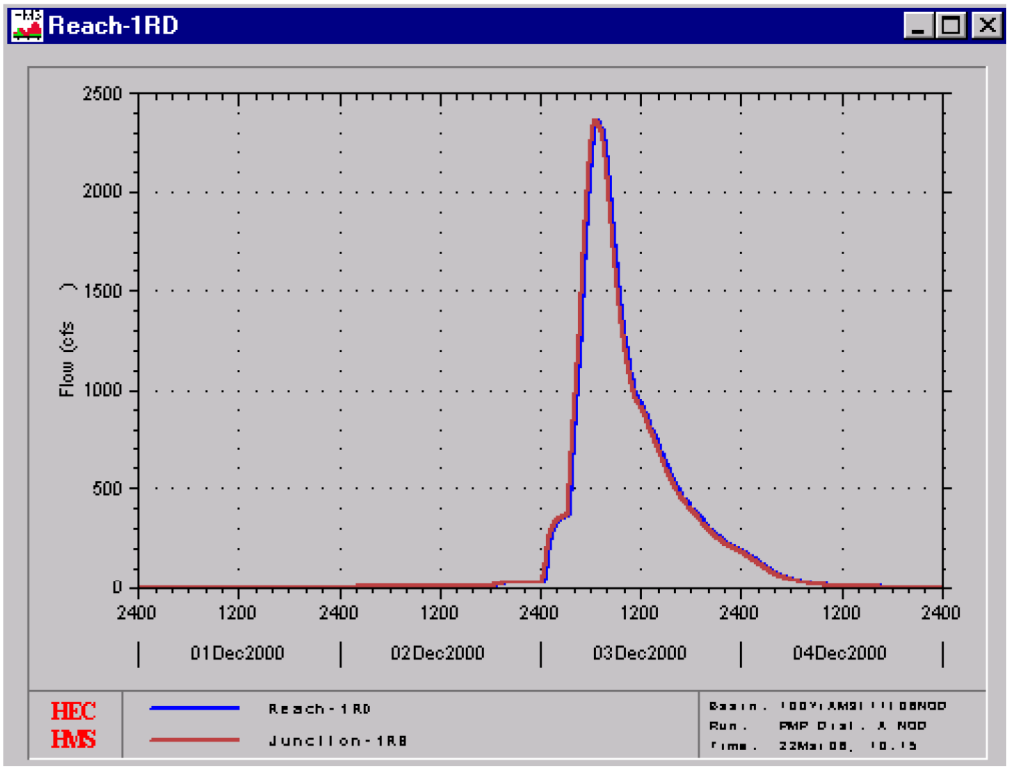

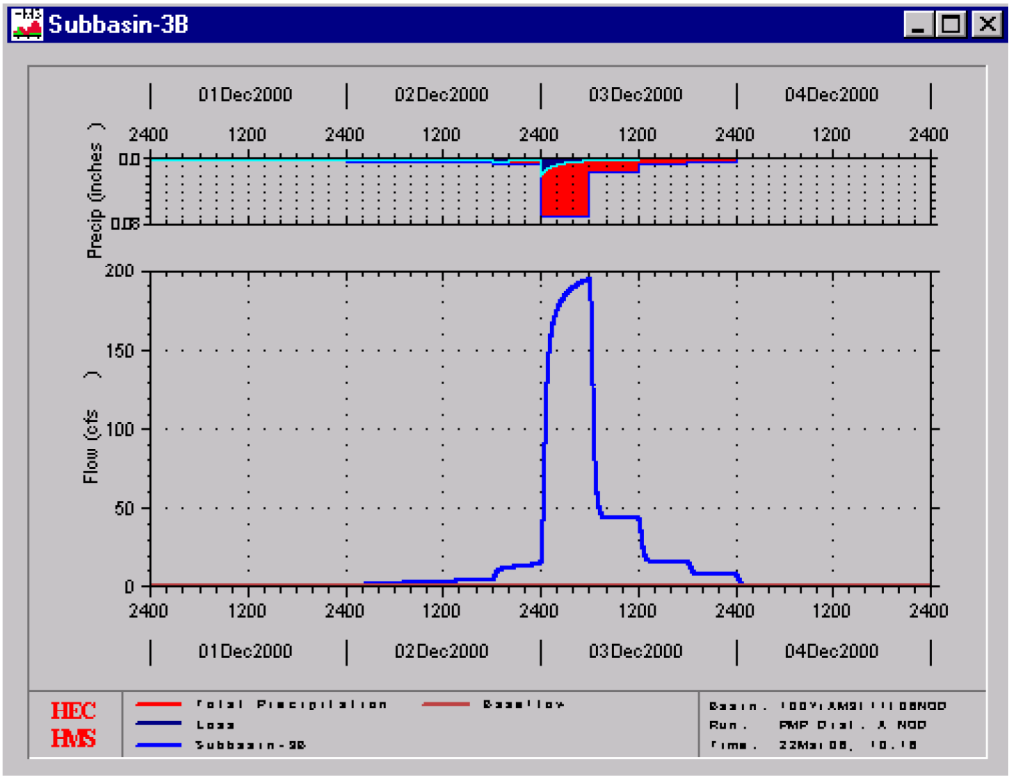

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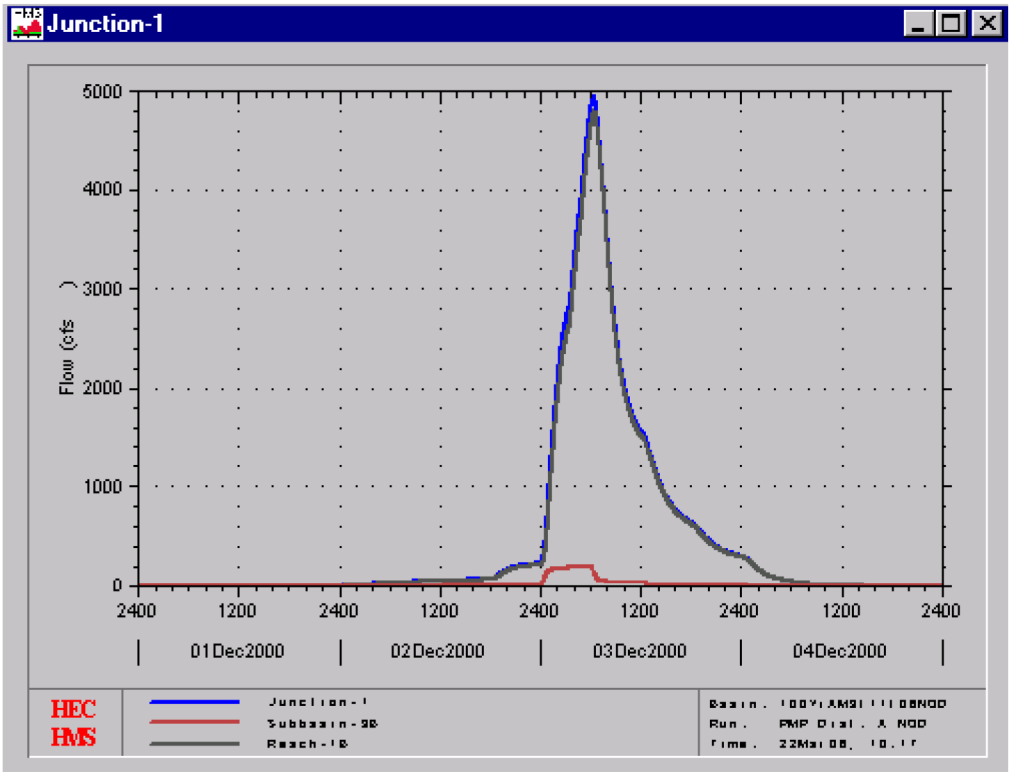

