Enclosure 1

Walker Run CLOMR Request

a. Form 1 – Overview and Concurrence Form
b. Form 2 – Riverine Hydrology & Hydraulics Form
c. Form 3 – Riverine Structure Form
d. Form 7 – Payment Information Form
e. LandStudies, Inc. "Bell Bend Nuclear Power Plant Flood Study Report, Walker Run, Salem Township, Luzerne County, PA.", January 2011, Rev 1. (Data CD enclosed)
f. Sealed Drawings for Bridge #4

Bell Bend Nuclear Power Plant
Flood Study Report
Walker Run

Salem Township, Luzerne County, PA




Prepared for:
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Rev 1, December 2010, Revised January 2011

Land Studies

Bell Bend Nuclear Power Plant

Walker Run Flood Study Report

Rev 1, January 2011

Table of Contents

1 Introduction

PPL is proposing a new facility, the Bell Bend Nuclear Power Plant (BBNPP), on a site near Berwick, PA. The site is located in Salem Township, Luzerne County, northeast of Berwick and north of Route 11. An existing nuclear power plant, Susquehanna Steam Electric Station (SSES), lies to the east of the proposed facility. The proposed site is primarily forested, with areas of field, meadow, and wetlands. Walker Run, which flows into the Susquehanna River at Beach Haven, PA, runs along the western edge of the proposed site and will be restored as part of the stream and wetland mitigation plan for the proposed nuclear facility. The Federal Emergency Management Agency (FEMA) conducted a flood study on Walker Run that was used as a basis for this hydraulic analysis. An unnamed tributary (Tributary #1) flows into Walker Run from the northeast and will also be impacted by several new bridges associated with the proposed facility.

The objectives of this study are to verify that existing condition results are consistent with the original Flood Insurance Study (FIS) prepared by FEMA in 1977, to determine the hydraulic effect of the proposed project on Walker Run and Tributary #1, to determine the extent of the 100-year floodplain, and to evaluate the effect of the proposed restoration on Walker Run's floodway through an encroachment analysis. This report presents the existing (Corrected Effective Model) floodplain characteristics, and how they compare to the FEMA FIS (Duplicate Effective Model) floodplain characteristics, as well as the proposed (Revised Conditions Model) floodplain characteristics.

2 Hydrology

The Walker Run watershed was evaluated in a Probable Maximum Flood (PMF) Event Study in 2008 by Paul C. Rizzo Associates, Inc. (Rizzo) for the Bell Bend Nuclear Power Plant project. Rizzo divided the watershed into three Subbasins, based on watershed delineations on the USGS Berwick Quadrangle base map (Appendix A). The drainage area for Subbasin A2 is the most upstream drainage area of Walker Run and measures 2.43 square miles. Tributary #1's drainage area is Subbasin A3, measuring 0.68 square miles. The downstream drainage area to Walker Run, Subbasin A1, measures 0.98 square miles. Land use in the watershed is primarily woods, with meadow and some urban.

Soils information and geology of the site were determined from the Rizzo report, then verified using Penn State University's online soil map tool (www.soilmap.psu.edu). Several soils exist in the Walker Run watershed, including Chenango, Oquaga & Lordstown, and Wyoming,

producing a mixture primarily of hydrologic soil groups "A" and "C". A soils map is included in Appendix A. Four distinct geologic formations exist within the Walker Run watershed, including the Hamilton Group, Trimmers Rock Formation, Irish Valley Member, and Sherman Creek Member. The underlying geology of the headwaters upstream of the project site consists of east to west trending bands of the upper Devonian-age Sherman Creek and Irish Valley Members. The Sherman Creek Member is composed of alternating grayish-red siltstone and claystone as well as minor intervals of gray sandstone. The Irish Valley Member consists of nonmarine, gray and grayish red sandstone and grayish-red claystone interbedded with minor, thin light-olive-gray marine siltstone. The underlying geology of the upstream portion of the project site consists of an east to west trending band of the upper Devonian-age Trimmers Rock Formation, which is composed of olive-gray siltstone and shale. The underlying geology of the downstream portion of the project site consists of an east to west trending band of the lower and middle Devonian-age Hamilton Group. The Hamilton Group is made up of two formations: the Mahantango Formation and the Marcellus Formation. The Mahantango Formation is composed of gray, brown and olive shale and siltstone while the Marcellus Formation is composed of black, carbonaceous shale (Appendix A).

Hydrologic analyses of the contributing drainage areas to Walker Run and Tributary #1 were performed to confirm existing peak discharges for the combined drainage area and Walker Run's drainage area, which were provided in the FEMA FIS, and to determine the existing peak discharge for Tributary #1 (not provided in the FEMA FIS). The 100-year peak discharge used in the FEMA FIS for the total watershed (combined drainage area) is 1860 cfs and for Subbasin A2 (Walker Run watershed) is 1640 cfs. Several methods were employed to compare peak discharges to these values. See Table 1 for a summary of all peak flows calculated for comparison purposes.

The first method (referred to as Hydraflow 1) involves utilizing land use and soils information, as well as a time of concentration, from the Rizzo study. The time of concentration was calculated using the Clark (1945) Method, which is a regression curve presented by Staub, et.al. (2000) and developed from small rural watersheds in Illinois. The Soil Conservation Service (SCS) Technical Release 55 (TR-55) methodology was used to generate runoff hydrographs and peak discharge rates. The total peak flow is 2953 cfs, while Walker Run and Tributary #1 peak flows are 2259 cfs and 940 cfs, respectively.

A second method (referred to as Hydraflow 2) utilizes the same land use and soils information as Hydraflow 1 (from the Rizzo study), but uses the SCS Lagtime Formula to determine the time of concentration. SCS TR-55 methodology was used to generate runoff hydrographs and peak discharge rates, yielding a total peak flow of 1393 cfs and Walker Run and Tributary #1 peak flows of 1092 cfs and 538 cfs, respectively.

The third method (referred to as Hydraflow 3), uses LandStudies, Inc. (LSI) data for land use and soils information, which resulted in lower curve numbers than the Rizzo analyses. The time of concentration was determined from the existing United States Geological Survey

(USGS) Quadrangle map and available topography of the project area. SCS TR-55 methodology was used to generate runoff hydrographs and peak discharge rates. The total peak flow is 1877 cfs, while Walker Run and Tributary #1 peak flows are 1628 cfs and 304 cfs, respectively.

The fourth method (referred to as USGS Regression 1) employs data from the Rizzo study in a USGS regression analysis for estimating peak flows for Pennsylvania streams, presented by Stuckey and Reed (2000). Input parameters include drainage area, percent forest cover, percent urban cover, percent carbonate area, and percent cover of lakes, swamps and reservoirs. Total peak flow with this method is 1089 cfs and Walker Run and Tributary #1 peak flows are 909 cfs and 361 cfs, respectively.

The fifth method (referred to as USGS Regression 2) utilizes the same USGS regression analysis, using LSI data for drainage area and percent cover information. Only total peak flow was calculated, yielding 1065 cfs.

All method analysis calculations and hydrology information can be found in Appendix H. Twenty-four hour rainfall depths of 2.89 in., 4.20 in., 5.18 in., 6.08 in. and 7.16 in. (for the 2, 10, 25, 50, and 100-year storm events, respectively, per National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server) were used. See Appendix H for complete rainfall data.

Table 1. 100-year Peak Discharges Analysis Comparison

Method	Combined Q_{100} (ft^3/s)	Tributary Q_{100} (ft^3/s)	Walker Run Q_{100} (ft^3/s)
FEMA	1860.0	—	1640.0
Hydraflow 1 (Rizzo data, Tc =IL regression)	2953.4	940.0	2259.2
Hydraflow 2 (Rizzo data, Tc =SCS Lagtime)	1392.9	538.2	1091.2
Hydraflow 3 (LSI data, Tc measured)	1877.2	303.5	1628.3
USGS Regression 1 (Rizzo data)	1088.9	361.4	909.0
USGS Regression 2 (LSI data)	1065.4	—	—

***Highlighted discharges represent the values used in the HEC-RAS model.**

In comparing all the analyzed methods, the FEMA FIS peak discharges fall in the middle of the calculated existing peak discharges, giving credibility to the FIS flows and confirming their use in the current flood study. Since the FEMA study provided only a combined peak flow (1860 cfs) and a Walker Run peak flow (1640 cfs), the 100-year discharge for the Tributary #1 watershed needed to be determined. The Hydraflow 3 method matches the FEMA data for the total and Walker Run discharges most closely of all analyzed methods, yielding a Tributary discharge of 303.5 cfs. Therefore, a discharge of 303.5 cfs determined by the Hydraflow 3 method calculations is used in the reach routing analysis.

3 Hydraulics

3.1 General Description

The US Army Corps of Engineers Hydrologic Engineering Centers River Analysis System (HEC-RAS) Version 4.0 software was used for the hydraulic analysis. HEC-RAS is intended for calculating water-surface profiles for steady or unsteady flow in natural or man-made channels. The computational procedure is based on the solution of the one-dimensional energy equation with energy loss due to friction computed using Manning's equation. The computational procedure is generally known as the Standard Step Method and can be used for subcritical as well as supercritical flow conditions.

For this project, the water-surface profile for steady, mixed (supercritical and subcritical) flow was calculated. The effects of various obstructions in the floodplain, notably the four existing bridges and one culvert crossing Walker Run, and the two existing culvert crossings and four proposed bridges on Tributary #1 were also considered in the computations.

3.2 FEMA Flood Insurance Study (FIS) (Duplicate Effective Model)

The original FEMA FIS HEC-2 input data was acquired from the FEMA Engineering Library. The data was entered into HEC-RAS to develop a "control" model for comparison with the more detailed existing and proposed models to be discussed later. The model includes HEC-2 cross-sections extending from Station 51+98 (FEMA FIS XS "BIA"; HEC-2 cross section 65.0) to Station -2+55 (FEMA FIS XS "BHJ"; HEC-2 cross section 44.0). The FEMA FIS model includes the bridge data original to the HEC-2 model. The 100-year peak flows used in the FEMA FIS were applied to the model. The 100-year water surface elevation of 653.29 ft, as listed in the FIS at cross section "BHJ", was used as the downstream boundary condition. A mixed flow regime was selected, though the flow remained in subcritical flow for the majority of the model, keeping with the original HEC-2 model. See FEMA FIS data in Appendix D.

3.3 Existing Conditions (Corrected Effective Model)

Detailed existing cross sections of Walker Run and Tributary #1 were surveyed by LandStudies, Inc. and supplemented with one (1) foot existing contours produced by Peters Consultants, Inc. Cross sections were inserted into the FEMA FIS HEC-RAS model. Existing

cross sections extend from Station 58+62 (upstream of FEMA FIS XS "BIA") to the downstream limit of the "control" model, Station -2+55 (FEMA FIS XS "BHJ"). Two LSI surveyed cross-sections (XS 35+32 and 51+98) overlapped with FEMA cross-sections, so the detailed surveyed channel information was substituted into the FEMA cross-section, while the floodplain and extended area of the FEMA cross-section were left intact.

Cross sections for Tributary #1 begin at the confluence of Walker Run and extend to Tributary Station 44+00, just south of Beach Grove Road. Manning's 'n' values for the surveyed existing cross sections were kept consistent with FEMA FIS Manning's 'n' values, when possible. Manning's 'n' values for tributary #1 were chosen from the HEC-RAS Hydraulic Reference Manual based on existing conditions. Photographs illustrating selected 'n' values are provided in the Appendix G.

Four bridges and one farm road culvert cross Walker Run within the studied section, while two culverts cross Tributary #1. All crossings are characterized within the existing conditions model.

The 100-year peak flows from FEMA FIS of 1860 cfs for the total watershed and 1640 cfs for the Walker Run watershed were used in the HEC-RAS existing model, as well as the calculated flow of 303.5 cfs for the Tributary #1 watershed. For the downstream boundary condition, the 100-year water surface elevation of 653.29 ft was used, as in the FEMA HEC-2 model and Duplicate Effective (FEMA FIS) HEC-RAS model. A mixed flow regime was considered in the HEC-RAS analysis. The existing conditions HEC-RAS data is located in Appendix E (Existing Hydraulics).

3.4 Proposed Conditions (Revised Conditions Model)

The proposed condition involves lowering the floodplain and bankfull elevations of Walker Run, as well as constructing a stable plan and profile to reduce erosive shear stresses on the banks during high flows. Wetlands will border the channel throughout the floodplain and native, wet-tolerant herbaceous and woody vegetation will be installed throughout the project. The proposed grading, primarily from the mitigation plan by LandStudies, Inc. and supplemented with proposed contours by Bechtel, was used to generate cross-sections and profiles for the proposed condition geometry data. Tributary #1 has very minor grading changes affecting the floodplain.

Of the four bridges crossing Walker Run in existing conditions, three will remain and one will be replaced with a larger structure to span the 100-year floodplain. Beach Grove Road at the upstream end of the project will remain, Market Street Bridge which divides the restoration project will remain, and the lower Market Street Bridge at the downstream limit of the study will remain. The small farm road crossing bridge through the lower restoration will be replaced with a larger bridge to span the 100-year floodplain. The culvert crossing downstream of the Tributary #1 confluence with Walker Run will remain. Manning's 'n'

values were increased slightly from existing condition values through the restored reach to reflect the proposed vegetation of heavy brush and understory in a forested wetland environment.

Tributary #1 will have four (4) proposed bridges spanning its 100-year floodplain. The existing culvert crossing at Station 12+81 will be removed and replaced with a bridge to span the floodplain. The other culvert crossing upstream at Station 45+28 will remain. The three additional proposed bridges include a pipe bridge near cross section Trib 16+58, a road and pipe bridge near Trib 28+34 and a railroad bridge near cross section Trib. 33+56.

The same flow information and boundary conditions used in the existing conditions model were used in proposed conditions (Q_{100} = 1640 cfs for Walker Run, Q_{100} = 303.5 cfs for the Tributary #1 watershed, and Q_{100} = 1860 cfs for total watershed with downstream $WSEL_{100}$ = 653.29 ft). A mixed flow regime was considered in the HEC-RAS analysis. Proposed HEC-RAS data can be found in Appendix G (Proposed Hydraulics).

An encroachment analysis was used to establish a revised floodway through the project reach in the proposed conditions model due to the extent of change in the channel plan-form. The floodway was determined by first using the automated encroachment analysis within HEC-RAS to raise the level of water surface elevation one (1) foot (Method 4). After an initial run using the automated method, encroachment stations were fine-tuned manually to achieve a consistent increase in the water surface elevation of as close to one (1) foot as possible. The proposed floodway information can be found in the proposed HEC-RAS data in Appendix G (Proposed Hydraulics).

4 Results and Conclusions

The FEMA FIS HEC-RAS model was first compared to the FEMA FIS HEC-2 data output. Water surface elevations generated by the HEC-RAS model have a discrepancy of 0.00 to 0.50 ft when compared to the elevations from the HEC-2 data, with a mean discrepancy of 0.24 ft. This variation is attributed to differences in computational procedures between HEC-2 and HEC-RAS, especially relative to structures.

The FEMA FIS HEC-RAS model was also compared to the existing conditions HEC-RAS model. The existing conditions model contains more detail of the studied site due to the additional existing cross-sections. Also, geometric variation can be attributed to the amount of degradation that has occurred in Walker Run since 1977 when the FEMA FIS HEC-2 data was executed. Based upon the geometrical differences, the two models' water surface elevations differ slightly from each other.

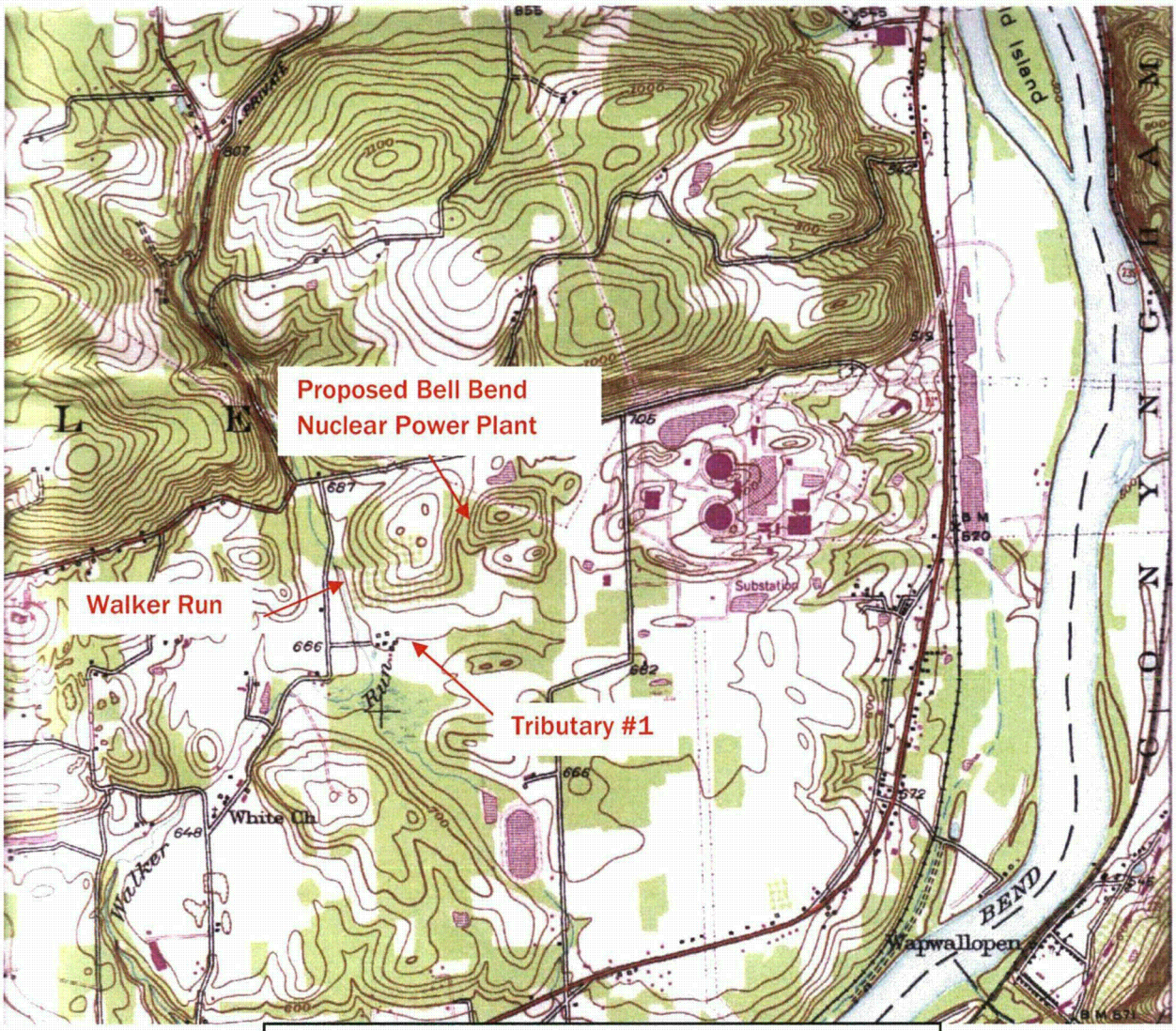
The existing conditions model water surface elevations have a discrepancy of 0.00 to 1.56 ft (mean discrepancy of 0.75 ft) when compared to the elevations of the FEMA FIS HEC-RAS model. The cross-sections with the most discrepancy in water surface elevation are immediately upstream and downstream of bridge structures, such as the bridge at Station 8+75. The discrepancy near structures indicates that there may be inconsistencies between the FEMA input data and LSI surveyed data for structures and/or there is more scour and erosion occurring near bridge structures, therefore altering the cross-sections around them. Other cross sections within the models have very little water surface elevation discrepancies, indicating that a reasonable correlation between the existing conditions geometry and the FEMA FIS geometry exists. Based on this comparison, it is concluded that the existing conditions model is reasonably consistent with the FEMA FIS model.

The existing conditions model was then compared to the proposed conditions model. In the restored channel and floodplain section of Walker Run, the proposed conditions water surface elevations are lower than the existing conditions water surface elevations by as much as 2.29 ft (mean difference of 0.85 ft). The additional storage provided in the proposed cross-section lowers the water surface elevations for the 100-year storm event substantially. In areas along Walker Run where no restoration is proposed, the water surface elevations for proposed and existing conditions are equal. Since the proposed water surface elevations are equal to or lower than the existing water surface elevations along Walker Run, it can be concluded that the proposed BBNPP and associated mitigation for Walker Run have no negative hydraulic effect on Walker Run or its floodplain.

Along Tributary #1, proposed conditions water surface elevations are equal to existing conditions water surface elevations at most cross-sections. Cross sections directly upstream and downstream of the proposed bridges at stations 12+81, 17+90, 30+10, and 31+08 differ in water surface elevations between the two models. The maximum discrepancy in water surface between the models is 0.42 ft at Station 13+60 and is due to a backwater condition in existing conditions from the existing culvert at Station 12+81. With the removal of the culvert comes a smoother water surface profile in proposed conditions which happens to be higher than the existing profile at Station 13+60. All water surface elevation discrepancies between the existing and proposed conditions models on the unstudied Tributary #1 are less than one (1) foot and all increases are contained within the PPL property; therefore, all improvements to the Tributary #1 can be considered to have no negative hydraulic effect on the 100-year water surface elevation.

A new floodway needed to be evaluated due to the relocation of Walker Run in the proposed restoration plans. A floodway was assessed using the encroachment analysis in HEC-RAS with a target water surface elevation increase of one (1.0) foot and plotted with the existing and proposed 100-year storm event floodplain. The plot of the proposed floodway can be found on the Proposed 100 Year Floodplain Map in Appendix B.

Appendix A:
Maps



Source: Berwick, PA USGS 7.5-minute topographic quadrangle

Location	Scale
41˚05'14" N, 76˚10'04" W	1" = 2000'

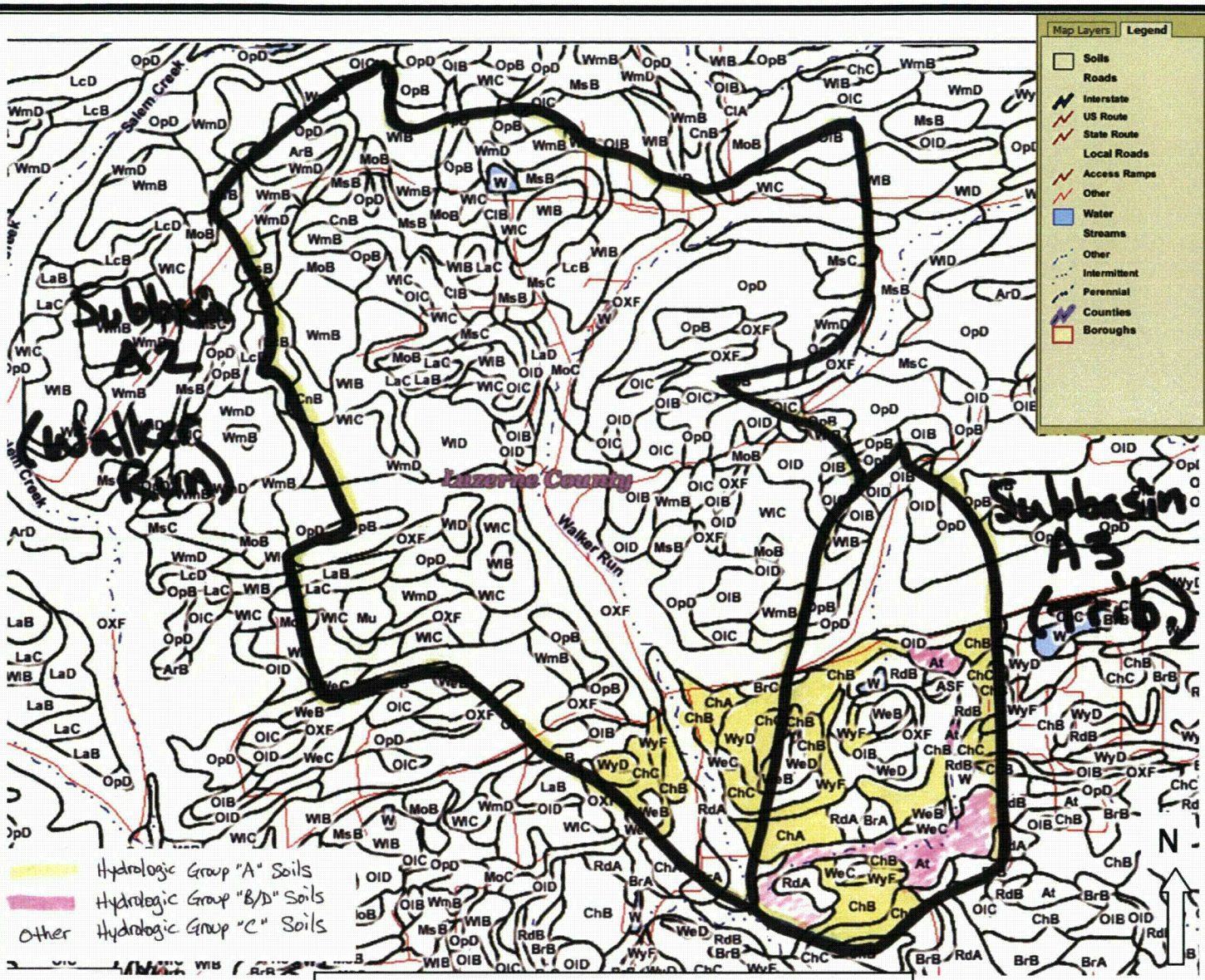
Project Location Map

BBNPP Proposed Site near Walker Run and Tributary #1

Land Studies

Walker Run Flood Study Report

Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
December 2010



Source: http://soilmap.psu.edu

Location	Scale
41˚05'14" N, 76˚10'04" W	1" = 2000'

Soils Location Map

Walker Run and Tributary #1 Drainage Areas

Land Studies

Walker Run Flood Study Report

Bell Bend Nuclear Power Plant

Salem Township, Luzerne County, PA

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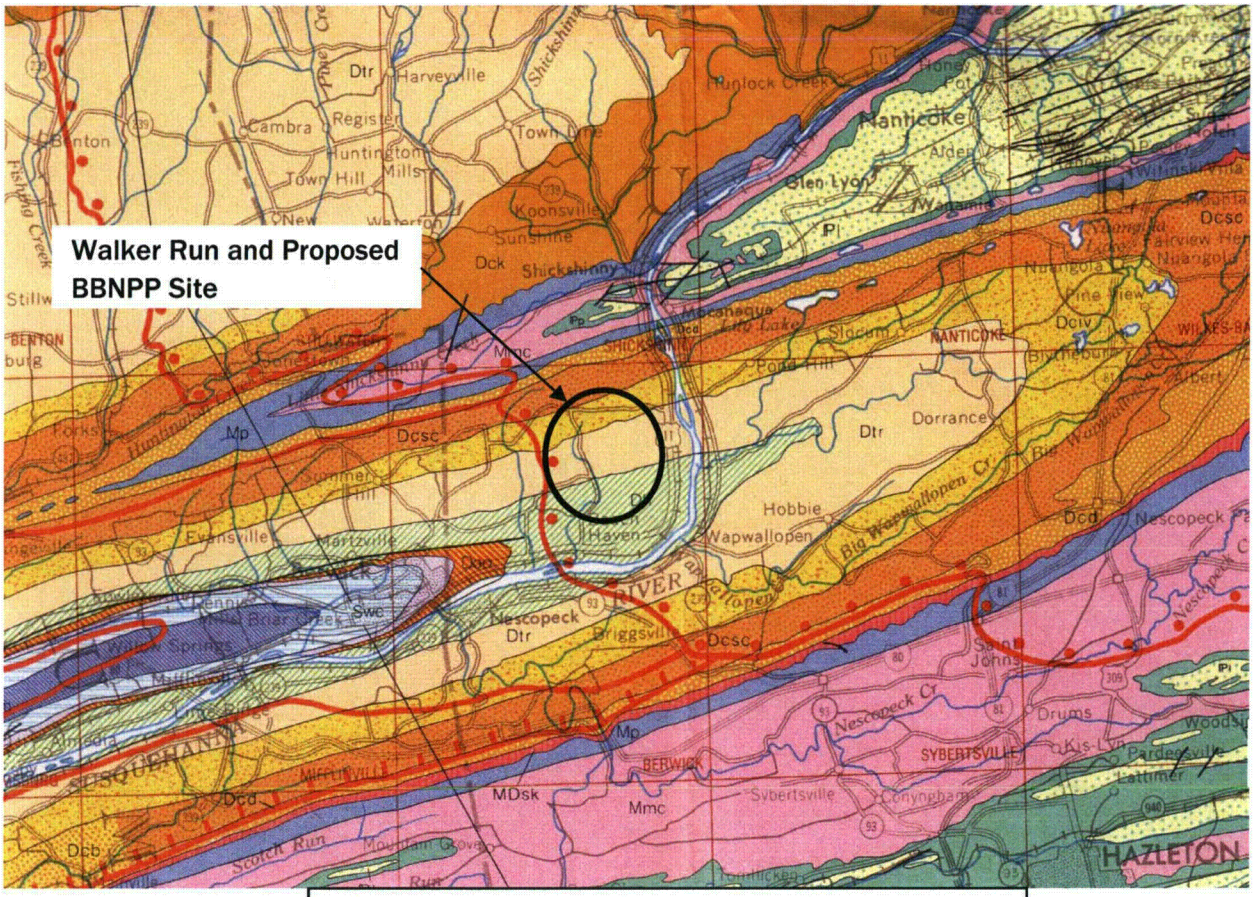

Source: Geologic Map of Pennsylvania. 1980.

Geologic Formation	Location
Dh = Hamilton Group	41°05'14" N, 76°10'04" W
	Scale
	1:250,000

Geology Map

BBNPP Proposed Site near Walker Run and Tributary #1

Land Studies

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Salem Township, Luzerne County, PA
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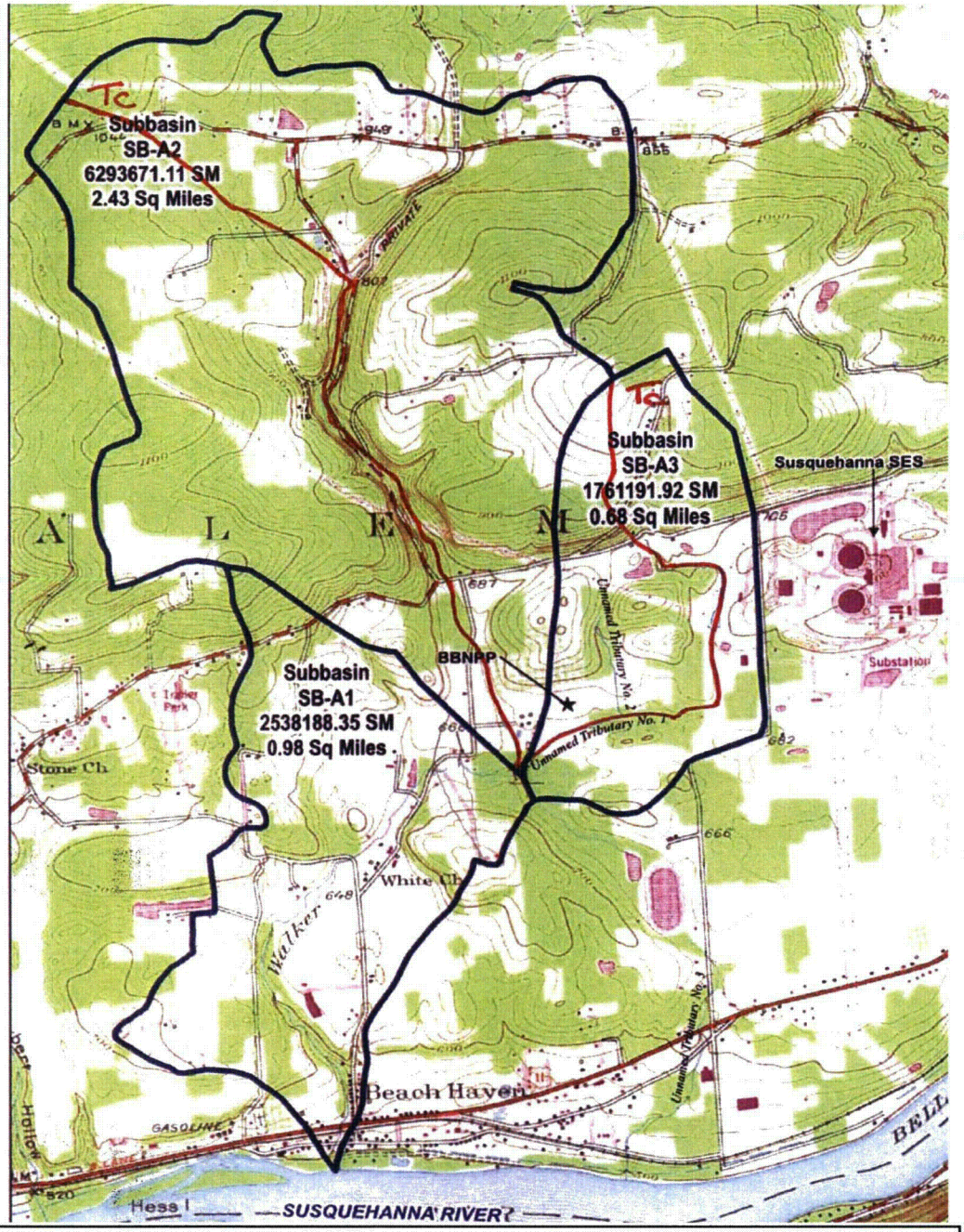


Source: Figure 2.4-3 from COLA; Berwick, PA USGS 7.5 minute topographic quadrangle

Location	Scale
41°05'17" N, 76°07'54" W	1" = 3,000'

Walker Run Watershed Map

Drainage area of Walker Run and Tributary #1 showing time of concentration paths for each subdrainage area

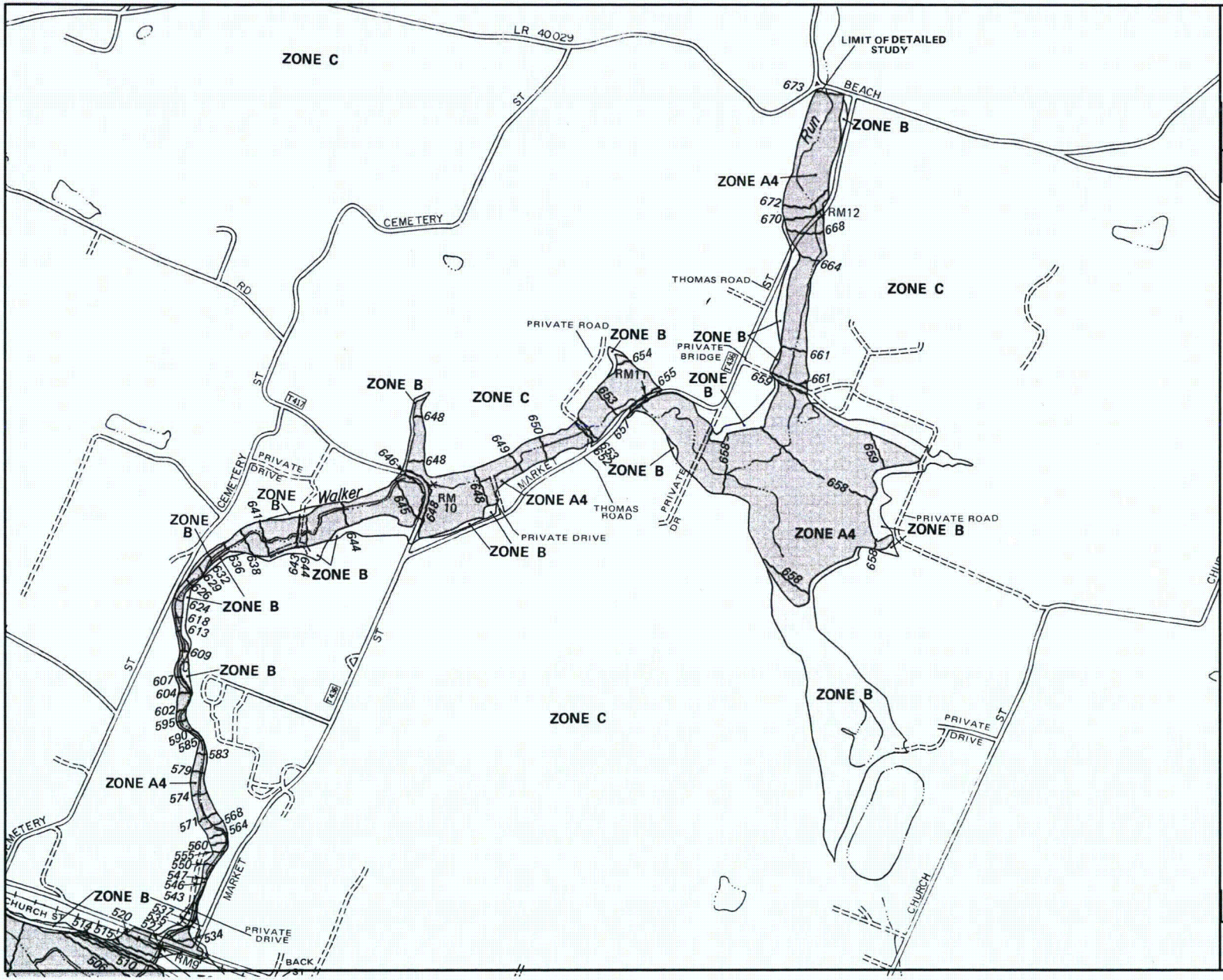
Land Studies

Walker Run Flood Study Report

Bell Bend Nuclear Power Plant

Salem Township, Luzerne County, PA

December 2010



APPROXIMATE SCALE

800 0 800 FEET

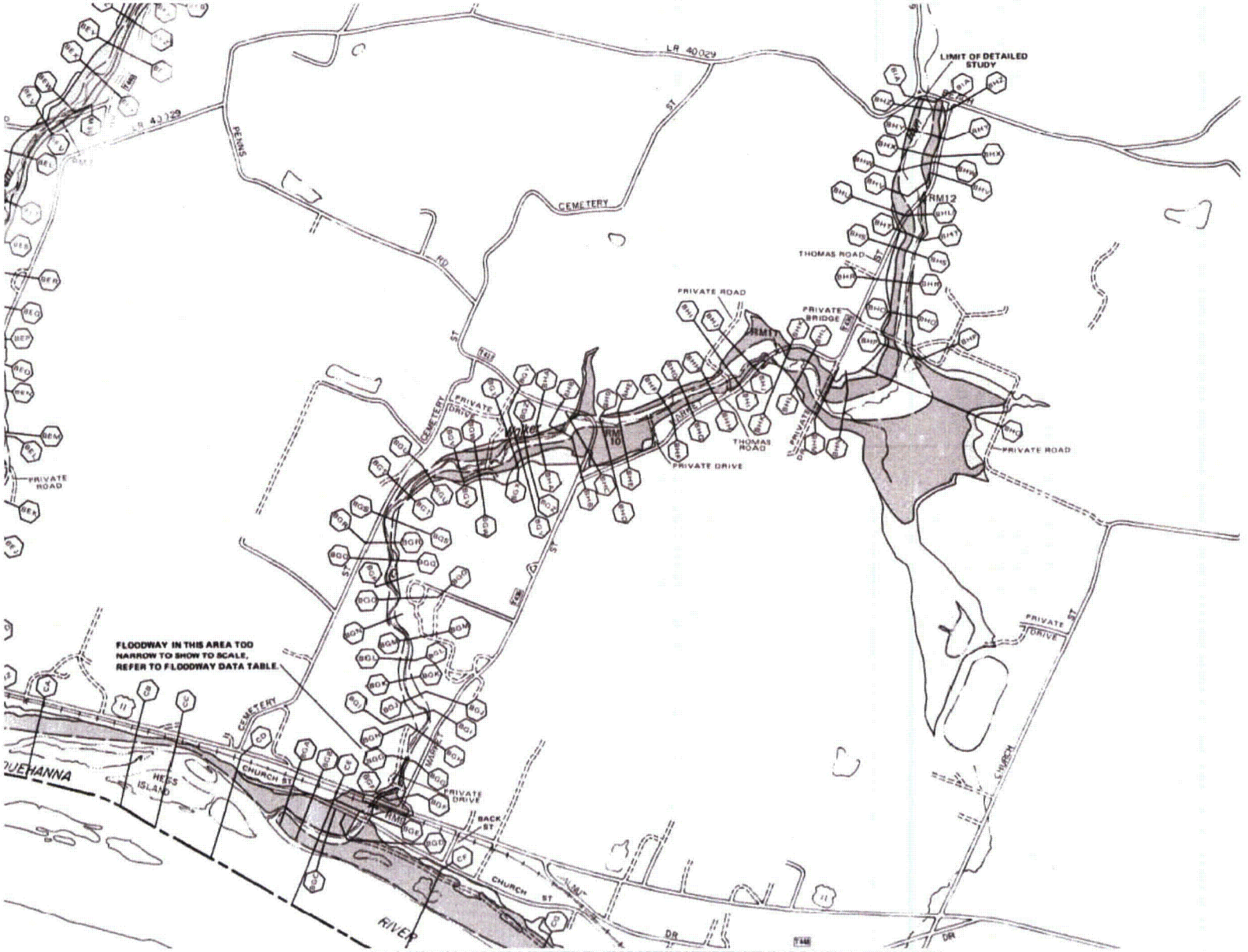
KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1 DATE / ZONE A5 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7 ×
River Mile	• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.



Source: FEMA Flood Insurance Study

Land Studies

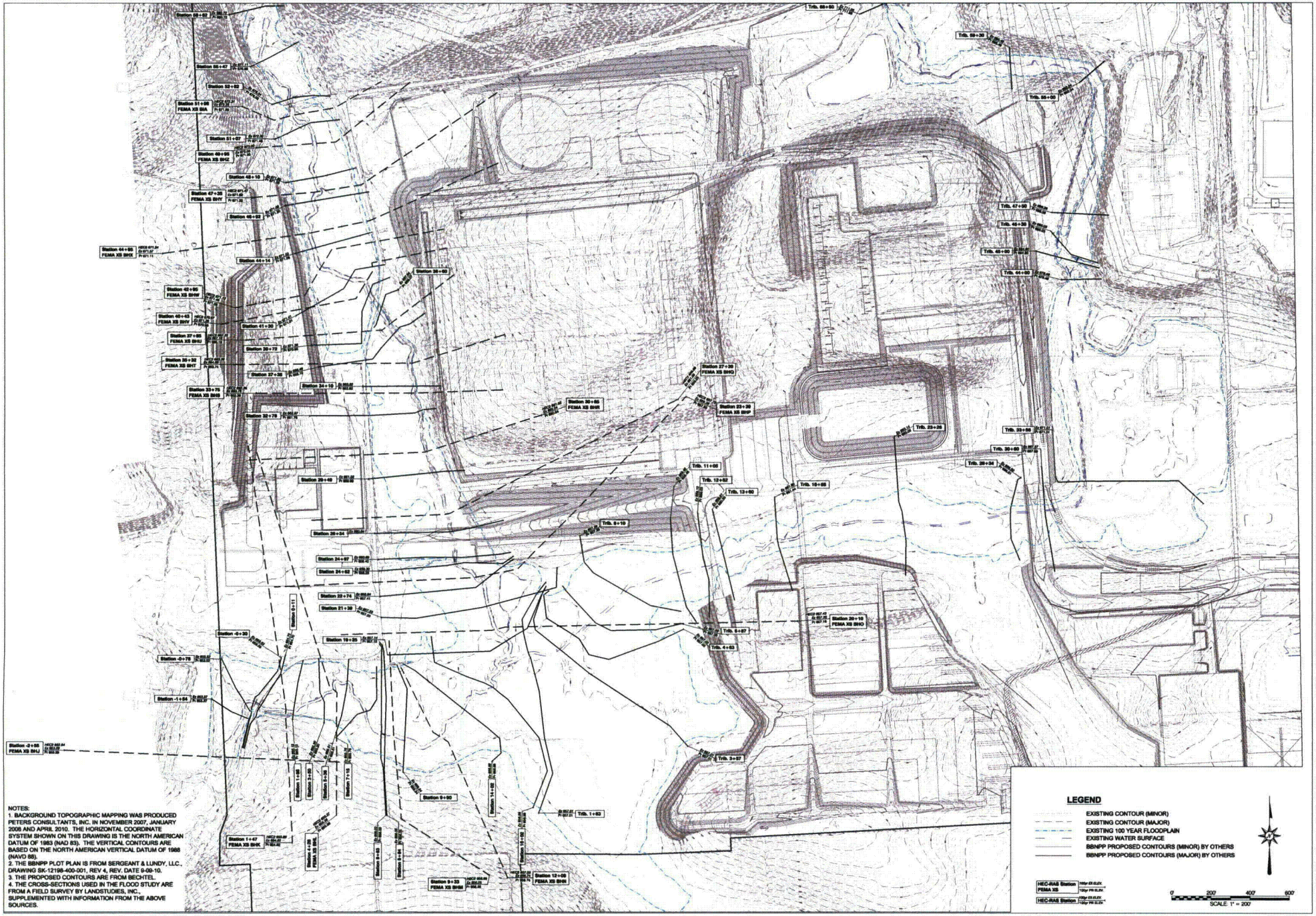
FEMA Cross Section Map

Cross Sections along Walker Run from FEMA FIS

Location

41°05'14" N, 76°10'04" W

Appendix B:
Floodplain Map



NOTES:
1. BACKGROUND TOPOGRAPHIC MAPPING WAS PRODUCED PETERS CONSULTANTS, INC. IN NOVEMBER 2007, JANUARY 2008 AND APRIL 2010. THE HORIZONTAL COORDINATE SYSTEM SHOWN ON THIS DRAWING IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83). THE VERTICAL CONTOURS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
2. THE BBNPP PLOT PLAN IS FROM SERGEANT & LUNDY, LLC., DRAWING SK-12198-400-001, REV 4, REV. DATE 9-09-10.
3. THE PROPOSED CONTOURS ARE FROM BECHTEL.
4. THE CROSS-SECTIONS USED IN THE FLOOD STUDY ARE FROM A FIELD SURVEY BY LANDSTUDIES, INC., SUPPLEMENTED WITH INFORMATION FROM THE ABOVE SOURCES.

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fax: 717-627-4660
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land@landstudies.com
315 North Street | Lititz, PA 17543
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PPL BELL BEND, LLC.
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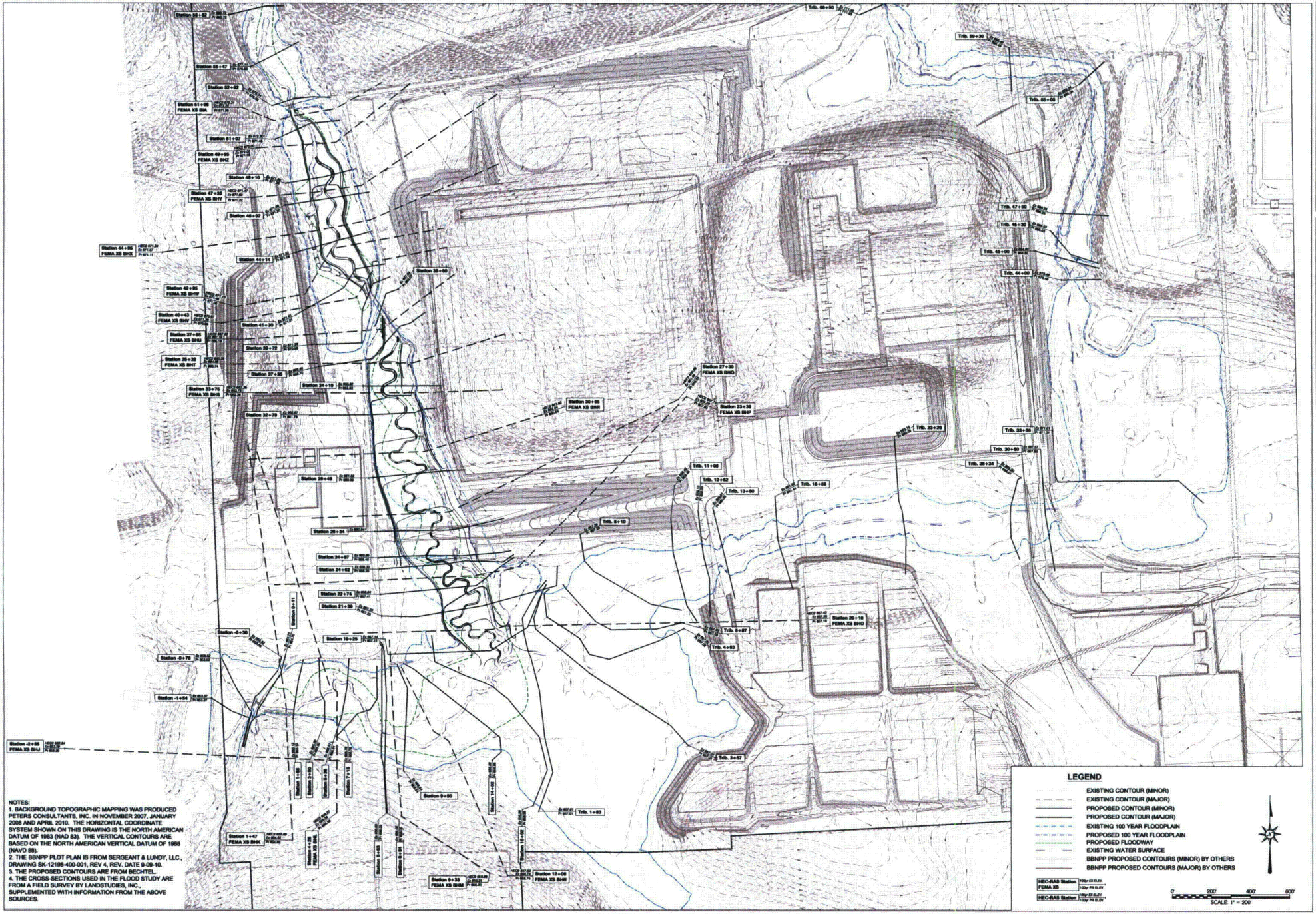
Sheet Title:
EXISTING 100 YEAR FLOODPLAIN MAP
WALKER RUN FLOOD STUDY
SALEM TOWNSHIP
LUZERNE COUNTY, PENNSYLVANIA

Revisions		
No.	Date	Description
X	X	X

Project Number: E-726-L8
Drawn By: EPJ
Checked By: BE
Date: DECEMBER 2010
Scale: 1" = 200'
PLAN SHEET
Sheet Number: 1 OF 2



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Project:
BELL BEND NUCLEAR POWER PLANT
PPL BELL BEND, LLC.
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BERWICK, PENNSYLVANIA 18603

Sheet Title:
PROPOSED 100 YEAR FLOODPLAIN MAP
WALKER RUN FLOOD STUDY
SALEM TOWNSHIP
LUZERNE COUNTY, PENNSYLVANIA

Revisions		
No.	Date	Description
X	X	X

Project Number: E-726-LB
Drawn By: EPJ
Checked By: BE
Date: DECEMBER 2010
Scale: 1" = 200'
PLAN SHEET
Sheet Number: 2 OF 2

Appendix C:
HEC-RAS Summary Data

Walker Run Flood Study Report
PPL Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
Flood Study Comparison Table

Land Studies

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
5862	Existing Conditions	1640	675.53	680.72		10.81	
	Proposed Conditions	1640	675.53	680.72	0.00	10.81	0.00
5547	Existing Conditions	1640	669.38	677.11		4.35	
	Proposed Conditions	1640	669.38	676.98	-0.13	4.50	0.15
5282	Existing Conditions	1640	667.03	676.24		6.02	
	Proposed Conditions	1640	667.03	676.02	-0.22	6.26	0.24
5250	Existing Bridge						
5198	FEMA (HEC-2)	1640		672.31		4.56	
HEC-2 XS 65.0, BIA	FEMA FIS (HEC-RAS)	1640	666.74	672.29	-0.01	4.57	0.01
	Existing Conditions	1640	665.71	672.25	-0.04	11.33	6.76
	Proposed Conditions	1640	665.71	671.55	-0.70	11.69	0.36
5107	Existing Conditions	1640	664.59	672.30		3.56	
	Proposed Conditions	1640	664.59	671.48	-0.82	4.27	0.71
4995	FEMA (HEC-2)	1640		672.00		4.47	
HEC-2 XS 64.0, BHZ	FEMA FIS (HEC-RAS)	1640	666.24	671.98	-0.01	4.49	0.02
	Existing Conditions	1640	666.24	672.05	0.07	4.39	-0.10
	Proposed Conditions	1640	666.24	671.35	-0.70	2.64	-1.75
4810	Existing Conditions	1640	663.49	671.80		3.19	
	Proposed Conditions	1640	662.87	671.26	-0.54	2.61	-0.58
4735	FEMA (HEC-2)	1640		671.47		3.90	
HEC-2 XS 63.0, BHY	FEMA FIS (HEC-RAS)	1640	664.24	671.45	-0.01	3.93	0.03
	Existing Conditions	1640	664.24	671.69	0.24	3.60	-0.33
	Proposed Conditions	1640	662.26	671.22	-0.47	2.56	-1.04
4692	Existing Conditions	1640	662.02	671.68		2.30	
	Proposed Conditions	1640	663.77	671.20	-0.48	2.47	0.17
4495	FEMA (HEC-2)	1640		671.24		3.14	
HEC-2 XS 62.0, BHX	FEMA FIS (HEC-RAS)	1640	663.74	671.21	-0.02	3.17	0.03
	Existing Conditions	1640	663.74	671.57	0.36	2.88	-0.29
	Proposed Conditions	1640	663.23	671.11	-0.46	2.46	-0.42
4414	Existing Conditions	1640	662.46	671.52		2.71	
	Proposed Conditions	1640	662.97	671.08	-0.44	2.19	-0.52
4295	FEMA (HEC-2)	1640		671.12		2.86	
HEC-2 XS 61.0, BHW	FEMA FIS (HEC-RAS)	1640	663.24	671.10	-0.01	2.78	-0.08
	Existing Conditions	1640	663.24	671.46	0.36	2.50	-0.28
	Proposed Conditions	1640	662.82	671.05	-0.41	1.84	-0.66
4130	Existing Conditions	1640	661.54	671.41		1.82	
	Proposed Conditions	1640	662.26	671.01	-0.40	1.82	0.00

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
4043	FEMA (HEC-2)	1640		670.97		2.71	
HEC-2 XS 60.0, BHV	FEMA FIS (HEC-RAS)	1640	662.24	670.96	0.00	2.59	-0.12
	Existing Conditions	1640	662.24	671.38	0.42	2.27	-0.32
	Proposed Conditions	1640	662.83	670.98	-0.40	2.40	0.13
3972	Existing Conditions	1640	661.21	671.36		1.68	
	Proposed Conditions	1640	661.21	670.96	-0.40	1.41	-0.27
3914	Existing Bridge						
3860	Existing Conditions	1640	660.73	667.84		8.79	
	Proposed Conditions	1640	660.73	666.07	-1.77	14.78	5.99
3785	FEMA (HEC-2)	1640		667.22		8.50	
HEC-2 XS 58.0, BHU	FEMA FIS (HEC-RAS)	1640	660.24	666.72	-0.50	10.95	2.45
	Existing Conditions	1640	660.24	667.18	0.46	7.39	-3.56
	Proposed Conditions	1640	660.85	665.19	-1.99	9.23	1.84
3735	Existing Conditions	1640	660.36	666.48		3.88	
	Proposed Conditions	1640	660.46	665.10	-1.38	6.74	2.86
3532	FEMA (HEC-2)	1640		663.28		8.48	
HEC-2 XS 57.0, BHT	FEMA FIS (HEC-RAS)	1640	658.24	663.52	0.25	7.58	-0.90
	Existing Conditions	1640	658.71	664.66	1.14	8.39	0.81
	Proposed Conditions	1640	658.87	663.74	-0.92	4.83	-3.56
3410	Existing Conditions	1640	657.83	663.82		4.24	
	Proposed Conditions	1640	658.92	662.82	-1.00	6.03	1.79
3375	FEMA (HEC-2)	1640		662.35		4.24	
HEC-2 XS 56.0, BHS	FEMA FIS (HEC-RAS)	1640	657.24	662.36	0.01	5.23	0.99
	Existing Conditions	1640	657.24	663.78	1.42	3.46	-1.77
	Proposed Conditions	1640	657.97	662.38	-1.40	7.25	3.79
3278	Existing Conditions	1640	657.01	662.97		8.65	
	Proposed Conditions	1640	657.99	661.78	-1.19	4.55	-4.10
3065	FEMA (HEC-2)	1640		661.02		5.92	
HEC-2 XS 55.0, BHR	FEMA FIS (HEC-RAS)	1640	655.95	660.88	-0.13	5.55	-0.37
	Existing Conditions	1640	655.95	662.04	1.16	3.66	-1.89
	Proposed Conditions	1640	656.75	660.64	-1.40	5.27	1.61
2949	Existing Conditions	1640	655.77	661.56		5.83	
	Proposed Conditions	1640	656.74	659.99	-1.57	4.24	-1.59
2730	FEMA (HEC-2)	1640		659.89		4.18	
HEC-2 XS 54.0, BHQ	FEMA FIS (HEC-RAS)	1640	654.74	659.53	-0.36	4.75	0.57
	Existing Conditions	1640	654.74	661.09	1.56	3.40	-1.35
	Proposed Conditions	1640	655.66	659.23	-1.86	3.72	0.32
2634	Existing Conditions	1640	653.74	660.84		4.68	
	Proposed Conditions - deleted for proposed bridge						
2497	Existing Conditions	1640	653.51	660.69		2.72	
	Proposed Conditions	1640	654.75	658.40	-2.29	4.04	1.32
2480	Existing Bridge						
2462	Existing Conditions	1640	653.86	659.30		6.44	
	Proposed Conditions	1640	654.61	658.29	-1.01	3.54	-2.90

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
2339	FEMA (HEC-2)	1640		657.75		2.55	
HEC-2 XS 52.0, BHP	FEMA FIS (HEC-RAS)	1640	653.24	657.94	0.20	2.59	0.04
	Existing Conditions	1640	653.24	659.26	1.32	1.65	-0.94
	Proposed Conditions	1640	654.38	657.83	-1.43	4.52	2.87
2274	Existing Conditions	1640	651.42	658.64		8.18	
	Proposed Conditions	1640	653.90	657.41	-1.23	5.14	-3.04
2139	Existing Conditions	1640	650.72	657.33		3.38	
	Proposed Conditions	1640	653.31	657.23	-0.10	2.09	-1.29
2010	FEMA (HEC-2)	1640		657.43		1.85	
HEC-2 XS 51.0, BHO	FEMA FIS (HEC-RAS)	1640	652.24	657.72	0.30	1.50	-0.35
	Existing Conditions	1640	652.24	657.20	-0.52	2.13	0.63
	Proposed Conditions	1640	652.70	657.16	-0.04	1.74	-0.39
1925	Existing Conditions	1640	651.09	657.14		1.77	
	Proposed Conditions	1640	652.07	657.12	-0.02	1.62	-0.15
1602	Existing Conditions	1640	650.67	656.98		1.46	
	Proposed Conditions	1640	650.67	656.98	0.00	1.46	0.00
1402	Existing Conditions	1640	649.80	656.88		1.59	
	Proposed Conditions	1640	649.80	656.88	0.00	1.59	0.00
1208	FEMA (HEC-2)	1860		657.03		2.01	
HEC-2 XS 50.0, BHN	FEMA FIS (HEC-RAS)	1860	650.74	657.39	0.37	1.75	-0.26
	Existing Conditions	1860	650.74	656.74	-0.65	2.30	0.55
	Proposed Conditions	1860	650.74	656.74	0.00	2.30	0.00
990	Existing Conditions	1860	649.47	656.54		2.28	
	Proposed Conditions	1860	649.47	656.54	0.00	2.28	0.00
933	FEMA (HEC-2)	1860		656.68		4.84	
HEC-2 XS 49.0, BHM	FEMA FIS (HEC-RAS)	1860	649.74	657.15	0.48	4.17	-0.67
	Existing Conditions	1860	649.74	656.25	-0.90	5.59	1.42
	Proposed Conditions	1860	649.74	656.25	0.00	5.59	0.00
884	Existing Conditions	1860	648.62	656.05		6.24	
	Proposed Conditions	1860	648.62	656.05	0.00	6.24	0.00
875	Existing Bridge						
863	Existing Conditions	1860	648.96	656.03		4.92	
	Proposed Conditions	1860	648.96	656.03	0.00	4.92	0.00
715	Existing Conditions	1860	647.90	655.76		3.85	
	Proposed Conditions	1860	647.90	655.76	0.00	3.85	0.00
536	Existing Conditions	1860	646.97	655.51		3.79	
	Proposed Conditions	1860	646.97	655.51	0.00	3.79	0.00
428	FEMA (HEC-2)	1860		656.27		2.49	
HEC-2 XS 47.0, BHL	FEMA FIS (HEC-RAS)	1860	647.24	656.63	0.37	2.64	0.15
	Existing Conditions	1860	647.24	655.36	-1.27	3.69	1.05
	Proposed Conditions	1860	647.24	655.36	0.00	3.69	0.00
350	Existing Conditions	1860	647.08	655.30		3.11	
	Proposed Conditions	1860	647.08	655.30	0.00	3.11	0.00

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
185	Existing Conditions	1860	646.40	655.12		3.48	
	Proposed Conditions	1860	646.40	655.12	0.00	3.48	0.00
147	FEMA (HEC-2)	1860		655.89		4.63	
HEC-2 XS 46.0, BHK	FEMA FIS (HEC-RAS)	1860	646.74	656.36	0.48	3.95	-0.68
	Existing Conditions	1860	646.74	654.82	-1.54	5.97	2.02
	Proposed Conditions	1860	646.74	654.82	0.00	5.97	0.00
11	Existing Conditions	1860	645.71	654.70		3.86	
	Proposed Conditions	1860	645.71	654.70	0.00	3.86	0.00
-10	Existing Bridge						
-30	Existing Conditions	1860	644.46	653.53		7.39	
	Proposed Conditions	1860	644.46	653.53	0.00	7.39	0.00
-78	Existing Conditions	1860	645.43	653.52		3.92	
	Proposed Conditions	1860	645.43	653.52	0.00	3.92	0.00
-154	Existing Conditions	1860	644.90	653.37		4.45	
	Proposed Conditions	1860	644.90	653.37	0.00	4.45	0.00
-255	FEMA (HEC-2)	1860		652.54		4.72	
HEC-2 XS 44.0, BHJ	FEMA FIS (HEC-RAS)	1860	645.74	653.29	0.75	3.72	-1.00
	Existing Conditions	1860	645.74	653.29	0.00	3.72	0.00
	Proposed Conditions	1860	645.74	653.29	0.00	3.72	0.00

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
6850	Existing Conditions	303.5	709.19	711.95		6.42	
	Proposed Conditions	303.5	709.19	711.95	0.00	6.42	0.00
5930	Existing Conditions	303.5	692.00	695.49		1.91	
	Proposed Conditions	303.5	692.00	695.49	0.00	1.91	0.00
5500	Existing Conditions	303.5	691.00	692.04		5.60	
	Proposed Conditions	303.5	691.00	692.04	0.00	5.60	0.00
4750	Existing Conditions	303.5	684.00	686.28		1.52	
	Proposed Conditions	303.5	684.00	686.28	0.00	1.52	0.00
4530	Existing Conditions	303.5	684.00	686.03		0.73	
	Proposed Conditions	303.5	684.00	686.03	0.00	0.73	0.00
4528	Existing Culvert						
4500	Existing Conditions	303.5	683.30	684.80		6.59	
	Proposed Conditions	303.5	683.30	684.80	0.00	6.59	0.00
4400	Existing Conditions	303.5	675.78	678.48		5.88	
	Proposed Conditions	303.5	675.78	678.48	0.00	5.88	0.00
3356	Existing Conditions	303.5	667.67	671.01		1.99	
	Proposed Conditions	303.5	667.67	671.01	0.00	1.99	0.00
3060	Existing Conditions	303.5	666.00	667.57		2.40	
	Proposed Conditions	303.5	666.00	667.66	0.09	2.22	-0.18
2834	Existing Conditions	303.5	664.89	666.50		2.29	
	Proposed Conditions	303.5	664.89	666.51	0.01	2.26	-0.03
2326	Existing Conditions	303.5	659.90	663.14		2.54	
	Proposed Conditions	303.5	659.90	663.02	-0.12	2.83	0.29
1658	Existing Conditions	303.5	657.96	661.60		3.03	
	Proposed Conditions	303.5	657.96	661.44	-0.16	3.43	0.40
1360	Existing Conditions	303.5	658.00	659.91		4.79	
	Proposed Conditions	303.5	658.00	660.33	0.42	2.72	-2.07
1281	Existing Culvert						
1252	Existing Conditions	303.5	656.64	659.13		4.25	
	Proposed Conditions	303.5	656.64	659.03	-0.10	1.62	-2.63
1105	Existing Conditions	303.5	655.65	658.45		1.91	
	Proposed Conditions	303.5	655.65	658.45	0.00	1.91	0.00
810	Existing Conditions	303.5	653.84	657.29		1.83	
	Proposed Conditions	303.5	653.84	657.29	0.00	1.83	0.00

River Station/ Cross Section	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ WSE (ft)	Vel Chnl (ft/s)	Δ V (ft/s)
587	Existing Conditions	303.5	653.78	657.03		0.81	
	Proposed Conditions	303.5	653.78	657.03	0.00	0.81	0.00
463	Existing Conditions	303.5	653.23	657.02		0.30	
	Proposed Conditions	303.5	653.23	657.02	0.00	0.30	0.00
357	Existing Conditions	303.5	652.40	657.01		0.20	
	Proposed Conditions	303.5	652.40	657.01	0.00	0.20	0.00
183	Existing Conditions	303.5	652.14	657.01		0.15	
	Proposed Conditions	303.5	652.14	657.01	0.00	0.15	0.00

Duplicate Effective Model

HEC-RAS Plan: FEMA HECRAS River: Walker Run Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	5198	PF 1	1640.00	666.74	672.29	670.21	672.45	0.00322	4.57	679.39	213.54	0.38
1	4995	PF 1	1640.00	666.24	671.98		672.10	0.00290	4.49	809.61	268.46	0.36
1	4735	PF 1	1640.00	664.24	671.45		671.53	0.00181	3.93	1014.88	328.46	0.29
1	4495	PF 1	1640.00	663.74	671.21		671.26	0.00085	3.17	1231.26	328.20	0.21
1	4295	PF 1	1640.00	663.24	671.10		671.13	0.00072	2.78	1481.19	417.58	0.19
1	4043	PF 1	1640.00	662.24	670.96	667.76	670.98	0.00059	2.59	1720.34	513.42	0.17
1	3914		Bridge									
1	3785	PF 1	1640.00	660.24	666.72	667.18	668.16	0.02906	10.95	215.96	226.04	0.97
1	3532	PF 1	1640.00	658.24	663.52	662.84	663.92	0.01386	7.58	371.00	171.79	0.63
1	3375	PF 1	1640.00	657.24	662.36		662.54	0.00439	5.23	558.85	195.75	0.44
1	3065	PF 1	1640.00	655.95	660.88		661.12	0.00446	5.55	483.24	190.20	0.45
1	2730	PF 1	1640.00	654.74	659.53	658.23	659.72	0.00404	4.75	516.14	214.41	0.42
1	2480		Bridge									
1	2339	PF 1	1640.00	653.24	657.94		658.02	0.00133	2.59	778.58	344.43	0.24
1	2010	PF 1	1640.00	652.24	657.72		657.73	0.00036	1.50	2013.20	1059.62	0.13
1	1208	PF 1	1860.00	650.74	657.39		657.41	0.00029	1.75	1757.12	502.62	0.12
1	933	PF 1	1860.00	649.74	657.15	654.65	657.26	0.00152	4.17	1010.32	347.88	0.28
1	875		Bridge									
1	428	PF 1	1860.00	647.24	656.63		656.68	0.00048	2.64	1493.39	366.17	0.16
1	147	PF 1	1860.00	646.74	656.36	652.93	656.46	0.00110	3.95	1003.23	278.18	0.24
1	-10		Bridge									
1	-255	PF 1	1860.00	645.74	653.29	650.73	653.35	0.00149	3.72	1114.02	299.31	0.26

Corrected Effective Model

HEC-RAS Plan: LSI Existing

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Walker Run	1	5862	100 year storm	1640.00	675.53	680.72	680.72	681.63	0.02251	10.81	321.10	162.84	0.92
Walker Run	1	5862	500 year storm	3600.00	675.53	682.00	682.00	683.38	0.02781	14.32	536.34	172.55	1.07
Walker Run	1	5547	100 year storm	1640.00	669.38	677.11	674.58	677.20	0.00176	4.35	890.41	218.06	0.29
Walker Run	1	5547	500 year storm	3600.00	669.38	678.79	675.66	678.98	0.00294	6.50	1263.59	226.57	0.39
Walker Run	1	5282	100 year storm	1640.00	667.03	676.24	673.33	676.58	0.00295	6.02	457.36	226.49	0.38
Walker Run	1	5282	500 year storm	3600.00	667.03	677.59	675.45	678.04	0.00420	7.99	1027.61	259.44	0.46
Walker Run	1	5250		Bridge									
Walker Run	1	5198	100 year storm	1640.00	665.71	672.25	672.25	673.74	0.01851	11.33	231.39	223.91	0.87
Walker Run	1	5198	500 year storm	3600.00	665.71	674.34	674.34	676.72	0.02127	15.15	383.75	249.54	0.98
Walker Run	1	5107	100 year storm	1640.00	664.59	672.30	670.22	672.39	0.00157	3.56	989.81	288.98	0.26
Walker Run	1	5107	500 year storm	3600.00	664.59	673.89	671.16	674.06	0.00236	5.16	1463.18	306.07	0.34
Walker Run	1	4995	100 year storm	1640.00	666.24	672.05		672.16	0.00273	4.39	826.98	269.66	0.35
Walker Run	1	4995	500 year storm	3600.00	666.24	673.49		673.71	0.00405	6.37	1236.24	296.47	0.45
Walker Run	1	4810	100 year storm	1640.00	663.49	671.80		671.86	0.00103	3.19	1208.61	329.14	0.21
Walker Run	1	4810	500 year storm	3600.00	663.49	673.05		673.18	0.00206	5.01	1630.02	345.41	0.30
Walker Run	1	4735	100 year storm	1640.00	664.24	671.69		671.76	0.00143	3.60	1096.91	330.82	0.26
Walker Run	1	4735	500 year storm	3600.00	664.24	672.83		673.00	0.00281	5.66	1480.08	341.66	0.37
Walker Run	1	4692	100 year storm	1640.00	662.02	671.68		671.72	0.00051	2.30	1379.63	349.44	0.16
Walker Run	1	4692	500 year storm	3600.00	662.02	672.79		672.91	0.00122	3.93	1773.58	360.30	0.25
Walker Run	1	4495	100 year storm	1640.00	663.74	671.57		671.61	0.00066	2.88	1350.83	335.74	0.19
Walker Run	1	4495	500 year storm	3600.00	663.74	672.50		672.63	0.00173	5.06	1673.15	354.76	0.31
Walker Run	1	4414	100 year storm	1640.00	662.46	671.52		671.56	0.00066	2.71	1401.92	345.90	0.17
Walker Run	1	4414	500 year storm	3600.00	662.46	672.37		672.49	0.00180	4.82	1700.93	355.68	0.29
Walker Run	1	4295	100 year storm	1640.00	663.24	671.46		671.49	0.00054	2.50	1632.18	421.29	0.16
Walker Run	1	4295	500 year storm	3600.00	663.24	672.20		672.29	0.00156	4.52	1947.75	428.96	0.28
Walker Run	1	4130	100 year storm	1640.00	661.54	671.41		671.42	0.00027	1.82	2046.31	435.84	0.11
Walker Run	1	4130	500 year storm	3600.00	661.54	672.03		672.09	0.00089	3.49	2326.10	458.16	0.21
Walker Run	1	4043	100 year storm	1640.00	662.24	671.38		671.39	0.00042	2.27	1939.12	532.22	0.14
Walker Run	1	4043	500 year storm	3600.00	662.24	671.94		672.00	0.00134	4.25	2243.45	551.40	0.26
Walker Run	1	3972	100 year storm	1640.00	661.21	671.36	667.07	671.37	0.00020	1.68	2526.31	605.88	0.10
Walker Run	1	3972	500 year storm	3600.00	661.21	671.88	668.65	671.92	0.00067	3.23	2844.33	616.38	0.18
Walker Run	1	3914		Bridge									
Walker Run	1	3860	100 year storm	1640.00	660.73	667.84	667.09	668.89	0.01004	8.79	216.92	96.28	0.61
Walker Run	1	3860	500 year storm	3600.00	660.73	669.38	669.38	671.91	0.01787	13.55	307.84	114.87	0.85
Walker Run	1	3785	100 year storm	1640.00	660.24	667.18	667.18	667.74	0.01141	7.39	336.84	292.96	0.62
Walker Run	1	3785	500 year storm	3600.00	660.24	667.19	667.94	669.82	0.05357	16.04	340.75	294.84	1.34
Walker Run	1	3735	100 year storm	1640.00	660.36	666.48	665.54	666.65	0.00307	3.88	503.03	298.67	0.31
Walker Run	1	3735	500 year storm	3600.00	660.36	667.62	666.45	667.89	0.00323	4.58	899.98	387.86	0.33
Walker Run	1	3532	100 year storm	1640.00	658.71	664.66	664.66	665.29	0.02558	8.39	336.81	224.33	0.77
Walker Run	1	3532	500 year storm	3600.00	658.71	665.80		666.49	0.02464	9.18	601.73	253.04	0.78
Walker Run	1	3410	100 year storm	1640.00	657.83	663.82	662.43	663.94	0.00300	4.24	712.23	265.45	0.35
Walker Run	1	3410	500 year storm	3600.00	657.83	664.94		665.19	0.00496	6.19	1027.34	290.72	0.46
Walker Run	1	3375	100 year storm	1640.00	657.24	663.78		663.86	0.00133	3.46	863.92	233.31	0.25
Walker Run	1	3375	500 year storm	3600.00	657.24	664.83		665.04	0.00312	5.92	1137.03	308.39	0.40
Walker Run	1	3278	100 year storm	1640.00	657.01	662.97	662.97	663.49	0.01432	8.65	383.49	317.40	0.72
Walker Run	1	3278	500 year storm	3600.00	657.01	664.08		664.49	0.01009	8.42	819.43	462.58	0.63
Walker Run	1	3065	100 year storm	1640.00	655.95	662.04	659.47	662.14	0.00145	3.66	730.89	245.14	0.27
Walker Run	1	3065	500 year storm	3600.00	655.95	663.34		663.55	0.00237	5.36	1100.27	320.40	0.35
Walker Run	1	2949	100 year storm	1640.00	655.77	661.56		661.79	0.00729	5.83	509.78	329.00	0.50
Walker Run	1	2949	500 year storm	3600.00	655.77	662.90		663.13	0.00524	5.95	1017.06	416.68	0.45
Walker Run	1	2730	100 year storm	1640.00	654.74	661.09		661.18	0.00134	3.40	785.64	272.20	0.25
Walker Run	1	2730	500 year storm	3600.00	654.74	662.14		662.34	0.00264	5.35	1087.36	305.83	0.37
Walker Run	1	2634	100 year storm	1640.00	653.74	660.84		660.97	0.00351	4.68	696.87	426.74	0.36
Walker Run	1	2634	500 year storm	3600.00	653.74	661.83		662.02	0.00411	5.69	1145.75	478.41	0.40
Walker Run	1	2497	100 year storm	1640.00	653.51	660.69	659.26	660.73	0.00090	2.72	1150.81	507.16	0.19
Walker Run	1	2497	500 year storm	3600.00	653.51	661.57	659.86	661.66	0.00159	3.96	1608.61	532.14	0.26
Walker Run	1	2480		Bridge									
Walker Run	1	2462	100 year storm	1640.00	653.86	659.30		659.58	0.00735	6.44	519.60	459.79	0.54
Walker Run	1	2462	500 year storm	3600.00	653.86	660.31		660.58	0.00623	6.80	1013.13	516.85	0.51

Corrected Effective Model, cont.