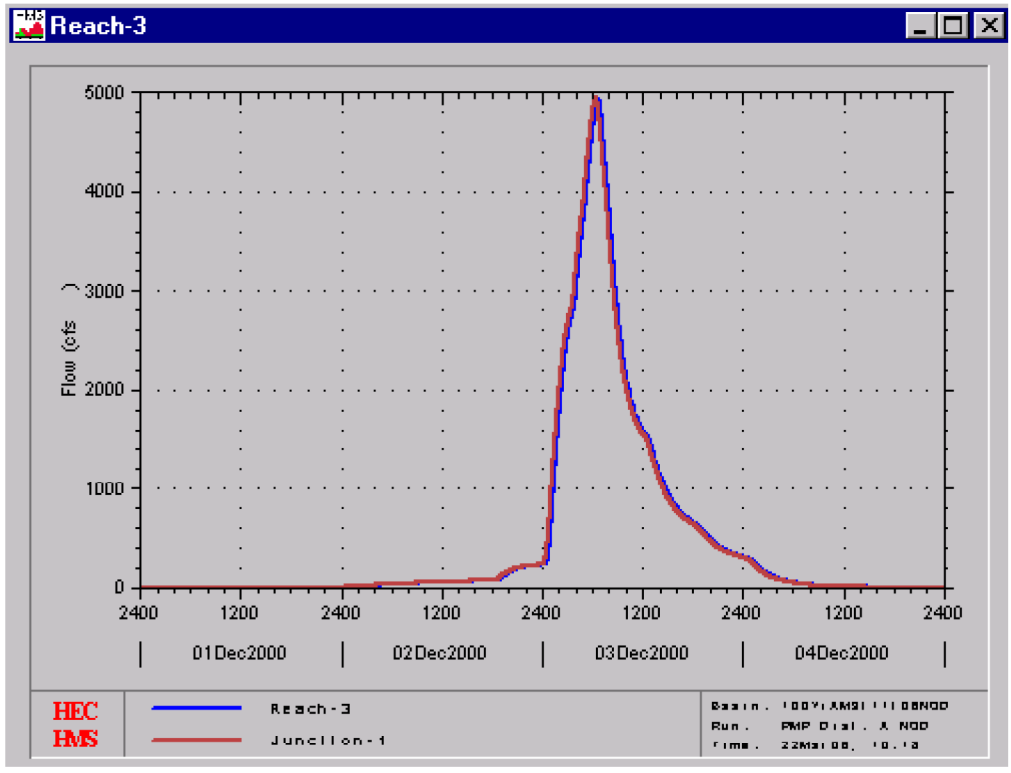

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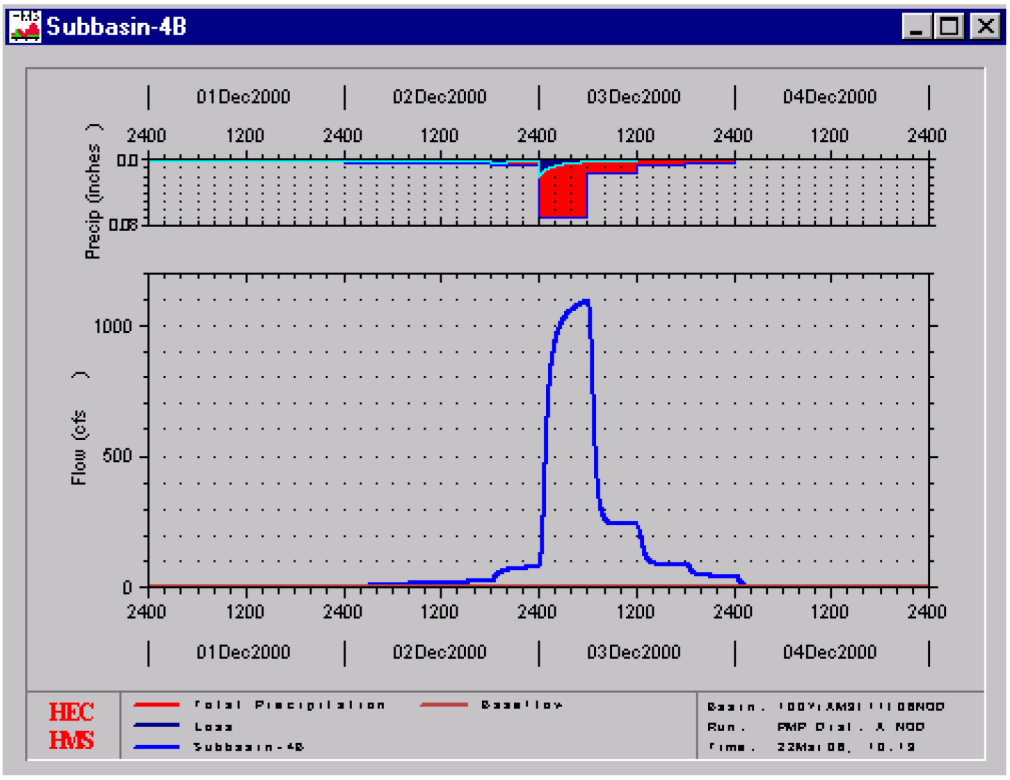

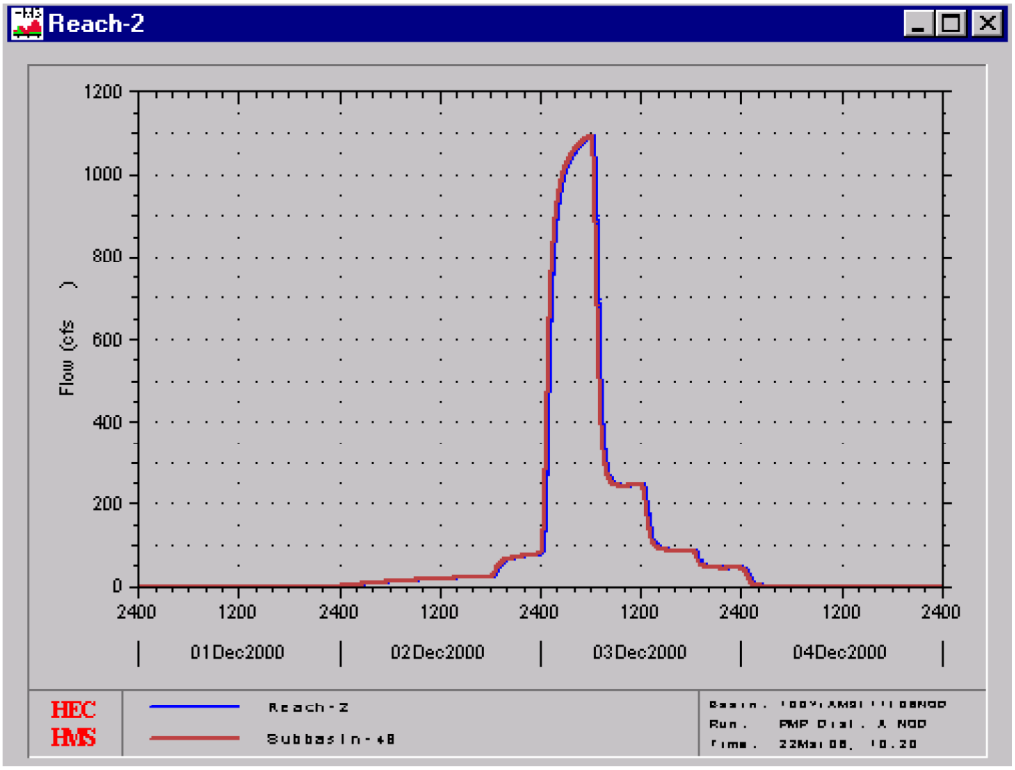

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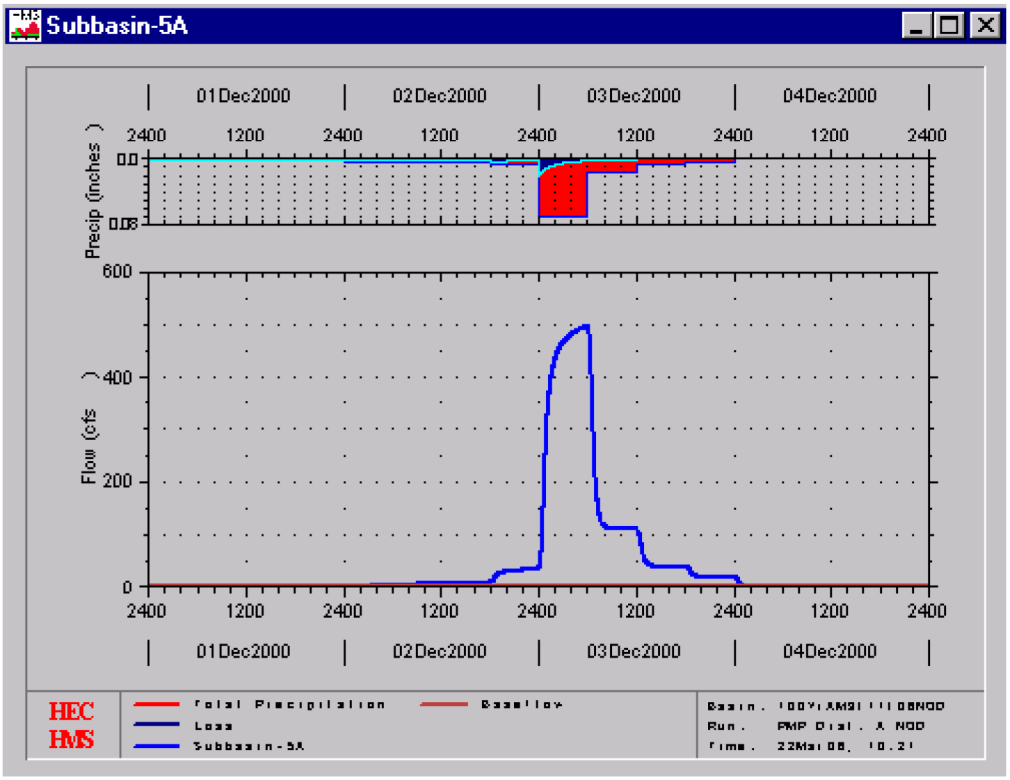