HEC-RAS Plan: LSI Existing (Continued)

River	Reach	River Sta	Profile	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
Walker Run	1	2339	100 year storm	1640.00	653.24	659.26		659.29	0.00036	1.65	1335.67	503.26	0.13
Walker Run	1	2339	500 year storm	3600.00	653.24	660.16		660.24	0.00078	2.72	1878.74	658.75	0.20
Walker Run	1	2274	100 year storm	1640.00	651.42	658.64	658.64	659.17	0.00981	8.18	438.59	387.16	0.61
Walker Run	1	2274	500 year storm	3600.00	651.42	659.48	659.48	660.06	0.01204	9.93	820.04	523.00	0.69
Walker Run	1	2139	100 year storm	1640.00	650.72	657.33	656.10	657.40	0.00214	3.38	865.59	549.99	0.27
Walker Run	1	2139	500 year storm	3600.00	650.72	658.46	656.87	658.56	0.00217	3.93	1597.04	728.42	0.28
Walker Run	1	2010	100 year storm	1640.00	652.24	657.20		657.22	0.00085	2.13	1485.30	966.77	0.19
Walker Run	1	2010	500 year storm	3600.00	652.24	658.36		658.39	0.00072	2.33	2731.39	1181.03	0.18
Walker Run	1	1925	100 year storm	1640.00	651.09	657.14		657.16	0.00059	1.77	1640.90	847.24	0.15
Walker Run	1	1925	500 year storm	3600.00	651.09	658.30		658.33	0.00064	2.15	2655.22	895.44	0.16
Walker Run	2	1602	100 year storm	1860.00	650.67	656.98		656.99	0.00045	1.46	2515.34	1080.54	0.11
Walker Run	2	1602	500 year storm	3100.00	650.67	658.16		658.18	0.00034	1.45	3865.33	1187.88	0.10
Walker Run	2	1402	100 year storm	1860.00	649.80	656.88		656.89	0.00050	1.59	2023.17	686.83	0.11
Walker Run	2	1402	500 year storm	3100.00	649.80	658.07		658.09	0.00048	1.74	2866.66	722.58	0.11
Walker Run	2	1208	100 year storm	1860.00	650.74	656.74		656.77	0.00085	2.30	1443.04	456.81	0.17
Walker Run	2	1208	500 year storm	3100.00	650.74	657.92		657.97	0.00096	2.77	2032.89	539.64	0.19
Walker Run	2	990	100 year storm	1860.00	649.47	656.54		656.57	0.00096	2.28	1455.12	511.53	0.17
Walker Run	2	990	500 year storm	3100.00	649.47	657.72		657.76	0.00091	2.51	2071.98	533.88	0.17
Walker Run	2	933	100 year storm	1860.00	649.74	656.25		656.46	0.00328	5.59	724.81	282.76	0.40
Walker Run	2	933	500 year storm	3100.00	649.74	657.40		657.65	0.00345	6.44	1097.15	366.27	0.43
Walker Run	2	884	100 year storm	1860.00	648.62	656.05	654.99	656.25	0.00581	6.24	688.16	292.08	0.46
Walker Run	2	884	500 year storm	3100.00	648.62	657.23	655.62	657.44	0.00503	6.59	1066.49	347.54	0.44
Walker Run	2	875		Culvert									
Walker Run	2	863	100 year storm	1860.00	648.96	656.03	654.48	656.18	0.00295	4.92	834.23	302.32	0.37
Walker Run	2	863	500 year storm	3100.00	648.96	657.20	655.13	657.38	0.00300	5.63	1217.61	351.16	0.38
Walker Run	2	715	100 year storm	1860.00	647.90	655.76		655.83	0.00146	3.85	1105.10	357.68	0.25
Walker Run	2	715	500 year storm	3100.00	647.90	656.91		657.01	0.00165	4.53	1555.58	417.70	0.28
Walker Run	2	536	100 year storm	1860.00	646.97	655.51		655.59	0.00130	3.79	1093.64	305.51	0.24
Walker Run	2	536	500 year storm	3100.00	646.97	656.59		656.71	0.00169	4.72	1445.07	343.92	0.28
Walker Run	2	428	100 year storm	1860.00	647.24	655.36		655.46	0.00117	3.69	1054.59	319.53	0.25
Walker Run	2	428	500 year storm	3100.00	647.24	656.39		656.54	0.00156	4.67	1404.69	357.75	0.29
Walker Run	2	350	100 year storm	1860.00	647.08	655.30		655.36	0.00086	3.11	1238.61	301.02	0.20
Walker Run	2	350	500 year storm	3100.00	647.08	656.31		656.40	0.00126	4.09	1551.32	317.24	0.25
Walker Run	2	185	100 year storm	1860.00	646.40	655.12		655.19	0.00098	3.48	1120.00	264.17	0.22
Walker Run	2	185	500 year storm	3100.00	646.40	656.02		656.15	0.00155	4.71	1367.68	282.18	0.28
Walker Run	2	147	100 year storm	1860.00	646.74	654.82		655.10	0.00331	5.97	625.03	191.48	0.41
Walker Run	2	147	500 year storm	3100.00	646.74	655.49		655.99	0.00558	8.25	771.06	243.67	0.53
Walker Run	2	011	100 year storm	1860.00	645.71	654.70	652.67	654.78	0.00116	3.86	1161.07	382.56	0.24
Walker Run	2	011	500 year storm	3100.00	645.71	655.30	652.96	655.44	0.00207	5.39	1402.37	430.41	0.32
Walker Run	2	-10		Bridge									
Walker Run	2	-30	100 year storm	1860.00	644.46	653.53	652.28	654.02	0.00480	7.39	546.58	255.23	0.47
Walker Run	2	-30	500 year storm	3100.00	644.46	654.90	653.73	655.32	0.00413	7.66	980.02	384.37	0.45
Walker Run	2	-78	100 year storm	1860.00	645.43	653.52		653.63	0.00158	3.92	1007.20	312.39	0.27
Walker Run	2	-78	500 year storm	3100.00	645.43	654.87		655.00	0.00160	4.48	1431.20	314.50	0.28
Walker Run	2	-154	100 year storm	1860.00	644.90	653.37		653.49	0.00197	4.45	858.83	216.03	0.29
Walker Run	2	-154	500 year storm	3100.00	644.90	654.68		654.85	0.00231	5.36	1150.66	253.36	0.32
Walker Run	2	-255	100 year storm	1860.00	645.74	653.29	650.73	653.35	0.00149	3.72	1114.02	299.31	0.26
Walker Run	2	-255	500 year storm	3100.00	645.74	654.60	651.23	654.68	0.00162	4.37	1521.10	321.15	0.27
Tributary	1	6850	100 year storm	303.50	709.19	711.95	711.95	712.55	0.05765	6.42	49.26	40.97	0.85
Tributary	1	6850	500 year storm	615.69	709.19	712.72	712.72	713.53	0.04633	7.33	85.46	52.94	0.81
Tributary	1	5930	100 year storm	303.50	692.00	695.49	694.41	695.55	0.00238	1.91	155.41	105.67	0.19
Tributary	1	5930	500 year storm	615.69	692.00	696.21	694.97	696.32	0.00284	2.39	237.78	121.05	0.21
Tributary	1	5500	100 year storm	303.50	691.00	692.04	692.04	692.52	0.08834	5.60	54.57	56.50	0.98
Tributary	1	5500	500 year storm	615.69	691.00	693.23		693.61	0.02428	4.90	125.00	62.13	0.58
Tributary	1	4750	100 year storm	303.50	684.00	686.28	684.86	686.32	0.00277	1.52	200.10	105.21	0.19
Tributary	1	4750	500 year storm	615.69	684.00	686.89		686.97	0.00454	2.33	265.88	110.85	0.26
Tributary	1	4530	100 year storm	303.50	684.00	686.03	686.03	686.04	0.00066	0.73	415.50	219.53	0.09
Tributary	1	4530	500 year storm	615.69	684.00	686.37	686.02	686.39	0.00157	1.26	489.93	222.97	0.15

Corrected Effective Model, cont.

HEC-RAS Plan: LSI Existing (Continued)

River	Reach	River Sta	Profile	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
Tributary	1	4528		Culvert									
Tributary	1	4500	100 year storm	303.50	683.30	684.80	684.80	685.52	0.07709	6.59	45.01	146.10	0.97
Tributary	1	4500	500 year storm	615.69	683.30	685.00	685.00	685.13	0.00406	1.65	226.99	148.77	0.23
Tributary	1	4400	100 year storm	303.50	675.78	678.48	678.60	679.05	0.05829	5.88	50.39	66.08	0.70
Tributary	1	4400	500 year storm	615.69	675.78	678.28	679.12	682.54	0.58711	17.46	37.31	62.22	2.20
Tributary	1	3356	100 year storm	303.50	667.67	671.01	671.01	671.02	0.00152	1.99	514.13	604.14	0.21
Tributary	1	3356	500 year storm	615.69	667.67	671.09	671.02	671.12	0.00484	3.62	560.74	609.00	0.38
Tributary	1	3306.66*	100 year storm	303.50	667.39	670.21	670.03	670.28	0.00775	4.18	251.04	441.91	0.49
Tributary	1	3306.66*	500 year storm	615.69	667.39	670.62		670.69	0.00689	4.42	449.13	511.66	0.48
Tributary	1	3257.33*	100 year storm	303.50	667.11	669.64		669.72	0.00806	4.06	237.96	364.42	0.51
Tributary	1	3257.33*	500 year storm	615.69	667.11	670.09		670.16	0.00730	4.42	405.46	389.19	0.50
Tributary	1	3208.*	100 year storm	303.50	666.83	669.08		669.15	0.00799	3.75	231.10	320.68	0.50
Tributary	1	3208.*	500 year storm	615.69	666.83	669.56		669.63	0.00714	4.17	388.38	337.34	0.49
Tributary	1	3158.66*	100 year storm	303.50	666.56	668.54		668.59	0.00764	3.34	225.97	281.34	0.48
Tributary	1	3158.66*	500 year storm	615.69	666.56	669.06		669.12	0.00672	3.83	377.58	298.47	0.48
Tributary	1	3109.33*	100 year storm	303.50	666.28	668.02		668.06	0.00694	2.89	223.02	246.69	0.45
Tributary	1	3109.33*	500 year storm	615.69	666.28	668.59		668.65	0.00610	3.47	370.05	264.40	0.45
Tributary	1	3060	100 year storm	303.50	666.00	667.57		667.60	0.00552	2.40	227.77	216.44	0.39
Tributary	1	3060	500 year storm	615.69	666.00	668.17		668.23	0.00545	3.15	362.62	233.34	0.42
Tributary	1	3014.8*	100 year storm	303.50	665.78	667.36		667.39	0.00563	2.47	225.54	211.79	0.40
Tributary	1	3014.8*	500 year storm	615.69	665.78	667.95		668.01	0.00564	3.24	357.75	229.16	0.43
Tributary	1	2969.6*	100 year storm	303.50	665.56	667.13		667.17	0.00583	2.55	222.80	209.62	0.41
Tributary	1	2969.6*	500 year storm	615.69	665.56	667.73		667.79	0.00588	3.34	353.55	227.55	0.44
Tributary	1	2924.4*	100 year storm	303.50	665.33	666.91		666.95	0.00596	2.59	222.79	211.11	0.41
Tributary	1	2924.4*	500 year storm	615.69	665.33	667.51		667.56	0.00600	3.38	353.99	228.88	0.44
Tributary	1	2879.2*	100 year storm	303.50	665.11	666.69		666.72	0.00582	2.57	228.20	216.04	0.40
Tributary	1	2879.2*	500 year storm	615.69	665.11	667.29		667.34	0.00580	3.32	365.59	242.12	0.43
Tributary	1	2834	100 year storm	303.50	664.89	666.50		666.52	0.00463	2.29	261.55	245.39	0.35
Tributary	1	2834	500 year storm	615.69	664.89	667.11		667.14	0.00460	2.94	419.87	275.01	0.38
Tributary	1	2770.5*	100 year storm	303.50	664.27	666.17		666.19	0.00484	2.67	251.98	237.92	0.37
Tributary	1	2770.5*	500 year storm	615.69	664.27	666.77		666.82	0.00485	3.32	406.26	270.23	0.40
Tributary	1	2707.*	100 year storm	303.50	663.64	665.81		665.85	0.00513	3.04	241.39	230.78	0.40
Tributary	1	2707.*	500 year storm	615.69	663.64	666.41		666.47	0.00517	3.69	391.13	264.71	0.42
Tributary	1	2643.5*	100 year storm	303.50	663.02	665.42		665.47	0.00562	3.44	227.36	224.12	0.42
Tributary	1	2643.5*	500 year storm	615.69	663.02	666.03		666.09	0.00557	4.07	373.06	257.73	0.44
Tributary	1	2580.*	100 year storm	303.50	662.40	665.00		665.07	0.00609	3.79	211.80	214.25	0.45
Tributary	1	2580.*	500 year storm	615.69	662.40	665.61		665.69	0.00610	4.45	352.78	251.20	0.47
Tributary	1	2516.5*	100 year storm	303.50	661.77	664.53		664.62	0.00686	4.18	193.44	203.87	0.48
Tributary	1	2516.5*	500 year storm	615.69	661.77	665.13		665.23	0.00696	4.89	329.44	246.88	0.50
Tributary	1	2453.*	100 year storm	303.50	661.15	663.97		664.09	0.00833	4.66	172.56	186.06	0.53
Tributary	1	2453.*	500 year storm	615.69	661.15	664.59		664.72	0.00791	5.29	309.32	246.51	0.53
Tributary	1	2389.5*	100 year storm	303.50	660.52	663.34		663.47	0.00942	4.90	168.95	189.90	0.56
Tributary	1	2389.5*	500 year storm	615.69	660.52	664.14		664.24	0.00585	4.68	351.08	266.04	0.46
Tributary	1	2326	100 year storm	303.50	659.90	663.14		663.17	0.00207	2.54	310.65	225.12	0.27
Tributary	1	2326	500 year storm	615.69	659.90	663.96		664.00	0.00200	2.97	518.66	288.12	0.27
Tributary	1	1658	100 year storm	303.50	657.96	661.60		661.66	0.00247	3.03	253.83	196.62	0.30
Tributary	1	1658	500 year storm	615.69	657.96	662.42		662.49	0.00252	3.57	422.68	210.71	0.32
Tributary	1	1360	100 year storm	303.50	658.00	659.91	659.74	660.16	0.01443	4.79	110.93	141.83	0.67
Tributary	1	1360	500 year storm	615.69	658.00	660.25	660.25	660.73	0.02381	7.02	164.38	169.74	0.89
Tributary	1	1281		Culvert									
Tributary	1	1252	100 year storm	303.50	656.64	659.13	658.71	659.35	0.02336	4.25	83.02	260.75	0.55
Tributary	1	1252	500 year storm	615.69	656.64	659.57	659.25	659.61	0.00445	2.14	380.55	284.40	0.25
Tributary	1	1222.6*	100 year storm	303.50	656.44	658.95		658.97	0.00413	1.77	241.50	257.61	0.23
Tributary	1	1222.6*	500 year storm	615.69	656.44	659.44		659.48	0.00464	2.20	373.97	281.64	0.25
Tributary	1	1193.2*	100 year storm	303.50	656.24	658.82		658.85	0.00418	1.81	240.32	257.77	0.23
Tributary	1	1193.2*	500 year storm	615.69	656.24	659.30		659.34	0.00488	2.27	367.35	280.53	0.26
Tributary	1	1163.8*	100 year storm	303.50	656.05	658.70		658.73	0.00423	1.84	238.38	257.16	0.23
Tributary	1	1163.8*	500 year storm	615.69	656.05	659.15		659.19	0.00526	2.36	357.55	279.44	0.27
Tributary	1	1134.4*	100 year storm	303.50	655.85	658.58		658.61	0.00426	1.87	236.59	255.25	0.24

Corrected Effective Model, cont.

HEC-RAS Plan: LSI Existing (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Tributary	1	1134.4*	500 year storm	615.69	655.85	658.98		659.03	0.00586	2.49	343.55	277.02	0.29
Tributary	1	1105	100 year storm	303.50	655.65	658.45		658.48	0.00434	1.91	235.54	251.50	0.24
Tributary	1	1105	500 year storm	615.69	655.65	658.78		658.84	0.00727	2.74	320.88	271.36	0.32
Tributary	1	810	100 year storm	303.50	653.84	657.29		657.31	0.00358	1.83	313.52	483.02	0.21
Tributary	1	810	500 year storm	615.69	653.84	658.29		658.30	0.00078	1.08	871.58	603.13	0.10
Tributary	1	587	100 year storm	303.50	653.78	657.03		657.04	0.00059	0.81	556.34	528.20	0.09
Tributary	1	587	500 year storm	615.69	653.78	658.21		658.21	0.00023	0.65	1298.48	706.29	0.06
Tributary	1	463	100 year storm	303.50	653.23	657.02		657.02	0.00007	0.30	1281.40	776.36	0.03
Tributary	1	463	500 year storm	615.69	653.23	658.20		658.20	0.00005	0.33	2331.59	973.00	0.03
Tributary	1	357	100 year storm	303.50	652.40	657.01		657.01	0.00002	0.20	2268.67	1143.99	0.02
Tributary	1	357	500 year storm	615.69	652.40	658.19		658.19	0.00002	0.22	3658.26	1203.42	0.02
Tributary	1	183	100 year storm	303.50	652.14	657.01		657.01	0.00001	0.15	2669.07	1134.99	0.01
Tributary	1	183	500 year storm	615.69	652.14	658.19		658.19	0.00001	0.19	4082.09	1242.80	0.01

Revised Conditions Model

HEC-RAS Plan: Prop

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Walker Run	1	5862	100 year storm	1640.00	675.53	680.72	680.72	681.63	0.02253	10.81	320.98	162.84	0.92
Walker Run	1	5862	100 year storm e	1640.00	675.53	681.58	681.58	683.30	0.02462	12.77	206.82	58.12	0.99
Walker Run	1	5862	500 year storm	3600.00	675.53	682.00	682.00	683.38	0.02781	14.32	536.34	172.55	1.07
Walker Run	1	5547	100 year storm	1640.00	669.38	676.98	674.58	677.08	0.00193	4.50	862.60	217.39	0.31
Walker Run	1	5547	100 year storm e	1640.00	669.38	677.97	674.54	678.12	0.00300	4.45	581.43	95.42	0.28
Walker Run	1	5547	500 year storm	3600.00	669.38	679.67	675.66	679.80	0.00187	5.53	1463.68	229.98	0.32
Walker Run	1	5282	100 year storm	1640.00	667.03	676.02	673.33	676.40	0.00331	6.26	440.15	221.20	0.40
Walker Run	1	5282	100 year storm e	1640.00	667.03	677.03	673.30	677.38	0.00248	5.89	440.77	61.24	0.35
Walker Run	1	5282	500 year storm	3600.00	667.03	679.11	675.45	679.31	0.00180	5.78	1448.07	296.26	0.31
Walker Run	1	5250		Bridge									
Walker Run	1	5198	100 year storm	1640.00	665.71	671.55	671.47	672.97	0.02037	11.69	232.93	212.80	0.92
Walker Run	1	5198	100 year storm e	1640.00	665.71	672.64	671.50	673.44	0.00937	9.05	312.43	73.00	0.65
Walker Run	1	5198	500 year storm	3600.00	665.71	673.56	673.56	675.95	0.02391	15.87	379.63	239.94	1.06
Walker Run	1	5107	100 year storm	1640.00	664.59	671.48		671.61	0.00223	4.27	874.96	280.17	0.32
Walker Run	1	5107	100 year storm e	1640.00	664.59	672.37		672.64	0.00290	5.38	541.39	101.00	0.38
Walker Run	1	5107	500 year storm	3600.00	664.59	673.22	670.74	673.43	0.00292	5.87	1378.12	298.84	0.39
Walker Run	1	4995	100 year storm	1640.00	666.24	671.35		671.44	0.00099	2.64	894.02	263.68	0.21
Walker Run	1	4995	100 year storm e	1640.00	666.24	672.34		672.44	0.00076	2.63	674.64	122.00	0.19
Walker Run	1	4995	500 year storm	3600.00	666.24	673.01		673.20	0.00152	3.99	1353.48	291.10	0.28
Walker Run	1	4810	100 year storm	1640.00	662.87	671.26		671.29	0.00058	2.61	1508.19	321.99	0.17
Walker Run	1	4810	100 year storm e	1640.00	662.87	672.26		672.30	0.00059	2.88	1216.85	174.33	0.18
Walker Run	1	4810	500 year storm	3600.00	662.87	672.85		672.93	0.00113	4.16	2039.04	343.00	0.24
Walker Run	1	4735	100 year storm	1640.00	662.26	671.22		671.25	0.00049	2.56	1591.03	326.32	0.16
Walker Run	1	4735	100 year storm e	1640.00	662.26	672.24		672.26	0.00030	2.15	1830.27	289.99	0.12
Walker Run	1	4735	500 year storm	3600.00	662.26	672.78		672.84	0.00102	4.13	2111.54	341.14	0.23
Walker Run	1	4692	100 year storm	1640.00	663.77	671.20		671.22	0.00049	2.47	1605.91	339.30	0.16
Walker Run	1	4692	100 year storm e	1640.00	663.77	672.23		672.25	0.00031	2.14	1764.67	264.48	0.13
Walker Run	1	4692	500 year storm	3600.00	663.77	672.74		672.80	0.00101	4.04	2148.62	361.11	0.24
Walker Run	1	4495	100 year storm	1640.00	663.23	671.11		671.13	0.00047	2.46	1615.81	336.79	0.16
Walker Run	1	4495	100 year storm e	1640.00	663.23	672.12		672.17	0.00056	2.93	1163.96	150.65	0.18
Walker Run	1	4495	500 year storm	3600.00	663.23	672.54		672.60	0.00104	4.11	2116.42	364.35	0.24
Walker Run	1	4414	100 year storm	1640.00	662.97	671.08		671.10	0.00037	2.19	1690.99	340.84	0.14
Walker Run	1	4414	100 year storm e	1640.00	662.97	672.09		672.13	0.00038	2.41	1333.64	168.58	0.15
Walker Run	1	4414	500 year storm	3600.00	662.97	672.46		672.53	0.00087	3.75	2177.72	359.74	0.22
Walker Run	1	4295	100 year storm	1640.00	662.82	671.05		671.06	0.00023	1.84	2179.45	417.07	0.11
Walker Run	1	4295	100 year storm e	1640.00	662.82	672.08		672.09	0.00018	1.75	2118.06	268.22	0.10
Walker Run	1	4295	500 year storm	3600.00	662.82	672.40		672.44	0.00057	3.18	2755.27	438.83	0.18
Walker Run	1	4130	100 year storm	1640.00	662.26	671.01		671.03	0.00022	1.82	2172.10	422.39	0.11
Walker Run	1	4130	100 year storm e	1640.00	662.26	672.03		672.06	0.00028	2.23	1584.19	203.36	0.13
Walker Run	1	4130	500 year storm	3600.00	662.26	672.31		672.35	0.00054	3.14	2748.18	460.98	0.18
Walker Run	1	4043	100 year storm	1640.00	662.83	670.98		671.00	0.00040	2.40	1875.55	514.26	0.15
Walker Run	1	4043	100 year storm e	1640.00	662.83	671.97		672.02	0.00056	3.07	1150.16	155.00	0.18
Walker Run	1	4043	500 year storm	3600.00	662.83	672.24		672.29	0.00085	3.83	2556.38	567.20	0.22
Walker Run	1	3972	100 year storm	1640.00	661.21	670.96	664.72	670.98	0.00013	1.41	2422.94	597.89	0.08
Walker Run	1	3972	100 year storm e	1640.00	661.21	671.95	664.72	671.99	0.00018	1.78	1305.00	177.25	0.10
Walker Run	1	3972	500 year storm	3600.00	661.21	672.20	666.59	672.25	0.00031	2.39	3179.33	622.89	0.13
Walker Run	1	3914		Bridge									
Walker Run	1	3860	100 year storm	1640.00	660.73	666.07	667.11	669.32	0.04375	14.78	123.21	63.68	1.21
Walker Run	1	3860	100 year storm e	1640.00	660.73	667.11	667.11	669.87	0.03418	13.54	129.93	24.00	0.98
Walker Run	1	3860	500 year storm	3600.00	660.73	669.66	669.66	672.24	0.01883	14.24	327.09	118.73	0.88
Walker Run	1	3785	100 year storm	1640.00	660.85	665.19	665.11	666.52	0.02840	9.23	179.81	76.26	0.95
Walker Run	1	3785	100 year storm e	1640.00	660.85	666.20	665.03	666.98	0.01138	7.07	232.05	56.22	0.61
Walker Run	1	3785	500 year storm	3600.00	660.85	665.96	667.45	669.65	0.05946	15.61	248.97	104.48	1.43
Walker Run	1	3735	100 year storm	1640.00	660.46	665.10		665.37	0.00876	6.74	523.10	241.03	0.57
Walker Run	1	3735	100 year storm e	1640.00	660.46	666.02		666.35	0.00687	6.78	469.67	102.43	0.52
Walker Run	1	3735	500 year storm	3600.00	660.46	666.63	665.37	666.96	0.00747	7.60	938.48	319.95	0.55
Walker Run	1	3532	100 year storm	1640.00	658.87	663.74		663.88	0.00622	4.83	638.11	254.48	0.43
Walker Run	1	3532	100 year storm e	1640.00	658.87	664.72		664.99	0.00669	5.81	465.43	112.15	0.46
Walker Run	1	3532	500 year storm	3600.00	658.87	665.26		665.50	0.00693	6.34	1039.66	272.34	0.48
Walker Run	1	3410	100 year storm	1640.00	658.92	662.82		663.00	0.00823	6.03	594.15	254.07	0.58
Walker Run	1	3410	100 year storm e	1640.00	658.92	663.77		664.08	0.00793	6.98	457.74	119.96	0.59
Walker Run	1	3410	500 year storm	3600.00	658.92	664.22		664.52	0.00903	7.95	964.76	283.48	0.64
Walker Run	1	3375	100 year storm	1640.00	657.97	662.38		662.64	0.01178	7.25	531.39	255.90	0.67
Walker Run	1	3375	100 year storm e	1640.00	657.97	663.41		663.77	0.00916	7.56	431.59	120.52	0.62
Walker Run	1	3375	500 year storm	3600.00	657.97	663.78		664.15	0.01141	8.89	900.28	275.45	0.70
Walker Run	1	3278	100 year storm	1640.00	657.99	661.78		661.90	0.00483	4.55	648.83	264.03	0.44

Revised Conditions Model cont.

HEC-RAS Plan: Prop (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Walker Run	1	3278	100 year storm e	1640.00	657.99	662.69		662.99	0.00685	6.36	418.80	113.78	0.55
Walker Run	1	3278	500 year storm	3600.00	657.99	663.14		663.36	0.00551	6.11	1023.15	298.10	0.50
Walker Run	1	3065	100 year storm	1640.00	656.75	660.64		660.77	0.00649	5.27	624.15	301.63	0.50
Walker Run	1	3065	100 year storm e	1640.00	656.75	661.74		661.89	0.00408	5.04	580.39	168.51	0.42
Walker Run	1	3065	500 year storm	3600.00	656.75	661.97		662.18	0.00622	6.42	1048.41	329.67	0.52
Walker Run	1	2949	100 year storm	1640.00	656.74	659.99		660.10	0.00445	4.24	714.43	349.10	0.42
Walker Run	1	2949	100 year storm e	1640.00	656.74	661.02		661.30	0.00542	5.65	446.11	125.25	0.49
Walker Run	1	2949	500 year storm	3600.00	656.74	661.35		661.53	0.00431	5.31	1193.13	355.24	0.44
Walker Run	1	2730	100 year storm	1640.00	655.66	659.23	657.87	659.30	0.00305	3.72	829.96	368.22	0.35
Walker Run	1	2730	100 year storm e	1640.00	655.66	660.15	658.22	660.30	0.00370	4.80	557.40	153.71	0.41
Walker Run	1	2730	500 year storm	3600.00	655.66	660.57	658.53	660.70	0.00331	4.83	1327.09	374.55	0.39
Walker Run	1	2620		Bridge									
Walker Run	1	2497	100 year storm	1640.00	654.75	658.40		658.48	0.00420	4.04	772.86	367.52	0.40
Walker Run	1	2497	100 year storm e	1640.00	654.75	659.48		659.55	0.00226	3.58	796.67	229.28	0.30
Walker Run	1	2497	500 year storm	3600.00	654.75	659.64		659.78	0.00451	5.19	1240.71	394.80	0.43
Walker Run	1	2462	100 year storm	1640.00	654.61	658.29		658.36	0.00269	3.54	838.80	383.73	0.33
Walker Run	1	2462	100 year storm e	1640.00	654.61	659.31		659.44	0.00308	4.49	606.54	150.00	0.37
Walker Run	1	2462	500 year storm	3600.00	654.61	659.52		659.64	0.00328	4.77	1369.20	469.98	0.39
Walker Run	1	2339	100 year storm	1640.00	654.38	657.83		657.92	0.00521	4.52	719.59	445.75	0.45
Walker Run	1	2339	100 year storm e	1640.00	654.38	658.58		658.84	0.00850	6.68	437.21	150.07	0.60
Walker Run	1	2339	500 year storm	3600.00	654.38	659.07		659.19	0.00420	5.09	1373.93	607.15	0.43
Walker Run	1	2274	100 year storm	1640.00	653.90	657.41		657.55	0.00660	5.14	602.03	281.37	0.50
Walker Run	1	2274	100 year storm e	1640.00	653.90	658.50		658.56	0.00198	3.41	854.22	252.44	0.29
Walker Run	1	2274	500 year storm	3600.00	653.90	658.61		658.84	0.00731	6.67	996.62	410.38	0.56
Walker Run	1	2139	100 year storm	1640.00	653.31	657.23		657.26	0.00092	2.09	1348.09	562.23	0.19
Walker Run	1	2139	100 year storm e	1640.00	653.31	658.32		658.36	0.00113	2.76	1031.41	264.54	0.22
Walker Run	1	2139	500 year storm	3600.00	653.31	658.42		658.47	0.00117	2.85	2100.87	726.28	0.23
Walker Run	1	2010	100 year storm	1640.00	652.70	657.16		657.17	0.00050	1.74	1936.33	1023.33	0.15
Walker Run	1	2010	100 year storm e	1640.00	652.70	658.21		658.24	0.00074	2.46	1160.60	263.62	0.19
Walker Run	1	2010	500 year storm	3600.00	652.70	658.34		658.36	0.00053	2.11	3262.37	1214.50	0.16
Walker Run	1	1925	100 year storm	1640.00	652.07	657.12		657.13	0.00040	1.62	1939.29	846.16	0.13
Walker Run	1	1925	100 year storm e	1640.00	652.07	658.12		658.17	0.00093	2.83	979.24	199.27	0.21
Walker Run	1	1925	500 year storm	3600.00	652.07	658.29		658.32	0.00052	2.16	2964.27	895.22	0.16
Walker Run	2	1602	100 year storm	1860.00	650.67	656.98		656.99	0.00045	1.46	2515.34	1080.54	0.11
Walker Run	2	1602	100 year storm e	1860.00	650.67	657.90		657.92	0.00062	1.91	1675.07	466.99	0.14
Walker Run	2	1602	500 year storm	3100.00	650.67	658.16		658.18	0.00034	1.45	3865.33	1187.88	0.10
Walker Run	2	1402	100 year storm	1860.00	649.80	656.88		656.89	0.00050	1.59	2023.17	686.83	0.11
Walker Run	2	1402	100 year storm e	1860.00	649.80	657.80		657.82	0.00039	1.54	1894.83	443.49	0.10
Walker Run	2	1402	500 year storm	3100.00	649.80	658.07		658.09	0.00048	1.74	2866.66	722.58	0.11
Walker Run	2	1208	100 year storm	1860.00	650.74	656.74		656.77	0.00085	2.30	1443.04	456.81	0.17
Walker Run	2	1208	100 year storm e	1860.00	650.74	657.72		657.74	0.00038	1.72	1692.82	345.12	0.12
Walker Run	2	1208	500 year storm	3100.00	650.74	657.92		657.97	0.00096	2.77	2032.89	539.64	0.19
Walker Run	2	990	100 year storm	1860.00	649.47	656.54		656.57	0.00096	2.28	1455.12	511.53	0.17
Walker Run	2	990	100 year storm e	1860.00	649.47	657.39		657.55	0.00284	4.29	624.05	122.69	0.29
Walker Run	2	990	500 year storm	3100.00	649.47	657.72		657.76	0.00091	2.51	2071.98	533.88	0.17
Walker Run	2	933	100 year storm	1860.00	649.74	656.25		656.46	0.00328	5.59	724.81	282.76	0.40
Walker Run	2	933	100 year storm e	1860.00	649.74	657.17		657.39	0.00246	5.32	632.55	120.00	0.36
Walker Run	2	933	500 year storm	3100.00	649.74	657.40		657.65	0.00345	6.44	1097.15	366.27	0.43
Walker Run	2	884	100 year storm	1860.00	648.62	656.05	654.99	656.25	0.00581	6.24	688.16	292.08	0.46
Walker Run	2	884	100 year storm e	1860.00	648.62	656.98	655.15	657.23	0.00467	6.19	570.21	133.19	0.42
Walker Run	2	884	500 year storm	3100.00	648.62	657.23	655.62	657.44	0.00503	6.59	1066.49	347.54	0.44
Walker Run	2	875		Culvert									
Walker Run	2	863	100 year storm	1860.00	648.96	656.03	654.48	656.18	0.00295	4.92	834.23	302.32	0.37
Walker Run	2	863	100 year storm e	1860.00	648.96	656.90	654.64	657.14	0.00307	5.53	611.32	129.08	0.38
Walker Run	2	863	500 year storm	3100.00	648.96	657.20	655.13	657.38	0.00300	5.63	1217.61	351.16	0.38
Walker Run	2	715	100 year storm	1860.00	647.90	655.76		655.83	0.00146	3.85	1105.10	357.68	0.25
Walker Run	2	715	100 year storm e	1860.00	647.90	656.57		656.73	0.00195	4.79	733.81	132.37	0.30
Walker Run	2	715	500 year storm	3100.00	647.90	656.91		657.01	0.00165	4.53	1555.58	417.70	0.28
Walker Run	2	536	100 year storm	1860.00	646.97	655.51		655.59	0.00130	3.79	1093.64	305.51	0.24
Walker Run	2	536	100 year storm e	1860.00	646.97	656.41		656.47	0.00090	3.39	1107.28	201.19	0.20
Walker Run	2	536	500 year storm	3100.00	646.97	656.59		656.71	0.00169	4.72	1445.07	343.92	0.28
Walker Run	2	428	100 year storm	1860.00	647.24	655.36		655.46	0.00117	3.69	1054.59	319.53	0.25
Walker Run	2	428	100 year storm e	1860.00	647.24	656.34		656.40	0.00060	2.89	1300.74	273.25	0.18
Walker Run	2	428	500 year storm	3100.00	647.24	656.39		656.54	0.00156	4.67	1404.69	357.75	0.29
Walker Run	2	350	100 year storm	1860.00	647.08	655.30		655.36	0.00086	3.11	1238.61	301.02	0.20
Walker Run	2	350	100 year storm e	1860.00	647.08	656.30		656.34	0.00052	2.62	1384.75	236.97	0.16

Revised Conditions Model cont.

HEC-RAS Plan: Prop (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Walker Run	2	350	500 year storm	3100.00	647.08	656.31		656.40	0.00126	4.09	1551.32	317.24	0.25
Walker Run	2	185	100 year storm	1860.00	646.40	655.12		655.19	0.00098	3.48	1120.00	264.17	0.22
Walker Run	2	185	100 year storm e	1860.00	646.40	655.84		656.14	0.00246	5.85	547.55	84.87	0.35
Walker Run	2	185	500 year storm	3100.00	646.40	656.02		656.15	0.00155	4.71	1367.68	282.18	0.28
Walker Run	2	147	100 year storm	1860.00	646.74	654.82		655.10	0.00331	5.97	625.03	191.48	0.41
Walker Run	2	147	100 year storm e	1860.00	646.74	655.81		656.01	0.00193	4.99	682.01	127.63	0.32
Walker Run	2	147	500 year storm	3100.00	646.74	655.49		655.99	0.00558	8.25	771.06	243.67	0.53
Walker Run	2	011	100 year storm	1860.00	645.71	654.70	652.67	654.78	0.00116	3.86	1161.07	382.56	0.24
Walker Run	2	011	100 year storm e	1860.00	645.71	655.68	652.69	655.78	0.00109	4.02	953.25	184.57	0.23
Walker Run	2	011	500 year storm	3100.00	645.71	655.30	652.96	655.44	0.00207	5.39	1402.37	430.41	0.32
Walker Run	2	-10		Bridge									
Walker Run	2	-30	100 year storm	1860.00	644.46	653.53	652.28	654.02	0.00480	7.39	546.58	255.23	0.47
Walker Run	2	-30	100 year storm e	1860.00	644.46	654.43	652.28	654.68	0.00238	5.62	711.00	206.31	0.34
Walker Run	2	-30	500 year storm	3100.00	644.46	654.90	653.73	655.32	0.00413	7.66	980.02	384.37	0.45
Walker Run	2	-78	100 year storm	1860.00	645.43	653.52		653.63	0.00158	3.92	1007.20	312.39	0.27
Walker Run	2	-78	100 year storm e	1860.00	645.43	654.40		654.50	0.00124	3.78	935.14	199.28	0.25
Walker Run	2	-78	500 year storm	3100.00	645.43	654.87		655.00	0.00160	4.48	1431.20	314.50	0.28
Walker Run	2	-154	100 year storm	1860.00	644.90	653.37		653.49	0.00197	4.45	858.83	216.03	0.29
Walker Run	2	-154	100 year storm e	1860.00	644.90	654.32		654.40	0.00114	3.66	996.22	190.19	0.22
Walker Run	2	-154	500 year storm	3100.00	644.90	654.68		654.85	0.00231	5.36	1150.66	253.36	0.32
Walker Run	2	-255	100 year storm	1860.00	645.74	653.29	650.73	653.35	0.00149	3.72	1114.02	299.31	0.26
Walker Run	2	-255	100 year storm e	1860.00	645.74	654.29	650.73	654.32	0.00072	2.83	1422.16	316.96	0.18
Walker Run	2	-255	500 year storm	3100.00	645.74	654.60	651.23	654.68	0.00162	4.37	1521.10	321.15	0.27
Tributary	1	6850	100 year storm	303.50	709.19	711.95	711.95	712.55	0.05765	6.42	49.26	40.97	0.85
Tributary	1	6850	100 year storm e	303.50	709.19	711.95	711.95	712.55	0.05765	6.42	49.26	40.97	0.85
Tributary	1	6850	500 year storm	615.69	709.19	712.72	712.72	713.53	0.04633	7.33	85.46	52.94	0.81
Tributary	1	5930	100 year storm	303.50	692.00	695.49	694.41	695.55	0.00238	1.91	155.41	105.67	0.19
Tributary	1	5930	100 year storm e	303.50	692.00	695.49	694.41	695.55	0.00238	1.91	155.41	105.67	0.19
Tributary	1	5930	500 year storm	615.69	692.00	696.21	694.97	696.32	0.00284	2.39	237.80	121.05	0.21
Tributary	1	5500	100 year storm	303.50	691.00	692.04	692.04	692.52	0.08834	5.60	54.57	56.50	0.98
Tributary	1	5500	100 year storm e	303.50	691.00	692.04	692.04	692.52	0.08834	5.60	54.57	56.50	0.98
Tributary	1	5500	500 year storm	615.69	691.00	693.23		693.61	0.02429	4.91	124.99	62.13	0.58
Tributary	1	4750	100 year storm	303.50	684.00	686.28	684.86	686.32	0.00277	1.52	200.10	105.21	0.19
Tributary	1	4750	100 year storm e	303.50	684.00	686.28	684.86	686.32	0.00277	1.52	200.10	105.21	0.19
Tributary	1	4750	500 year storm	615.69	684.00	686.89		686.97	0.00454	2.33	265.88	110.85	0.26
Tributary	1	4530	100 year storm	303.50	684.00	686.03	686.03	686.04	0.00066	0.73	415.50	219.53	0.09
Tributary	1	4530	100 year storm e	303.50	684.00	686.03	686.03	686.04	0.00066	0.73	415.50	219.53	0.09
Tributary	1	4530	500 year storm	615.69	684.00	686.37	686.02	686.39	0.00157	1.26	489.93	222.97	0.15
Tributary	1	4528		Culvert									
Tributary	1	4500	100 year storm	303.50	683.30	684.80	684.80	685.52	0.07709	6.59	45.01	146.10	0.97
Tributary	1	4500	100 year storm e	303.50	683.30	684.80	684.80	685.52	0.07709	6.59	45.01	146.10	0.97
Tributary	1	4500	500 year storm	615.69	683.30	685.00	685.00	685.13	0.00406	1.65	226.99	148.77	0.23
Tributary	1	4400	100 year storm	303.50	675.78	678.48	678.60	679.05	0.05829	5.88	50.39	66.08	0.70
Tributary	1	4400	100 year storm e	303.50	675.78	678.48	678.60	679.05	0.05829	5.88	50.39	66.08	0.70
Tributary	1	4400	500 year storm	615.69	675.78	678.28	679.12	682.54	0.58711	17.46	37.31	62.22	2.20
Tributary	1	3356	100 year storm	303.50	667.67	671.01	671.01	671.02	0.00151	1.99	516.60	614.41	0.21
Tributary	1	3356	100 year storm e	303.50	667.67	671.01	671.01	671.02	0.00151	1.99	516.60	614.41	0.21
Tributary	1	3356	500 year storm	615.69	667.67	671.02	671.02	671.06	0.00602	3.98	522.68	615.24	0.42
Tributary	1	3108		Bridge									
Tributary	1	3060	100 year storm	303.50	666.00	667.66	666.86	667.69	0.00431	2.22	247.01	219.14	0.35
Tributary	1	3060	100 year storm e	303.50	666.00	667.66	666.86	667.69	0.00431	2.22	247.01	219.14	0.35
Tributary	1	3060	500 year storm	615.69	666.00	668.27	667.13	668.32	0.00447	2.97	386.65	235.49	0.38
Tributary	1	3010		Bridge									
Tributary	1	2834	100 year storm	303.50	664.89	666.51	666.03	666.54	0.00444	2.26	265.14	246.16	0.35
Tributary	1	2834	100 year storm e	303.50	664.89	666.51	666.03	666.54	0.00444	2.26	265.14	246.16	0.35
Tributary	1	2834	500 year storm	615.69	664.89	667.11	666.04	667.14	0.00460	2.94	419.77	275.00	0.38
Tributary	1	2791.66*	100 year storm	303.50	664.47	666.30		666.32	0.00472	2.55	256.07	242.56	0.37
Tributary	1	2791.66*	100 year storm e	303.50	664.47	666.30		666.32	0.00472	2.55	256.07	242.56	0.37
Tributary	1	2791.66*	500 year storm	615.69	664.47	666.88		666.92	0.00492	3.24	406.03	272.79	0.40
Tributary	1	2749.33*	100 year storm	303.50	664.06	666.06		666.10	0.00510	2.86	247.79	240.94	0.39
Tributary	1	2749.33*	100 year storm e	303.50	664.06	666.06		666.10	0.00510	2.86	247.79	240.94	0.39
Tributary	1	2749.33*	500 year storm	615.69	664.06	666.64		666.68	0.00530	3.54	394.20	271.08	0.42
Tributary	1	2707.*	100 year storm	303.50	663.64	665.81		665.85	0.00553	3.15	238.93	238.80	0.41
Tributary	1	2707.*	100 year storm e	303.50	663.64	665.81		665.85	0.00553	3.15	238.93	238.80	0.41
Tributary	1	2707.*	500 year storm	615.69	663.64	666.37		666.43	0.00572	3.83	382.99	270.83	0.44

Revised Conditions Model cont.

HEC-RAS Plan: Prop (Continued)

River	Reach	River Sta	Profile	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
Tributary	1	2664.66*	100 year storm	303.50	663.23	665.53		665.58	0.00599	3.44	230.35	239.34	0.43
Tributary	1	2664.66*	100 year storm e	303.50	663.23	665.53		665.58	0.00599	3.44	230.35	239.34	0.43
Tributary	1	2664.66*	500 year storm	615.69	663.23	666.09		666.15	0.00611	4.10	372.56	270.47	0.46
Tributary	1	2622.33*	100 year storm	303.50	662.81	665.23		665.29	0.00650	3.71	220.45	239.57	0.46
Tributary	1	2622.33*	100 year storm e	303.50	662.81	665.23		665.29	0.00650	3.71	220.45	239.57	0.46
Tributary	1	2622.33*	500 year storm	615.69	662.81	665.79		665.86	0.00650	4.35	362.64	270.11	0.47
Tributary	1	2580.*	100 year storm	303.50	662.40	664.90		664.97	0.00704	3.95	209.62	234.73	0.48
Tributary	1	2580.*	100 year storm e	303.50	662.40	664.90		664.97	0.00704	3.95	209.62	234.73	0.48
Tributary	1	2580.*	500 year storm	615.69	662.40	665.46		665.54	0.00693	4.58	352.28	271.32	0.49
Tributary	1	2537.66*	100 year storm	303.50	661.98	664.55		664.63	0.00761	4.18	198.47	229.77	0.50
Tributary	1	2537.66*	100 year storm e	303.50	661.98	664.55		664.63	0.00761	4.18	198.47	229.77	0.50
Tributary	1	2537.66*	500 year storm	615.69	661.98	665.12		665.21	0.00730	4.77	341.22	269.14	0.51
Tributary	1	2495.33*	100 year storm	303.50	661.56	664.17		664.27	0.00809	4.34	188.73	219.10	0.51
Tributary	1	2495.33*	100 year storm e	303.50	661.56	664.17		664.27	0.00809	4.34	188.73	219.10	0.51
Tributary	1	2495.33*	500 year storm	615.69	661.56	664.77		664.87	0.00737	4.85	335.10	264.27	0.51
Tributary	1	2453.*	100 year storm	303.50	661.15	663.79		663.89	0.00825	4.40	186.06	196.17	0.52
Tributary	1	2453.*	100 year storm e	303.50	661.15	663.79		663.89	0.00825	4.40	186.06	196.17	0.52
Tributary	1	2453.*	500 year storm	615.69	661.15	664.44		664.54	0.00689	4.77	338.55	261.26	0.49
Tributary	1	2410.66*	100 year storm	303.50	660.73	663.44		663.52	0.00733	4.21	195.46	198.83	0.49
Tributary	1	2410.66*	100 year storm e	303.50	660.73	663.44		663.52	0.00733	4.21	195.46	198.83	0.49
Tributary	1	2410.66*	500 year storm	615.69	660.73	664.16		664.24	0.00563	4.42	359.97	261.97	0.45
Tributary	1	2368.33*	100 year storm	303.50	660.32	663.17		663.23	0.00506	3.63	224.70	206.48	0.41
Tributary	1	2368.33*	100 year storm e	303.50	660.32	663.17		663.23	0.00506	3.63	224.70	206.48	0.41
Tributary	1	2368.33*	500 year storm	615.69	660.32	663.96		664.02	0.00394	3.85	406.04	268.08	0.38
Tributary	1	2326	100 year storm	303.50	659.90	663.02	662.27	663.05	0.00272	2.83	282.30	219.83	0.30
Tributary	1	2326	100 year storm e	303.50	659.90	663.02	662.27	663.05	0.00272	2.83	282.30	219.83	0.30
Tributary	1	2326	500 year storm	615.69	659.90	663.82	662.60	663.86	0.00250	3.23	477.96	279.76	0.30
Tributary	1	1790		Bridge									
Tributary	1	1658	100 year storm	303.50	657.96	661.44		661.52	0.00338	3.43	224.12	192.24	0.35
Tributary	1	1658	100 year storm e	303.50	657.96	661.44		661.52	0.00338	3.43	224.12	192.24	0.35
Tributary	1	1658	500 year storm	615.69	657.96	662.21		662.30	0.00345	4.03	379.06	208.28	0.37
Tributary	1	1608.33*	100 year storm	303.50	657.97	661.25		661.35	0.00357	3.46	192.20	164.59	0.36
Tributary	1	1608.33*	100 year storm e	303.50	657.97	661.25		661.35	0.00357	3.46	192.20	164.59	0.36
Tributary	1	1608.33*	500 year storm	615.69	657.97	661.99		662.11	0.00392	4.23	327.01	195.87	0.39
Tributary	1	1558.66*	100 year storm	303.50	657.97	661.06		661.17	0.00372	3.43	178.70	156.16	0.37
Tributary	1	1558.66*	100 year storm e	303.50	657.97	661.06		661.17	0.00372	3.43	178.70	156.16	0.37
Tributary	1	1558.66*	500 year storm	615.69	657.97	661.77		661.91	0.00422	4.27	299.36	183.08	0.41
Tributary	1	1509.*	100 year storm	303.50	657.98	660.88		660.98	0.00380	3.34	170.84	150.59	0.37
Tributary	1	1509.*	100 year storm e	303.50	657.98	660.88		660.98	0.00380	3.34	170.84	150.59	0.37
Tributary	1	1509.*	500 year storm	615.69	657.98	661.55		661.69	0.00442	4.22	281.57	176.83	0.42
Tributary	1	1459.33*	100 year storm	303.50	657.99	660.69		660.79	0.00388	3.22	165.10	149.88	0.37
Tributary	1	1459.33*	100 year storm e	303.50	657.99	660.69		660.79	0.00388	3.22	165.10	149.88	0.37
Tributary	1	1459.33*	500 year storm	615.69	657.99	661.33		661.47	0.00460	4.12	269.15	176.57	0.42
Tributary	1	1409.66*	100 year storm	303.50	657.99	660.50		660.59	0.00390	3.07	162.50	151.44	0.37
Tributary	1	1409.66*	100 year storm e	303.50	657.99	660.50		660.59	0.00390	3.07	162.50	151.44	0.37
Tributary	1	1409.66*	500 year storm	615.69	657.99	661.10		661.24	0.00464	3.95	265.37	188.41	0.42
Tributary	1	1360	100 year storm	303.50	658.00	660.33	659.67	660.40	0.00338	2.72	178.54	174.95	0.34
Tributary	1	1360	100 year storm e	303.50	658.00	660.33	659.67	660.40	0.00338	2.72	178.54	174.95	0.34
Tributary	1	1360	500 year storm	615.69	658.00	660.91	660.13	661.01	0.00387	3.45	290.91	212.10	0.38
Tributary	1	1281		Bridge									
Tributary	1	1252	100 year storm	303.50	656.64	659.03		659.06	0.00366	1.62	233.64	255.39	0.22
Tributary	1	1252	100 year storm e	303.50	656.64	659.01		659.04	0.00386	1.65	229.31	254.49	0.22
Tributary	1	1252	500 year storm	615.69	656.64	659.52		659.57	0.00396	1.99	365.97	281.54	0.23
Tributary	1	1203.*	100 year storm	303.50	656.31	658.85		658.87	0.00382	1.71	235.70	257.48	0.22
Tributary	1	1203.*	100 year storm e	303.50	656.31	658.81		658.84	0.00426	1.78	227.12	255.86	0.23
Tributary	1	1203.*	500 year storm	615.69	656.31	659.32		659.36	0.00435	2.12	362.61	280.29	0.25
Tributary	1	1154.*	100 year storm	303.50	655.98	658.66		658.68	0.00404	1.81	236.68	256.92	0.23
Tributary	1	1154.*	100 year storm e	303.50	655.98	658.58		658.62	0.00511	1.98	218.22	253.21	0.26
Tributary	1	1154.*	500 year storm	615.69	655.98	659.08		659.13	0.00516	2.34	351.73	278.97	0.27
Tributary	1	1105	100 year storm	303.50	655.65	658.45		658.48	0.00434	1.91	235.51	251.49	0.24
Tributary	1	1105	100 year storm e	303.50	655.65	658.26		658.31	0.00824	2.46	187.78	237.30	0.32
Tributary	1	1105	500 year storm	615.69	655.65	658.78		658.84	0.00729	2.74	320.53	271.28	0.32
Tributary	1	810	100 year storm	303.50	653.84	657.29		657.31	0.00358	1.83	313.49	483.04	0.21
Tributary	1	810	100 year storm e	303.50	653.84	657.97		657.97	0.00040	0.72	681.25	586.48	0.07
Tributary	1	810	500 year storm	615.69	653.84	658.29		658.30	0.00078	1.08	870.63	596.53	0.10

Revised Conditions Model cont.

HEC-RAS Plan: Prop (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Tributary	1	587	100 year storm	303.50	653.78	657.03		657.04	0.00059	0.81	556.24	528.17	0.09
Tributary	1	587	100 year storm e	303.50	653.78	657.94		657.94	0.00009	0.38	1108.10	692.76	0.04
Tributary	1	587	500 year storm	615.69	653.78	658.21		658.21	0.00023	0.65	1298.48	706.29	0.06
Tributary	1	463	100 year storm	303.50	653.23	657.02		657.02	0.00007	0.30	1281.25	776.32	0.03
Tributary	1	463	100 year storm e	303.50	653.23	657.93		657.93	0.00002	0.18	2075.40	957.60	0.02
Tributary	1	463	500 year storm	615.69	653.23	658.20		658.20	0.00005	0.33	2331.59	973.00	0.03
Tributary	1	357	100 year storm	303.50	652.40	657.01		657.01	0.00002	0.20	2268.46	1143.98	0.02
Tributary	1	357	100 year storm e	303.50	652.40	657.93		657.93	0.00001	0.12	3343.16	1196.87	0.01
Tributary	1	357	500 year storm	615.69	652.40	658.19		658.19	0.00002	0.22	3658.26	1203.42	0.02
Tributary	1	183	100 year storm	303.50	652.14	657.01		657.01	0.00001	0.15	2675.39	1134.98	0.01
Tributary	1	183	100 year storm e	303.50	652.14	657.93		657.93	0.00000	0.10	3765.07	1234.23	0.01
Tributary	1	183	500 year storm	615.69	652.14	658.19		658.19	0.00001	0.19	4088.55	1242.80	0.01

Appendix D:
FEMA Flood Insurance Study
(Duplicate Effective Model)

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                                                                      THIS RUN EXECUTED
**********************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50,51,52
**********************************************
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Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

10/24/77

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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHIC-SHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ      NINV     IDIR      STRT     METRIC    HVINS      Q       WSEL      FQ
      0.        4.       0.       0.   -1.000000    0.0       0.0      0.     638.000    0.0

J2  NPROF    IPLOT    PRFVS    XSECV     XSECH      FN      ALLDC     IBW     CHNIM     ITRACE
    1.000     0.0    -1.000     0.0       0.0      0.0      0.0      0.0      0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   43.000    1.000    9.000   58.000    3.000   61.000   36.000   21.000   22.000

   27.000   28.000    4.000    0.0     39.000   49.000   40.000    1.000    3.000   11.000

    [illegible].000   10.000   26.000   20.000   50.000   51.000    4.000    0.0    200.000    0.0

QT     5.000    660.000   1400.000   2200.000   2200.000   3790.000     0.0      0.0      0.0      0.0
NC     0.080      0.080      0.080      0.300      0.[illegible]     0.0      0.0      0.0      0.0      0.0
ET     0.0        0.0        0.0        0.0      10.400       0.0      0.0      0.0      0.0      0.0

X1    25.000     18.000   1652.000   1666.000    250.000    310.000    290.000      0.0        0.0        0.0
GR   645.200   1000.000    643.900   1147.000    641.700   1264.000    640.300   1397.000    637.200   1599.000
GR   638.300   1652.000    629.800   1[illegible].000    629.000   1662.000    629.000   1668.000    629.000   1675.000
GR   629.500   1677.000    631.000   1[illegible].000    639.000   1754.000    640.700   1798.000    655.700   1879.000
GR   656.000   1897.000    655.400   1965.000    658.100   2027.000      0.0        0.0        0.0
ET     0.0        0.0        0.0        0.0       9.100       0.0        0.0        0.0    1560.000   1698.000

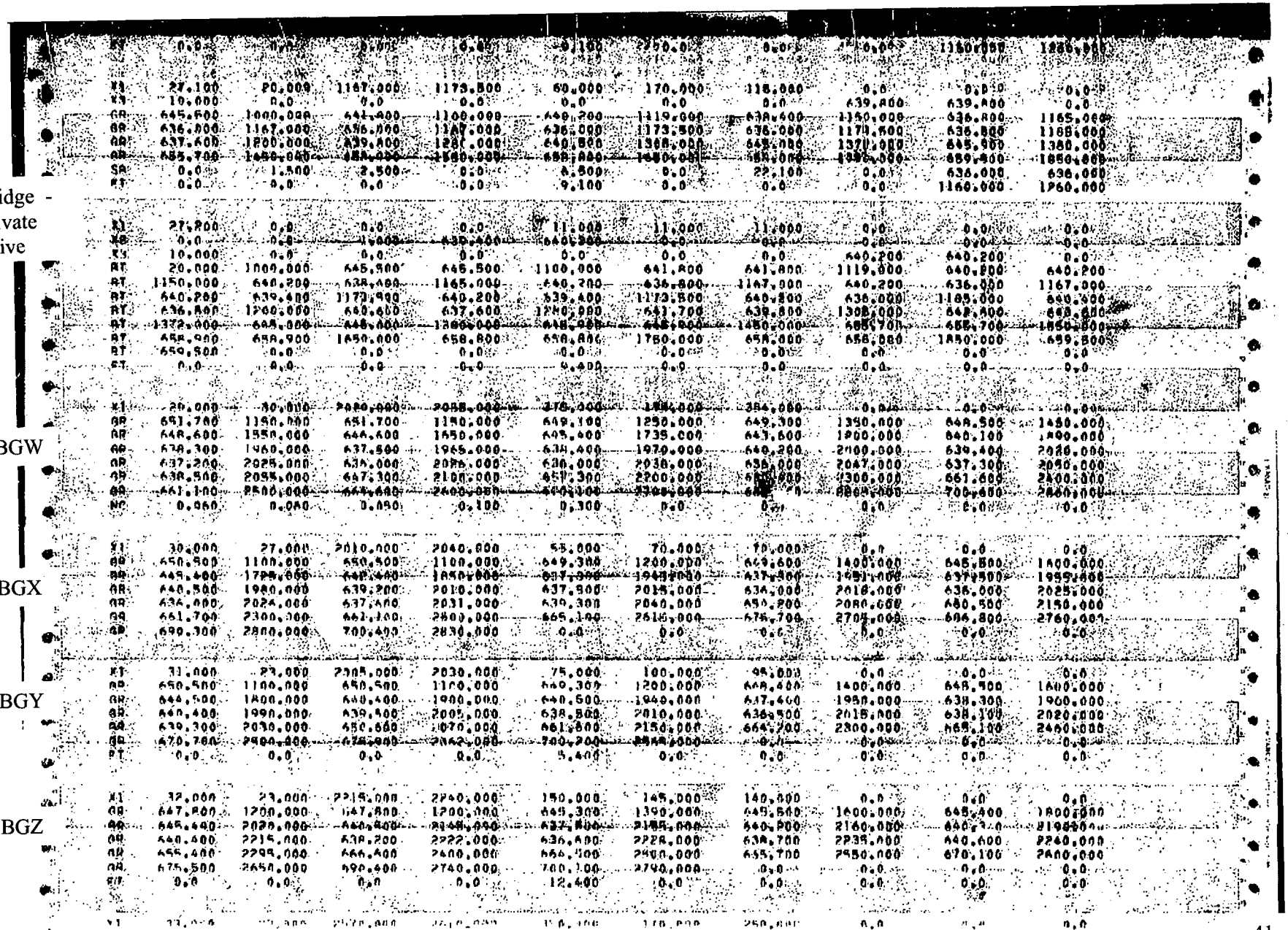
X1    26.000     26.000   1590.000   1600.000    270.000    275.000    440.000      0.0        0.0        0.0
GR   645.400   1000.000    644.600   1100.000    645.100   1240.000    645.600   1300.000    648.300   1360.000
GR   640.300   1495.000    638.300   1580.000    636.300   1587.000    635.000   1590.000    635.000   1595.000
GR   635.000   1597.000    636.400   1598.000    637.500   1600.000    639.100   1700.000    640.600   1750.000
GR   645.500   1830.000    650.700   1860.000    653.400   1950.000    658.700   2100.000    654.100   2200.000
GR   653.500   2300.000    655.300   2390.000    668.100   2475.000    655.300   2500.000    670.400   2550.000
GR   70[illegible].100   2628.000      0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
NC     0.050      0.080      0.050      0.300      0.700       0.0        0.0        0.0        0.0        0.0
ET     0.0        0.0        0.0        0.0       9.400       0.0        0.0        0.0        0.0        0.0