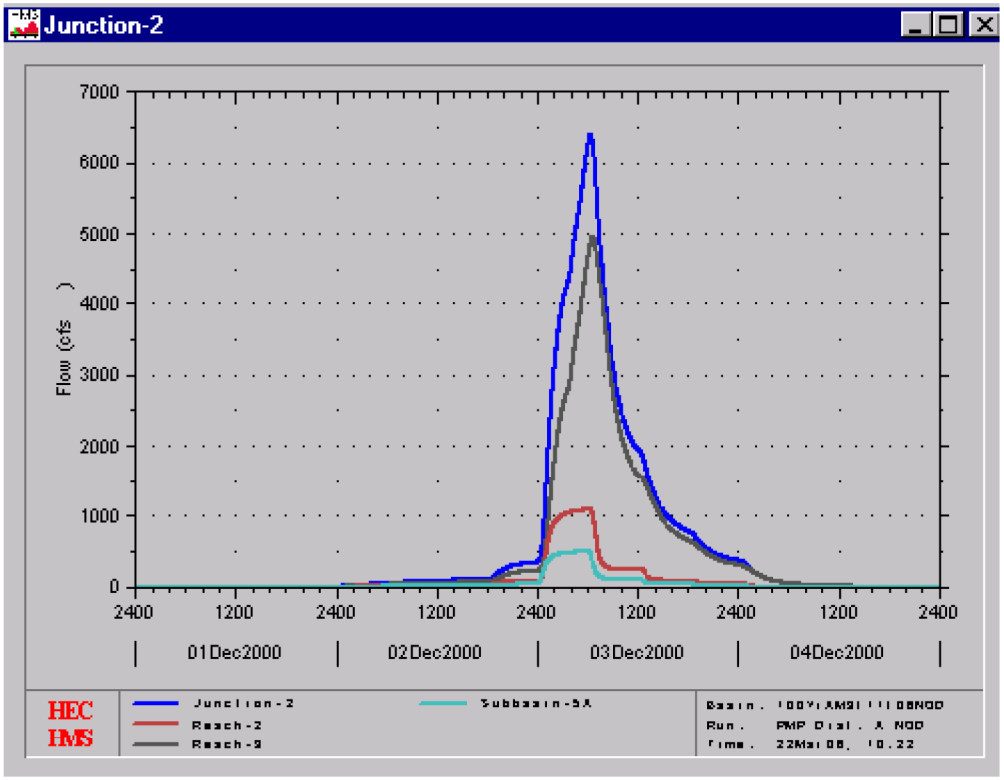

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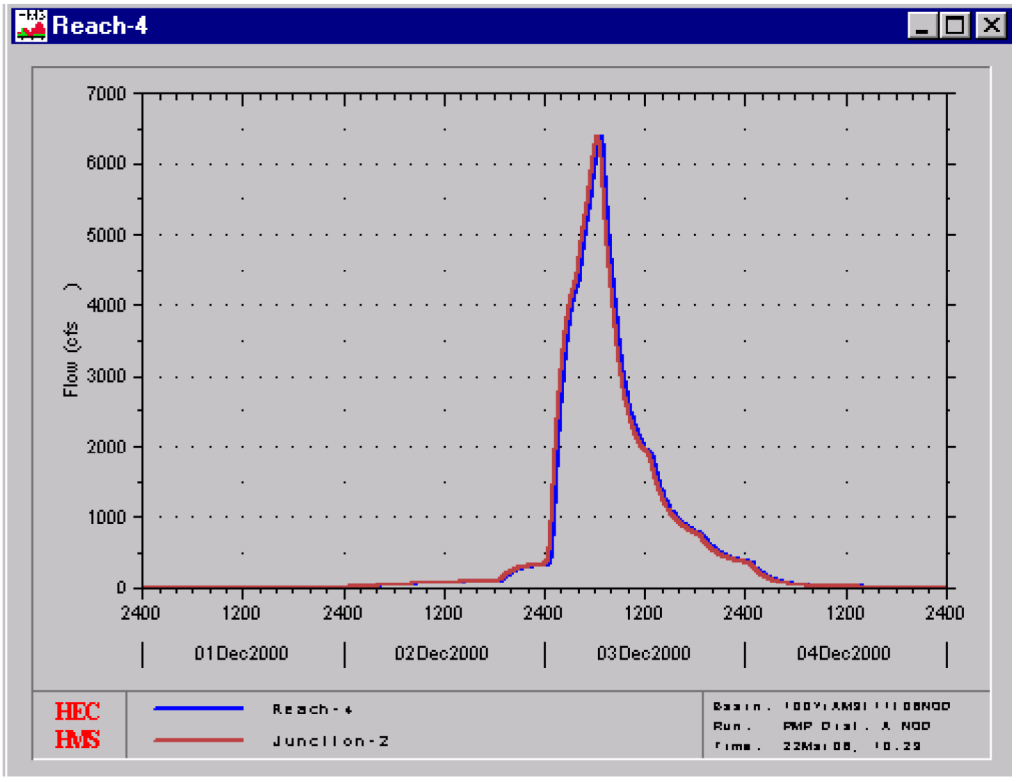

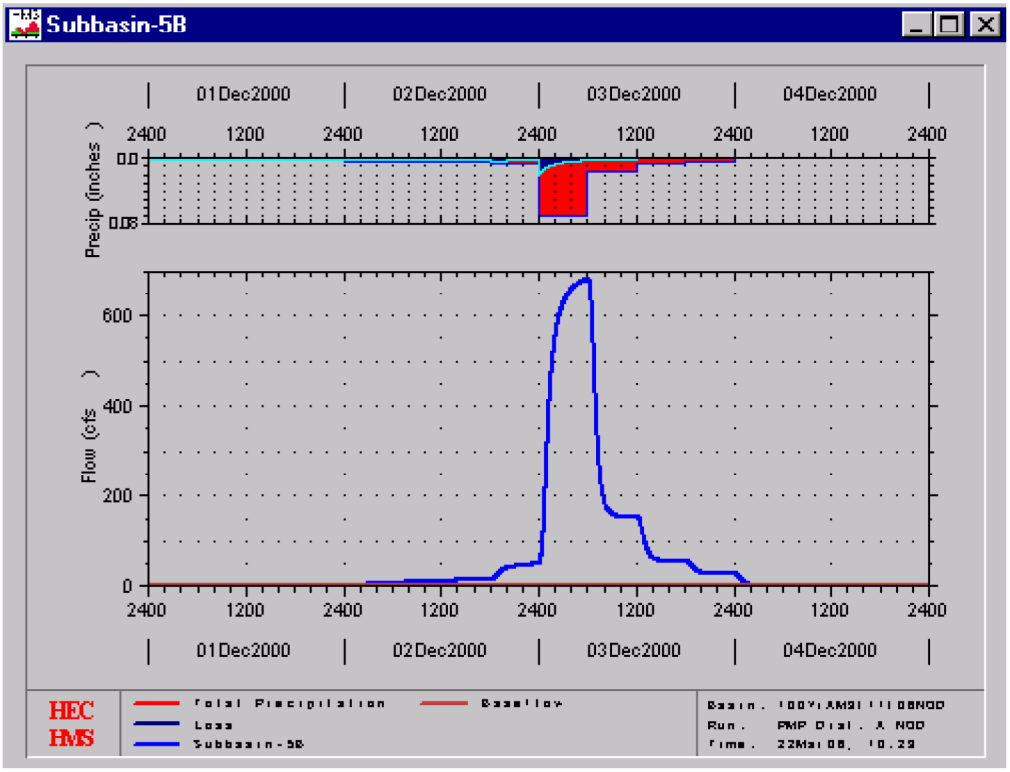

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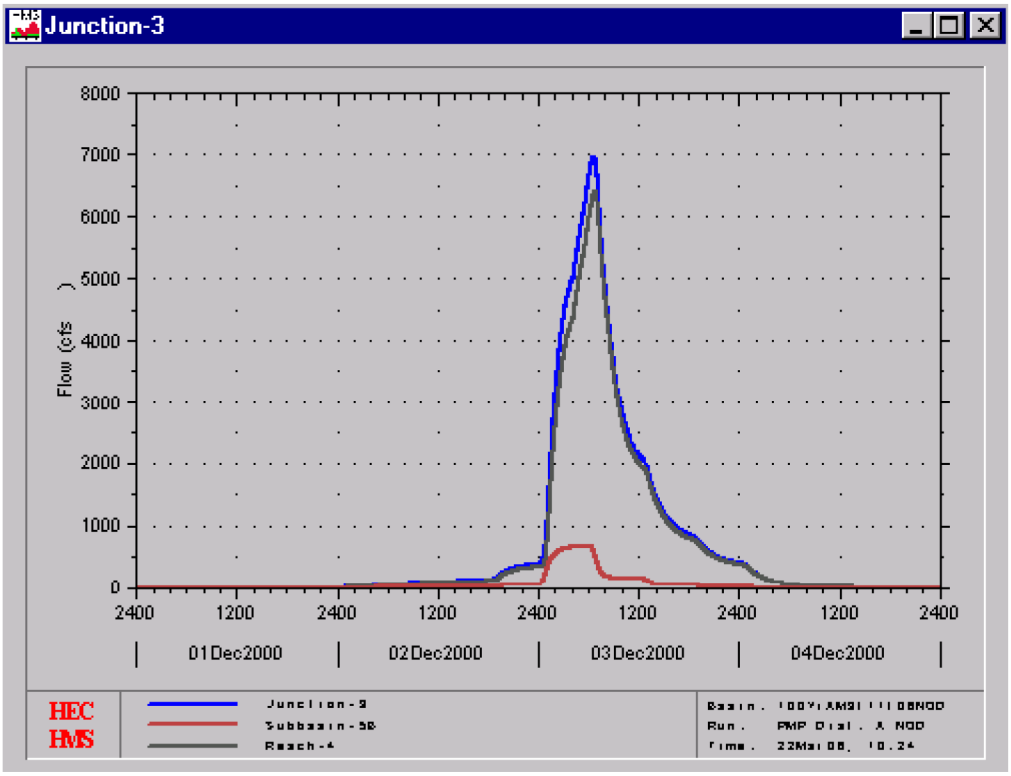