X1    27.000     19.000   1150.000   1200.000    170.000    210.000    190.000      0.0        0.0        0.0
GR   645.200   1000.000    641.400   1100.000    634.100   1140.000    636.500   1165.000    6[illegible].600   1170.000
GR   636.500   1185.000    637.300   1190.000    640.200   1305.000    645.600   1380.000    [illegible].400   1650.000
GR   [illegible]   1550.000    654.500   1650.000    657.700   1750.000    659.200   [illegible].000    660.100   191[illegible].000
GR   [illegible]   2010.000    [illegible]
```

BGT

BGU

BGV



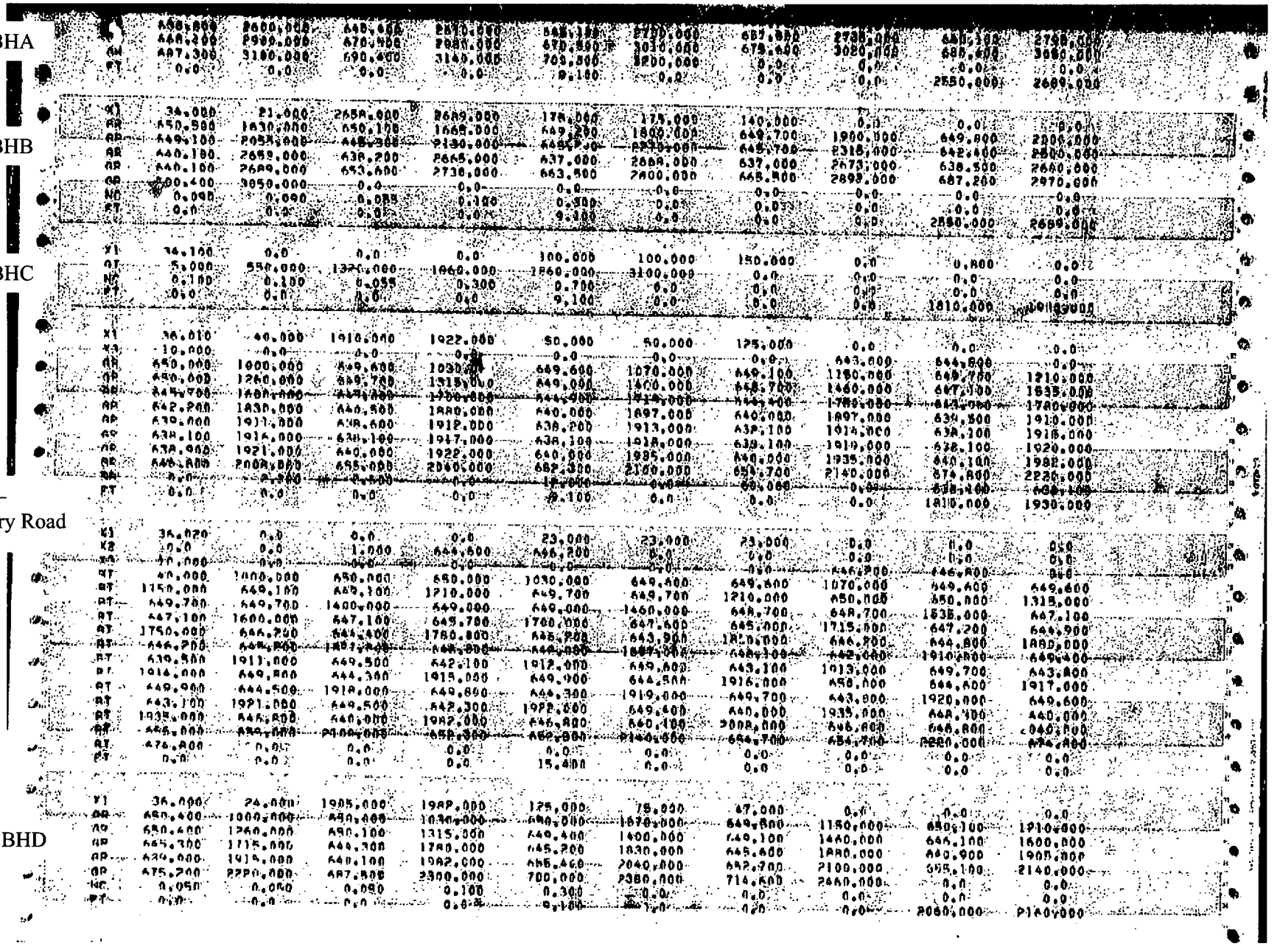
Bridge - Private Drive

BGW

BGX

BGY

BGZ



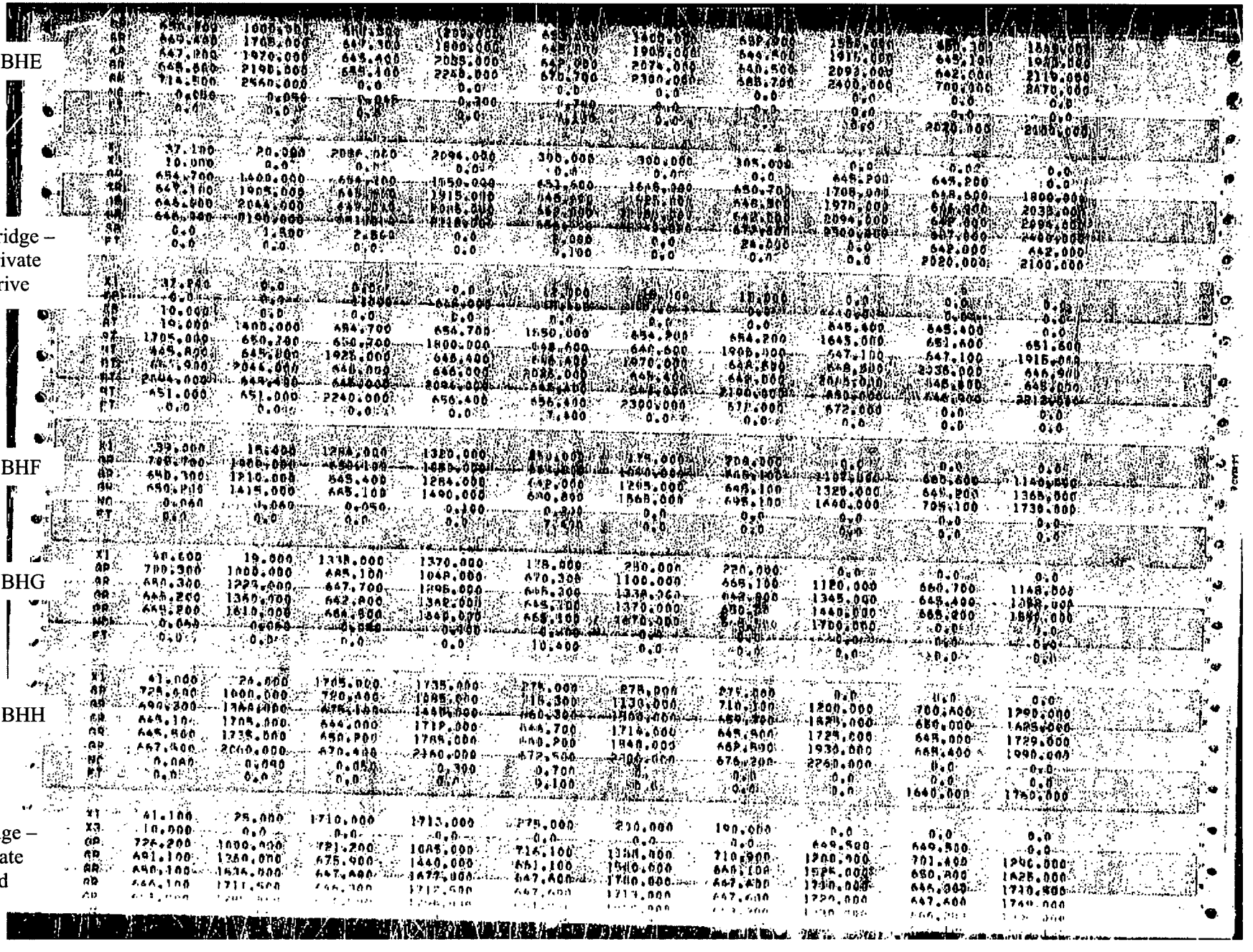
BHA

BHB

BHC

Bridge –
Cemetery Road

BHD



BHE

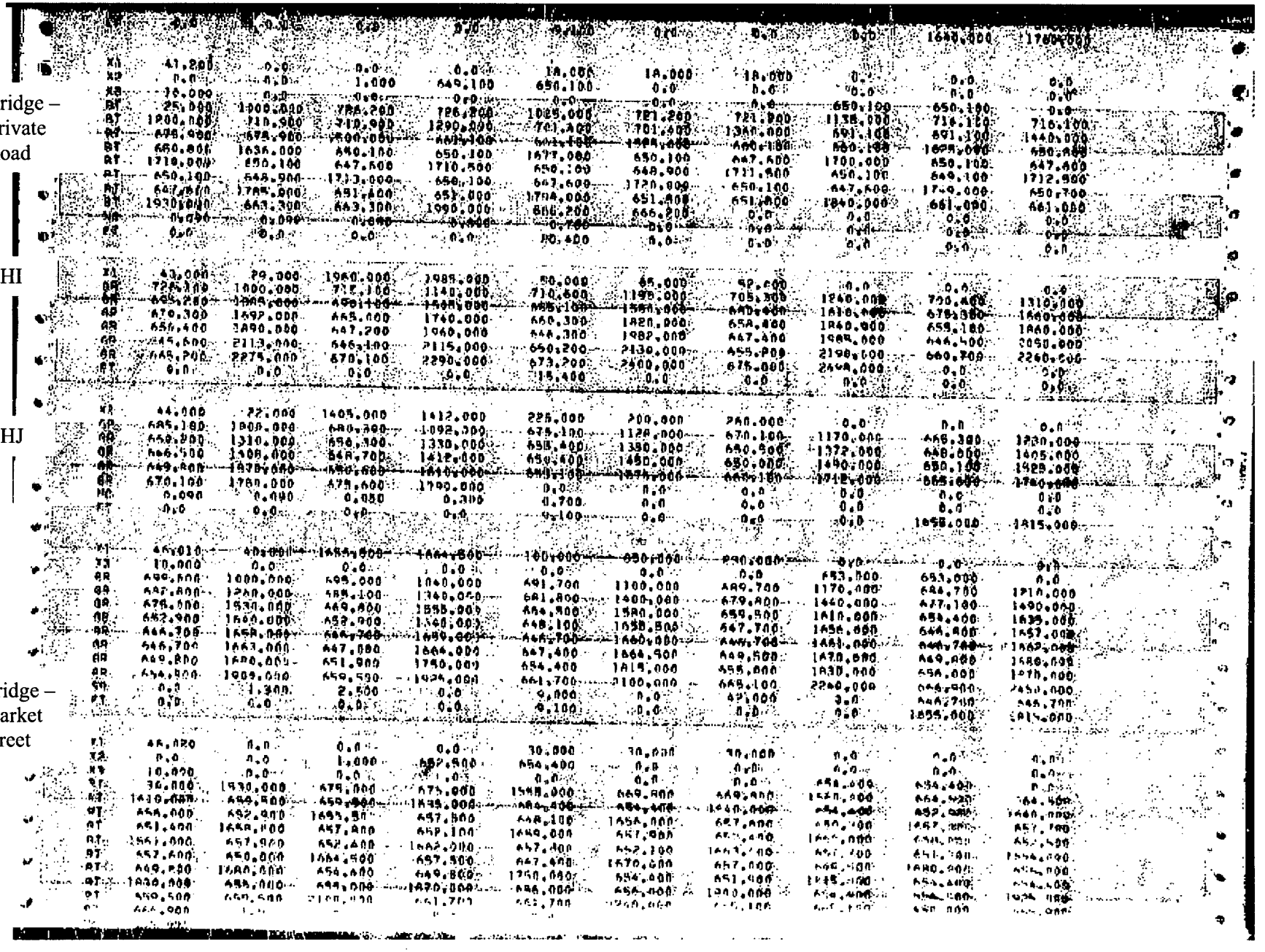
Bridge – Private Drive

BHF

BHG

BHH

Bridge – Private Road

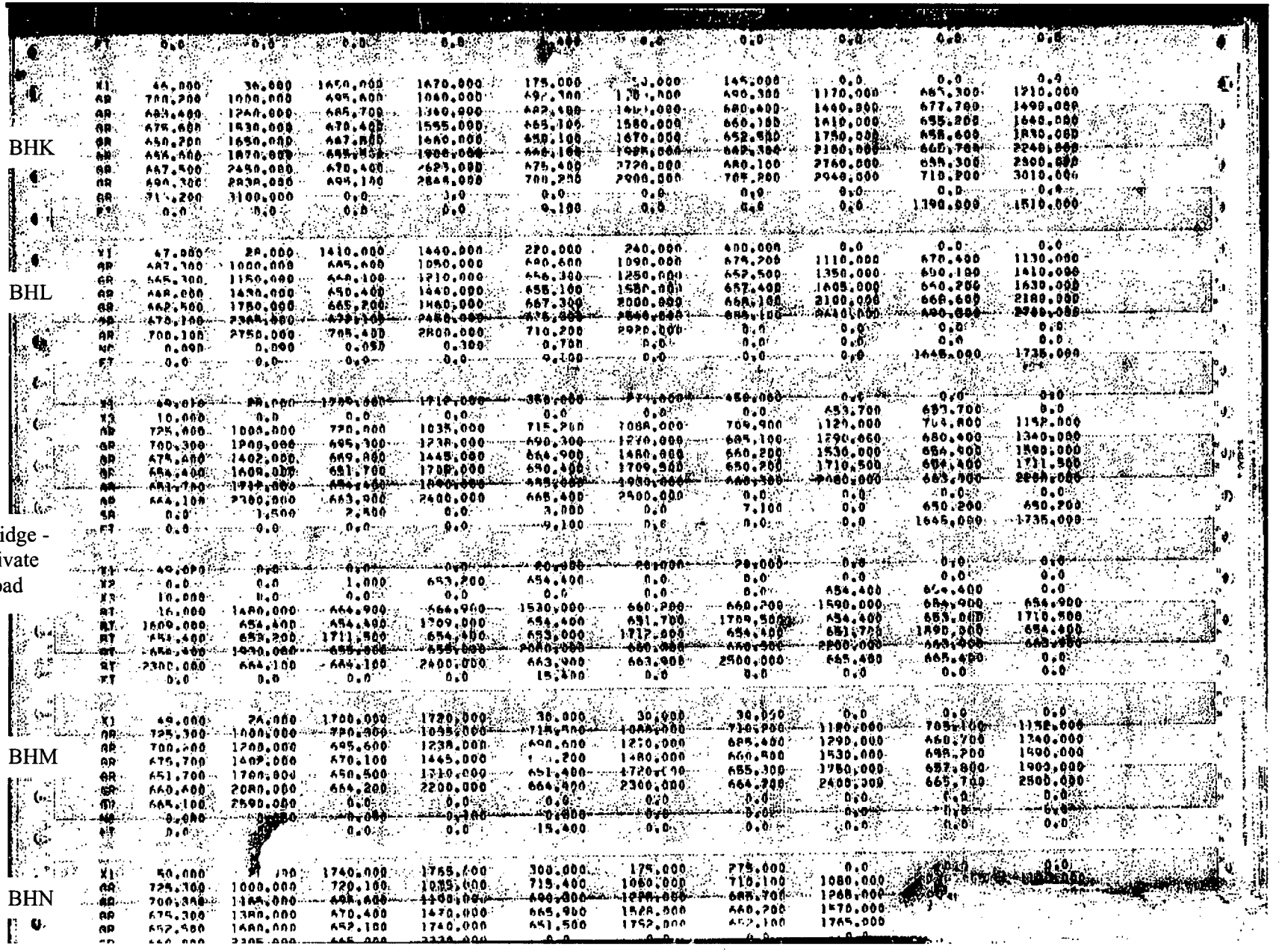


Bridge – Private Road

BHI

BHJ

Bridge – Market Street



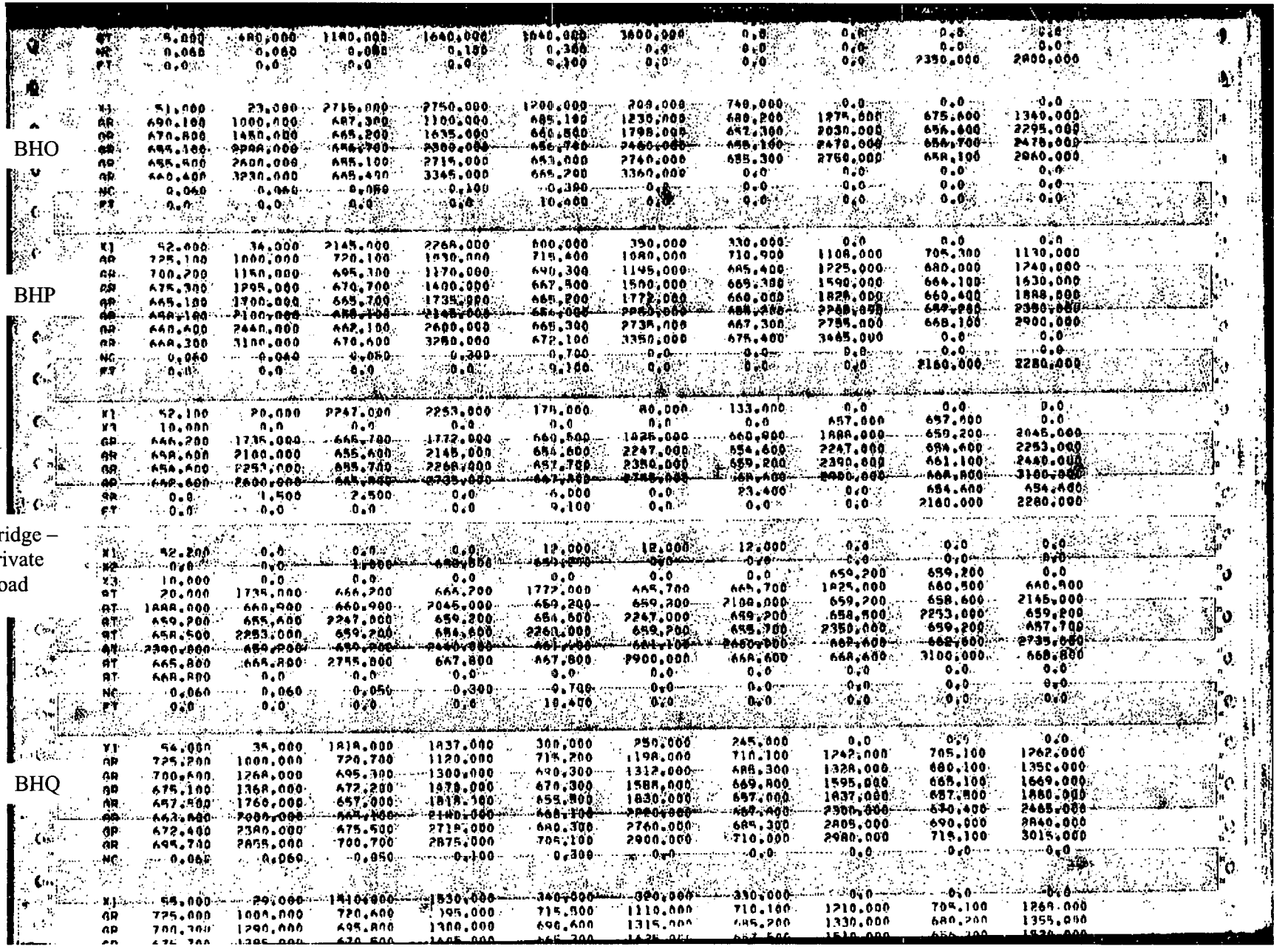
BHK

BHL

Bridge - Private Road

BHM

BHN

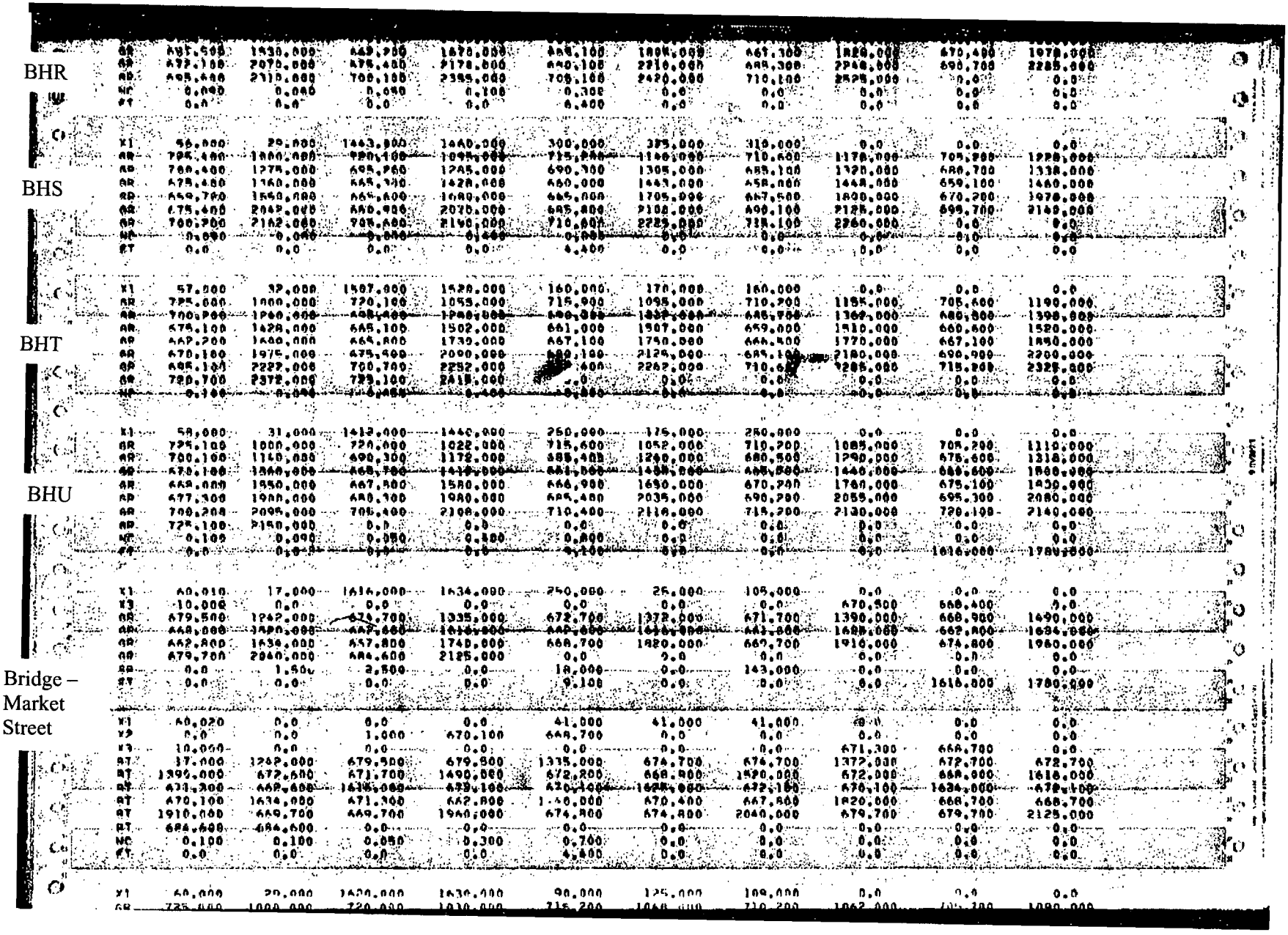


BHO

BHP

Bridge – Private Road

BHQ



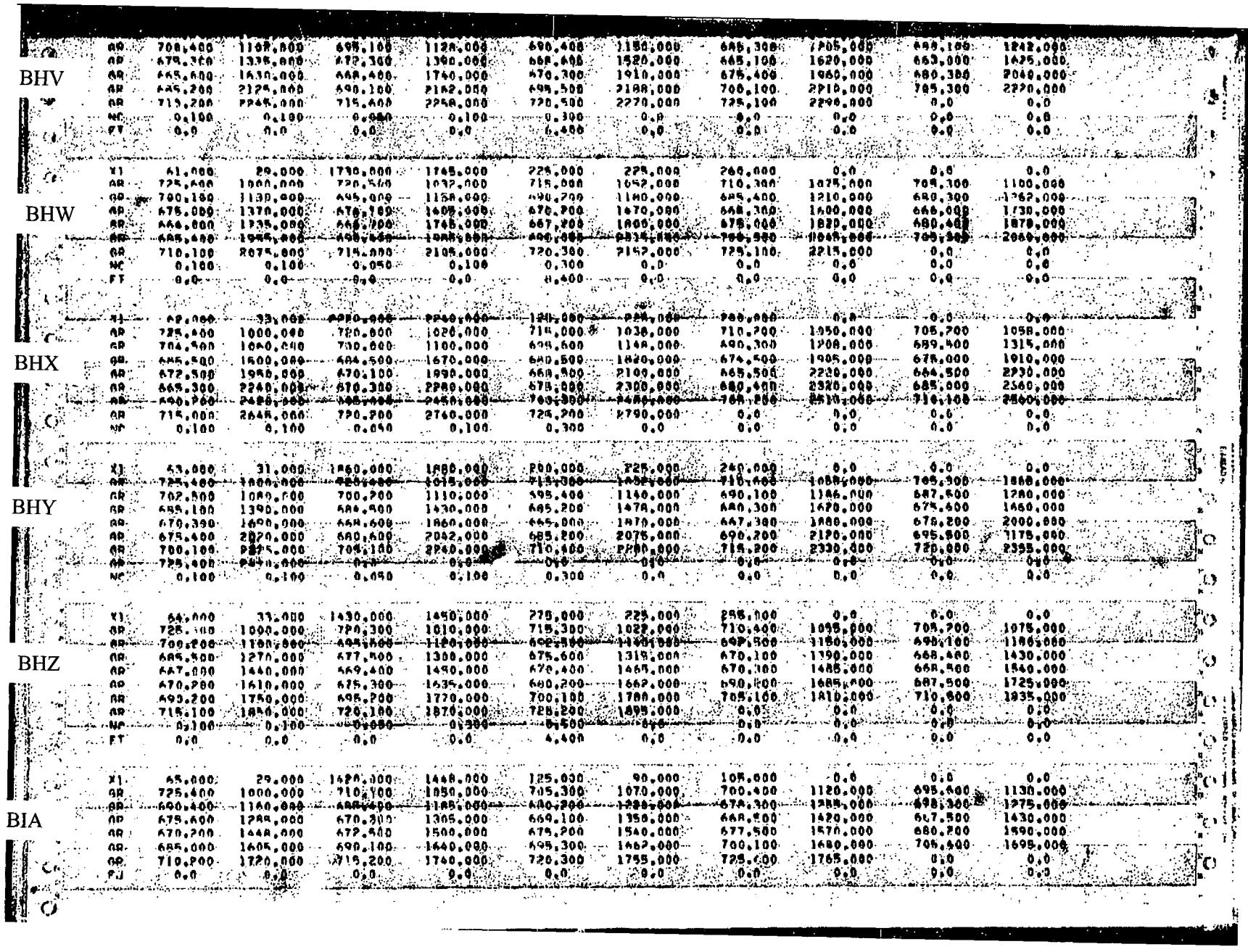
BHR

BHS

BHT

BHU

Bridge – Market Street



BHV

OR	700,400	1100,000	695,100	1120,000	690,400	1150,000	685,300	1205,000	695,100	1242,000
OR	675,300	1335,000	672,300	1390,000	668,600	1520,000	665,100	1620,000	663,000	1635,000
OR	665,600	1630,000	668,400	1740,000	670,300	1910,000	675,400	1960,000	680,300	2040,000
OR	685,200	2125,000	690,100	2162,000	695,500	2188,000	700,100	2210,000	705,300	2220,000
OR	715,200	2245,000	715,600	2250,000	720,500	2270,000	725,100	2290,000	0,0	0,0
NC	0,100	0,100	0,050	0,100	0,300	0,0	0,0	0,0	0,0	0,0
FT	0,0	0,0	0,0	0,0	4,400	0,0	0,0	0,0	0,0	0,0

BHW

XJ	61,000	29,000	1790,000	1745,000	225,000	225,000	260,000	0,0	0,0	0,0
OR	725,400	1000,000	720,500	1032,000	715,000	1052,000	710,300	1075,000	705,300	1100,000
OR	700,100	1130,000	695,000	1150,000	690,200	1180,000	685,400	1210,000	680,300	1262,000
OR	675,000	1370,000	670,100	1405,000	670,200	1470,000	668,300	1600,000	668,000	1730,000
OR	666,000	1735,000	668,200	1745,000	667,200	1800,000	675,000	1825,000	680,400	1870,000
OR	685,400	1945,000	690,000	1988,000	690,000	2015,000	700,500	2045,000	705,300	2060,000
OR	710,100	2075,000	715,000	2105,000	720,300	2147,000	725,100	2215,000	0,0	0,0
NC	0,100	0,100	0,050	0,100	0,300	0,0	0,0	0,0	0,0	0,0
FT	0,0	0,0	0,0	0,0	4,400	0,0	0,0	0,0	0,0	0,0

BHX

XJ	62,000	33,000	1790,000	1740,000	230,000	225,000	260,000	0,0	0,0	0,0
OR	725,400	1000,000	720,500	1020,000	715,000	1038,000	710,300	1050,000	705,300	1058,000
OR	704,500	1040,000	700,000	1100,000	695,600	1148,000	690,300	1208,000	689,400	1315,000
OR	685,500	1600,000	684,500	1670,000	680,500	1820,000	674,500	1905,000	675,000	1910,000
OR	672,500	1950,000	670,100	1990,000	668,500	2100,000	665,500	2220,000	664,500	2230,000
OR	665,300	2240,000	670,300	2280,000	675,000	2300,000	680,400	2320,000	685,000	2360,000
OR	690,200	2400,000	695,000	2450,000	700,300	2480,000	705,200	2510,000	710,100	2560,000
OR	715,000	2648,000	720,200	2760,000	725,200	2790,000	0,0	0,0	0,0	0,0
NC	0,100	0,100	0,050	0,100	0,300	0,0	0,0	0,0	0,0	0,0

BHY

XJ	63,000	31,000	1460,000	1480,000	230,000	225,000	240,000	0,0	0,0	0,0
OR	725,400	1000,000	720,000	1015,000	715,300	1035,000	710,400	1050,000	705,300	1060,000
OR	702,500	1080,000	700,200	1110,000	695,400	1140,000	690,100	1146,000	687,600	1240,000
OR	685,100	1390,000	684,900	1430,000	685,200	1470,000	680,300	1620,000	675,600	1460,000
OR	670,300	1600,000	668,600	1860,000	665,000	1870,000	667,300	1880,000	670,200	2000,000
OR	675,400	2020,000	680,600	2042,000	685,200	2075,000	690,200	2120,000	695,500	2175,000
OR	700,100	2225,000	705,100	2260,000	710,400	2280,000	715,200	2330,000	720,000	2355,000
OR	725,400	2400,000	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
NC	0,100	0,100	0,050	0,100	0,300	0,0	0,0	0,0	0,0	0,0

BHZ

XJ	64,000	33,000	1430,000	1450,000	225,000	225,000	255,000	0,0	0,0	0,0
OR	725,400	1000,000	720,300	1010,000	715,300	1022,000	710,400	1035,000	705,300	1075,000
OR	700,200	1100,000	695,500	1120,000	690,500	1140,000	685,500	1150,000	690,100	1186,000
OR	685,500	1270,000	677,500	1300,000	675,600	1315,000	670,100	1390,000	668,400	1430,000
OR	667,000	1440,000	669,400	1490,000	670,400	1465,000	670,300	1485,000	668,500	1540,000
OR	670,200	1610,000	675,300	1635,000	680,200	1662,000	690,500	1685,000	687,500	1725,000
OR	695,200	1750,000	695,200	1770,000	700,100	1780,000	705,100	1810,000	710,500	1835,000
OR	715,100	1850,000	720,100	1870,000	725,200	1895,000	0,0	0,0	0,0	0,0
NC	0,100	0,100	0,050	0,100	0,500	0,0	0,0	0,0	0,0	0,0
FT	0,0	0,0	0,0	0,0	4,400	0,0	0,0	0,0	0,0	0,0

BIA

XJ	65,000	29,000	1420,000	1448,000	125,000	90,000	105,000	0,0	0,0	0,0
OR	725,400	1000,000	710,400	1050,000	705,300	1070,000	700,400	1120,000	695,400	1130,000
OR	690,400	1160,000	685,400	1185,000	680,200	1220,000	674,300	1255,000	698,300	1275,000
OR	675,600	1288,000	670,300	1305,000	669,100	1350,000	668,400	1420,000	667,500	1430,000
OR	670,200	1448,000	672,400	1500,000	675,200	1540,000	677,500	1570,000	680,200	1590,000
OR	685,000	1605,000	690,100	1640,000	695,300	1662,000	700,100	1680,000	705,400	1695,000
OR	710,200	1720,000	715,200	1740,000	720,300	1755,000	725,400	1765,000	0,0	0,0
FJ	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

```
                                                                                  THIS RUN EXECUTED
 ******************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR - 01
   MODIFICATION - 50,51,52
 ******************************************************

 T1      SUSQUEHANNA RIVER BASIN COMMISSION
 T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
 T3      WALKER RUN - 100 YR. FLOODWAY RUN

 J1  ICHECK    INQ     NINV     IDIR    STRT    METRIC   HVINS     Q      WSEL      FQ
        0.      5.       0.       0.     0.0      0.0      0.0     0.   636.280     0.0

 J2  NPROF    IPLOT    PRFVS    XSECV   XSECH     FN     ALLDC    IBW    CHNIM    ITRACE
     15.000     0.0   -1.000     0.0     0.0     0.0      0.0     0.0     0.0      0.0
```

WALKER RUN - 100 YR, 6 HR

SUMMARY PRINTOUT

SECNO	V.CH	Q	CWSEL	FR	HI	DLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
25.000	290.00	2200.00	635.28	636.06	0.0	0.0	1.44	10.99	1.00	0.0	0.0	94.18
25.000	290.00	2200.00	636.79	637.99	0.0	0.0	1.71	10.48	0.0	1.00	0.0	34.00
26.000	440.00	2200.00	641.04	641.39	4.32	0.13	0.35	7.19	0.0	0.0	5.77	294.41
26.000	440.00	2200.00	641.73	642.18	4.07	0.11	0.49	7.43	0.0	0.68	5.45	130.00
27.000	190.00	2200.00	641.99	642.17	0.78	0.00	0.18	4.14	0.0	0.0	0.94	243.02
27.000	190.00	2200.00	642.73	643.01	0.78	0.05	0.28	4.67	0.0	0.74	1.05	99.25
27.100	115.00	2200.00	642.31	642.47	0.29	0.01	0.14	4.70	0.0	0.0	0.34	246.61
27.100	115.00	2200.00	643.13	643.41	0.40	0.00	0.28	5.86	0.0	0.80	0.40	100.00
27.200	11.00	2200.00	643.32	643.40	0.93	0.0	0.08	3.46	0.0	0.0	0.99	288.19
27.200	11.00	2200.00	643.64	643.69	0.26	0.0	0.05	6.52	0.0	0.11	0.31	100.00
29.000	354.00	2200.00	643.61	643.78	0.26	0.01	0.09	3.20	0.0	0.0	0.28	781.35
29.000	354.00	2200.00	644.07	644.21	0.50	0.03	0.14	7.55	0.0	0.47	0.64	196.88
30.000	70.00	2200.00	643.66	643.70	0.04	0.01	0.11	3.47	0.0	0.0	0.05	268.67
30.000	70.00	2200.00	644.14	644.21	0.09	0.01	0.17	3.88	0.0	0.48	0.06	118.39
31.000	95.00	2200.00	643.78	643.91	0.13	0.02	0.16	4.32	0.0	0.0	0.09	227.59
31.000	95.00	2200.00	644.25	644.39	0.18	0.03	0.28	4.78	0.0	0.50	0.11	102.77
32.000	140.00	2200.00	644.09	644.34	0.48	0.03	0.29	5.32	0.0	0.0	0.34	199.65
32.000	140.00	2200.00	644.71	645.02	0.48	0.01	0.31	5.21	0.0	0.61	0.46	99.18
33.000	250.00	2200.00	644.81	644.91	0.55	0.01	0.10	3.46	0.0	0.0	0.71	403.49
33.000	250.00	2200.00	645.54	645.73	0.70	0.01	0.19	4.07	0.0	0.73	0.83	128.79
34.000	140.00	2200.00	645.00	645.10	0.19	0.00	0.10	3.56	0.0	0.0	0.17	349.47
34.000	140.00	2200.00	645.82	645.96	0.23	0.00	0.14	3.64	0.0	0.83	0.28	139.00
34.100	150.00	2200.00	645.14	645.37	0.24	0.04	0.24	5.40	0.0	0.0	0.14	310.27
34.100	150.00	2200.00	646.00	646.23	0.24	0.03	0.23	4.98	0.0	0.86	0.18	139.00
36.010	125.00	1860.00	645.43	645.61	0.19	0.05	0.07	3.87	0.0	0.0	0.40	379.36
36.010	125.00	1860.00	646.29	646.49	0.28	0.01	0.20	5.87	0.0	0.76	0.29	120.00
36.020	23.00	1860.00	647.87	647.89	P.28	0.0	0.02	2.05	0.0	0.0	2.34	513.68
36.020	23.00	1860.00	647.82	647.93	1.44	0.0	0.12	4.28	0.0	-0.05	1.52	120.00
36.000	47.00	1860.00	647.89	647.93	0.03	0.02	0.05	2.03	0.0	0.0	0.02	498.00
36.000	47.00	1860.00	647.90	648.01	0.02	0.00	0.11	2.70	0.0	0.01	0.09	109.14
37.000	190.00	1860.00	647.96	648.01	0.01	0.00	0.05	2.33	0.0	0.0	0.07	431.91
37.000	190.00	1860.00	648.02	648.19	0.16	0.02	0.17	3.81	0.0	0.06	0.12	100.00
37.100	305.00	1860.00	648.17	648.28	0.21	0.04	0.11	4.12	0.0	0.0	0.22	346.83
37.100	305.00	1860.00	648.85	649.11	0.65	0.29	0.98	8.25	0.0	0.37	0.62	80.00
37.200	17.00	1860.00	648.69	648.77	0.48	0.0	0.07	3.34	0.0	0.0	0.52	403.94
37.200	17.00	1860.00	648.55	649.11	0.0	0.0	0.98	8.23	0.0	-0.14	0.00	80.00

	SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
	39.000	208.00	1860.00	648.91	649.16	0.27	0.12	0.25	4.03	0.0	0.0	0.22	171.11
	39.000	208.00	1860.00	649.98	649.99	[illegible]	0.07	0.35	5.00	0.0	0.67	1.03	80.40
	40.000	220.00	1860.00	649.56	649.87	0.49	0.02	0.31	5.43	0.0	0.0	0.65	188.70
	40.000	220.00	1860.00	650.22	650.68	0.72	0.04	0.47	6.22	0.0	0.66	0.63	72.75
	41.000	275.00	1860.00	650.66	650.87	1.00	0.01	0.22	4.03	0.0	0.0	1.18	149.53
	41.000	275.00	1860.00	651.41	651.81	1.10	0.01	0.40	5.74	0.0	0.76	1.19	80.12
	41.100	100.00	1860.00	651.71	651.91	1.03	0.00	0.20	3.51	0.0	0.0	1.05	175.00
	41.100	100.00	1860.00	652.61	652.79	5.41	0.07	0.18	4.76	0.0	0.90	1.20	120.00
	41.200	10.00	1860.00	682.96	683.05	1.16	0.0	0.10	3.60	0.0	0.0	1.30	195.07
	41.200	10.00	1860.00	683.34	683.05	[illegible]	0.0	0.14	4.05	0.0	0.19	[illegible]	120.00
	43.000	52.00	1850.00	653.09	653.13	0.15	0.02	0.03	2.26	0.0	0.0	0.14	201.96
	43.000	52.00	1860.00	653.30	653.39	0.11	6.02	0.08	3.04	0.0	0.20	0.30	192.61
BHJ	44.000	260.00	1860.00	653.29	653.38	5.21	0.06	0.09	4.78	0.0	0.0	0.19	209.02
	44.000	260.00	1860.00	680.25	658.00	0.40	0.00	0.20	4.35	0.0	0.47	0.06	134.01
Bridge Market	46.010	230.00	1860.00	655.16	655.39	1.91	0.10	0.23	4.40	0.0	0.0	1.87	212.91
	46.010	230.00	1860.00	656.20	656.36	2.39	0.01	0.16	5.47	0.0	1.04	2.44	160.00
	46.020	30.00	1860.00	656.55	656.66	1.28	0.0	0.09	4.36	0.0	0.0	1.30	286.49
	46.002	30.00	1860.00	656.69	[illegible]	[illegible]	0.0	0.10	4.03	0.0	0.10	0.49	160.00
BHK	46.000	145.00	1860.00	656.64	656.78	0.11	0.03	0.14	4.53	0.0	0.0	0.10	278.00
	46.000	145.00	1860.00	656.02	656.99	0.14	0.03	0.10	4.59	0.0	0.17	0.13	110.71
BHL	[illegible]	400.00	1860.00	657.02	657.08	0.27	0.02	0.06	2.89	0.0	0.0	0.37	353.68
	[illegible]	400.00	1860.00	657.50	658.40	0.40	0.01	0.10	4.05	0.0	0.25	0.51	120.00
Bridge Private	49.010	450.00	1860.00	657.31	657.34	0.25	0.01	0.03	2.40	0.0	0.0	0.38	432.83
	49.010	450.00	1860.00	658.06	658.20	0.75	0.04	0.22	5.06	0.0	0.75	0.74	90.00
	49.020	20.00	1860.00	657.43	657.46	0.12	0.0	0.02	2.31	0.0	0.0	0.12	437.46
	49.020	20.00	1860.00	658.06	658.28	0.0	0.0	0.22	4.06	0.0	0.60	0.0	90.00
BHM	49.000	30.00	1860.00	657.43	657.59	0.06	0.09	0.15	4.84	0.0	0.0	0.60	313.19
	49.000	30.00	1860.00	658.14	658.50	0.12	0.10	0.36	4.31	0.0	0.71	0.08	80.98
BHN	5..000	275.00	1860.00	657.78	657.80	0.21	0.01	0.02	2.01	0.0	0.0	0.38	808.78
	44.000	275.00	1860.00	658.76	660.81	[illegible]	0.04	0.06	2.53	0.0	0.90	0.60	201.00
BHO	51.000	740.00	1640.00	658.18	658.20	0.40	0.00	0.02	1.85	0.0	0.0	0.40	1002.32
	51.000	740.00	1640.00	659.14	659.16	0.35	0.00	0.02	1.66	0.0	0.95	0.37	650.00
BHP	52.000	330.00	1640.00	658.50	658.58	0.36	0.02	0.08	2.55	0.0	0.0	0.31	320.80
	52.000	330.00	1640.00	659.85	660.05	0.26	0.03	0.10	2.80	0.0	0.85	0.19	120.00
Bridge Private	52.100	133.00	1640.00	658.71	658.80	0.21	0.01	0.09	3.45	0.0	0.0	0.21	286.53
	52.100	133.00	1640.00	659.55	659.70	0.23	0.02	0.15	3.96	0.0	0.84	0.22	120.00
	52.200	12.00	1640.00	660.45	660.48	1.60	0.0	0.02	1.02	0.0	0.0	1.78	493.98
	52.200	12.00	1640.00	660.61	660.51	0.41	0.0	0.11	3.31	0.0	0.08	0.06	120.00

	SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
BHQ	54.000	2[illegible].00	1640.00	660.64	660.79	0.22	0.08	0.14	4.1[illegible]	0.0	0.0	0.10	219.35
	54.000	2[illegible].00	1640.00	660.94	661.2[illegible]	0.60	0.19	0.[illegible]	5.[illegible]	0.0	0.30	0.54	97.[illegible]
BHR	55.000	330.00	1640.00	661.77	662.04	1.22	0.04	0.27	5.92	0.0	0.0	1.13	193.70
	55.000	330.00	1640.00	662.61	663.11	1.80	0.04	0.50	6.42	0.0	0.84	1.67	61.61
BHS	56.000	310.00	1640.00	663.10	663.29	1.20	0.01	0.15	4.24	0.0	0.0	1.33	190.68
	56.000	310.00	1640.00	[illegible]	[illegible]	1.10	0.03	0.17	3.79	0.0	1.03	1.92	101.17
BHT	57.000	160.00	1640.00	664.03	664.55	1.00	0.29	0.52	8.48	0.0	0.0	0.93	162.83
	57.000	150.00	1640.00	664.85	665.35	0.78	0.06	0.50	7.04	0.0	0.82	0.72	78.01
BHU	58.000	250.00	1640.00	667.97	668.73	3.41	0.21	0.78	8.50	4097.00	0.0	3.94	297.12
	58.000	250.00	[illegible]	668.1[illegible]	6[illegible]	3.43	0.49	1.12	9.44	0.0	0.19	3.51	78.09
Bridge Market	0.010	105.00	1640.00	669.20	669.39	0.41	0.24	0.18	4.91	0.0	0.0	1.24	249.55
	0.010	105.00	1640.00	669.86	669.99	0.32	0.30	0.13	4.13	0.0	0.65	1.70	164.00
	0.020	41.00	1640.00	670.43	671.29	0.28	0.55	0.86	8.54	4097.00	0.0	1.28	301.15
	0.020	41.00	1640.00	669.61	671.90	0.10	1.76	2.[illegible]	12.[illegible]	0.0	0.[illegible]	0.[illegible]	164.00
BHV	60.000	109.00	1640.00	671.72	671.75	0.20	0.25	0.03	2.71	0.0	0.0	1.29	513.37
	60.000	109.00	1640.00	672.73	672.76	0.15	0.69	0.02	2.45	0.0	1.01	3.13	294.78
BHW	61.000	260.00	1640.00	671.87	671.91	0.16	0.00	0.04	2.86	0.0	0.0	0.15	369.89
	61.000	260.00	1640.00	672.[illegible]	672.[illegible]	0.12	0.00	0.04	[illegible]	0.0	0.97	0.11	[illegible]
BHX	62.000	200.00	1640.00	671.99	672.04	0.13	0.01	0.05	3.14	0.0	0.0	0.11	228.79
	62.000	200.00	1640.00	672.94	672.99	0.11	0.00	0.06	2.02	0.0	0.95	0.10	176.46
BHY	63.000	240.00	1640.00	672.22	672.31	0.25	0.01	0.08	3.90	0.0	0.0	0.23	328.65
	63.000	240.00	1640.00	673.13	673.26	0.18	0.02	0.12	4.14	0.0	0.91	0.21	1[illegible].66
BHZ	64.000	2[illegible].00	1640.00	672.75	672.86	0.95	0.01	0.11	4.47	0.0	0.0	0.53	268.62
	64.000	2[illegible].00	1640.00	673.63	673.79	0.51	0.01	0.17	4.90	0.0	0.08	0.48	191.78
BIA	65.000	105.00	1640.00	673.06	673.21	0.33	0.02	0.19	4.56	0.0	0.0	0.31	213.65
	65.000	105.00	1640.00	673.[illegible]	674.07	0.[illegible]	0.00	0.16	4.40	0.0	0.88	0.28	125.[illegible]

SUMMARY OF ERRORS

CAUTION SECNO= 25.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 58.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 58.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 60.020 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.020 PROFILE= 1 MINIMUM SPECIFIC ENERGY

THIS RUN EXECUTED OCT 26 1977

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3 WALKER RUN - 10 YR FLOOD

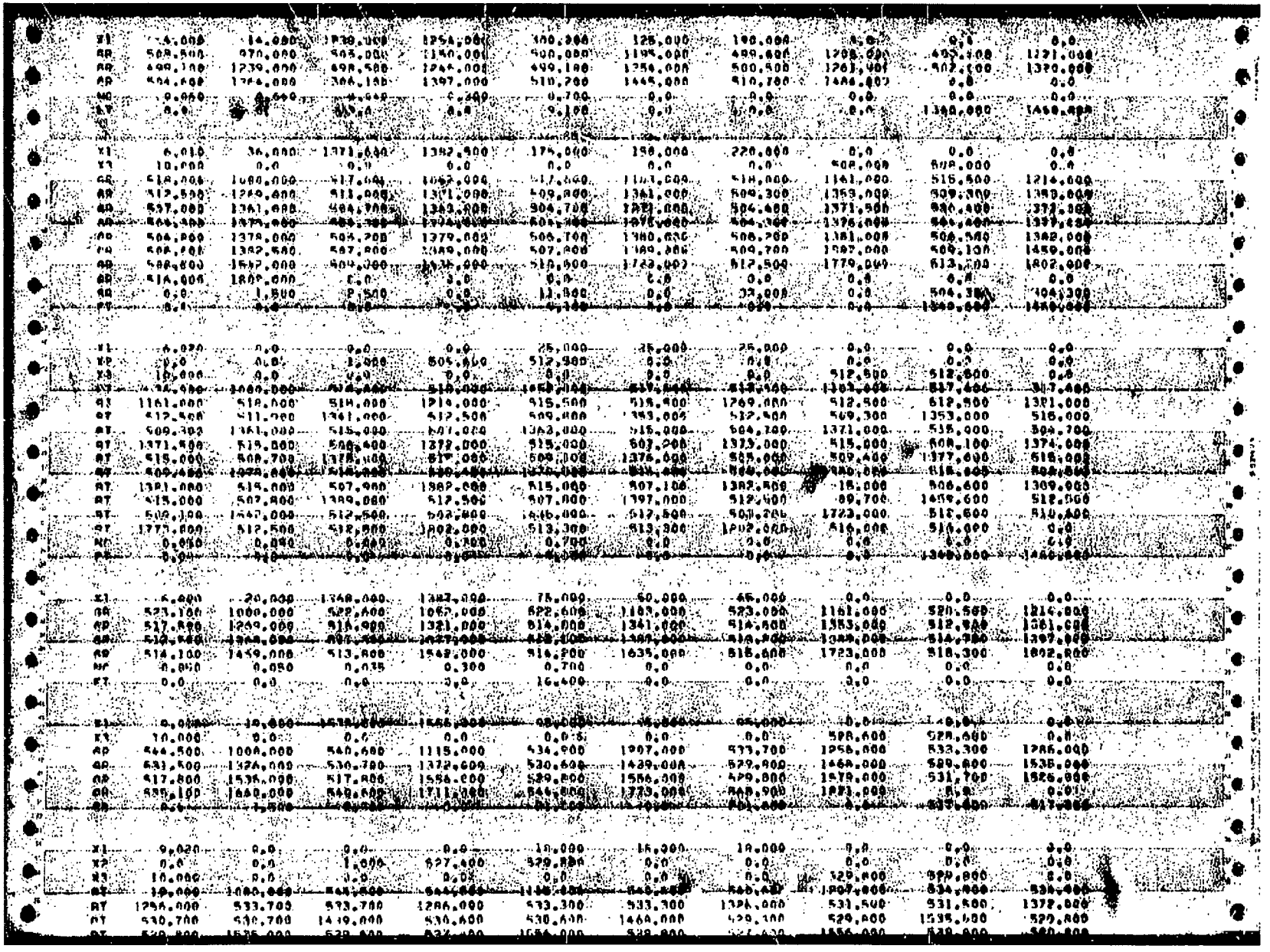
J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	0.	0.0	0.0	0.0	0.	483.800	0.0

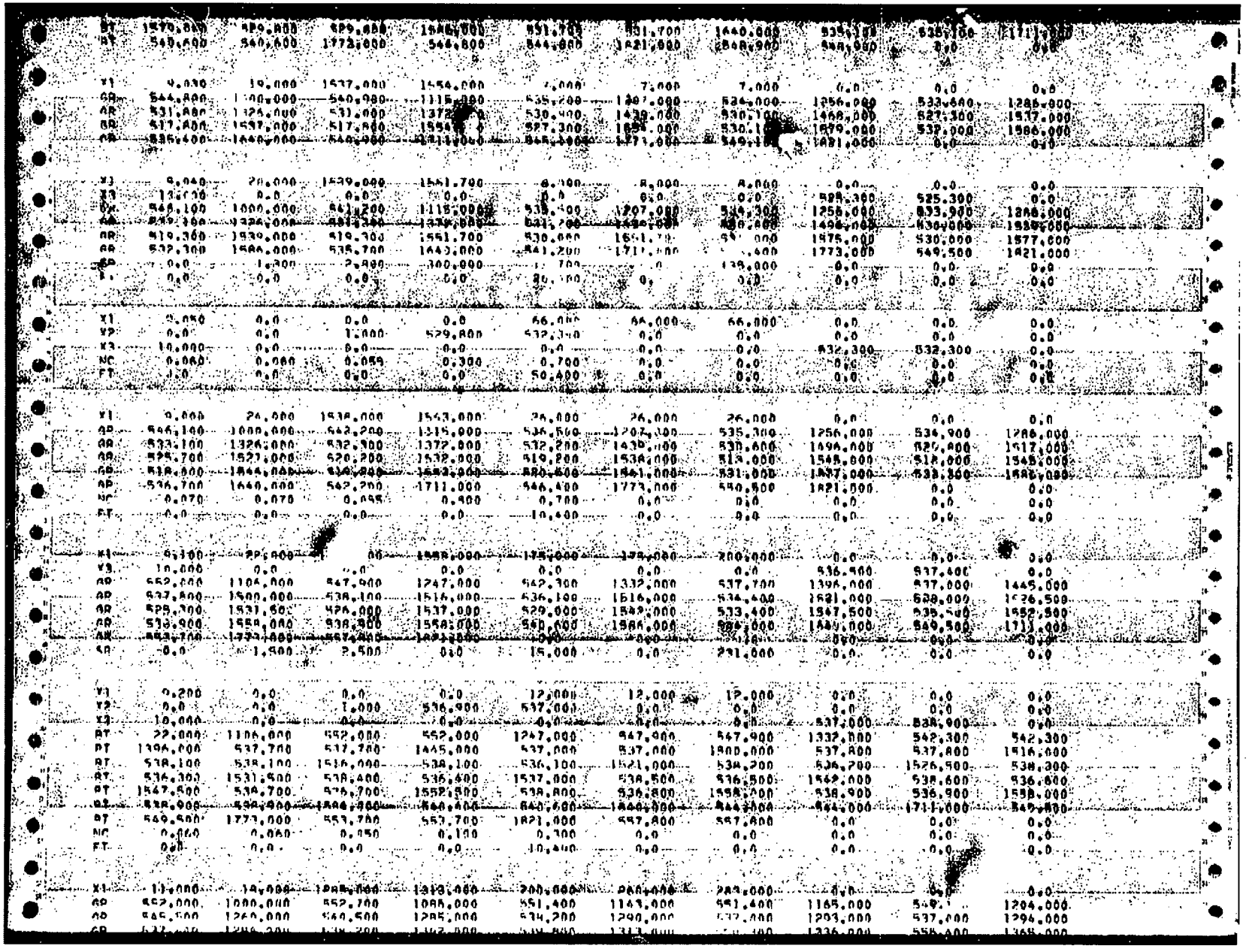
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

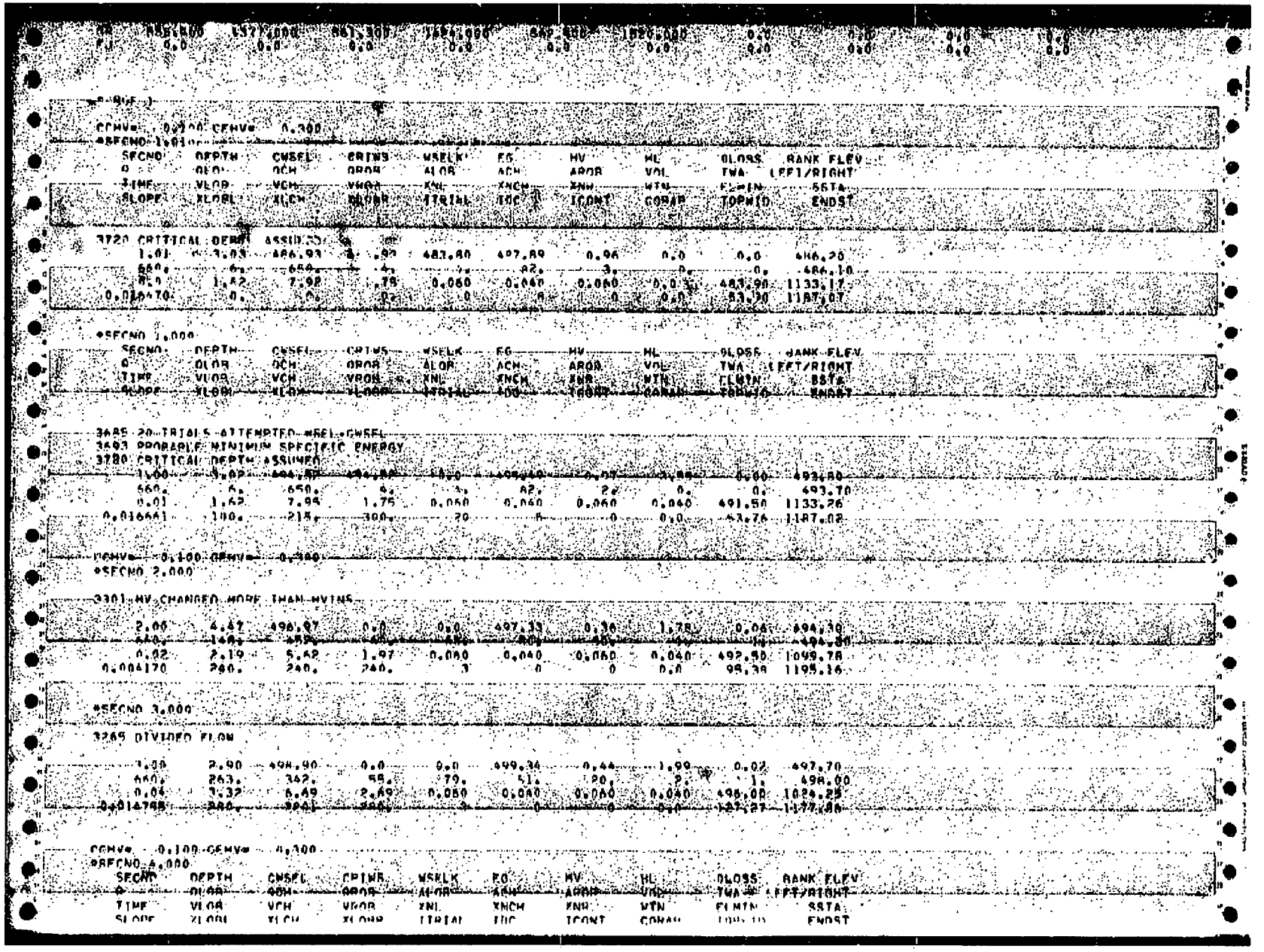
J3 VARIABLE CODES FOR SUMMARY PRINTOUT

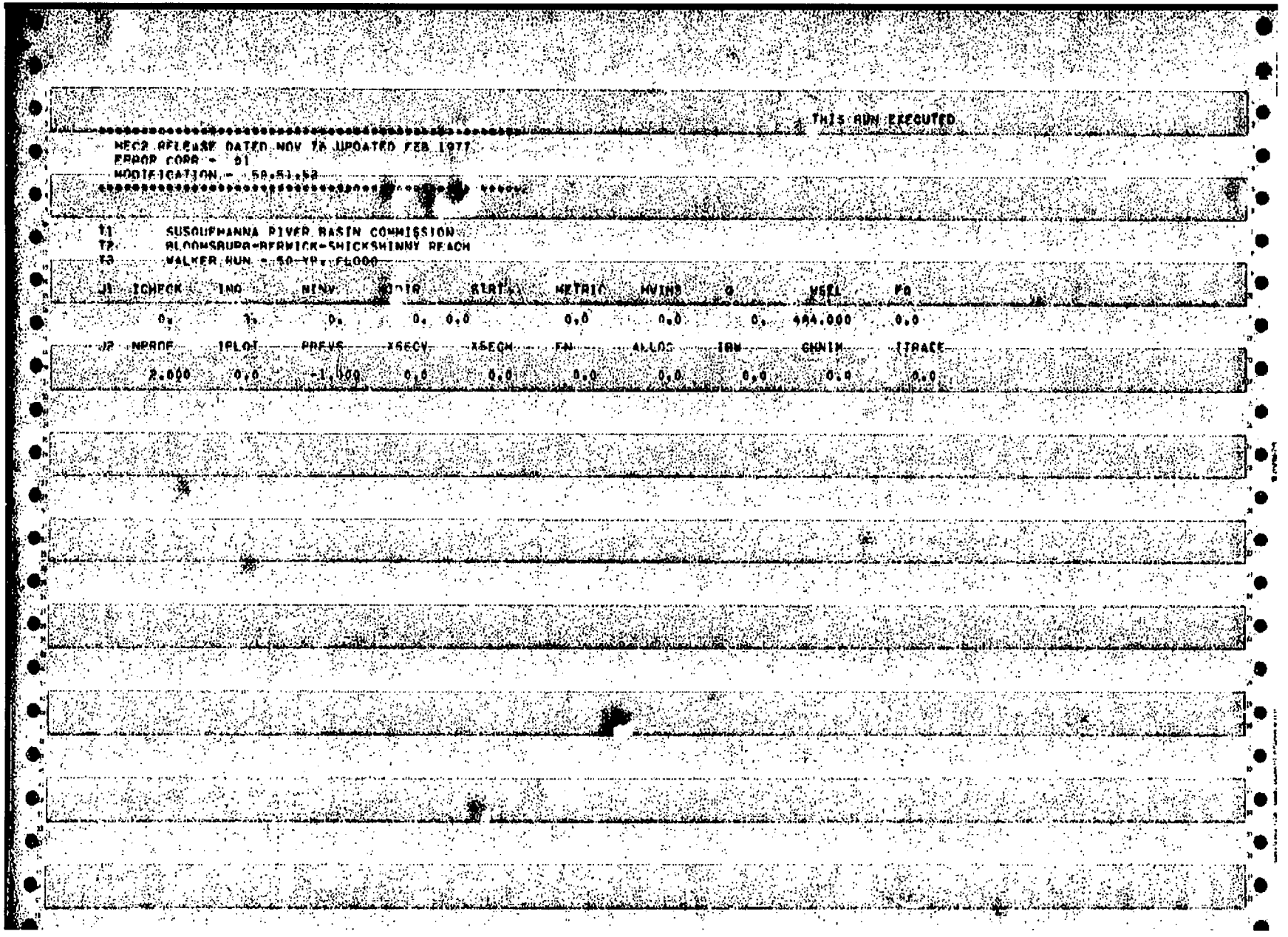
38.000	39.000	21.000	42.000	62.000	40.000	41.000	43.000	1.000	4.000
[illegible]								11.000	10.000
10.000	26.030	20.060	50.000	61.000	4.000	0.0	201.000	0.0	0.0

QT	9.000	660.000	1600.000	2200.000	2700.000	3790.000	0.0	0.0	0.0	0.0
[illegible]										
ET	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
X1	1.010	15.000	1147.000	1161.000	0.0	0.0	0.0	0.0	-7.400	0.0
GR	494.900	1000.000	495.800	1024.000	495.100	1057.000	488.000	1096.000	495.000	1116.000
GR	[illegible]	1147.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1156.000	[illegible]	1167.000
GR	492.300	1172.000	493.700	1181.000	496.700	1203.000	502.100	1256.000	506.200	1303.000
X1	1.000	0.0	0.0	0.0	100.000	300.000	215.000	0.0	7.600	0.0
NC	0.040	0.048	0.048	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	2.000	17.000	1150.000	1172.000	240.000	240.000	240.000	0.0	0.0	0.0
GR	490.300	1000.000	506.700	1006.000	498.700	1020.000	497.500	1090.000	495.300	1131.000
GR	494.300	1150.000	493.400	1154.000	492.300	1160.000	492.800	1160.000	492.800	1160.000
GR	493.400	1166.000	494.500	1172.000	496.900	1194.000	500.[illegible]	1252.000	504.400	1312.000
[illegible]										
ET	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	0.0	0.0
X1	3.000	15.000	1124.000	1152.000	280.000	280.000	280.000	0.0	0.0	0.0
GR	500.600	1000.000	497.400	1040.000	497.400	1090.000	500.000	1098.000	500.500	1113.000
GR	499.700	1124.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1144.000	[illegible]	1150.000
GR	496.000	1172.000	501.600	1193.000	502.600	1262.000	507.500	1342.000	510.600	1392.000
NC	0.060	0.060	0.040	0.100	0.300	0.0	0.0	0.0	0.0	0.0








THIS RUN EXECUTED
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CODE = 01
MODIFICATION = 50,51,52
T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3 WALKER RUN - 50-YR. FLOOD
J1 ICHECK INO NINV IDIR STRT METRIC HVINS Q WSEL FQ
0. 1. 0. 0. 0.0 0.0 0.0 0. 444.000 0.0
J2 NPROF IPLOT PRFVS XSECV XSECH FN ALLOC IBW CHNIM ITRACE
2.000 0.0 -1.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0

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                                                                          THIS RUN EXECUTED
**************************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR - 01
   MODIFICATION - 50,51,52
**************************************************************

   T1     SUSQUEHANNA RIVER BASIN COMMISSION
   T2     BLOOMSBURG-BERWICK-SHICKSHINNY REACH
   T3     WALKER RUN - 100 YR. FLOOD

   J1  ICHECK    INQ     NINV     IDIR     STRT     METRIC    HVINS     Q      WSEL     FQ
           0.      4.      0.       0.     0.0        0.0       0.0      0.   484.100    0.0

   J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN       ALLDC     IBW    CHNIM    ITRACE
        1.000     0.0   -1.000      0.0      0.0      0.0       0.0      0.0     0.0      0.0
```

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                                                                                  THIS RUN EXECUTED
**********************************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR - 01
   MODIFICATION - 50,51,52
**********************************************************************

T1       SUSQUEHANNA RIVER BASIN COMMISSION
T2       BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3       WALKER RUN - 500 YR. FLOOD

J1   ICHECK     INQ      NINV      IDIR      STRT     METRIC    HVINS       Q      WSEL       FQ
         0.       5.       0.        0.      0.0        0.0      0.0       0.   488.500     0.0

J2   NPROF    IPLOT     PRFVS     XSECV     XSECH       FN     ALLDC      IBW     CHNIM    ITRACE
    15.000      0.0    -1.000       0.0       0.0      0.0       0.0      0.0       0.0       0.0
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WALKER RUN - 10 YR. FLOOD

SUMMARY PRINTOUT

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
1.010	0.0	660.00	[illegible]	487.80	0.0	0.0	0.96	7.92	1.00	0.0	0.0	93.90
1.010	0.0	1600.00	[illegible]	489.69	0.0	0.0	0.98	8.78	1.00	1.74	0.0	187.10
1.010	0.0	2200.00	[illegible]	[illegible]	0.0	0.0	1.07	9.54	1.00	[illegible]	0.0	[illegible]
1.010	0.0	3790.00	490.19	491.56	0.0	0.0	1.37	11.45	1.00	0.98	0.0	198.88
1.090	215.00	660.00	494.52	495.49	3.55	0.00	0.97	7.95	11.00	0.0	[illegible]	53.16
1.090	215.00	1600.00	496.28	497.25	1.93	0.00	0.97	8.69	11.00	1.78	[illegible]	[illegible]
1.090	[illegible]	2200.00	[illegible]	497.86	1.77	0.00	1.07	9.52	11.00	[illegible]	7.60	171.47
1.090	[illegible]	3790.00	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	11.00	[illegible]	[illegible]	[illegible]
2.000	240.00	660.00	496.97	497.33	1.78	0.06	0.36	5.62	0.0	0.0	2.45	95.38
2.000	240.00	1600.00	498.33	498.92	1.41	0.04	0.57	7.74	0.0	1.36	2.05	174.28
2.000	240.00	2200.00	498.95	499.55	1.63	0.05	0.61	8.40	0.0	0.62	2.13	206.94
2.000	240.00	3790.00	[illegible]	[illegible]	1.65	0.07	0.67	9.44	0.0	[illegible]	2.30	[illegible]
3.000	280.00	660.00	498.90	499.34	1.99	0.02	0.44	6.69	0.0	0.0	1.94	127.27
3.000	280.00	1600.00	500.26	500.71	1.41	0.01	0.46	7.28	0.0	1.36	1.93	163.06
3.000	280.00	2200.00	500.82	501.34	1.78	0.01	0.52	7.87	0.0	0.56	1.87	180.45
3.000	280.00	3790.00	501.92	502.60	1.78	0.00	0.68	9.23	0.0	1.10	1.71	216.90
4.000	190.00	660.00	501.50	[illegible]	[illegible]	[illegible]	0.36	[illegible]	0.0	0.0	[illegible]	[illegible]
4.000	190.00	1600.00	502.40	503.10	2.31	0.07	0.70	9.44	0.0	0.89	2.14	153.88
4.000	190.00	2200.00	502.97	503.69	2.26	0.09	0.81	10.61	0.0	0.48	2.05	165.63
4.000	190.00	3790.00	503.90	504.92	2.22	0.10	1.03	12.38	0.0	1.02	1.98	192.12
6.010	220.00	660.00	508.83	509.82	2.36	0.00	1.29	10.50	11.00	0.0	6.72	34.09
6.010	220.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11.00	1.91	7.74	[illegible]
6.010	220.00	2200.00	510.38	511.05	1.90	0.04	0.69	10.60	11.00	0.23	7.49	372.62
6.010	220.00	3790.00	510.99	511.74	2.01	0.08	0.77	12.30	11.00	0.62	7.09	404.79
6.020	25.00	660.00	512.73	512.74	3.21	0.0	0.00	0.97	0.0	0.0	4.50	521.14
6.020	25.00	1600.00	[illegible]	513.44	2.77	0.0	0.01	1.48	0.0	0.71	3.31	550.41
6.020	25.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.04	[illegible]	0.0	0.30	3.37	[illegible]
6.020	25.00	3790.00	514.37	514.42	2.65	0.0	0.05	3.35	0.0	0.63	3.38	567.32
8.000	65.00	660.00	514.60	514.97	0.01	0.25	0.36	6.43	11.00	0.0	1.67	297.45
8.000	65.00	1600.00	515.11	515.63	0.03	0.35	0.51	8.71	11.00	0.51	1.67	384.82
8.000	65.00	2200.00	515.41	515.93	0.04	[illegible]	0.52	9.11	11.00	0.30	1.67	375.64
8.000	65.00	[illegible]	[illegible]	[illegible]	0.07	[illegible]	0.68	10.73	11.00	0.49	1.83	[illegible]
9.010	95.00	660.00	520.93	522.50	1.08	0.86	1.57	10.04	11.00	0.0	6.32	21.00
9.010	95.00	1600.00	523.45	526.27	[illegible]	1.42	2.83	13.50	11.00	2.52	8.33	21.00
9.010	95.00	2200.00	524.77	528.28	1.37	2.10	3.52	15.06	11.00	1.31	9.35	21.00
9.010	95.00	3790.00	527.80	532.86	1.59	3.08	5.08	18.04	11.00	3.04	11.90	21.00
9.020	18.00	660.00	522.04	522.90	0.19	0.21	0.85	7.41	0.0	0.0	1.11	21.00
9.020	18.00	1600.00	525.18	526.84	0.21	0.34	1.66	10.33	0.0	3.14	1.74	21.00
9.020	18.00	2200.00	526.85	528.94	0.23	0.43	2.08	11.58	0.0	1.67	2.10	21.00
9.020	18.00	3790.00	528.80	532.80	0.0	0.0	4.68	17.36	10.00	1.34	0.40	21.00
9.030	7.00	[illegible]	[illegible]	[illegible]	0.08	[illegible]	1.35	9.34	0.0	0.0	-0.09	17.00
9.030	7.00	1600.00	524.95	527.64	0.08	0.72	2.69	13.16	0.0	2.99	-0.23	17.00
9.030	7.00	2200.00	526.54	529.94	0.09	[illegible]	3.40	14.80	0.0	1.59	-0.31	17.00
[illegible]	7.00	3790.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]	[illegible]

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
9.040	8.00	660.00	523.66	525.87	0.18	0.60	2.20	11.91	11.00	0.0	1.71	12.70
9.040	8.00	1600.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15.90	11.00	[illegible]	[illegible]	12.70
9.040	8.00	2200.00	529.04	533.95	0.18	1.06	4.91	17.78	11.00	1.87	2.50	12.79
9.040	8.00	3790.00	534.02	534.32	0.01	0.07	0.30	6.40	0.0	4.97	0.02	336.02
9.050	66.00	660.00	526.08	526.99	[illegible]	0.19	0.91	7.67	0.0	0.0	[illegible]	12.70
9.050	66.00	1600.00	530.96	533.19	[illegible]	0.82	2.24	12.00	0.0	4.88	[illegible]	12.70
9.050	66.00	2200.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0	2.69	[illegible]	[illegible]
9.050	66.00	3790.00	534.56	534.76	0.44	0.0	0.20	5.28	0.0	0.73	0.54	370.63
9.000	26.00	660.00	527.19	527.27	0.04	0.35	0.09	2.78	0.0	0.0	[illegible]	47.82
9.000	26.00	1600.00	533.81	533.87	0.02	0.65	0.05	2.55	0.0	6.63	2.86	284.08
9.000	26.00	2800.00	533.87	533.97	0.08	0.01	0.10	3.47	0.0	0.06	0.04	286.38
9.000	26.00	3790.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]	[illegible]
9.100	200.00	660.00	530.44	532.10	0.37	1.10	1.66	10.34	11.00	0.0	3.25	19.39
9.100	206.00	1600.00	533.25	535.72	0.16	1.69	2.47	12.61	0.0	2.81	0.57	25.34
9.100	200.00	2200.00	534.65	537.41	0.27	1.86	2.76	13.33	11.00	1.40	0.77	30.18
9.100	200.00	3790.00	538.71	540.19	0.44	0.89	1.48	10.35	11.00	4.07	4.13	176.18
9.200	12.00	660.00	531.81	532.61	0.25	0.26	0.79	7.14	0.0	0.0	1.38	22.28
9.200	12.00	1600.00	535.09	536.34	0.25	0.37	1.24	8.94	0.0	3.28	1.85	32.55
9.200	12.00	2200.00	536.77	538.19	0.38	0.40	1.42	9.57	0.0	1.67	2.12	41.44
9.200	12.00	3790.00	539.32	540.33	0.14	[illegible]	1.01	8.84	0.0	2.55	0.81	191.47
11.000	283.00	660.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8.96	11.00	0.0	[illegible]	33.43
11.000	283.00	1600.00	543.11	544.96	4.67	0.18	1.85	11.30	11.00	2.07	8.01	48.29
11.000	283.00	2200.00	544.09	546.20	6.44	0.21	2.11	12.28	4097.00	0.98	7.32	55.33
11.000	283.00	3790.00	546.25	548.65	2.94	0.42	[illegible]	13.68	11.00	2.14	6.93	78.79

SUMMARY OF ERRORS

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CAUTION SECNO=    1.010  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.010  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.010  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.010  PROFILE= 4  CRITICAL DEPTH ASSUMED

CAUTION SECNO=    1.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    1.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    1.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    1.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=    4.010  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4.010  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    4.010  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    4.010  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4.010  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    4.010  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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THIS RUN EXECUTED

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3229
Harrisburg, Pa. 17105

10/24/77

T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG BERWICK SHICKSHINNY REACH
T3 WALKER RUN - 10 YR. FLOOD

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	1.	-1.000000	0.0	0.0	0.	639.500	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDF	IBW	CHNIM	ITRACE
	1.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

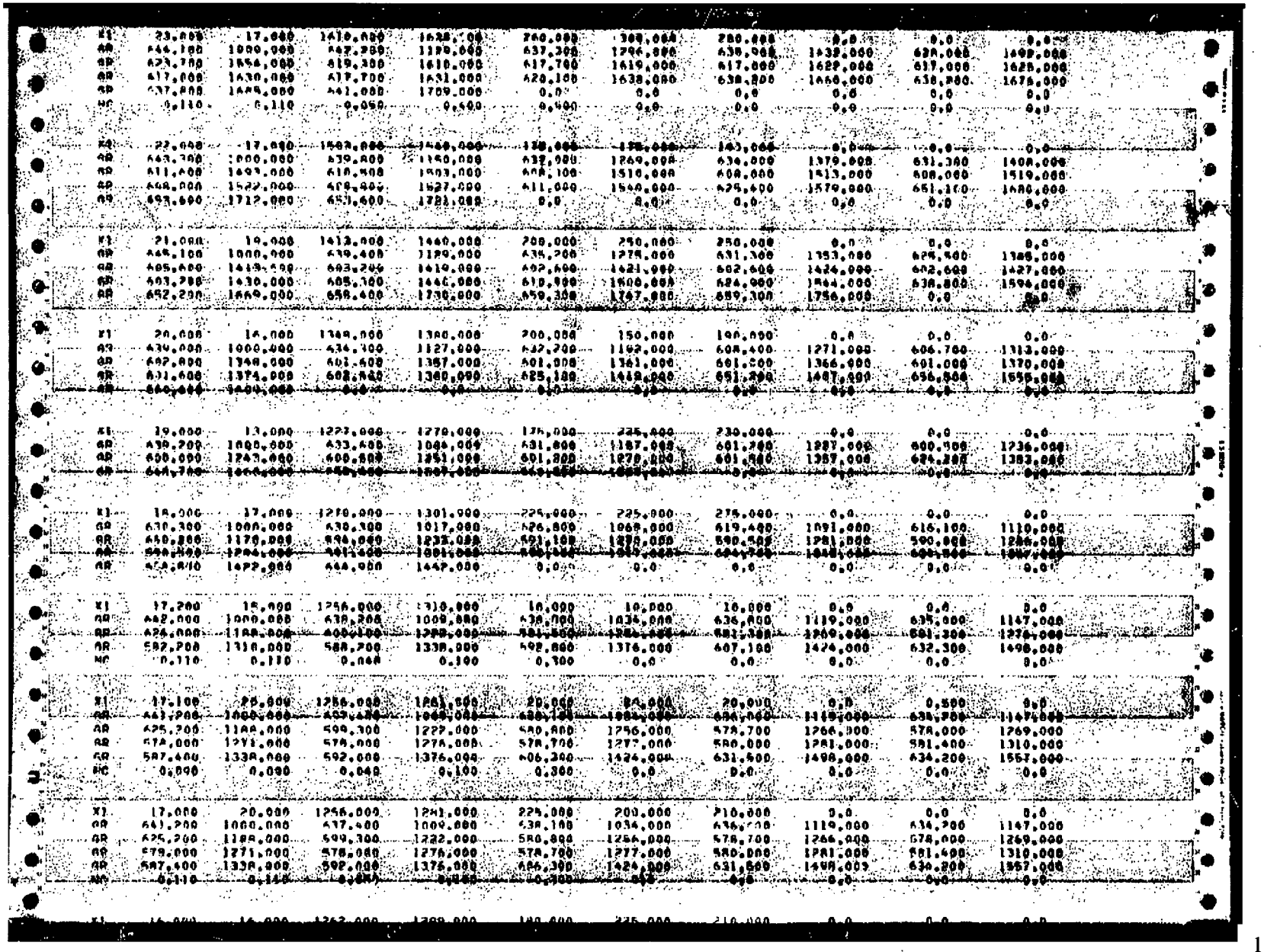
38.000	39.000	21.000	22.000	42.000	40.000	41.000	43.000	1.000	4.000
53.000	54.000	[illegible]	[illegible]	30.000	[illegible]	1.000	3.000	11.000	19.000
10.000	26.000	20.000	50.000	61.000	4.000	0.0	201.000	0.0	0.0

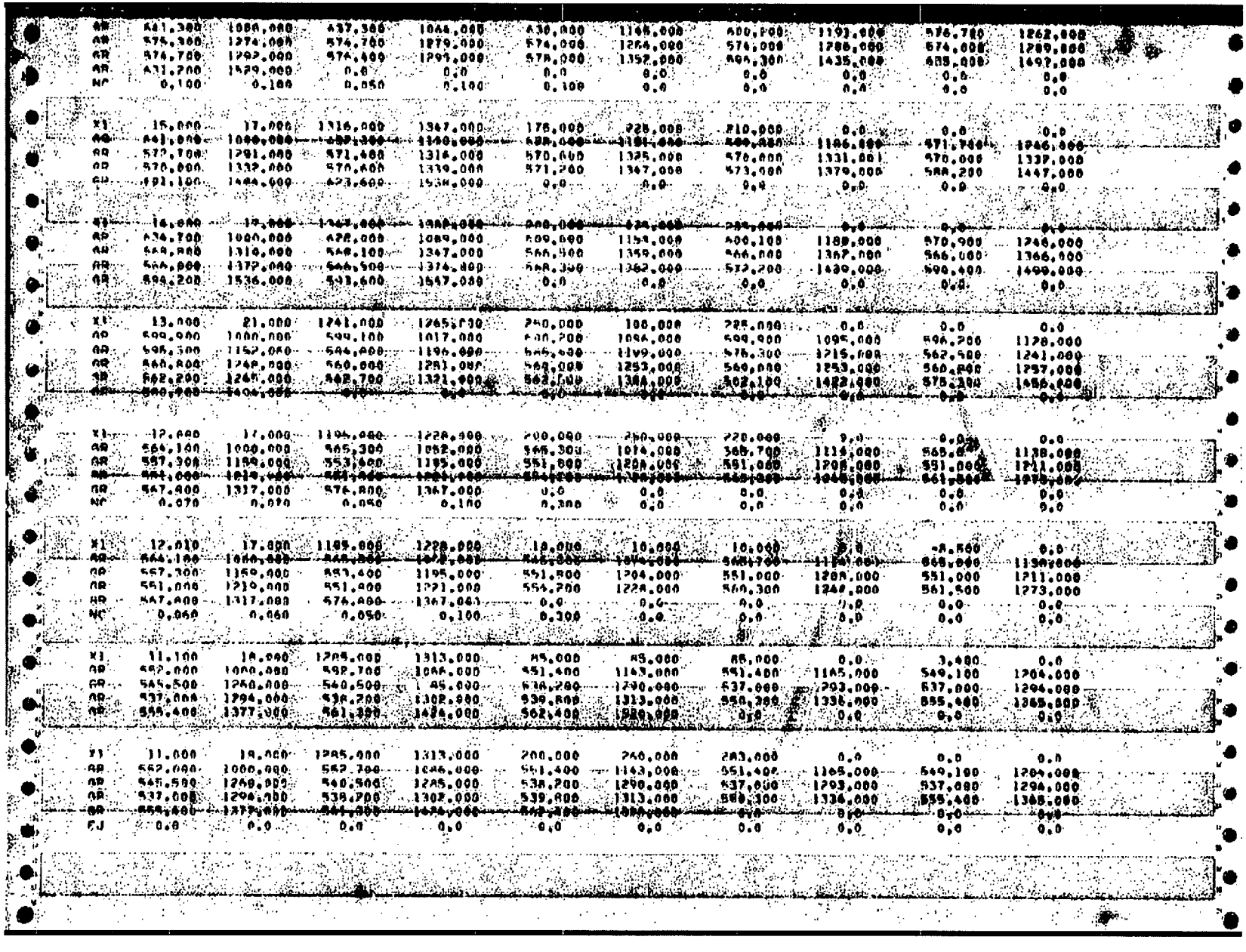
NC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
QT	6.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0

X1	26.000	26.000	1560.000	1600.000	275.000	375.000	440.000	0.0	0.0	0.0
GR	646.400	1000.000	644.600	1100.000	648.100	1240.000	645.500	1300.000	645.300	1340.000
GR	640.300	1495.000	636.300	1580.000	636.300	1587.000	635.000	1590.000	638.000	1595.000
GR	640.000	1597.000	[illegible]	1600.000	[illegible]	1600.000	650.100	1700.000	640.600	1700.000
GR	645.500	1830.000	650.700	1860.000	653.400	1950.000	655.700	2100.000	654.100	2200.000
GR	653.500	2300.000	655.300	2390.000	655.100	2475.000	656.800	2500.000	670.400	2550.000
GR	700.100	2625.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	26.000	18.000	1500.000	1600.000	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0
GR	645.200	1000.000	643.900	1147.000	641.700	1264.000	640.300	1397.000	637.200	599.000
GR	633.300	1652.000	629.500	1661.000	629.000	1662.000	629.000	1668.000	629.000	1675.000
GR	629.600	1677.000	631.900	1686.000	639.000	1756.000	640.700	1796.000	655.700	1879.000
GR	656.000	1897.000	655.400	1965.000	685.100	2027.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.400	0.500	0.0	0.0	0.0	0.0	0.0

X1	26.000	18.000	1600.000	1622.000	300.000	340.000	320.000	0.0	0.0	0.0
GR	645.600	1000.000	643.740	1203.000	640.600	1326.000	637.200	1437.000	687.600	1520.000
GR	635.400	1544.000	625.800	1600.000	623.500	1607.000	623.000	1609.000	623.000	1611.000
GR	620.000	1612.000	623.500	1614.000	635.600	1622.000	627.500	1673.000	639.000	1745.000
GR	650.800	1763.000	[illegible]	[illegible]	[illegible]	[illegible]	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0





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*****************************************************                    THIS RUN EXECUTED
   HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR - 01
   MODIFICATION - 50,51,52
*****************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 50 YR. FLOOD

J1   ICHECK     INQ      NINV      IDIR      STRT     METRIC     HVINS       Q       WSEL       FQ
        0.        3.       0.        1.  -1.000000     0.0        0.0       0.     640.500    0.0

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC      IBW     CHNIM     ITRACE
      2.000      0.0     -1.000      0.0       0.0      0.0       0.0       0.0      0.0       0.0
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                                                                   THIS RUN EXECUTED
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50,51,52
*************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q      WSEL      FQ
        0.       4.       0.       1. -1.000000     0.0      0.0     0.   641.000    0.0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW    CHNIM    ITRACE
     3.000     0.0   -1.000      0.0      0.0     0.0      0.0     0.0     0.0      0.0
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                                                                                              THIS RUN EXECUTED
*****************************************************
   HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
   ERROR CORR - 01
   MODIFICATION - 50,51,52
*****************************************************

T1        SUSQUEHANNA RIVER BASIN COMMISSION
T2        BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3        WALKER RUN - 500 YR. FLOOD

J1   ICHECK      INQ      NINV      IDIR      STRT      METRIC     HVINS       Q        WSEL       FQ
        0.        6.        0.        1.  -1.000000     0.0        0.0        0.     642.000      0.0

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH       FN       ALLDC       IBW      CHNIM     ITRACE
     15.000      0.0    -1.000      0.0       0.0       0.0       0.0        0.0       0.0       0.0
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THIS RUN EXECUTED

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**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
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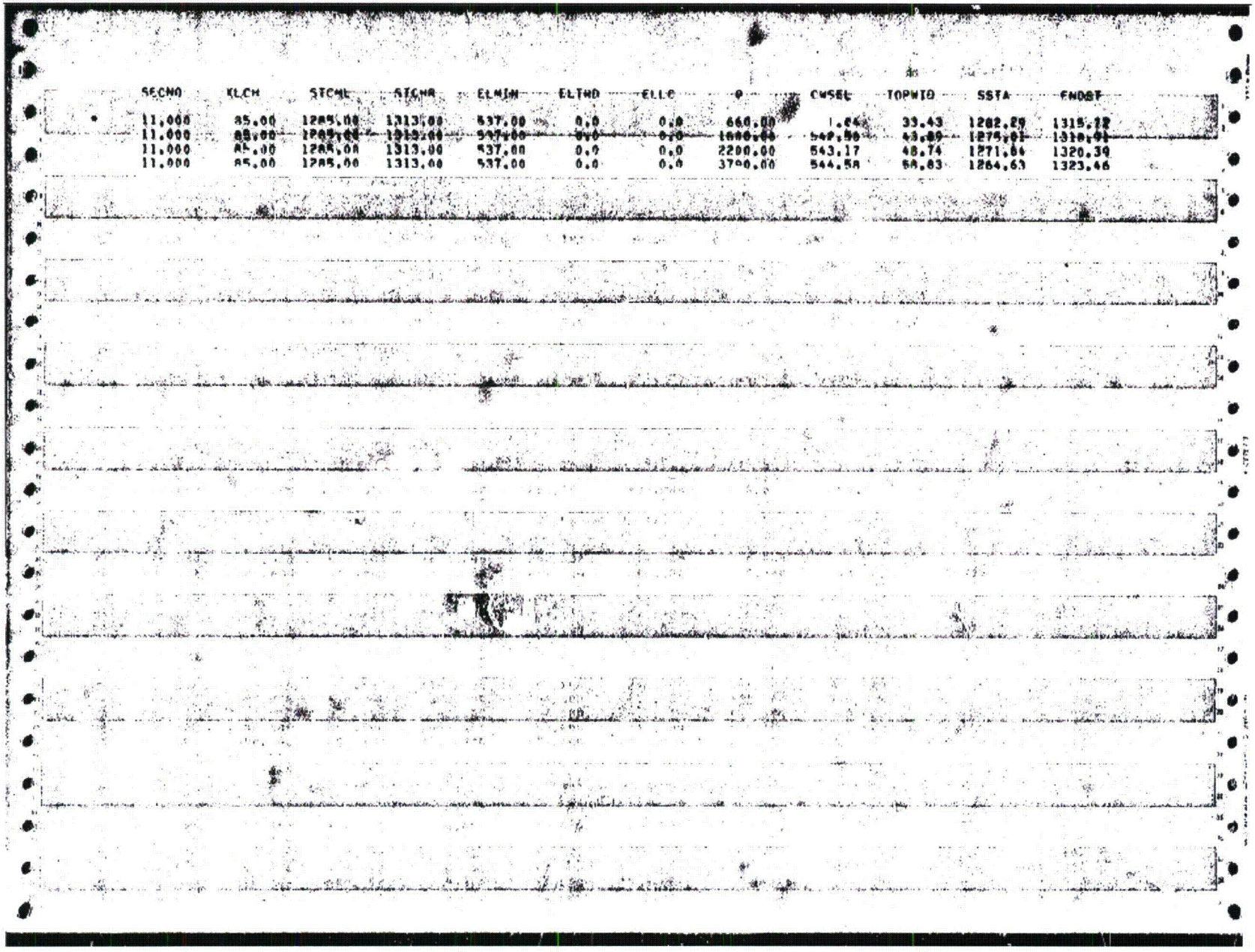
NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

WALKER RUN - 10 YR. FLOOD

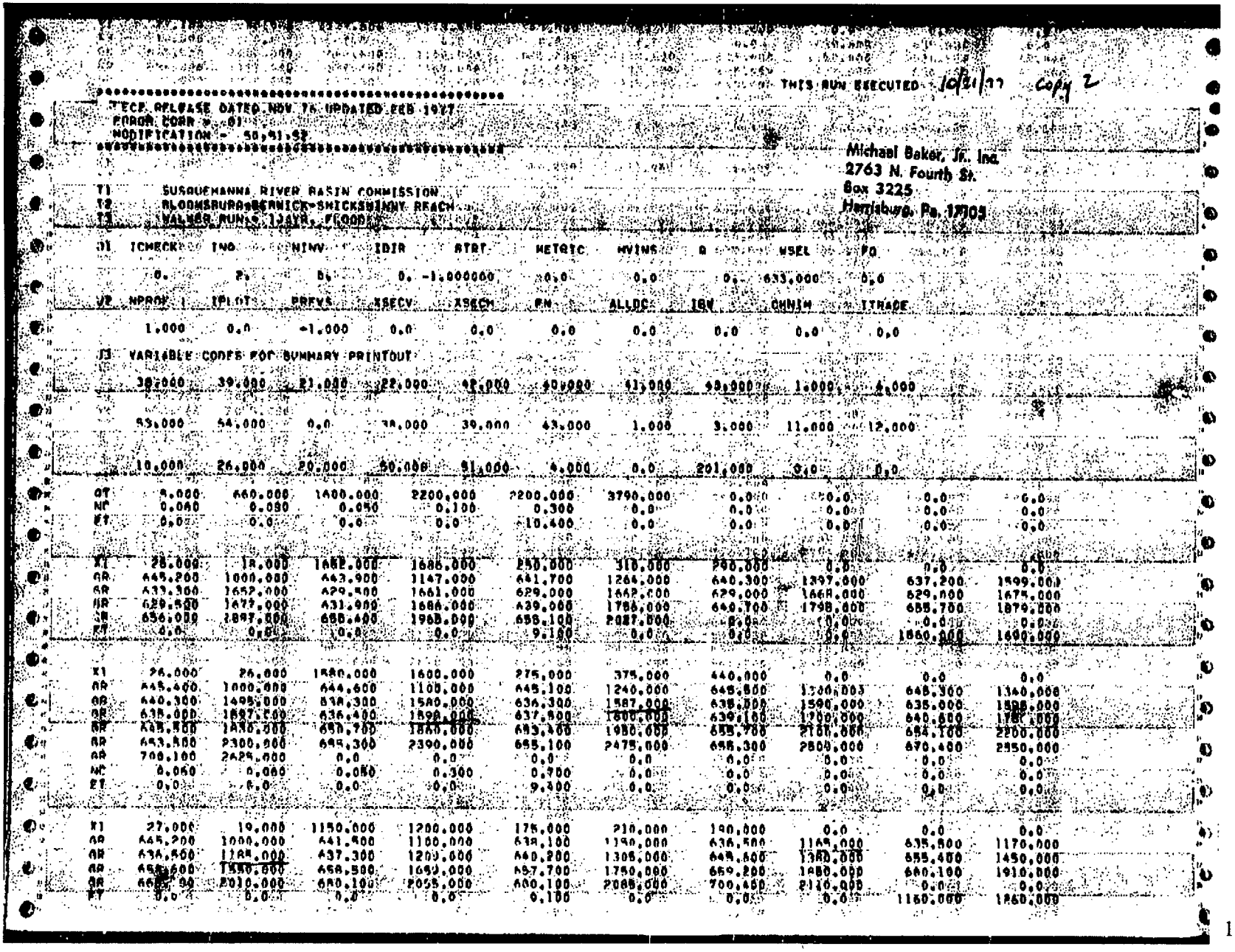
SUMMARY PRINTOUT

	SECNO	XLCH	STCHL	STCHR	ELMIN	ELTRD	ELLC	Q	CWSEL	TOPWID	SSTA	ENDST
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	460.00	639.89	160.03	1538.79	1706.78
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	1600.00	640.21	237.74	1502.88	1740.86
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	2200.00	640.83	269.07	1487.98	1757.05
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	3790.00	641.11	297.26	1469.98	1767.24
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	460.00	632.24	35.40	1654.38	1689.88
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	1600.00	634.38	72.41	1637.71	1710.15
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	2200.00	635.49	94.81	1624.40	1719.48
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	3790.00	638.98	134.04	1602.08	1736.06
*	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	460.00	627.18	72.60	1591.93	1664.51
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	1600.00	628.68	97.03	1583.15	1680.19
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	2200.00	629.17	102.80	1580.39	1683.19
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	3790.00	630.49	117.79	1578.95	1696.74
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	460.00	620.62	45.50	1593.13	1638.64
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	1600.00	622.56	72.40	1568.53	1640.90
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	2200.00	623.40	85.32	1556.79	1642.11
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	3790.00	625.27	118.97	1531.32	1648.29
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	460.00	610.91	40.31	1499.26	1539.57
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	1600.00	612.00	51.50	1491.23	1542.73
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	2200.00	612.60	54.69	1489.66	1544.35
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	3790.00	614.08	66.09	1482.30	1548.39
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	460.00	606.38	40.24	1441.46	1482.10
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	1600.00	608.44	67.23	1409.00	1476.23
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	2200.00	609.38	79.30	1407.69	1487.03
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	3790.00	611.39	97.06	1405.65	1502.71
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	460.00	603.00	45.23	1337.34	1382.57
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	1600.00	604.85	64.91	1320.83	1385.74
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	2200.00	606.81	77.20	1310.24	1387.44
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	3790.00	608.72	120.81	1269.93	1390.74
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	460.00	602.27	132.87	1225.01	1357.88
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	1600.00	603.18	134.51	1224.41	1358.92
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	2200.00	603.60	135.68	1223.80	1359.48
	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	3790.00	604.22	137.06	1223.06	1360.11

SECNO	XLCH	STCHL	STCHR	ELMIN	ELTRD	ELLC	Q	CWSEL	TOPWID	SSTA	ENDST
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	660.00	597.80	58.16	1251.10	1303.38
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	1600.00	594.09	74.20	1232.11	1306.39
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	2200.00	594.81	83.03	1224.78	1307.82
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	3790.00	596.65	105.42	1206.08	1311.50
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	660.00	583.20	62.10	1252.92	1315.02
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	1600.00	584.22	68.25	1251.18	1319.43
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	2200.00	584.84	70.99	1250.41	1321.40
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	3790.00	585.88	77.08	1248.69	1325.76
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	660.00	581.69	50.38	1255.28	1305.66
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	1600.00	583.50	65.49	1251.96	1317.45
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	2200.00	584.27	70.63	1250.54	1321.07
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	3790.00	585.16	80.40	1247.06	1327.40
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	660.00	581.94	56.02	1254.64	1310.66
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	1600.00	582.93	65.09	1252.08	1317.16
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	2200.00	583.68	69.94	1250.70	1320.65
17.000	[illegible].00	1256.00	1281.00	578.00	0.0	0.0	3790.00	585.39	81.04	1247.57	1328.61
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	660.00	577.37	71.19	1259.97	1331.16
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	1600.00	578.65	98.83	1256.11	1354.94
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	2200.00	579.11	102.39	1254.73	1357.02
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	3790.00	579.96	108.66	1252.18	1360.84
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	660.00	572.90	134.24	1243.38	1377.59
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	1600.00	573.85	141.50	1241.32	1382.82
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	2200.00	574.38	145.02	1240.17	1385.19
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	3790.00	575.41	151.88	1237.92	1389.80
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	660.00	569.14	94.72	1299.58	1394.30
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	1600.00	570.47	154.64	1259.18	1413.82
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	2200.00	571.06	177.02	1245.64	1422.66
14.000	210.00	1347.00	1382.00	565.00	0.0	0.0	3790.00	572.21	195.62	1243.40	1439.03
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	660.00	563.08	184.69	1239.83	1424.52
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	1600.00	563.63	187.26	1238.69	1425.95
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	2200.00	563.[illegible]	189.42	1238.10	1426.[illegible]
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	3790.00	564.83	191.44	1236.85	1428.29
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	660.00	553.92	36.98	1190.22	1227.10
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	1600.00	555.37	61.26	1172.21	1233.47
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	2200.00	556.[illegible]	73.[illegible]	1163.16	1236.69
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	3790.00	558.[illegible]	[illegible]	1166.78	1243.[illegible]
12.010	0.00	1195.00	1228.00	542.50	0.0	0.0	660.00	545.61	30.91	1180.20	1227.70
12.010	20.00	1195.00	1228.00	542.50	0.0	0.0	1600.00	546.84	51.38	1179.35	1230.[illegible]
12.010	220.00	1195.00	1228.00	542.50	0.0	0.0	2200.00	547.09	57.68	1174.[illegible]	1232.52
12.010	220.00	1195.00	1228.00	542.50	0.0	0.0	3790.00	548.[illegible]	71.71	1168.[illegible]	1236.21
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	660.00	543.68	28.40	1285.52	1314.01
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	1600.00	545.27	39.30	1278.15	1317.56
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	2200.00	546.45	44.31	1274.[illegible]	1319.03
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	3790.00	547.41	54.90	1267.36	1322.26



SECNO	KLCH	STCHL	STCHR	ELMIN	ELTHD	ELLC	Q	CWSEL	TOPWID	SSTA	ENDST
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	660.00	1.64	33.43	1282.29	1315.72
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	1800.00	542.86	43.89	1275.01	1318.91
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	2200.00	543.17	48.74	1271.64	1320.39
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	3700.00	544.58	60.83	1264.63	1323.46



THIS RUN EXECUTED 10/21/77 Copy 2

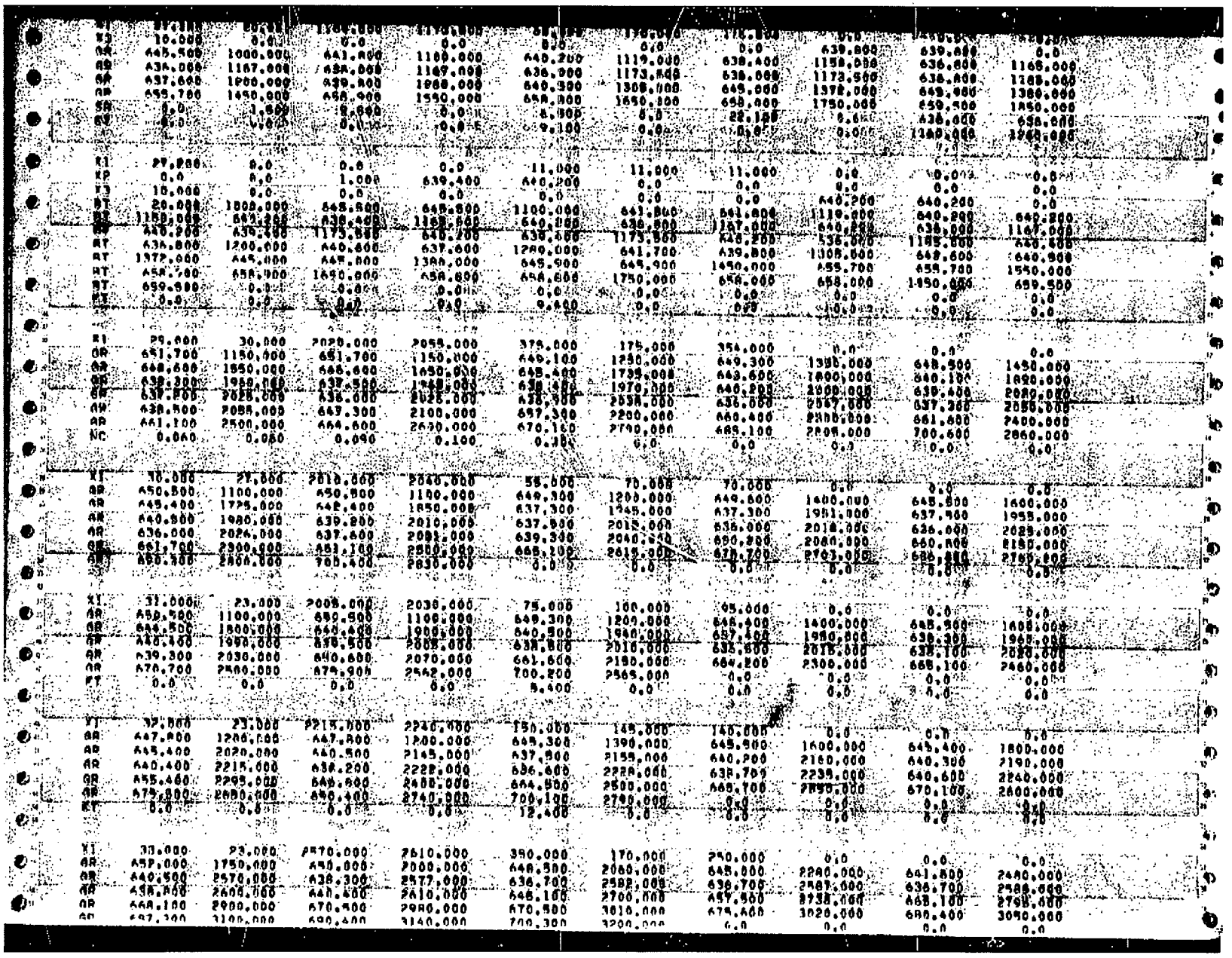
HECP RELEASE DATED NOV 76 UPDATED FEB 1977
FORGN CORR # 01
MODIFICATION - 50,51,52

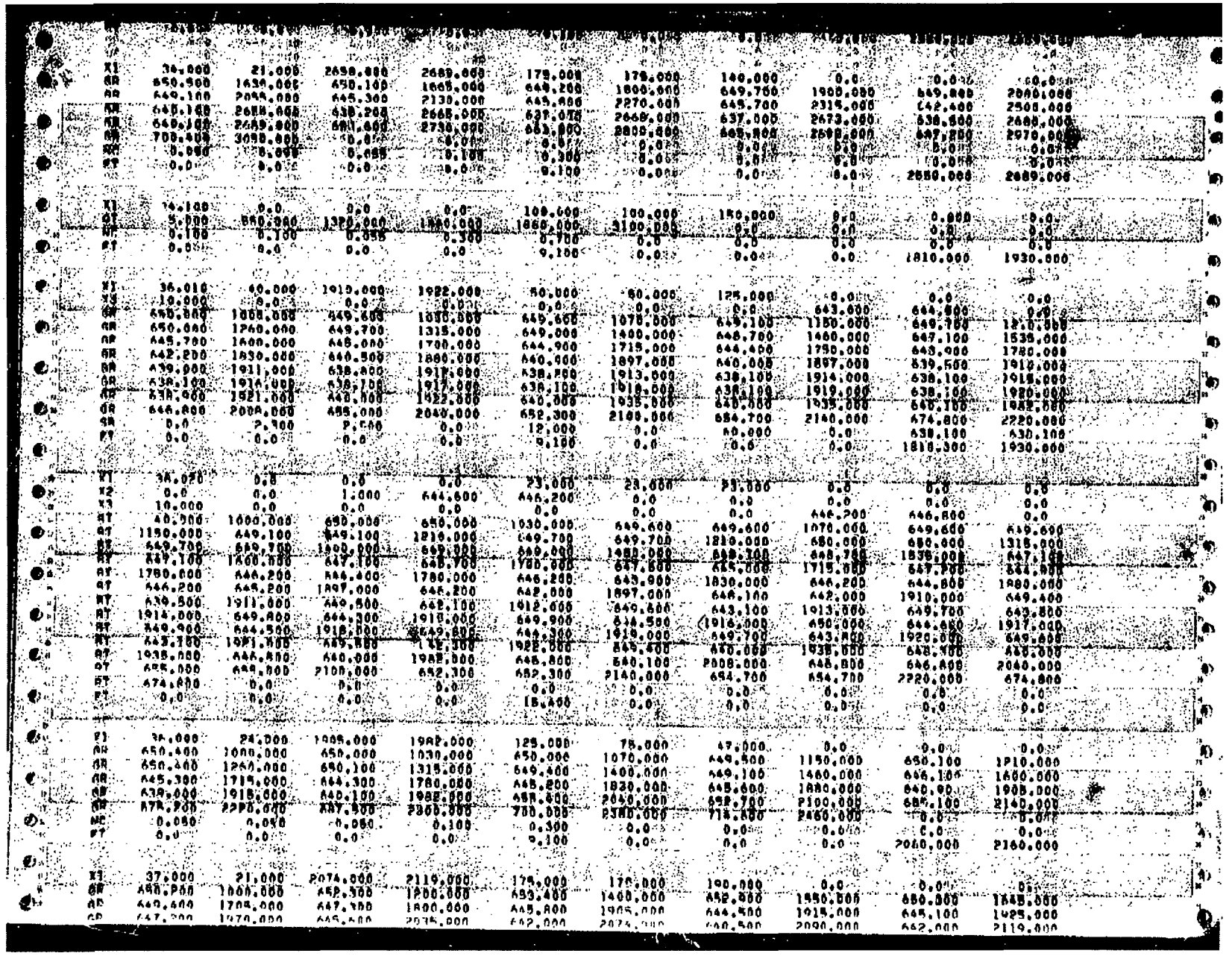
Michael Baker, Jr. Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

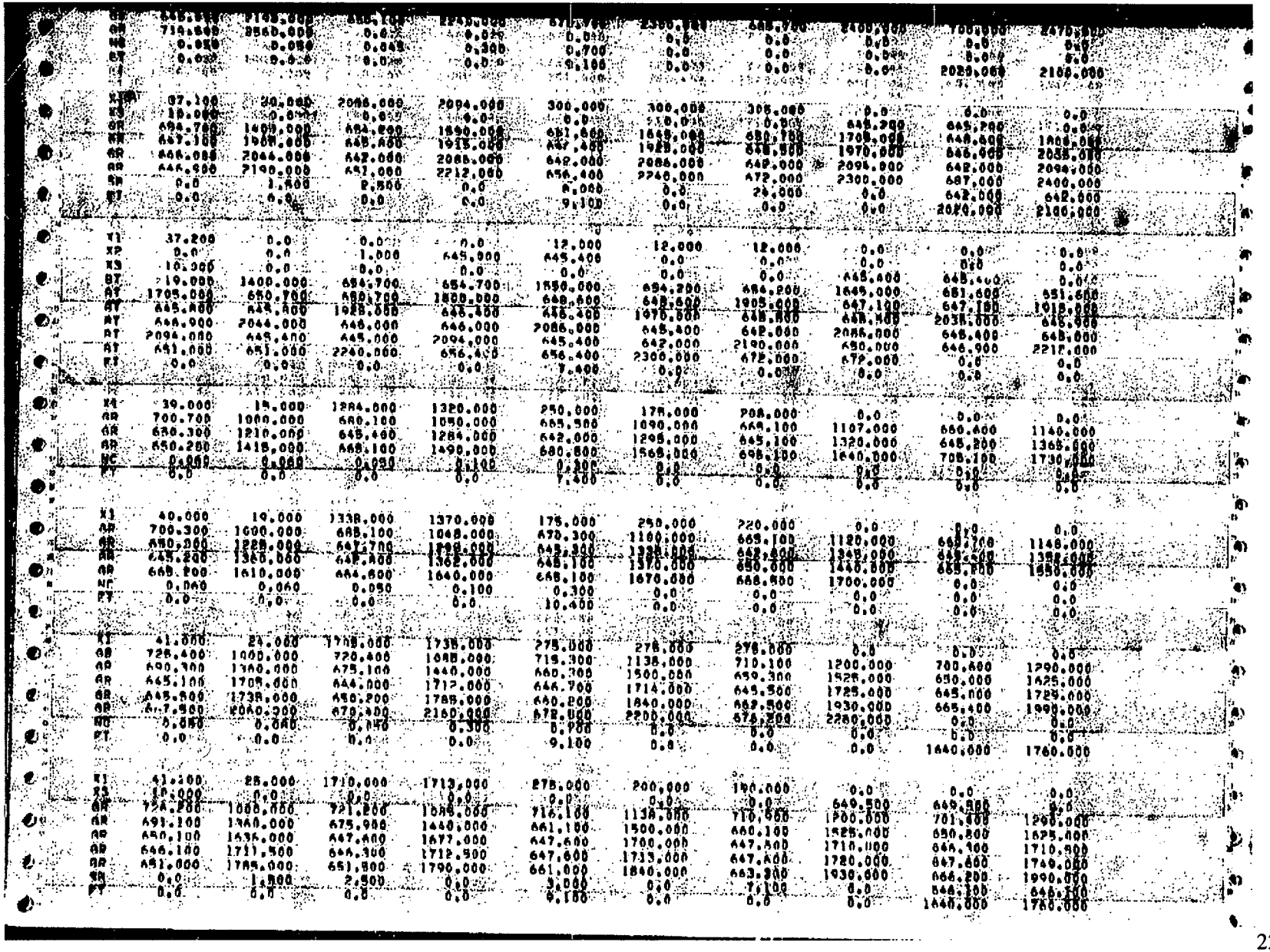
T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3 VALMER RUN, 100YR, FLOODS

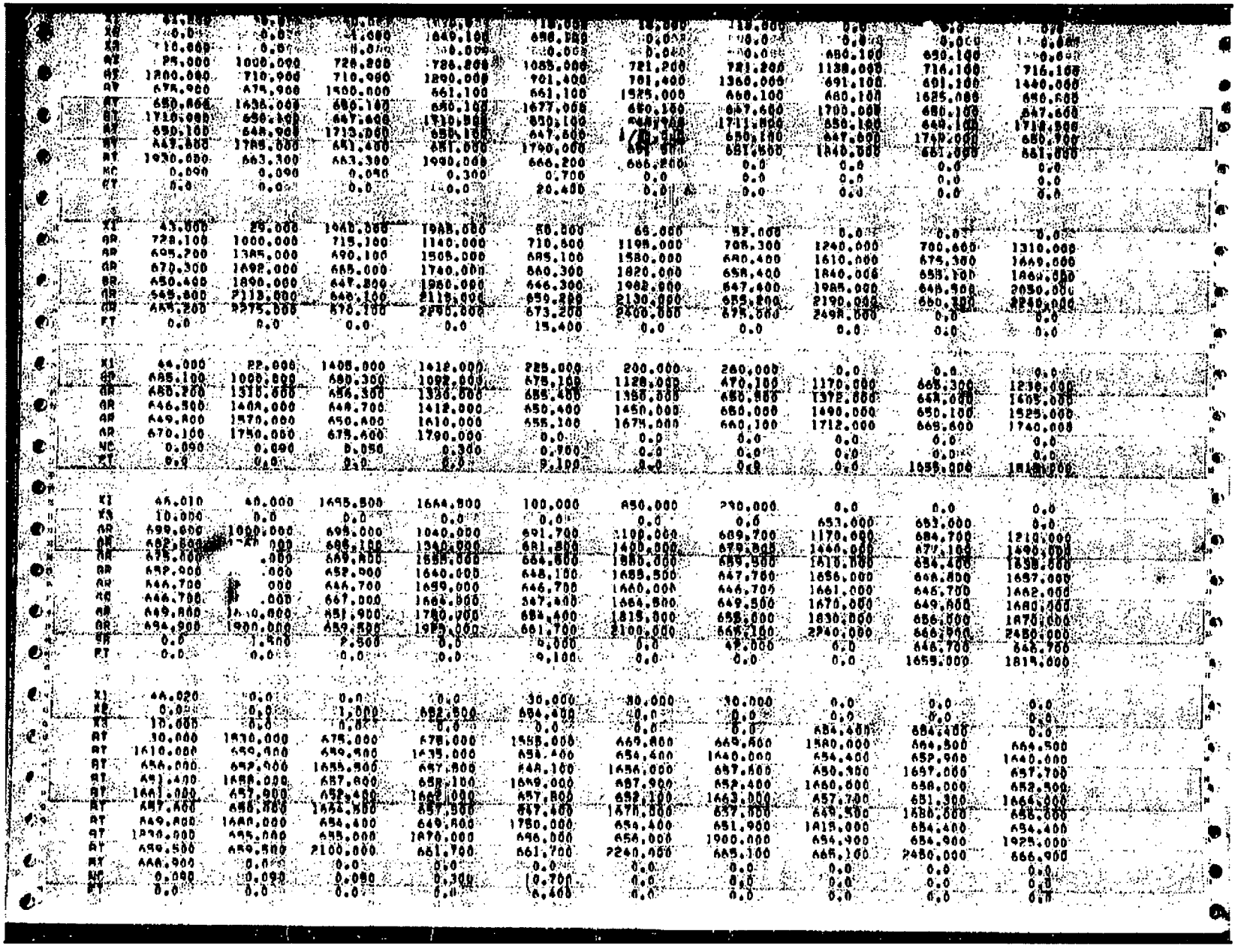
J1	ICHECK	INO	NINV	IDIR	STRT	METRIC	HVINS	Q		WSEL	FQ
	0.	2.	5.	0.	-1.000000	0.0	0.0	0.		633.000	0.0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW		CHNIM	ITRACE
	1.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0		0.0	0.0
J3	VARIABLE CODES FOR SUMMARY PRINTOUT										
	38.000	39.000	21.000	22.000	42.000	40.000	41.000	43.000		1.000	4.000
	53.000	54.000	0.0	38.000	39.000	43.000	1.000	3.000		11.000	12.000
	10.000	26.000	20.000	50.000	51.000	4.000	0.0	201.000		0.0	0.0

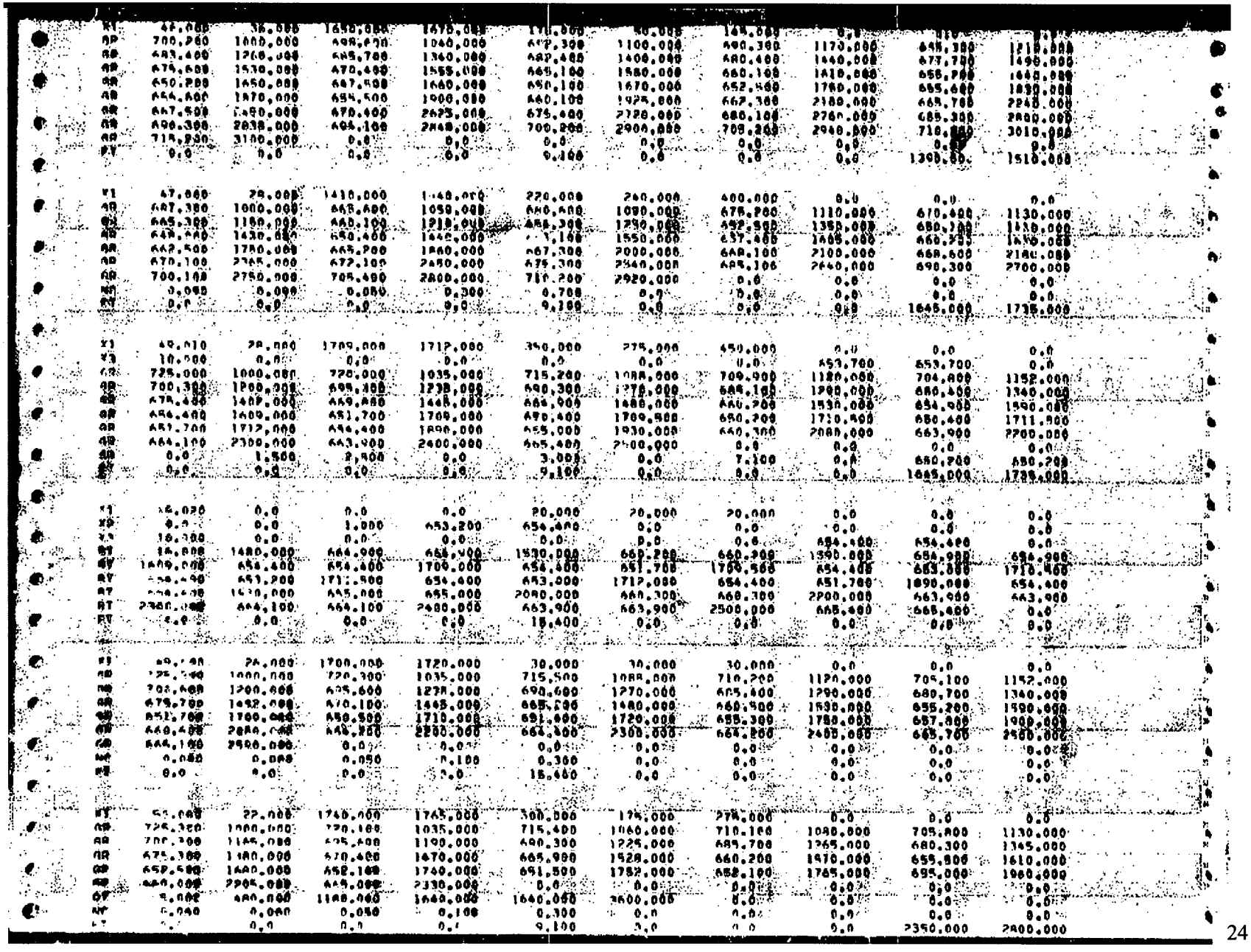
QT	0.000	660.000	1400.000	2200.000	2200.000	3790.000	0.0	0.0		0.0	0.0
NC	0.060	0.080	0.050	0.100	0.300	0.0	0.0	0.0		0.0	0.0
ET	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0		0.0	0.0
X1	28.000	18.000	1662.000	1686.000	250.000	310.000	290.000	0.0		0.0	0.0
GR	645.200	1000.000	643.900	1147.000	641.700	1264.000	640.300	1397.000		637.200	1399.000
GR	633.300	1652.000	629.500	1661.000	629.000	1662.000	629.000	1668.000		629.000	1675.000
GR	629.500	1677.000	631.000	1686.000	639.000	1786.000	640.700	1798.000		655.700	1879.000
GR	656.000	1897.000	658.400	1968.000	658.100	2027.000	0.0	0.0		0.0	0.0
ET	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0		1860.000	1690.000
X1	26.000	26.000	1580.000	1600.000	275.000	375.000	440.000	0.0		0.0	0.0
GR	645.400	1000.000	644.600	1100.000	645.100	1240.000	645.800	1330.000		645.300	1340.000
GR	640.300	1495.000	638.300	1580.000	636.300	1587.000	638.000	1590.000		635.000	1598.000
GR	638.000	1687.000	636.400	1890.000	637.800	1800.000	639.100	1900.000		640.600	1980.000
GR	648.500	1880.000	650.700	1860.000	653.400	1980.000	655.700	2100.000		654.100	2200.000
GR	663.800	2300.000	695.300	2390.000	685.100	2475.000	698.300	2800.000		870.400	2950.000
GR	700.100	2429.000	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
NC	0.060	0.080	0.050	0.300	0.700	0.0	0.0	0.0		0.0	0.0
ET	0.0	0.0	0.0	0.0	9.300	0.0	0.0	0.0		0.0	0.0
X1	27.000	19.000	1150.000	1200.000	175.000	210.000	190.000	0.0		0.0	0.0
GR	645.200	1000.000	641.900	1100.000	638.100	1190.000	636.500	1169.000		635.800	1170.000
GR	634.500	1188.000	637.300	1200.000	640.200	1305.000	648.800	1380.000		655.400	1450.000
GR	658.600	1550.000	668.500	1660.000	657.700	1750.000	669.200	1880.000		680.100	1910.000
GR	668.00	2010.000	680.100	2055.000	680.100	2088.000	700.400	2110.000		0.0	0.0
ET	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0		1150.000	1860.000

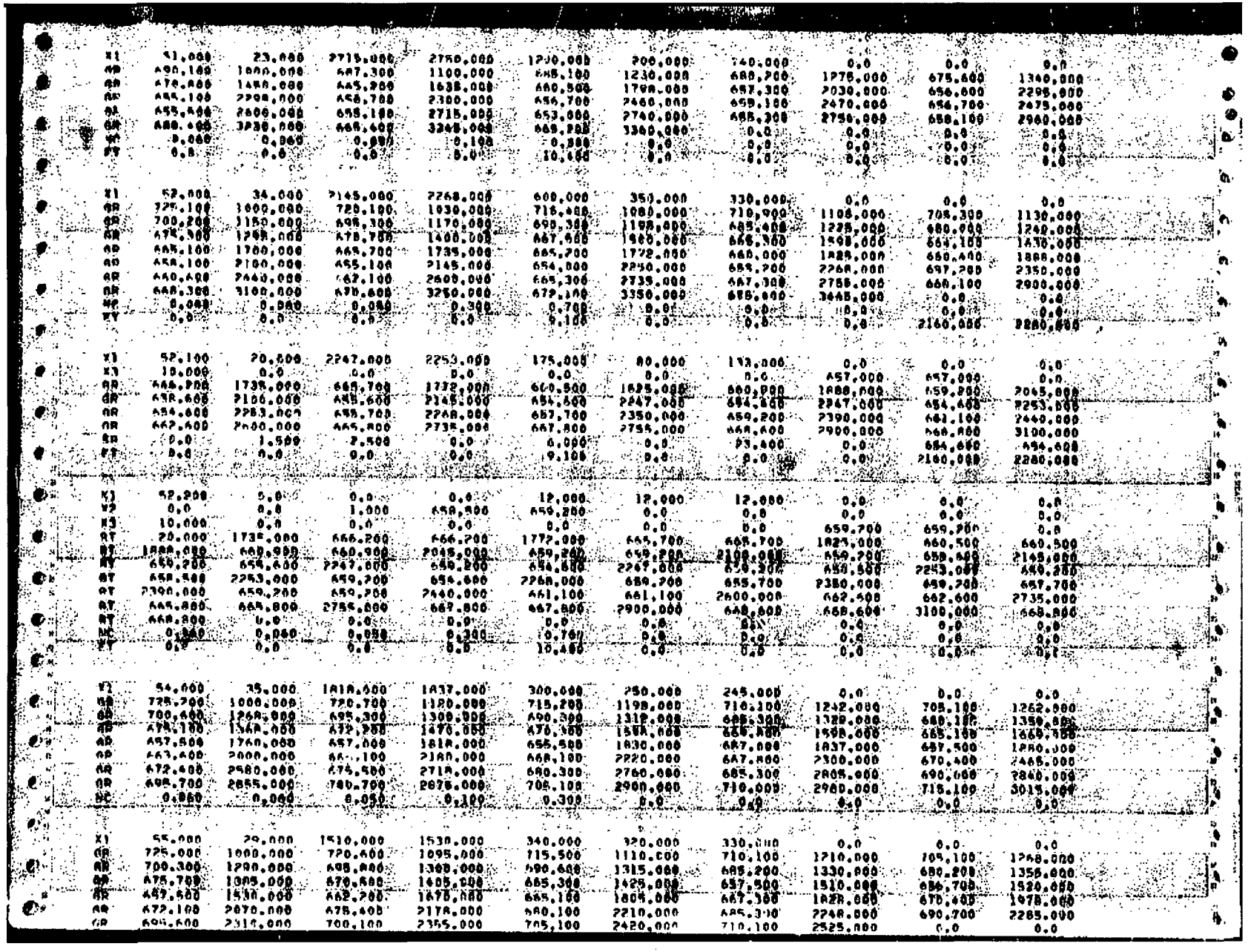












X1	51,000	23,000	2715,000	2750,000	1200,000	200,000	740,000	0,0	0,0	0,0
QR	690,100	1000,000	687,300	1100,000	685,100	1230,000	688,200	1275,000	675,600	1340,000
QR	670,800	1400,000	665,200	1638,000	660,500	1700,000	687,300	2030,000	656,000	2295,000
QR	655,100	2200,000	658,700	2300,000	656,700	2460,000	659,100	2470,000	654,700	2475,000
QR	655,400	2800,000	658,100	2715,000	653,000	2740,000	685,300	2750,000	658,100	2960,000
QR	680,600	3230,000	668,600	3248,000	668,200	3360,000	0,0	0,0	0,0	0,0
MC	0,000	0,000	0,000	0,100	0,300	0,0	0,0	0,0	0,0	0,0
RT	0,0	0,0	0,0	0,0	10,600	0,0	0,0	0,0	0,0	0,0
X1	52,000	34,000	2145,000	2268,000	600,000	350,000	330,000	0,0	0,0	0,0
QR	725,100	1000,000	720,100	1030,000	715,600	1080,000	710,900	1108,000	708,300	1130,000
QR	700,200	1150,000	695,300	1170,000	690,300	1198,000	685,400	1228,000	680,000	1240,000
QR	675,300	1260,000	670,700	1400,000	667,600	1480,000	666,300	1508,000	664,100	1430,000
QR	665,100	1700,000	665,700	1735,000	665,700	1772,000	660,000	1828,000	660,400	1888,000
QR	658,100	2100,000	655,100	2145,000	654,000	2250,000	685,700	2268,000	697,200	2350,000
QR	640,400	2440,000	642,100	2600,000	665,300	2739,000	667,300	2755,000	660,100	2900,000
QR	668,300	3100,000	670,600	3250,000	672,100	3350,000	688,600	3648,000	0,0	0,0
MC	0,000	0,000	0,000	0,300	0,700	0,0	0,0	0,0	0,0	0,0
RT	0,0	0,0	0,0	0,0	9,100	0,0	0,0	0,0	2160,000	2280,000
X1	52,100	20,000	2242,000	2253,000	175,000	80,000	113,000	0,0	0,0	0,0
X2	10,000	0,0	0,0	0,0	0,0	0,0	0,0	657,000	657,000	0,0
QR	668,700	1738,000	668,700	1772,000	660,500	1825,000	800,000	1888,000	659,200	2065,000
QR	658,600	2100,000	655,600	2145,000	654,600	2247,000	654,600	2247,000	654,600	2253,000
QR	654,600	2253,000	658,700	2268,000	687,700	2350,000	659,200	2390,000	661,100	2440,000
QR	662,600	2900,000	665,800	2735,000	667,800	2755,000	668,600	2900,000	660,800	3100,000
MC	0,0	1,500	2,500	0,0	0,000	0,0	93,600	0,0	654,600	654,600
RT	0,0	0,0	0,0	0,0	9,100	0,0	0,0	0,0	2160,000	2280,000
X1	52,200	0,0	0,0	0,0	12,000	12,000	12,000	0,0	0,0	0,0
X2	0,0	0,0	1,000	658,800	659,200	0,0	0,0	0,0	0,0	0,0
X3	10,000	0,0	0,0	0,0	0,0	0,0	0,0	659,700	659,700	0,0
QT	20,000	1735,000	666,200	666,200	1772,000	665,700	665,700	1825,000	660,500	660,500
QT	1888,000	660,900	660,900	2045,000	659,200	659,200	2100,000	659,200	659,600	2145,000
QT	659,200	654,600	2247,000	659,200	654,600	2247,000	659,200	659,600	2253,000	659,200
QT	658,600	2253,000	659,200	654,600	2268,000	659,700	655,700	2350,000	659,200	657,700
QT	2390,000	659,200	659,200	2440,000	661,100	661,100	2600,000	662,600	662,600	2735,000
QT	665,800	665,800	2755,000	667,800	667,800	2900,000	668,600	668,600	3100,000	668,800
RT	668,800	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
MC	0,000	0,000	0,000	0,300	0,700	0,0	0,0	0,0	0,0	0,0
RT	0,0	0,0	0,0	0,0	10,600	0,0	0,0	0,0	0,0	0,0
X1	54,000	35,000	1818,000	1837,000	300,000	250,000	245,000	0,0	0,0	0,0
QR	725,700	1000,000	720,700	1120,000	715,200	1198,000	710,100	1242,000	705,100	1262,000
QR	700,400	1268,000	695,300	1308,000	690,300	1318,000	685,300	1328,000	680,100	1350,000
QR	675,100	1368,000	672,200	1478,000	670,300	1588,000	666,800	1508,000	665,100	1668,000
QR	657,500	1760,000	657,000	1818,000	655,500	1830,000	657,000	1837,000	657,500	1880,000
QR	663,400	2000,000	666,100	2180,000	668,100	2220,000	667,800	2300,000	670,400	2465,000
QR	672,400	2580,000	675,500	2718,000	680,300	2760,000	685,300	2805,000	690,000	2840,000
QR	698,700	2855,000	700,700	2878,000	705,100	2900,000	710,000	2980,000	715,100	3015,000
MC	0,000	0,000	0,000	0,100	0,300	0,0	0,0	0,0	0,0	0,0
X1	55,000	29,000	1510,000	1530,000	340,000	320,000	330,000	0,0	0,0	0,0
QR	725,000	1000,000	720,600	1095,000	715,500	1110,000	710,100	1210,000	705,100	1268,000
QR	700,300	1280,000	695,800	1308,000	690,600	1315,000	685,200	1330,000	680,200	1358,000
QR	675,700	1385,000	670,600	1405,000	665,300	1425,000	657,500	1510,000	656,700	1520,000
QR	667,600	1530,000	662,200	1670,000	665,100	1804,000	667,300	1828,000	670,400	1978,000
QR	672,100	2070,000	675,400	2178,000	680,100	2210,000	685,300	2248,000	690,700	2285,000
QR	698,600	2310,000	700,100	2355,000	705,100	2420,000	710,100	2525,000	0,0	0,0

LA	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.0	
RT	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	
X1	56.000	29.000	1443.000	1460.000	300.000	325.000	310.000	0.0	0.0	0.0	
AR	725.400	1000.000	720.100	1095.000	715.200	1140.000	710.600	1170.000	705.200	1220.000	
AR	700.400	1275.000	695.200	1285.000	690.300	1305.000	685.100	1320.000	680.700	1335.000	
AR	675.400	1360.000	665.300	1420.000	660.000	1443.000	650.000	1460.000	659.100	1460.000	
AR	650.700	1550.000	665.600	1600.000	665.800	1705.000	667.900	1800.000	670.900	1870.000	
AR	675.400	2042.000	680.900	2070.000	688.800	2100.000	690.100	2125.000	695.700	2140.000	
AR	700.200	2162.000	705.600	2190.000	710.600	2220.000	715.100	2260.000	0.0	0.0	
NC	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.0	
RT	0.0	0.0	0.0	0.0	0.000	0.0	0.0	0.0	0.0	0.0	
X1	57.000	35.000	1437.000	1520.000	160.000	170.000	160.000	0.0	0.0	0.0	
AR	725.000	1000.000	720.100	1056.000	715.400	1095.000	710.200	1155.000	705.600	1190.000	
AR	700.200	1240.000	695.000	1280.000	690.300	1332.000	685.700	1360.000	680.300	1398.000	
AR	675.100	1428.000	665.100	1502.000	661.000	1507.000	659.000	1510.000	660.600	1520.000	
AR	662.900	1600.000	665.800	1730.000	667.100	1760.000	668.500	1770.000	667.100	1858.000	
AR	670.100	1975.000	675.500	2001.000	680.300	2125.000	685.100	2180.000	690.900	2200.000	
AR	695.100	2222.000	700.700	2252.000	705.400	2260.000	710.400	2268.000	715.200	2326.000	
AR	720.700	2372.000	725.100	2419.000	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.100	0.090	0.058	0.400	0.800	0.0	0.0	0.0	0.0	0.0	
X1	58.000	31.000	1412.000	1440.000	250.000	175.000	250.000	0.0	0.0	0.0	
AR	725.100	1000.000	720.000	1022.000	715.400	1052.000	710.200	1085.000	705.200	1110.000	
AR	700.100	1140.000	690.300	1172.000	685.400	1240.000	680.500	1290.000	675.800	1318.000	
AR	670.100	1360.000	665.700	1417.000	661.000	1430.000	665.700	1440.000	666.600	1500.000	
AR	668.000	1550.000	667.500	1580.000	668.900	1650.000	670.200	1760.000	675.100	1830.000	
AR	677.300	1900.000	680.300	1980.000	685.400	2035.000	690.700	2085.000	695.300	2080.000	
AR	700.700	2095.000	705.400	2100.000	710.400	2110.000	715.200	2100.000	720.100	2140.000	
AR	725.100	2150.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.100	0.090	0.080	0.400	0.800	0.0	0.0	0.0	0.0	0.0	
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1610.000	1780.000	
X1	60.010	17.000	1618.000	1630.000	250.000	25.000	105.000	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	670.000	668.600	0.0	
AR	679.900	1242.000	674.700	1315.000	672.700	1372.000	671.700	1390.000	668.900	1490.000	
AR	668.000	1520.000	662.600	1616.000	662.600	1616.000	661.600	1625.000	662.800	1634.000	
AR	662.800	1634.000	667.800	1740.000	668.700	1820.000	669.700	1918.000	674.800	1960.000	
AR	679.700	2040.000	684.600	2125.000	0.0	0.0	0.0	0.0	0.0	0.0	
AR	0.0	1.000	2.000	0.0	10.000	0.0	143.000	0.0	0.0	0.0	
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1610.000	1780.000	
X1	60.070	0.0	0.0	0.0	41.000	41.000	41.000	0.0	0.0	0.0	
X2	0.0	0.0	1.000	670.100	668.700	0.0	0.0	0.0	0.0	0.0	
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	671.300	668.700	0.0	
RT	17.000	1242.000	679.500	679.500	1335.000	674.700	674.700	1372.000	672.700	672.700	
RT	1390.000	672.600	671.700	1490.000	672.200	668.900	1920.000	672.000	668.000	1616.000	
RT	671.300	662.600	1616.000	672.100	670.100	1625.000	672.100	670.100	1634.000	672.100	
RT	670.100	1634.000	671.300	662.800	1740.000	670.400	667.800	1820.000	668.700	668.700	
RT	1910.000	668.700	669.700	1965.000	674.800	674.800	2040.000	679.700	679.700	2125.000	
RT	504.600	684.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NC	0.100	0.100	0.040	0.300	0.700	0.0	0.0	0.0	0.0	0.0	
RT	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	0.0	0.0	
X1	63.000	29.000	1420.000	1630.000	90.000	125.000	109.000	0.0	0.0	0.0	
AR	725.000	1000.000	720.000	1038.000	715.200	1048.000	710.200	1062.000	705.700	1090.000	
AR	700.400	1102.000	695.100	1124.000	690.400	1150.000	685.300	1205.000	680.100	1242.000	
AR	675.300	1335.000	672.300	1390.000	668.600	1520.000	665.100	1620.000	663.000	1625.000	
AR	665.600	1630.000	668.600	1740.000	670.300	1910.000	675.400	1960.000	680.300	2040.000	

OR	685.200	2125.000	690.100	2162.000	695.500	2185.000	700.100	2210.000	705.200	2220.000
OR	710.200	2245.000	715.600	2258.000	720.500	2270.000	725.100	2290.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
XI	61.000	20.000	1730.000	1745.000	225.000	225.000	260.000	0.0	0.0	0.0
OR	725.400	1000.000	720.500	1032.000	715.000	1052.000	710.200	1076.000	705.300	1100.000
OR	700.100	1150.000	695.000	1150.000	690.200	1180.000	685.400	1210.000	680.300	1252.000
OR	675.000	1370.000	674.100	1405.000	670.200	1470.000	668.100	1680.000	666.000	1730.000
OR	664.000	1735.000	666.200	1745.000	667.200	1800.000	675.000	1825.000	680.400	1878.000
OR	685.400	1955.000	690.400	1985.000	695.000	2015.000	700.300	2045.000	705.300	2060.000
OR	710.100	2075.000	715.000	2105.000	720.300	2152.000	725.100	2215.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	0.0	0.0
XI	62.000	33.000	2220.000	2240.000	125.000	225.000	200.000	0.0	0.0	0.0
OR	725.400	1000.000	720.000	1020.000	715.000	1038.000	710.700	1050.000	705.200	1058.000
OR	704.500	1080.000	700.000	1100.200	695.600	1148.000	690.300	1208.000	689.600	1315.000
OR	685.500	1500.000	684.800	1670.000	680.500	1820.000	676.500	1905.000	675.000	1910.000
OR	672.500	1950.000	670.100	1990.000	668.500	2100.000	665.500	2220.000	664.500	2230.000
OR	668.300	2240.000	670.300	2280.000	678.000	2300.000	680.400	2320.000	685.000	2360.000
OR	690.200	2420.000	695.000	2450.000	700.300	2480.000	705.200	2515.000	710.100	2560.000
OR	715.000	2645.000	720.200	2740.000	725.200	2790.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	63.000	31.000	1860.000	1880.000	200.000	225.000	240.000	0.0	0.0	0.0
OR	725.400	1000.000	720.400	1015.000	715.300	1032.000	710.600	1058.000	705.300	1068.000
OR	702.500	1080.000	700.200	1110.000	695.400	1140.000	690.100	1186.000	687.500	1280.600
OR	685.100	1390.000	684.500	1430.000	685.200	1478.000	680.300	1620.000	675.600	1660.000
OR	670.300	1690.000	665.600	1860.000	665.000	1870.000	667.300	1880.000	670.200	2000.000
OR	675.400	2020.000	680.600	2042.000	685.200	2075.000	690.200	2120.000	695.500	2175.000
OR	700.100	2225.000	705.100	2240.000	710.400	2280.000	715.200	2330.000	720.000	2355.000
OR	725.400	2410.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	64.000	33.000	1430.000	1450.000	275.000	225.000	255.000	0.0	0.0	0.0
OR	725.300	1000.000	720.300	1010.000	715.300	1022.000	710.400	1055.000	705.200	1075.000
OR	700.200	1100.000	695.600	1120.000	692.500	1140.000	692.500	1150.000	690.100	1180.000
OR	685.500	1270.000	677.500	1300.000	675.600	1315.000	670.100	1390.000	668.400	1430.000
OR	667.000	1460.000	669.400	1450.000	670.400	1465.000	670.300	1485.000	680.500	1540.000
OR	670.200	1610.000	675.300	1635.000	680.200	1682.000	690.200	1685.000	687.800	1788.000
OR	690.200	1758.000	695.200	1770.000	700.100	1780.000	705.100	1810.000	710.500	1835.000
OR	715.100	1850.000	720.100	1870.000	725.200	1895.000	0.0	0.0	0.0	0.0
NC	0.100	0.300	0.050	0.300	0.500	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
XI	65.000	29.000	1620.000	1440.000	125.000	90.000	105.000	0.0	0.0	0.0
OR	725.400	1000.000	710.300	1050.000	705.300	1070.000	700.400	1120.000	695.600	1138.000
OR	690.480	1160.000	695.400	1185.000	680.700	1220.000	678.300	1255.000	678.300	1275.000
OR	675.600	1285.000	670.300	1385.000	669.100	1350.000	668.500	1420.000	667.500	1430.000
OR	670.200	1448.000	672.900	1500.000	675.200	1540.000	677.500	1570.000	680.200	1590.000
OR	685.000	1605.000	690.100	1640.000	695.300	1662.000	700.300	1680.000	705.400	1695.000
OR	710.200	1720.000	715.200	1740.000	720.300	1755.000	728.400	1765.000	0.0	0.0
FJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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**************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CORR - 01
  MODIFICATION - 50,51,52
**************************************************                              THIS RUN EXECUTED

T1        SUSQUEHANNA RIVER BASIN COMMISSION
T2        BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3        WALKER RUN - 50 YR. FLOOD

J1   ICHECK      INQ       NINV      IDIR       STRT     METRIC    HVINS      Q       WSEL     FQ
         0.        3.        0.        0.  -1.000000     0.0       0.0       0.   634.000    0.0

J2   NPROF     IPLOT     PREVS     XSECV     XSECH       FN      ALLDC     IBW     CHNIM    ITRACE
     2.000      0.0    -1.000      0.0       0.0       0.0       0.0       0.0      0.0      0.0
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THIS RUN EXECUTED

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HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

****

T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3 WALKER RUN - 100 YR. FLOOD

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	4	0.	0.	-1.000000	0.0	0.0	0.	635.000	0.0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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**************************************************            THIS RUN EXECUTED
 HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
 ERROR CORR - 01
 MODIFICATION - 50,51,52
**************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 500 YR. FLOOD

J1   ICHECK     INQ     NINV     IDIR     STRT   METRIC   HVINS     Q      WSEL      FQ
        0.       6.       0.       0. -1.000000      0.0      0.0     0.   636.000     0.0

J2   NPROF    IPLOT    PRFVS    XSECV    XSECH       FN    ALLDC     IBW    CHNIM   ITRACE
    35.000      0.0   -1.000      0.0      0.0      0.0      0.0     0.0      0.0      0.0
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WALKER NOW - 10 YR. FLOOD

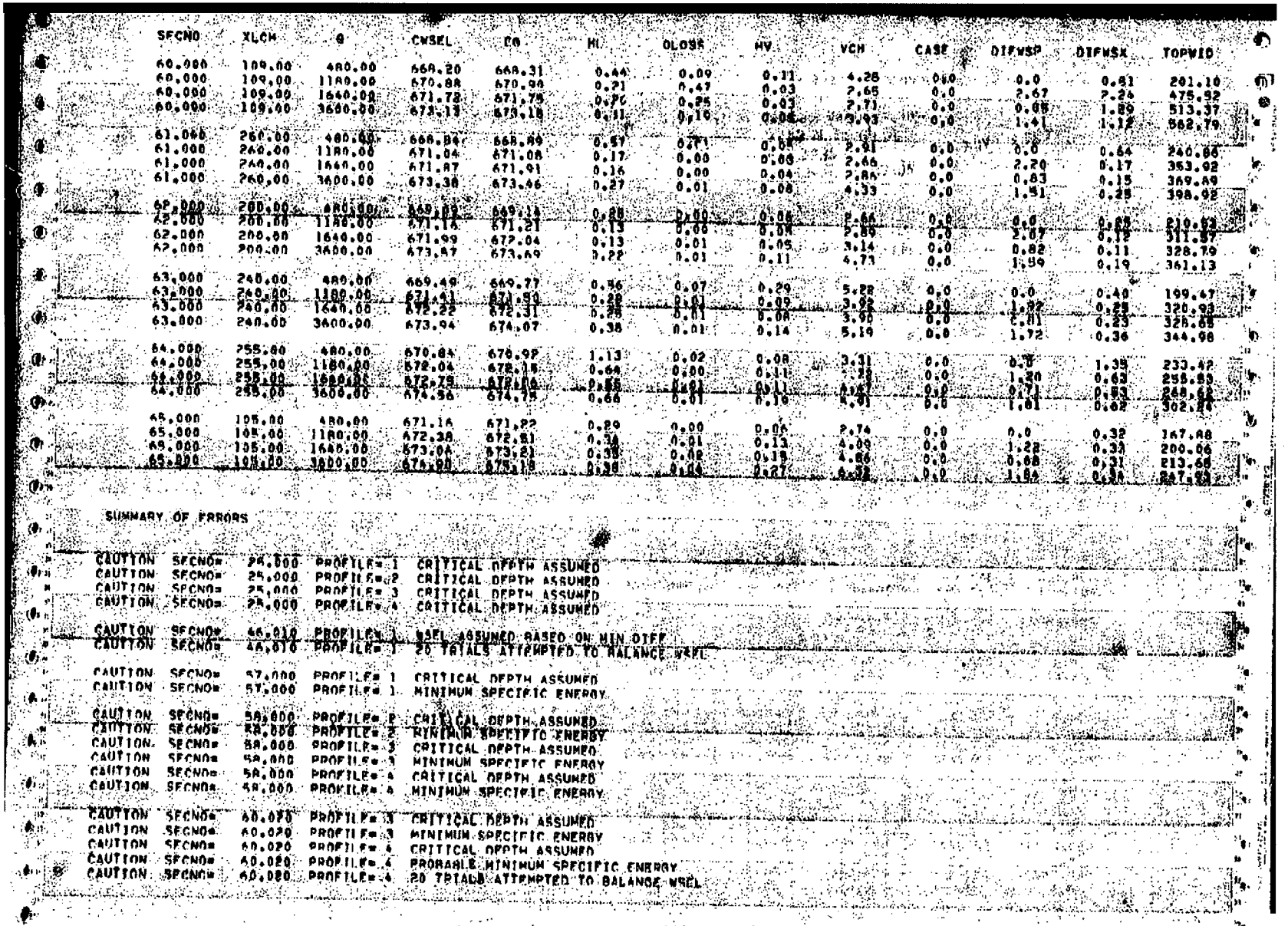
SUMMARY PRINTOUT

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
25.000	290.00	660.00	632.[illegible]	633.47	0.[illegible]	0.0	1.10	6.77	1.00	0.0	0.0	35.49
25.000	290.00	1600.00	634.[illegible]	635.92	0.0	0.0	1.57	10.37	1.00	2.06	0.0	72.50
25.000	290.00	2200.00	635.28	636.94	0.0	0.[illegible]	1.66	10.99	1.00	0.92	0.0	94.15
25.000	290.00	3790.00	636.67	638.53	0.0	0.0	1.86	12.33	1.00	1.69	0.0	133.86
26.000	440.00	660.00	639.[illegible]	639.79	6.3[illegible]	0.00	0.30	5.96	0.0	0.0	7.1[illegible]	[illegible]
26.000	440.00	1600.00	640.[illegible]	640.9[illegible]	[illegible]	0.12	0.35	6.92	0.0	1.11	6.2[illegible]	270.90
26.000	440.00	2200.00	641.06	641.38	5.38	0.13	0.35	7.19	0.0	0.49	5.77	294.67
26.000	440.00	3790.00	642.16	642.51	3.57	0.15	0.35	7.52	0.0	1.12	5.19	345.26
27.000	190.00	660.00	640.31	640.37	0.50	0.0[illegible]	0.07	2.41	0.0	0.0	0.67	188.9[illegible]
27.000	190.00	1600.00	641.5[illegible]	641.6[illegible]	0.6[illegible]	0.0[illegible]	0.1[illegible]	3.60	0.0	1.1[illegible]	0.9[illegible]	222.6[illegible]
27.000	190.00	2200.00	641.9[illegible]	642.17	0.7[illegible]	0.0[illegible]	0.1[illegible]	4.1[illegible]	0.0	0.50	0.9[illegible]	245.0[illegible]
27.000	190.00	3790.00	643.06	643.31	0.78	0.02	0.2[illegible]	5.25	0.0	1.05	0.88	288.70
27.100	115.00	660.00	640.50	640.58	0.10	0.00	0.0[illegible]	3.06	0.0	0.0	0.1[illegible]	189.30
27.100	115.00	1600.00	641.78	641.9[illegible]	0.2[illegible]	0.0[illegible]	0.1[illegible]	4.16	0.0	1.2[illegible]	0.2[illegible]	223.9[illegible]
27.100	115.00	2200.00	642.3[illegible]	642.6[illegible]	0.2[illegible]	0.0[illegible]	0.1[illegible]	4.70	0.0	[illegible]	0.3[illegible]	246.[illegible]
27.100	115.00	3790.00	643.6[illegible]	643.9[illegible]	0.38	0.0[illegible]	0.2[illegible]	5.70	0.0	1.1[illegible]	0.4[illegible]	294.8[illegible]
27.200	11.00	660.00	641.7[illegible]	641.77	1.21	0.0	0.02	1.73	0.0	0.0	1.25	223.19
27.200	11.00	1600.00	642.63	642.69	1.00	0.0	0.0[illegible]	2.91	0.0	1.09	1.09	267.02
27.200	11.00	2200.00	643.3[illegible]	643.4[illegible]	0.93	0.0	0.08	3.4[illegible]	0.0	[illegible]	0.9[illegible]	288.19
27.200	11.00	3790.00	[illegible]	644.61	0.82	0.0	0.1[illegible]	4.8[illegible]	0.0	[illegible]	0.80	33[illegible]
29.000	354.00	660.00	641.85	641.88	0.11	0.01	0.03	1.68	0.0	0.0	0.11	227.21
29.000	354.00	1600.00	643.06	643.12	0.23	0.01	0.07	2.72	0.0	1.20	0.22	264.30
29.000	354.00	2200.00	643.61	643.70	0.29	0.01	0.09	3.20	0.0	0.55	0.28	281.35
29.000	354.00	3790.00	644.78	644.92	0.39	0.01	0.14	4.08	0.0	1.17	0.39	329.44
30.000	70.00	660.00	641.88	641.91	0.03	0.00	0.03	1.84	0.0	0.0	0.02	189.69
30.000	70.00	1600.00	643.10	643.18	0.04	0.00	0.08	2.96	0.0	1.22	0.04	233.34
30.000	70.00	2200.00	643.66	643.76	0.06	0.01	0.11	3.47	0.0	0.56	0.05	258.67
30.000	70.00	3790.00	644.84	645.01	0.08	0.01	0.17	4.44	0.0	1.18	0.06	311.99
31.000	95.00	660.00	641.92	641.98	0.07	0.01	0.06	2.55	0.0	0.0	0.0[illegible]	176.[illegible]
31.000	95.00	1600.00	643.18	643.30	0.11	0.01	0.12	3.77	0.0	1.26	0.0[illegible]	211.6[illegible]
31.000	95.00	2200.00	643.75	643.91	0.13	0.02	0.16	4.32	0.0	0.57	0.09	227.89
31.000	95.00	3790.00	644.96	645.19	0.16	0.02	0.23	5.31	0.0	1.21	0.12	343.37
32.000	140.00	660.00	642.15	642.26	0.26	0.02	0.11	3.38	0.0	0.0	0.2[illegible]	142.69
32.000	140.00	1600.00	643.49	643.69	0.36	0.08	0.20	4.73	0.0	1.34	0.31	181.91
32.000	140.00	2200.00	644.09	644.34	0.40	[illegible]	0.25	5.32	0.0	0.61	0.34	199.68
32.000	140.00	3790.00	645.34	645.69	0.46	0.03	0.35	6.47	0.0	1.25	0.38	280.51
33.000	250.00	660.00	642.63	642.71	0.45	0.00	0.07	2.57	0.0	0.0	0.49	233.11
33.000	250.00	1600.00	644.13	644.23	0.53	0.01	0.09	3.21	0.0	1.50	0.65	351.26
33.000	250.00	2200.00	644.81	644.91	0.55	0.01	0.10	3.45	0.0	0.67	0.71	403.65
33.000	250.00	3790.00	646.16	646.26	0.58	0.02	0.11	3.76	0.0	1.35	0.82	498.97
34.000	140.00	660.00	642.81	642.88	0.17	0.00	0.07	2.68	0.0	0.0	0.18	220.30
34.000	140.00	1600.00	644.32	644.41	0.19	0.00	0.09	3.20	0.0	1.51	0.19	309.59
34.000	140.00	2200.00	645.00	645.10	0.19	0.00	0.10	3.56	0.0	0.67	0.19	349.47
34.000	140.00	3790.00	646.34	646.44	0.18	0.00	0.11	3.9[illegible]	0.0	1.34	0.18	598.62