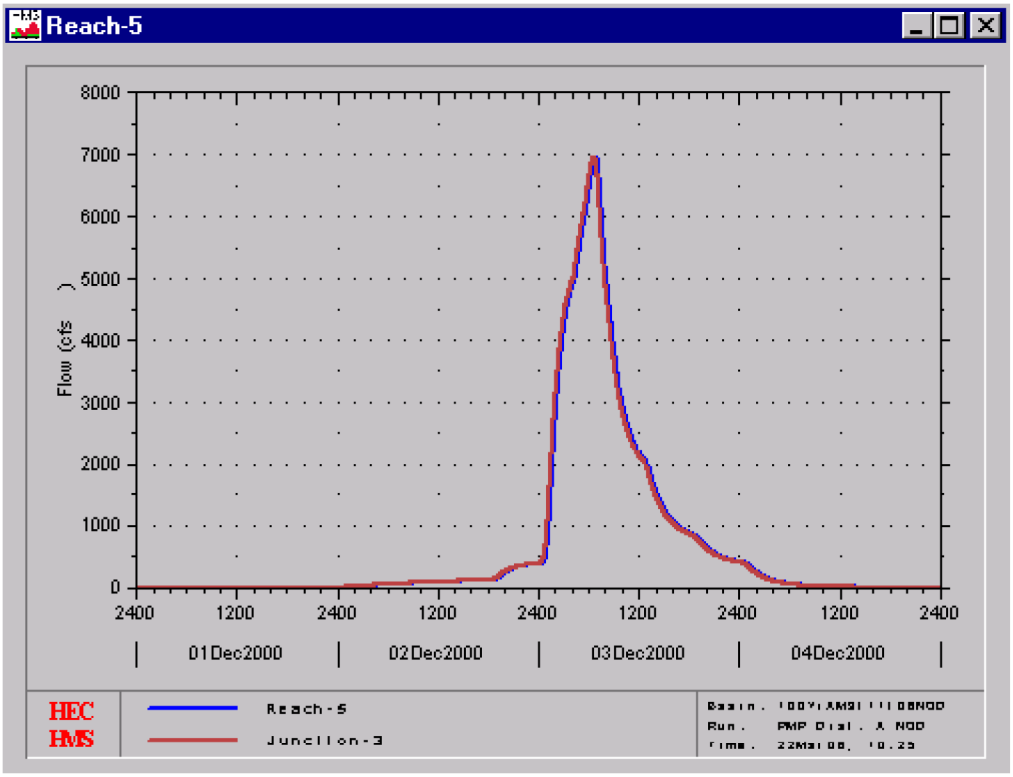

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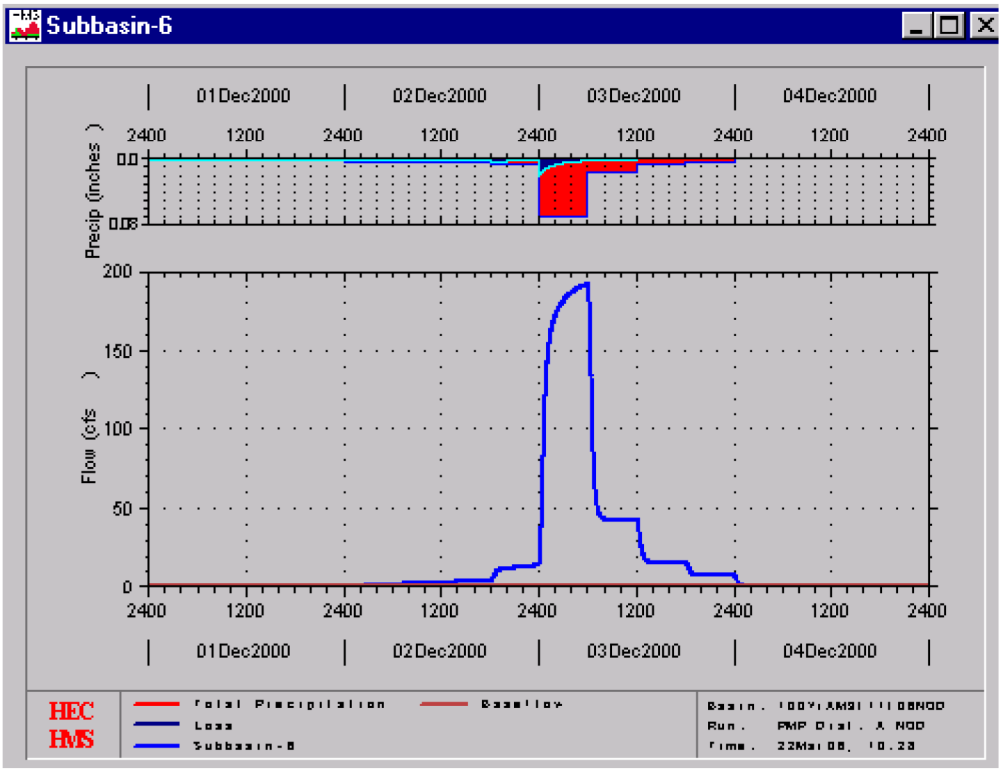