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
34.100	150.00	660.00	642.98	643.18	0.26	0.04	0.21	4.17	0.0	0.0	0.17	180.18
34.100	150.00	1600.00	644.47	644.49	0.24	0.04	0.23	5.06	0.0	1.49	0.14	270.33
34.100	150.00	2200.00	645.14	644.37	0.24	0.04	0.24	5.40	0.0	0.67	0.14	310.87
34.100	180.00	3790.00	646.46	646.71	0.72	0.05	[illegible]	6.12	0.0	1.31	0.11	442.70
36.010	125.00	580.00	643.21	643.83	0.32	0.05	0.12	3.46	0.0	0.0	0.48	127.68
36.010	125.00	1320.00	644.87	644.93	0.18	0.08	0.06	3.36	0.0	1.46	0.40	283.88
36.010	125.00	1860.00	645.53	645.61	0.19	0.05	0.07	3.87	0.0	0.67	0.40	379.36
36.010	125.00	3100.00	646.86	646.94	0.18	0.05	0.09	4.43	0.0	1.32	0.41	461.92
36.020	23.00	550.00	643.30	646.31	2.78	0.0	0.0	1.40	0.0	0.0	2.88	349.90
36.020	23.00	1320.00	647.51	647.57	2.60	0.0	0.01	1.89	0.0	1.22	2.88	496.48
36.020	23.00	1860.00	647.87	647.89	2.28	0.0	0.02	2.08	0.0	0.36	2.34	513.68
36.020	23.00	3100.00	648.50	648.53	1.59	0.0	0.04	2.96	0.0	0.63	1.64	545.14
36.000	47.00	550.00	646.31	646.32	0.01	0.00	0.01	0.89	0.0	0.0	0.01	415.14
36.000	47.00	1320.00	647.82	647.86	0.02	0.01	0.03	1.97	0.0	1.88	0.01	476.68
36.000	47.00	1860.00	647.89	647.93	0.03	0.02	0.08	2.03	0.0	0.36	0.02	498.00
36.000	47.00	3100.00	648.54	648.63	0.06	0.04	0.09	2.92	0.0	0.68	0.04	527.66
37.000	190.00	550.00	646.32	646.34	0.02	0.00	0.02	1.30	0.0	0.0	0.02	272.09
37.000	190.00	1320.00	647.57	647.61	0.05	0.00	0.04	1.92	0.0	1.28	0.05	412.20
37.000	190.00	1860.00	647.96	648.01	0.07	0.00	0.05	2.03	0.0	0.39	0.07	431.81
37.000	190.00	3100.00	648.67	648.75	0.12	0.00	0.08	3.08	0.0	0.71	0.13	467.48
37.100	305.00	550.00	646.43	646.48	0.12	0.02	0.05	2.62	0.0	0.0	0.11	156.83
37.100	305.00	1320.00	647.73	647.82	0.18	0.03	0.08	3.42	0.0	1.30	0.16	286.24
37.100	305.00	1860.00	648.17	648.28	0.23	0.04	0.11	4.12	0.0	0.44	0.22	346.83
37.100	305.00	3100.00	648.97	649.13	0.33	0.08	0.16	4.97	0.0	0.79	0.30	417.38
37.200	12.00	550.00	647.23	647.25	0.77	0.0	0.02	1.83	0.0	0.0	0.79	218.77
37.200	12.00	1320.00	648.26	648.31	0.50	0.0	0.05	2.82	0.0	1.03	0.53	358.97
37.200	12.00	1860.00	648.69	648.77	0.48	0.0	0.07	3.34	0.0	0.43	0.52	403.94
37.200	12.00	3100.00	649.46	649.57	0.44	0.0	0.11	4.13	0.0	0.77	0.49	442.73
39.000	208.00	550.00	647.33	647.40	0.11	0.04	0.08	2.55	0.0	0.0	0.10	131.38
39.000	208.00	1320.00	648.43	648.61	0.21	0.08	0.17	3.98	0.0	1.11	0.17	159.39
39.000	208.00	1860.00	648.91	649.16	0.27	0.12	0.25	4.83	0.0	0.48	0.22	171.11
39.000	208.00	3100.00	649.74	650.15	0.37	0.21	0.41	6.34	0.0	0.83	0.28	191.93
40.000	220.00	550.00	647.65	647.82	0.39	0.03	0.16	3.69	0.0	0.0	0.33	110.66
40.000	220.00	1320.00	648.95	649.21	0.58	0.03	0.26	4.99	0.0	1.30	0.52	163.78
40.000	220.00	1860.00	649.56	649.87	0.69	0.02	0.31	5.63	0.0	0.61	0.65	188.70
40.000	220.00	3100.00	650.62	65..01	0.88	0.00	0.39	6.55	0.0	1.06	0.88	221.78
41.000	275.00	550.00	648.54	648.64	0.82	0.01	0.10	3.14	0.0	0.0	0.88	118.32
41.000	275.00	1320.00	649.99	650.17	0.95	0.01	0.18	4.03	0.0	1.45	1.04	157.48
41.000	275.00	1860.00	650.66	650.87	1.00	0.01	0.22	4.60	0.0	0.67	1.10	169.53
41.000	275.00	3100.00	651.79	652.09	1.08	0.01	0.31	5.73	0.0	1.13	1.17	187.92
41.100	190.00	550.00	649.58	649.71	1.05	0.02	0.13	4.73	0.0	0.0	1.04	129.25
41.100	190.00	1320.00	651.03	651.20	1.03	0.00	0.17	5.14	0.0	1.45	1.04	162.73
41.100	190.00	1860.00	651.71	651.91	1.03	0.00	0.20	5.51	0.0	0.68	1.05	175.68
41.100	190.00	3100.00	652.91	653.19	1.08	0.01	0.27	6.23	0.0	1.21	1.13	195.16

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
41.200	18.00	550.00	651.47	651.49	1.70	0.0	0.02	1.18	0.0	0.0	1.89	171.89
41.200	18.00	1320.00	652.42	652.49	1.29	0.0	0.06	3.06	0.0	0.95	1.46	187.33
41.200	18.00	1860.00	652.96	653.05	1.19	0.0	0.10	3.40	0.0	0.53	1.25	195.87
41.200	18.00	3100.00	654.00	654.18	0.97	0.0	0.18	4.73	0.0	1.04	1.09	218.58
43.000	52.00	550.00	651.50	651.51	0.01	0.00	0.01	0.97	0.0	0.0	0.03	262.69
43.000	52.00	1320.00	652.48	652.56	0.04	0.01	0.02	1.78	0.0	1.18	0.10	281.40
43.000	52.00	1860.00	653.09	653.13	0.08	0.02	0.03	2.24	0.0	0.57	0.14	291.94
43.000	52.00	3100.00	654.21	654.27	0.08	0.03	0.06	3.08	0.0	1.12	0.21	312.51
44.000	260.00	550.00	651.40	651.47	0.07	0.02	0.06	3.41	0.0	0.0	0.06	258.44
44.000	260.00	1320.00	652.67	652.74	0.16	0.03	0.08	4.37	0.0	1.11	0.15	277.60
44.000	260.00	1860.00	653.29	653.38	0.21	0.04	0.09	4.78	0.0	0.62	0.19	289.32
44.000	260.00	3100.00	654.48	654.59	0.28	0.04	0.12	5.45	0.1	1.19	0.28	311.84
46.010	230.00	550.00	653.06	654.54	2.12	2.03	1.89	9.99	12.00	0.0	1.44	9.00
46.010	230.00	1320.00	654.39	654.69	1.78	0.89	0.30	5.40	0.0	1.30	1.78	179.74
46.010	230.00	1860.00	655.17	655.30	1.91	0.10	0.13	6.48	0.0	0.77	1.87	212.01
46.010	230.00	3100.00	656.50	656.76	2.06	0.10	0.26	7.38	0.0	1.34	2.02	283.89
46.020	30.00	550.00	654.97	654.99	0.48	0.0	0.02	2.02	0.0	0.0	1.97	199.28
46.020	30.00	1320.00	656.08	656.14	1.52	0.0	0.06	3.34	0.0	1.08	1.86	279.38
46.020	30.00	1860.00	[illegible]	656.64	1.59	0.0	0.08	[illegible]	0.0	0.90	1.32	[illegible]
46.020	30.00	3100.00	657.47	657.62	0.40	0.0	0.15	[illegible]	0.0	0.92	0.97	234.00
46.000	145.00	550.00	655.00	655.04	0.03	0.01	0.04	2.08	0.0	0.0	0.03	173.93
46.000	145.00	1320.00	656.18	656.22	0.08	0.03	0.10	3.62	0.0	1.18	0.07	237.01
46.000	145.00	1860.00	656.64	656.78	0.11	0.03	0.14	4.48	0.0	0.52	0.10	275.06
46.000	145.00	3100.00	657.41	657.63	0.18	0.09	0.18	[illegible]	0.0	0.77	[illegible]	288.21
47.000	400.00	550.00	655.12	655.14	0.10	0.01	0.02	1.48	0.0	0.0	0.12	269.17
47.000	400.00	1320.00	656.40	656.48	0.21	0.02	0.04	2.42	0.0	1.28	0.28	332.08
47.000	400.00	1860.00	657.02	657.08	0.27	0.02	0.06	2.89	0.0	0.62	0.37	353.65
47.000	400.00	3100.00	658.15	658.24	0.37	0.04	0.09	3.70	0.0	1.14	0.84	381.12
49.010	450.00	550.00	655.27	655.28	0.14	0.00	0.01	1.80	0.0	0.0	0.18	351.75
49.010	450.00	1320.00	656.65	656.67	0.22	0.01	0.02	2.17	0.0	1.38	0.25	406.48
49.010	450.00	1860.00	657.31	657.34	0.25	0.01	0.03	2.40	0.0	0.66	0.30	432.83
49.010	450.00	3100.00	658.52	658.56	0.31	0.02	0.04	2.81	0.0	1.23	0.38	480.81
49.010	20.00	550.00	655.38	655.39	0.11	0.0	0.01	1.68	0.0	0.0	0.11	388.30
49.020	20.00	1320.00	656.75	656.77	0.10	0.0	0.02	2.08	0.0	1.37	0.10	418.97
49.020	20.00	1860.00	657.48	657.46	0.12	0.0	0.02	2.31	0.0	0.68	0.12	437.45
49.020	20.00	3100.00	658.67	658.71	0.15	0.0	0.04	2.70	0.0	1.24	0.15	486.71
49.000	30.00	550.00	655.39	655.47	0.08	0.05	0.08	3.10	0.0	0.0	0.01	167.89
49.000	30.00	1320.00	656.76	656.89	0.04	0.08	0.13	4.13	0.0	1.37	0.00	264.89
49.000	30.00	1860.00	657.63	657.80	0.04	0.09	0.16	[illegible]	0.0	0.68	0.00	313.19
49.000	30.00	3100.00	658.67	658.85	0.04	0.10	0.18	5.61	0.0	1.24	0.0	405.51
50.000	275.00	550.00	655.62	655.63	0.16	0.01	0.01	1.31	0.0	0.0	[illegible]	381.50
50.000	275.00	1320.00	657.07	657.09	0.19	0.01	0.02	1.77	0.0	1.45	0.38	464.85
50.000	275.00	1860.00	657.78	657.80	0.21	0.01	0.02	2.01	0.0	0.71	0.38	505.78
50.000	275.00	3100.00	659.05	659.08	0.22	0.01	0.03	2.43	0.0	1.27	0.38	578.68

SECNO	XLCH	Q	CWSEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
51.000	740.00	480.00	656.16	656.28	0.62	0.03	0.12	3.84	0.0	0.0	0.07	297.56
51.000	740.00	1180.00	657.83	657.96	0.47	0.00	0.03	2.20	0.0	1.37	0.46	903.99
51.000	740.00	1640.00	658.18	658.20	0.40	0.00	0.02	1.85	0.0	0.66	0.40	1002.32
51.000	740.00	3600.00	659.48	659.47	0.39	0.00	0.02	2.03	0.0	1.27	0.40	1262.82
52.000	330.00	480.00	656.93	656.94	0.65	0.01	0.03	1.48	0.0	0.0	0.75	220.83
52.000	330.00	1180.00	657.97	658.03	0.40	0.01	0.07	2.33	0.0	1.06	0.40	268.38
52.000	330.00	1640.00	658.50	658.58	0.36	0.02	0.08	2.55	0.0	0.53	0.31	320.80
52.000	330.00	3600.00	659.73	659.90	0.38	0.04	0.16	3.73	0.0	1.24	0.28	487.69
52.100	133.00	480.00	657.07	657.10	0.17	0.01	0.06	2.37	0.0	0.0	0.17	201.27
52.100	133.00	1180.00	658.17	658.25	0.21	0.01	0.08	3.14	0.0	1.10	0.20	256.19
52.100	133.00	1640.00	658.71	658.80	0.21	0.01	0.09	3.46	0.0	0.53	0.03	286.83
52.100	133.00	3600.00	660.04	660.19	0.29	0.00	0.15	4.60	0.0	1.33	0.30	443.77
52.200	12.00	480.00	659.60	659.61	2.49	0.0	0.00	0.71	0.0	0.0	2.53	393.86
52.200	12.00	1180.00	660.19	660.20	1.98	0.0	0.01	1.43	0.0	0.58	2.01	463.04
52.200	12.00	1640.00	660.45	660.48	1.68	0.0	0.02	1.82	0.0	0.27	1.78	493.98
52.200	12.00	3600.00	661.26	661.32	1.14	0.0	0.06	3.08	0.0	0.81	1.83	640.37
54.000	245.00	480.00	659.64	659.67	0.05	0.02	0.03	1.49	0.0	0.0	0.04	187.83
54.000	245.00	1180.00	660.31	660.41	0.18	0.06	0.09	3.43	0.0	0.67	0.12	208.97
54.000	245.00	1640.00	660.64	660.78	0.22	0.08	0.14	4.19	0.0	0.33	0.16	219.38
54.000	245.00	3600.00	661.67	662.01	0.49	0.19	0.33	6.81	0.0	1.03	0.61	352.09
55.000	330.00	480.00	660.07	660.21	0.91	0.03	0.14	3.87	0.0	0.0	0.43	124.81
55.000	330.00	1180.00	661.22	661.45	1.08	0.04	0.23	5.14	0.0	1.15	0.91	171.69
55.000	330.00	1640.00	661.77	662.04	1.28	0.04	0.27	5.82	0.0	0.55	1.13	193.70
55.000	330.00	3600.00	663.38	663.71	1.59	0.01	0.30	7.23	0.0	1.57	1.85	276.07
56.000	310.00	480.00	661.21	661.29	1.07	0.01	0.07	2.92	0.0	0.0	1.14	143.90
56.000	310.00	1180.00	662.50	662.63	1.16	0.01	0.12	3.80	0.0	1.29	1.28	175.77
56.000	310.00	1640.00	663.10	663.25	1.20	0.01	0.15	4.24	0.0	0.60	1.33	190.68
56.000	310.00	3600.00	664.79	665.06	1.34	0.01	0.27	5.75	0.0	1.69	1.45	232.63
57.000	160.00	480.00	662.34	662.87	1.11	0.36	0.52	7.58	4097.00	0.0	1.13	99.88
57.000	160.00	1180.00	663.45	663.97	1.02	0.32	0.52	8.29	0.0	1.10	0.94	141.16
57.000	160.00	1640.00	664.03	664.55	1.00	0.29	0.52	8.48	0.0	0.58	0.93	162.83
57.000	160.00	3600.00	665.78	666.34	1.05	0.23	0.56	9.38	0.0	1.75	0.99	232.15
58.000	250.00	480.00	666.32	666.80	3.92	0.02	0.48	5.63	0.0	0.0	3.98	76.66
58.000	250.00	1180.00	667.51	668.26	3.71	0.19	0.76	7.67	4097.00	1.18	4.06	232.23
58.000	250.00	1640.00	667.97	668.74	3.41	0.21	0.78	8.50	4097.00	0.46	3.94	297.12
58.000	250.00	3600.00	669.06	669.98	3.10	0.29	0.93	10.67	4097.00	1.09	3.28	349.67
60.010	105.00	480.00	667.13	667.58	0.26	0.01	0.44	5.35	0.0	0.0	0.81	18.00
60.010	105.00	1180.00	668.73	668.87	0.36	0.29	0.14	4.17	0.0	1.60	1.23	206.78
60.010	105.00	1640.00	669.20	669.39	0.41	0.24	0.18	4.91	0.0	0.47	1.24	249.59
60.010	105.00	3600.00	670.57	670.72	0.13	0.31	0.15	5.53	0.0	1.36	1.51	408.05
60.020	41.00	480.00	667.39	667.79	0.20	0.02	0.40	5.08	0.0	0.0	0.26	18.00
60.020	41.00	1180.00	668.64	670.28	0.20	1.16	1.58	10.10	0.0	1.28	-0.09	18.00
60.020	41.00	1640.00	670.43	671.29	0.28	0.58	0.86	8.54	4097.00	1.79	1.20	301.79
60.020	41.00	3600.00	672.01	672.68	0.19	0.47	0.67	9.61	11.00	1.58	1.44	548.15



SECNO	XLCH	Q	CWSEL	CD	HI	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
60.000	100.00	480.00	668.20	668.31	0.44	0.09	0.11	4.28	0&0	0.0	0.81	201.10
60.000	100.00	1180.00	670.88	670.90	0.21	0.47	0.03	2.65	0.0	2.67	2.24	475.52
60.000	100.00	1640.00	671.78	671.75	0.26	0.25	0.03	2.71	0.0	0.05	1.89	513.37
60.000	100.00	3600.00	673.13	673.18	0.11	0.10	0.06	3.93	0.0	1.41	1.12	582.79
61.000	260.00	480.00	668.84	668.89	0.57	0.11	0.08	3.81	0.0	0.0	0.64	240.86
61.000	260.00	1180.00	671.04	671.08	0.17	0.00	0.00	2.66	0.0	2.20	0.17	353.92
61.000	260.00	1640.00	671.87	671.91	0.16	0.00	0.04	2.86	0.0	0.83	0.15	369.89
61.000	260.00	3600.00	673.38	673.46	0.27	0.01	0.08	4.33	0.0	1.51	0.28	398.92
62.000	200.00	480.00	669.09	669.13	0.28	0.00	0.06	3.66	0.0	0.0	0.68	210.63
62.000	200.00	1180.00	671.14	671.21	0.13	0.00	0.04	2.89	0.0	2.07	0.12	311.37
62.000	200.00	1640.00	671.99	672.04	0.13	0.01	0.05	3.14	0.0	0.82	0.11	328.79
62.000	200.00	3600.00	673.87	673.69	0.22	0.01	0.11	4.73	0.0	1.59	0.19	361.13
63.000	240.00	480.00	669.49	669.77	0.56	0.07	0.29	5.28	0.0	0.0	0.40	199.47
63.000	240.00	1180.00	671.41	671.50	0.28	0.01	0.09	3.92	0.0	1.92	0.25	320.93
63.000	240.00	1640.00	672.22	672.31	0.28	0.01	0.08	3.98	0.0	0.81	0.23	328.85
63.000	240.00	3600.00	673.94	674.07	0.38	0.01	0.14	5.19	0.0	1.72	0.36	344.98
64.000	255.00	480.00	670.84	670.97	1.13	0.02	0.08	3.31	0.0	0.0	1.35	233.42
64.000	255.00	1180.00	672.04	672.18	0.64	0.00	0.11	3.23	0.0	1.20	0.62	255.85
64.000	255.00	1640.00	672.79	ATTEMPTS	0.55	0.01	0.11	3.67	0.0	0.71	0.53	268.62
64.000	255.00	3600.00	674.56	674.75	0.66	0.01	0.19	4.91	0.0	1.81	0.62	302.20
65.000	105.00	480.00	671.16	671.22	0.29	0.00	0.06	2.74	0.0	0.0	0.32	167.48
65.000	105.00	1180.00	672.38	672.51	0.34	0.01	0.13	4.09	0.0	1.28	0.33	200.06
65.000	105.00	1640.00	673.06	673.21	0.38	0.02	0.19	4.86	0.0	0.68	0.31	213.68
65.000	105.00	3600.00	674.90	675.19	0.38	0.04	0.27	6.92	0.0	1.94	0.38	247.93

SUMMARY OF ERRORS

CAUTION SECNO= 24.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 24.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 24.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 24.000 PROFILE= 4 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 46.010 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 46.010 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 57.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 57.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 58.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 58.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 58.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 58.000 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 58.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 58.000 PROFILE= 4 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 60.020 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.020 PROFILE= 3 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.020 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.020 PROFILE= 4 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 60.020 PROFILE= 4 20 TRIALS ATTEMPTED TO BALANCE WSEL

THIS RUN EXECUTED NOV. 2 1977

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

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**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
**************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      NAISER RUN - 100 YR. FLOOD

J1   ICHECK     INQ      NINV      IDIR      STRT    METRIC    HVINS      Q      WSEL      FQ
         0.      4.       0.        0.       0.0      0.0       0.0      0.   484.100    0.0

J2   NPROF    IPLOT    PRFVS     XSECV     XSECH      FN     ALLDC     IBW     CHNIM    ITRACE
      1.000     0.0    -1.000      0.0       0.0      0.0      0.0      0.0      0.0      0.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT
     38.000   43.000    1.000    4.000  100.000    2.000   41.000   36.000   21.000   22.000

     27.000   28.000    4.000     0.0   39.000   19.000   42.000    1.000    3.000   11.000

     12.000   10.000   29.000   20.000   50.000   41.000    4.000     0.0  200.000     .010

QT     5.000   460.000  1600.000  2200.000  2200.000  3790.000      0.0       0.0       0.0       0.0
NC     0.060     0.060     0.110     0.100     0.300      0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0     6.400      0.0       0.0       0.0       0.0       0.0

X1     1.010    15.000  1143.000  1191.000      0.0       0.0      .000       0.0    -7.600      0.0
GR   494.000  1000.000   495.800  1026.000   495.100  1057.000   498.630  1106.000   495.800  1116.000
GR   493.300  1143.000   492.300  1153.000   491.500  1158.000   491.500  1164.000   491.500  1167.000
GR   492.300  1172.000   493.200  1186.000   496.700  1203.000   502.130  1250.000   506.200  1300.000

X1     1.000      0.0       0.0       0.0   100.000   100.000   215.000      0.0     7.600      0.0
NC     0.060     0.060     0.040     0.100     0.300      0.0       0.0       0.0       0.0       0.0

X1     2.000    17.000  1150.000  1172.000   240.000   240.000   240.000      0.0       0.0       0.0
GR   499.300  1000.000   500.700  1005.000   498.700  1020.000   497.800  1090.000   498.300  1137.000
GR   494.300  1150.000   493.400  1154.000   492.800  1158.000   492.500  1160.000   492.500  1160.000
GR   493.400  1166.000   494.300  1172.000   496.900  1194.000   500.700  1252.000   502.400  1312.000
GR   509.000  1373.000   510.600  1411.000      0.0       0.0       0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0     8.400      0.0       0.0       0.0       0.0       0.0

X1     3.000    15.000  1120.000  1150.000   280.000   280.000   280.000      0.0       0.0       0.0
GR   500.000  1000.000   497.800  1010.000   497.400  1090.000   500.800  1098.000   500.800  1113.000
GR   497.700  1124.000   497.100  1132.000   496.000  1138.000   497.100  1146.000   498.000  1152.000
GR   498.000  1172.000   501.600  1193.000   502.400  1260.000   507.800  1340.000   510.050  1392.000
NC     0.140     0.060     0.040     0.100     0.300      0.0       0.0       0.0       0.0       0.0

X1     4.000    16.000  1233.000  1254.000   300.000   125.000   300.000      0.0       0.0       0.0
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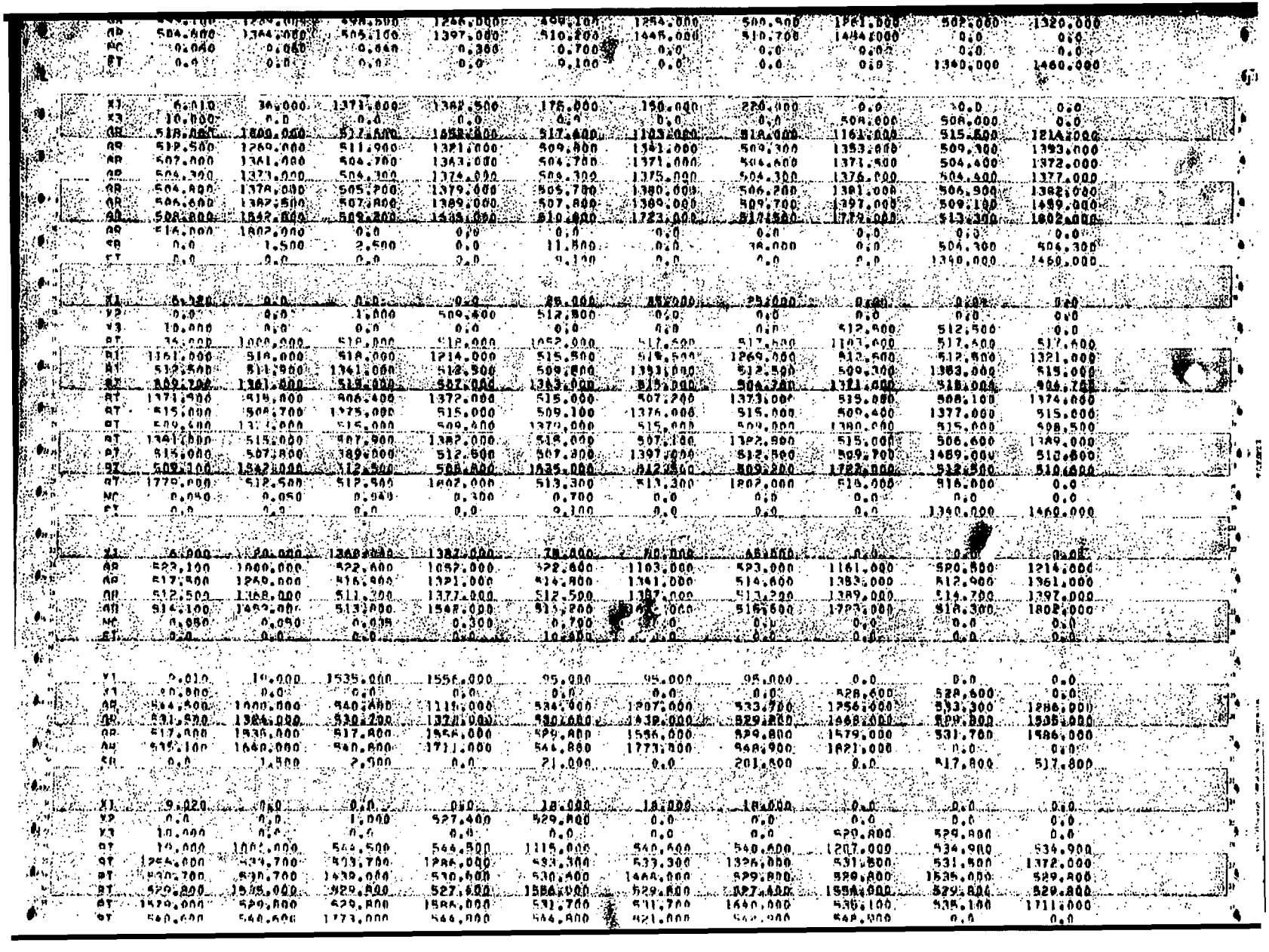
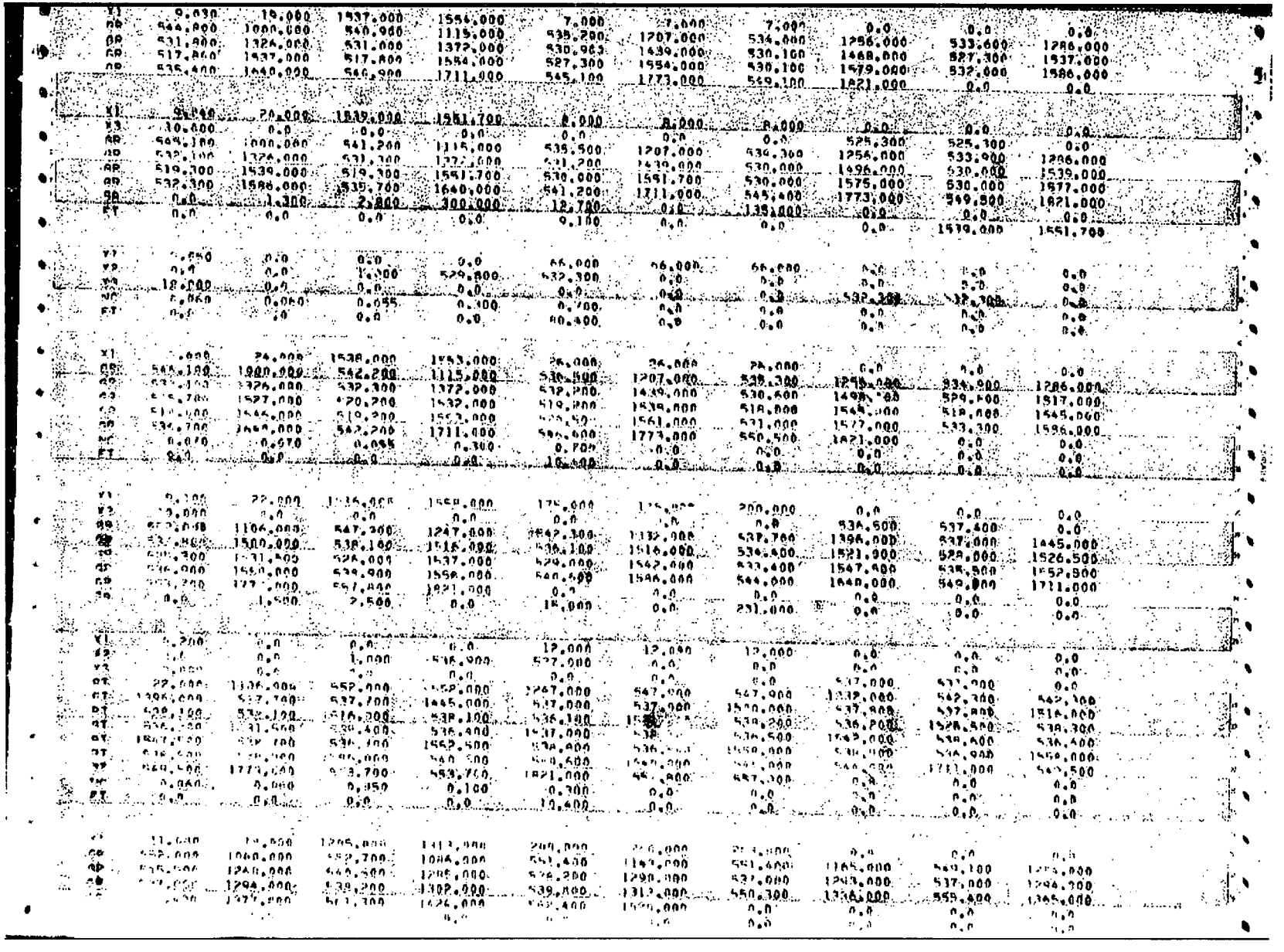
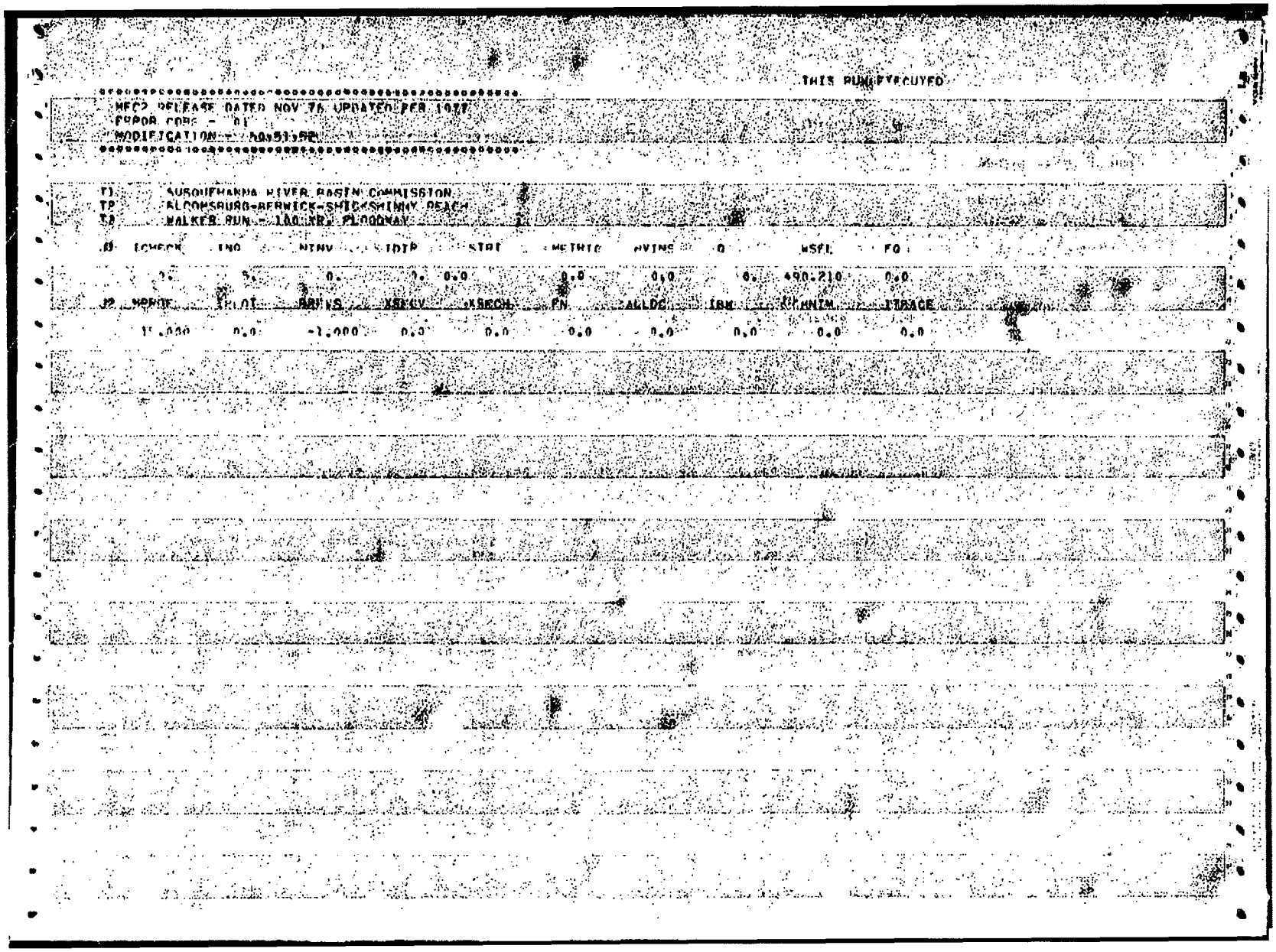
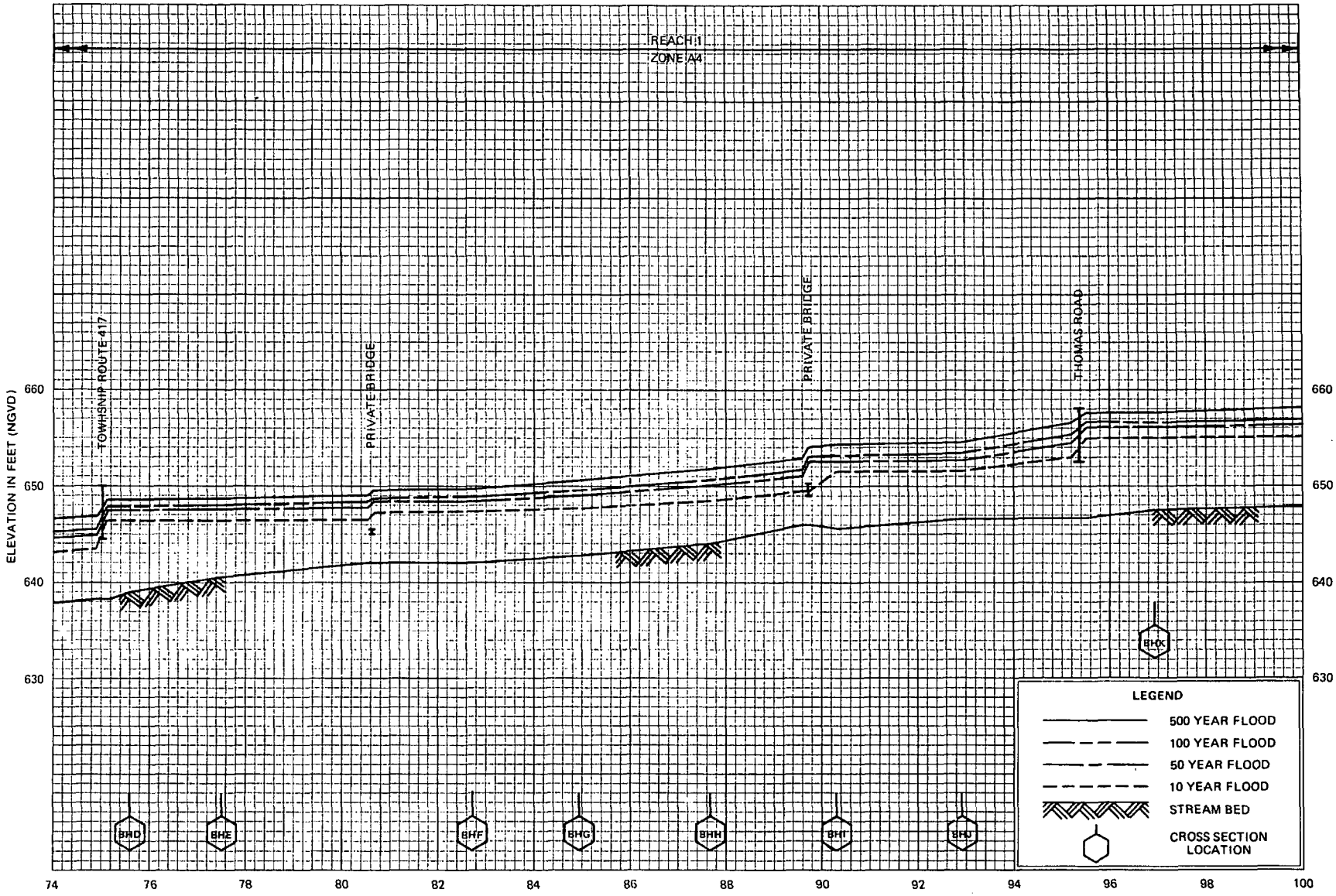





THIS RUN EXECUTED
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CODE = 01
MODIFICATION = NONSTAND
T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3 WALKER RUN - 100 YR. FLOODWAY
J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ
0. 0. 0. 0.0 0.0 0.0 0. 490.210 0.0
J2 UNITS PLOT PRINT XSECV XSECH FN ALLDC IBW CHNIM ITRACE
1.000 0.0 -1.000 0.0 0.0 0.0 0.0 0.0 0.0 0.0



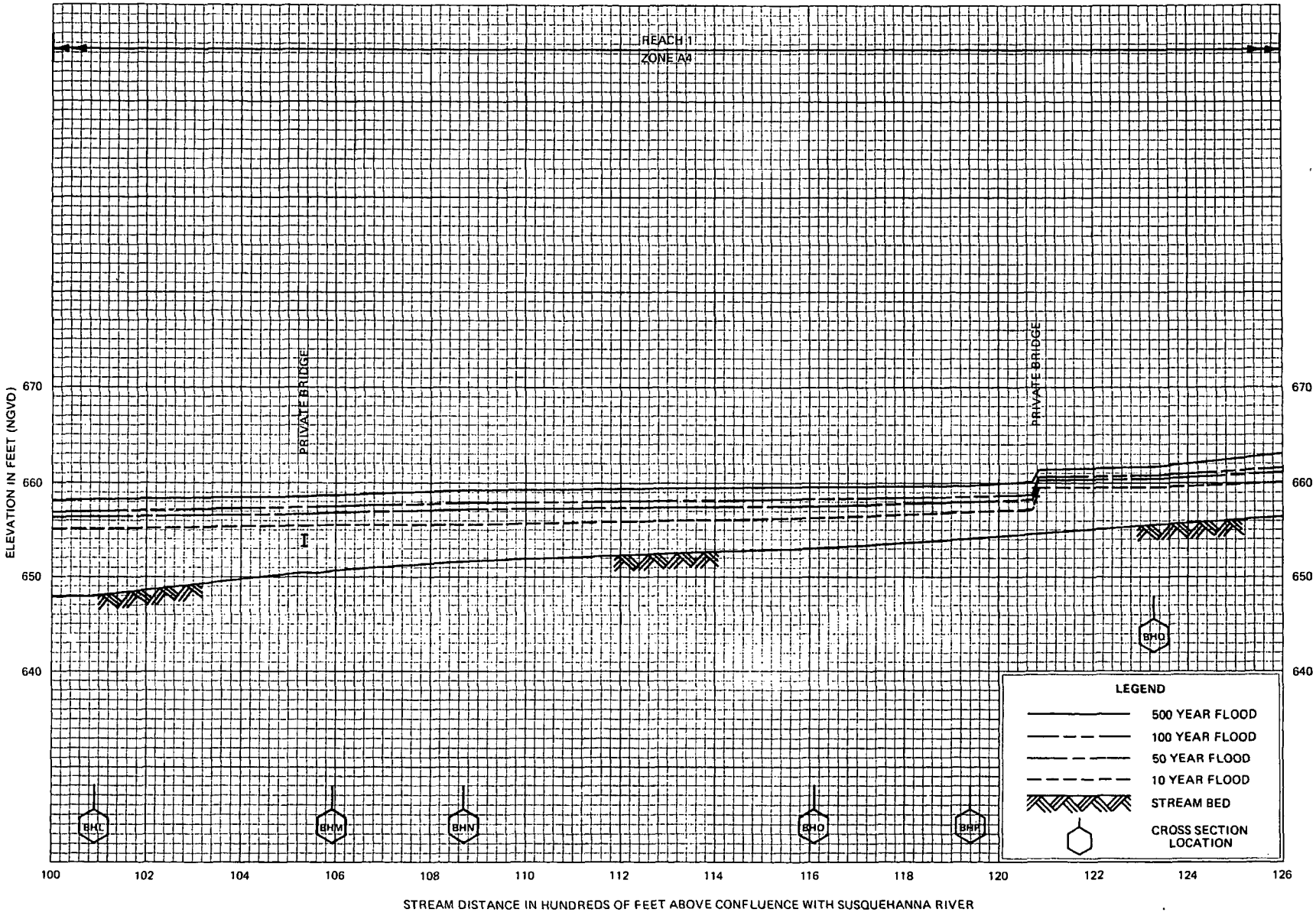
FLOOD PROFILES

WALKER RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

14P



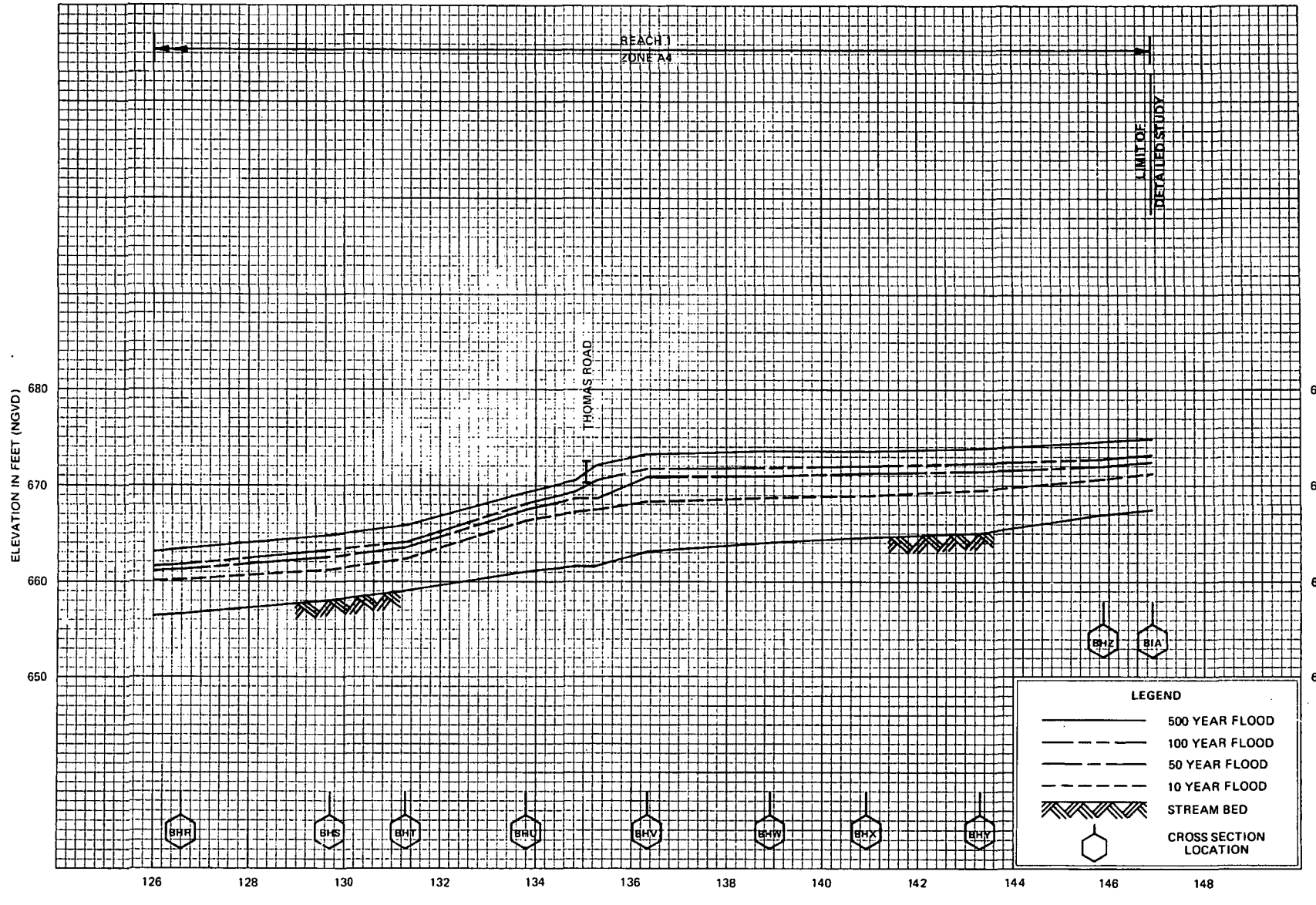
FLOOD PROFILES

WALKER RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

15P



FLOOD PROFILES

WALKER RUN

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

16P

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: FEMA FldStudy
Project File : FEMAFldStudy.prj
Run Date and Time: 11/29/2010 1:56:05 PM

Project in English units

PLAN DATA

Plan Title: FEMA FIS HEC-RAS
Plan File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.p07

Geometry Title: FEMA FIS HEC-RAS
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.g05

Flow Title : FEMA Flow Data
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.f04

Plan Summary Information:
Number of: Cross Sections = 18 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 4 Lateral Structures = 0

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

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FEMA Flow Data
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.f04

Flow Data (cfs)

River	Reach	RS	PF 1
Walker Run	1	5198	1640
Walker Run	1	1208	1860

Boundary Conditions

River	Reach	Profile	Upstream	Downstream

Walker Run 1 PF 1 Known WS = 673.06 Known WS = 653.29

GEOMETRY DATA

Geometry Title: FEMA FIS HEC-RAS
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.g05

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5198

INPUT
Description: BIA
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1050	709.54	1070	704.54	1120	699.65	1130	694.84
1160	689.65	1185	684.65	1220	679.45	1265	677.54	1275	677.54
1285	674.84	1305	669.54	1350	668.34	1420	667.74	1430	666.74
1448	669.45	1500	671.74	1540	674.45	1570	676.74	1590	679.45
1605	684.24	1640	689.34	1662	694.54	1680	699.34	1695	704.65
1720	710.04	1740	714.45	1755	719.54	1765	724.24		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1420	.05	1448	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1420	1448	125	105	90	.3 .5

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4995

INPUT
Description: BHZ
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1010	719.54	1022	714.54	1055	709.65	1075	704.45
1100	699.45	1120	694.84	1140	691.74	1150	691.74	1180	689.34
1270	684.74	1300	676.74	1315	674.84	1390	669.34	1430	667.65
1440	666.24	1450	668.65	1465	669.65	1485	669.54	1540	667.74
1610	669.45	1635	674.54	1662	679.45	1685	690.04	1725	686.74
1750	689.45	1770	694.45	1780	699.34	1810	704.34	1835	709.84
1850	714.34	1870	719.34	1895	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1430	.05	1450	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1430	1450	275	255	225	.1 .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4735

INPUT
Description: BHY
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1015	719.65	1030	714.54	1058	709.84	1068	704.54
1080	701.74	1110	699.45	1140	694.65	1186	689.34	1280	686.74
1390	684.34	1430	683.74	1478	684.45	1620	679.54	1660	674.84
1690	669.54	1860	667.84	1870	664.24	1880	666.54	2000	669.45
2020	674.65	2042	679.84	2075	684.45	2120	689.45	2175	694.74
2225	699.34	2240	704.34	2280	709.65	2330	714.45	2355	719.24
2410	724.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1860	.05	1880	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1860	1880	200	240	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4495

INPUT
Description: BHX
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1020	719.24	1038	714.24	1050	709.45	1058	704.45
1060	703.74	1100	699.24	1148	694.84	1208	689.54	1315	688.74
1500	684.74	1670	683.74	1820	679.74	1905	673.74	1910	674.24
1950	671.74	1990	669.34	2100	667.74	2220	664.74	2230	663.74
2240	664.54	2280	669.54	2300	674.24	2320	679.65	2360	684.24
2420	689.45	2450	694.24	2480	699.24	2510	704.45	2560	709.34
2645	714.24	2740	719.45	2790	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	2220	.05	2240	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2220	2240	125	200	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4295

INPUT
Description: BHW
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.84	1032	719.74	1052	714.24	1075	709.54	1100	704.54
1130	699.34	1158	694.24	1180	689.45	1210	684.65	1262	679.54
1370	674.24	1408	669.34	1470	669.45	1600	667.54	1730	665.24
1735	663.24	1745	665.45	1800	666.45	1820	674.24	1875	679.65
1955	684.65	1985	689.74	2015	694.24	2045	699.24	2060	704.54
2075	709.34	2105	714.24	2152	719.54	2215	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1730	.05	1745	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1730	1745	225	260	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4043

INPUT
Description: BHV
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1030	719.24	1048	714.45	1062	709.45	1080	704.95
1102	699.65	1128	694.34	1150	689.65	1205	684.54	1242	679.34
1330	674.54	1390	671.54	1520	667.84	1620	664.34	1625	662.24
1630	664.84	1740	667.24	1910	669.54	1960	674.65	2040	679.54
2125	684.45	2162	689.34	2188	694.74	2210	699.34	2220	704.54
2245	714.45	2258	714.84	2270	719.74	2295	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1620	.05	1630	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1620	1630	381	255	191	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 3914

INPUT
Description: Market Street u/s
Distance from Upstream XS = 128.4
Deck/Roadway Width = 43.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1242	678.745	678.745	1335	673.945	673.945	1372	671.945	671.945
1390	671.845	670.945	1490	671.445	668.145	1520	671.245	667.245
1616	670.545	661.845	1616	671.345	669.345	1625	671.345	669.345
1634	671.345	669.345	1634	670.545	662.045	1740	669.645	667.045
1820	667.945	667.945	1910	668.945	668.945	1960	674.045	674.045
2040	678.945	678.945	2125	683.845	683.845			

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1242	678.745	1335	673.945	1378	671.945	1390	670.945	1490	668.145
1520	667.245	1616	661.845	1625	660.845	1634	662.045	1740	667.045
1820	667.945	1910	668.945	1960	674.045	2040	678.945	2125	683.845

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1242	.1	1616	.05	1634	.09

Bank Sta: Left Right Coeff Contr. Expan.
1616 1634 .3 .7

Downstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1242	678.745	678.745	1335	673.945	673.945	1372	671.945	671.945
1390	671.845	670.945	1490	671.445	668.145	1520	671.245	667.245
1616	670.545	661.845	1616	671.345	669.345	1625	671.345	669.345
1634	671.345	669.345	1634	670.545	662.045	1740	669.645	667.045
1820	667.945	667.945	1910	668.945	668.945	1960	674.045	674.045
2040	678.945	678.945	2125	683.845	683.845			

Downstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1242	678.745	1335	673.945	1378	671.945	1390	670.945	1490	668.145
1520	667.245	1616	661.845	1625	660.845	1634	662.045	1740	667.045
1820	667.945	1910	668.945	1960	674.045	2040	678.945	2125	683.845

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1242	.1	1616	.05	1634	.09

Bank Sta: Left Right Coeff Contr. Expan.
1616 1634 .4 .8

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 668.7
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 670.1

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

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3785

INPUT
Description: BHU
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1022	719.24	1052	714.84	1085	709.45	1110	704.45
1140	699.34	1172	689.54	1260	684.65	1290	679.74	1318	674.84
1360	669.34	1412	664.95	1430	660.24	1440	665.95	1500	665.84
1550	667.24	1580	666.74	1650	666.15	1760	669.45	1800	674.34
1900	676.54	1980	679.54	2035	684.65	2055	689.45	2080	694.54
2095	699.45	2108	707.65	2118	709.65	2130	714.45	2140	719.34
2150	724.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1412	.055	1440	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1412	1440	250	250	175	.4 .8

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3532

INPUT
Description: BHT
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1055	719.34	1095	715.15	1155	709.45	1190	704.84
1240	699.45	1280	694.84	1330	689.54	1368	684.95	1390	679.74
1428	674.34	1502	664.34	1507	660.24	1510	658.24	1520	659.84
1600	661.45	1730	665.04	1750	666.34	1770	665.74	1850	666.34
1975	669.34	2000	674.74	2125	679.34	2180	684.34	2200	690.15
2222	694.34	2232	699.95	2262	704.84	2285	709.84	2325	714.45
2372	719.95	2415	724.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1507	.06	1520	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1507	1520	160	160	170	.4 .8

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3375

INPUT
Description: BHS
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1095	719.34	1140	714.45	1170	709.84	1220	704.45
1275	699.65	1285	694.45	1305	689.54	1320	684.34	1338	679.95
1360	674.65	1420	664.54	1443	659.24	1448	657.24	1460	658.34
1550	658.95	1680	664.84	1705	664.24	1800	666.74	1978	669.45
2042	674.65	2080	679.74	2100	685.04	2125	689.34	2140	694.95
2162	699.45	2180	704.84	2225	709.84	2260	714.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1443	.05	1460	.08

Bank Sta: Left 1443 Right 1460 Lengths: Left Channel 300 Right 310 Coeff Contr. 325 .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3065

INPUT
Description: BHR
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1095	719.84	1110	714.74	1210	709.34	1260	704.34
1290	699.54	1300	695.04	1315	689.84	1330	684.45	1355	679.45
1385	674.95	1405	669.74	1425	664.54	1510	656.74	1520	655.95
1530	656.15	1670	661.45	1805	664.34	1828	666.54	1978	669.65
2070	671.34	2178	674.65	2210	679.34	2248	687.54	2285	689.95
2310	694.84	2355	699.34	2420	704.34	2525	709.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1510	.05	1530	.06

Bank Sta: Left 1510 Right 1530 Lengths: Left Channel 340 Right 330 Coeff Contr. 320 .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2730

INPUT
Description: BHQ
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.45	1120	719.95	1198	714.45	1242	709.34	1262	704.34
1268	699.84	1300	694.54	1312	689.54	1328	684.54	1350	679.34
1368	674.34	1470	671.45	1588	669.54	1595	669.04	1669	664.34
1760	656.74	1818	656.24	1830	654.74	1837	656.24	1880	656.74
2000	662.24	2180	664.34	2220	667.34	2300	666.24	2465	669.65
2680	671.65	2718	674.74	2760	679.54	2805	684.54	2840	689.24
2855	694.95	2875	699.95	2900	704.34	2980	709.24	3015	714.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1818	.05	1837	.06

Bank Sta: Left 1818 Right 1837 Lengths: Left Channel 487 Right 390 Coeff Contr. 342 .3 Expan. .7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 2480

INPUT
Description:
Distance from Upstream XS = 251
Deck/Roadway Width = 12.5
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1735	665.445	665.445	1772	664.945	664.945	1825	659.745	659.745
1888	660.145	660.145	2045	658.445	658.445	2100	658.445	657.845
2145	658.445	654.845	2247	658.445	653.845	2247	658.445	657.745
2253	658.445	657.745	2253	658.445	653.845	2268	658.445	654.945
2350	658.445	656.945	2390	658.445	658.445	2440	660.345	660.345
2600	661.845	661.845	2735	665.045	665.045	2755	667.045	667.045
2900	667.845	667.845	3100	668.045	668.045			

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1735	665.445	1772	664.945	1825	659.745	1888	660.145	2045	658.445
2100	657.845	2145	654.845	2247	653.845	2253	653.845	2268	654.945

2350	656.945	2390	658.445	2440	660.345	2600	661.845	2735	665.045		
2755	667.045	2900	667.845	3100	668.045						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1735	.06	2247	.05	2253	.06

Bank Sta: Left Right Coeff Contr. Expan.
2247 2253 .3 .7

Downstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1735	665.445	665.445	1772	664.945	664.945	1825	659.745	659.745
1888	660.145	660.145	2045	658.445	658.445	2100	658.445	657.845
2145	658.445	654.845	2247	658.445	653.845	2247	658.445	657.745
2253	658.445	657.745	2253	658.445	653.845	2268	658.445	654.945
2350	658.445	656.945	2390	658.445	658.445	2440	660.345	660.345
2600	661.845	661.845	2735	665.045	665.045	2755	667.045	667.045
2900	667.845	667.845	3100	668.045	668.045			

Downstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1735	665.445	1772	664.945	1825	659.745	1888	660.145	2045	658.445
2100	657.845	2145	654.845	2247	653.845	2253	653.845	2268	654.945
2350	656.945	2390	658.445	2440	660.345	2600	661.845	2735	665.045
2755	667.045	2900	667.845	3100	668.045				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1735	.06	2247	.05	2253	.06

Bank Sta: Left Right Coeff Contr. Expan.
2247 2253 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 659.2
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 658.5

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

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2339

INPUT
Description: BHP
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1030	719.34	1080	714.65	1108	710.15	1130	704.54
1150	699.45	1170	694.54	1195	689.54	1225	684.65	1240	679.24
1295	674.54	1400	669.95	1500	666.74	1590	664.54	1630	663.34
1700	664.34	1735	664.95	1772	664.45	1825	659.24	1888	659.65
2100	657.34	2145	655.34	2250	653.24	2268	654.45	2350	656.45
2440	659.84	2600	661.34	2735	664.54	2755	666.54	2900	667.34

3100	667.54	3250	669.24	3350	671.34	3465	674.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2145	.05	2268	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2145	2268	600	330	350	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2010

INPUT
Description: BHO
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	689.34	1100	686.54	1230	684.34	1275	679.45	1340	674.84
1450	670.04	1635	664.45	1798	659.74	2030	656.54	2295	655.65
2298	654.34	2300	655.95	2460	655.95	2470	654.34	2475	655.95
2600	654.74	2715	654.34	2740	652.24	2750	654.54	2960	657.34
3230	659.65	3345	664.65	3360	664.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2715	.05	2750	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2715	2750	1200	809	740	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 1208

INPUT
Description: BHN
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.34	1060	714.65	1080	709.34	1165	699.54
1190	694.84	1225	689.54	1265	684.95	1380	674.54	1470	669.65
1528	665.15	1570	659.45	1680	651.74	1740	651.34	1752	650.74
1765	651.34	2205	659.24	2220	664.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1740	.05	1765	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1740	1765	300	275	175	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 933

INPUT
Description: BHM
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.54	1088	714.74	1120	710.04	1152	704.34
1200	699.74	1238	694.84	1270	689.84	1290	684.65	1340	679.95
1402	674.95	1445	669.34	1480	664.45	1530	659.74	1590	654.45
1700	650.95	1710	649.74	1720	650.65	1750	654.54	1900	657.04
2080	659.84	2200	663.45	2300	663.65	2400	663.45	2500	664.95
2590	664.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1700	.05	1720	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1700	1720	400	500	325	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 875

INPUT
Description: Private Farm Road
Distance from Upstream XS = 50
Deck/Roadway Width = 14.9
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1400	664.145	664.145	1530	659.445	659.445	1590	654.145	654.145
1609	653.645	653.645	1709	653.645	650.945	1709.5	653.645	652.245
1710.5	653.645	652.445	1711.5	653.645	652.245	1712	653.645	650.945
1890	653.645	653.645	1930	654.245	654.245	2080	659.545	659.545
2200	663.145	663.145	2300	663.345	663.345	2400	663.145	663.145
2500	664.645	664.645						

Upstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.245	1035	719.245	1088	714.445	1120	709.145	1152	704.045
1200	699.545	1238	694.545	1270	689.545	1290	684.345	1340	679.645
1402	674.645	1445	669.045	1480	664.145	1530	659.445	1590	654.145
1608	653.645	1709	650.945	1709.5	649.645	1710.5	649.445	1711.5	650.645
1712	650.945	1890	653.645	1930	654.245	2080	659.545	2200	662.245
2300	663.345	2400	663.145	2500	664.645				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1709	.05	1712	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1709	1712	.3	.7

Downstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1400	664.145	664.145	1530	659.445	659.445	1590	654.145	654.145
1609	653.645	653.645	1709	653.645	650.945	1709.5	653.645	652.245
1710.5	653.645	652.445	1711.5	653.645	652.245	1712	653.645	650.945
1890	653.645	653.645	1930	654.245	654.245	2080	659.545	659.545
2200	663.145	663.145	2300	663.345	663.345	2400	663.145	663.145
2500	664.645	664.645						

Downstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.245	1035	719.245	1088	714.445	1120	709.145	1152	704.045
1200	699.545	1238	694.545	1270	689.545	1290	684.345	1340	679.645
1402	674.645	1445	669.045	1480	664.145	1530	659.445	1590	654.145
1608	653.645	1709	650.945	1709.5	649.645	1710.5	649.445	1711.5	650.645
1712	650.945	1890	653.645	1930	654.245	2080	659.545	2200	662.245
2300	663.345	2400	663.145	2500	664.645				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1709	.05	1712	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1709	1712	.3	.7

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 654.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method

```
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   653.2

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

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 428

INPUT
Description: BHL
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  686.54    1050  684.84    1090  679.84    1110  674.45    1130  669.65
    1150  664.54    1210  659.34    1250  655.54    1350  651.74    1410  649.34
    1430  647.24    1440  649.65    1550  654.34    1605  656.65    1630  659.45
    1750  661.74    1860  664.45    2000  666.54    2100  667.34    2180  667.84
    2365  669.34    2450  671.34    2540  674.54    2640  684.34    2700  689.54
    2750  699.34    2800  704.65    2920  709.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1410     .05    1440     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1410    1440             220     400     240             .3       .7

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 147

INPUT
Description: BHK
Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  699.45    1040  694.84    1100  691.54    1170  689.54    1210  687.54
    1260  682.65    1340  684.95    1400  681.65    1440  679.65    1490  676.95
    1530  674.84    1555  669.65    1580  664.34    1610  659.24    1640  655.04
    1650  649.45    1660  646.74    1670  649.34    1750  651.74    1830  654.84
    1870  655.84    1900  654.74    1925  659.34    2100  661.54    2240  664.95
    2450  666.74    2623  669.65    2720  674.65    2760  679.34    2800  684.54
    2838  689.54    2848  694.34    2900  699.45    2940  704.45    3010  709.45
    3100  714.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1650     .05    1670     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1650    1670             305     380     405             .3       .7

BRIDGE


RIVER: Walker Run
REACH: 1                    RS: -10

INPUT
Description: Market Street
Distance from Upstream XS =     163
Deck/Roadway Width        =    23.7
Weir Coefficient          =     2.5
Upstream  Deck/Roadway Coordinates
    num=      30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1530 674.245 674.245    1555 669.045 669.045    1560 663.745 663.745
    1610 658.745 658.745    1635 653.645 653.645    1640 653.645 651.645
    1640 655.245 652.145  1655.5 656.745 647.345    1656 656.745 649.545
```

1657	656.945	650.645	1658	657.045	651.345	1659	657.145	651.645
1660	657.245	651.745	1661	657.045	651.645	1662	657.045	651.345
1663	656.945	650.545	1664	656.845	649.245	1664.5	656.745	646.645
1670	656.245	648.745	1680	655.245	649.045	1680	653.645	649.045
1750	653.645	651.145	1845	653.645	653.645	1860	654.245	654.245
1870	655.245	655.245	1900	656.745	656.745	1925	658.745	658.745
2100	660.945	660.945	2240	664.345	664.345	2480	666.145	666.145

Upstream Bridge Cross Section Data
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	698.845	1040	694.245	1100	690.945	1170	688.945	1210	683.945
1260	682.045	1340	684.345	1400	681.045	1440	679.045	1490	676.345
1530	674.245	1555	669.045	1580	664.045	1610	658.745	1635	653.645
1640	652.145	1641	652.145	1655.5	647.345	1656	646.945	1657	645.845
1658	645.945	1659	645.945	1660	645.945	1661	645.945	1662	645.945
1663	645.945	1664	646.245	1664.5	646.645	1670	648.745	1680	649.045
1750	651.145	1815	653.645	1830	654.245	1870	655.245	1900	654.145
1925	658.745	2100	660.945	2240	664.345	2450	663.245		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1640	.05	1655.5	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1655.5	1664.5	.3	.7

Downstream Deck/Roadway Coordinates
num= 30

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1530	674.245	674.245	1555	669.045	669.045	1560	663.745	663.745
1610	658.745	658.745	1635	653.645	653.645	1640	653.645	651.645
1640	655.245	652.145	1655.5	656.745	647.345	1656	656.745	649.545
1657	656.945	650.645	1658	657.045	651.345	1659	657.145	651.645
1660	657.245	651.745	1661	657.045	651.645	1662	657.045	651.345
1663	656.945	650.545	1664	656.845	649.245	1664.5	656.745	646.645
1670	656.245	648.745	1680	655.245	649.045	1680	653.645	649.045
1750	653.645	651.145	1845	653.645	653.645	1860	654.245	654.245
1870	655.245	655.245	1900	656.745	656.745	1925	658.745	658.745
2100	660.945	660.945	2240	664.345	664.345	2480	666.145	666.145

Downstream Bridge Cross Section Data
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	698.845	1040	694.245	1100	690.945	1170	688.945	1210	683.945
1260	682.045	1340	684.345	1400	681.045	1440	679.045	1490	676.345
1530	674.245	1555	669.045	1580	664.045	1610	658.745	1635	653.645
1640	652.145	1641	652.145	1655.5	647.345	1656	646.945	1657	645.845
1658	645.945	1659	645.945	1660	645.945	1661	645.945	1662	645.945
1663	645.945	1664	646.245	1664.5	646.645	1670	648.745	1680	649.045
1750	651.145	1815	653.645	1830	654.245	1870	655.245	1900	654.145
1925	658.745	2100	660.945	2240	664.345	2450	663.245		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1640	.05	1655.5	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1655.5	1664.5	.3	.7

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 654.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 652.5

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

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: -255

INPUT
Description: BHJ
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	684.34	1092	679.54	1128	674.34	1170	669.34	1230	664.54
1310	660.04	1330	657.54	1350	654.84	1372	649.74	1405	647.24
1408	645.74	1412	647.95	1450	649.65	1490	649.24	1525	649.34
1570	649.04	1610	649.84	1670	654.34	1712	659.34	1740	664.84
1750	669.34	1790	674.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1405	.05	1412	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1405	1412	225	260	200	.3	.7

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	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
1	5198	PF 1	1640.00	666.74	672.29	670.21	672.45	0.00322	4.57	679.39	213.54	0.38
1	4995	PF 1	1640.00	666.24	671.98		672.10	0.00290	4.49	809.61	268.46	0.36
1	4735	PF 1	1640.00	664.24	671.45		671.53	0.00181	3.93	1014.88	328.46	0.29
1	4495	PF 1	1640.00	663.74	671.21		671.26	0.00085	3.17	1231.26	328.20	0.21
1	4295	PF 1	1640.00	663.24	671.10		671.13	0.00072	2.78	1481.19	417.58	0.19
1	4043	PF 1	1640.00	662.24	670.96	667.76	670.98	0.00059	2.59	1720.34	513.42	0.17
1	3914			Bridge								
1	3785	PF 1	1640.00	660.24	666.72	667.18	668.16	0.02906	10.95	215.96	226.04	0.97
1	3532	PF 1	1640.00	658.24	663.52	662.84	663.92	0.01386	7.58	371.00	171.79	0.63
1	3375	PF 1	1640.00	657.24	662.36		662.54	0.00439	5.23	558.85	195.75	0.44
1	3065	PF 1	1640.00	655.95	660.88		661.12	0.00446	5.55	483.24	190.20	0.45
1	2730	PF 1	1640.00	654.74	659.53	658.23	659.72	0.00404	4.75	516.14	214.41	0.42
1	2480			Bridge								
1	2339	PF 1	1640.00	653.24	657.94		658.02	0.00133	2.59	778.58	344.43	0.24
1	2010	PF 1	1640.00	652.24	657.72		657.73	0.00036	1.50	2013.20	1059.62	0.13
1	1208	PF 1	1860.00	650.74	657.39		657.41	0.00029	1.75	1757.12	502.62	0.12
1	933	PF 1	1860.00	649.74	657.15	654.65	657.26	0.00152	4.17	1010.32	347.88	0.28
1	875			Bridge								
1	428	PF 1	1860.00	647.24	656.63		656.68	0.00048	2.64	1493.39	366.17	0.16
1	147	PF 1	1860.00	646.74	656.36	652.93	656.46					

FEMAFldStudy

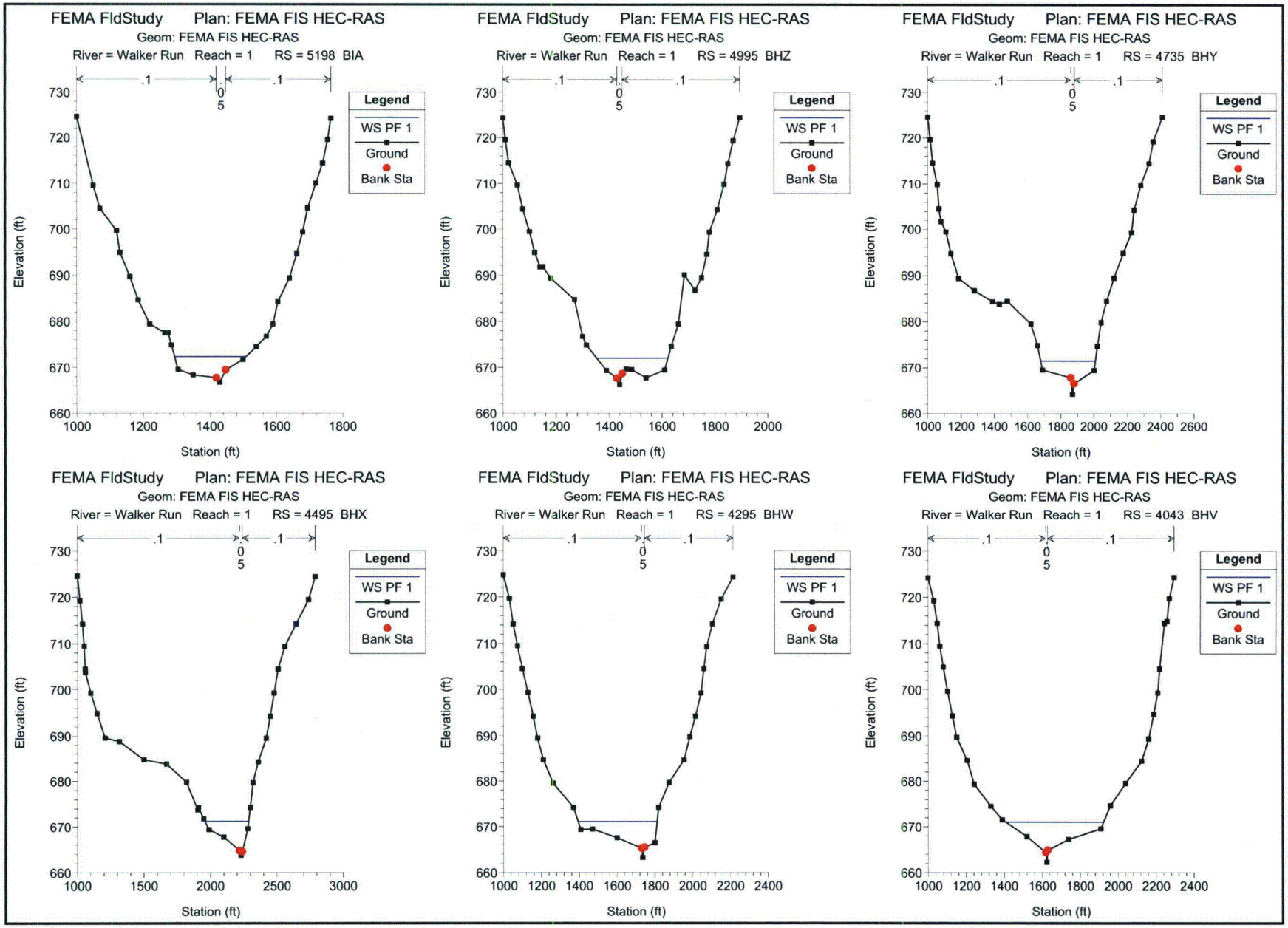
0.00110	3.95	1003.23	278.18	0.24				
1	-10		Bridge					
1	-255	PF 1	1860.00	645.74	653.29	650.73	653.35	
0.00149	3.72	1114.02	299.31	0.26				