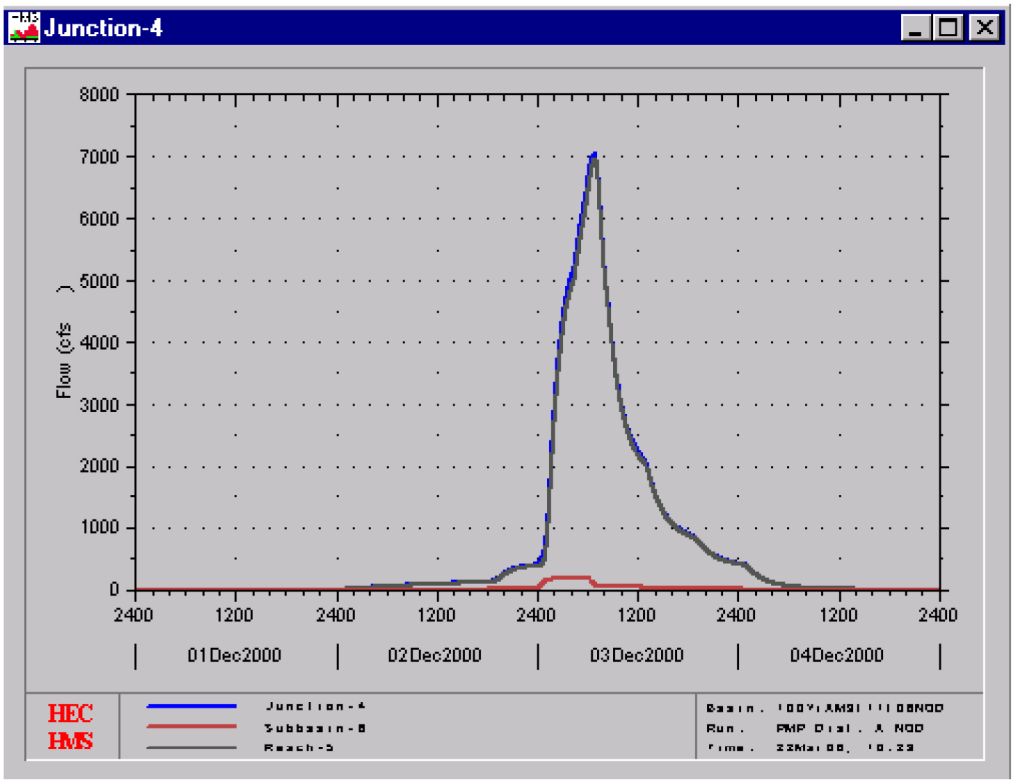

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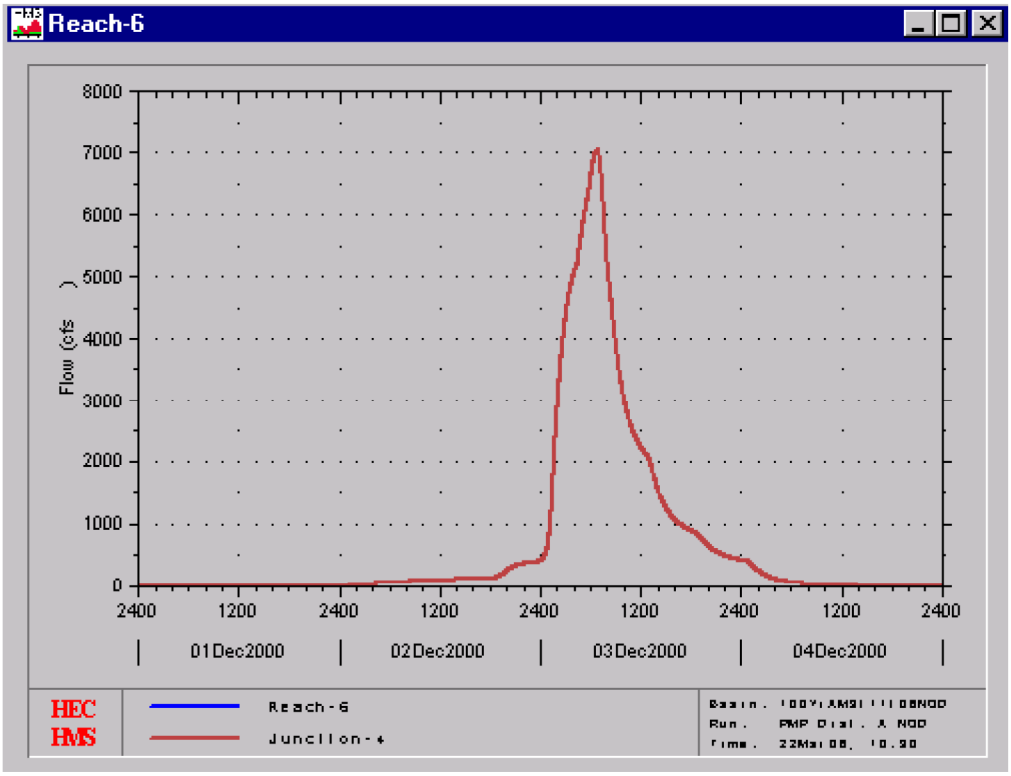