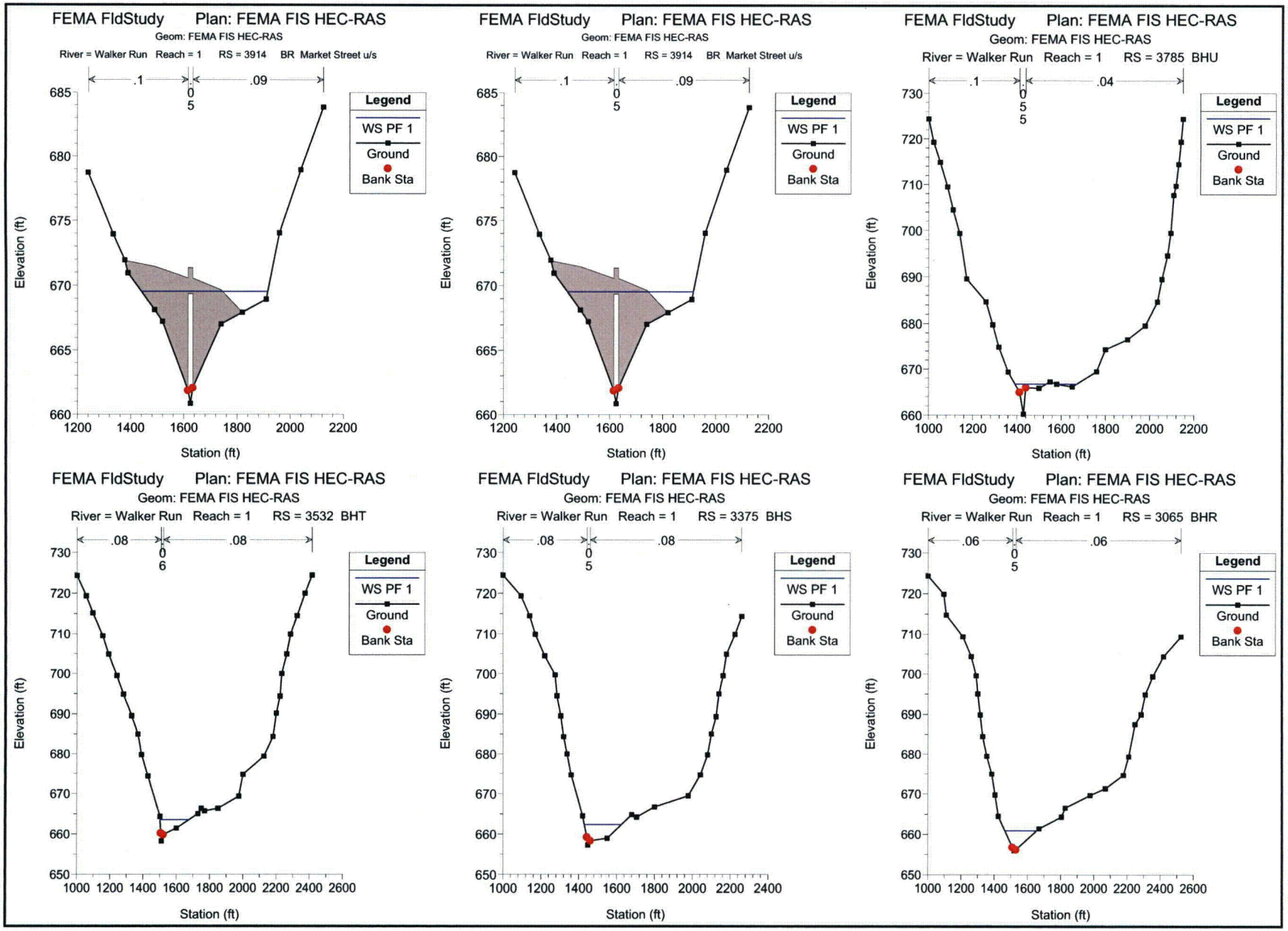
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : FEMA HECRAS

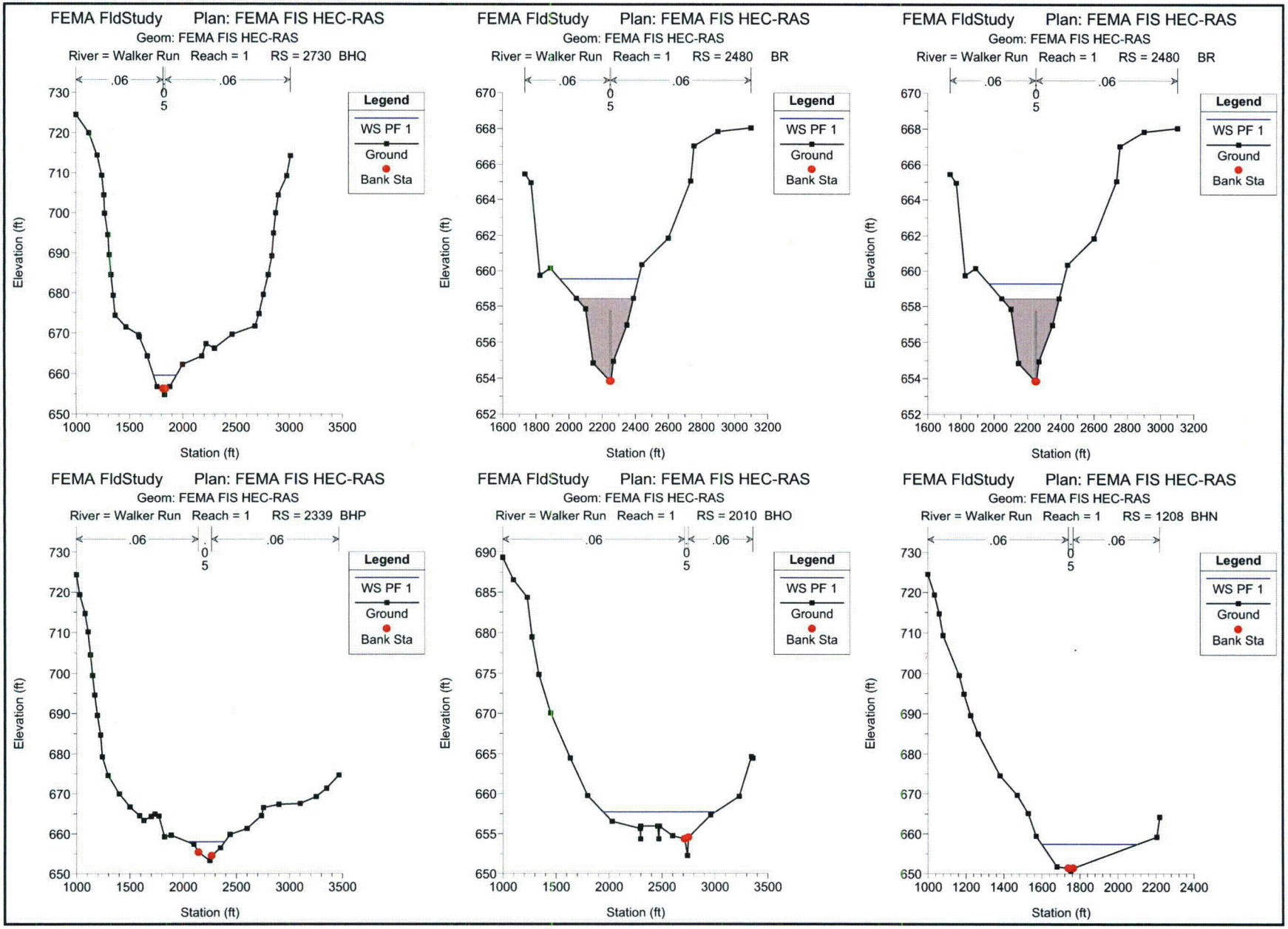
River: Walker Run Reach: 1 RS: 4735 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: PF 1
Warning:The velocity 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.
River: Walker Run Reach: 1 RS: 3914 Profile: PF 1
Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: PF 1 Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: PF 1 Downstream
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3785 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: The energy method has computed a class B profile.
River: Walker Run Reach: 1 RS: 3532 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was 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.
River: Walker Run Reach: 1 RS: 3375 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3065 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2480 Profile: PF 1
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 2480 Profile: PF 1 Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: PF 1 Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2339 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

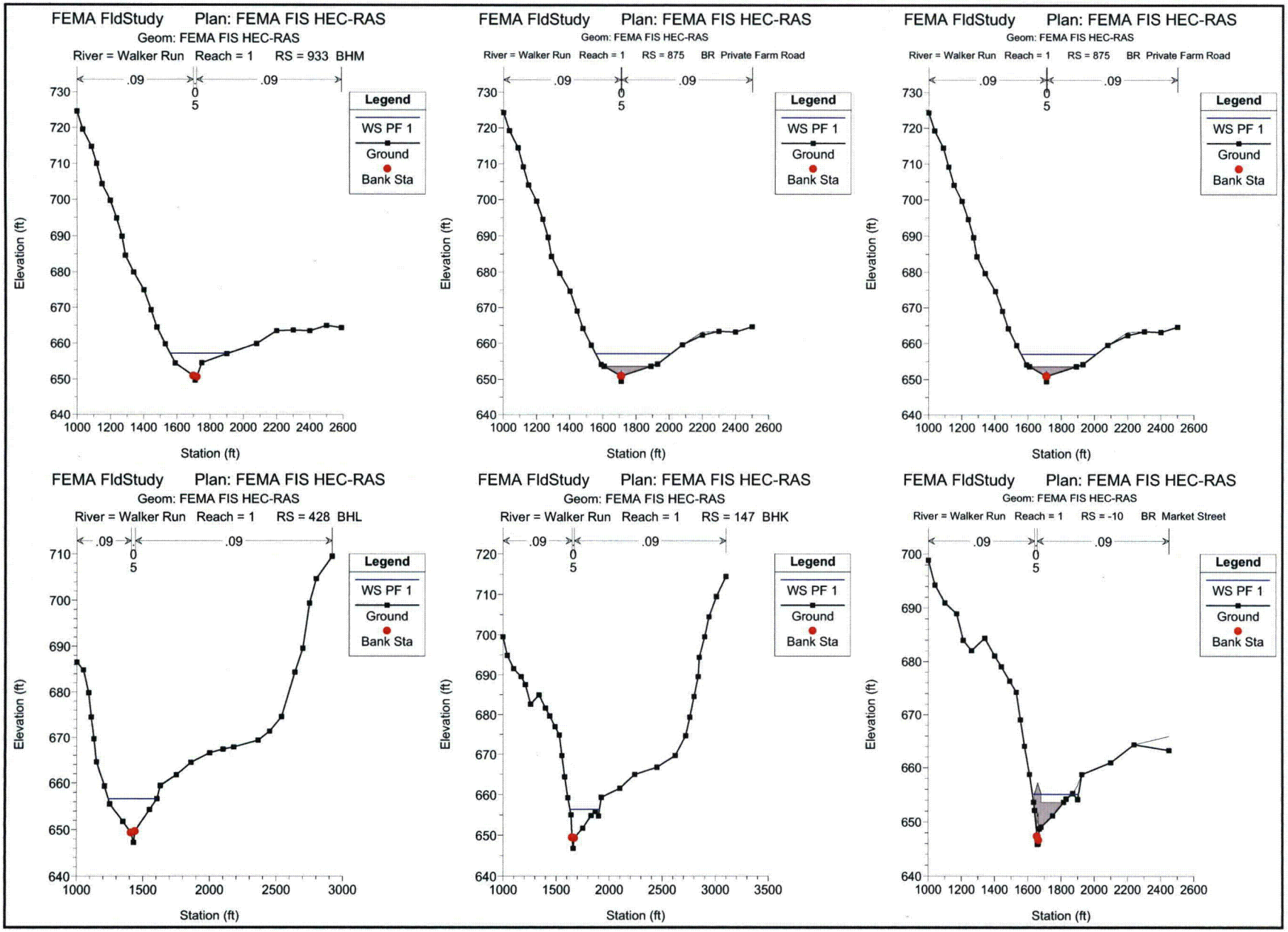
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 1208 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 933 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1
Warning:The pressure flow/weir calculations did not converge within the given number of iterations.
Note: The water surface computed by the sluice gate equation (during pressure/weir calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1 Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1 Downstream
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:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was 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.
River: Walker Run Reach: 1 RS: 428 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 147 Profile: PF 1
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.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1
Warning:The pressure flow/weir calculations did not converge within the given number of iterations.
Warning:The pure energy/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The water surface computed by the sluice gate equation (during pressure only calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1 Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: Notes(60): This is an inside cross section of a perched bridge that has energy, low flow inside of the bridge and
weir flow over the embankment. The reported hydraulics are based on the flow and area inside of the bridge.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1 Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: Notes(60): This is an inside cross section of a perched bridge that has energy, low flow

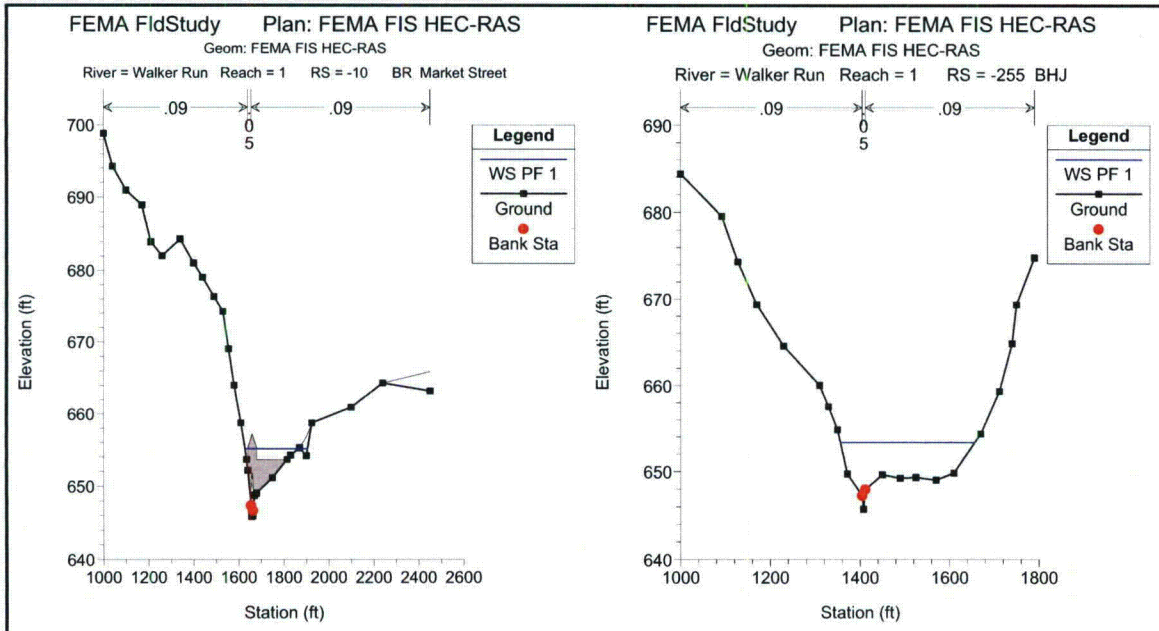
inside of the bridge and
weir flow over the embankment. The reported hydraulics are based on the flow and area inside of the bridge.


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 5198 BIA
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4995 BHZ
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4735 BHY
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4495 BHX
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4295 BHW
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4043 BHV
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

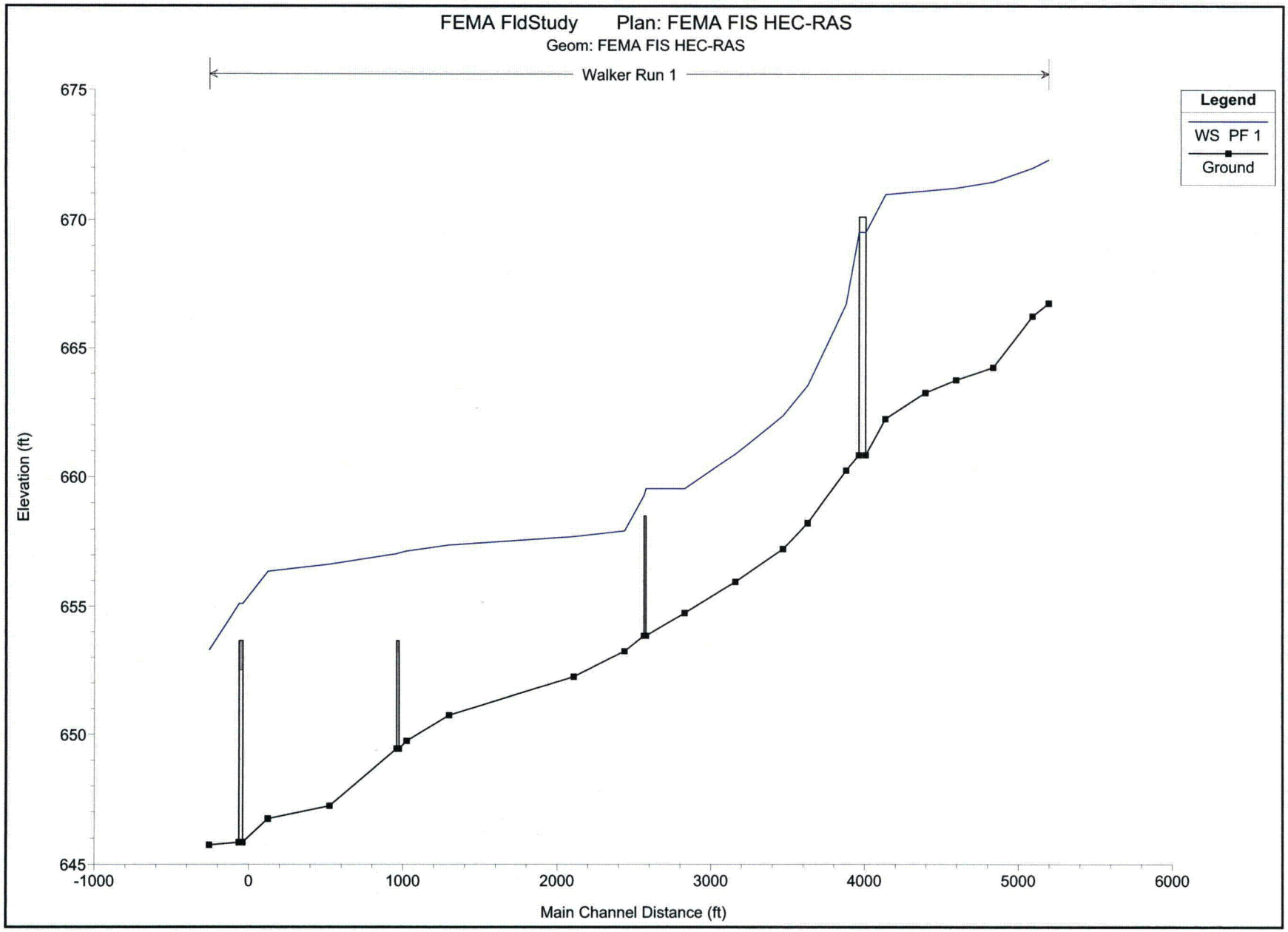

FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
.1
.09
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
.1
.09
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3785 BHU
.1
.04
0
5
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3532 BHT
.08
.08
0
6
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3375 BHS
.08
.08
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3065 BHR
.06
.06
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2730 BHQ
.06
.06
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2480 BR
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2480 BR
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2339 BHP
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2010 BHO
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 1208 BHN


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 933 BHM
.09
0
5
.09
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 875 BR Private Farm Road
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 875 BR Private Farm Road
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 428 BHL
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 147 BHK
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = -10 BR Market Street


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = -10 BR Market Street
.09
.09
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
700
690
680
670
660
650
640
1000 1200 1400 1600 1800 2000 2200 2400 2600
Station (ft)

FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = -255 BHJ
.09
.09
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
690
680
670
660
650
640
1000 1200 1400 1600 1800
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
Walker Run 1
Legend
WS PF 1
Ground
Elevation (ft)
675
670
665
660
655
650
645
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)

Appendix E:
Existing Hydraulics
(Corrected Effective Model)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: WalkerRunFld
Project File : WalkerRunFld.prj
Run Date and Time: 11/29/2010 2:04:37 PM

Project in English units

PLAN DATA

Plan Title: Existing Conditions
Plan File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.p05

Geometry Title: Existing Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g04

Flow Title : Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Plan Summary Information:

Number of:					
	Cross Sections =	91	Multiple Openings =	0
	Culverts =	3	Inline Structures =	0
	Bridges =	4	Lateral Structures =	0

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

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Flow Data (cfs)

River	Reach	RS	100 year storm	100 year storm encroachment	500 year storm
Tributary	1	6850	303.5	303.5	615.69
Tributary	1	4400	303.5	303.5	615.69
Tributary	1	1252	303.5	303.5	615.69
Walker Run	1	5862	1640	1640	3600
Walker Run	1	5198	1640	1640	3600
Walker Run	2	1602	1860	1860	3100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Tributary	1	100 year storm	Critical	
Tributary	1	100 year storm encroachment		Critical
Tributary	1	500 year storm	Critical	
Walker Run	1	100 year storm	Critical	
Walker Run	1	100 year storm encroachment		Critical
Walker Run	1	500 year storm	Critical	
Walker Run	2	100 year storm		Known WS = 653.29
Walker Run	2	100 year storm encroachment		Known WS = 654.29
Walker Run	2	500 year storm		Known WS = 654.6

GEOMETRY DATA

Geometry Title: Existing Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g04

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Tributary	1		Trib Junc
Walker Run	1		Trib Junc
Walker Run	2	Trib Junc	

JUNCTION INFORMATION

Name: Trib Junc
Description:
Energy computation Method

Length across Junction			Tributary			
River	Reach		River	Reach	Length	Angle
Walker Run	1	to Walker Run	2		325.9	
Tributary	1	to Walker Run	2		133	

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 6850

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	717.52	.35	717.54	2.18	717.61	3.78	717.66	6.3	717.8
7.85	717.82	12.81	718	20.71	718.1	21.89	718.12	30.23	718.06
30.44	718.06	34.3	718	34.95	717.97	35.49	717.93	40.01	717.62
40.91	717.52	41.61	717.38	43.04	717.13	43.18	717.1	43.68	717.04
43.98	717	47.48	716.55	50.04	716.18	50.95	716	52.04	715.78
54.81	715	56.01	714.66	58.49	714	60.5	713.45	61.8	713
73.57	712.06	74.45	712	75.39	711.91	76.44	711.85	84.53	711.28
90.32	711	91.39	710.93	91.8	710.91	92.02	710.89	92.48	710.85
96.49	710.55	101.47	710	102.88	709.75	104.15	709.32	104.25	709.26
104.43	709.22	104.66	709.19	104.87	709.2	105.86	709.3	106.32	709.38
107.84	709.67	109.84	710	112.63	710.84	113.19	711	113.34	711.06
116.12	712	118.92	712.94	119.09	713	119.23	713.05	122.01	714
123.04	714.38	124.97	715	126.95	715.63	128.05	716	130.39	716.75
131.16	717	132.68	717.25	138.64	718	141.42	718.08	146.9	718.11
148.71	718.06	153.13	718	156.17	717.38	157.97	717	159.64	716.99
159.72	716.99	161.24	717	161.76	717	162.96	717.28	166.09	718
167.49	718.26	174.81	719	177.43	719.22	185.26	719.81	186.71	719.92
187.13	719.95	187.68	720	195.49	720.55	201.16	721	207.47	721.56
209.54	721.73	212.78	722	224.62	722.84	226.57	723	236.08	723.8
238.51	724	242.33	724.16	249.45	724.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	90.32	.08	113.19	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
90.32	113.19	858.49	916.24	905.57	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5930

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	707.61	.21	707.52	1.49	707	3.75	706.23	4.35	706.04
4.46	706	4.67	705.91	6.78	705	7.13	704.87	9.64	704
11.48	703.34	12.46	703	12.85	702.86	15.32	702	16.31	701.64
18.18	701	20.11	700.31	21	700	23.24	699.19	23.8	699
24.33	698.81	26.66	698	27.99	697.57	29.87	697	31.89	696.61
35.21	696	40.81	695.52	43.76	695.24	46.22	695	47.88	694.93
73.56	694	78.44	693.3	80.01	693	80.83	692.64	82.4	692
83.33	692	84.28	692	84.3	692	84.31	692	86.28	692
87.21	692.48	88.27	693	101.79	693.51	104.21	693.59	106.79	693.68
108.18	693.72	110.29	693.73	112.58	693.7	112.72	693.69	118.36	693.78
120.92	693.83	122.97	693.9	125.05	694	139.58	694.93	140.72	695
141.28	695.05	153.31	696	158.07	696.55	162.09	697	166	697.45
170.75	698	174.95	698.5	179.08	699	183.24	699.61	185.81	700
188.27	700.35	192.66	701	196.14	701.53	199.34	702	204.09	702.76
205.4	703	207.13	703.33	210.72	704	213.77	704.54	216.32	705
218.9	705.47	221.12	705.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	80.01	.08	88.27	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.01	88.27	448.37	429.25	409.23	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5500

INPUT
Description:
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	705.59	1.65	705.28	3.11	705	3.68	704.9	9.3	704
10.58	703.79	14.78	703	14.79	703	19.67	702.91	20.62	702.9
22.18	702.9	22.97	702.9	23.58	702.92	24.01	702.94	24.36	702.98
24.87	703	25.93	703.05	26.08	703.05	35.07	703.38	37.21	703.44
39.27	703.47	41.12	703.49	42.58	703.48	43.53	703.46	44.12	703.41
44.76	703.31	46.18	703	46.94	702.52	47.85	702	48.86	701.36
49.48	701	50.69	700.22	51.08	700	51.86	699.5	52.59	699
53.94	698.19	54.24	698	54.73	697.69	55.88	697	57.44	696.04
57.51	696	57.79	695.83	59.23	695	60.7	694.11	60.9	694
62.37	693.25	62.91	693	62.98	692.98	65.37	692	65.4	691.99
66.48	691.55	67.85	691	67.95	691	75.95	691	79.78	691
84.86	691	87.6	691	89.79	691	96.84	691	105.06	691
105.18	691	106.9	691	107.22	691	114.51	691	116.13	691
118.28	691.39	121.68	692	123.18	692.64	124.03	693	126.02	693.87
126.33	694	127.25	694.4	128.76	695	129.16	695.13	132.13	696
132.9	696.22	135.68	697	137.76	697.61	139.16	698	139.62	698.13
142.67	699	143.27	699.17	146.17	700	149.04	700.82	149.66	701
150.18	701.16	153.12	702	153.66	702.15	156.6	703	158.09	703.4
160.27	704	162.03	704.45	164.06	705	166.44	705.61	168.26	706
169.59	706.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	66.48	.08	118.28	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66.48	118.28	758.93	739.98	740.88	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4750

INPUT
Description:
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	719.11	7.68	719	10.17	718.76	18.45	718	20.03	717.49
21.92	717	22.84	716.49	23.71	716	24.48	715.58	25.43	715
26.3	714.49	27.18	714	28.1	713.46	28.92	713	29.88	712.44
30.65	712	31.64	711.37	32.27	711	33.35	710.38	33.99	710
35.06	709.39	35.7	709	36.83	708.35	37.43	708	38.7	707.26
39.13	707	39.54	706.76	40.87	706	42.26	705.19	42.58	705
43.96	704.19	44.31	704	45.75	703.16	46.03	703	47.5	702.13
47.72	702	49.25	701.01	49.26	701	49.27	700.99	50.71	700
51.78	699.09	51.92	699	52.06	698.89	53.27	698	53.57	697.79
54.58	697	55.07	696.68	55.87	696	56.82	695.31	57.23	695
58.25	694.16	58.5	694	60.18	693.01	60.19	693	60.23	692.98
62.33	692	64.4	691	64.41	691	66.77	690	68.03	689.39
68.88	689	70.28	688.56	71.66	688	73.93	687.54	76.53	687
79.74	686.35	81.27	686	83.57	685.49	85.56	685	86.56	684
89.9	684	94.99	684	124.36	684	137.07	684	144.81	684
176.24	685	176.89	685.09	183.88	686	186.34	686.5	188.39	687
191.16	687.7	192.31	688	193.07	688.2	196.16	689	197.57	689.37
200.05	690	206.17	690.93	206.7	691	214.37	691.48	215.87	691.59
217.4	691.74	217.65	691.76	218.07	691.79	218.54	691.81	219.08	691.82
219.68	691.82	220.29	691.82	221.04	691.82	221.15	691.82	221.32	691.79
221.59	691.74	222.48	691.36	223.33	691	225.37	690.05	225.47	690
225.68	689.91	227.73	689	229.96	688.11	230.23	688	230.4	687.93
232.65	687	233.17	686.93	233.41	686.89	233.91	686.96	234.15	687
234.42	687.11	236.86	688	237.5	688.24	239.62	689	242.37	690
245.17	691	245.95	691.05	247.15	691.13	252.96	691.51	261.76	692
269.9	692.26	288.24	692.9	290.57	692.98	291.12	693	296.01	693.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	81.27	.08	183.88	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
81.27	183.88	238.3	226.5	190.7	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4530

INPUT
Description: U/S XS of Beaver Dam Pond Culvert
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43
261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.25	256.85	26.8	29.2	29.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

CULVERT

RIVER: Tributary
REACH: 1 RS: 4528

INPUT
Description: Beaver Dam Pond Culvert
Distance from Upstream XS = 10.5
Deck/Roadway Width = 4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	
.37	699.82		1.81	699.59		4.29	699.12	
4.86	699		5.91	698.73		7.54	698.44	
9.65	698		12.65	697.57		15.79	697	
17.04	696.74		19.94	696		20.51	695.88	
24.52	695		25.05	694.9		29.34	694	
29.78	693.91		34.3	693		38.09	692.22	
39.2	692		43.19	691.18		43.98	691	
44.34	690.93		44.67	690.88		49.26	690	
51.11	689.68		55.23	689		60.28	688.18	
61.36	688		65.16	687.39		67.46	687	
68.34	686.86		70.96	686.33		80.51	686.24	
80.67	686.24		84.94	686.05		86.72	686.04	
89.52	686.04		93.66	686.03		94.45	686.03	
95.14	686.02		96.47	686.02		97.36	686.02	
101.68	686.02		102.68	686.02		104.7	686.03	
105.44	686.03		109.35	686.02		114.19	686.01	
117.38	686		119.45	685.81		120.95	685.78	
123.15	685.61		123.97	685.38		125.3	685	
127.21	685		132.46	685		134.61	685	
139.57	685		141.83	685		144.59	685	
147.06	685		149.69	685		153.25	685	
155	685		158.41	685		163.68	685	
164.26	685		164.58	685		172.54	685	
173.23	685		174.29	685		182.66	685	
183.32	685		185.42	685		189.93	684.94	
190.82	684.95		198.27	684.93		198.45	684.93	
205.79	684.9		205.98	684.91		206.25	684.92	
207.99	685		214.82	685		215.17	685	
216.22	685		218.29	685		218.85	685	
220.55	685		221.47	685		221.8	685	
222.26	685		222.79	685		223.34	685	
225.66	685		229.27	685		229.91	685	
232.18	685		233.95	685		235.25	685	
238.49	685		239.5	685		240.33	685	
240.63	685		242.95	685		245.9	685	
246.88	685		249.8	685		250.83	685	
252.46	685		260.7	685		262.47	685.37	
265.16	686		268.07	686.63		269.63	687	
272.57	687.71		273.81	688		274.81	688.23	
278.02	689		278.88	689.03		292.31	689.45	
305.41	690		309.17	690.2		310.77	690.28	

Upstream Bridge Cross Section Data
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43

261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
39.25	256.85	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

Downstream Deck/Roadway Coordinates

num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	
.37	699.82		1.81	699.59		4.29	699.12	
4.86	699		5.91	698.73		7.54	698.44	
9.65	698		12.65	697.57		15.79	697	
17.04	696.74		19.94	696		20.51	695.88	
24.52	695		25.05	694.9		29.34	694	
29.78	693.91		34.3	693		38.09	692.22	
39.2	692		43.19	691.18		43.98	691	
44.34	690.93		44.67	690.88		49.26	690	
51.11	689.68		55.23	689		60.28	688.18	
61.36	688		65.16	687.39		67.46	687	
68.34	686.86		70.96	686.33		80.51	686.24	
80.67	686.24		84.94	686.05		86.72	686.04	
89.52	686.04		93.66	686.03		94.45	686.03	
95.14	686.02		96.47	686.02		97.36	686.02	
101.68	686.02		102.68	686.02		104.7	686.03	
105.44	686.03		109.35	686.02		114.19	686.01	
117.38	686		119.45	685.81		120.95	685.78	
123.15	685.61		123.97	685.38		125.3	685	
127.21	685		132.46	685		134.61	685	
139.57	685		141.83	685		144.59	685	
147.06	685		149.69	685		153.25	685	
155	685		158.41	685		163.68	685	
164.26	685		164.58	685		172.54	685	
173.23	685		174.29	685		182.66	685	
183.32	685		185.42	685		189.93	684.94	
190.82	684.95		198.27	684.93		198.45	684.93	
205.79	684.9		205.98	684.91		206.25	684.92	
207.99	685		214.82	685		215.17	685	
216.22	685		218.29	685		218.85	685	
220.55	685		221.47	685		221.8	685	
222.26	685		222.79	685		223.34	685	
225.66	685		229.27	685		229.91	685	
232.18	685		233.95	685		235.25	685	
238.49	685		239.5	685		240.33	685	
240.63	685		242.95	685		245.9	685	
246.88	685		249.8	685		250.83	685	
252.46	685		260.7	685		262.47	685.37	
265.16	686		268.07	686.63		269.63	687	
272.57	687.71		273.81	688		274.81	688.23	
278.02	689		278.88	689.03		292.31	689.45	
305.41	690		309.17	690.2		310.77	690.28	

Downstream Bridge Cross Section Data

Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	698.39	2.25	698	3.51	697.78	8.04	697	10.4	696.58
13.75	696	17.58	695.27	19.01	695	24.3	694.01	24.35	694
24.36	694	24.39	693.99	24.56	693.96	29.6	693	29.96	692.93
34.84	692	35.26	691.92	40.08	691	40.93	690.86	43.54	690.41
45.59	690	46.73	689.76	50.78	689	51.85	688.8	56.28	688
56.66	687.94	56.88	687.91	57.21	687.86	62.06	687	64.06	686.74
67.41	686.48	73.1	686	73.58	685.87	76.63	685.77	78.89	685.6
81.72	685.36	82.81	685.28	83.36	685.25	84.22	685.21	84.7	685.21
87.07	685.08	87.43	685.08	88.66	685	90.82	684.79	91.94	684.65
92.9	684.44	93.35	684.38	94.01	684.33	94.9	684.3	99.29	684.28
104.43	684.19	106.71	684.15	109.3	684.08	111.09	684	111.21	683.99
112.38	683.85	113.67	683.78	114.6	683.71	115.76	683.68	117.21	683.5
118.12	683.44	119.46	683.39	121.24	683.35	122.15	683.37	127.52	683.35
131.92	683.3	134.65	683.33	135.14	683.32	139.51	683.33	140.67	683.32
141.87	683.33	142.84	683.34	143.7	683.37	146.54	683.44	152.28	683.42

157.84	683.49	163.36	683.36	165.79	683.33	166.88	683.33	172.36	683.22
173.32	683.21	176.18	683.19	177.33	683.17	190.83	683.03	191.87	683
198.11	682.59	198.65	682.57	200.68	682.65	201.32	682.65	205.33	682.59
206.51	682.67	207.73	682.75	210.04	682.71	210.84	682.68	212.81	682.65
213.82	682.63	213.87	682.6	216.59	682.57	219.18	682.57	222.09	682.65
229.54	682.91	231.92	683	232.46	683.21	234.58	684	235.86	684.47
237.43	685	237.7	685.1	240.19	686	245.86	686.3	256.09	687
266.97	687.52	275.91	688	283.94	688.34	286.47	688.44	294.52	688.78
302.29	689	315.27	689.42	320.65	689.56	325.31	689.67	329.74	689.81
338.75	689.97	339.92	689.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	117.21	.08	146.54	.05

Bank Sta: Left Right Coeff Contr. Expan.
117.21 146.54 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	115	686.02	F
146.54	339.92	685	F

Right Levee Station= 146.54 Elevation= 683.44

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	2	

FHWA Chart # 55- Circular Culvert
FHWA Scale # 1 - Smooth tapered inlet throat
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
4.3	18	.013	.013	0	.9	1

Upstream Elevation = 679.28
Centerline Station = 106
Downstream Elevation = 679.1
Centerline Station = 122

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4500

INPUT
Description: D/S XS of Beaver Dam Pond Culvert
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	698.39	2.25	698	3.51	697.78	8.04	697	10.4	696.58
13.75	696	17.58	695.27	19.01	695	24.3	694.01	24.35	694
24.36	694	24.39	693.99	24.56	693.96	29.6	693	29.96	692.93
34.84	692	35.26	691.92	40.08	691	40.93	690.86	43.54	690.41
45.59	690	46.73	689.76	50.78	689	51.85	688.8	56.28	688
56.66	687.94	56.88	687.91	57.21	687.86	62.06	687	64.06	686.74
67.41	686.48	73.1	686	73.58	685.87	76.63	685.77	78.89	685.6
81.72	685.36	82.81	685.28	83.36	685.25	84.22	685.21	84.7	685.21
87.07	685.08	87.43	685.08	88.66	685	90.82	684.79	91.94	684.65
92.9	684.44	93.35	684.38	94.01	684.33	94.9	684.3	99.29	684.28
104.43	684.19	106.71	684.15	109.3	684.08	111.09	684	111.21	683.99
112.38	683.85	113.67	683.78	114.6	683.71	115.76	683.68	117.21	683.5
118.12	683.44	119.46	683.39	121.24	683.35	122.15	683.37	127.52	683.35
131.92	683.3	134.65	683.33	135.14	683.32	139.51	683.33	140.67	683.32
141.87	683.33	142.84	683.34	143.7	683.37	146.54	683.44	152.28	683.42
157.84	683.49	163.36	683.36	165.79	683.33	166.88	683.33	172.36	683.22
173.32	683.21	176.18	683.19	177.33	683.17	190.83	683.03	191.87	683
198.11	682.59	198.65	682.57	200.68	682.65	201.32	682.65	205.33	682.59
206.51	682.67	207.73	682.75	210.04	682.71	210.84	682.68	212.81	682.65
213.82	682.63	213.87	682.6	216.59	682.57	219.18	682.57	222.09	682.65
229.54	682.91	231.92	683	232.46	683.21	234.58	684	235.86	684.47
237.43	685	237.7	685.1	240.19	686	245.86	686.3	256.09	687
266.97	687.52	275.91	688	283.94	688.34	286.47	688.44	294.52	688.78
302.29	689	315.27	689.42	320.65	689.56	325.31	689.67	329.74	689.81

```
  338.75  689.97  339.92  689.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  117.21     .08  146.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.21  146.54             87.5    99.4   102.5             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     115  686.02        F
  146.54  339.92     685        F
Right Levee     Station=  146.54      Elevation=  683.44

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 4400

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      36  683.01     104  679.71  116.53   678.6   128.1  677.84  152.93  677.53
  158.35   677.2   158.8  675.98  159.72  675.78  160.48  676.59   161.3  676.98
  163.98  677.49  176.22  678.17  181.98  677.84     190  680.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      36     .05  158.35     .08   161.3     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        158.35   161.3           1043.98  1051.3 1040.76             .3       .5

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 3356

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -438.69  672.01 -380.28  671.01 -365.82  670.01      28  670.01     100  671.01
  194.18  670.23  205.77  669.77   208.9  670.84  210.78  669.09  213.43  668.53
  214.16  667.67  215.07  667.67  215.68  667.68  216.52  667.72     217  667.83
  219.51  670.12  224.24  671.09  229.11  672.65  234.42  670.53  267.47  672.28
  295.86  673.86  312.17  675.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -438.69      .1  213.43     .05  219.51      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.43  219.51           79.33   49.33      17             .1       .3
Left Levee      Station=     100      Elevation=  671.01
Right Levee     Station=  229.11      Elevation=  672.65

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 3306.66*

INPUT
Description:
Station Elevation Data    num=     150
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -365.58  672.89 -356.29   672.7 -340.98  672.37 -327.21  672.08 -312.14  671.76
 -303.36  671.16 -298.91  670.86 -296.06  670.84 -289.12  670.79  -271.4  670.67
 -257.81   670.6 -245.46  670.51 -223.43  670.37 -220.64  670.35 -219.57  670.34
  -218.2  670.33 -193.72  670.17 -176.88  670.03 -174.43  670.01 -172.82  669.99
  -156.4  669.84 -143.88  669.71 -139.88  669.67 -133.27  669.64 -121.84  669.59
 -109.56  669.53  -105.7  669.51 -103.25   669.5  -93.82  669.49  -76.52  669.46
  -74.99  669.45  -73.04  669.45  -68.83  669.45  -51.07  669.45  -40.16  669.45
  -27.39  669.45  -18.77  669.45  -9.41  669.45      -1  669.45    2.12  669.45
   12.42  669.45   18.14  669.44    21.4  669.44   25.65  669.44   30.44  669.44
```

34.89	669.43	38.11	669.42	43.35	669.41	47.64	669.4	52.77	669.4
57.9	669.39	61.35	669.39	64.69	669.43	70	669.49	72.79	669.52
78.37	669.59	84.43	669.66	89.17	669.72	96.02	669.8	97.27	669.81
116.25	670.04	116.42	670.04	120.46	670.09	127.22	670.17	138.39	670.09
145.84	670.03	150.95	669.99	154.6	669.96	157.73	669.94	163.17	669.9
173.92	669.85	179.03	669.83	188.57	669.79	213.37	669.68	216.61	669.57
223.97	669.31	224.62	669.51	226.84	670.2	228.56	668.74	230.98	668.28
231.17	668.13	232.1	667.39	232.43	667.39	232.71	667.39	233.04	667.39
233.28	667.39	234.08	667.42	235.19	667.49	235.82	667.6	238.86	669.45
239.11	669.6	239.2	669.61	243.35	670.3	244.79	670.54	246.31	670.91
250.19	671.87	250.64	671.99	252.74	671.46	256.73	670.45	257.02	670.38
259.17	670.52	263.02	670.8	264.09	670.87	267.67	671.11	269.51	671.23
273.25	671.5	274.5	671.58	274.9	671.61	279.74	671.94	283.98	672.21
285.63	672.33	287.35	672.47	289.44	672.63	290.42	672.72	293.03	672.93
294.86	673.08	296.62	673.23	296.74	673.24	297.95	673.34	300.45	673.54
303.17	673.76	304.27	673.86	309.41	674.17	310.13	674.21	310.29	674.22
310.89	674.25	311.06	674.26	312.77	674.35	314.16	674.42	314.43	674.43
317.24	674.56	317.97	674.59	322.26	674.79	323.5	674.84	326.4	674.97
328.11	675.04	329.23	675.09	330.19	675.13	330.85	675.15	331.11	675.17
332.05	675.24	333.06	675.32	336.37	675.57	339.05	675.76	340.75	675.89
341.41	675.94	345.3	676.22	345.99	676.27	346.65	676.31	350.44	676.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-365.58	.1	230.98	.05	239.11	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
230.98	239.11	79.33	49.33	17	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3257.33*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-292.46	673.77	-284.04	673.56	-270.16	673.19	-257.67	672.86	-244	672.51
-236.04	671.97	-232.01	671.7	-229.42	671.67	-223.13	671.57	-207.05	671.34
-194.73	671.19	-183.53	671.01	-163.55	670.72	-161.02	670.69	-160.05	670.67
-158.82	670.66	-136.62	670.34	-121.34	670.05	-119.12	670.01	-117.66	669.98
-102.77	669.67	-91.42	669.42	-87.78	669.34	-81.79	669.28	-71.42	669.16
-60.29	669.05	-56.79	669.01	-54.57	669	-46.01	668.96	-30.33	668.9
-28.94	668.9	-27.17	668.89	-23.36	668.89	-7.25	668.89	2.65	668.89
14.22	668.89	22.05	668.89	30.53	668.89	38.15	668.89	40.99	668.89
50.32	668.88	55.52	668.88	58.47	668.88	62.32	668.87	66.67	668.86
70.71	668.85	73.63	668.84	78.38	668.8	82.27	668.79	86.92	668.78
91.57	668.77	94.7	668.76	97.73	668.79	102.55	668.83	105.08	668.86
110.14	668.9	115.64	668.96	119.93	669	126.14	669.06	127.28	669.07
144.49	669.24	144.64	669.24	148.31	669.27	154.43	669.34	164.57	669.26
171.32	669.21	175.96	669.18	179.27	669.16	182.1	669.15	187.04	669.12
196.78	669.11	201.42	669.11	210.07	669.12	232.56	669.13	235.5	669.06
242.18	668.85	242.76	669.01	244.78	669.56	246.33	668.39	248.53	668.02
248.78	667.88	250.03	667.11	250.44	667.11	250.78	667.11	251.2	667.11
251.5	667.11	252.49	667.17	253.85	667.25	254.63	667.36	258.4	668.95
258.71	669.08	258.81	669.09	263.66	669.75	265.35	669.99	267.12	670.33
271.65	671.22	272.18	671.32	274.63	670.97	279.29	670.28	279.63	670.23
282.13	670.42	286.64	670.8	287.88	670.89	292.06	671.22	294.21	671.39
298.58	671.75	300.04	671.87	300.51	671.91	306.15	672.35	311.11	672.71
313.03	672.86	315.04	673.07	317.48	673.31	318.63	673.43	321.67	673.74
323.81	673.97	325.87	674.18	326	674.2	327.42	674.34	330.34	674.63
333.51	674.94	334.8	675.09	340.8	675.48	341.64	675.53	341.83	675.54
342.53	675.57	342.73	675.58	344.72	675.68	346.35	675.75	346.67	675.76
349.95	675.89	350.79	675.92	355.81	676.11	357.25	676.16	360.64	676.29
362.63	676.34	363.94	676.39	365.07	676.42	365.83	676.44	366.14	676.46
367.24	676.51	368.41	676.57	372.28	676.77	375.41	676.91	377.4	677.01
378.17	677.04	382.71	677.25	383.52	677.29	384.29	677.32	388.72	677.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-292.46	.1	248.53	.05	258.71	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
248.53	258.71	79.33	49.33	17	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3208.*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-219.35	674.65	-211.79	674.42	-199.33	674	-188.12	673.65	-175.87	673.26
-168.72	672.78	-165.1	672.55	-162.78	672.51	-157.13	672.36	-142.71	672.01
-131.65	671.78	-121.6	671.51	-103.68	671.08	-101.41	671.03	-100.54	671.01
-99.43	670.98	-79.51	670.51	-65.8	670.07	-63.8	670.01	-62.49	669.96
-49.14	669.51	-38.95	669.12	-35.69	669.01	-30.31	668.91	-21.01	668.74
-11.02	668.57	-7.88	668.51	-5.89	668.49	1.79	668.44	15.86	668.34
17.11	668.34	18.69	668.33	22.12	668.33	36.57	668.33	45.45	668.32
55.84	668.33	62.86	668.33	70.48	668.33	77.31	668.33	79.86	668.33
88.23	668.32	92.89	668.31	95.54	668.31	99	668.3	102.9	668.29
106.52	668.27	109.14	668.25	113.41	668.2	116.9	668.17	121.07	668.17
125.24	668.14	128.05	668.14	130.77	668.16	135.09	668.18	137.36	668.19
141.9	668.22	146.84	668.26	150.69	668.29	156.26	668.33	157.28	668.33
172.73	668.43	172.86	668.43	176.15	668.45	181.65	668.5	190.74	668.44
196.81	668.4	200.96	668.38	203.93	668.36	206.48	668.35	210.91	668.34
219.65	668.37	223.81	668.4	231.57	668.45	251.76	668.58	254.39	668.54
260.38	668.39	260.91	668.51	262.71	668.92	264.11	668.05	266.08	667.77
266.4	667.62	267.97	666.83	268.46	666.83	268.86	666.83	269.36	666.83
269.71	666.83	270.89	666.91	272.52	667.02	273.45	667.13	277.95	668.45
278.31	668.55	278.43	668.57	283.97	669.21	285.9	669.43	287.93	669.75
293.11	670.56	293.71	670.66	296.51	670.48	301.84	670.11	302.23	670.08
305.1	670.31	310.25	670.8	311.67	670.92	316.45	671.34	318.91	671.54
323.9	672	325.57	672.15	326.11	672.21	332.57	672.77	338.23	673.21
340.43	673.4	342.73	673.67	345.52	673.98	346.83	674.14	350.32	674.56
352.77	674.86	355.11	675.14	355.27	675.15	356.88	675.34	360.23	675.73
363.86	676.13	365.32	676.31	372.2	676.78	373.15	676.84	373.36	676.86
374.16	676.89	374.4	676.9	376.68	677.01	378.54	677.08	378.9	677.09
382.65	677.22	383.62	677.25	389.35	677.44	391.01	677.48	394.88	677.61
397.16	677.65	398.66	677.69	399.94	677.72	400.82	677.73	401.17	677.74
402.43	677.78	403.77	677.82	408.19	677.96	411.77	678.06	414.05	678.13
414.93	678.15	420.13	678.28	421.05	678.3	421.93	678.32	426.99	678.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.35	.1	266.08	.05	278.31	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
266.08	278.31	79.33	49.33	17	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3158.66*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-146.23	675.53	-139.54	675.28	-128.51	674.82	-118.58	674.43	-107.73	674.01
-101.4	673.59	-98.2	673.39	-96.14	673.34	-91.14	673.14	-78.37	672.67
-68.58	672.37	-59.67	672	-43.8	671.44	-41.79	671.37	-41.02	671.34
-40.04	671.3	-22.4	670.67	-10.26	670.09	-8.49	670	-7.33	669.94
4.49	669.34	13.52	668.82	16.4	668.67	21.16	668.55	29.4	668.32
38.25	668.09	41.03	668	42.8	667.98	49.59	667.91	62.05	667.79
63.16	667.78	64.56	667.78	67.6	667.77	80.4	667.76	88.26	667.76
97.46	667.77	103.67	667.77	110.42	667.77	116.47	667.77	118.72	667.77
126.14	667.75	130.27	667.75	132.62	667.74	135.68	667.73	139.13	667.71
142.34	667.69	144.66	667.66	148.44	667.6	151.52	667.56	155.22	667.55
158.91	667.52	161.4	667.51	163.81	667.52	167.64	667.52	169.65	667.53
173.67	667.54	178.04	667.56	181.45	667.57	186.39	667.59	187.29	667.59
200.96	667.63	201.09	667.63	204	667.64	208.87	667.66	216.92	667.62
222.29	667.59	225.97	667.57	228.6	667.56	230.85	667.56	234.78	667.56
242.52	667.64	246.2	667.68	253.08	667.78	270.95	668.03	273.28	668.03
278.59	667.92	279.05	668	280.65	668.28	281.89	667.7	283.64	667.51
284.02	667.37	285.91	666.56	286.47	666.56	286.94	666.56	287.52	666.56
287.92	666.56	289.3	666.65	291.18	666.79	292.26	666.9	297.49	667.95
297.91	668.03	298.04	668.04	304.28	668.66	306.45	668.88	308.73	669.16
314.56	669.91	315.25	670	318.4	669.98	324.4	669.93	324.84	669.93
328.06	670.21	333.86	670.8	335.46	670.95	340.84	671.45	343.61	671.69
349.23	672.25	351.11	672.43	351.71	672.5	358.98	673.18	365.36	673.7
367.84	673.93	370.42	674.27	373.56	674.65	375.04	674.86	378.96	675.37

381.72	675.74	384.36	676.09	384.53	676.11	386.35	676.33	390.12	676.82
394.2	677.31	395.85	677.54	403.59	678.09	404.66	678.16	404.9	678.17
405.8	678.21	406.06	678.22	408.63	678.34	410.72	678.41	411.13	678.42
415.36	678.55	416.45	678.58	422.9	678.77	424.76	678.8	429.12	678.92
431.69	678.95	433.37	678.99	434.82	679.01	435.81	679.02	436.2	679.03
437.61	679.05	439.13	679.07	444.11	679.16	448.14	679.21	450.69	679.25
451.69	679.26	457.54	679.31	458.58	679.32	459.57	679.32	465.26	679.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-146.23	.1	283.64	.05	297.91	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
283.64	297.91	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3109.33*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-73.11	676.41	-67.29	676.14	-57.68	675.64	-49.04	675.22	-39.59	674.76
-34.08	674.41	-31.29	674.24	-29.5	674.17	-25.14	673.92	-14.02	673.34
-5.5	672.96	2.25	672.5	16.07	671.79	17.82	671.7	18.49	671.67
19.35	671.62	34.71	670.84	45.28	670.11	46.82	670	47.83	669.92
58.13	669.17	65.98	668.53	68.5	668.34	72.64	668.18	79.82	667.9
87.52	667.61	89.94	667.5	91.48	667.48	97.4	667.39	108.25	667.23
109.21	667.22	110.43	667.22	113.07	667.21	124.22	667.2	131.06	667.2
139.07	667.21	144.49	667.21	150.36	667.21	155.63	667.21	157.59	667.21
164.05	667.19	167.64	667.18	169.69	667.17	172.35	667.16	175.36	667.14
178.15	667.11	180.17	667.08	183.46	666.99	186.15	666.95	189.37	666.94
192.59	666.9	194.76	666.89	196.85	666.89	200.18	666.87	201.93	666.87
205.43	666.85	209.24	666.86	212.21	666.85	216.51	666.85	217.29	666.85
229.2	666.82	229.31	666.82	231.84	666.82	236.08	666.83	243.09	666.79
247.77	666.77	250.97	666.76	253.26	666.76	255.23	666.77	258.64	666.78
265.38	666.9	268.59	666.97	274.58	667.11	290.14	667.48	292.17	667.51
296.79	667.46	297.2	667.5	298.59	667.64	299.67	667.35	301.19	667.26
301.63	667.11	303.84	666.28	304.49	666.28	305.02	666.28	305.67	666.28
306.14	666.28	307.7	666.39	309.85	666.56	311.08	666.66	317.03	667.45
317.51	667.51	317.66	667.52	324.59	668.11	327.01	668.33	329.54	668.58
336.02	669.25	336.78	669.33	340.28	669.49	346.95	669.76	347.44	669.79
351.03	670.1	357.47	670.81	359.25	670.97	365.23	671.56	368.31	671.85
374.55	672.5	376.64	672.72	377.32	672.8	385.4	673.59	392.48	674.2
395.24	674.47	398.11	674.87	401.6	675.33	403.24	675.57	407.61	676.19
410.67	676.63	413.6	677.05	413.8	677.07	415.82	677.33	420.01	677.91
424.55	678.49	426.38	678.77	434.98	679.39	436.17	679.47	436.44	679.49
437.44	679.53	437.73	679.54	440.59	679.67	442.91	679.74	443.37	679.75
448.06	679.88	449.27	679.91	456.44	680.09	458.52	680.12	463.36	680.24
466.21	680.26	468.09	680.29	469.69	680.31	470.79	680.32	471.23	680.32
472.8	680.33	474.48	680.33	480.02	680.36	484.5	680.35	487.34	680.36
488.45	680.36	494.95	680.34	496.1	680.34	497.2	680.33	503.54	680.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-73.11	.1	301.19	.05	317.51	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
301.19	317.51	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3060

INPUT
Description:
Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	677.29	4.96	677	13.14	676.458	20.5	676	33.24	675.219
37.14	675	40.85	674.703	50.32	674	57.58	673.547	64.18	673
75.95	672.148	77.44	672.043	78.01	672	78.74	671.948	91.82	671
100.82	670.131	102.13	670	102.99	669.907	111.76	669	118.45	668.231
120.59	668	124.12	667.815	130.23	667.473	136.79	667.132	138.85	667
140.16	666.969	145.2	666.863	154.44	666.68	155.26	666.666	156.3	666.66

158.55	666.654	168.04	666.64	173.87	666.635	180.69	666.647	185.3	666.653
190.3	666.653	194.79	666.65	196.46	666.646	201.96	666.623	205.02	666.614
206.76	666.606	209.03	666.59	211.59	666.565	213.97	666.531	215.69	666.49
218.49	666.39	220.78	666.337	223.52	666.327	226.26	666.277	229.89	666.254
232.73	666.212	234.22	666.204	237.2	666.171	240.44	666.159	242.97	666.138
246.63	666.115	247.3	666.111	257.44	666.02	257.53	666.019	259.69	666
269.27	665.969	273.25	665.96	275.98	665.958	277.93	665.962	279.6	665.973
282.51	666	288.25	666.162	290.98	666.257	296.08	666.443	311.06	667
315.34	667	318.74	667	319.25	666.857	321.78	666	322.5	666
323.1	666	323.83	666	324.35	666	336.57	666.947	337.11	666.988
337.27	667	344.9	667.568	350.35	668	357.48	668.597	362.17	669
369.51	669.588	373.99	670	381.08	670.809	383.04	671	389.62	671.675
393.01	672	399.88	672.75	402.18	673	402.92	673.096	411.81	674
419.61	674.697	422.64	675	425.8	675.465	429.64	676	431.45	676.282
436.25	677	439.62	677.517	442.85	678	445.29	678.334	449.9	679
454.89	679.674	456.91	680	466.37	680.694	467.68	680.787	467.98	680.804
469.08	680.847	469.4	680.864	472.54	681	475.1	681.07	475.6	681.085
480.77	681.211	482.1	681.238	489.99	681.417	492.27	681.436	497.6	681.559
500.74	681.561	502.8	681.594	504.57	681.607	506.26	681.606	507.99	681.597
509.84	681.581	515.93	681.561	520.86	681.502	523.99	681.484	525.21	681.47
532.36	681.376	533.63	681.355	534.84	681.329	541.81	681.241		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	318.74	.05	337.11	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
318.74	337.11	37.6	45.2	28.2	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3014.8*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.86	675.43	6.58	675.16	14.37	674.65	21.38	674.22	23.85	674.08
33.52	673.54	37.23	673.35	40.76	673.1	49.78	672.5	56.7	672.11
62.98	671.65	74.12	670.92	74.19	670.92	75.61	670.83	76.15	670.8
76.85	670.75	89.31	669.97	97.88	669.25	99.13	669.14	99.95	669.07
108.3	668.32	114.67	667.69	116.71	667.5	120.07	667.34	125.89	667.06
132.14	666.77	134.1	666.66	135.34	666.63	140.14	666.53	148.94	666.37
149.73	666.35	150.72	666.35	152.86	666.34	157.74	666.32	161.9	666.31
167.45	666.31	173.94	666.32	178.34	666.32	183.1	666.32	187.37	666.32
188.96	666.32	194.2	666.3	197.12	666.29	198.77	666.29	200.93	666.27
203.37	666.25	205.64	666.23	207.28	666.19	209.94	666.11	212.13	666.07
214.73	666.06	217.34	666.02	220.8	666.01	223.51	665.97	224.93	665.97
227.76	665.94	230.85	665.93	233.26	665.91	236.74	665.89	237.38	665.89
245.24	665.83	247.04	665.82	247.13	665.82	249.18	665.81	258.31	665.81
262.1	665.82	264.7	665.82	266.55	665.83	268.14	665.85	270.92	665.87
276.38	666.02	278.98	666.1	283.84	666.27	298.11	666.75	298.36	666.75
302.18	666.78	305.42	666.81	305.95	666.63	307.25	666.13	308.58	665.78
309.15	665.78	309.63	665.78	310.22	665.78	310.63	665.78	314.41	666.09
317.41	666.3	321	666.7	321.46	666.75	321.62	666.76	327.21	667.11
328.92	667.2	334.15	667.51	340.98	667.94	343.8	668.13	345.47	668.27
352.5	668.83	356.79	669.22	363.59	669.96	365.46	670.14	371.77	670.76
375.02	671.07	381.6	671.76	382.31	671.83	383.8	672	384.51	672.09
393.03	672.99	400.5	673.7	403.4	674.01	406.43	674.44	410.11	674.94
411.84	675.21	416.44	675.88	418.44	676.17	419.67	676.36	422.76	676.83
425.1	677.16	429.52	677.81	434.3	678.47	436.23	678.78	445.3	679.57
446.55	679.68	446.84	679.7	447.89	679.76	448.2	679.78	451.21	679.97
453.66	680.09	454.14	680.11	457.72	680.28	459.09	680.33	460.36	680.38
467.92	680.66	470.11	680.72	475.21	680.91	478.22	680.97	480.2	681.03
481.34	681.06	481.89	681.07	483.51	681.07	485.17	681.07	486.94	681.06
492.77	681.06	497.5	681.02	500.5	681.01	501.66	681.01	508.51	680.95
509.73	680.93	510.89	680.92	517.57	680.86				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.86	.1	305.42	.05	321.46	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
305.42	321.46	37.6	45.2	28.2	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2969.6*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.72	673.58	8.21	673.32	15.61	672.85	22.27	672.45	24.61	672.31
33.79	671.86	37.32	671.7	40.68	671.49	49.25	671	55.82	670.67
61.79	670.29	72.37	669.7	72.44	669.69	73.78	669.62	74.3	669.59
74.96	669.56	86.79	668.93	94.94	668.37	96.12	668.28	96.9	668.22
104.83	667.64	110.89	667.15	112.82	667	116.02	666.87	121.55	666.64
127.48	666.41	129.34	666.32	130.53	666.29	135.09	666.21	143.45	666.05
144.19	666.04	145.13	666.03	147.17	666.02	151.81	665.99	155.75	665.99
161.03	665.98	167.2	665.99	171.37	666	175.89	666	179.96	665.99
181.47	665.99	186.44	665.98	189.21	665.97	190.79	665.97	192.84	665.96
195.16	665.94	197.31	665.92	198.87	665.9	201.4	665.84	203.47	665.81
205.95	665.8	208.43	665.77	211.71	665.76	214.28	665.73	215.63	665.73
218.33	665.71	221.26	665.7	223.55	665.69	226.86	665.67	227.46	665.67
234.93	665.63	236.64	665.63	236.72	665.63	238.67	665.63	247.34	665.66
250.94	665.68	253.41	665.69	255.18	665.7	256.69	665.72	259.32	665.75
264.51	665.88	266.98	665.95	271.6	666.09	285.15	666.5	285.39	666.5
289.02	666.56	292.1	666.61	292.65	666.4	294	665.82	295.38	665.56
295.81	665.56	296.17	665.56	296.61	665.56	296.92	665.56	300.02	665.83
302.49	665.98	305.44	666.46	305.81	666.52	305.96	666.53	311.31	666.78
312.95	666.83	317.94	667.02	324.47	667.29	327.17	667.4	328.77	667.54
335.49	668.08	339.6	668.44	346.09	669.11	347.89	669.28	353.91	669.85
357.02	670.14	363.31	670.76	363.99	670.83	365.42	670.99	366.1	671.08
374.24	671.98	381.39	672.71	384.16	673.01	387.06	673.41	390.57	673.89
392.23	674.13	396.63	674.75	398.54	675.03	399.72	675.21	402.68	675.66
404.91	675.98	409.13	676.61	413.7	677.26	415.55	677.56	424.22	678.44
425.42	678.57	425.7	678.59	426.7	678.67	427	678.7	429.87	678.93
432.22	679.1	432.68	679.14	436.1	679.38	437.41	679.45	438.63	679.51
445.86	679.91	447.95	680	452.83	680.27	455.7	680.38	457.59	680.47
458.68	680.52	459.21	680.53	460.76	680.53	462.35	680.54	464.04	680.54
469.62	680.55	474.14	680.54	477	680.55	478.12	680.54	484.67	680.52
485.83	680.51	486.94	680.5	493.33	680.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.72	.1	292.1	.05	305.81	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
292.1	305.81	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2924.4*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.58	671.72	9.83	671.48	16.84	671.05	23.15	670.67	25.37	670.54
34.07	670.18	37.41	670.05	40.59	669.89	48.71	669.5	54.93	669.23
60.59	668.94	70.62	668.47	70.68	668.46	71.96	668.41	72.44	668.39
73.07	668.37	84.28	667.9	92	667.49	93.12	667.43	93.86	667.38
101.37	666.96	107.11	666.61	108.94	666.5	111.97	666.4	117.2	666.22
122.83	666.04	124.59	665.98	125.71	665.95	130.03	665.88	137.95	665.74
138.66	665.73	139.55	665.72	141.48	665.7	145.87	665.66	149.61	665.66
154.61	665.66	160.45	665.66	164.41	665.67	168.69	665.67	172.54	665.67
173.97	665.66	178.68	665.66	181.31	665.65	182.8	665.65	184.74	665.64
186.94	665.63	188.98	665.62	190.45	665.6	192.85	665.56	194.82	665.54
197.16	665.54	199.51	665.52	202.62	665.51	205.06	665.49	206.34	665.49
208.89	665.47	211.67	665.47	213.84	665.46	216.97	665.45	217.55	665.45
224.62	665.42	226.24	665.43	226.32	665.43	228.17	665.44	236.38	665.5
239.79	665.53	242.13	665.55	243.8	665.57	245.23	665.59	247.73	665.62
252.65	665.73	254.99	665.79	259.36	665.91	272.2	666.25	272.42	666.26
275.87	666.34	278.78	666.42	279.35	666.16	280.74	665.51	282.17	665.33
282.46	665.33	282.7	665.33	282.99	665.33	283.2	665.33	285.63	665.58
287.56	665.67	289.87	666.22	290.17	666.29	290.31	666.29	295.41	666.45
296.97	666.47	301.74	666.53	307.97	666.63	310.54	666.68	312.07	666.81
318.49	667.33	322.4	667.66	328.6	668.26	330.31	668.42	336.06	668.94
339.03	669.2	345.03	669.77	345.68	669.83	347.04	669.99	347.69	670.07
355.46	670.97	362.28	671.71	364.92	672.01	367.69	672.39	371.04	672.83
372.62	673.05	376.82	673.63	378.65	673.88	379.76	674.06	382.59	674.49

384.72	674.81	388.75	675.42	393.11	676.06	394.88	676.34	403.15	677.32
404.29	677.45	404.55	677.48	405.51	677.58	405.79	677.61	408.54	677.9
410.78	678.12	411.21	678.16	414.48	678.48	415.73	678.57	416.89	678.65
423.79	679.15	425.78	679.28	430.44	679.62	433.19	679.79	434.99	679.91
436.03	679.98	436.53	679.99	438.01	680	439.52	680.01	441.14	680.01
446.46	680.05	450.77	680.06	453.51	680.08	454.57	680.08	460.82	680.09
461.93	680.09	462.99	680.09	469.08	680.11				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.58	.1	278.78	.05	290.17	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
278.78	290.17	37.6	45.2	28.2	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2879.2*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7.44	669.87	11.46	669.64	18.08	669.24	24.03	668.9	26.13	668.78
34.35	668.5	37.5	668.4	40.51	668.28	48.17	668	54.05	667.79
59.39	667.59	68.86	667.24	68.92	667.24	70.13	667.2	70.59	667.19
71.18	667.17	81.77	666.86	89.05	666.61	90.11	666.57	90.81	666.54
97.91	666.28	103.33	666.07	105.06	666	107.92	665.93	112.86	665.81
118.17	665.68	119.84	665.63	120.9	665.62	124.98	665.55	132.46	665.43
133.12	665.42	133.96	665.41	135.79	665.39	139.94	665.34	143.47	665.34
148.19	665.34	153.71	665.34	157.44	665.34	161.49	665.34	165.12	665.34
166.47	665.34	170.93	665.33	173.4	665.33	174.81	665.33	176.65	665.33
178.72	665.32	180.65	665.31	182.04	665.31	184.31	665.29	186.16	665.28
188.38	665.27	190.6	665.26	193.54	665.26	195.83	665.25	197.04	665.25
199.45	665.24	202.08	665.24	204.12	665.24	207.09	665.23	207.63	665.23
214.31	665.22	215.84	665.23	215.91	665.23	217.66	665.25	225.41	665.35
228.64	665.39	230.85	665.42	232.42	665.44	233.78	665.46	236.13	665.5
240.78	665.59	242.99	665.64	247.12	665.73	259.24	666.01	259.46	666.01
262.71	666.12	265.46	666.22	266.05	665.93	267.49	665.21	268.97	665.11
269.12	665.11	269.24	665.11	269.38	665.11	269.49	665.11	271.24	665.32
272.64	665.35	274.31	665.97	274.52	666.05	274.65	666.06	279.51	666.12
281	666.1	285.53	666.04	291.47	665.98	293.92	665.95	295.37	666.07
301.48	666.57	305.2	666.89	311.1	667.41	312.73	667.55	318.21	668.03
321.03	668.27	326.75	668.78	327.36	668.83	328.66	668.99	329.28	669.07
336.67	669.96	343.16	670.72	345.68	671.02	348.31	671.36	351.51	671.78
353.02	671.98	357.01	672.51	358.75	672.74	359.81	672.9	362.5	673.32
364.53	673.63	368.37	674.22	372.52	674.85	374.2	675.12	382.07	676.19
383.16	676.34	383.41	676.38	384.33	676.49	384.59	676.53	387.2	676.87
389.33	677.14	389.75	677.19	392.86	677.58	394.05	677.69	395.16	677.79
401.72	678.39	403.62	678.56	408.06	678.97	410.67	679.2	412.38	679.35
413.37	679.44	413.86	679.45	415.26	679.46	416.7	679.48	418.24	679.49
423.31	679.55	427.41	679.58	430.01	679.61	431.03	679.62	436.98	679.67
438.04	679.67	439.04	679.68	444.84	679.73				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7.44	.1	265.46	.05	274.52	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
265.46	274.52	37.6	45.2	28.2	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2834

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.3	668.01	26.89	667.01	67.11	666.01	134	665.01	204	665.01
246.49	665.76	252.14	666.03	254.24	664.9	255.77	664.89	256.85	665.07
257.71	665.03	258.87	665.82	263.61	665.79	277.29	665.23	309.05	667.83
338.85	671.59	371.24	676.68	390.72	678.9	420.6	679.35		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.3	.1	252.14	.05	258.87	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
252.14	258.87	69.43	69.15	69.71	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2770.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
22.15	667.64	38.97	666.73	77.41	665.78	102.89	665.38	141.36	664.83
155.31	664.82	208.27	664.66	224.9	664.87	247.67	665.24	248.89	665.24
254.29	665.36	255.75	664.66	256.53	664.32	257.08	664.32	258.16	664.27
259.2	664.44	259.32	664.43	260.03	664.47	261.14	665.27	265.97	665.26
267.08	665.23	279.91	664.78	312.28	667.04	319.57	667.83	342.65	670.33
369.62	673.97	375.67	674.81	388.33	676.09	395.52	676.87	412.93	677.27
425.97	677.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
22.15	.1	254.29	.05	261.14	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
254.29	261.14	69.43	69.15	69.71	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2707.*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.01	667.26	51.05	666.45	87.72	665.55	112.02	665.16	148.71	664.64
162.02	664.62	212.54	664.3	228.4	664.43	250.12	664.74	251.28	664.71
256.43	664.7	257.98	664.02	258.81	663.73	259.4	663.74	260.55	663.64
261.55	663.81	261.66	663.81	262.34	663.92	263.41	664.73	268.33	664.74
269.46	664.71	282.54	664.32	315.52	666.26	322.94	666.93	346.46	669.08
373.94	672.19	380.09	672.93	392.99	674.08	400.32	674.83	418.06	675.39
431.35	675.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.01	.1	256.43	.05	263.41	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
256.43	263.41	69.43	69.15	69.71	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2643.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
47.86	666.89	63.12	666.16	98.02	665.32	121.15	664.93	156.07	664.46
168.73	664.42	216.81	663.95	231.9	663.99	252.57	664.25	253.68	664.19
258.58	664.03	260.22	663.38	261.1	663.15	261.72	663.16	262.94	663.02
263.89	663.17	264	663.18	264.66	663.36	265.68	664.18	270.7	664.21
271.85	664.2	285.16	663.87	318.75	665.47	326.31	666.03	350.26	667.82
378.25	670.42	384.52	671.06	397.66	672.07	405.12	672.8	423.18	673.51
436.72	673.81								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
47.86	.1	258.58	.05	265.68	.1

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

258.58	265.68		69.43	69.15	69.71		.1	.3	

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2580.*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60.72	666.51	75.2	665.88	108.33	665.09	130.28	664.7	163.42	664.28
175.44	664.23	221.08	663.59	235.4	663.54	255.02	663.75	256.07	663.66
260.73	663.36	262.46	662.75	263.39	662.57	264.04	662.58	265.33	662.4
266.24	662.54	266.35	662.55	266.97	662.81	267.96	663.64	273.06	663.69
274.23	663.68	287.79	663.41	321.98	664.69	329.68	665.13	354.07	666.56
382.56	668.64	388.94	669.19	402.32	670.06	409.92	670.77	428.31	671.62
442.09	671.96								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60.72	.1	260.73	.05	267.96	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
260.73	267.96	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2516.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
73.57	666.14	87.28	665.6	118.63	664.86	139.41	664.47	170.78	664.09
182.15	664.04	225.34	663.24	238.9	663.1	257.48	663.25	258.47	663.14
262.87	662.7	264.7	662.11	265.67	661.98	266.37	662	267.71	661.77
268.59	661.91	268.69	661.92	269.29	662.25	270.23	663.09	275.42	663.16
276.61	663.17	290.41	662.96	325.22	663.9	333.05	664.23	357.87	665.3
386.87	666.86	393.37	667.31	406.99	668.05	414.72	668.73	433.44	669.74
447.46	670.12								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
73.57	.1	262.87	.05	270.23	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
262.87	270.23	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2453.*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
86.42	665.76	99.36	665.32	128.94	664.63	148.54	664.25	178.13	663.91
188.87	663.84	229.61	662.88	242.41	662.66	259.93	662.75	260.86	662.61
265.02	662.03	266.93	661.47	267.96	661.4	268.69	661.42	270.1	661.15
270.94	661.28	271.03	661.29	271.6	661.69	272.5	662.54	277.78	662.64
278.99	662.65	293.04	662.51	328.45	663.11	336.42	663.33	361.68	664.05
391.19	665.08	397.8	665.44	411.65	666.05	419.52	666.7	438.57	667.86
452.83	668.27								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
86.42	.1	265.02	.05	272.5	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
265.02	272.5	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2389.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
99.28	665.39	111.44	665.04	139.24	664.4	157.67	664.02	185.49	663.72
195.58	663.65	233.88	662.53	245.91	662.21	262.38	662.26	263.26	662.09
267.16	661.37	269.17	660.84	270.25	660.82	271.01	660.84	272.49	660.52
273.28	660.65	273.38	660.66	273.92	661.14	274.77	662	280.14	662.11
281.38	662.14	295.66	662.05	331.68	662.33	339.79	662.43	365.48	662.79
395.5	663.31	402.22	663.57	416.32	664.04	424.32	664.67	443.69	665.97
458.21	666.43								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
99.28	.1	267.16	.05	274.77	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
267.16	274.77	69.43	69.15	69.71	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2326

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
112.13	665.01	166.8	663.79	202.29	663.45	249.41	661.77	264.83	661.76
269.31	660.7	271.41	660.2	273.33	660.26	274.88	659.9	275.72	660.03
277.04	661.45	283.76	661.62	343.16	661.53	399.81	661.53	420.98	662.03
448.82	664.09	463.58	664.58						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
112.13	.1	269.31	.05	277.04	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
269.31	277.04	673.02	669.78	671.58	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1658

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
173.75	665.01	198.13	661.86	245.91	659.93	256.45	659.51	262.44	659.72
264.16	658.26	265.67	657.96	267.08	657.99	268.29	658.05	269.24	658.2
271.93	658.6	274.07	659.54	279.61	659.65	315.47	660.02	400.34	661.36
434.93	670.15	448.28	670.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
173.75	.1	262.44	.05	274.07	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
262.44	274.07	289.98	298.02	301.02	.1 .3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1360

INPUT
Description: U/S XS of Farm Road Culvert
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	663.365	8.11	663	15.93	662.641	21.14	662.423	26.61	662.185
31.61	662	32.7	661.981	41.37	661.85	48.82	661.755	52.16	661.744

55.89	661.708	58.08	661.707	59.26	661.703	60.41	661.694	61.58	661.68
62.81	661.661	65.38	661.618	66.49	661.595	68.85	661.538	72.65	661.501
75.75	661.436	79.04	661.405	85.46	661.35	98.24	661.027	98.37	661.025
99.34	661	102.23	660.857	104.38	660.771	111.18	660.526	123.04	660.053
126.01	660	127.18	659.98	136.22	659.885	136.56	659.877	142.99	659.783
146.79	659.703	155.28	659.601	159.01	659.499	161.23	659.46	166.49	659.282
173.2	659	174.09	658.999	174.21	658.999	191.49	658.982	191.85	658.982
196.28	658.984	198.06	658.985	201.95	658.992	202.85	658.992	204.56	658.995
206.92	659	210.16	659.002	211.98	659.003	212.84	659.002	214.84	659.001
216.87	659.001	217.64	659	217.94	658.88	219.24	658.295	219.7	658.07
219.84	658	220.21	658	229.38	658	231.64	658.227	231.99	658.242
234.8	658.391	238.12	658.584	244.74	659	247.18	659.09	278.53	660
280.97	660.065	281.4	660.078	290.08	660.31	296.63	660.471	298.54	660.529
302.43	660.616	311.2	660.867	313.3	660.914	315.27	661	326.87	661.587
329.7	661.73	331.06	661.792	335.65	662	346.63	662.658	348.5	662.778
351.83	663	362.64	663.75	364.72	663.894	365.98	664	369.59	664.346
376.67	665	378.66	665.236	386.46	666	386.77	666.037	394.3	667
396.29	667.279	400.99	668	413.48	668.692	418.73	669	419.36	669.003
420.17	669.006	420.4	669.006	426.91	669.016	427.87	669.017	428.87	669.016
429.6	669.015	429.99	669.014	440.45	669.262	440.86	669.198	442.35	669.153
442.92	669.198	442.99	669.211	443.05	669.248	443.3	669.29	444.34	669.314
448.02	669.897	448.28	669.923	448.73	670	452.25	670.375	457.45	670.92
458.12	671	458.89	671.131	460.41	671.347	461.87	671.508	463.6	671.644
465.55	671.859	465.76	671.885	467.9	672	472.53	672.128	478.07	672.263
479.32	672.227	480.67	672.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	217.64	.05	244.74	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
217.64	244.74	110	100	.4	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	183.25	659.25	F
322.75	480.67	659.25	F

CULVERT

RIVER: Tributary
REACH: 1 RS: 1281

INPUT
Description: Farm Road Culvert
Distance from Upstream XS = 69
Deck/Roadway Width = 19.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5	663.33		185	659.19		250	659.25	
360	660.01		410	660.68		530	668.88	

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.92	663.325	130.71	658.235	195.23	657.765	245.69	657.685	249.14	657.605
250.31	657.055	253.09	656.635	254.08	656.685	256.22	657.225	258.88	657.465
262.11	657.675	272.66	658.275	351.77	658.505	414.17	660.695	522.68	667.715

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4.92	.08	245.69	.08	262.11	.08

Bank Sta: Left	Right	Coeff Contr.	Expan.
245.69	262.11	.4	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4.92	183.25	659.25	F
322.75	522.68	659.25	F

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5	663.33		185	659.19		250	659.25	
360	660.01		410	660.68		530	668.88	

Downstream Bridge Cross Section Data

Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.92	663.33	130.71	658.23	195.23	657.77	245.69	657.68	249.14	657.6
250.31	657.05	253.09	656.64	254.08	656.68	256.22	657.22	258.88	657.46
262.11	657.67	272.66	658.28	351.77	658.51	414.17	660.7	522.68	667.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4.92	.08	245.69	.08	262.11	.08

Bank Sta: Left Right Coeff Contr. Expan.
245.69 262.11 .3 .7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4.92	223.26	659.25	F
282.75	522.68	659.25	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.5	

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

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	69	19.5	.017	.017	0	.5	1

Upstream Elevation = 656.68
Centerline Station = 253
Downstream Elevation = 656.64
Centerline Station = 253

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1252

INPUT
Description: D/S XS of Farm Road Culvert
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.92	663.33	130.71	658.23	195.23	657.77	245.69	657.68	249.14	657.6
250.31	657.05	253.09	656.64	254.08	656.68	256.22	657.22	258.88	657.46
262.11	657.67	272.66	658.28	351.77	658.51	414.17	660.7	522.68	667.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4.92	.08	245.69	.08	262.11	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
245.69 262.11 28.8 29.4 29.6 .3 .7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4.92	223.26	659.25	F
282.75	522.68	659.25	F

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1222.6*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.94	662.82	58.79	660.91	131.55	658.28	176.1	657.84	197.01	657.69
248.2	657.55	250.05	657.47	251.51	657.37	252.3	657.35	253.69	656.9
253.73	656.9	254.83	656.72	255.76	656.69	256.19	656.63	256.99	656.44
257.89	656.51	258.32	656.63	259.83	657.04	261.29	657.22	262.25	657.33
265.18	657.59	271.22	657.91	275.91	658.1	283.35	658.08	356.43	658.44

366.14	658.73	408.62	660.73	419.93	661.21	457.75	663.67	530.37	667.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.94	.08	248.2	.08	265.18	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
248.2	265.18	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1193.2*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.95	662.31	58.6	660.69	132.4	658.32	177.59	657.76	198.79	657.61
250.72	657.41	252.85	657.3	254.55	657.13	255.46	657.1	257.07	656.75
257.11	656.75	258.38	656.53	259.46	656.59	259.96	656.53	260.89	656.24
261.7	656.35	262.09	656.46	263.44	656.85	264.75	657.08	265.61	657.2
268.25	657.51	274.39	657.81	279.17	657.92	286.74	657.85	361.08	658.37
370.96	658.62	414.18	661.15	425.7	661.71	464.18	664.24	538.05	667.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.95	.08	250.72	.08	268.25	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
250.72	268.25	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1163.8*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.97	661.81	58.4	660.46	133.24	658.37	179.07	657.68	200.57	657.53
253.23	657.28	255.66	657.13	257.59	656.88	258.62	656.85	260.45	656.6
260.5	656.6	261.94	656.34	263.17	656.49	263.73	656.42	264.79	656.05
265.51	656.18	265.85	656.29	267.05	656.67	268.21	656.94	268.98	657.07
271.31	657.44	277.56	657.71	282.42	657.74	290.12	657.62	365.74	658.3
375.79	658.51	419.75	661.57	431.46	662.22	470.6	664.81	545.74	667.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.97	.08	253.23	.08	271.31	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
253.23	271.31	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1134.4*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.98	661.3	58.2	660.24	134.08	658.42	180.55	657.6	202.35	657.45
255.75	657.14	258.46	656.96	260.62	656.64	261.78	656.61	263.83	656.45
263.88	656.45	265.5	656.15	266.87	656.39	267.51	656.32	268.69	655.85
269.31	656.02	269.62	656.12	270.67	656.49	271.68	656.79	272.34	656.94
274.38	657.36	280.74	657.61	285.68	657.56	293.51	657.4	370.4	658.23
380.61	658.4	425.31	661.99	437.22	662.72	477.02	665.38	553.42	667.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.98	.08	255.75	.08	274.38	.08

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

255.75	274.38		28.8	29.4	29.6		.3	.7	

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1105

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	660.79	58	660.01	182.03	657.52	258.26	657.01	261.27	656.79
263.66	656.39	267.27	656.3	269.06	655.96	270.58	656.29	271.28	656.21
272.59	655.65	273.38	655.95	275.14	656.65	277.45	657.28	283.91	657.51
296.89	657.17	385.44	658.29	430.88	662.41	483.44	665.95	561.11	667.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	258.26	.08	277.45	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
258.26	277.45	287	295	303	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 810

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.67	658.53	16.9	657.88	160	656.82	271.95	656.84	302.8	656.15
307.34	656.47	308.53	655.21	309.94	654.96	311.1	654.83	313.17	654.83
314.06	654.79	314.94	653.84	315.53	654.71	316.36	654.9	317.37	654.24
318.8	654.78	320.94	655.51	327.28	655.79	351.67	656.4	565.4	656.84
707	661.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.67	.08	307.34	.08	320.94	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
307.34	320.94	228	224	222	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 587

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-362	658.01	-200	657.01	0	656.21	18.41	655.67	92.6	655.34
102.91	654.9	103.88	654.39	105.93	654.47	108.13	654.79	109.33	653.92
110.17	653.78	110.56	654.16	111.32	654.28	112.69	654.85	114.18	654.96
132.53	655.09	307.17	656.16	344.29	658.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-362	.08	102.91	.08	114.18	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
102.91	114.18	122	126	127	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 463

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

-416	658.01	-250	657.01	-87	656.01	0	655.59	109.8	654.54
194.42	654.32	208.54	654.65	213.7	654.92	215.61	654.29	217.64	654.15
219.79	653.77	223.31	654.2	224.25	653.23	226.46	653.59	227.82	654.41
233.37	654.53	278.57	654.4	400	655.01	496.5	656.01	525.1	657.01
557	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-416	.08	213.7	.08	233.37	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
213.7	233.37	105	104	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 357

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-626.5	660.01	-604.5	658.01	-594.5	657.01	-584.5	656.01	-479.5	655.01
0	655.01	153.93	654.15	175.05	653.71	185.31	653.59	188.41	652.4
191.14	653.59	193.32	653.82	195.38	654.05	198.28	654.41	202.04	654.7
206.36	654.46	350	655.01	528.59	656.01	549.3	657.01	596.9	658.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-626.5	.08	185.31	.08	191.14	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
185.31	191.14	179	175	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 183

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-631.8	658.01	-603	657.01	-586	656.01	-551	655.01	-252	654.01
-242	654.01	11.07	654.27	105.3	654.68	160.67	655.27	176.42	654.35
191.7	654.33	196.59	653.2	201.52	652.43	202.85	652.14	204.43	652.46
205.71	653.27	208.19	653.86	217.88	653.96	255.38	654.23	305.72	654.38
349	655.01	494	656.01	531.9	657.01	611	658.01		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-631.8	.08	191.7	.08	208.19	.08

Bank Sta: Left	Right	Coeff Contr.	Expan.
191.7	208.19	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5862

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6.57	692.9	16.52	686.09	30.12	679.79	46.8	679.9	59.74	679.08
61.77	675.79	63.16	675.53	66.68	676.21	70.59	676.51	72.5	676.66
75.29	677.24	83.9	677.66	93.4	677.98	108.12	680.46	126.96	680.02
134.28	678.08	144.98	678.89	173.49	677.49	203.06	682.96	252.93	692.83
275.94	705.68	283.35	706.71						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
6.57	.1	59.74	.05	75.29	.1

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

59.74	75.29		200.9	314.2	312.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5547

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.27	683.2	30.72	673.65	63.49	674.03	97.47	674.46	108.85	672.92
130.75	672.73	212.69	671.49	215.49	671.05	218.29	670.1	219.35	669.38
220.92	669.9	222.1	669.99	224.66	670.6	226.17	670.93	227.99	671.82
230.09	673.4	245.5	678.64	264.68	690.27	273.75	691.73		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.27	.1	215.49	.05	226.17	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
215.49	226.17	266.1	262	254.2	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5282

INPUT
Description: U/S XS of Beach Grove Rd Bridge
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	681.12	55.69	675.84	85.36	674.65	174.96	673.59	184.04	670.66
207.55	670.04	212.26	669.41	214.34	667.03	219.14	667.34	223.57	668.03
230.88	671.08	241.05	670.68	255.44	674.6	304.55	678.17	320	679.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	212.26	.05	230.88	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
212.26	230.88	82	83.7	86.2	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	174	677.42	F
253	320	677.42	F

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 5250

INPUT
Description: Beach Grove Rd Bridge
Distance from Upstream XS = 22.3
Deck/Roadway Width = 19.3
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
201.96	677.41	0	202.64	677.41	0	214.6	677.42	667.71
216.27	677.42	671.5	217.27	677.42	672.7	218.96	677.42	673.3
219.96	677.43	673.4	220.96	677.43	673.3	222.65	677.43	672.7
224.11	677.43	671.5	226.87	677.43	668.95	226.9	677.43	0
237.26	677.43	0						

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	681.12	55.69	675.84	85.36	674.65	174.96	673.59	184.04	670.66
207.55	670.04	212.26	669.41	214.61	667.71	220.04	668.18	223.99	667.71
230.88	671.08	241.05	670.68	255.44	674.6	304.55	678.17	320	679.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	212.26	.05	230.88	.1

```
Bank Sta: Left   Right    Coeff Contr.    Expan.
       212.26  230.88           .3          .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     174  677.42       F
     253     320  677.42       F

Downstream  Deck/Roadway Coordinates
    num=       13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   193.8  677.34       0  194.48   677.4       0  206.44  677.49       0
  207.04  677.48  667.76  208.11  677.42  670.88  209.11  677.42  672.08
   210.8  677.42  672.68   211.8  677.64  672.78   212.8  677.43  672.68
  214.49  677.43  672.08  215.95  677.43  670.88   218.1  677.43  668.66
  229.29  677.19       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  203.09  669.53  207.96  667.71  212.14  668.18  215.99  667.71   222.6  670.21
  244.99  670.15  272.89  671.76  306.75  677.78  363.89  679.45  378.89  684.24
  413.89  689.34  435.89  694.54  453.89  699.34  468.89  704.65  493.89  710.04
  513.89  714.45  528.89  719.54  538.89  724.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -226.11      .1  203.09     .05   222.6      .1

Bank Sta: Left   Right    Coeff Contr.    Expan.
       203.09   222.6           .3          .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -226.11  176.89  677.42       F
  249.89  538.89  677.42       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

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

High Flow Method
      Energy Only

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

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 5198

INPUT
Description: FEMA BIA, D/S XS of Beach Grove Rd Bridge
Station Elevation Data    num=      29
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  203.09  669.53  207.96  665.96  212.14  665.71  215.99  665.85  217.97  666.58
   222.6  670.21  244.99  670.15  272.89  671.76  306.75  677.78  363.89  679.45
  378.89  684.24  413.89  689.34  435.89  694.54  453.89  699.34  468.89  704.65
  493.89  710.04  513.89  714.45  528.89  719.54  538.89  724.24
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-226.11	.1	203.09	.05	222.6	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
203.09	222.6	89.8	90.1	89.3	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-226.11	176.89	677.42	F
249.89	538.89	677.42	F

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5107

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.11	677.51	37.49	670.27	96.16	668.4	156.22	668.53	158.69	666.07
161.58	664.84	163.25	664.65	164.42	664.59	165.79	665.03	166.43	665.04
169.94	666.9	178.46	667.79	182.69	668.84	193.2	668.9	238.09	668.33
302.28	669.86	349	678.03						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.11	.1	156.22	.05	182.69	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
156.22	182.69	112	112	112	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4995

INPUT
Description: FEMA BHZ
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1010	719.54	1022	714.54	1055	709.65	1075	704.45
1100	699.45	1120	694.84	1140	691.74	1150	691.74	1180	689.34
1270	684.74	1300	676.74	1315	674.84	1390	669.34	1430	667.65
1440	666.24	1450	668.65	1465	669.65	1485	669.54	1540	667.74
1610	669.45	1635	674.54	1662	679.45	1685	690.04	1725	686.74
1750	689.45	1770	694.45	1780	699.34	1810	704.34	1835	709.84
1850	714.34	1870	719.34	1895	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1430	.05	1450	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1430	1450	180.8	181.3	177.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4810

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	673.03	22.15	670.47	30.66	668.65	57.63	668.16	111.49	668.7
152.11	668.15	195.12	668.51	201.6	666.51	202.75	663.97	210.2	664.04
214.86	663.49	215.85	664.09	220.3	668.33	253.63	667.96	275.4	667.76
288.1	666.6	321.23	667.68	361.14	676.54				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	201.6	.05	220.3	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
201.6	220.3	74	73.7	76	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4735

INPUT
Description: FEMA BHY
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1015	719.65	1030	714.54	1058	709.84	1068	704.54
1080	701.74	1110	699.45	1140	694.65	1186	689.34	1280	686.74
1390	684.34	1430	683.74	1478	684.45	1620	679.54	1660	674.84
1690	669.54	1860	667.84	1870	664.24	1880	666.54	2000	669.45
2020	674.65	2042	679.84	2075	684.45	2120	689.45	2175	694.74
2225	699.34	2240	704.34	2280	709.65	2330	714.45	2355	719.24
2410	724.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1860	.05	1880	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1860	1880	41.8	43	43	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4692

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.2	676.54	14.2	673.9	29.44	673.96	39.22	671.77	100.41	668.46
182.33	667.17	248.38	667.34	268.47	666.03	281.75	664.29	284.12	662.53
284.81	662.09	290.66	662.02	296.54	662.16	298.07	664.62	299.42	666.98
320.4	666.76	380.91	669.4	431.24	681.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.2	.1	248.38	.05	299.42	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
248.38	299.42	188.7	197	188.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4495

INPUT
Description: FEMA BHX
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1020	719.24	1038	714.24	1050	709.45	1058	704.45
1060	703.74	1100	699.24	1148	694.84	1208	689.54	1315	688.74
1500	684.74	1670	683.74	1820	679.74	1905	673.74	1910	674.24
1950	671.74	1990	669.34	2100	667.74	2220	664.74	2230	663.74
2240	664.54	2280	669.54	2300	674.24	2320	679.65	2360	684.24
2420	689.45	2450	694.24	2480	699.24	2510	704.45	2560	709.34
2645	714.24	2740	719.45	2790	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	2220	.05	2240	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2220	2240	77.5	81	77.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4414

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-5.7	673.7	1.31	671.76	19.96	669.88	70.87	667.77	193.46	667.01
240.89	666.16	297.49	667.18	302.08	662.9	308.32	662.46	313.21	662.89
316.82	666.65	331.76	668.59	406.27	680.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-5.7	.1	297.49	.05	316.82	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
297.49	316.82	114.9	119	117.5	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4295

INPUT
Description: FEMA BHW
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.84	1032	719.74	1052	714.24	1075	709.54	1100	704.54
1130	699.34	1158	694.24	1180	689.45	1210	684.65	1262	679.54
1370	674.24	1408	669.34	1470	669.45	1600	667.54	1730	665.24
1735	663.24	1745	665.45	1800	666.45	1820	674.24	1875	679.65
1955	684.65	1985	689.74	2015	694.24	2045	699.24	2060	704.54
2075	709.34	2105	714.24	2152	719.54	2215	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1730	.05	1745	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1730	1745	160.8	170.5	164.4	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4130

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.79	672.78	38.19	668.15	65.97	666.24	127.28	666.03	170.88	665.59
200.6	666.07	205.29	663.4	210.07	661.54	214.21	661.99	216.84	662.54
219.86	666.1	253.95	665.83	269.33	665.98	370.38	665.85	415.17	670.09
549.86	674.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.79	.1	200.6	.05	219.86	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
200.6	219.86	87.5	89.5	81.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4043

INPUT
Description: FEMA BHV
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1030	719.24	1048	714.45	1062	709.45	1080	704.95
1102	699.65	1128	694.34	1150	689.65	1205	684.54	1242	679.34
1330	674.54	1390	671.54	1520	667.84	1620	664.34	1625	662.24
1630	664.84	1740	667.24	1910	669.54	1960	674.65	2040	679.54
2125	684.45	2162	689.34	2188	694.74	2210	699.34	2220	704.54
2245	714.45	2258	714.84	2270	719.74	2295	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1620	.05	1630	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1620	1630	67.9	88.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3972

INPUT
Description: U/S XS of Market Street Bridge
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
123.85	674.24	171.83	670.24	197.75	670.47	204.44	667.88	215.91	667.02
223.06	665.53	249.69	664.89	259.88	664.22	268.46	664.16	270.18	661.21
277.41	661.6	281.39	661.43	285.52	661.64	287.08	664.59	315.58	665.35
372.3	666.78	391.2	666.21	536	666.78	559	667.64	748.66	669.45
788.66	674.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
123.85	.1	268.46	.05	287.08	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
268.46	287.08	101.2	98.1	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
123.85	202.37	670.8	F
341.4	788.66	670.3	F

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 3914

INPUT
Description: Market Street Bridge
Distance from Upstream XS = 40.1
Deck/Roadway Width = 43.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.611	673.611	71.3	672.778	672.278	151.64	671.546	671.546
216.18	671.069	671.069	254.71	670.8	664.72	260.35	670.8	663.3
260.36	673.78	663.04	260.37	673.78	669.04	272.2	673.78	669.04
283.42	673.78	669.04	283.43	673.78	663.08	285	673.78	664.36
285.1	670.45	664.36	287.02	670.3	665.83	339.19	669.234	669.234
435.84	667.629	667.629						

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-113.65	679.5	-20.65	674.7	0	673.611	71.3	672.778	151.64	671.546
216.18	671.069	254.71	664.72	261	663.04	272.49	661.04	283.42	663.08
287.02	665.83	339.19	669.234	435.84	667.629	464.35	668.7	554.35	669.7
604.35	674.8	684.35	679.7	769.35	684.6	1000	684.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-113.65	.1	254.71	.05	287.02	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
254.71	287.02	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-113.65	202.37	670.8	F
341.4	1000	670.3	F

Downstream Deck/Roadway Coordinates
num= 15

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.611	673.611	71.3	672.778	672.278	151.64	671.546	671.546
216.18	671.069	671.069	254.71	670.8	664.72	260.35	670.8	661.95
260.36	673.42	668.72	272.2	673.42	668.72	283.42	673.42	668.72

```
  283.43  673.42  661.35     285  673.42  664.36   285.1  670.45  664.36
  289.14   670.3  664.78  339.19 669.234 669.234  435.84 667.629 667.629

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -350   679.5 -113.65   679.5  -20.65   674.7       0 673.611    71.3 672.778
  151.64 671.546  216.18 671.069  254.71  664.72     261  663.04  272.49  661.04
  283.42  663.08  287.02  665.83  339.19 669.234  435.84 667.629  464.35   668.7
  554.35   669.7  604.35   674.8  684.35   679.7  769.35   684.6

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    -350      .1 -113.65      .1  254.71    .055  287.02      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        254.71  287.02            .4       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -350     200   670.9        F
     310  769.35   670.3        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   668.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   670.1

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

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 3860

INPUT
Description: D/S XS of Market Street Bridge
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  117.66  675.84  137.05  672.03  181.62  671.65  219.23  671.09  253.06  668.65
  262.64  664.21  265.16  663.32  266.08  661.15  272.52  660.73  283.67  661.59
  288.12  663.96  295.78  666.15  334.66  665.91  349.26  667.65  357.79  668.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  117.66      .1  265.16    .055  288.12     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        265.16  288.12             75.5    68.6    74.8             .4       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  117.66     200   670.9        F
     310  357.79   670.3        F