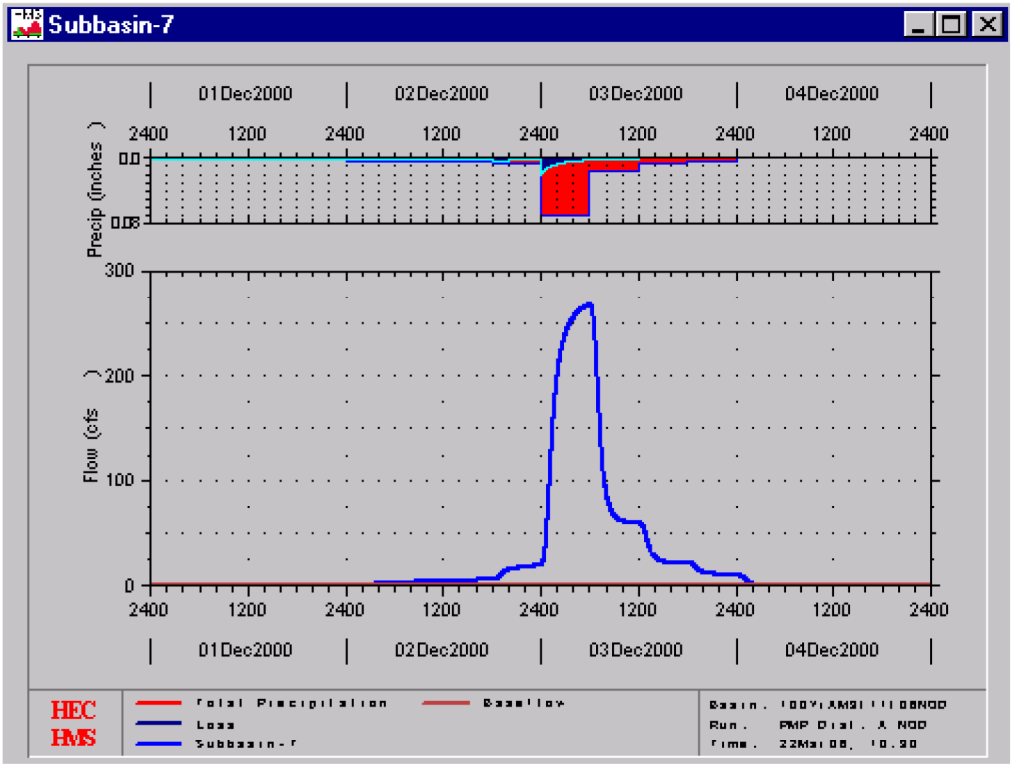

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