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 3785
```

INPUT
Description: FEMA BHU
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1022	719.24	1052	714.84	1085	709.45	1110	704.45
1140	699.34	1172	689.54	1260	684.65	1290	679.74	1318	674.84
1360	669.34	1412	664.95	1430	660.24	1440	665.95	1500	665.84
1550	667.24	1580	666.74	1650	666.15	1760	669.45	1800	674.34
1900	676.54	1980	679.54	2035	684.65	2055	689.45	2080	694.54
2095	699.45	2108	707.65	2118	709.65	2130	714.45	2140	719.34
2150	724.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1412	.055	1440	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1412	1440	63.5	58.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3735

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46.72	679.91	74.63	675.8	101.02	670.65	135.38	669.18	157.56	666.89
181.15	666.12	181.25	664.03	182.71	662.51	184.32	662.24	185.67	660.86
187.89	660.4	192.29	660.36	196.75	660.67	199.82	660.74	207.26	665.22
222.51	665.76	281.32	665.28	293.21	664.71	340	664	396	664
402	665	420	666	422	666	440	666	642.15	669.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
46.72	.1	181.15	.055	207.26	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
181.15	207.26	208.1	193.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3532

INPUT
Description: FEMA BHT
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1055	719.34	1095	715.15	1155	709.45	1190	704.84
1240	699.45	1280	694.84	1330	689.54	1368	684.95	1390	679.74
1428	674.34	1455	671.09	1479.93	668.1	1496.1	666.46	1510.17	662.05
1513.34	660.29	1514.53	659.03	1518.38	658.71	1519.83	658.78	1524.51	659.04
1527.37	664.82	1537.93	664.34	1612.95	662.99	1728.54	663.46	1730	665.04
1750	666.34	1770	665.74	1850	666.34	1975	669.34	2000	674.74
2125	679.34	2180	684.34	2200	690.15	2222	694.34	2232	699.95
2262	704.84	2285	709.84	2325	714.45	2372	719.95	2415	724.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1496.1	.06	1527.37	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1496.1	1527.37	123.6	125	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3410

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

33.79	674.7	76.45	668.35	118.62	664.23	127.12	658.22	129.14	657.83
131.86	658.02	136.11	657.9	138.1	658.16	141.34	659.72	154.15	659.99
159.04	661.67	173.29	662.2	193.85	659.88	228.32	660.18	314.35	662.42
376	661.82	381.4	662.93	385.18	663.96	402.12	664.21		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
33.79	.08	118.62	.05	141.34	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118.62	141.34	36.2	35	34.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3375

INPUT
Description: FEMA BHS
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1095	719.34	1140	714.45	1170	709.84	1220	704.45
1275	699.65	1285	694.45	1305	689.54	1320	684.34	1338	679.95
1360	674.65	1420	664.54	1443	659.24	1448	657.24	1460	658.34
1550	658.95	1680	664.84	1705	664.24	1800	666.74	1978	669.45
2042	674.65	2080	679.74	2100	685.04	2125	689.34	2140	694.95
2162	699.45	2180	704.84	2225	709.84	2260	714.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1443	.05	1460	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1443	1460	92.9	96	103.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3278

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
40.42	666.96	56.89	663.45	68.65	662.53	75.07	662.03	79.29	658.4
81.65	657.27	82.94	657.07	85.53	657.01	86.77	657.6	90.32	660.28
96.28	660.96	102.77	661.42	111.91	662.29	155.88	661.02	343	662.66
653	665.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
40.42	.06	75.07	.05	90.32	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75.07	90.32	195.6	214	204.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3065

INPUT
Description: FEMA BHR
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1095	719.84	1110	714.74	1210	709.34	1260	704.34
1290	699.54	1300	695.04	1315	689.84	1330	684.45	1355	679.45
1385	674.95	1405	669.74	1425	664.54	1510	656.74	1520	655.95
1530	656.15	1670	661.45	1805	664.34	1828	666.54	1978	669.65
2070	671.34	2178	674.65	2210	679.34	2248	687.54	2285	689.95
2310	694.84	2355	699.34	2420	704.34	2525	709.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1510	.05	1530	.06

Bank Sta: Left 1510 Right 1530 Lengths: Left Channel 129.8 Right 116.6 121.4 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2949

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
34.18	664.58	74.16	659.96	96.72	659.48	132.97	659.67	148.16	660.33
152.24	655.9	153.74	655.8	155.46	655.77	156.94	655.96	158.15	656.45
164.41	660.28	192.14	659.68	255.96	659.64	464.54	662.65	474.11	665.45
491.53	665.76								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
34.18	.06	148.16	.05	164.41	.06

Bank Sta: Left 148.16 Right 164.41 Lengths: Left Channel 211 Right 213.4 221.1 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2730

INPUT
Description: FEMA BHQ
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-421.78	724.45	-301.78	719.95	-223.78	714.45	-179.78	709.34	-159.78	704.34
-153.78	699.84	-121.78	694.54	-109.78	689.54	-93.78	684.54	-71.78	679.34
-53.78	674.34	48.22	671.45	166.22	669.54	173.22	669.04	247.22	664.34
302.74	659	389.32	658	396.22	656.24	408.22	654.74	415.22	656.24
458.22	656.74	578.22	662.24	717.97	663	739.24	664	745.24	665
754.54	668	774.2	668	792.47	668	798.22	667.34	878.22	666.24
1043.22	669.65	1258.22	671.65	1296.22	674.74	1338.22	679.54	1383.22	684.54
1418.22	689.24	1433.22	694.95	1453.22	699.95	1478.22	704.34	1558.22	709.24
1593.22	714.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-421.78	.06	396.22	.05	415.22	.06

Bank Sta: Left 396.22 Right 415.22 Lengths: Left Channel 99.6 Right 93.9 94.4 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2634

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.46	666.85	121.54	661.36	218.2	657.67	260.41	658.53	265.68	658.26
269.53	654.41	272.46	653.74	274.6	653.83	275.22	654.29	275.87	655.2
282.17	658.65	550.04	660.42	638.28	663.53	654	664.03	663	667.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.46	.06	265.68	.05	282.17	.06

Bank Sta: Left 265.68 Right 282.17 Lengths: Left Channel 137.8 Right 138 136.4 Coeff Contr. .1 Expan. .3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2497

INPUT
Description: U/S XS of Walker Run Crossing
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.53	665.89	39.47	664.2	44.97	663.57	107.45	659.28	166.22	657.83
205.6	657.61	262.97	657.78	280.78	656.99	283.96	654.28	286.94	653.51
288.71	653.76	291.25	653.78	294.33	654.23	295.69	655.07	296.61	655.54
297.97	657.53	303.08	657.83	439.74	659.15	528.78	658.58	585.34	660.05
658.58	665.36	678.36	665.96	682.31	667.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.53	.06	280.78	.05	297.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
280.78	297.97	33.8	35.9	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 2480

INPUT
Description: Walker Run Crossing
Distance from Upstream XS = 9.5
Deck/Roadway Width = 13.8
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
11.87	665.82	665.82	47.14	662.724	662.724	74.04	660.848	660.848
113.05	659.88	659.28	162.23	658.903	658.06	172.76	658.91	657.83
211.42	658.93	657.61	287.93	658.98	657	289.31	658.99	655
290	659.02	654.27	292.65	659.05	653.74	292.65	659.05	657.67
294.77	659.103	657.67	297.73	659	657.67	297.74	659	654.24
297.95	659	654.24	301.58	658.9	655	301.83	658.9	655.06
303.52	658.95	655.54	304.43	658.97	657.53	310.59	659.05	657.82
422.97	660.036	657.82	447.67	660.3	659.14	533.91	660.9	658.57
591.63	661.4	660.06	605.41	662.027	661	653	665	664.61
665.09	666	665.37	694.26	667.627	667.627			

Upstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11.87	665.882	39.22	664.19	46.11	663.57	113.05	659.28	172.76	657.83
211.42	657.61	270.23	657.78	287.93	657	290	654.27	293.2	653.74
295.57	653.36	295.74	653.75	297.74	653.79	297.95	654.24	301.83	655.06
303.52	655.54	304.43	657.53	310.59	657.82	447.67	659.14	533.91	658.57
591.63	660.06	653	664.61	665.09	665.37	694.25	667.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
11.87	.06	287.93	.05	304.43	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
287.93	304.43	.3	.7

Downstream Deck/Roadway Coordinates
num= 31

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
11.87	665.82	665.82	47.14	662.724	662.724	62.28	661.7	659.98
74.04	660.848	658.43	114.78	659.4	658.43	162.23	658.903	657
222.04	658.91	657.5	268.28	658.96	657.91	282.83	658.98	657.41
289.31	658.99	654	290.86	659.01	654.02	292.33	659.02	653.93
292.65	659.05	653.74	292.66	659.05	657.67	294.77	659.103	657.67
297.73	659	657.67	297.74	659	654.24	298.39	659	654.38
301.58	658.9	655	302.27	658.9	657.21	365.85	659.8	658.01
380.66	659.9	659.03	418.1	659.99	659.03	422.97	660.036	658.78
520.51	661	658.78	538.81	661.1	659.14	544.9	661.2	659.31
605.41	662.027	660	615.07	662.1	661.25	669.45	665	664.61
694.26	667.627	667.627						

Downstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10	665.882	11.87	665.882	50.11	662.78	62.28	659.98	114.78	658.43
222.04	657.5	268.28	657.91	282.83	657.41	290.86	654.02	292.33	653.93
293.18	653.85	295.81	653.81	296.52	654.02	298.39	654.38	302.27	657.21

365.85	658.01	380.66	659.03	418.1	659.03	520.51	658.78	538.81	659.14
544.9	659.31	615.07	661.25	669.45	664.61	694.25	667.63		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-10	.06	11.87	.06	282.83	.05	302.27	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
282.83	302.27	.3	.7

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 659.2
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 658.5

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

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2462

INPUT
Description: D/S XS of Walker Run Crossing
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.2	666.86	49.93	662.78	70.39	659.98	130.3	658.42	237.98	657.49
283.65	657.9	298.45	657.41	305.06	654.03	307.41	653.92	309.95	653.86
311.78	654.02	315.94	654.96	317.95	657.21	381.94	658.01	396.57	659.03
433.04	659.03	535.44	658.78	555.06	659.14	560.39	659.8	629.95	661.26
684.19	664.6	700.62	665.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.2	.06	298.45	.05	317.95	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
298.45	317.95	117	123	126.5	.3	.7

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2339

INPUT
Description: FEMA BHP
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1030	719.34	1080	714.65	1108	710.15	1130	704.54
1150	699.45	1170	694.54	1195	689.54	1225	684.65	1240	679.24
1295	674.54	1400	669.95	1500	666.74	1590	664.54	1630	663.34
1700	664.34	1735	664.95	1772	664.45	1825	659.24	1888	659.65
2100	657.34	2145	655.34	2250	653.24	2268	654.45	2350	656.45
2440	659.84	2600	661.34	2735	664.54	2755	666.54	2900	667.34
3100	667.54	3250	669.24	3350	671.34	3465	674.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2145	.05	2268	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2145	2268	62.3	64.8	61.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2274

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-85.7	666.85	-46.1	663.17	-23	659.97	16.47	657.72	45.83	658.28
67.54	658.17	89.33	656.46	91.41	654.78	92.23	652.48	95.09	651.42
99.01	652.22	102.9	653.21	104.42	653.39	105.71	655.36	121.29	656.82
507.83	659.46	557.25	660.35	636	663.34	650.4	665.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-85.7	.06	89.33	.05	105.71	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
89.33	105.71	136.2	136.2	129.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2139

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-101	660.01	41.82	658.6	77.75	655.4	217.23	654.68	305.8	654.64
307.09	656.3	314.38	656.84	327.19	656.9	354.66	655.54	357.53	654.39
358.78	652.08	360.05	651.18	362.06	650.72	364.09	651.21	366.47	651.49
369.75	654.6	370.25	655.38	374.79	656.34	396.01	655.99	767.34	658.35
818.4	659.6	905	662.46	916.1	663.58				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-101	.06	354.66	.05	370.25	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
354.66	370.25	126.7	129	129.7	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2010

INPUT
Description: FEMA BHO
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	689.34	1100	686.54	1230	684.34	1275	679.45	1340	674.84
1450	670.04	1635	664.45	1798	659.74	2030	656.54	2295	655.65
2298	654.34	2300	655.95	2460	655.95	2470	654.34	2475	655.95
2600	654.74	2715	654.34	2740	652.24	2750	654.54	2960	657.34
3230	659.65	3345	664.65	3360	664.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2715	.05	2750	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2715	2750	84.1	85.6	88.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 1925

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-232.06	658.01	-166.67	655.4	34.55	654.38	78.78	654.68	85.55	655
101.09	655.65	109.35	655.67	111.58	653.77	113.72	652.28	115.93	651.72
120.12	651.09	123.07	651.4	125.43	652.9	126.09	654.67	128.49	655.57
142.56	655.17	278.44	654.58	368.74	655.3	496.43	655.55	623.92	656.57
700.01	659.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-232.06	.06	109.35	.05	128.49	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
109.35	128.49	282.6	325.9	321	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1602

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-627.1	658.01	-562.09	656.01	-429.8	655.01	-285.4	654.01	20.81	654.67
48.57	654.71	66.44	654.61	72.14	654.79	85.07	654.21	87.82	651.4
91.51	650.67	93.9	650.84	96.86	651.6	98.18	651.9	100.7	654.03
108.02	654.27	243	654.08	428.23	655.01	456.83	656.01	487.78	657.01
560.78	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-627.1	.08	85.07	.06	100.7	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
85.07	100.7	202.2	203.5	203	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1402

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-214.73	660.01	-151.73	657.01	-116.53	656.01	-65.33	655.01	-57.33	654.01
-47.9	653.01	-26.6	653.01	61.72	652.96	129.69	653.53	136.69	653.6
143.69	653.86	148.69	654.03	153.69	654.21	156.09	654.04	156.39	652.1
156.89	651.34	158.69	650.52	160.49	650.2	161.99	649.8	163.69	649.82
165.69	649.95	166.99	650.67	168.49	651.36	169.29	651.84	169.89	653.64
172.09	654.15	177.99	653.93	183.69	653.92	187.1	653.79	232.35	653.34
246.57	653.84	359.8	654.16	416.89	654.15	519.9	654.01	527.8	655.01
536.5	656.01	540.2	657.01	548.5	658.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-214.73	.08	156.09	.06	169.89	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
156.09	169.89	183	194	196.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1208

INPUT
Description: FEMA BHN
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.34	1060	714.65	1080	709.34	1165	699.54
1190	694.84	1225	689.54	1265	684.95	1380	674.54	1470	669.65

1528	665.15	1570	659.45	1680	651.74	1740	651.34	1752	650.74
1765	651.34	2205	659.24	2220	664.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1740	.06	1765	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1740	1765	228.9	218.5	209.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 990

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-41.4	660.01	-4.3	656.01	32.63	652.9	63.74	651.93	118.97	653.07
125.76	650.82	126.92	650.45	132.87	649.47	135.28	649.66	136.76	650.43
138.23	653.22	149.36	652.61	186.43	652.59	234.63	654.38	362.19	653.45
497.17	656.01	516.5	658.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-41.4	.08	118.97	.06	138.23	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118.97	138.23	56.8	56.5	58.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 933

INPUT
Description: FEMA BHM
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.54	1088	714.74	1120	710.04	1152	704.34
1200	699.74	1238	694.84	1270	689.84	1290	684.65	1340	679.95
1402	674.95	1445	669.34	1480	664.45	1530	659.74	1590	654.45
1700	650.95	1710	649.74	1720	650.65	1750	654.54	1900	657.04
2080	659.84	2200	663.45	2300	663.65	2400	663.45	2500	664.95
2590	664.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1700	.05	1720	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1700	1720	48.7	48.4	45.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 884

INPUT
Description: U/S XS of Private Farm Road
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-288	691.97	-147.11	671.47	-33	660.01	12.49	656.08	52.79	653.68
71.68	653.18	101.89	653.2	117.08	652.72	120.1	649.74	121.4	649.01
123.02	648.62	125.03	649.16	129.44	653.21	174.49	652.41	194.38	652.9
524	662.27	538	663.17	560.8	664.45	607.89	664.67		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-288	.09	117.08	.05	129.44	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
117.08	129.44	20.6	19.1	19.6	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent

-288	112.93	652.53	F
133.68	607.89	652.53	F

CULVERT

RIVER: Walker Run
REACH: 2 RS: 875

INPUT
Description: Private Farm Road
Distance from Upstream XS = 1.6
Deck/Roadway Width = 15.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.14	656.071	656.071	52.52	653.686	653.686	71.38	653.5	653.18
115.86	653.386	649.74	122.61	652.528	648.62	122.83	652.53	648.66
124.23	652.54	648.9	130.22	653.444	653.21	173.58	653.2	652.41
194.42	653.1	652.9	217.91	652.805	652.805	378.6	653.084	653.084
465.08	656.47	656.47	522.51	662.265	662.265	535.78	663.101	663.101
535.81	663.177	663.177	535.99	663.037	663.037			

Upstream Bridge Cross Section Data
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-322.11	691.97	-147.11	671.47	-2.11	656.57	12.14	656.071	52.52	653.686
71.38	653.18	101.3	653.2	116.89	652.72	120.15	649.74	120.82	648.93
121.18	649.01	122.65	648.62	124.23	648.9	124.43	649.16	129.48	653.21
173.58	652.41	194.42	652.9	297.89	656.07	337.89	656.67	607.89	664.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-322.11	.09	116.89	.05	129.48	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
116.89	129.48	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-322.11	112.93	652.53	F
133.68	607.89	652.53	F

Downstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.14	656.071	656.071	52.52	653.686	653.686	77.11	653.4	652.55
115.86	653.386	651.91	122.61	652.528	649.92	122.73	652.53	650.54
122.85	652.53	651.24	123.07	652.53	651.64	123.32	652.53	651.8
123.57	652.53	651.64	123.79	652.53	651.24	123.91	652.53	650.54
124.03	652.53	650.11	126.1	652.53	648.93	130.22	653.444	649.62
136.9	653.4	652.21	185.27	653.2	652.86	217.91	652.805	652.8
378.6	653.084	653.084	465.08	656.47	656.47	522.51	662.265	662.265
535.78	663.101	663.101	535.81	663.177	663.177	535.99	663.037	663.037

Downstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-322.11	691.97	-147.11	671.47	-2.11	656.57	12.14	656.071	52.52	653.686
77.11	652.55	116.71	651.91	123.34	649.92	124.03	650.11	125.51	649.41
126.1	648.93	130.12	649.62	136.9	652.21	185.27	652.86	218.62	652.8
297.89	656.07	337.89	656.67	607.89	664.667				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-322.11	.09	116.71	.05	136.9	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
116.71	136.9	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-322.11	109	652.53	F
136	607.89	652.53	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 654.4
Energy head used in spillway design =

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

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	2.75	

FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	2.2	14.9	.023	.023	.1	.9	1

Upstream Elevation = 648.96
Centerline Station = 123.3
Downstream Elevation = 649.411
Centerline Station = 123.2

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 863

INPUT
Description: D/S XS of Private Farm Road
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-294	691.97	-147.11	671.47	-22.2	660.01	24.99	655.04	34.67	653.86
72.57	652.55	113.12	651.91	120.43	649.92	123.41	648.96	126.4	649.62
133.22	652.21	182	652.85	214.18	652.8	518.46	662.27	588	664.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-294	.09	113.12	.05	133.22	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
113.12	133.22	157.2	147.1	138.4	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-294	109	652.53	F
136	588	652.53	F

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 715

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-92.4	658.01	2.21	655.41	40.88	653.76	46.14	653.57	77.95	651.4
100.08	650.67	101.47	648.52	104.64	647.91	107.47	647.9	108.96	648.04
110.34	648.14	111.67	648.52	114.47	650.93	126.37	650.97	191.93	651.64
278.3	653.09	365.34	656.46						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-92.4	.09	100.08	.05	114.47	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100.08	114.47	172	178.4	188.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 536

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-86.6	657.01	-45.02	655.01	5.76	652.05	48.16	650.97	149.99	651.14
170.47	649.65	172.89	647.93	174.84	647.22	176.44	647.18	179.25	646.97
182.05	647.71	182.91	648.29	184.3	650.54	191.59	650.96	206.95	652.58
269.71	656.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-86.6	.09	170.47	.05	184.3	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
170.47	184.3	89.9	107	110.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 428

INPUT
Description: FEMA BHL
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	686.54	1050	684.84	1090	679.84	1110	674.45	1130	669.65
1150	664.54	1210	659.34	1250	655.54	1350	651.74	1410	649.34
1430	647.24	1440	649.65	1550	654.34	1605	656.65	1630	659.45
1750	661.74	1860	664.45	2000	666.54	2100	667.34	2180	667.84
2365	669.34	2450	671.34	2540	674.54	2640	684.34	2700	689.54
2750	699.34	2800	704.65	2920	709.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1410	.05	1440	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1410	1440	84.2	119.6	73.2	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 350

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7.67	656.47	30.04	652.51	50.26	651.27	122.31	650.39	128.41	647.64
131.05	647.09	132.71	647.08	135.14	647.17	138.64	647.65	139.08	648.11
140.48	648.18	141.29	649.59	150.13	650.23	156.97	649.72	249.39	650.76
267.01	652.4	309.86	655.02	325.84	655.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7.67	.09	122.31	.05	141.29	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
122.31	141.29	169.4	222.4	165.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 185

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8.8	659.55	15.53	658.78	23.2	653.48	25.13	652.64	29.31	649.46
32.38	649.12	33.4	647.67	34.97	646.89	37.17	646.4	40.26	646.66
42.19	646.41	44.77	646.96	46.4	647.15	49.26	649.32	59.74	649.89
197.88	650.38	234.08	652.49	273.02	654.62	299.87	655.74	305.41	656.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8.8	.09	32.38	.05	49.26	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
32.38	49.26	39.3	58	36.4	.1	.3

CROSS SECTION

RIVER: Walker Run

REACH: 2 RS: 147

INPUT
Description: FEMA BHK
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	699.45	1040	694.84	1100	691.54	1170	689.54	1210	687.54
1260	682.65	1340	684.95	1400	681.65	1440	679.65	1490	676.95
1530	674.84	1555	669.65	1580	664.34	1610	659.24	1640	655.04
1650	649.45	1660	646.74	1670	649.34	1750	651.74	1830	654.84
1870	655.84	1900	654.74	1925	659.34	2100	661.54	2240	664.95
2450	666.74	2623	669.65	2720	674.65	2760	679.34	2800	684.54
2838	689.54	2848	694.34	2900	699.45	2940	704.45	3010	709.45
3100	714.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1650	.05	1670	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1650	1670	138.5	154.5	134.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 011

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-177.52	656.04	33.24	653.12	38.49	652.67	45.07	649.46	51.29	648.2
53.81	646.7	54.7	645.84	57.12	645.71	59.41	645.74	61.18	646.53
64.38	648.11	69.53	648.34	79.21	649.32	111.92	649.09	167.8	651.4
249.3	651.46	251.06	651.01	293.8	653.77	352.41	660.72		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-177.52	.09	51.29	.05	64.38	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51.29	64.38	39.9	38	43.7	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-177.52	42	652.95	F
90	352.41	652.95	F

BRIDGE

RIVER: Walker Run
REACH: 2 RS: -10

INPUT
Description: Market Street
Distance from Upstream XS = 8.5
Deck/Roadway Width = 24.9
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-172.52	655.288		32.59	653.113		44.69	652.945	
44.69	654.155		62.11	656.025	644.195	62.5	656.045	646.915
62.61	656.065	647.975	63.5	656.085	649.645	65.5	656.125	650.645
65.9	656.125	650.675	66.3	656.125	650.645	68.3	656.085	649.645
69.6	656.065	647.975	70	656.045	646.915	70.35	656.025	644.915
98.44	654.145		98.45	652.945		172.12	652.5	
253.49	653.245							

Upstream Bridge Cross Section Data
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-172.52	655.288	32.43	652.375	38.83	651.925	48.62	648.705	55.15	647.445
59.2	645.945	61.39	645.095	65.45	644.995	67.71	645.785	70.85	647.355
86.15	648.555	116.5	649.245	172.12	652.5	253.49	653.245	332.2	654.325
350.6	655.245	358.85	656.245						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-172.52	.09	55.15	.05	70.85	.09

Bank Sta: Left 55.15 Right 70.85 Coeff Contr. .3 Expan. .7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-172.52	42	652.95	F
90	358.85	652.95	F

Downstream Deck/Roadway Coordinates num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-199.02	655.288		6.09	653.113		18.19	652.945	
18.19	653.665		35.61	656.025	645.195	36	656.075	647.915
36.11	656.095	648.765	37	656.165	649.835	39	656.225	650.835
39.4	656.225	650.865	39.8	656.225	650.835	41.8	656.165	649.835
43.1	656.095	648.765	43.5	656.075	647.995	43.85	656.025	646.665
71.94	654.415		71.95	652.945		145.62	652.5	
226.99	653.245							

Downstream Bridge Cross Section Data
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-199.02	655.288	-6.99	653.185	1.13	653.145	13.19	650.795	26.39	648.445
31.8	647.955	33.72	646.465	36.22	645.845	39.63	644.505	42.3	643.715
44.81	644.305	48.1	645.855	51	647.395	61.17	647.815	72.07	651.545
145.62	652.5	226.99	653.245	332.2	654.325	350.6	655.245	358.85	656.245

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-199.02	.09	31.8	.05	51	.09

Bank Sta: Left 31.8 Right 51 Coeff Contr. .3 Expan. .7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-199.02	15.72	652.95	F
63.89	358.85	652.95	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 654.4
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

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

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 652.5

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

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: -30

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-199.02	656.04	-46.68	654.28	-4.4	653.95	4.43	653.9	17.96	651.54
30.08	649.2	35.6	648.71	37.35	647.22	38.98	646.6	41.82	645.27

45.52	644.46	48.05	645.07	52.27	646.61	53.56	648.15	63.11	648.57
79.88	650.16	85.95	652.29	181.4	651.9	273.84	653.77	319.73	659.02

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-199.02	.09	35.6	.05	53.56	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.6	53.56	39.8	41.7	52.9	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-199.02	15.72	652.95	F
63.89	319.73	652.95	F

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: -78

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-15	653.95	8.17	649.27	36.56	649.66	42.24	648.9	46.48	646.51
49.12	645.82	52.33	645.43	54.96	645.72	58.47	646.11	62.68	648.65
65.38	648.62	71.37	648.11	81.36	648.01	96.66	649.71	189	651.01
294.7	652.01	299.5	653.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-15	.09	36.56	.05	62.68	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36.56	62.68	70.8	70.8	80.2	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: -154

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-151.5	656.03	0	654.28	13.15	649.96	23.45	649.01	28.15	648.96
30.73	645.21	33.05	644.9	35.85	645.52	40.46	645.66	41.74	646.07
43.72	648.39	63.07	648.9	97	649.15	199.07	650.01	206.89	651.01
218.8	653.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-151.5	.09	28.15	.05	43.72	.09

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28.15	43.72	75	75	75	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: -255

INPUT
Description: FEMA BHJ
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	684.34	1092	679.54	1128	674.34	1170	669.34	1230	664.54
1310	660.04	1330	657.54	1350	654.84	1372	649.74	1405	647.24
1408	645.74	1412	647.95	1450	649.65	1490	649.24	1525	649.34
1570	649.04	1610	649.84	1670	654.34	1712	659.34	1740	664.84
1750	669.34	1790	674.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1405	.05	1412	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.

1405 1412 .1 .3

Profile Output Table - Standard Table 1

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.
E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl (cfs)	(ft)	(ft)	(ft)
Walker Run	1	5862	100 year storm	1640.00	675.53	680.72	680.72
681.63	0.02251	10.81	321.10	162.84	0.92		
Walker Run	1	5862	500 year storm	3600.00	675.53	682.00	682.00
683.38	0.02781	14.32	536.34	172.55	1.07		
Walker Run	1	5547	100 year storm	1640.00	669.38	677.11	674.58
677.20	0.00176	4.35	890.41	218.06	0.29		
Walker Run	1	5547	500 year storm	3600.00	669.38	678.79	675.66
678.98	0.00294	6.50	1263.59	226.57	0.39		
Walker Run	1	5282	100 year storm	1640.00	667.03	676.24	673.33
676.58	0.00295	6.02	457.36	226.49	0.38		
Walker Run	1	5282	500 year storm	3600.00	667.03	677.59	675.45
678.04	0.00420	7.99	1027.61	259.44	0.46		
Walker Run	1	5250		Bridge			
Walker Run	1	5198	100 year storm	1640.00	665.71	672.25	672.25
673.74	0.01851	11.33	231.39	223.91	0.87		
Walker Run	1	5198	500 year storm	3600.00	665.71	674.34	674.34
676.72	0.02127	15.15	383.75	249.54	0.98		
Walker Run	1	5107	100 year storm	1640.00	664.59	672.30	670.22
672.39	0.00157	3.56	989.81	288.98	0.26		
Walker Run	1	5107	500 year storm	3600.00	664.59	673.89	671.16
674.06	0.00236	5.16	1463.18	306.07	0.34		
Walker Run	1	4995	100 year storm	1640.00	666.24	672.05	
672.16	0.00273	4.39	826.98	269.66	0.35		
Walker Run	1	4995	500 year storm	3600.00	666.24	673.49	
673.71	0.00405	6.37	1236.24	296.47	0.45		
Walker Run	1	4810	100 year storm	1640.00	663.49	671.80	
671.86	0.00103	3.19	1208.61	329.14	0.21		
Walker Run	1	4810	500 year storm	3600.00	663.49	673.05	
673.18	0.00206	5.01	1630.02	345.41	0.30		
Walker Run	1	4735	100 year storm	1640.00	664.24	671.69	
671.76	0.00143	3.60	1096.91	330.82	0.26		
Walker Run	1	4735	500 year storm	3600.00	664.24	672.83	
673.00	0.00281	5.66	1480.08	341.66	0.37		
Walker Run	1	4692	100 year storm	1640.00	662.02	671.68	
671.72	0.00051	2.30	1379.63	349.44	0.16		
Walker Run	1	4692	500 year storm	3600.00	662.02	672.79	
672.91	0.00122	3.93	1773.58	360.30	0.25		
Walker Run	1	4495	100 year storm	1640.00	663.74	671.57	
671.61	0.00066	2.88	1350.83	335.74	0.19		
Walker Run	1	4495	500 year storm	3600.00	663.74	672.50	
672.63	0.00173	5.06	1673.15	354.76	0.31		
Walker Run	1	4414	100 year storm	1640.00	662.46	671.52	
671.56	0.00066	2.71	1401.92	345.90	0.17		
Walker Run	1	4414	500 year storm	3600.00	662.46	672.37	
672.49	0.00180	4.82	1700.93	355.68	0.29		

Walker Run	1	4295	100 year storm	1640.00		663.24	671.46	
671.49	0.00054	2.50	1632.18	421.29	0.16			
Walker Run	1	4295	500 year storm	3600.00		663.24	672.20	
672.29	0.00156	4.52	1947.75	428.96	0.28			
Walker Run	1	4130	100 year storm	1640.00		661.54	671.41	
671.42	0.00027	1.82	2046.31	435.84	0.11			
Walker Run	1	4130	500 year storm	3600.00		661.54	672.03	
672.09	0.00089	3.49	2326.10	458.16	0.21			
Walker Run	1	4043	100 year storm	1640.00		662.24	671.38	
671.39	0.00042	2.27	1939.12	532.22	0.14			
Walker Run	1	4043	500 year storm	3600.00		662.24	671.94	
672.00	0.00134	4.25	2243.45	551.40	0.26			
Walker Run	1	3972	100 year storm	1640.00		661.21	671.36	667.07
671.37	0.00020	1.68	2526.31	605.88	0.10			
Walker Run	1	3972	500 year storm	3600.00		661.21	671.88	668.65
671.92	0.00067	3.23	2844.33	616.38	0.18			
Walker Run	1	3914	Bridge					
Walker Run	1	3860	100 year storm	1640.00		660.73	667.84	667.09
668.89	0.01004	8.79	216.92	96.28	0.61			
Walker Run	1	3860	500 year storm	3600.00		660.73	669.38	669.38
671.91	0.01787	13.55	307.84	114.87	0.85			
Walker Run	1	3785	100 year storm	1640.00		660.24	667.18	667.18
667.74	0.01141	7.39	336.84	292.96	0.62			
Walker Run	1	3785	500 year storm	3600.00		660.24	667.19	667.94
669.82	0.05357	16.04	340.75	294.84	1.34			
Walker Run	1	3735	100 year storm	1640.00		660.36	666.48	665.54
666.65	0.00307	3.88	503.03	298.67	0.31			
Walker Run	1	3735	500 year storm	3600.00		660.36	667.62	666.45
667.89	0.00323	4.58	899.98	387.86	0.33			
Walker Run	1	3532	100 year storm	1640.00		658.71	664.66	664.66
665.29	0.02558	8.39	336.81	224.33	0.77			
Walker Run	1	3532	500 year storm	3600.00		658.71	665.80	
666.49	0.02464	9.18	601.73	253.04	0.78			
Walker Run	1	3410	100 year storm	1640.00		657.83	663.82	662.43
663.94	0.00300	4.24	712.23	265.45	0.35			
Walker Run	1	3410	500 year storm	3600.00		657.83	664.94	
665.19	0.00496	6.19	1027.34	290.72	0.46			
Walker Run	1	3375	100 year storm	1640.00		657.24	663.78	
663.86	0.00133	3.46	863.92	233.31	0.25			
Walker Run	1	3375	500 year storm	3600.00		657.24	664.83	
665.04	0.00312	5.92	1137.03	308.39	0.40			
Walker Run	1	3278	100 year storm	1640.00		657.01	662.97	662.97
663.49	0.01432	8.65	383.49	317.40	0.72			
Walker Run	1	3278	500 year storm	3600.00		657.01	664.08	
664.49	0.01009	8.42	819.43	462.58	0.63			
Walker Run	1	3065	100 year storm	1640.00		655.95	662.04	659.47
662.14	0.00145	3.66	730.89	245.14	0.27			
Walker Run	1	3065	500 year storm	3600.00		655.95	663.34	
663.55	0.00237	5.36	1100.27	320.40	0.35			
Walker Run	1	2949	100 year storm	1640.00		655.77	661.56	

WalkerRunFld

661.79	0.00729	5.83	509.78	329.00		0.50		
Walker Run	1	2949		500 year storm	3600.00		655.77	662.90
663.13	0.00524	5.95	1017.06	416.68		0.45		
Walker Run	1	2730		100 year storm	1640.00		654.74	661.09
661.18	0.00134	3.40	785.64	272.20		0.25		
Walker Run	1	2730		500 year storm	3600.00		654.74	662.14
662.34	0.00264	5.35	1087.36	305.83		0.37		
Walker Run	1	2634		100 year storm	1640.00		653.74	660.84
660.97	0.00351	4.68	696.87	426.74		0.36		
Walker Run	1	2634		500 year storm	3600.00		653.74	661.83
662.02	0.00411	5.69	1145.75	478.41		0.40		
Walker Run	1	2497		100 year storm	1640.00		653.51	660.69	659.26
660.73	0.00090	2.72	1150.81	507.16		0.19		
Walker Run	1	2497		500 year storm	3600.00		653.51	661.57	659.86
661.66	0.00159	3.96	1608.61	532.14		0.26		
Walker Run	1	2480			Bridge			
Walker Run	1	2462		100 year storm	1640.00		653.86	659.30
659.58	0.00735	6.44	519.60	459.79		0.54		
Walker Run	1	2462		500 year storm	3600.00		653.86	660.31
660.58	0.00623	6.80	1013.13	516.85		0.51		
Walker Run	1	2339		100 year storm	1640.00		653.24	659.26
659.29	0.00036	1.65	1335.67	503.26		0.13		
Walker Run	1	2339		500 year storm	3600.00		653.24	660.16
660.24	0.00078	2.72	1878.74	658.75		0.20		
Walker Run	1	2274		100 year storm	1640.00		651.42	658.64	658.64
659.17	0.00981	8.18	438.59	387.16		0.61		
Walker Run	1	2274		500 year storm	3600.00		651.42	659.48	659.48
660.06	0.01204	9.93	820.04	523.00		0.69		
Walker Run	1	2139		100 year storm	1640.00		650.72	657.33	656.10
657.40	0.00214	3.38	865.59	549.99		0.27		
Walker Run	1	2139		500 year storm	3600.00		650.72	658.46	656.87
658.56	0.00217	3.93	1597.04	728.42		0.28		
Walker Run	1	2010		100 year storm	1640.00		652.24	657.20
657.22	0.00085	2.13	1485.30	966.77		0.19		
Walker Run	1	2010		500 year storm	3600.00		652.24	658.36
658.39	0.00072	2.33	2731.39	1181.03		0.18		
Walker Run	1	1925		100 year storm	1640.00		651.09	657.14
657.16	0.00059	1.77	1640.90	847.24		0.15		
Walker Run	1	1925		500 year storm	3600.00		651.09	658.30
658.33	0.00064	2.15	2655.22	895.44		0.16		
Walker Run	2	1602		100 year storm	1860.00		650.67	656.98
656.99	0.00045	1.46	2515.34	1080.54		0.11		
Walker Run	2	1602		500 year storm	3100.00		650.67	658.16
658.18	0.00034	1.45	3865.33	1187.88		0.10		
Walker Run	2	1402		100 year storm	1860.00		649.80	656.88
656.89	0.00050	1.59	2023.17	686.83		0.11		
Walker Run	2	1402		500 year storm	3100.00		649.80	658.07
658.09	0.00048	1.74	2866.66	722.58		0.11		
Walker Run	2	1208		100 year storm	1860.00		650.74	656.74
656.77	0.00085	2.30	1443.04	456.81		0.17		
Walker Run	2	1208		500 year storm	3100.00		650.74	657.92
657.97	0.00096	2.77	2032.89	539.64		0.19		

Walker Run	2	990	100 year storm	1860.00	649.47	656.54		
656.57	0.00096	2.28	1455.12	511.53	0.17			
Walker Run	2	990	500 year storm	3100.00	649.47	657.72		
657.76	0.00091	2.51	2071.98	533.88	0.17			
Walker Run	2	933	100 year storm	1860.00	649.74	656.25		
656.46	0.00328	5.59	724.81	282.76	0.40			
Walker Run	2	933	500 year storm	3100.00	649.74	657.40		
657.65	0.00345	6.44	1097.15	366.27	0.43			
Walker Run	2	884	100 year storm	1860.00	648.62	656.05	654.99	
656.25	0.00581	6.24	688.16	292.08	0.46			
Walker Run	2	884	500 year storm	3100.00	648.62	657.23	655.62	
657.44	0.00503	6.59	1066.49	347.54	0.44			
Walker Run	2	875		Culvert				
Walker Run	2	863	100 year storm	1860.00	648.96	656.03	654.48	
656.18	0.00295	4.92	834.23	302.32	0.37			
Walker Run	2	863	500 year storm	3100.00	648.96	657.20	655.13	
657.38	0.00300	5.63	1217.61	351.16	0.38			
Walker Run	2	715	100 year storm	1860.00	647.90	655.76		
655.83	0.00146	3.85	1105.10	357.68	0.25			
Walker Run	2	715	500 year storm	3100.00	647.90	656.91		
657.01	0.00165	4.53	1555.58	417.70	0.28			
Walker Run	2	536	100 year storm	1860.00	646.97	655.51		
655.59	0.00130	3.79	1093.64	305.51	0.24			
Walker Run	2	536	500 year storm	3100.00	646.97	656.59		
656.71	0.00169	4.72	1445.07	343.92	0.28			
Walker Run	2	428	100 year storm	1860.00	647.24	655.36		
655.46	0.00117	3.69	1054.59	319.53	0.25			
Walker Run	2	428	500 year storm	3100.00	647.24	656.39		
656.54	0.00156	4.67	1404.69	357.75	0.29			
Walker Run	2	350	100 year storm	1860.00	647.08	655.30		
655.36	0.00086	3.11	1238.61	301.02	0.20			
Walker Run	2	350	500 year storm	3100.00	647.08	656.31		
656.40	0.00126	4.09	1551.32	317.24	0.25			
Walker Run	2	185	100 year storm	1860.00	646.40	655.12		
655.19	0.00098	3.48	1120.00	264.17	0.22			
Walker Run	2	185	500 year storm	3100.00	646.40	656.02		
656.15	0.00155	4.71	1367.68	282.18	0.28			
Walker Run	2	147	100 year storm	1860.00	646.74	654.82		
655.10	0.00331	5.97	625.03	191.48	0.41			
Walker Run	2	147	500 year storm	3100.00	646.74	655.49		
655.99	0.00558	8.25	771.06	243.67	0.53			
Walker Run	2	011	100 year storm	1860.00	645.71	654.70	652.67	
654.78	0.00116	3.86	1161.07	382.56	0.24			
Walker Run	2	011	500 year storm	3100.00	645.71	655.30	652.96	
655.44	0.00207	5.39	1402.37	430.41	0.32			
Walker Run	2	-10		Bridge				
Walker Run	2	-30	100 year storm	1860.00	644.46	653.53	652.28	
654.02	0.00480	7.39	546.58	255.23	0.47			
Walker Run	2	-30	500 year storm	3100.00	644.46	654.90	653.73	

655.32	0.00413	7.66	980.02	384.37		0.45			
Walker Run	2	-78		100 year storm	1860.00		645.43	653.52	
653.63	0.00158	3.92	1007.20	312.39		0.27			
Walker Run	2	-78		500 year storm	3100.00		645.43	654.87	
655.00	0.00160	4.48	1431.20	314.50		0.28			
Walker Run	2	-154		100 year storm	1860.00		644.90	653.37	
653.49	0.00197	4.45	858.83	216.03		0.29			
Walker Run	2	-154		500 year storm	3100.00		644.90	654.68	
654.85	0.00231	5.36	1150.66	253.36		0.32			
Walker Run	2	-255		100 year storm	1860.00		645.74	653.29	650.73
653.35	0.00149	3.72	1114.02	299.31		0.26			
Walker Run	2	-255		500 year storm	3100.00		645.74	654.60	651.23
654.68	0.00162	4.37	1521.10	321.15		0.27			
Tributary	1	6850		100 year storm	303.50		709.19	711.95	711.95
712.55	0.05765	6.42	49.26	40.97		0.85			
Tributary	1	6850		500 year storm	615.69		709.19	712.72	712.72
713.53	0.04633	7.33	85.46	52.94		0.81			
Tributary	1	5930		100 year storm	303.50		692.00	695.49	694.41
695.55	0.00238	1.91	155.41	105.67		0.19			
Tributary	1	5930		500 year storm	615.69		692.00	696.21	694.97
696.32	0.00284	2.39	237.78	121.05		0.21			
Tributary	1	5500		100 year storm	303.50		691.00	692.04	692.04
692.52	0.08834	5.60	54.57	56.50		0.98			
Tributary	1	5500		500 year storm	615.69		691.00	693.23	
693.61	0.02428	4.90	125.00	62.13		0.58			
Tributary	1	4750		100 year storm	303.50		684.00	686.28	684.86
686.32	0.00277	1.52	200.10	105.21		0.19			
Tributary	1	4750		500 year storm	615.69		684.00	686.89	
686.97	0.00454	2.33	265.88	110.85		0.26			
Tributary	1	4530		100 year storm	303.50		684.00	686.03	686.03
686.04	0.00066	0.73	415.50	219.53		0.09			
Tributary	1	4530		500 year storm	615.69		684.00	686.37	686.02
686.39	0.00157	1.26	489.93	222.97		0.15			
Tributary	1	4528			Culvert				
Tributary	1	4500		100 year storm	303.50		683.30	684.80	684.80
685.52	0.07709	6.59	45.01	146.10		0.97			
Tributary	1	4500		500 year storm	615.69		683.30	685.00	685.00
685.13	0.00406	1.65	226.99	148.77		0.23			
Tributary	1	4400		100 year storm	303.50		675.78	678.48	678.60
679.05	0.05829	5.88	50.39	66.08		0.70			
Tributary	1	4400		500 year storm	615.69		675.78	678.28	679.12
682.54	0.58711	17.46	37.31	62.22		2.20			
Tributary	1	3356		100 year storm	303.50		667.67	671.01	671.01
671.02	0.00152	1.99	514.13	604.14		0.21			
Tributary	1	3356		500 year storm	615.69		667.67	671.09	671.02
671.12	0.00484	3.62	560.74	609.00		0.38			
Tributary	1	3306.66*		100 year storm	303.50		667.39	670.21	670.03
670.28	0.00775	4.18	251.04	441.91		0.49			
Tributary	1	3306.66*		500 year storm	615.69		667.39	670.62	
670.69	0.00689	4.42	449.13	511.66		0.48			

Tributary	1	3257.33*	100 year storm	303.50	667.11	669.64	
669.72	0.00806	4.06	237.96	364.42	0.51		
Tributary	1	3257.33*	500 year storm	615.69	667.11	670.09	
670.16	0.00730	4.42	405.46	389.19	0.50		
Tributary	1	3208.*	100 year storm	303.50	666.83	669.08	
669.15	0.00799	3.75	231.10	320.68	0.50		
Tributary	1	3208.*	500 year storm	615.69	666.83	669.56	
669.63	0.00714	4.17	388.38	337.34	0.49		
Tributary	1	3158.66*	100 year storm	303.50	666.56	668.54	
668.59	0.00764	3.34	225.97	281.34	0.48		
Tributary	1	3158.66*	500 year storm	615.69	666.56	669.06	
669.12	0.00672	3.83	377.58	298.47	0.48		
Tributary	1	3109.33*	100 year storm	303.50	666.28	668.02	
668.06	0.00694	2.89	223.02	246.69	0.45		
Tributary	1	3109.33*	500 year storm	615.69	666.28	668.59	
668.65	0.00610	3.47	370.05	264.40	0.45		
Tributary	1	3060	100 year storm	303.50	666.00	667.57	
667.60	0.00552	2.40	227.77	216.44	0.39		
Tributary	1	3060	500 year storm	615.69	666.00	668.17	
668.23	0.00545	3.15	362.62	233.34	0.42		
Tributary	1	3014.8*	100 year storm	303.50	665.78	667.36	
667.39	0.00563	2.47	225.54	211.79	0.40		
Tributary	1	3014.8*	500 year storm	615.69	665.78	667.95	
668.01	0.00564	3.24	357.75	229.16	0.43		
Tributary	1	2969.6*	100 year storm	303.50	665.56	667.13	
667.17	0.00583	2.55	222.80	209.62	0.41		
Tributary	1	2969.6*	500 year storm	615.69	665.56	667.73	
667.79	0.00588	3.34	353.55	227.55	0.44		
Tributary	1	2924.4*	100 year storm	303.50	665.33	666.91	
666.95	0.00596	2.59	222.79	211.11	0.41		
Tributary	1	2924.4*	500 year storm	615.69	665.33	667.51	
667.56	0.00600	3.38	353.99	228.88	0.44		
Tributary	1	2879.2*	100 year storm	303.50	665.11	666.69	
666.72	0.00582	2.57	228.20	216.04	0.40		
Tributary	1	2879.2*	500 year storm	615.69	665.11	667.29	
667.34	0.00580	3.32	365.59	242.12	0.43		
Tributary	1	2834	100 year storm	303.50	664.89	666.50	
666.52	0.00463	2.29	261.55	245.39	0.35		
Tributary	1	2834	500 year storm	615.69	664.89	667.11	
667.14	0.00460	2.94	419.87	275.01	0.38		
Tributary	1	2770.5*	100 year storm	303.50	664.27	666.17	
666.19	0.00484	2.67	251.98	237.92	0.37		
Tributary	1	2770.5*	500 year storm	615.69	664.27	666.77	
666.82	0.00485	3.32	406.26	270.23	0.40		
Tributary	1	2707.*	100 year storm	303.50	663.64	665.81	
665.85	0.00513	3.04	241.39	230.78	0.40		
Tributary	1	2707.*	500 year storm	615.69	663.64	666.41	
666.47	0.00517	3.69	391.13	264.71	0.42		
Tributary	1	2643.5*	100 year storm	303.50	663.02	665.42	
665.47	0.00562	3.44	227.36	224.12	0.42		
Tributary	1	2643.5*	500 year storm	615.69	663.02	666.03	
666.09	0.00557	4.07	373.06	257.73	0.44		
Tributary	1	2580.*	100 year storm	303.50	662.40	665.00	

665.07	0.00609	3.79	211.80	214.25		0.45		
Tributary	1	2580.*		500 year storm	615.69		662.40	665.61
665.69	0.00610	4.45	352.78	251.20		0.47		
Tributary	1	2516.5*		100 year storm	303.50		661.77	664.53
664.62	0.00686	4.18	193.44	203.87		0.48		
Tributary	1	2516.5*		500 year storm	615.69		661.77	665.13
665.23	0.00696	4.89	329.44	246.88		0.50		
Tributary	1	2453.*		100 year storm	303.50		661.15	663.97
664.09	0.00833	4.66	172.56	186.06		0.53		
Tributary	1	2453.*		500 year storm	615.69		661.15	664.59
664.72	0.00791	5.29	309.32	246.51		0.53		
Tributary	1	2389.5*		100 year storm	303.50		660.52	663.34
663.47	0.00942	4.90	168.95	189.90		0.56		
Tributary	1	2389.5*		500 year storm	615.69		660.52	664.14
664.24	0.00585	4.68	351.08	266.04		0.46		
Tributary	1	2326		100 year storm	303.50		659.90	663.14
663.17	0.00207	2.54	310.65	225.12		0.27		
Tributary	1	2326		500 year storm	615.69		659.90	663.96
664.00	0.00200	2.97	518.66	288.12		0.27		
Tributary	1	1658		100 year storm	303.50		657.96	661.60
661.66	0.00247	3.03	253.83	196.62		0.30		
Tributary	1	1658		500 year storm	615.69		657.96	662.42
662.49	0.00252	3.57	422.68	210.71		0.32		
Tributary	1	1360		100 year storm	303.50		658.00	659.91	659.74
660.16	0.01443	4.79	110.93	141.83		0.67			
Tributary	1	1360		500 year storm	615.69		658.00	660.25	660.25
660.73	0.02381	7.02	164.38	169.74		0.89			
Tributary	1	1281			Culvert				
Tributary	1	1252		100 year storm	303.50		656.64	659.13	658.71
659.35	0.02336	4.25	83.02	260.75		0.55			
Tributary	1	1252		500 year storm	615.69		656.64	659.57	659.25
659.61	0.00445	2.14	380.55	284.40		0.25			
Tributary	1	1222.6*		100 year storm	303.50		656.44	658.95	
658.97	0.00413	1.77	241.50	257.61		0.23			
Tributary	1	1222.6*		500 year storm	615.69		656.44	659.44	
659.48	0.00464	2.20	373.97	281.64		0.25			
Tributary	1	1193.2*		100 year storm	303.50		656.24	658.82	
658.85	0.00418	1.81	240.32	257.77		0.23			
Tributary	1	1193.2*		500 year storm	615.69		656.24	659.30	
659.34	0.00488	2.27	367.35	280.53		0.26			
Tributary	1	1163.8*		100 year storm	303.50		656.05	658.70	
658.73	0.00423	1.84	238.38	257.16		0.23			
Tributary	1	1163.8*		500 year storm	615.69		656.05	659.15	
659.19	0.00526	2.36	357.55	279.44		0.27			
Tributary	1	1134.4*		100 year storm	303.50		655.85	658.58	
658.61	0.00426	1.87	236.59	255.25		0.24			
Tributary	1	1134.4*		500 year storm	615.69		655.85	658.98	
659.03	0.00586	2.49	343.55	277.02		0.29			
Tributary	1	1105		100 year storm	303.50		655.65	658.45	
658.48	0.00434	1.91	235.54	251.50		0.24			
Tributary	1	1105		500 year storm	615.69		655.65	658.78	
658.84	0.00727	2.74	320.88	271.36		0.32			

Tributary	1	810		100 year storm	303.50		653.84	657.29
657.31	0.00358	1.83	313.52	483.02		0.21		
Tributary	1	810		500 year storm	615.69		653.84	658.29
658.30	0.00078	1.08	871.58	603.13		0.10		
Tributary	1	587		100 year storm	303.50		653.78	657.03
657.04	0.00059	0.81	556.34	528.20		0.09		
Tributary	1	587		500 year storm	615.69		653.78	658.21
658.21	0.00023	0.65	1298.48	706.29		0.06		
Tributary	1	463		100 year storm	303.50		653.23	657.02
657.02	0.00007	0.30	1281.40	776.36		0.03		
Tributary	1	463		500 year storm	615.69		653.23	658.20
658.20	0.00005	0.33	2331.59	973.00		0.03		
Tributary	1	357		100 year storm	303.50		652.40	657.01
657.01	0.00002	0.20	2268.67	1143.99		0.02		
Tributary	1	357		500 year storm	615.69		652.40	658.19
658.19	0.00002	0.22	3658.26	1203.42		0.02		
Tributary	1	183		100 year storm	303.50		652.14	657.01
657.01	0.00001	0.15	2669.07	1134.99		0.01		
Tributary	1	183		500 year storm	615.69		652.14	658.19
658.19	0.00001	0.19	4082.09	1242.80		0.01		

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : LSI Existing

River: Tributary Reach: 1 RS: 6850 Profile: 500 year storm
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.
River: Tributary Reach: 1 RS: 5930 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was 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.
River: Tributary Reach: 1 RS: 5930 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was 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.
River: Tributary Reach: 1 RS: 5500 Profile: 100 year storm
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.
River: Tributary Reach: 1 RS: 5500 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4530 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm
Warning:During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of
energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm Culv: Culvert #1
Warning:During the culvert inlet control computations, the program could not balance the culvert/weir flow. The reported
inlet energy grade answer may not be valid.
Warning:During the culvert outlet control computations, the program could not balance the culvert/weir flow. The reported
outlet energy grade answer may not be valid.
River: Tributary Reach: 1 RS: 4500 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4500 Profile: 500 year storm
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.
River: Tributary Reach: 1 RS: 4400 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 500 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3356 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Tributary Reach: 1 RS: 3356 Profile: 500 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3306.66* Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3306.66* Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
River: Tributary Reach: 1 RS: 2389.5* Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 2389.5* Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 500 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1658 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1658 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1360 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1360 Profile: 500 year storm
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 1281 Profile: 500 year storm
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 1252 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 1105 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1105 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 357 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Tributary Reach: 1 RS: 183 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 5862 Profile: 100 year storm
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.
River: Walker Run Reach: 1 RS: 5862 Profile: 500 year storm
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.
River: Walker Run Reach: 1 RS: 5547 Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5547 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5282 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5282 Profile: 500 year storm
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Upstream
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Upstream
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Downstream
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 100 year storm
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 500 year storm
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest,

valid, energy was used.
River: Walker Run Reach: 1 RS: 5107 Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5107 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 4995 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4810 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 4735 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4735 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3972 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3972 Profile: 500 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm
Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
Note: The weir over a bridge is submerged, the energy answer was used.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Downstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm
Warning:The pressure flow/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest,

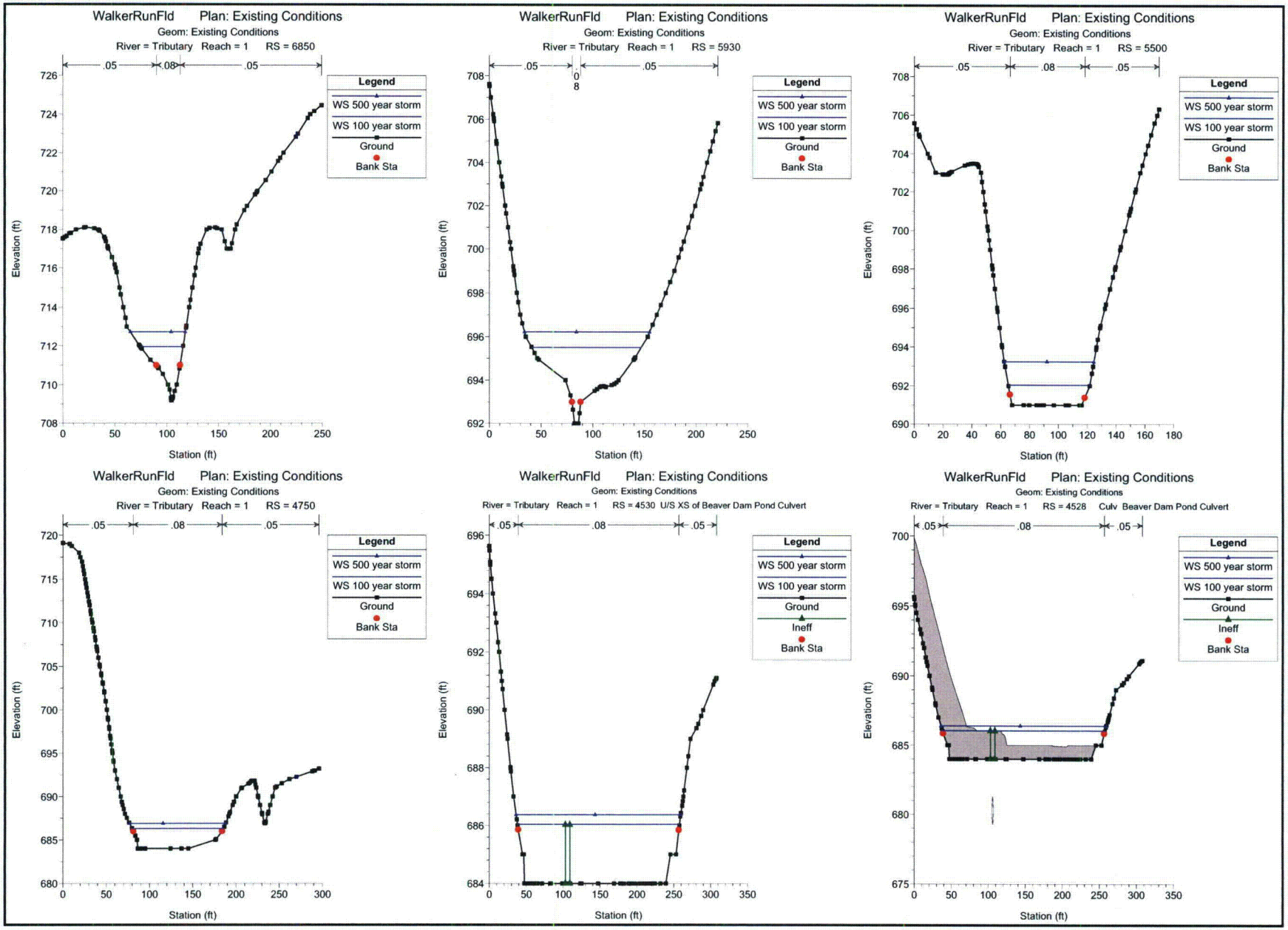
valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3785 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 3785 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3735 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was 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.
River: Walker Run Reach: 1 RS: 3735 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was 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.
River: Walker Run Reach: 1 RS: 3532 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The 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.

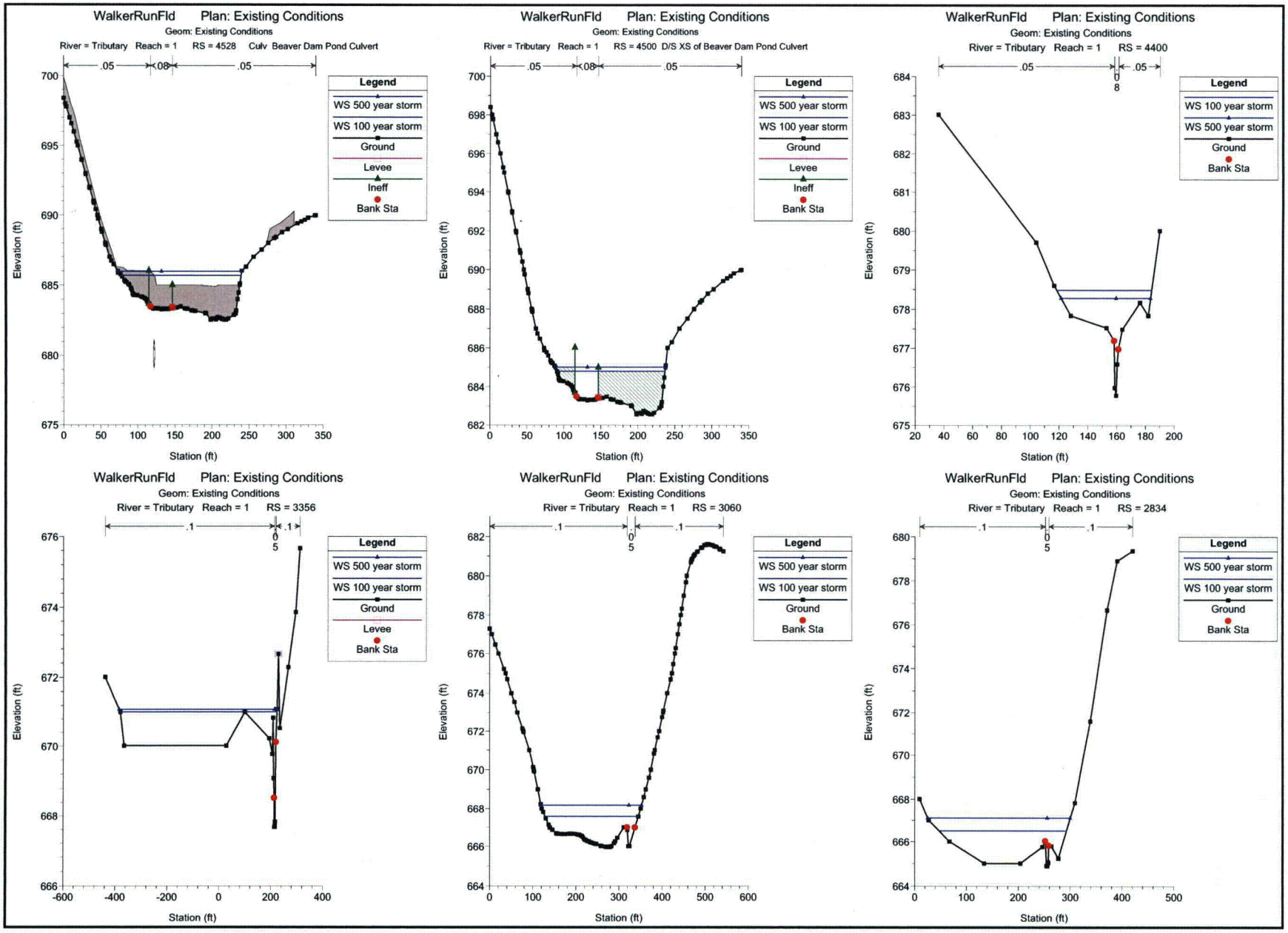
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 3532 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3410 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3410 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 3375 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3375 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3278 Profile: 100 year storm
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.
River: Walker Run Reach: 1 RS: 3278 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3065 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3065 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2949 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2730 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2634 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2634 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy

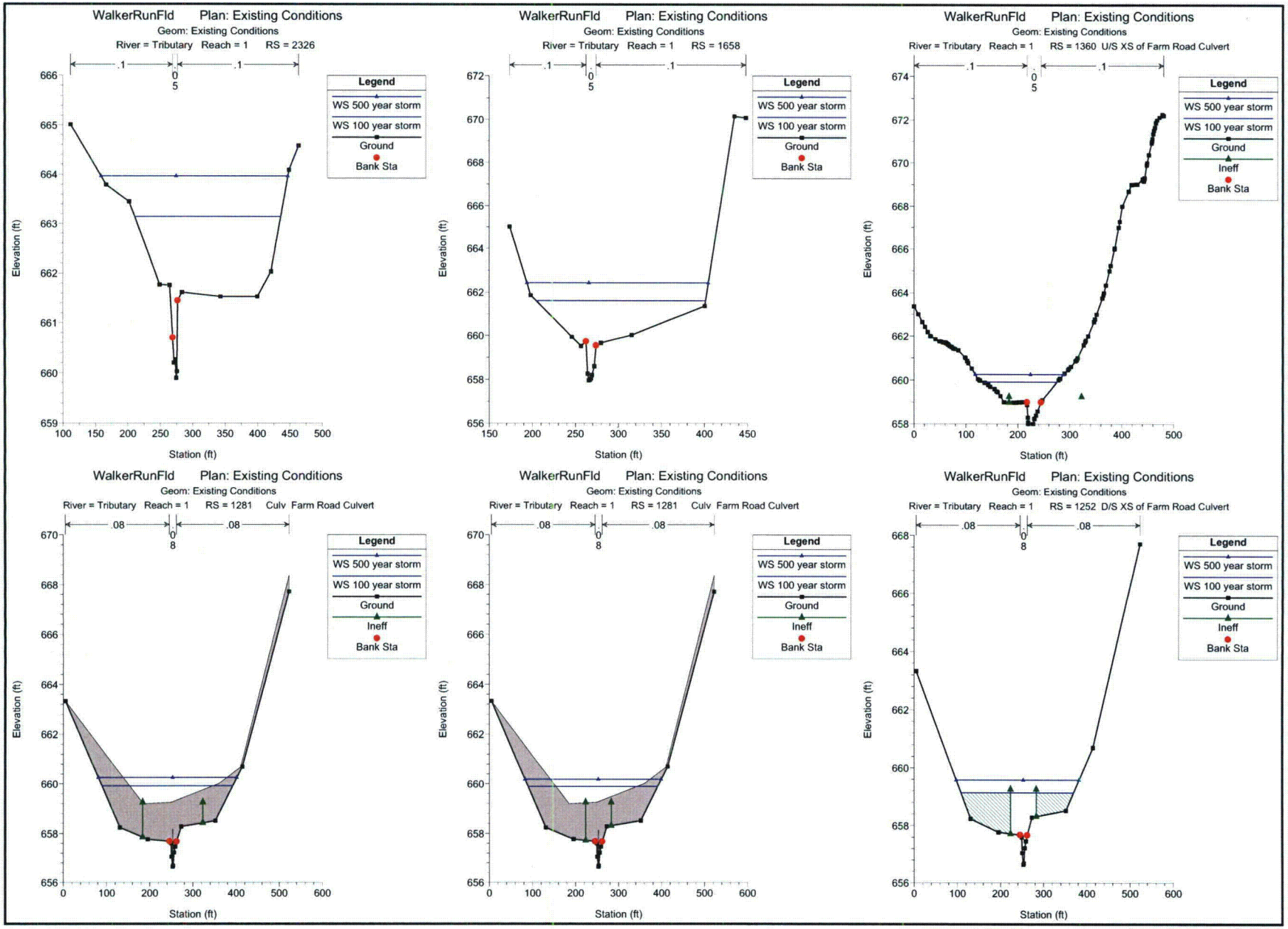
have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm
Warning:The pressure flow/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2462 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2462 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2339 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
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.
River: Walker Run Reach: 1 RS: 2339 Profile: 500 year storm
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.
River: Walker Run Reach: 1 RS: 2274 Profile: 100 year storm
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.
River: Walker Run Reach: 1 RS: 2274 Profile: 500 year storm
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

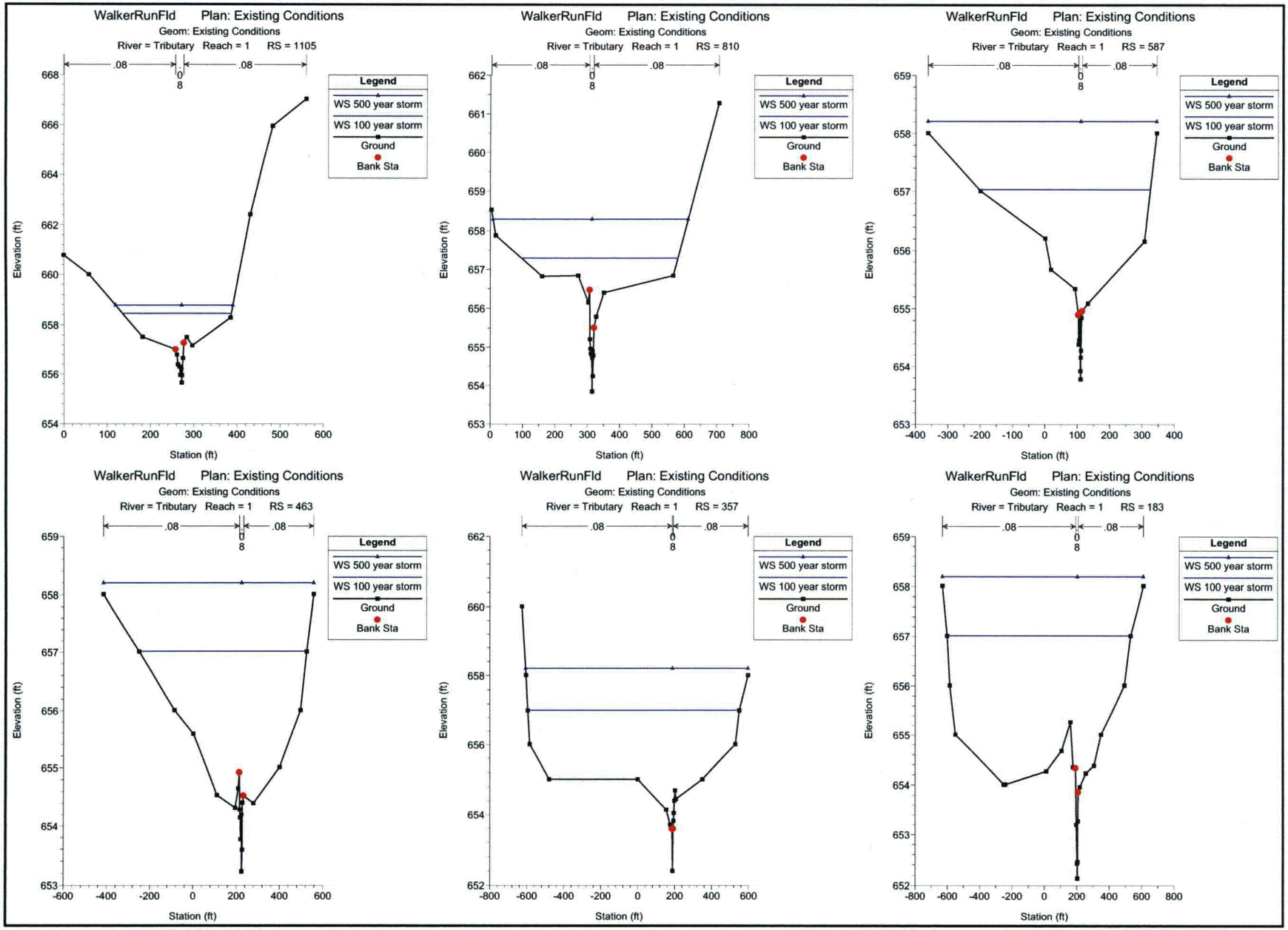
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 2139 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 2139 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 1925 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1602 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1402 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 884 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 884 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 715 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 350 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 185 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 185 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 011 Profile: 100 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: 011 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy

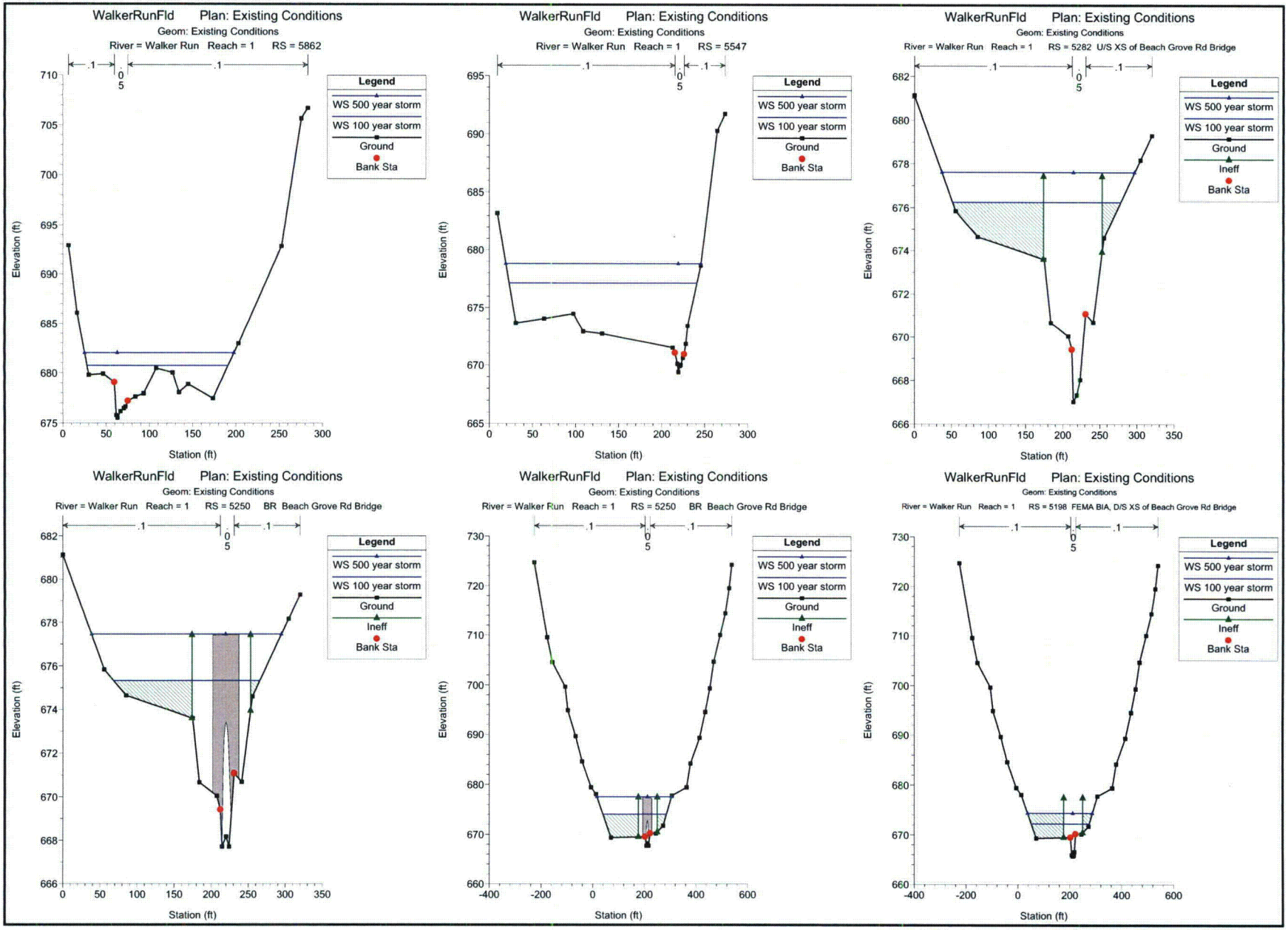
have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from
the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: -78 Profile: 100 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -78 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -154 Profile: 100 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -154 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.

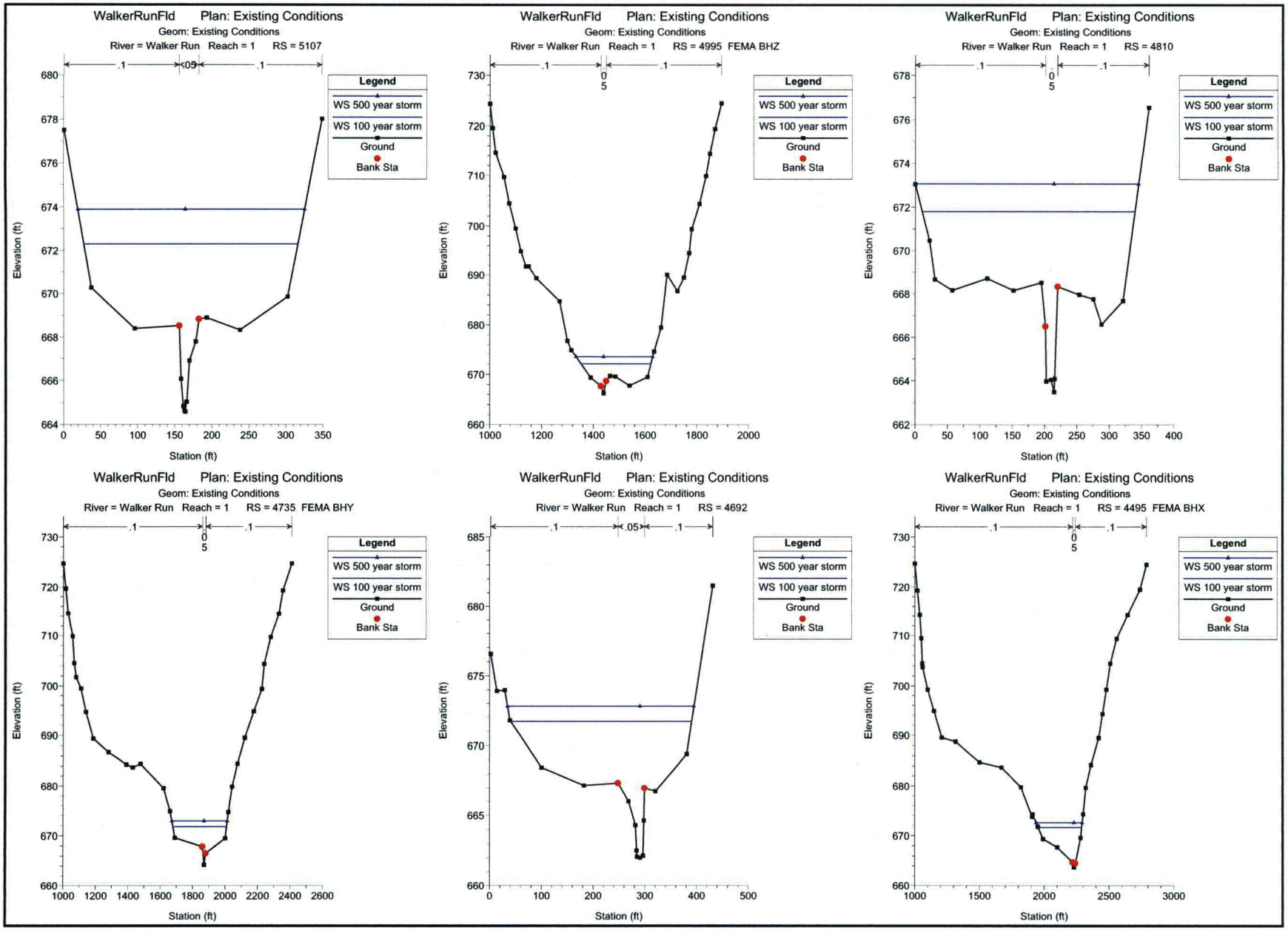

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 6850
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 5930
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 5500
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4750
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4530 U/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

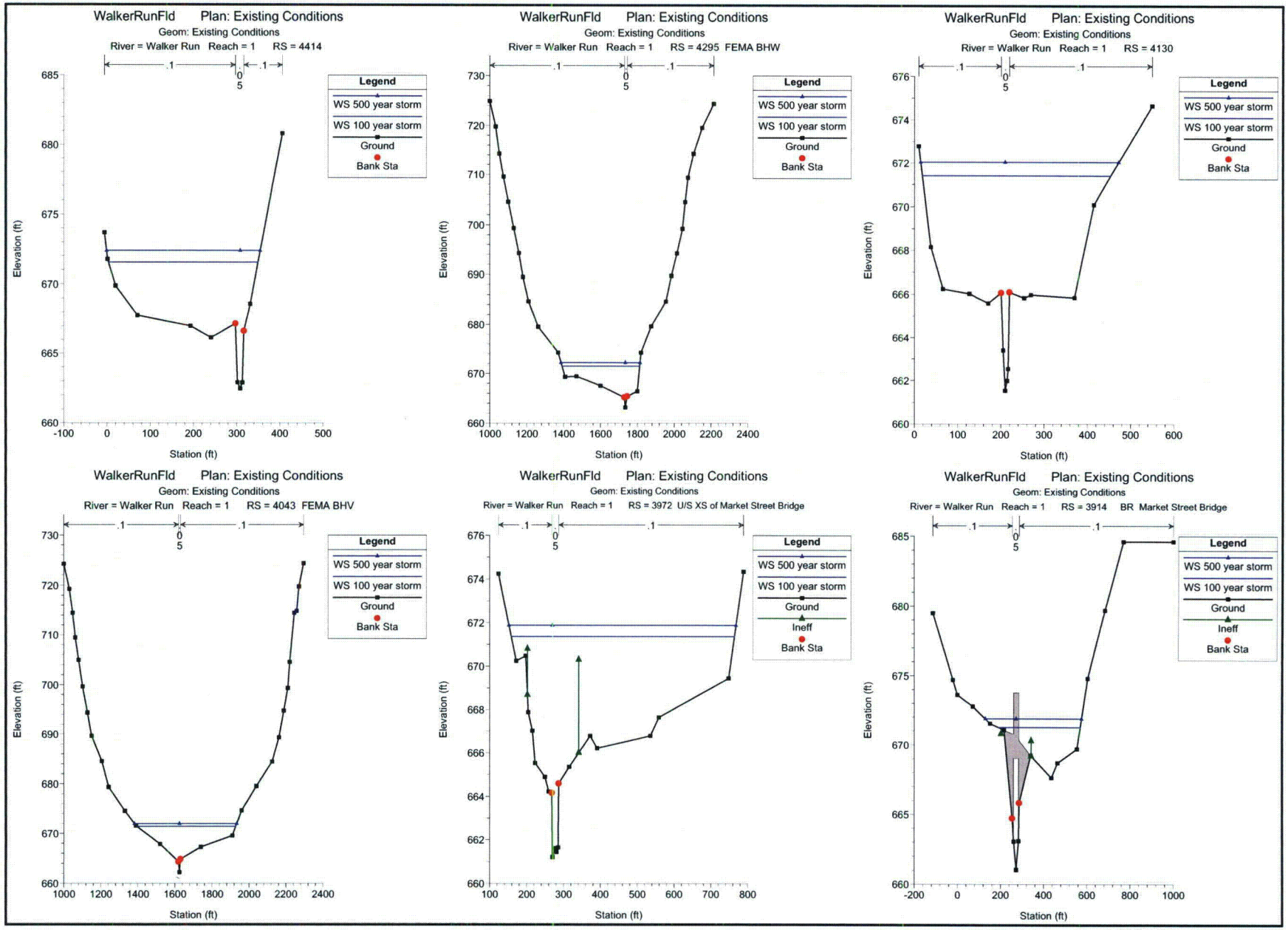

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4500 D/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4400
.05 .05
Legend
WS 100 year storm
WS 500 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 3356
.1 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 3060
.1 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 2834
.1 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

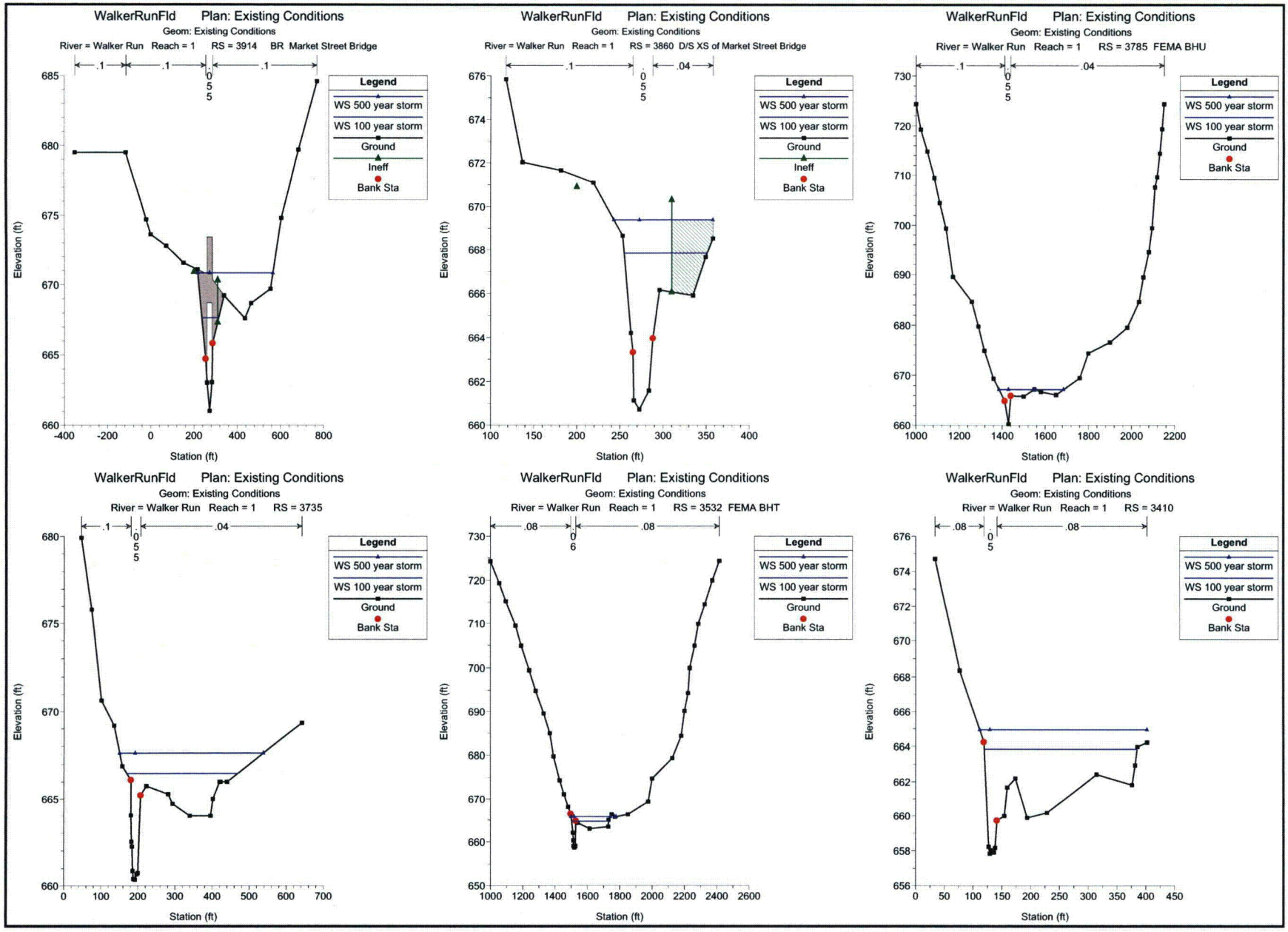

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 2326
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1658
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1360 U/S XS of Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1281 Culv Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1281 Culv Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1252 D/S XS of Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

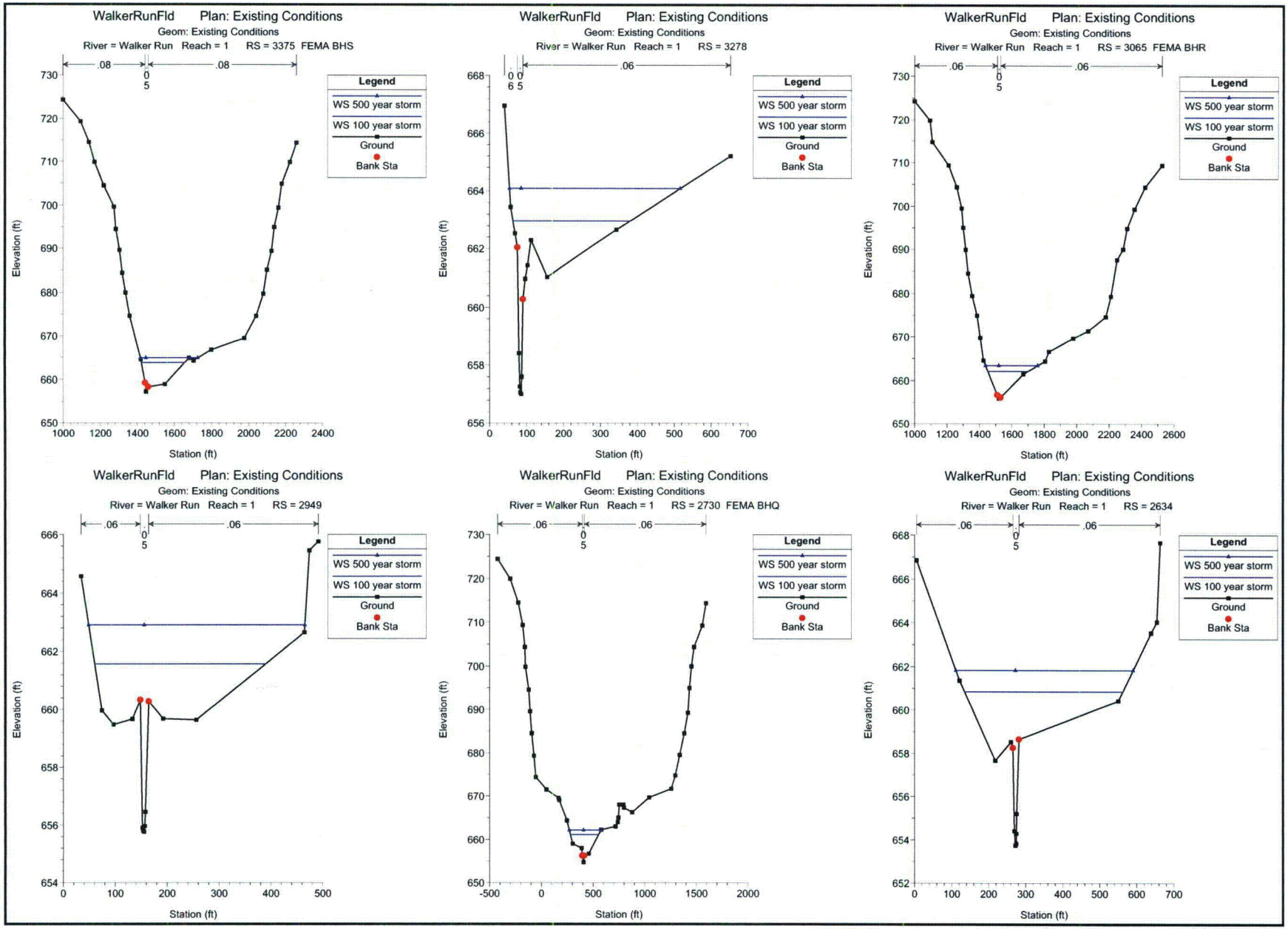

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1105
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 810
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 587
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 463
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 357
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 183
.08
.08
0
8
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

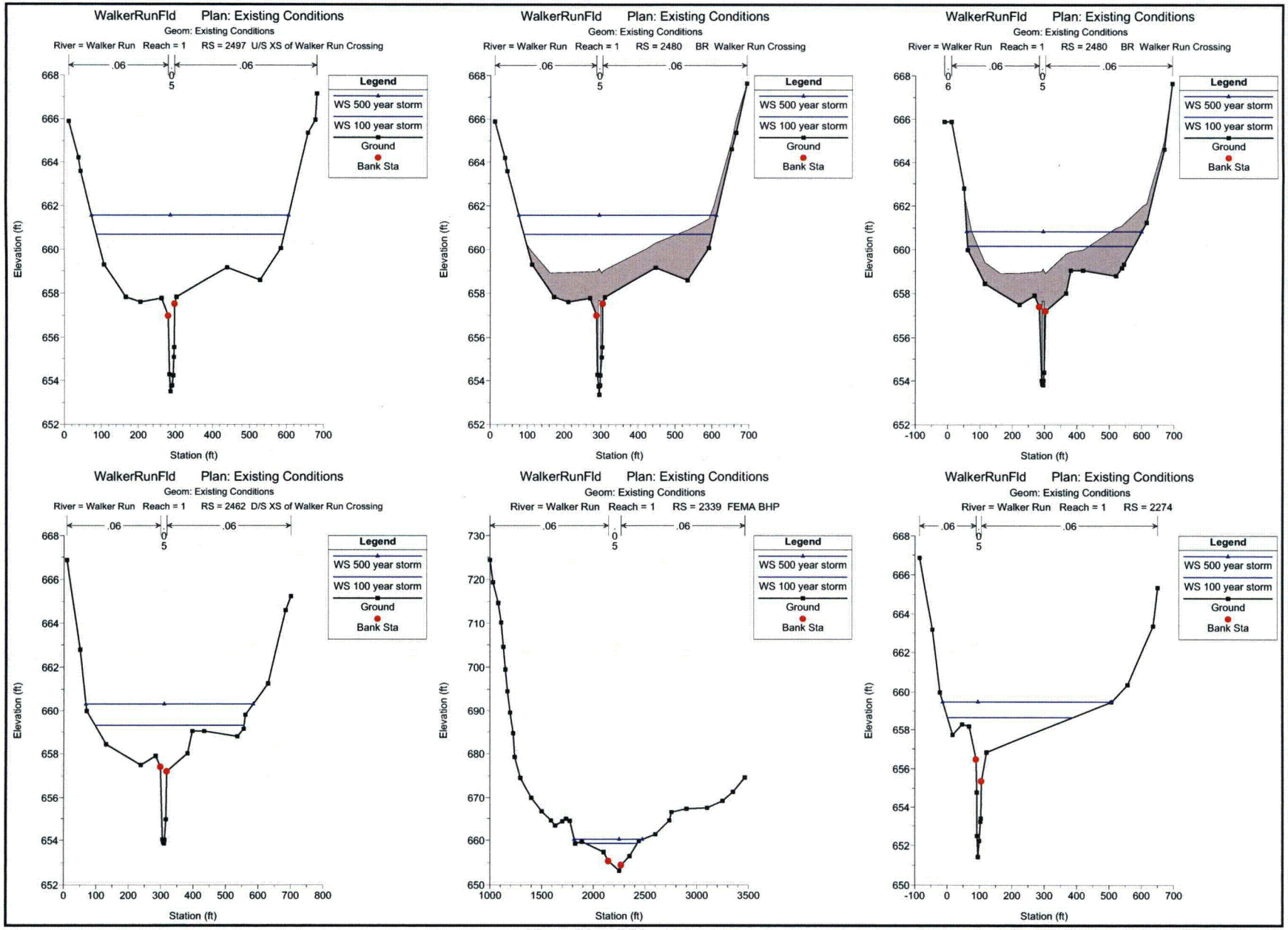

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5862
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5547
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5282 U/S XS of Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5250 BR Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5250 BR Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5198 FEMA BIA, D/S XS of Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

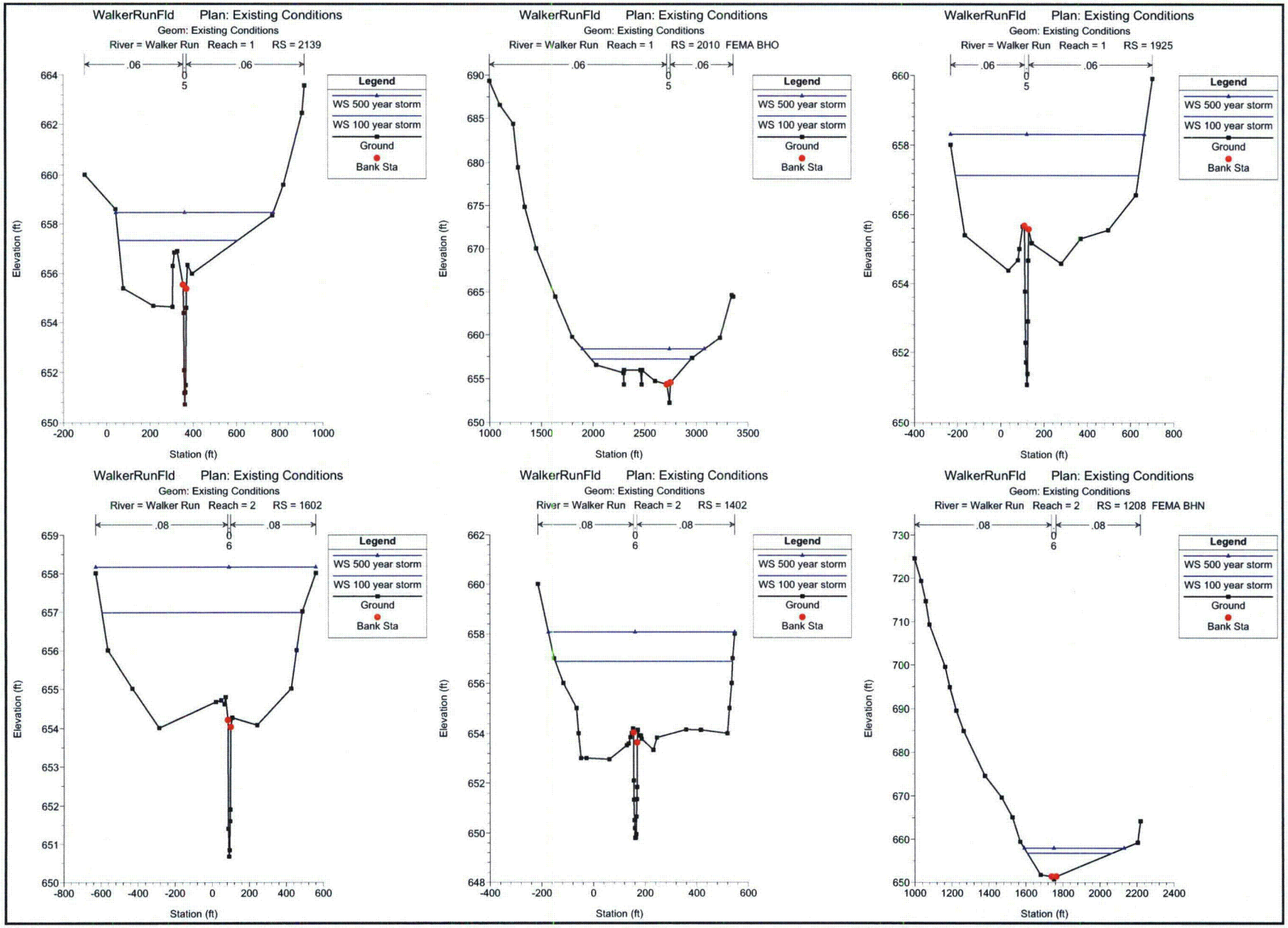

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5107
.1 .05 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4995 FEMA BHZ
.1 0 .1
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4810
.1 0 .1
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4735 FEMA BHY
.1 0 .1
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4692
.1 .05 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4495 FEMA BHX
.1 0 .1
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

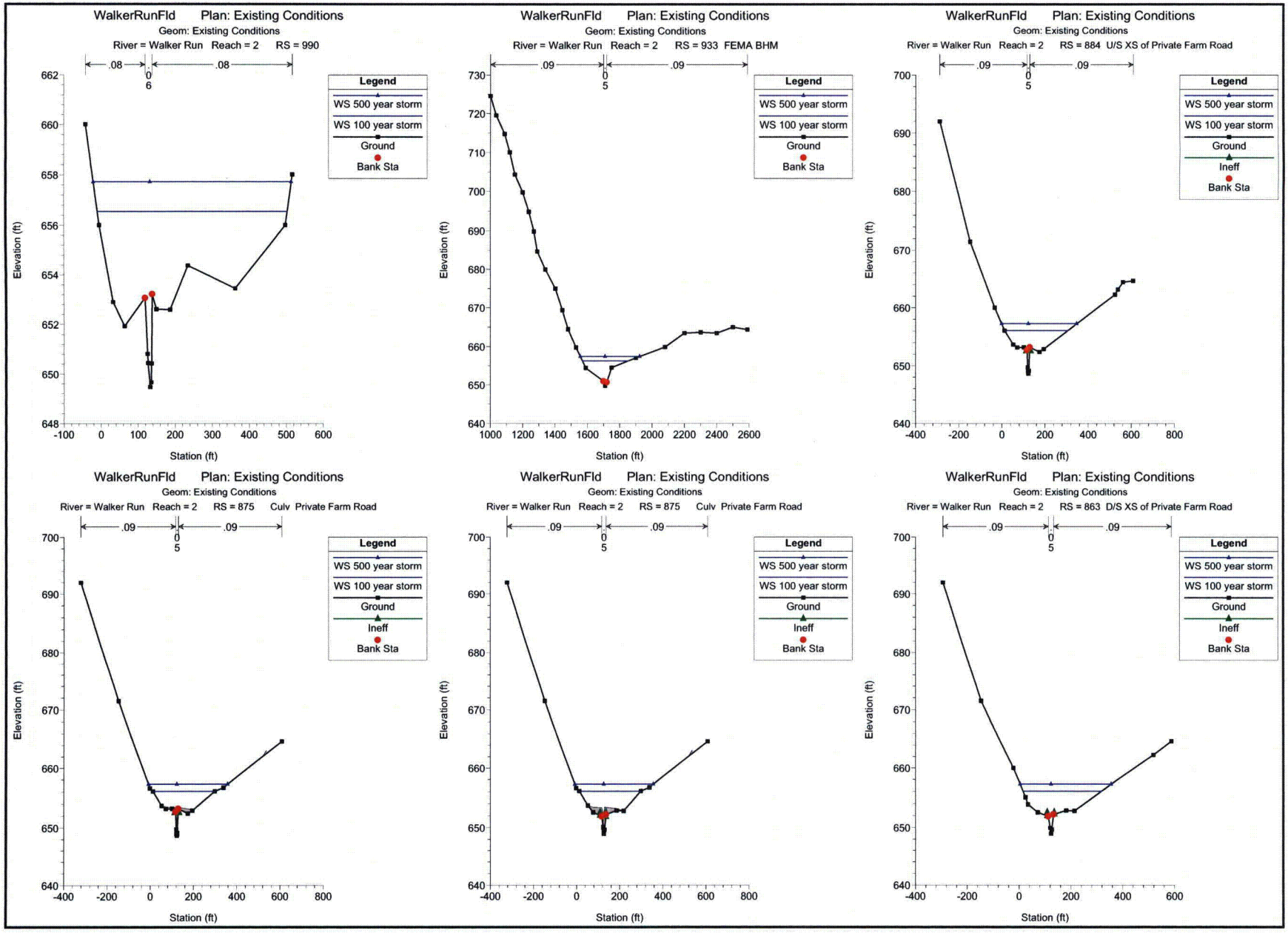

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4414
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4295 FEMA BHW
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4130
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4043 FEMA BHV
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3972 U/S XS of Market Street Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

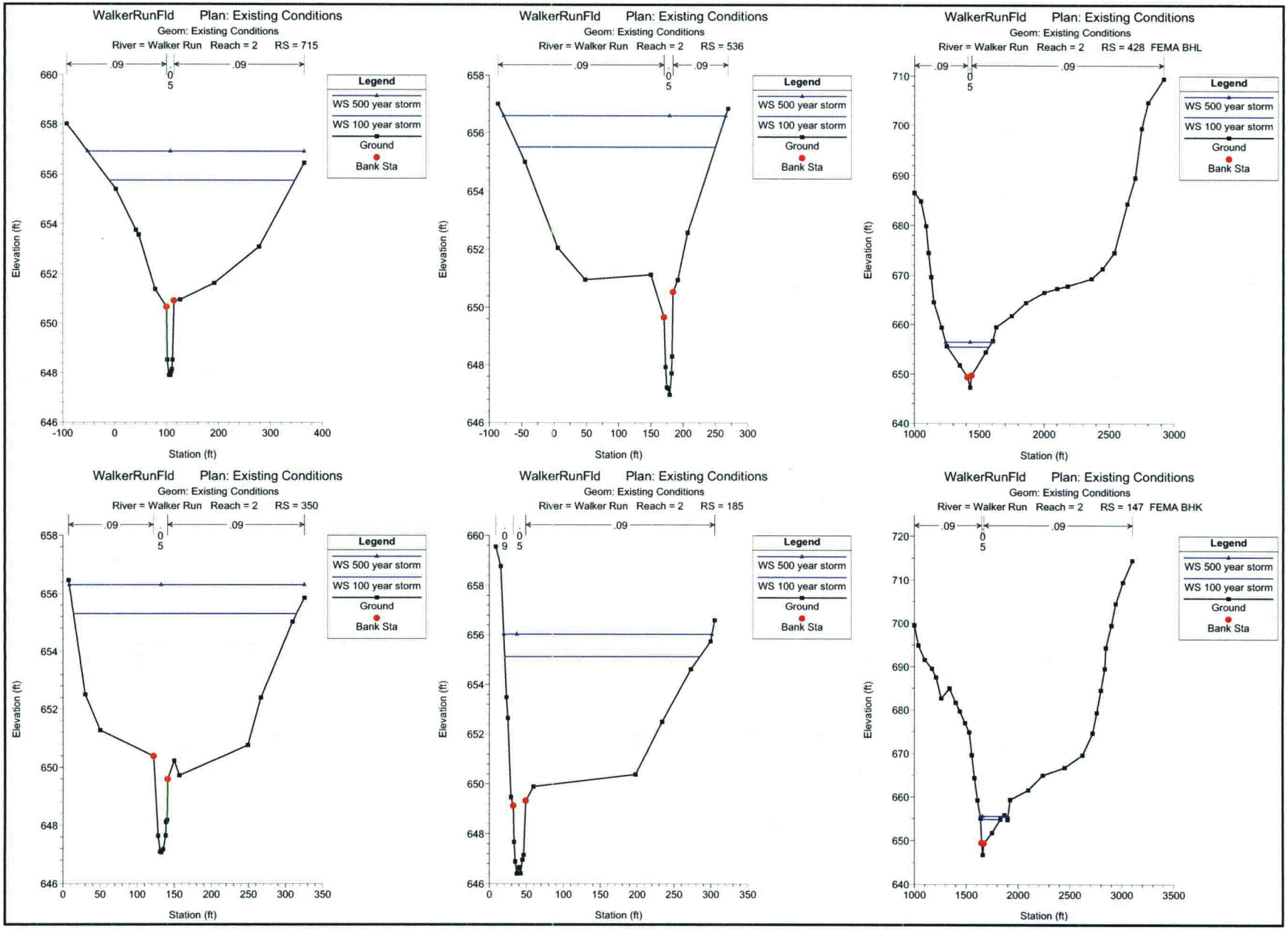

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street Bridge
.1 .1 .05 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3860 D/S XS of Market Street Bridge
.1 .05 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3785 FEMA BHU
.1 .05 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3735
.1 .05 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3532 FEMA BHT
.08 .06 .08
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3410
.08 .05 .08
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

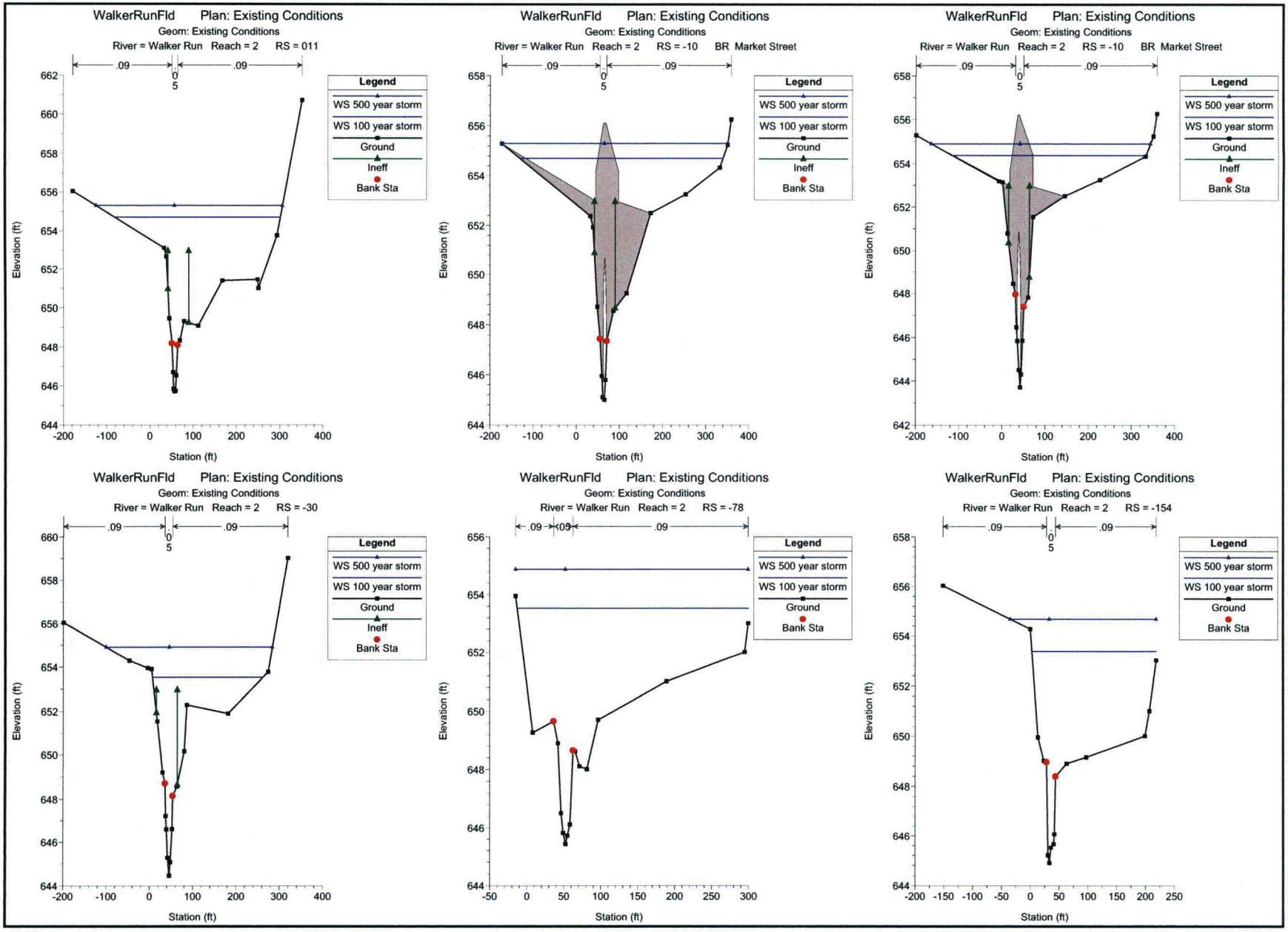

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3375 FEMA BHS
.08
.08
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3278
.06
0 0
6 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3065 FEMA BHR
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2949
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2730 FEMA BHQ
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2634
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

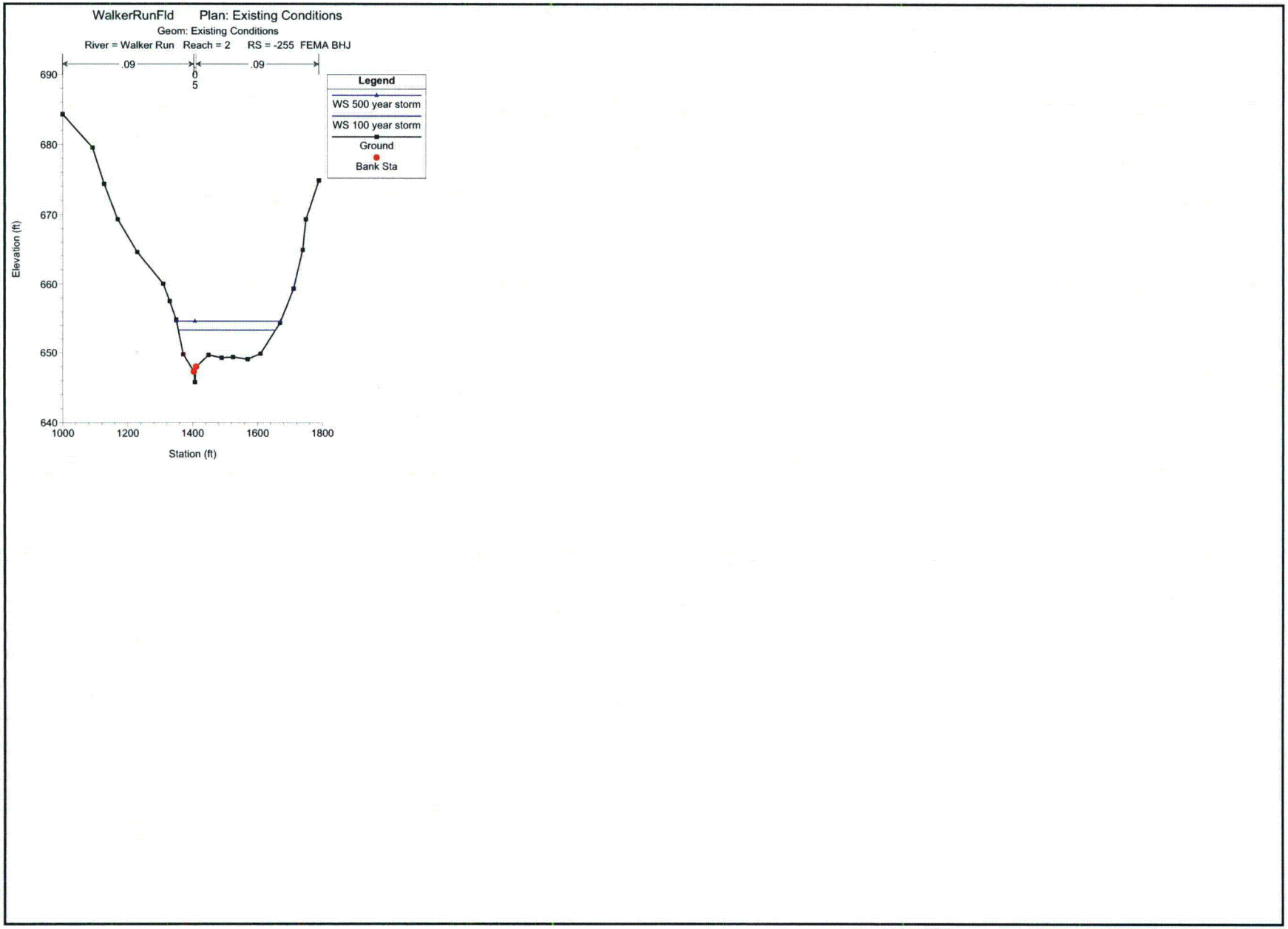

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2497 U/S XS of Walker Run Crossing
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2480 BR Walker Run Crossing
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2480 BR Walker Run Crossing
.06
.06
0
6
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2462 D/S XS of Walker Run Crossing
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2339 FEMA BHP
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2274
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

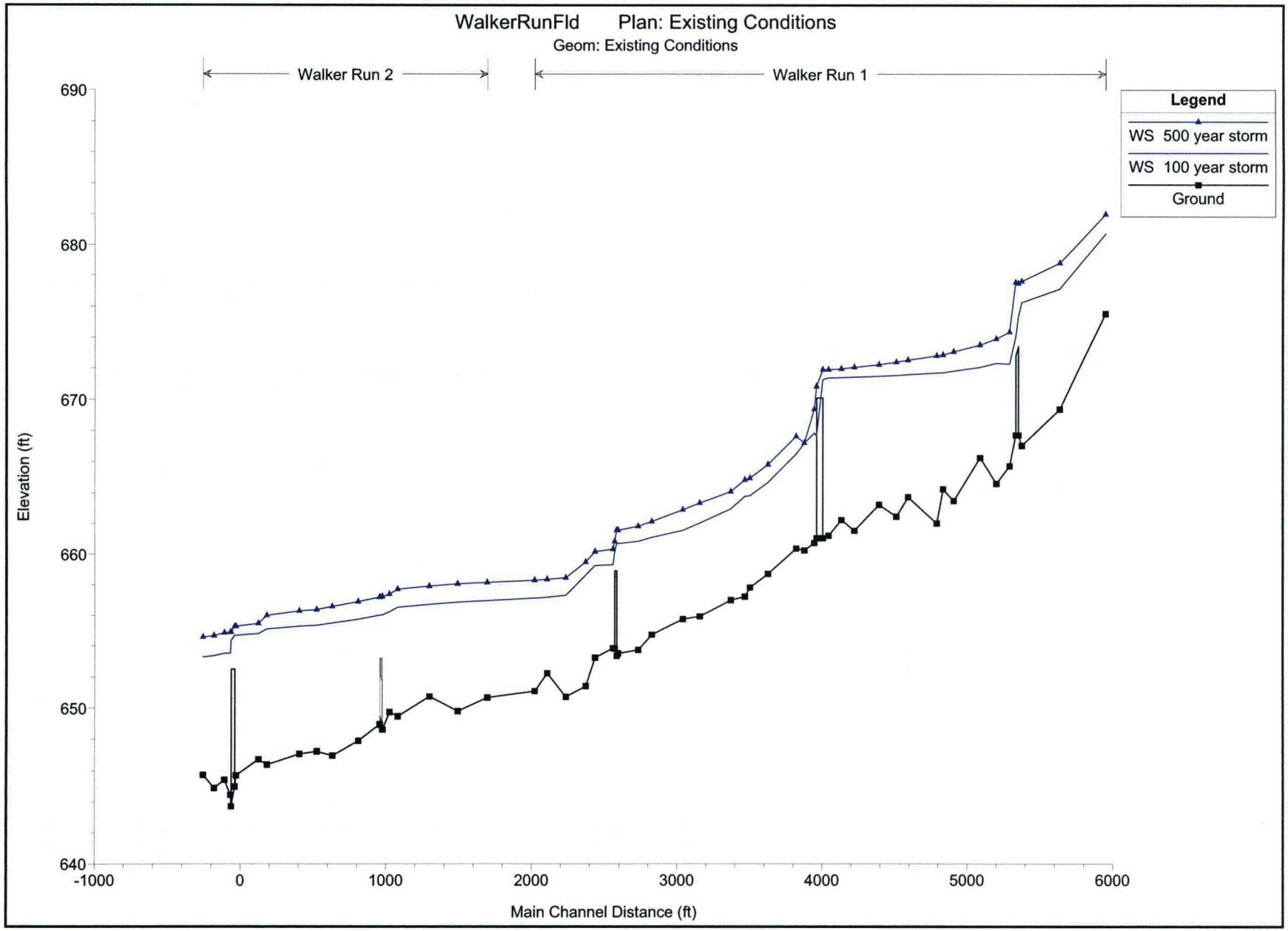

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2139
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2010 FEMA BHO
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 1925
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1602
.08
.08
0
6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1402
.08
.08
0
6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1208 FEMA BHN
.08
.08
0
6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

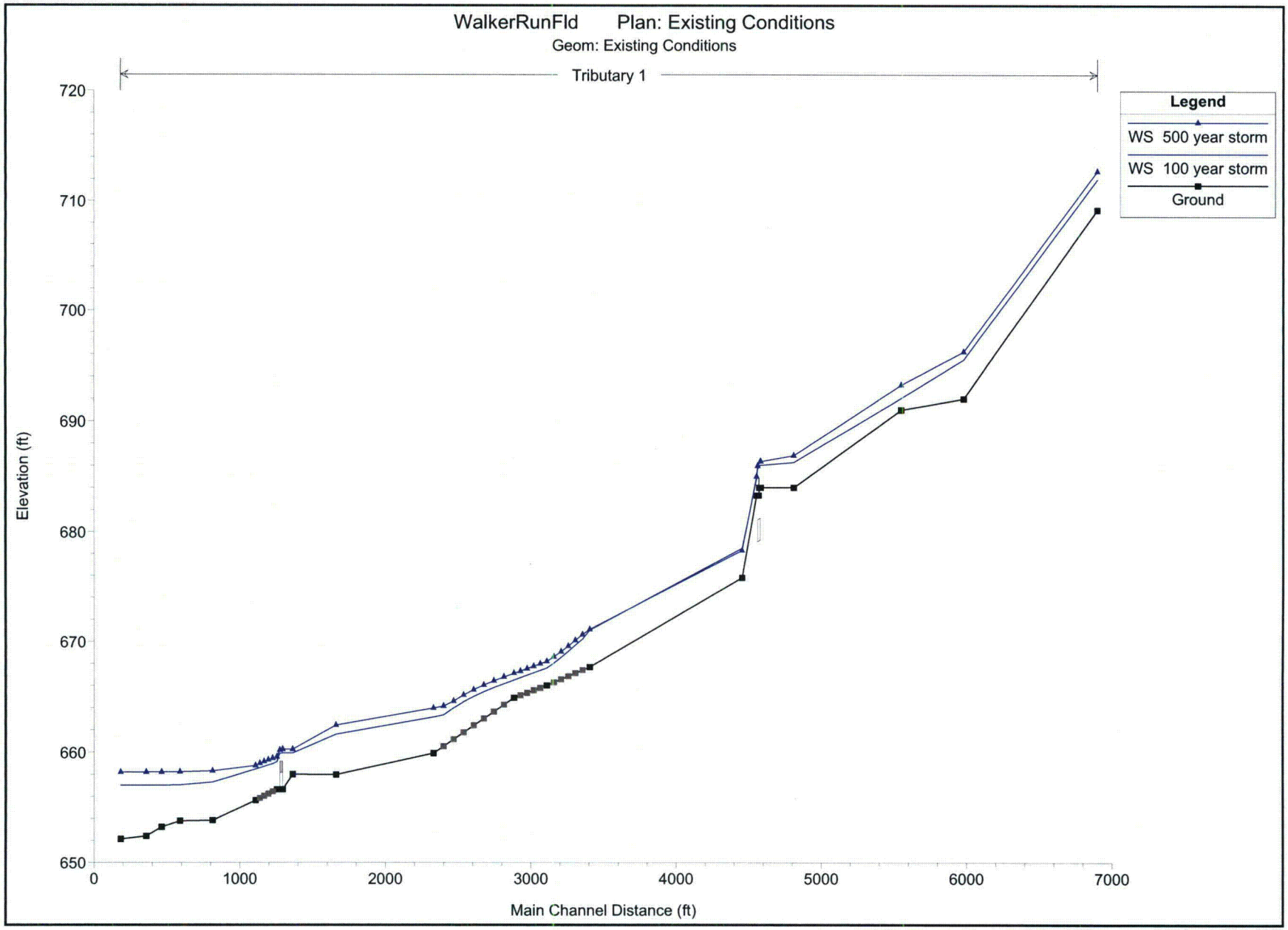

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 990
.08
.08
6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 933 FEMA BHM
.09
.09
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 884 U/S XS of Private Farm Road
.09
.09
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
.09
.09
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
.09
.09
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 863 D/S XS of Private Farm Road
.09
.09
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 715
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 536
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 428 FEMA BHL
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 350
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 185
.09
0
9
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 147 FEMA BHK
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 011
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -10 BR Market Street
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -10 BR Market Street
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -30
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -78
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -154
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -255 FEMA BHJ
.09
0
5
.09
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
690
680
670
660
650
640
1000
1200
1400
1600
1800
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
Walker Run 2
Walker Run 1
Legend
WS 500 year storm
WS 100 year storm
Ground
Elevation (ft)
690
680
670
660
650
640
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
Tributary 1
Legend
WS 500 year storm
WS 100 year storm
Ground
Elevation (ft)
720
710
700
690
680
670
660
650
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)